Summary of Recommended Urban Freight Research Topics

Generated at the Transportation Research Board 2018 Annual Meeting Urban Freight Workshop

1. Purpose

This document summarizes priority research topics/statements generated by participants of an Urban Freight Workshop that was held on January 7, 2018, during the 2018 TRB Annual Meeting in Washington, DC. It is intended to share ideas that will support U.S. and international freight practitioners, planners, and researchers to collaborate more effectively to advance the urban freight state of the practice. The workshop was co-hosted by the Federal Highway Administration (FHWA) and European Commission (EC), and co-sponsored by the TRB Committees on Urban Freight Transportation, Freight Transportation Planning & Logistics, and International Cooperation.

FHWA will track how many of the research topics listed here are implemented over time. **If you engage in research on any of the listed topics, please email urbanfreightresearch@dot.gov with your name, topic, and how you plan to investigate the issue.**

FHWA can assist to link you to key partners and suggest potential funding avenues or other resources.

2. Background

As the United States' population and economy continue to grow, freight movements across all modes are also expected to increase by roughly 40 percent over the next 20 years. While critical to overall economic development and our quality of life, increased freight demand will also reveal new and more complex challenges in areas ranging from safety and infrastructure to resiliency, supply chain efficiency, and others. These challenges may be particularly acute in urban areas, where most of the Nation's population currently lives and most population growth in the coming decades is anticipated to occur. Furthermore, most goods movement across the Nation either starts or ends in urban areas.

Metropolitan areas across the globe experience many of the same freight mobility challenges. To identify the highest-priority challenges and advance effective solutions to them, freight practitioners, planners, and researchers need to work collaboratively with U.S. and international partners as well as with the private sector. Collaboration is expected to lead to several benefits that include:

- **Reducing duplication**: Minimizing potentially identical efforts.
- **Leveraging resources**: Channeling scarce research dollars into the highest-priority topics.
- **Building consensus**: Creating a more cohesive voice within the urban freight community of practice to identify and advance pressing research needs.

3. Workshop Structure/Format

The workshop convened over 70 freight practitioners from around the globe. Practitioners included representatives of Federal, State, and regional/local government, the private sector, the U.S., and international research/academic communities. Through a series of facilitated discussions, the workshop provided an opportunity for participants to:

- **Exchange information on practices, initiatives, and tactics** for improved urban goods mobility.
- **Identify priority areas of research** to advance knowledge and innovation in urban freight.
- **Articulate research statements** to catalyze further collaboration.

During the workshop, participants were divided into four groups and asked a series of questions on different urban freight topics. Each group discussed their answers, identifying areas where they believed further analysis would be needed; the groups then reported on their discussion. At the end of the workshop, all participants were asked to vote on priority research topics they believed should be investigated over the coming year.

4. Next Steps

FHWA is committed to helping the urban freight community identify and investigate pressing research needs. **If you engage in research on any of the topics listed in this document, please email urbanfreightresearch@dot.gov with your name, topic, and how you plan to explore the issue.** FHWA will periodically report on efforts being researched. Upon request, FHWA can also assist freight practitioners and researchers to connect, collaborate, and link research with funding opportunities.

FHWA will also continue its partnership with the TRB Urban Freight Committee and others to host a similar event at the TRB 2019 Annual Meeting on January 13, 2019 in an effort to refine these research topics as well as to identify new and emerging themes.

5. Highest-Ranked Research Topics/Statements

The following topics received at least 5 votes during the workshop, indicating the highest-priority research topics identified by workshop attendees. See pages 3-6 of this document (Additional Materials) for the full list of topics and comments generated at the workshop.

- **Engaging the "right" players:** How do we factor in intermediary companies' perspectives (not just shippers and receivers) into freight decisionmaking?
- **Externalities and unintended consequences:** How does "free" home delivery impact congestion?
- **Interactions between freight and land use/e-commerce**: Brick-and-mortar stores are beginning to close due to the rise of e-commerce. How will this alter our land use decisionmaking and building? Do these future large, vacant parcels (such as former

shopping malls) present an opportunity for land use consolidation? For locations of freight consolidation centers?

- **Interactions between freight and land use/zoning and development:** How do we develop zoning regulations and development agreements that take truck deliveries into account?
- **Improving efficiency of supply chains:** How do we capture supply chain implications of e-commerce?
- **Linkages between freight and socioeconomics:** What is the correlation between socioeconomic segregation and freight trip generation? For instance, do wealthy areas generate more freight deliveries?
- **Overall state of practice:** What is the current freight state-of-the-practice? How do practices differ at various geographic scales (neighborhood, city, state, region, nation, and international)?

6. List of Research Statements Generated

This section provides the complete list of research statements/topics generated by workshop participants. Participants were asked to vote on their highest-priority research topics. Numbers in brackets after a statement indicates the number of votes that a particular question or comment received. Statements without brackets did not receive any votes.

Better Engaging the "Right" Players

- How do we factor in intermediary companies' perspectives (not just shippers and receivers) into freight decisionmaking? [8]
- How can existing government entities be better leveraged and partnered up to produce greater insights for freight? For example, forging a Department of Transportation—United States Parcel Service partnership to create Living Labs and deploy pilots. [4]
- What should consumers communicate to elected officials regarding their freight needs and quality of life impacts? [2]
- How do we get politicians and decisionmakers to care more about freight interests? How do we factor in the ever-changing politicians in office, and their varying policy directions into long-term freight planning?
- How are local freight champions developed? How does this vary from community to community?
- How do we ensure we're engaging small(er) companies? They make up the majority of freight traffic on the road, but often we get only the large companies' perspective.
- How do we reconcile disagreement between various actors? How can we identify and address disagreement earlier in the planning process?
- How do we identify and convey the different benefits of "coming to the table" for each stakeholder in order to successfully engage them in planning?
- How can planners/researchers better engage the shipping and retailing industry to gain deeper insight on trends, peak periods, private sector challenges, etc.? One attendee

shared the example of a recent trucking industry meeting where people weren't enthused about truck platooning.

Developing Freight Corridors

- What are the best practices of integrating freight and passenger corridors? [2]
- How do States, Metropolitan Planning Organizations (MPOs) in megaregions work together? Creation/working as corridor coalitions (ex: I-95 corridor coalition) [1]
- How do we balance what's good for a corridor (i.e., competitiveness; streamlining regulation) with what's good for the urban areas it serves (i.e., reducing negative externalities like noise and particulate pollution)?
- What security implications need to be taken into account throughout corridor development and operations?
- Are there multiple typologies of "freight corridors?" Examples: "Last 50 Feet," corridors by mode or capture of the Global Supply Chain.
- How can we better integrate freight corridors and consolidation centers into urban plans?

Externalities and Unintended Consequences

- How does the prevalence and ease of e-commerce change consumer purchasing behaviors, and what is the impact on freight purchasing patterns, generation of trips, land use, etc.? How can we help the public understand the freight logistics implications of their purchasing behaviors? [10]
- How does "free" home delivery impact congestion? [6]
- How does the rise in teleworking affect the shipping industry? Does this also correlate to an increase in work-related shipments to residential land uses? [1]

Freight Data

- Would the private sector be more willing to share its data with the public sector if academia served as an intermediary (and possibly vice-versa)? [4]
- How can we collect data on the movements of small freight vehicles? Currently, no data exists to describe what they are doing and how they fit into the larger freight context. [2]
- What role can social media play in mining deeper insights on freight logistics and planning? [1]
- How can we leverage automation to obtain better real-time freight flow data?
- How can we gain access to better and more detailed data for global supply chain commodity flows?
- How can we gain better data to understand how the transportation networks are used (volumes, vehicle trips, etc.)?
- What barriers currently exist to developing better real time data?

- How are commodities moving between modes? We need better data about intermodal connections.
- How do we collect data and insights on what delivery conditions result in delivery routes being created?
- How can we develop better models to make inferences from incomplete data? It is likely impossible to collect all necessary data.

Improving the Efficiency of Supply Chains

- How do we capture the supply chain implications of e-commerce? [10]
- The current model is to take goods to people, but a new, emerging model makes people go get their goods (e.g. lockers). However, every operator has their own locker system. What are the advantages and disadvantages of incentivizing freight locker consolidation among several private operators?
- What is the optimal timing for loading zones relative to peak traffic hours?

Interactions between Freight and Land Use

- Brick-and-mortar stores are beginning to close due to the rise of e-commerce. How will this alter our land use decisionmaking and building? Do these future large, vacant parcels (such as former shopping malls) present an opportunity for land use consolidation? Or for locations of freight consolidation centers? [5]
- How do we develop zoning regulations and development agreements that take truck deliveries into account? [5]
- Are there specific land use typologies which are best suited for specific urban freight vehicle types? For instance, does dense urban development better facilitate the use of tricycle delivery, but not van delivery? [3]
- How will e-commerce change the value of different types of land uses?
- How do we factor in development deals which impact delivery logistics, but aren't themselves logistical inputs (e.g. developing new park space).

Linkages between Freight and Socioeconomics

- What is the correlation between socioeconomic segregation and freight trip generation? For instance, do wealthy areas generate more deliveries? [8]
- How will the emergence of personal grocery delivery companies affect people living in "food deserts"?

Miscellaneous / Macro-Level Questions

- What is the current freight state-of-practice, particularly delineating the differences at varying geographic levels (including internationally)? [7]
- How do the type of goods affect the type of freight movement it produces? For instance, as we consume more prepared food, how does that change flows/modes relative to producing and distributing fresh food? [1]

- How can cities become more nimble in responding the quick-changing shipping trends? [1]
- Should we (partially) tie public funding (for roads, development) to freight movements?
- How can we encourage/increase the prevalence of testing new technologies into regular planning processes to get a better understanding of their benefits and limitations?
- What is the "right" scale for freight planning?
- What will e-commerce look like in 5 years? How do you plan for this industry as it rapidly evolves?

7. Workshop Comments and Observations

In addition to the research topics and questions generated at the workshop, participants also offered the following general observations that may spur additional insights.

Expressed Needs

- It would be helpful to have data from trucks showing when and where they make deliveries. This would result in better planning, especially for planning (un)loading zones (including off-street parking).
- The private sector has a role in devising with innovative solutions to urban freight challenges.
- There needs to be a short-term gain for the private sector to participate.
- There is a need to develop a guidebook for establishing freight corridors. [4]
- Champions are needed for each corridor in order for them to be successful.
- It would be helpful to integrate supply chain data with vehicle data and land use data [10]

Planning

- There is a mismatch between planning and legislation, which is not discussed much in freight.
- Parcel deliveries represent a smaller overall percentage of companies' activities; this may incentivize companies to share data to benefit from a more supportive public infrastructure.
- Working through MPOs assists State DOTs (and other regional agencies) bring more stakeholders to the table. MPOs are often viewed as an "unbiased" agency.
- MPOs can try to plan freight corridors but cities have their own priorities. We need to encourage the consideration of truck movements during the early planning processes. There are not a lot of designated "freight people" in cities. Having a point person would help.

Potential Process Improvements

- The public sector could rely more on academia (or private organizations where trust has already been established), which has had success engaging with private industry.

- Going through trade groups or Business Improvement Districts for information on freight would reduce the need to contact private companies individually.
- The public sector could identify gaps and goals and ask the private sector for the minimum required data. We should treat data as a means to an end. This might help with advocacy, as well. [4]
- We need to better standardize freight language. For instance, what constitutes a "small freight vehicle?"
- Concentrating investment (federal or State) along corridors and using them as test labs could help prove a variety of freight initiatives.

General Observations

- Freight doesn't get votes; bikes and pedestrians do.
- In Europe, freight corridors are made up of 2 or 3 modes. Nodes consist of both transport and economic development centers, with both keeping in mind the environmental impact of freight transport.
- There are several barriers to adopting international best practices, including: varied governance structure (Federal, State, local); scale, distance, and size; and urban settings/typologies.
- Heterogeneous demographic data is always a challenge.
- Integrating household surveys with freight surveys could be useful. [2]

Should you have any additional questions, thoughts, or comments on this document or broader interest in Urban Freight topics, please contact any of the following:

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