Sponsored by the Metropolitan Policy, Planning, and Processes Committee (ADA20); Joint Subcommittee on Mega-regions (ADA20(1)); Intermodal Freight Transport Committee (AT045); Marine-Group (AW000); Urban Freight Transportation Committee (AT025); Freight Transportation Data Committee (ABJ90); Trucking Industry Research Committee (AT060); Freight Planning and Logistics Committee (AT015); Truck Size and Weight Committee (AT055)

A workshop on “Freight in Mega Regions” was held at the 2013 Annual Meeting of the Transportation Research Board (TRB) in Washington, DC. It took place on Sunday, January 13, 2013 from 8:00 a.m. - 12:00 p.m. at the Washington Hilton and was sponsored by
various TRB committees and subcommittees: the Metropolitan Policy, Planning, and Processes Committee; Joint Subcommittee on Mega-regions; Intermodal Freight Transport Committee; Marine Group; Urban Freight Transportation Committee; Freight Transportation Data Committee; Trucking Industry Research Committee; Freight Planning and Logistics Committee; and the Truck Size and Weight Committee (AT055). Approximately eighty (80) people attended.

The purpose of the workshop was two-fold:

- To improve freight and mega-region planning practices by developing research statements that will lead to:
  
  - precise, nationally accepted definitions of freight corridors including metropolitan and inter-mega region corridors
  
  - a better understanding of performance goals for different types of corridors in and connecting mega-regions based on use
  
  - additional research topics to be prioritized by participants

- To inform participants about the baseline body of planning work on mega-regions

The workshop was organized by a planning team co-chaired by Barbara Ivanov of the Washington State Department of Transportation. Ivanov also serves as Chair of the TRB Intermodal Freight Transport Committee. The format included three formal presentations as well as both large group facilitated discussions and small table group discussions. The workshop resulted in a series of research needs focusing on freight movements in and through mega regions. This report is a summary of the discussion and key findings.

1. Freight Mobility in the Mega Region

The workshop began with a presentation on “Freight Mobility in the Mega Region” by Dr. Catherine Ross, Harry West Professor of City and Regional Planning and Director of the Center for Quality Growth and Regional Development at the Georgia Institute of Technology. Dr. Ross provided a context for the day’s discussions by relating the question of freight in mega regions to earlier research on mega regions as geography, concept and method. She argued that the mega region problem is not a new one and proposed that researchers could learn from the earlier work of geographers, economists, and others who have grappled with the idea of “connectedness.”

She cautioned however that research on mega regions also demands new levels of inquiry. Cities may still anchor mega regions but researchers need to look at those cities with a new lens and draw upon different skill sets. Cross-border efforts, for example, need new performance metrics that incorporate customer service, finance, and information technology. Mega region cooperation needs to be analyzed from a system wide perspective
that is both horizontal and network-based. In the absence of this kind of analysis, it will be difficult to develop tools that incentive cross-border cooperation.

Dr. Ross also emphasized the importance of defining the mega region as a critical first step in developing a research agenda tied to freight movement. Most observers agree that mega regions show evidence of an economic core that drives activity within the region. At the same time, the economic diversity within the mega region connects it to other parts of the country via interstates, rail systems and inland waterways and to other parts of the world via air and water transport. Information technology facilitates it all.

The specific kinds of connections help to differentiate one mega region from another and provide context for further analysis. Ross offered the Pacific Northwest (PNW) as an example. The PNW mega region stretches from Vancouver to Portland but its intermodal connections stretch to Chicago and beyond. This suggests that the concept of the mega region is in the eye of the beholder whether in the North American, European, Asian or African context. The economic mega region is different than the institutional/political mega region which is different than the cultural mega region.

Scale also matters when defining freight corridors within and across mega regions. For the local resident, truck traffic on local streets makes for a freight corridor. Regional planners need to address that local traffic but also be concerned with shifting national and global freight flows that have an impact on the demand for infrastructure.

As a result, planning for the mega region means making the case at the local level (digging down) as well as understanding its connections at a global scale. This creates a need for micro level data (truck volumes on collector streets) as well as macro level data (commodity flows throughout the entire supply chain).

For Dr. Ross, there is room for growth in freight planning at the mega region scale and the need for a national multimodal freight strategy that provides direction to those planning efforts. There is some evidence that stakeholders agree. Dr. Ross reported on a national survey being undertaken that explores the implications of current planning approaches on the mega region. The findings indicate that freight infrastructure would benefit from an approach focused on a mega regional scale.

After her comments, Dr. Ross facilitated a discussion with workshop attendees regarding the definitions of a) mega region, b) freight corridor, c) metropolitan freight corridor, and d) inter-mega region freight corridor. Some of the key points from that discussion include:
• Perceptions of both mega regions and freight corridors depend upon scale: where you live, what you see. Impacts differ in downtown areas, rural areas and in residential communities.
• Corridors need to be scalable and connected.
• All politics is local. Infrastructure improvements at trade gateways may benefit Vermont and New Hampshire but you have to make the case that infrastructure investments elsewhere are also important to them.
• Mega regions transcend geo-political boundaries (e.g. San Diego and Tijuana). Intergovernmental planning practices and our institutional systems are catching up; but we still need a better understanding of how traditional transportation planning methods are relevant for mega regions.

2. Overview of National and International Freight Transportation Planning Practices for Mega Regions

Dr. Genevieve Giuliano, Professor, Margaret and John Ferraro Chair in Effective Local Government and Senior Associate Dean for Research and Technology at the Price School of Public Policy at the University of Southern California, provided an overview of national and international freight transportation planning practices for mega regions. She argued that mega regions were an old concept with a new label. There is a lot of research on the merging or blurring of commute sheds in large metropolitan regions, economic linkages, multiple activity centers, hierarchical spatial organizations, and fuzzy and shifting boundaries. This includes the work done on the Randstad in the Netherlands. What is new is the magnitude, scale and spatial extent of the regions involved; the intensity of interactions (more cross commuting, more trade flows and more information flows); and the growing transportation problems tied to congestion, bottlenecks and freight system capacity constraints, especially in trade nodes.

These challenges create new planning problems particularly with regard to the spatial mismatch of governing institutions. Spatial boundaries don’t respect political boundaries and they shift with growth. When this is the case, who is responsible for the planning function within mega regions? The only common thread to mega regions – particularly those on the east coast – is the federal government which is constrained from a financial perspective. States have varying levels of capacity to respond.

Government responsibility has devolved to local authorities including metropolitan planning organizations (MPOs). But MPOs can be weak and this devolution results in a fragmentation of planning and decision making with regard to infrastructure (follow the money). This translates into collaborative, bottoms up planning, the emergence of single purpose authorities and ad hoc arrangements and responses. This can be a problem for freight planning where flows are driven by supply and demand which is beyond the control of local and state government. Freight is extremely price sensitive and thus flexible so local efforts to control freight are usually unsuccessful. In addition, freight is protected by interstate commerce policy and national trade policy.
The implication for planning is that freight and its data are private. The historical roots of regional planning are in highway planning, which is dominated by passenger movements even today. Freight data is still highly aggregated. The Commodity Flow Survey (CFS) data has lots of missing values at the county level. The best data are proprietary, protected and when available, very expensive. Universities can’t access it. Budget problems preclude planning agencies from accessing it as well.

The role of exogenous factors also makes for a difficult forecasting problem. As researchers, we lack appropriate models even though flows are driven by supply and demand. There is also no widely accepted standardized approach yet. There is a lot of work on optimization models and economic supply and demand models, but they are often extensions of conventional passenger demand models applied to freight and added to a demand matrix to assign to a network. In fact, freight exhibits different temporal patterns, more long distance trips, and through trips.

Dr. Giuliano provided a comparative case study of at-grade crossings in the Seattle and Los Angeles regions. The challenging question is who pays for at-grade crossings when costs are localized but benefits are widespread. This creates a challenge as well as an opportunity from a governance perspective. Seattle’s FAST Corridor project identified a key role for the Governor’s office to play in coordinating multiple organizations with overlapping membership. The first phase of the project resulted in 12 grade separations and 3 truck access projects, facilitated by a non-binding Memorandum of Understanding (MOU) with each project individually managed and funded. State fuel and weight taxes contributed to funding.

In Southern California, the Alameda Corridor East (ACE) project was also designed to alleviate the problem of congestion on rail and highway systems. ACE was led by an MPO, in this case the Southern California Association of Governments (SCAG) but with responsibility devolved to Councils of Government (COGs) and counties within the SCAG region. While ACE was decentralized, there was much less industry participation than governmental participation. There was also no process for organization across multiple units. The result was an unfunded wish list. The difference is that there was no clear leadership and consistent industry participation. Like Seattle, a special purpose authority was created but with different results. Seattle also used voter support for the project in the form of taxes which Southern California did not do. FAST was a success because there was a shared perspective on goals and strong leadership, a smaller and more homogeneous region, and less serious environmental problems.

Dr. Giuliano summarized by identifying the key factors that lead to successes like FAST. They include vertical and horizontal intergovernmental collaboration, clear authority to act, available funding, leadership and program champions. Most successful projects really are public-private collaborations that involve community engagement with a clear understanding of risks and rewards on all sides. The current state of freight planning practice is ultimately about finding unique responses to specific problems using a bottoms-up approach to capture the needs of multiple stakeholders. When effective, they tend to include special purpose entities with a strong infrastructure focus and some pricing mechanism to ensure a funding stream.
3. Meeting Trucking Carriers’ Performance Requirements in a Mega Region-Lessons Learned

The third speaker was Dr. Elizabeth Deakin, Professor of City & Regional Planning and Urban Design and Co-Chair of the Master of Urban Design Program at the University of California, Berkeley. She discussed the obstacles to, deficiencies inherent in and benefits of integrating state and MPO planning practices.

Dr. Deakin began with a discussion of the issues facing freight carriers. Carriers want things better, cheaper, and faster. That means cost, time and reliability. Carriers face uncertainties about fuel prices, rocky labor markets and conflicts over impacts of operations. They would like a predictable legal and institutional environment from government as well as adequate infrastructure (supply, operations, maintenance) offering predictable travel times at affordable prices. Carriers also want some recognition of freight’s contribution to the economy and, in some case, help in resolving conflicts with other industry partners and affected communities.

Deakin argued that there are public policy impacts of not dealing with freight. These include cost increases. Longer and more unpredictable travel times increase transport costs; slower and less predictable delivery necessitates having a larger inventory or planning farther in advance for shipments. Not dealing with freight also means not capturing the impacts of goods movement on the infrastructure (e.g. trucks not paying for pavement damage) or on communities, which can be negative and disproportionately affect low income neighborhoods.

But freight planning is not easy. There are competing demands on funding and freight does not have as high a priority as passenger transport. There are also concerns about spending public money for projects that benefit a particular industry. All politics is local and freight can’t vote. Finally, the public sector has a difficult time planning for freight because its planning horizons differ so greatly from those of industry.

Dr. Deakin also argued that freight is understudied in part because the nature of the industry makes it difficult. Competition among freight operators and modes results in problems of data confidentiality and resistance to sharing proprietary data. Freight patterns also vary widely and can change fast making it difficult to research. There is not a stable set of flows in the economy.

In recent years however, freight has enjoyed a higher profile with both the public sector and researchers. The federal government now funds research through the National Cooperative Highway and National Cooperative Freight Research Programs (NCHRP and NCFRP) but the dollar amounts are still small. Many states have freight or freight-related plans but those plans don’t often proceed to project implementation. At the regional level, most MPOs cover freight issues in Long Range Plans (LRP) but also lack the data, money and staff to turn them into projects. At the local level, there is some work on partnerships with carriers to reduce adverse community impacts but the scale and scope of the conflicts can easily overwhelm the capacity of local agencies. Some of the work is actually being done by the
private sector. Carriers are improving logistics and testing cleaner fuels in order to save money while improving sustainability; but they are not ready to cover the full costs for needed improvements to pavement and security for example.

Dr. Deakin cautioned that a discussion of freight planning needs to account for the different approaches to mega regions taken in the US and in Europe. The US came late to the discussion of overlapping regional jurisdictions and what that meant for planning. The challenges are evident in the US, with conurbations of 7-10 million people spilling over traditional boundaries, economic powerhouses where freight demand is generated by institutions that don’t match the scale of the agencies responsible for planning to accommodate growth. An example is northern California where the Sacramento and Bay Area regions are spilling over at commute shed boundaries. This creates even greater planning challenges: capacity not keeping pace with growth, congestion, lack of intermodal perspective, inadequate data, no in-house expertise, underfunding of transport and/or reliance on inadequate locally generated funding sources, community opposition, lack of organization of freight stakeholders and difficulty in implementing new technologies due to budget shortfalls. Opportunities afforded by public-private partnerships are made more difficult (or even impossible) by a lack of enabling legislation at the state level and the lack of a willing partner in the private sector uneasy about public forums that focus on local impacts at the expense of economic benefits.

Yet, there have been successes. California’s Proposition 1B, a bond initiative that, in part, funded corridor wide improvements is a model. The voters approved it because it had something for everyone. The public had seen on-the-ground improvements like the Alameda Corridor and viewed them as success stories. Caltrans and MPO had also completed planning processes resulting in projects ready to put forward. These plans began to show the impact of goods movement on local economies. There was also significant input into the development of the proposition from freight carriers and other stakeholders. A full range of issues were identified and this helped to develop a shared purpose. The emphasis was on projects that improve both freight movement and local conditions.

For Dr. Deakin, the lesson is that it helps to document the role of freight in improving the local economy. Stakeholder groups are difficult to manage but they need to be in place in order to identify projects. It is also easier to argue for projects when you have state and regional freight data ready to use in support. She also emphasized the need to hire adequate staff to create and maintain plans that take advantage of windows of opportunity like the one offered by Prop 1B.

4. Summary of table discussions

After the presentations, the participants broke into eight different groups at various tables around the room to discuss proposed research needs tied to the movement of freight in and through mega regions. Each table reported its findings through a spokesperson. Following is a summary of the key research needs and issues offered by each group.

- Group 1:
- Get data on freight flows from content perspective and intermodal perspective (not just trip), proprietary data;
- Projects of national significance now matched by fed funds, but interstate perspective goes beyond projects of national significance, how to evaluate multistate framework, revenue sharing, multimodal strategies;
- Multi-level frameworks, how to understand data at different levels, multi-state investments;
- Big federal level corridors break up and go into smaller corridors at region’s edge; Investment in one state falls into another state, need to invest in methods to evaluate this flow;
- Best use of MPOs, how to empower MPOs to take part in larger network.

**Group 2:**
- Relationship between mega regions and freight, spillover of commute sheds, Europeans look at it as freight travel regions, spills over institutional boundaries – proves to be a challenge but idea of conflict with local communities is different in Europe because of land use planning that has separated freight from communities; in US, conflict with local government and local communities; multiple scale of issues
- Research needs – data, last mile trips – pickup and delivery, local trucks, which often generate problems with local communities, should be part of research agenda;
- Best Practices – impacts of e-commerce on warehousing and trucking; best practices for institutional arrangements
- Logistics can change very quickly based on business decisions – seems to be a major issue, documenting how it’s working and impact on freight flows would assist our understanding, e.g., relationship between warehousing location and pickup and deliveries,
- Inland waterways, used to be marginal, now becoming economic; facilitates multimodal transport but has impacts on flows; changes should be studied and documented more;
- Intergovernmental issues, partnerships with institutions, relationships between ports and states, e.g. LA vs. NY competition, role of subsidies in creating competitive forces or perceptions of competition, benefit and cost from competition and economic investments in states;
- Good role models of institutional relationships that cross state boundaries, share info to generate ideas.

**Group 3:**
- Freight corridors, looking for concept not definition; what’s the corridor with respect to trucks vs. waterways vs. rail; What are the OD data and minimum thresholds needed to define critical levels of a corridor; minimum thresholds for roads and local streets; what is a freight route vs. freight corridor (artery vs capillary); How to accommodate multiple ODs;
- Which freight flows need more data – local, regional, cross-border; statistical analysis for better understanding of flows, how are decisions made about where freight flows;
Performance goals – throughput, efficiency in a broader context, other impacts: community /health/ environmental;
Future planning needs, getting cities more engaged in planning process at regional level; what is “desirable” trade?

**Group 4:**
- Defining freight corridor (rivers, roadways, rail, port); rivers include shoreside investments; roadway improvements and designations; rail includes new investments like intermodal facilities; Defining freight corridors to incorporate governance issues (local zoning vs. regional planning, landlord ports vs. operating ports) and shared port ranges
- Defining metro freight corridor – county, requires more city interest/involvement, partnerships between regions vary, cost sharing;
- Defining mega region – federal control issues, especially regarding interstates, how improvements are funded, more complicated because it can involve multiple states and how that multi-level cooperation is facilitated; need better understanding of economic flows across and through regions to facilitate planning; Better defining relationship between freight flows and Environmental Justice issues in a mega region, including economic benefits to a community of freight.

**Group 5**
- Economic viability within different regions and relationship to movement of both people and freight; Current approaches to mega regions don’t always consider that decision making/voting, communication is instantaneous, and ties regions together;
- Data challenges; governance is not aligned with freight flows; need to understand interaction and mobility/trade between clusters; need more detailed commodity level, industry level data and ideas on how to break loose the data;
- Trying to solve the problem before we define the problem; haven’t defined the process for public policy problem, communication between data owners, researchers, and consultants is critical;
- Need to do SWOT analysis of mega regions; mega regions need to figure out what their comparative advantage is and they want to be when they grow up;
- We need to understand more of the supply chain and industry specific pieces and how they interact; figure out industries that could co-locate and how this would improve system efficiency; this could contribute to useful P3 models bringing benefits to all parties.

**Group 6**
- Develop characteristics of the mega region—some will be core, some will be unique, 30K ft. level vs. 10 ft. level;
- Policy needs – don’t have tools to make good decisions; different strategies for forecasting freight flows, proprietary data, negotiation of confidentiality
agreements, all to inform processes; do it collectively at national level to then share with local and regional levels;

- Importance of intermodality – truck, rail, air and water; interconnectivity, where are the connections the best, import vs. export vs. throughput communities, which one is better, are the intermodalities different?
- How pricing and policy decisions can influence more efficient use of infrastructure, can we do better pricing and policy incentives (public) to make private side work better; maybe DOT and Commerce could be leaders;
- Performance measures – competition, ports, states, can our national infrastructure handle all these competitive decisions, maybe national freight performance measure could be integrated into local decision making; bringing local decisions into collective decision making process to avoid tragedy of the commons.

- Group 7
  - Definitions – multistate as well as intrastate, institutional as well as user; 4 types of mega regions: economic, political, social and network (geo-spatial); differing definitions are acceptable, don’t need to have a single definition, but interdisciplinary definitions very important;
  - Implementation usually falls short of planning goals suggests need for project prioritization, selection, all important from agency perspective, need to be thinking of long term as well as day to day issues; leadership needed within each agency and at national level
  - Improvements in research for collaboration – communication, technology, all about listening to each other, good ideas but not being shared;
  - Funding – how do we get funding distribution to drive collaboration, apply it per mega region vs. state or local level; need to put performance metrics – resiliency, sustainability into common metrics that help determine funding;
  - How do we draw out more of the social perspective.

- Group 8
  - Research needs should incorporate practitioner perspective
  - Definitions - need for congress to articulate mega regions and define goals; multijurisdictional issues - need for alignment, scaling of corridors (local, state), need to develop common understandings across jurisdictions; logistics needs for megacorridors;
  - Data availability, how do we develop data at mega regional scale; willingness to share the resources, how to translate national benefits into local benefits;
  - Institutional structures – look internationally for models, particularly for private perspective (delivery distribution);
  - Funding options and strategies, especially in an increasingly devolving system;
  - Learn from previous research efforts: what has worked, what hasn’t, what are the lessons learned, what are the useful models for interaction between public and private, what are lessons from TIGER and can they be applied to mega region freight planning; what are the lessons from the rail industry (and
others) that already plan at mega region level; successful models for translating national benefits into local benefits
  o Freight industry dynamics – don’t have a good handle on what they are and how to apply them, e.g., Panama Canal impacts for east coast and west coast and impacts upstream and downstream; impacts of nearshoring and reshoring on supply chains

5. Finding Points of Consensus

Dr. Ross summarized the key points coming out of the table discussions, focusing on points of convergence. Clearly, the need for data is a consistent theme. Better (and publicly available) data helps us understand freight flows and their relationship to mega regions, however defined. Researchers need to take every opportunity to gather data to contribute to our collective understanding of those flows and their impacts.

Participants also agreed that coming to a consensus on the definition of a mega region or a freight corridor is problematic. Scale matters; and a local resident views the corridor and the region differently than someone managing flows across global supply chains. As a result, there is a great need to develop the literature on best practices that give us insight into the strategies that negotiate the conflicts at different levels.

Dr. Ross’ other key points in summary:

- Logistics are part of the solution regardless of scale. That means understanding current and future trends at different levels, for different commodities and for different industry segments like warehousing.
- Governance is the beginning and end point for discussions around planning for freight in mega regions. Intergovernmental relationships are complex and involve ports, states, the federal government, different modes and regulatory agencies across different corridors and in different regions. New levels of cooperation and new partnerships are needed. The role of MPOs is changing and planners need new sets of skills including project negotiation (with the private sector and other levels of government) to be successful. Federal control issues may actually help solve things in a comprehensive way. Multi-state involvement with intra- and interregional freight flows (collaboration on same GPS data in different regions e.g.) may provide useful guidance to MPO level planners. At the same time, connectivity scales up from the neighborhood level to the international level.
- Redefining mega regions (corridor vs. route, e.g.) and assessing freight flows begins at the local level. This is the best place to begin to define context, critical levels, and minimum thresholds. From there, it is possible to scale up.
- There is a need for new tools to aid planners in making better decisions. This includes new ways of doing old business (like surveys). These tools need to tell us not just what we’re looking at but where we want to go and should incorporate both public and private perspectives, and local and regional perspectives. Some of these tools can be learned from industry (UPS, FedEx), some from the regions (Atlanta and Birmingham, LA and Seattle) and some lessons can be learned by
manipulating existing data in new ways. The latter includes putting a freight lens
on other types of projects such as transit improvements at the city and metro
levels to observe the interplay between different levels of government, industry
and the community. We should also be looking at performance measurements
from these other projects as we attempt to develop a common metric
framework for the mega region.

- Intermodality in particular demands lessons on pricing and the role that policy
plays in pricing mechanisms.
- The focus needs to be on implementation. That’s how ground both research and
planning. Implementation moves us to the next level;

6. Research Needs

The Freight in Mega Regions Workshop was an important step in defining the mega region
in the freight context (and freight in the mega region context). Participants took on the task
of trying to define the mega region and freight corridor and identifying the kinds of data
needed to assess the relationship between freight flows and place at various scales.
Participants raised questions on mega region inter jurisdictional issues including the impacts
of local operator decisions on the larger system and how to bridge interests across
boundaries. They also articulated the need to improve linkages between freight and the
economy as a key motivation to use a mega regions framework.

A changing landscape at the federal level – in particular a new emphasis on performance
measurements – raised questions about the relationship between metrics used in planning
and the measures of success used by private industry.

While much of the discussion in both large and small group settings generated more
questions than answers, those questions are an important first step in developing a research
agenda for freight in mega regions. The key information needs may be organized as follows:

Definitions

- What defines a mega-region?
- What is the appropriate scale to measure freight flows in, through and
  between mega regions?

Data Aggregation

- Identify (and forecast) freight flows at a commodity and cluster level
- Identify (and forecast) freight flows from an intermodal perspective
- Identify (and forecast) freight flows using a mega-region and multistate
  framework (including calculations of multistate investments, and
  investments made in 1 state that benefit another)
- Identify (and forecast) freight flows that spill over regional commute sheds
How do we define the concept of a “freight corridor” (as opposed to a freight route) for trucking, rail and waterways and what corridor-wide data are needed with regard to OD, thresholds

Cross-jurisdictional Governance, Planning and Financing Issues

What changes (regulatory and otherwise) are needed to empower/encourage MPOs to take part in larger network planning and analysis?

How do we engage local cities in freight planning and address the impact of local decisions (e.g. zoning) on system-wide flows?

How do we facilitate cost sharing among cities? Can funding streams drive cooperation?

What are the lessons from state investments/subsidies in freight-related operations including the ports? What are the impacts on competition? Which models of governance allow for the greatest impact?

Are there best practices for multi-state freight planning?

How do we measure performance of corridor-wide investments: throughput, efficiency community/health/environment, resiliency, etc.? From an economic, political, social and/or network (geo-spatial) perspective? Do existing measures focus on projects at the expense of long range solutions?

What conditions would allow for use of PPP for freight investments?

Are national freight performance measures helpful for state, regional and local agencies?

What are the best practices for information sharing among freight stakeholders?

Is the TIGER grant process a useful model for prioritizing investments for mega-regions?

First Mile/Last Mile

What are impacts of first mile/last mile deliveries on mega-regions?

What are patterns of van deliveries within urbanized regions?

Changing Supply Chain Operations

What are the impacts of JIT trends on freight flows?

What are impacts of e-commerce on the distribution function and what does this mean for freight flows within mega-regions?

What are the benefits of increased use of inland waterways? Does it make economic sense?

What lessons are there from supply chain mapping that could assist regulatory agencies in better understanding the changing nature of supply chains?

What makes for an efficient intermodal connection? Where are the bottlenecks?
Economic Impacts of Freight Flows

- What tools are needed to better quantify the direct and indirect employment generated by freight flows in mega-regions?