WHAT’S ON THE ROAD AHEAD: THOUGHTS ON THE ANALYTICAL CHALLENGES OF FREIGHT PLANNING

BRUCE LAMBERT

INSTITUTE FOR TRADE AND TRANSPORTATION STUDIES
What is Freight?
Outline

• Changing Role Of Freight Transportation
• Evolving Federal Policy On “Freight Projects”
• The State DOT Response
• ITTS Work Plan For Member States
Changing Role of Freight Transportation

Zoey, remember the discussion we had about your difficulties controlling what you buy online?
3D Printing

1. Potential Disruption – Reduced inventories
2. Shipment of raw materials, not finished goods
3. Specialized parts (advanced manufacturing)
4. “Faster to market” adoption

Paper and webinar on the topic for ITTS member states this fall
Omnichannel Marketing

Integration of store front and internet spaces

More shoppers basing information on both experiences/rankings

Faster to market push for local deliveries
  ◦ Local deliveries (shared deliveries)
  ◦ Drone shipments
  ◦ At store pickup
Linkages to Global Markets

Potential for more trade agreements
Panama Canal expansion
Containerized shipping financial woes
“Reshoring” trends
Capital versus labor investment
Evolving Federal Policy on Freight “Projects”
The Evolution of Freight Programs

The Intermodal Surface Transportation Act of 1991 (ISTEA)

Transportation Equity Act for the 21st Century (TEA-21) 1998

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) 2005

MAP-21 - Moving Ahead for Progress in the 21st Century, 2012

Fixing America’s Surface Transportation (FAST) Act, 2015
National Highway Freight Network
Jason’s Law- Truck Parking by State and Highway
Some Items To Consider Regarding Truck Parking Availability

**Infrastructure**
- Convert DOT facilities into truck only rest areas
- Utilize other publically owned land in urban areas
- CMAQ/other programs

**Regulatory**
- Hours of Service studies
- Local ordinances
- Signage

**Shipper-Carrier Dynamics**
- Consider other policy actions for lessons learned: Chassis drivability, fuel surcharges, etc.
- Understand who bears the risk

**Land Use Incentives**
- NIMBYism, business permitting, etc.
- Ties to Truck routes

**Improve Operational Communications**
- Apps (Haystack, reservation systems)
- Driver notifications
- Emissions Reductions- mobile deployment

**Public Private Partnerships**
- Rest area commercialization
- Truck stop expansion
- Tax credits for temporary uses
- Infrastructure banks
Technology in Trucking Fleets

Connected Vehicles
- Platooning
- Technology Deployment
- Limited public involvement regarding infrastructure

Autonomous Vehicles
- Emerging Rulemaking
- Question of public sector investment in infrastructure
- Still with driver in vehicle
Alternative Fuels

Emerging technologies

Access to fuels can be problematic

Adoption by fleets based on satisfying cost breakpoints/gaining efficiencies
Why Do You Need Freight Data?

- FAST Act Requirements
- TIGER Grants
- Long Term Freight Planning
- Operations
- State and local Funding-planning programs
- Understand ways to support/create economic development opportunities
What is really needed?

Show economic value
Link with performance metrics
Demonstrate Private sector participation
Not seen as a “One-and-done” project
State Investment profile
The Ideal Database?
(Based on TRB Reports)

| Time (date) associated with the shipment movement itself; |
| Mode (truck, rail, water) and submode; |
| Product origin and destination, including international shipments; |
| Facility or equipment interchanges, including intermodalism; |
| Type of equipment used to move the product; |
| Product weight, density (measured in pounds per cubic foot) and value; |
| Shipment size; |
| Route used for domestic shipments. |

| Equipment movements, including repositioning empties and backhauls; |
| Other products moving on the same piece of equipment (multiple products from either the same or different shippers); |
| The economic multipliers associated with the shipment (tied to other modeling efforts); |
| Cargo ownership, including the names and addresses of the shipper, receiver, and carriage provider; |
| Tax and fuel payments tied to shipment; |
| The relationship between goods movement to the economy and jobs; |
| Timely data collection and reporting of the shipment event to others (the information is reported fairly quickly after the shipment occurred); |
| Identifying the actual product that was shipped? |
Planning for Freight

More modal balance
Largest trading partners are neighbors
Need to move along corridors

All Modes
All cargos
Discretionary routing

Within State
Mostly Trucks
Tend to be heavier products
Rural-urban flows
Urban-urban flows

To-From State

Through Freight
Regionally, we are interested in corridors
States regionally working together to improve freight planning/policy
Outline of Current Work Tasks

SHIFT Model
FEAT Model
Data Warehouse
Containerizable/Overweight cargo study
Freight in the Southeast Conference

**Training
Southern Highway Freight Interactive Tool (SHIFT)

Build on LATTIS Network

Expanded to 2014, with E&C network for Southeast States

Focusing now on training for state use
SHIFT Model - Master Network
OD Trip Tables

- **ODME Analysis**
  - 2014 Highway Network
  - AADT counts for Auto and Truck
  - Count weights by functional class
  - Seed OD trip tables for Auto and Truck

2014 Trip Table Validation
- Count cleanup
- Centroid Connector placements
- Least perturbed seed
  - Auto % Diff (-8.7%); Truck % Diff (-2.4%)

2040 Trip Table Validation
- Reasonable OD trip growth rates (TAF, FAF, ODME)
- Reasonable VMT growth rates (output from assignment)

### Data Sources

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAF 2008 Auto (DLY)</td>
<td>3,525,144</td>
</tr>
<tr>
<td>TAF 2040 Auto (DLY)</td>
<td>5,027,863</td>
</tr>
<tr>
<td>TAF AGR</td>
<td>1.64%</td>
</tr>
<tr>
<td>FAF 2007 Truck KiloTons</td>
<td>13,282,167</td>
</tr>
<tr>
<td>FAF 2040 Truck KiloTons</td>
<td>19,794,258</td>
</tr>
<tr>
<td>FAF AGR</td>
<td>1.89%</td>
</tr>
<tr>
<td>NatlFreight ‘07 Auto (DLY)</td>
<td>103,464,670</td>
</tr>
<tr>
<td>NatlFreight ‘07 Truck (DLY)</td>
<td>8,463,189</td>
</tr>
<tr>
<td>2014 ODME Auto Trips</td>
<td>94,498,219</td>
</tr>
<tr>
<td>2014 ODME Truck Trips</td>
<td>8,263,298</td>
</tr>
<tr>
<td>2040 ODME Auto Trips</td>
<td>115,072,502</td>
</tr>
<tr>
<td>2040 ODME Truck Trips</td>
<td>11,066,088</td>
</tr>
<tr>
<td>Auto ODME AGR</td>
<td>0.84%</td>
</tr>
<tr>
<td>Truck ODME AGR</td>
<td>1.30%</td>
</tr>
</tbody>
</table>
# Louisiana (Flooding Scenarios)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closure of Interstates in the State due to flooding</td>
<td>To look at larger regional disruptions along the Interstate corridors</td>
</tr>
</tbody>
</table>

**Limits**

- A. Closure of I-20 in vicinity of Bossier City
- B. Closure of I-10 in vicinity of the Sabine River
- C. Combination of A & B

**Other Scenarios**

- Adding Truck Lane
- I69
- Madras Fault
- I70 rolling lane closures
Modeling Steps

Identify project attributes and termini

Input Project IDs into the Project List

Input Project IDs into the Master Network
  ◦ Splitting of links to match described project termini
  ◦ Geographic alignment checks

Light Validation of project study area
  ◦ Add new / shift existing centroid connectors
  ◦ Verify surrounding link connectivity and attributes

Create and run new scenarios
  ◦ No Build Scenario
  ◦ Build Scenario

Summarize Results
Results – Bandwidth Flow Maps
Build Daily Volume Flows (Scenario 3_C: I-20 & I-10 Closure)
Other Projects-Freight Economic Analysis Tool (FEAT)

1. Develop a toolkit of economic tools for State DOTs to use when considering freight projects
   1. Project definition
   2. Integrator for required transportation system operations and performance data
   3. Economic analysis
   4. Reporting tools

2. Will have some multimodal freight modules

<table>
<thead>
<tr>
<th>Task</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aug</td>
<td>Sept</td>
</tr>
<tr>
<td>Project Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Develop Methodology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data Compilation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proof of Concept</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Report and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Other Projects-Data Warehouse

Data Warehouse for regional freight studies

Integration of databases into Tableau for member states
  ◦ Next week, Rollout of FAF3, FAF4 and County Business Pattern Databases

In October, Corridor Dashboard release

Training for ITTS member states in November
Other Projects-
Containerizable/Overweight Freight

Focus on potential for modal diversion
Outline the costs and supply chain implications for these cargos
Provide insights into how logistics partners can influence shipper behavior
### Freight in the Southeast Conference

**Tentative - Savannah Georgia, Feb 22-24**

<table>
<thead>
<tr>
<th>Day</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday</td>
<td>Freight data and model training, ITTS work plan meeting</td>
</tr>
<tr>
<td>Thursday</td>
<td>The Status of Southern Economy in 2040 and implications for Transportation</td>
</tr>
<tr>
<td>Friday</td>
<td>FASTlane and TIGER Grant Applications</td>
</tr>
</tbody>
</table>
Regionally, we will continue to discussing integrating Freight Analytical Data/Tools

Safety data
Regulatory data
Simulation tools for operational events
Integration with land use/business geography
Working with states to incorporate into their existing programs
NCFRP-TRB research
FHWA programs
Summary

Freight remains an evolving topic
- Technology driving a changing logistics cycle
- Federal policy emphasizing freight projects

State DOTs need to understand freight to satisfy federal and state needs

Various tools are being developed/adopted within the Southeast to help member states
If I gave West Virginia one dollar to spend on freight projects...

What would the State buy?
Thank you

Bruce Lambert
Executive Director
Institute for Trade and Transportation Studies
540-455-9882
bruce@ittsresearch.org