Innovations in Freight Planning and Project Prioritization

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Multimodal Investment and Project Prioritization
Melissa Ziegler, CDM Smith
Multimodal Project Prioritization

- Provides additional analytical rigor for decision-makers
- Integrates stakeholder input throughout process
- Creates transparency in project selection enabling citizens to “see” policies and strategies used to evaluate projects
How does a prioritization process help?

- DOTs use prioritization to identify the projects that best support their goals and foster economic competitiveness.
- Prioritization helps decision makers evaluate projects comparing a selected key factors.
- Can track performance metrics over time and compare to prioritization measures.
Decision Making Process
Missouri Multimodal Prioritization

- 3 tiered project evaluation process
- Projects prioritized by mode: highway, freight rail, ports, and airports
- Prioritization evaluation filters based on Freight Plan goals:
  - Safety
  - Economy
  - Major Maintenance
  - Connectivity and Mobility
Analysis Used in MoDOT Prioritization Process

- Geospatial analysis
- Volume to capacity ratios
- Truck volumes and crash data
- Economic link scores utilizing freight movement and jobs impact analysis
- Points for preservation and maintenance of existing infrastructure, reflecting stakeholder feedback
MoDOT Prioritization filters included:

- Improves bridges with vertical clearance or weight restrictions
- Establishes or improves rail-port intermodal facilities
- Addresses freight bottlenecks
- Improves rail safety
- Expands aviation freight services
- Supports or expands aviation/land use for air cargo operations
- Improves connections to top freight generators
PennDOT Multimodal Prioritization: Overview

- Project types: widening, new highway alignment, new or reconstructed interchange, port capacity enhancement, new rail lines or facilities, rail-highway safety improvement, rail corridor capacity or constraint, inter-regional bus/rail service
- Tool output: technical scores and economic scores for each project
PennDOT Multimodal Prioritization Analysis

- Capacity, freight, safety (CFS) factor - simultaneous consideration of freight volumes, capacity, and safety
- Improvement in V/C from project
- Improved connections to employment concentrations
- Improved connections to multimodal facilities and infrastructure
- Increase in overall throughput volumes at port resulting in ROI for Commonwealth
- Upgrading or modernizing operation of on-port facility
  Correction of obsolete design or improved functionality of interchange
- Improved connections to public transportation facilities
- Sustainable land use and transportation
PennDOT Prioritization Tool

- Project Profile CREATOR – user friendly, data selected or entered by user
- Tool extracts data from GIS database for selected information: crash data, AADT, truck volumes, mobility, connectivity
- Travel demand model provides VHT and delay inputs
- Evaluates projects across modes
CDM Smith Analytical Tools

- Innovative and Creative ideas gleaned from previous projects
- Analytical tools to help with decision making
  - Commodity Information Management System (CIMS)
  - GIS based Project Prioritization Tool
  - Travel Demand Modeling
  - Simulation Modelling
  - Visualization GIS-based Tools
  - Competitiveness Metrics

Tools save time, reduce cost, and allow evaluation of many projects simultaneously
Multimodal Prioritization and Project Funding and Financing

- Value of prioritization for funding and financing
- FAST LANE grants
- FAST Act funding
- Resilience bonds
- Value Capture Strategies
- Public-private partnership
- ???
Freight Planning
What’s Driving Freight Planning

- Federal regulations
- State legislation
- Transportation funding shortfalls
- Potential for private sector investment
- Private sector demands
- Economic development
- Funding flexibility and options
- Accountability for investments
Factors Driving Freight Demand

- Demographics
- Technology
- Trade/Industry Growth
- Institutional & Regulatory
- Logistics Industry
- Environmental & Cultural
<table>
<thead>
<tr>
<th></th>
<th>MAP-21 State Freight Plan</th>
<th>FAST State Freight Plan</th>
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<tbody>
<tr>
<td>State Freight Plan required</td>
<td>Optional (recommended)</td>
<td>Yes, as a condition for receipt of federal funding</td>
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<tr>
<td>Connection to funding</td>
<td>Yes, for approval to use 90/95% match for specific projects that also need approval</td>
<td>Yes, as a condition for receipt of federal funding</td>
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<tr>
<td></td>
<td></td>
<td>Federal funding match changed</td>
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<tr>
<td>Neighbor state coordination</td>
<td>Not required</td>
<td>Section 70101, b. (8) States should support multi-state corridor planning and creation of multi-state organizations</td>
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<tr>
<td>Planning horizon year</td>
<td>Not specific</td>
<td>5-year projection must be included</td>
</tr>
<tr>
<td>Updates required</td>
<td>Not specific</td>
<td>Minimum every 5 years</td>
</tr>
<tr>
<td>Financial Investment Plan</td>
<td>Identify projects</td>
<td>Investment Plan, fiscally constrained with priority projects identified</td>
</tr>
</tbody>
</table>
The Dimensions of Freight

- Cargo: Moving “Stuff” People Want & Need
- Supply Chain: Integrated Facilities & Processes
- Modes: Trucks, Rail, Water, Air, & Pipelines
- Economic Impacts of Freight
- Geographical: Nodes, Flows, & Networks
How we think about Freight

<table>
<thead>
<tr>
<th>Legacy</th>
<th>Today</th>
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<tbody>
<tr>
<td>Regulatory</td>
<td>Economic Development</td>
</tr>
<tr>
<td>Safety</td>
<td>Competitiveness</td>
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<tr>
<td>Capacity Needs</td>
<td>Investment Prioritization</td>
</tr>
<tr>
<td>Moving Vehicles</td>
<td>Moving People &amp; Freight</td>
</tr>
<tr>
<td>Vehicle Volumes</td>
<td>System Performance</td>
</tr>
<tr>
<td>Separate Modal Networks</td>
<td>Integrated Freight System</td>
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<tr>
<td>Separate Modal Movements</td>
<td>Intermodal Connectivity</td>
</tr>
<tr>
<td>Individual Jurisdictions</td>
<td>Commerce Corridors</td>
</tr>
<tr>
<td>Independent Decisions</td>
<td>Partnership with Users</td>
</tr>
<tr>
<td>Reactive</td>
<td>Proactive</td>
</tr>
</tbody>
</table>
Freight Mobility Plan – Holistic approach

Integrated & Balanced Approach
SUPPLY CHAIN: CORN

Seed → Feed Grain → Feed Yards → Distribution Center → Grocery Store

Farm → Grain Elevator → Food Ingredient → Food Processing Plant → Distribution Center → Grocery Store

Fuel → Equipment → Commodity → Ethanol Plant → Gas Station

Commodity → Fuel Additive → Fuel Rack → Gas Station

Commodity → DGS (Dried Grains with Solubles) → Caged Chicken Feed → Poultry Farms → Grocery Store
Supply Chain Analysis

INPUTS

- Freight System Criteria
  - Time
  - Cost
  - Capacity
  - Reliability
  - Availability
  - Connectivity
  - Safety
  - Security
  - Economic Impact

- Modal Characteristics
  - Air
  - Truck
  - Rail
  - Water
  - Pipeline
  - Transferability

- Industry Factors
  - Agriculture
  - Manufacturing
  - Distribution
  - Market Locations

OUTPUTS

- Freight System Optimization
- Geographical Development Locations
- Project Evaluation & Prioritization
- Policies & Programs

Additional Information
- Product Competitiveness
- Support Travel Demand Modeling
Key Challenges and Recommendations

Recommendations Framework

10 Freight Transportation Challenges

1. System Capacity
2. System Operations, ITS & IT
3. Safety/Security
4. Intermodal Connectivity
5. Rural Connectivity
6. NAFTA and Border Challenges
7. Energy/Environment
8. Education/Public Awareness
9. Public and Private Sector Coordination
10. Funding/Financing

3 Recommendation Categories

- Policies/Institutional
- Programs
- Projects
Data Collection & Commodity Flows

**Data Sources**
- FAF 4.1
- BTS CFS summary data
- Rail Waybill (Freight Rail)
- ATRI Data (Truck)
- Air Cargo (FAA T100)
- USA Trade data
- Water (USACE)
- State & MPO data
- NPMRDS data
- Industry data
- BLS / Census
- IMPLAN economic model
Identify your Freight Network and System

- Backbone for investment and decision-making
- Provides guidance at the local level to enhance connectors to the system
- Guides land-use and economic development decisions
Out of the Box, Into the Scenario

Enlisting a powerful tool to address the future of freight.

By DANIEL HAAKE, AICP

Transportation planners are increasingly turning to scenario planning to supplement their traditional projections based on population and job growth estimates. There are two main reasons: As the urban landscape and global stability continue to shift rapidly, linear projections have become less useful; more importantly, scenario planning allows planners to embrace a future that the community desires, not a predestined one.

Demand models need new assumptions since 2000, traffic volume increased...
Analytical Tools

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- **Tools save time and reduce cost**
- **Improve quality of analysis**
- **Support on-going planning efforts**
Freight Plan Implementation

- Integrate freight projects into overall project process
- Performance measures: data, metrics, and tracking
- Enact policies and implement programs
- Freight Advisory Committee involvement
- Continue stakeholder engagement
- Freight modal plans: rail, air, water, trucking
- Regional – District freight planning
- Information and awareness of freight
- Continuing planning process
Thank you!

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