MINNESOTA FREIGHT NETWORK OPTIMIZATION TOOL (FNOT) UPDATE

International Commerce Forum #10 | June 25, 2025

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ICM FORUM #10

- FNOT Overview
- FNOT Demonstration
  - Use Case: Quantify freight demand
  - Use Case: Find location for manufacturing plant
  - BCA Tool
- Next Steps
- Questions and Discussion

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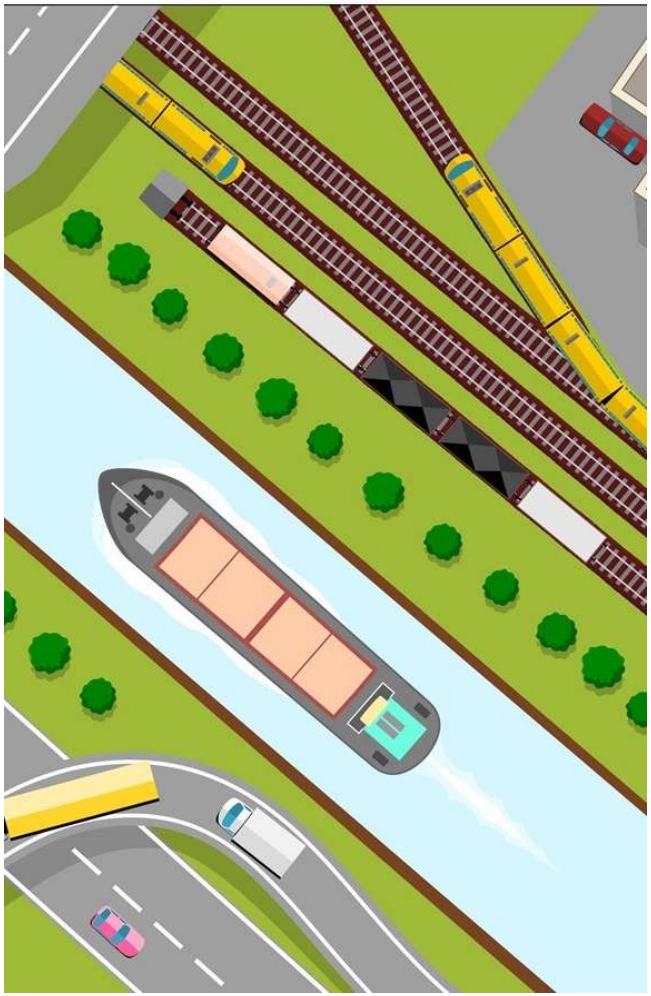
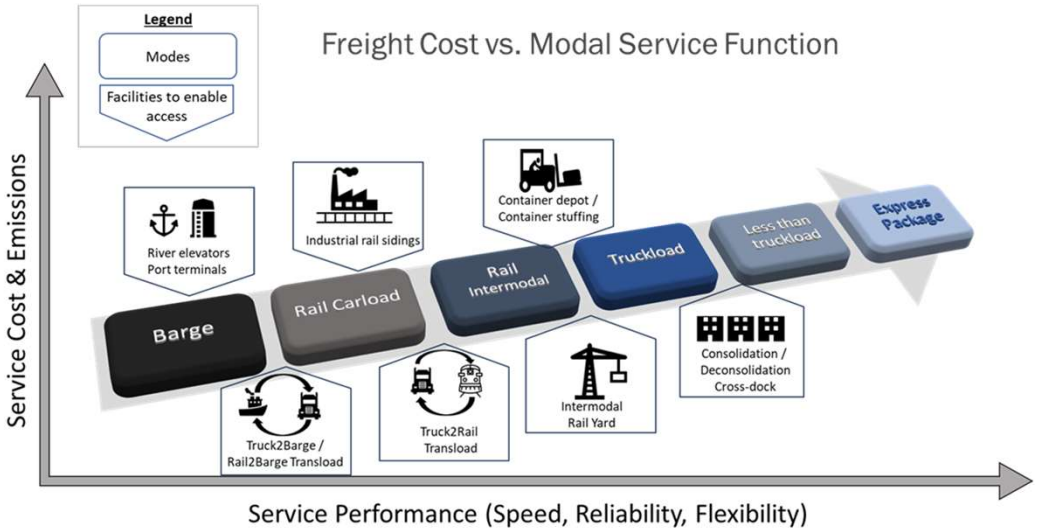


ABOUT THE MINNESOTA FREIGHT NETWORK OPTIMIZATION TOOL (FNOT)

- MN Legislature passed a bill in 2021 to procure a Minnesota Freight Network Optimization Tool with goals around:
  - Improving transportation and supply chain efficiency
  - Reducing supply chain bottlenecks
  - Developing strategic information to support economic development
- Procured under a partnership between Minnesota Department of Transportation (MnDOT) and Minnesota IT Services (MNIT)
- FNOT is an online resource for both public and private sector users to:
  - Analyze freight demand & benchmarks to identify needs & opportunities
  - Run what-if scenarios & develop business cases for investment
- Today's session will provide a preview of FNOT prototype solution that has been implemented & discuss next steps for a Fall 2025 rollout

EXPLORING OPPORTUNITIES WITH FNOT

- Users can query freight databases & explore "what if" scenarios for opportunities to:
  - Lower shipping costs & increase economic competitiveness
  - Identify market opportunities and support projected growth
  - Improve supply chain network performance, address constraints & inefficiencies
  - Reduce highway congestion, emissions & truck-related crashes, while lessening road maintenance & capital expenditures
  - Anticipate impact of changes in economic conditions or new infrastructure investments



The ability to access lower cost, more efficient transportation modes is often hindered by lack of infrastructure.

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CORE COMPONENTS OF THE MINNESOTA FNOT SOLUTION

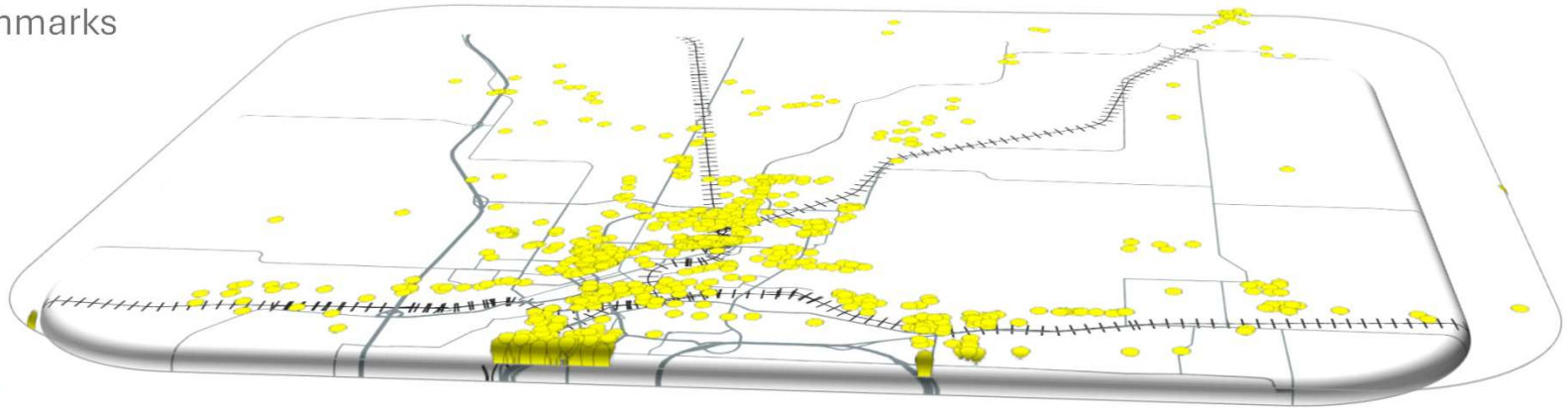
(1) Database and Source Data

- Freight Flows
  - County-level
  - Shipping Records
  - Import/Export
- Multimodal Network
  - Links and nodes
- Transportation Benchmarks
  - Shipping Records
  - GPS

Disaggregated Freight Analysis Framework Data

Enhanced with Private Sector Shipment Records & Mode-Specific Data

Import/Export Enhancement for Agriculture & Other Commodities



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CORE COMPONENTS OF THE MINNESOTA FNOT SOLUTION

(2) Network Optimization Engine & Model

- Optimization infers making something as perfect or effective as possible
- Advanced math-based approach using data to achieve the maximum or minimum value of a function
- A commonly used tool in private sector supply chain design
- A “digital twin” of the regions multimodal freight network
- What-if scenarios to simulate impacts to freight flows from changes to multimodal network

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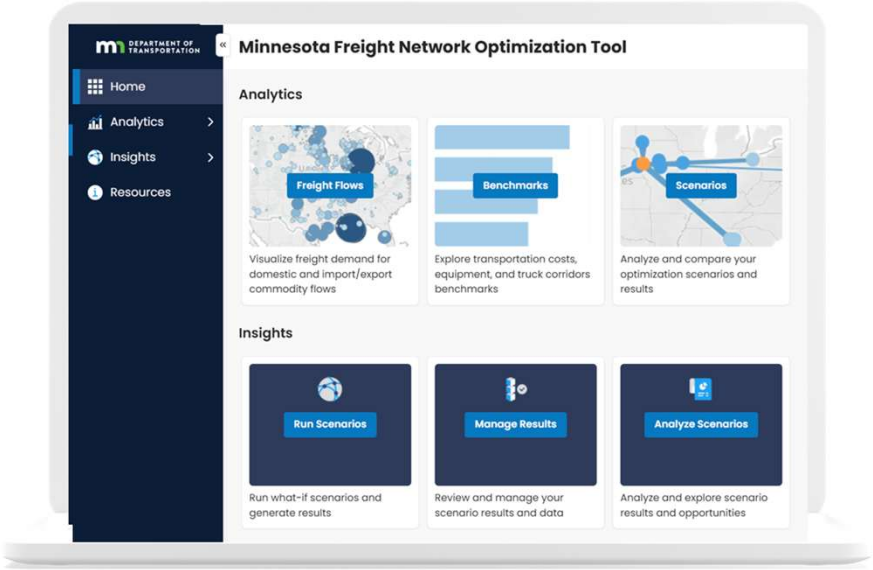
CORE COMPONENTS OF THE MINNESOTA FNOT SOLUTION

(3) Online End User Application for Data Visualization and What-If Scenario Analysis

- **Analytics**
  - Analyze the flow of goods over the transportation network (the demand for transportation services and infrastructure) and the transportation costs, equipment used, and road corridors associated with those movements (supply of transportation services and infrastructure)
- **Insights**
  - Run freight network optimization scenarios to gain insights into the impacts on freight flows and costs from the introduction of new or improved freight infrastructure or where the optimal location to place a supply chain facility would be



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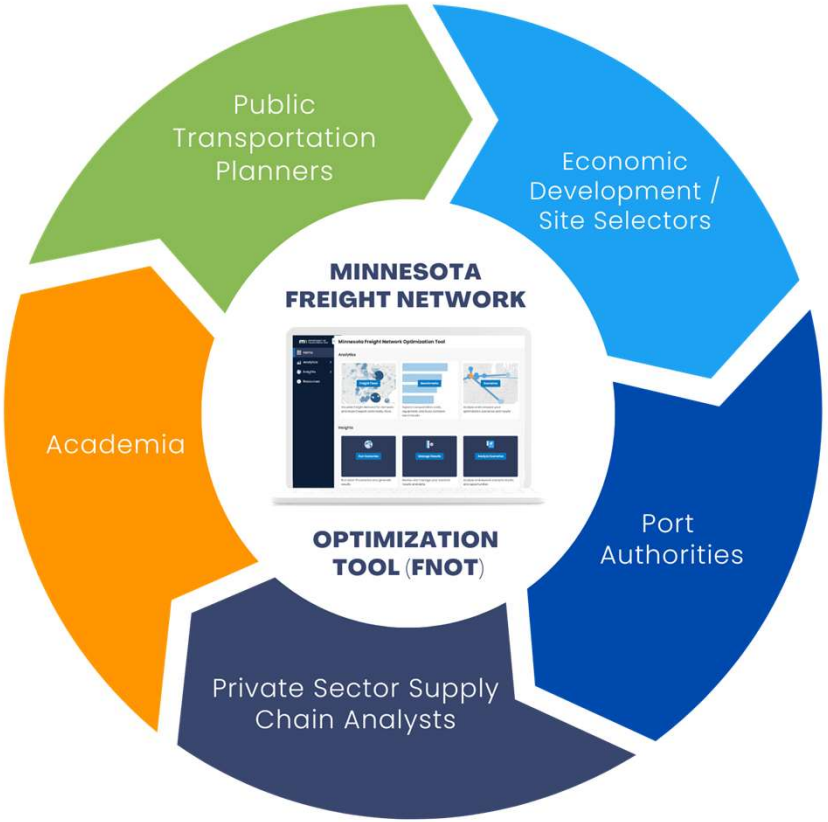
FNOT PUBLIC & PRIVATE SECTOR USER GROUPS AND USE CASES



- Quantify freight demand to identify opportunities. Use data visualization & analytics to inform policy & long-range multimodal freight planning studies
- Quantify the benefits from developing a new or expanding an existing multimodal freight facility or logistics service at an identified location (county)
- Find the optimal location to develop a new multimodal freight facility or logistics service to transfer modes
- Find the optimal location to build a new manufacturing plant/distribution center
- Compare a short list of candidate counties in MN to build a new or expand an existing multimodal freight facility or logistics service

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MINNESOTA FREIGHT NETWORK OPTIMIZATION TOOL (FNOT)

DEMONSTRATION

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NEXT STEPS

- Online Preview
  - Tomorrow
- Summer 2025
  - Testing and finetuning prototype
- Fall 2025
  - Rollout with in-person, hands on session
- Beyond
  - User trial & input period