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# Eight County Freight Plan

*East Central Intergovernmental Association &  
Blackhawk Hills Regional Council*

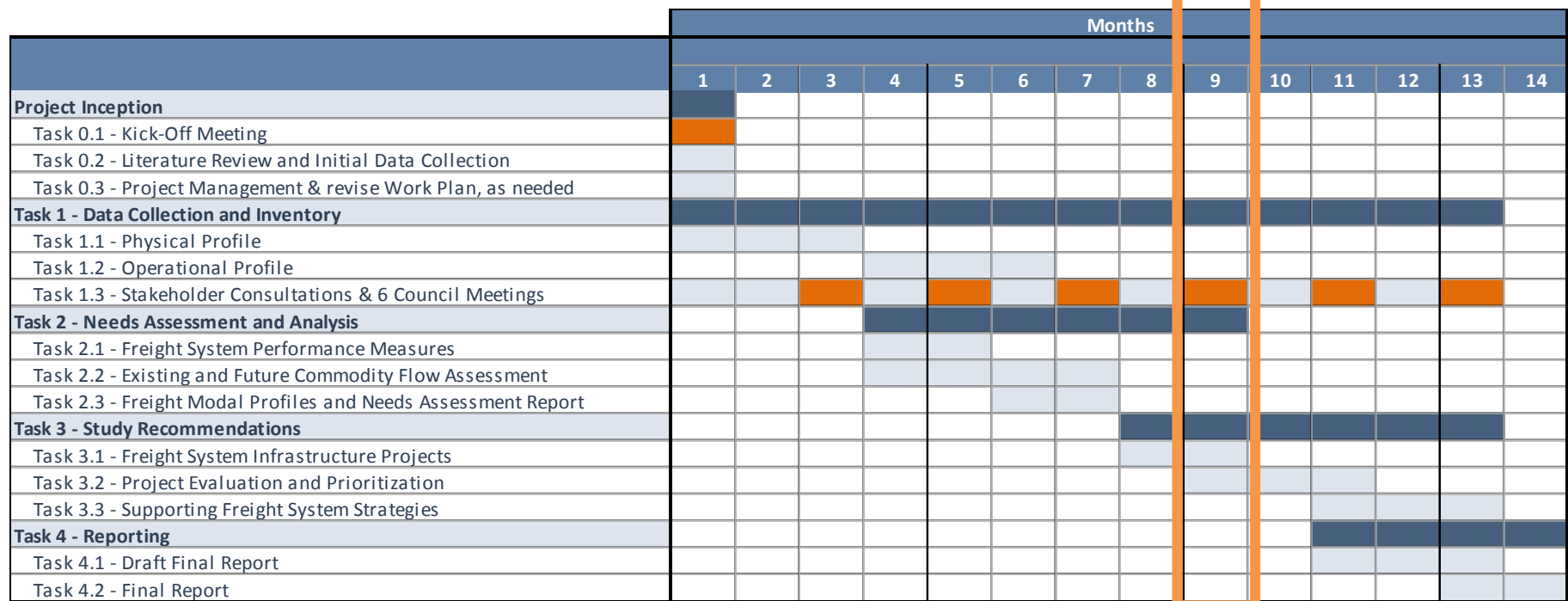
CPCS Team  
September 25, 2017  
Hurtsville Interpretive Center  
Maquoketa, IA

# Project Sponsors



# Work Plan Overview

We are  
here



## Legend



Major Task Duration



Work Activity



Meeting

# Presentation Map



## **Freight System Needs (Working Paper 3)**

Strategic Opportunities and Initial Projects Identification

Process to Evaluate and Prioritize Projects

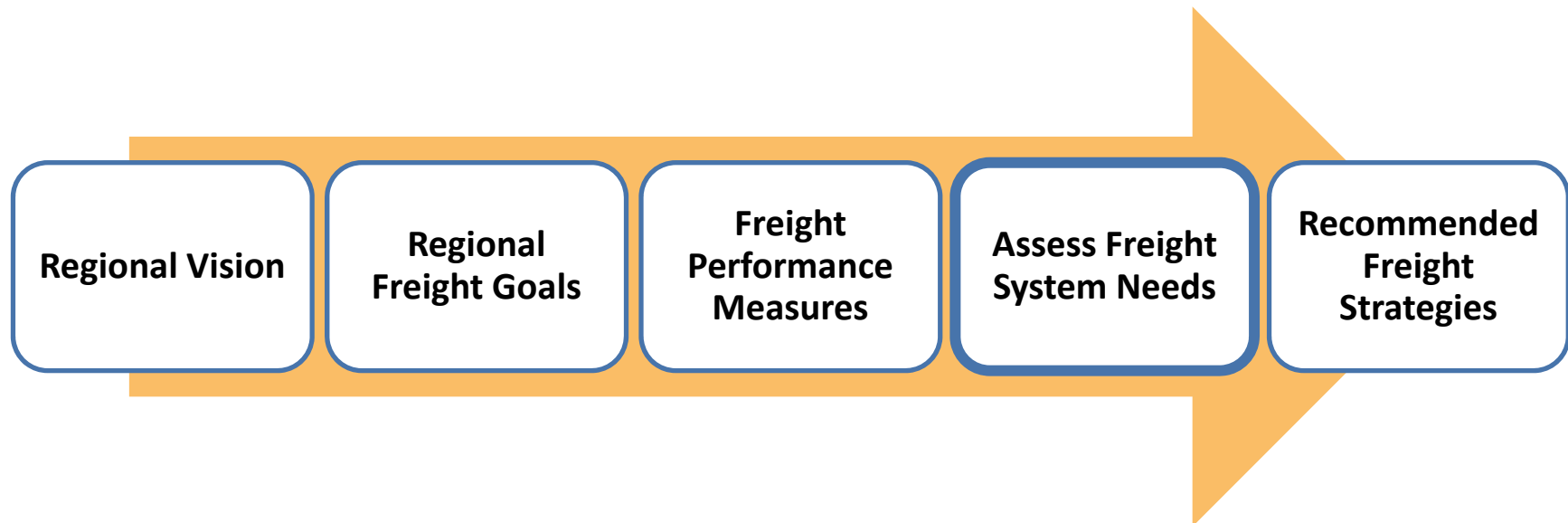
Questions & Discussion



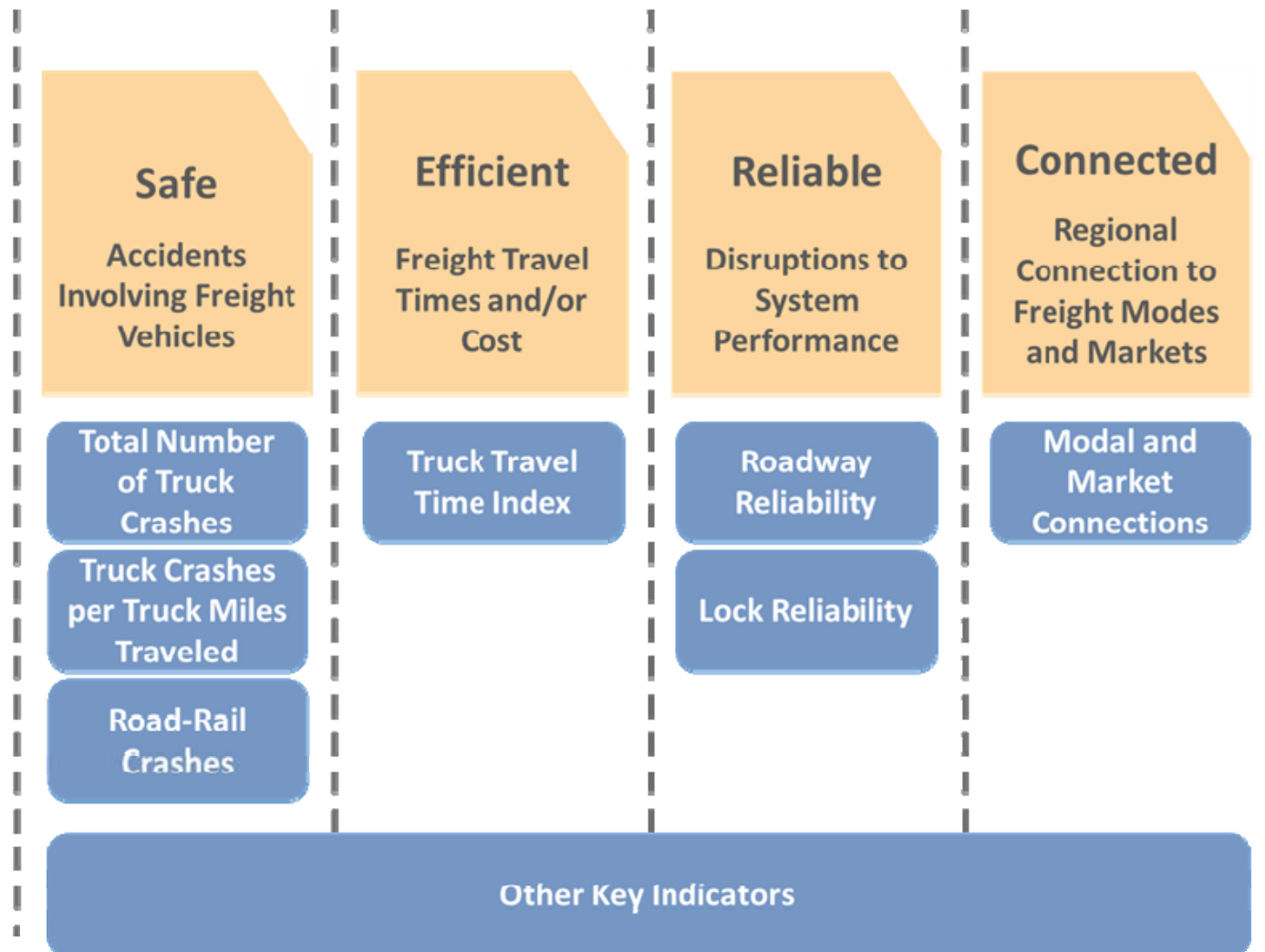
# Eight County Freight Plan Development Framework

## Assess Freight System Needs

- Current system performance
- Inform future needs
- Inform recommended strategies

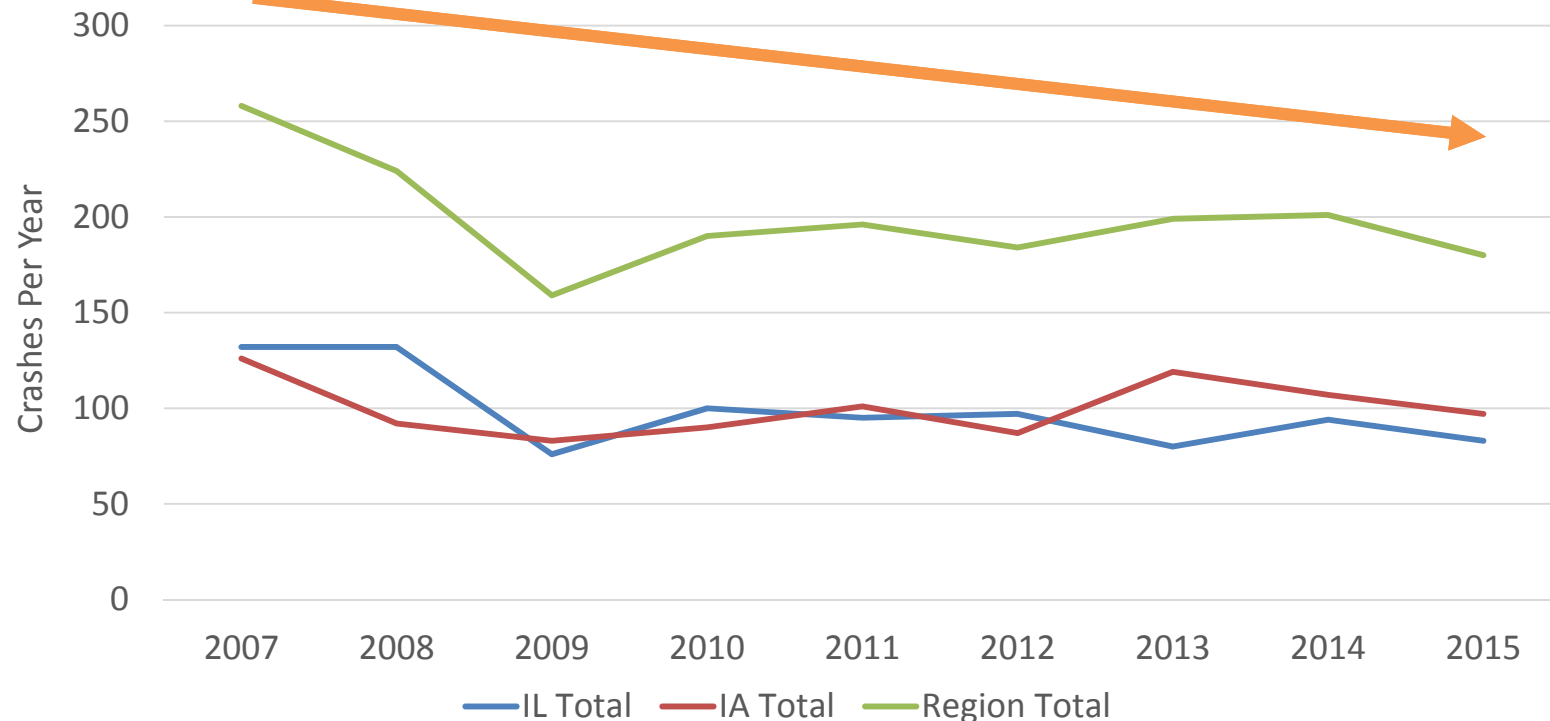


# Freight System Needs Assessment



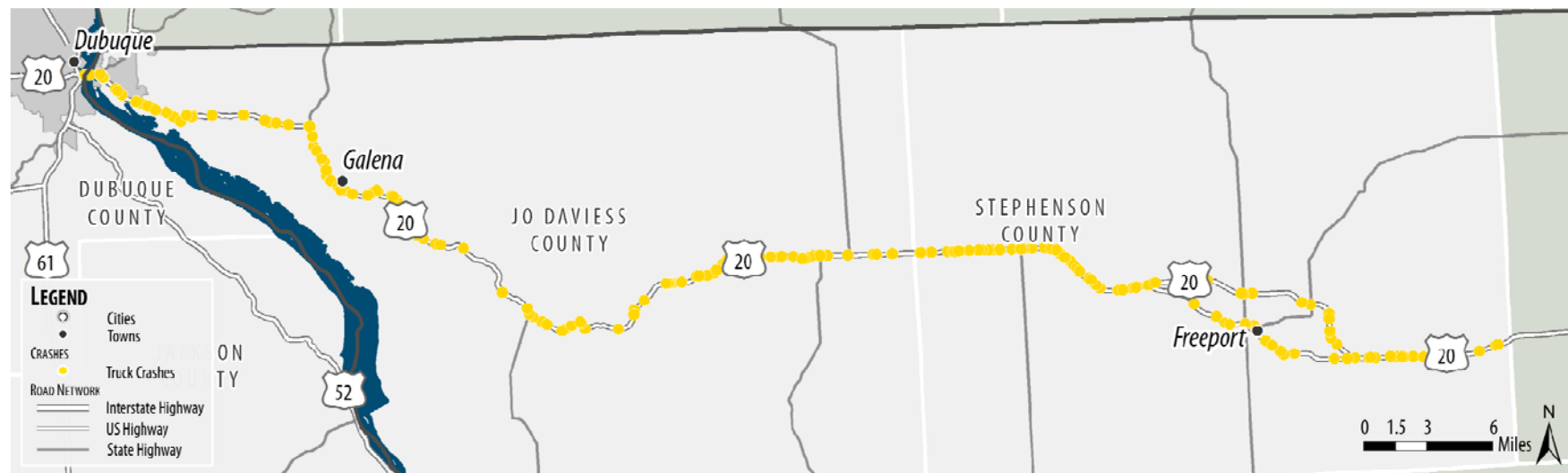
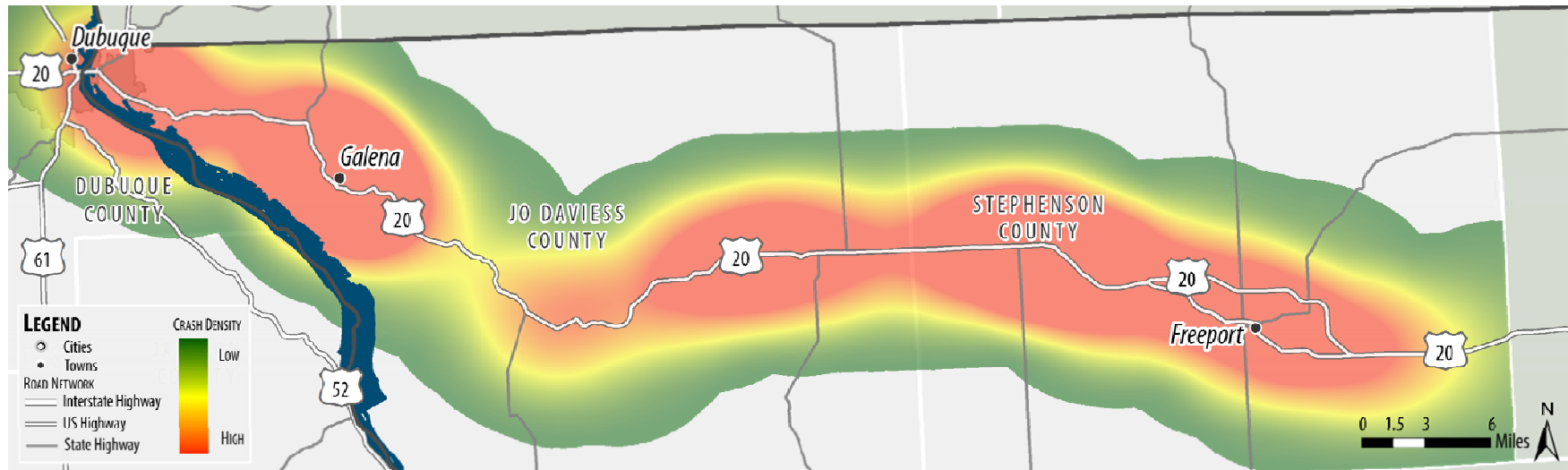
# Safety: Truck-Involved Crashes on Regional Interstates, National Highways, and State Highways

**Eight County Truck Crash Rate (2015) = 0.36 truck crashes per million miles of truck VMT**



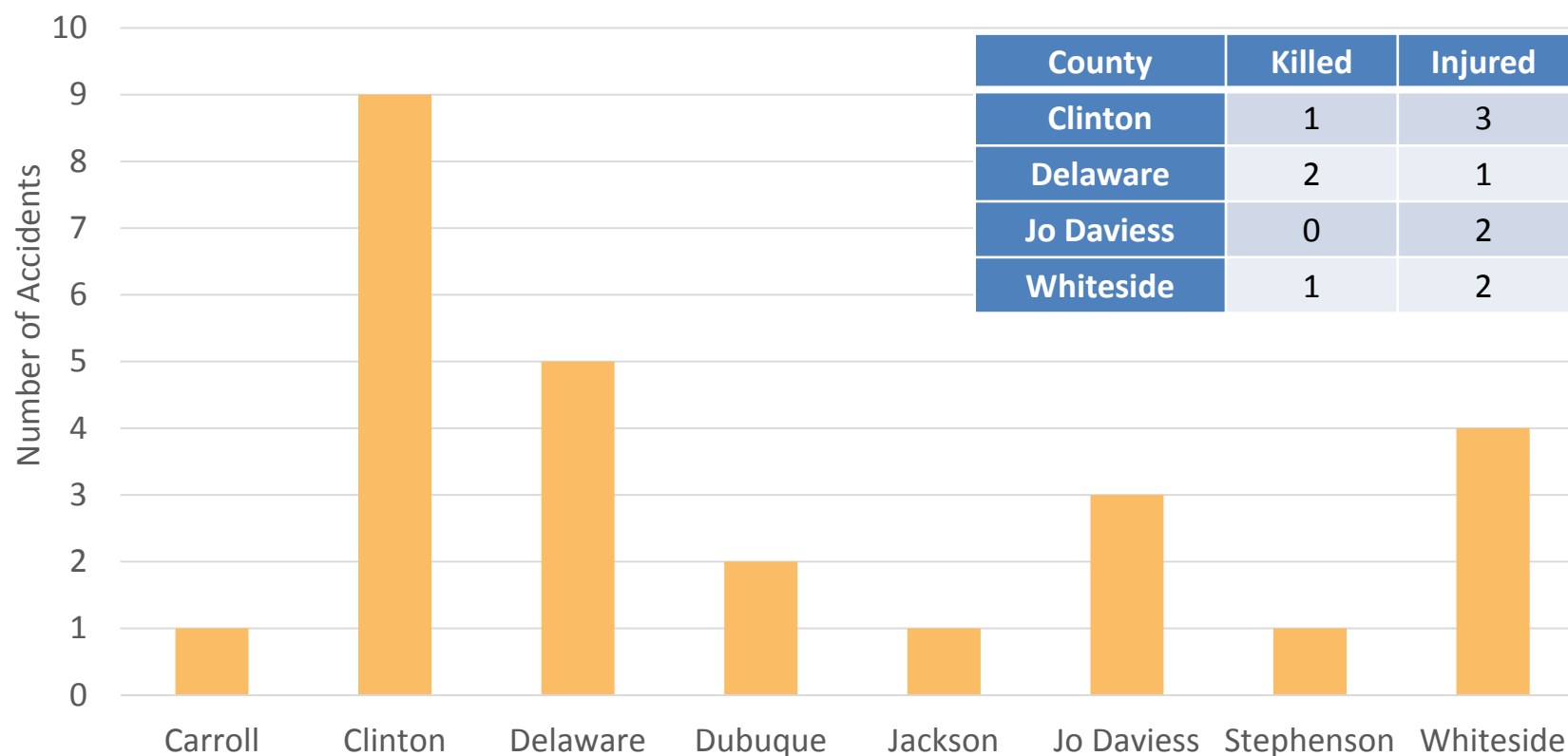
# Safety: Truck Crashes (US 20)

*300 Truck-involved crashes between 2007 – 2015*



# Safety: Rail-Highway Crossing Incidents

## At-Grade Public Crossing Incidents, April 2007- April 2017\*



\*Includes two accidents not involving road vehicles in Clinton and Whiteside Counties.

# Safety: Rail-Highway Crossing Incidents

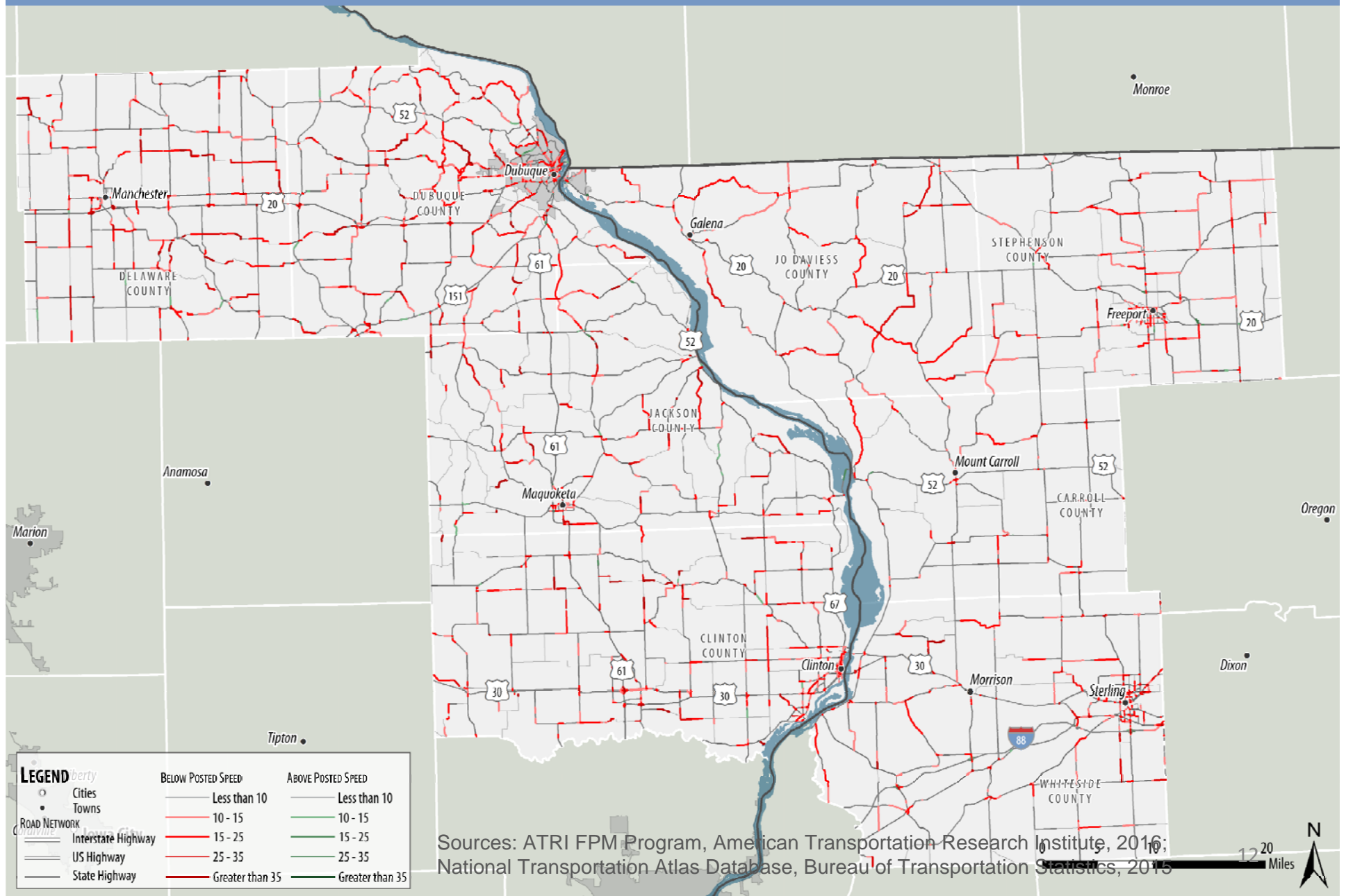


# Efficiency: Truck Travel Time Index

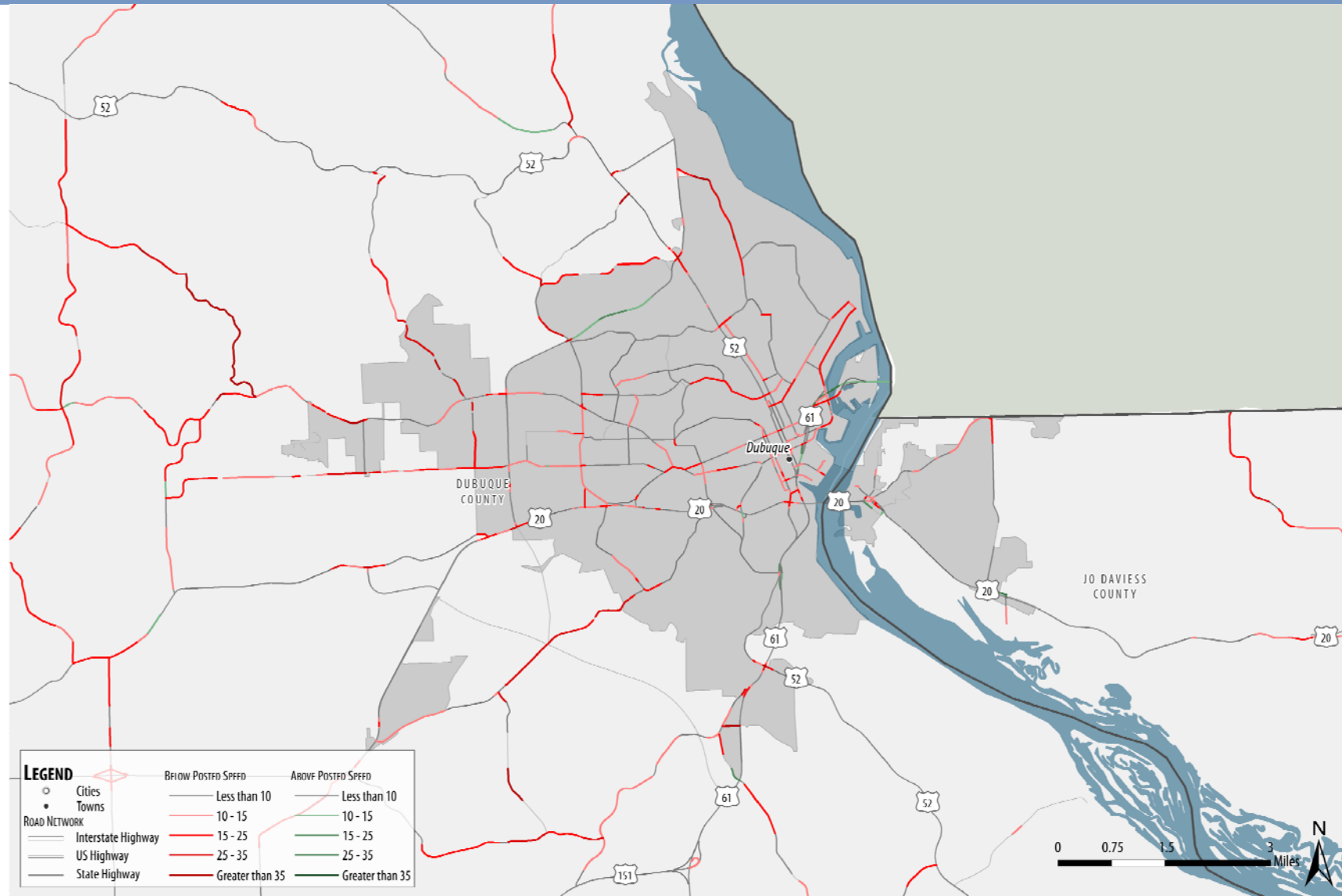
- Truck Travel Time Index (TTTI) is calculated to compare average truck travel times at peak hours (at 6:00-9:00 AM and 4:00-7:00 PM) against free-flow traffic times
  - **The Region's TTTI value = 1.11**
  - A truck trip that takes 1 hour in free-flow conditions takes an additional 6.6 minutes at peak times.
- The US overall Travel Time Index = 1.22 (in 2014)



# Average Annual Speed vs. Posted Speed



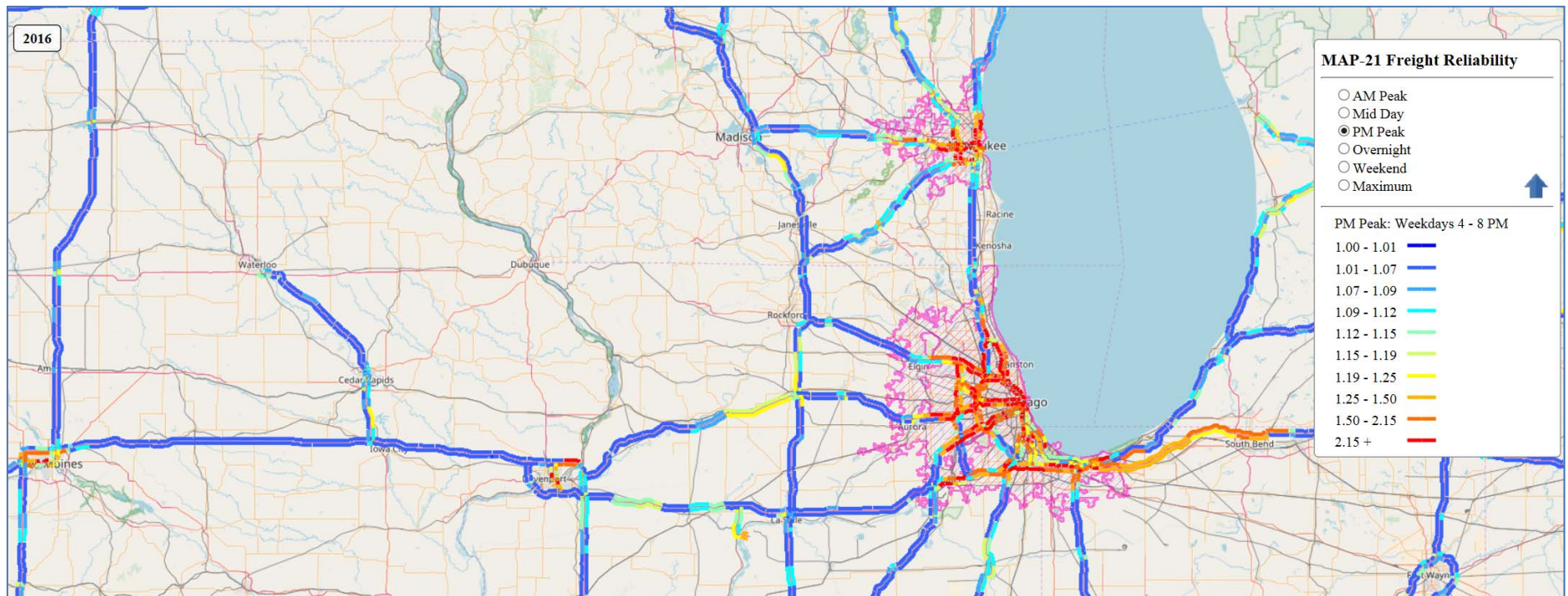
# Average Annual Speed vs. Posted Speed (Dubuque)



# Reliability: Truck Travel Time Reliability

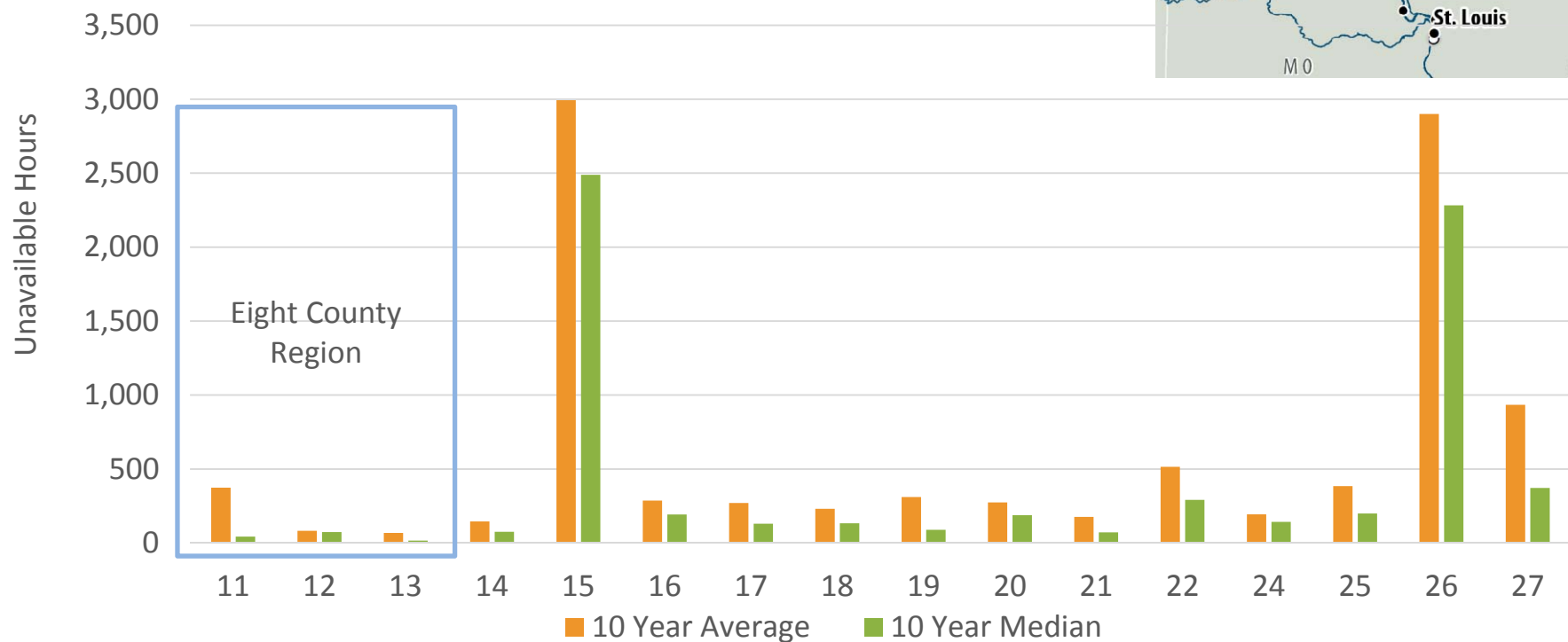
For the region as a whole, truck travel times between peak and non-peak hours are almost identical.

PM Peak Interstate Reliability (2016)

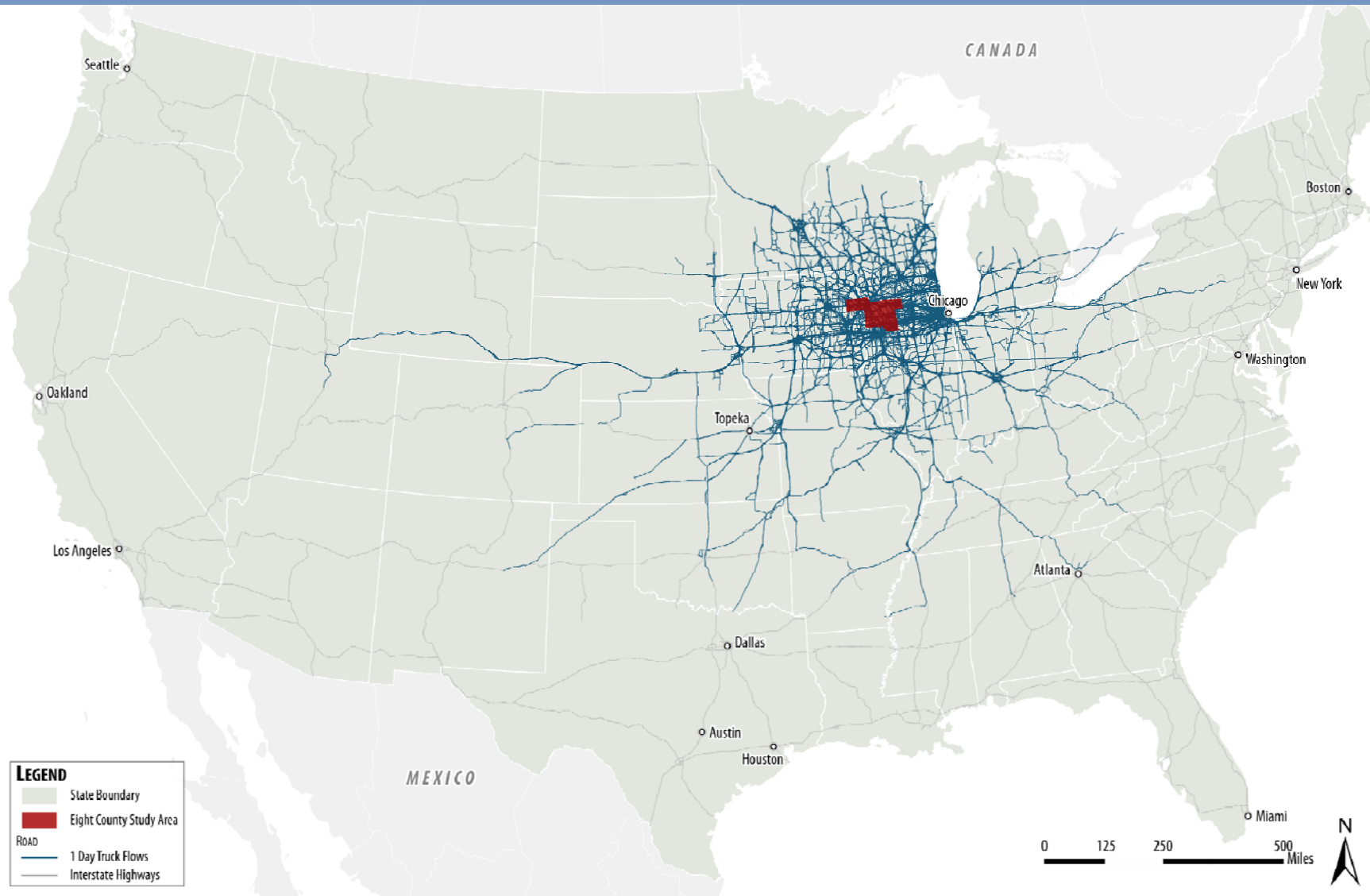


# Reliability: Waterway Reliability

## Average and Median Annual Unavailable Hours by Lock and Dam

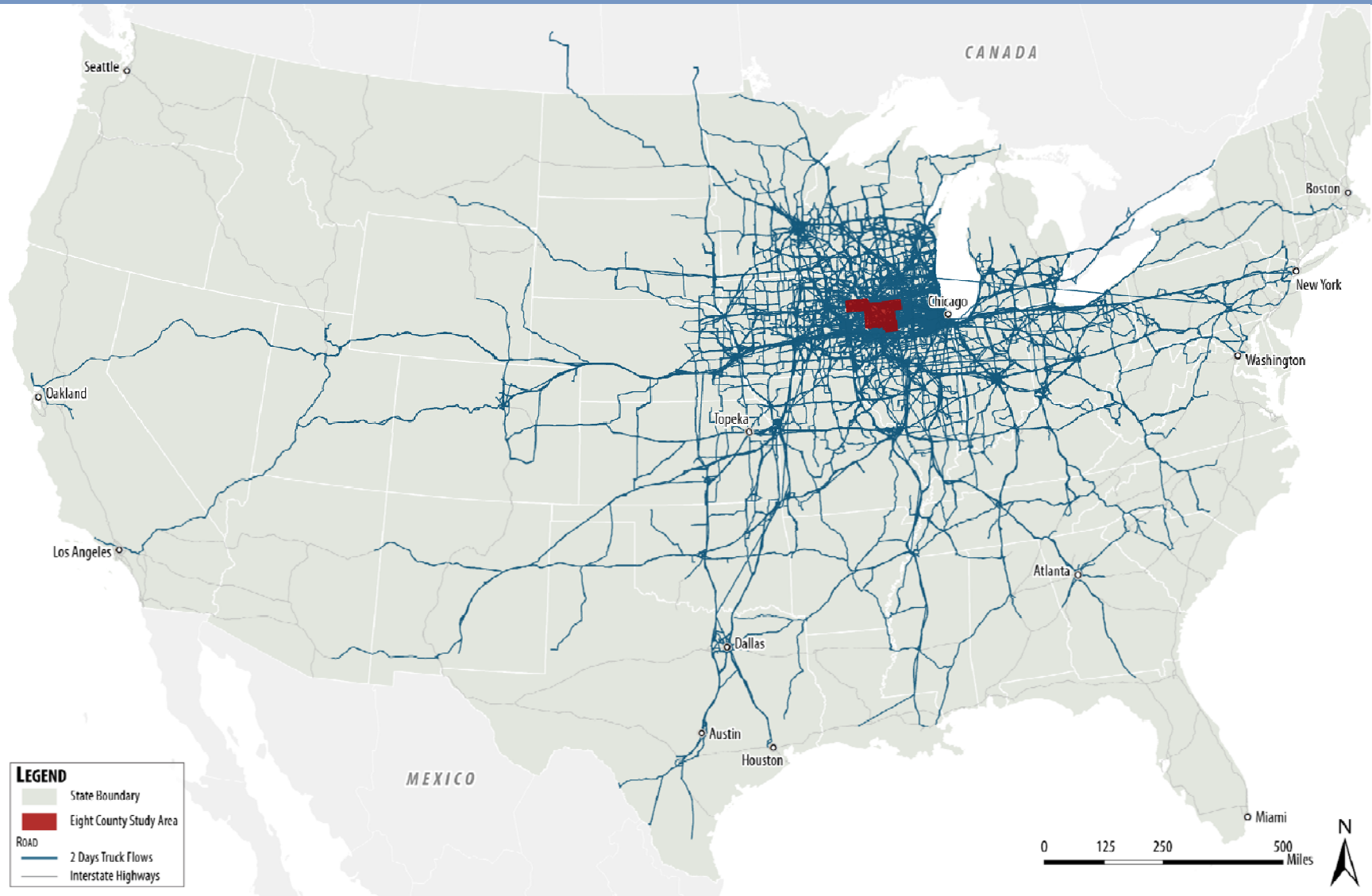


# Connectivity: 1-Day of Truck Flows from Region

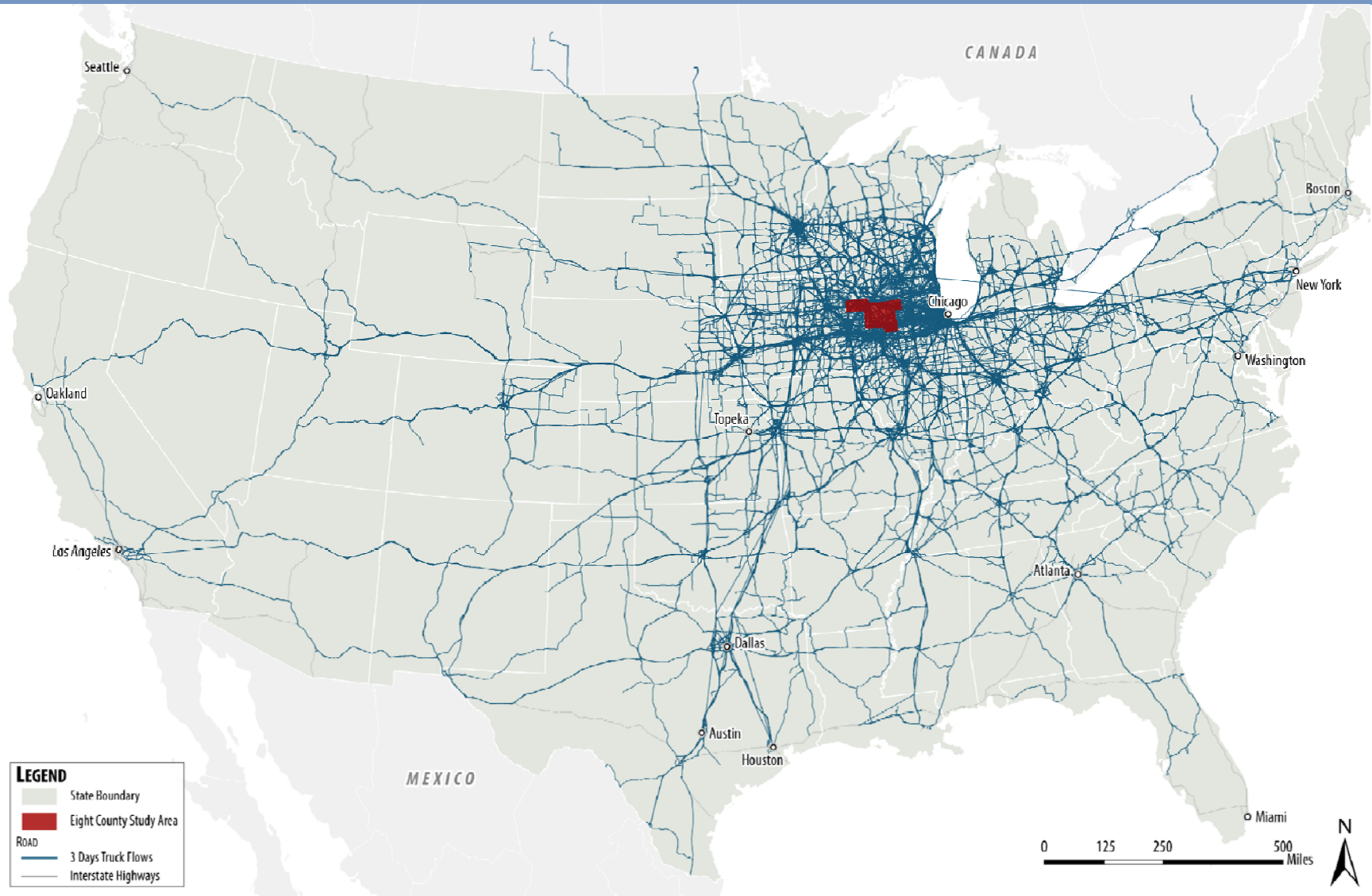




# Connectivity: 2-Days of Truck Flows from Region



# Connectivity: 3-Days of Truck Flows from Region





# Connectivity: Regional connection to freight modes and markets

- Intermodal Rail Facilities
  - 0 in Region
  - 3 outside Region
  - 1 planned outside Region
- Barge Terminals
  - 19 in Region
- Bulk Transfer Facilities (non-barge)
  - 13 in Region
- Airports
  - 2 that can accommodate Boeing 757's and 767's
  - no dedicated cargo service

# Discussion on freight system needs

## Open Discussion

- Are there freight system needs that we have not yet identified?

# Presentation Map

Freight System Needs (Working Paper 3)



**Strategic Opportunities and Initial Projects Identification**

Process to Evaluate and Prioritize Projects

Questions & Discussion

# Initial Slate of Strategic Recommendations

- Projects and project types
- Programs
- Policies
- Partnerships

*Initial recommendations are conceptual, only, and have been developed in order to receive your feedback*

# Projects and Project Types

- New/expanded roadways (minimal need identified)
- Spot highway improvements to address congestion and safety
- Maintenance
  - Pavement improvements
  - Bridge improvements
- New/improved intermodal and/or port facilities
- Transload/consolidation facilities
- Lock and dam improvements

## Specific Roadway Projects (Stakeholder ID'd)

- **US-20** between Freeport and East Dubuque, and the Julien Dubuque Bridge (*maintenance and safety improvements*)
- **US-30** expansion between Morrison and Clinton, and a full four lanes to Cedar Rapids (*maintenance and safety improvements*)
- **IL-73** in poor condition and needs passing lanes for safety
- **Stagecoach Trail** in Illinois as a potential truck route (*maintenance and safety improvements*)
- **IL-64** in poor condition with narrow shoulders (*maintenance and safety improvements*)
- **IA-136** was noted in poor condition with narrow shoulders (*maintenance and safety improvements*)
- **IA-64** was noted in poor condition (*maintenance*)

# Programs

- Programs focused on highway and railway safety
- Programs focused on technology applications to the (freight) transportation system
- Freight planning program to monitor needs, issues and progress
- Programs focused on enhancing skills of local workforce



# Policies

- Truck regulation harmonization between Iowa and Illinois
- Illinois seasonal exemption for agricultural loads (up to 90,000 lbs).
- Truck route guidance

# Partnerships

- State, county and local public agency partnerships
- Federal transportation agencies, including USDOT and the USACE
- Regional and local economic development agencies
- Class I and short line railroads
- Airports
- Water ports
- Other local private industry/businesses, especially those representing key freight industries of manufacturing and agriculture

# Discussion on Slate of Initial Recommendations

## Open Discussion

- What projects, programs, policies or partnerships do you consider critical for improved freight transportation?

# Presentation Map

Freight System Needs (Working Paper 3)

Strategic Opportunities and Initial Projects Identification



**Process to Evaluate and Prioritize Projects**

Questions & Discussion

# About Benefit-Cost Analysis

## What do we learn?

- Benefits of freight improvements
  - Improvements in supply chain performance -- cost, speed, reliability, etc. – compared to without-project conditions
  - Performance and cost data to help define/fine-tune projects
  - Support discretionary grant applications
- Benefit-cost analysis typically does not include economic impact evaluation (jobs, wages, taxes, etc.) or neutral “transfers” of benefits across regions or facilities

# Benefit Cost Analysis Guidance

## Recent USDOT guidance for INFRA and TIGER

- Costs and monetized benefits calculated annually over long-term (20-30 years) and discounted to present value at 7% and 3%; BCR is the ratio of discounted benefits to discounted costs
- Primary benefit categories
  1. State of good repair (pavement damage, etc.)
  2. Economic competitiveness (transportation cost, land value)
  3. Livability (congestion reduction, etc.)
  4. Sustainability (emissions reduction, etc.)
  5. Safety (crash reduction, etc.)
- New provisions
  - Reduced value for modal diversion projects
  - No recommended federal value for marginal social cost of carbon
  - Increased rigor in modeling congestion and safety improvements

# Recommended Approach for this Study

## Follow Federal guidance and develop spreadsheet analysis tool for BCR calculation

- Basic functions
  - Will includes all necessary factors, conversions, calculations
  - Will generate non-monetized benefits (changes in vehicle/railcar/vessel miles of travel, crashes, emissions, etc.)
  - Will generate the required monetized benefits and BCRs
- Input limitations
  - Full BCR requires detailed project definition, including detailed cost by year, detailed traffic forecasts, etc. – may not be available for all projects of interest
  - Solution: “parametric” approach, showing how results and BCRs vary based on different inputs – similar to recent BSRC Freight Plan



# Example #1: Intermodal Rail Terminal

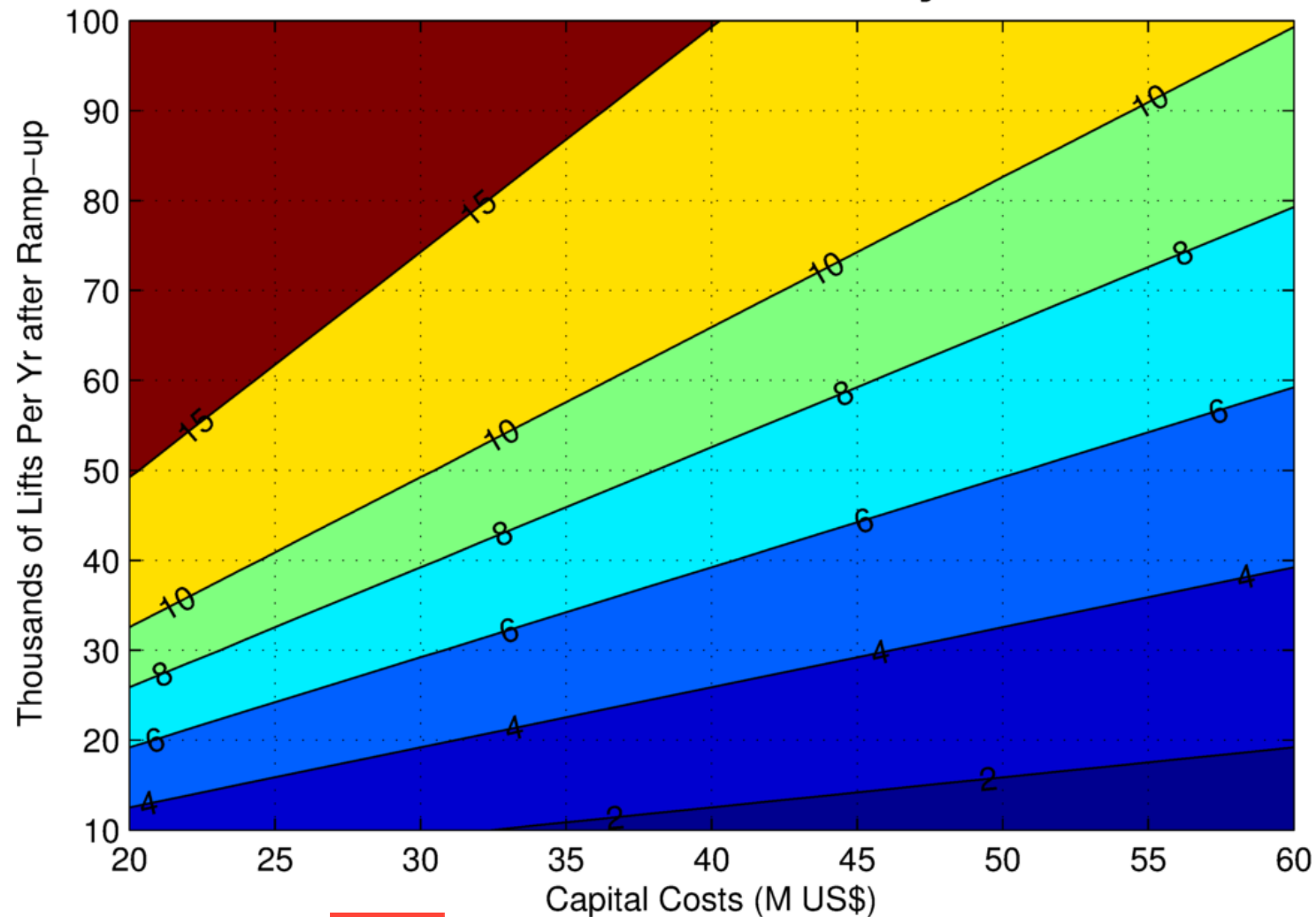
- What would be the societal benefits of building an intermodal rail terminal?
- B/C based on cost and volume of rail traffic
- Benefits considered
  - Cost savings to existing rail shippers
  - Benefits from truck to rail diversion
    - Reduction of emissions (NOX, PM, VOC & CO2)
    - Reduction of vehicular accidents
    - Reduction of pavement deterioration

# Example #1: Assumptions

- Assumptions in BSRC analysis, based on anticipated project types and performance characteristics
  - Weighted average distance per truckload: 1,000 miles
  - Weighted average distance per rail container: 1,140 miles
  - Average weight of container: 16.5 tons
  - Considered truck drays
  - Intermodal market grows at 2.5% per year after 4 year ramp-up period
  - 10% discount relative to current cost
  - 30 year analysis horizon
  - Monetization parameters from USDOT

# Example #1: BSRC Intermodal Rail Analysis Results

## B/C Ratio of Intermodal Projects @ 7%



## Example #2 – Highway Bottleneck Elimination

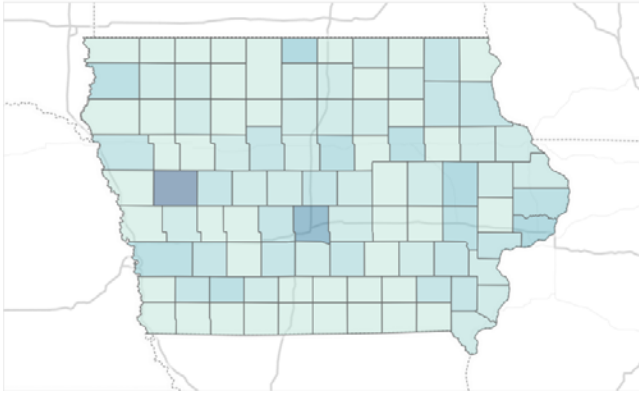
- What would be the societal benefits of eliminating a highway bottleneck (at grade rail crossing, signalization, low-speed segment, etc.)?
- B/C based on cost and volume of highway traffic
- Benefits considered
  - Improved travel time
  - Reduced fuel cost
  - Reduced emissions
  - Reduced accidents
  - Reduced maintenance costs

# Demand and Network Performance Inputs

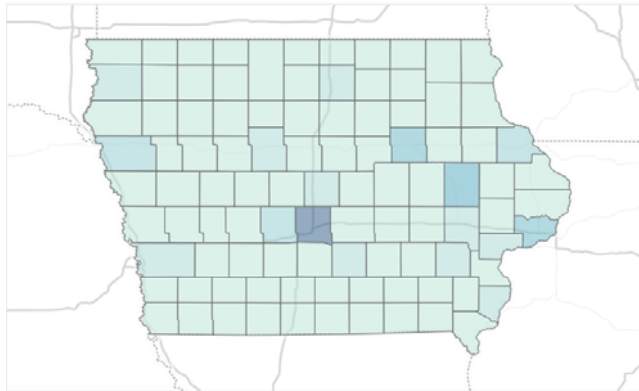
- We can use the Freight Analysis Framework data (from Working Paper 2) to generate key inputs to these models
- Origin-destination demand
  - By county and state, by mode, by commodity
  - Tells us how much freight will benefit from certain kinds of improvements -- high levels of traffic help drive high BCRs
- Network performance
  - We can assign FAF truck volumes to the FAF highway network
    - Calculate routes, volumes, travel times (and if desired costs) based on current conditions, for all commodities or market segments
    - Calculate future routes, volumes, travel times, and costs assuming performance changes in the network based on improvements
    - Distinguish Study Area trucks vs pass-through trucks
    - Current and future forecast growth
  - Water easy to assign; rail can be inferred from FRA line densities and validated with industry input

# Truck Tonnage Desire Lines and IA-IL Densities

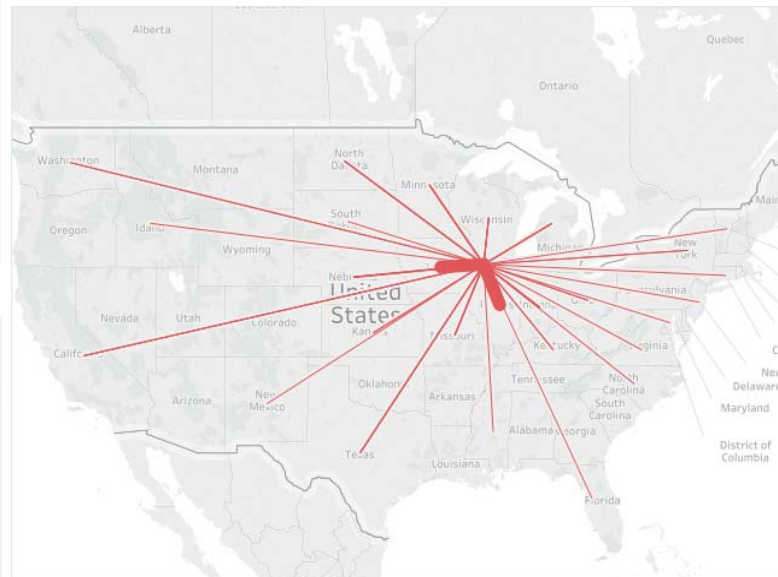
Inbound Truck Tons, IA to Study Area



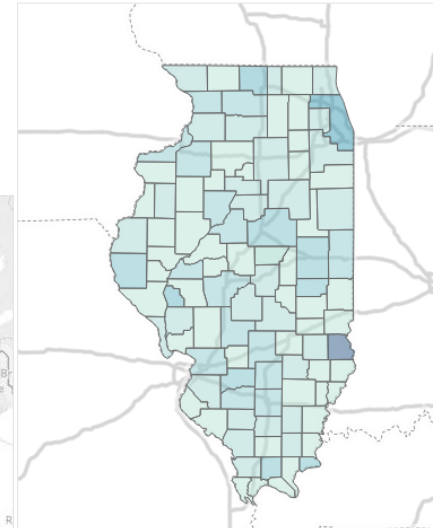
Outbound Truck Tons, Study Area to IA



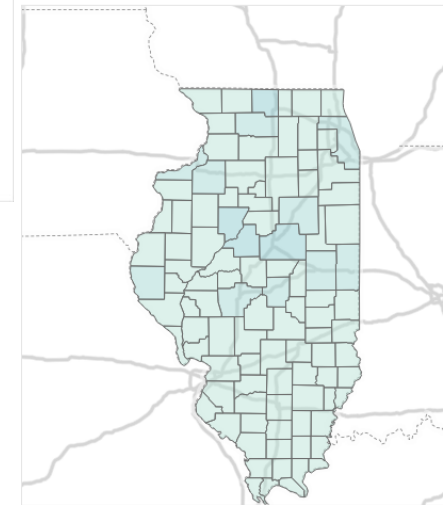
FAF supports strong county-level assignments



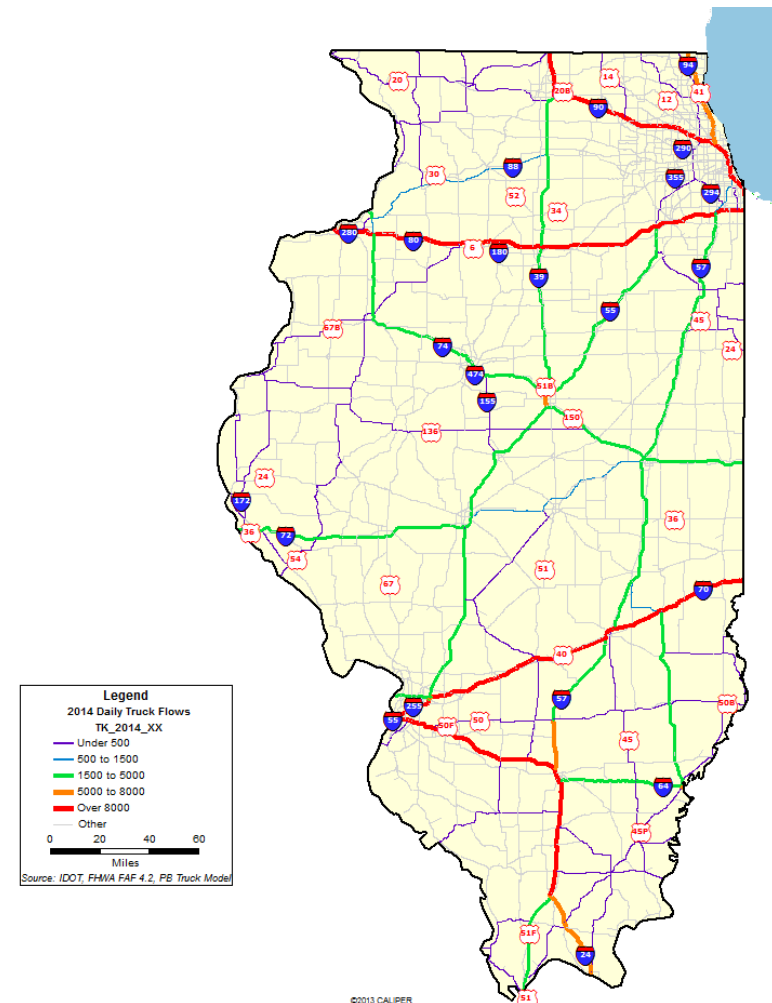
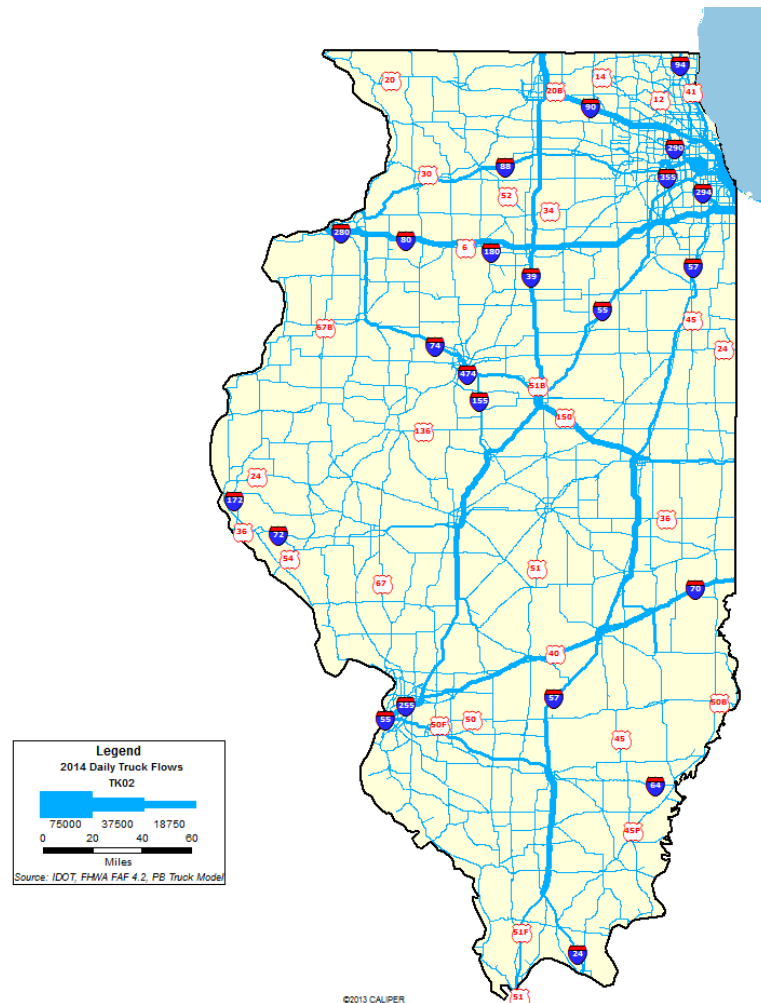
Inbound Truck Tons, IL to Study Area



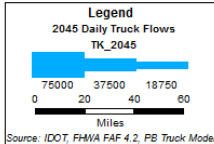
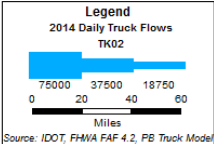
Outbound Truck Tons, Study Area to IL



# Example: All Trucks vs. Through Trucks, IL

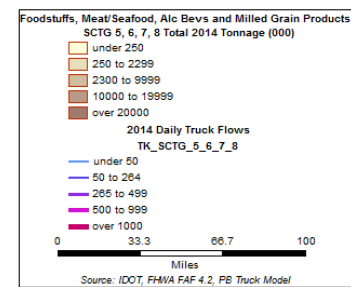
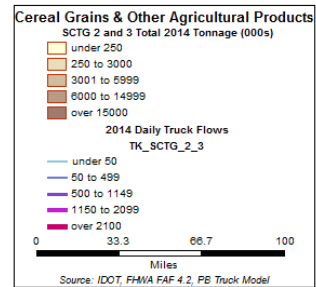


Example: 2014 vs. 245 Trucks, IL



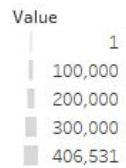
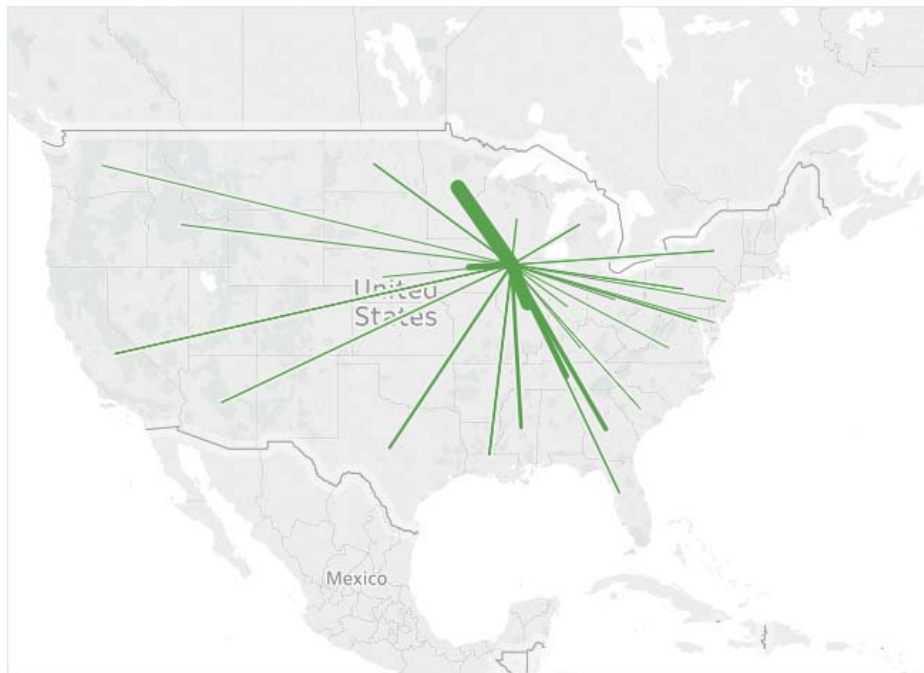


## Example: Cereal Grains and Foodstuffs Trucks, IL

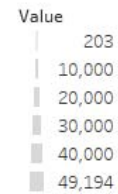


# Rail and Water Desire Lines

FAF assignments to be supported by STB Waybill



FAF assignments to be supported by Port / Corps data



# Discussion on Benefit-Cost Analysis

- Is this preferred approach? (As an alternative to parametric/FAF analysis, we could analyze fewer projects with greater detail)
- If we proceed with parametric analysis, what types of projects should we address?
  - Rail
    - Intermodal terminal, transload terminal
    - Existing line improvement / new line construction
  - Highway
    - Grade crossing or other bottleneck elimination
    - Bypass or performance/capacity enhancement
  - Water
    - Transfer terminal
  - Others?

# Presentation Map

Freight System Needs (Working Paper 3)

Strategic Opportunities and Initial Projects Identification

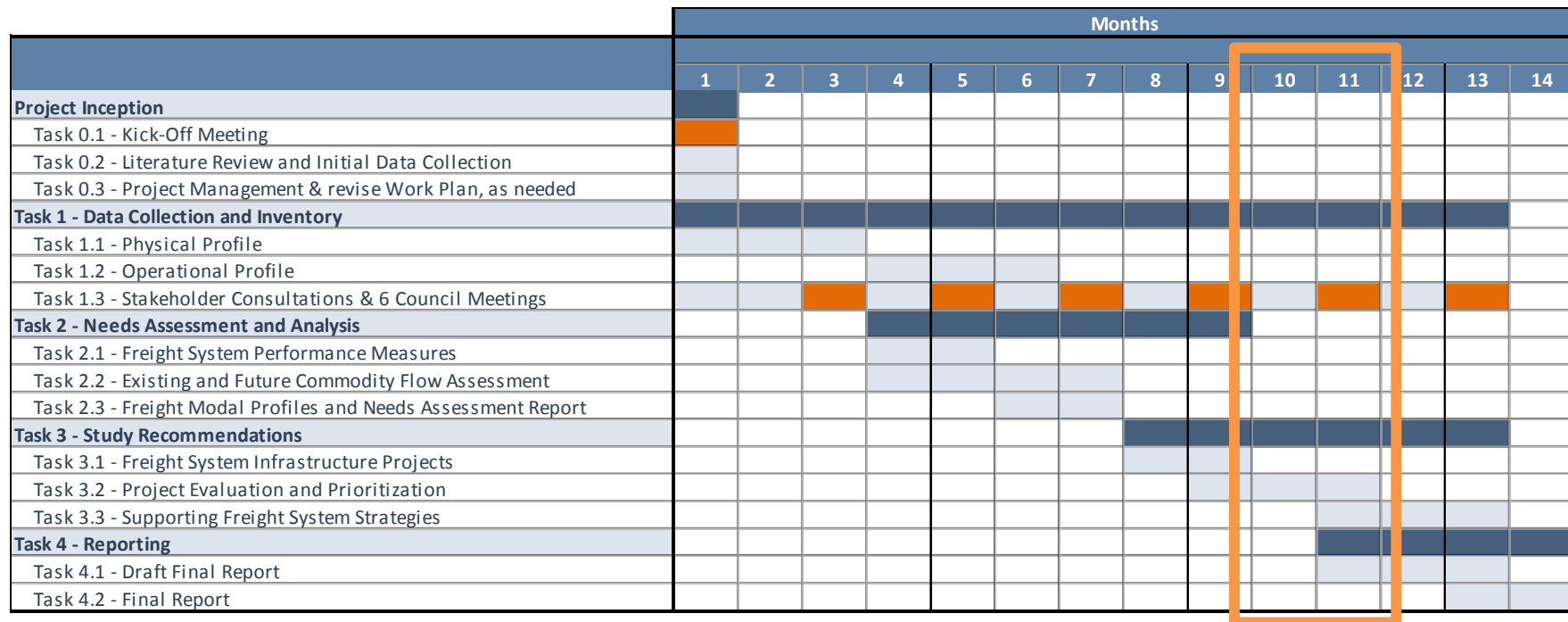
Process to Evaluate and Prioritize Projects



**Questions & Discussion**

# Our Next Steps...

- Refine process to evaluate freight projects
- Select freight projects/types to evaluate
- Develop recommendations



# Thank You



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