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Eight County Freight Study

Iowa DOT Transportation Meeting

December 14, 2017

Dubuque, IA

Project Sponsors

bhrc Blackhawk Hills Regional Council

ECIA Business Growth INC. Financing for Growing Businesses

Clinton County Development Association

DeWitt Chamber & Development Company

Delaware County Economic Development

Greater Dubuque Development Corp.

Illinois Farmers Union

Illinois Soybean Association

Jackson County Economic Alliance

Jo Daviess County, Illinois

Riverport Railroad, LLC

TCEDA Tri-County Economic Development Alliance

Elizabeth The heart of Jo Daviess County

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Presentation Map

The Eight County Freight Study

- **Work Plan**
- **Schedule and Status**

Key Outcomes and Information to be Delivered

Next Steps

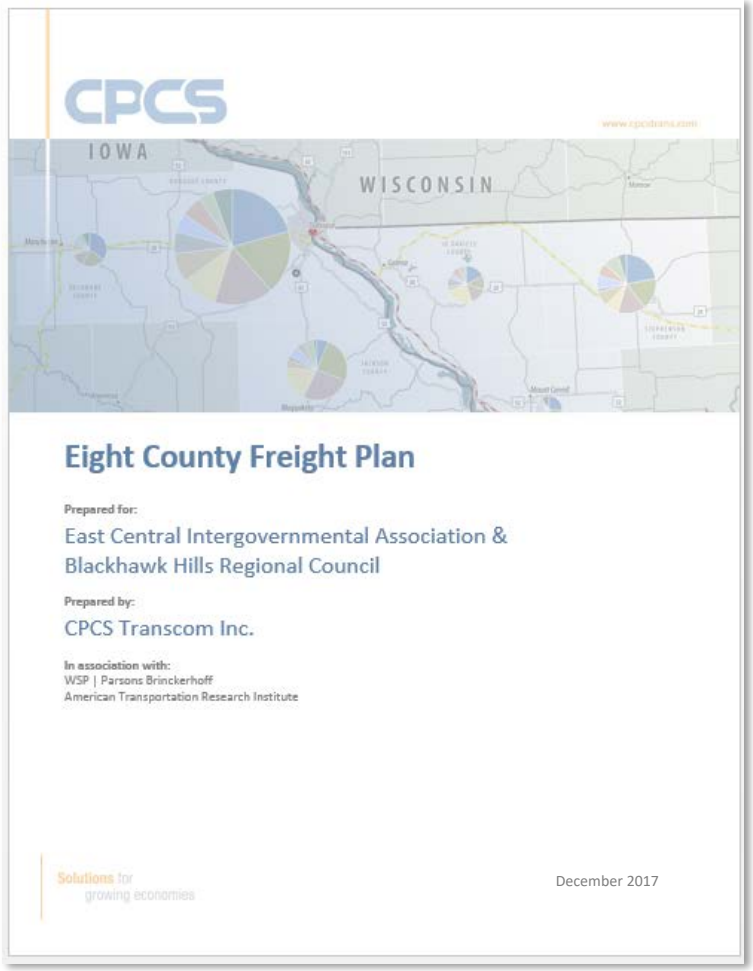
Project Motivations

- Inconsistent data across freight modes
- Understand link between freight transportation system and local economy
- Be aware freight system needs and opportunities
- Incorporate freight in local transportation planning decisions

Project Objective

To develop a better understanding of the multimodal freight system in the bistate region and to use this information to better inform policy and programming decisions in the region.

Eight County Freight Study



Key Tasks

- Physical System Inventory
- Commodity Flow Profile
- Freight System Needs Assessment
- Freight System Recommendations & Benefits Evaluation
- Stakeholder Outreach

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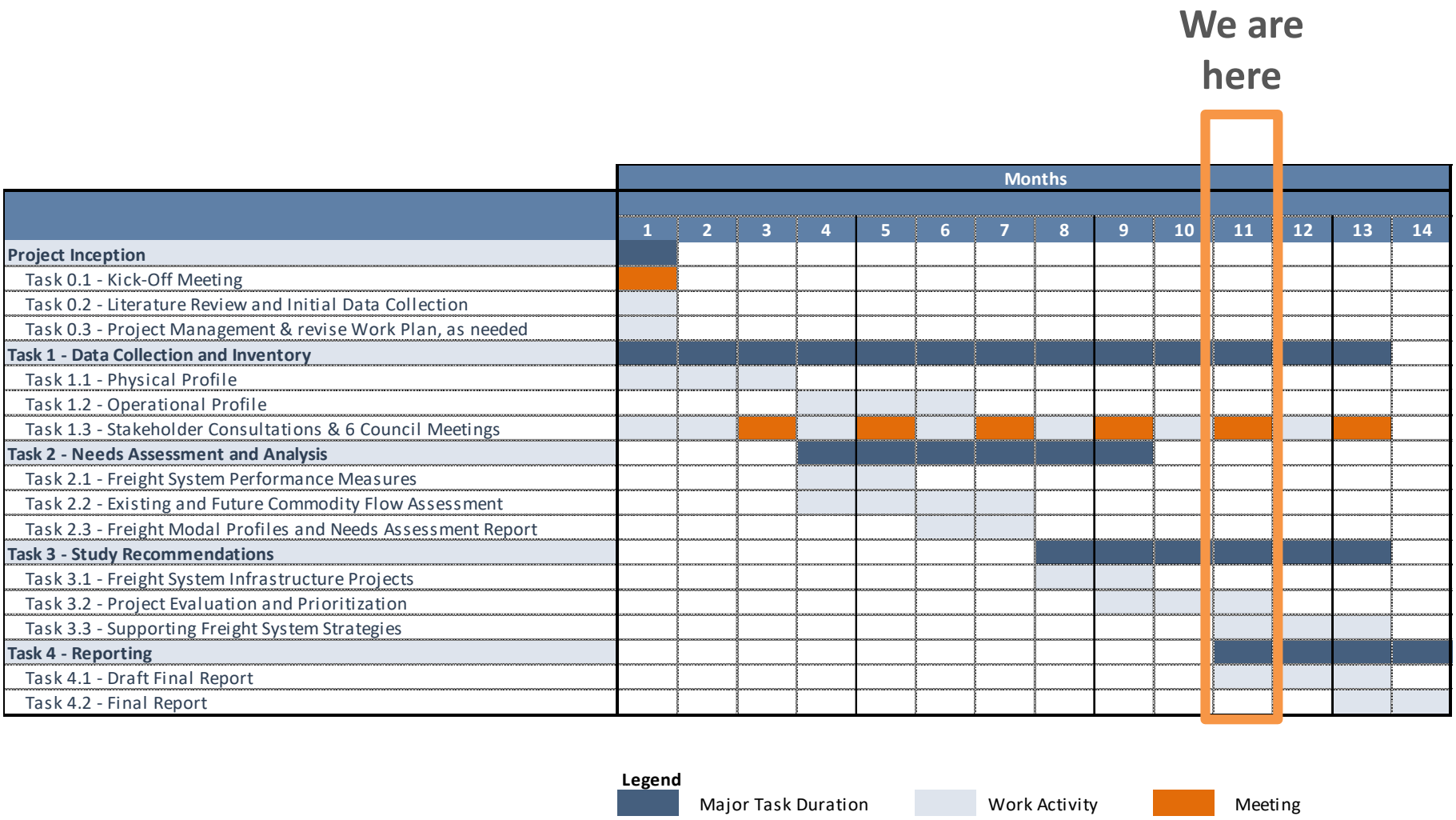
Work Plan Overview



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Presentation Map

The Eight County Freight Study

Key Outcomes and Information to be Delivered

- **Primary questions to be answered**
- **Datasets and tools to be delivered**

Next Steps

Questions the Eight County Freight Study Can Answer

1. What are the Region's freight system assets?
2. What goods use the Regional freight system and how?
3. What transportation connections are most critical for the Region's economy?
4. What is the cost of using the Regional freight system?
5. What recommendations will enhance the Region's competitiveness?

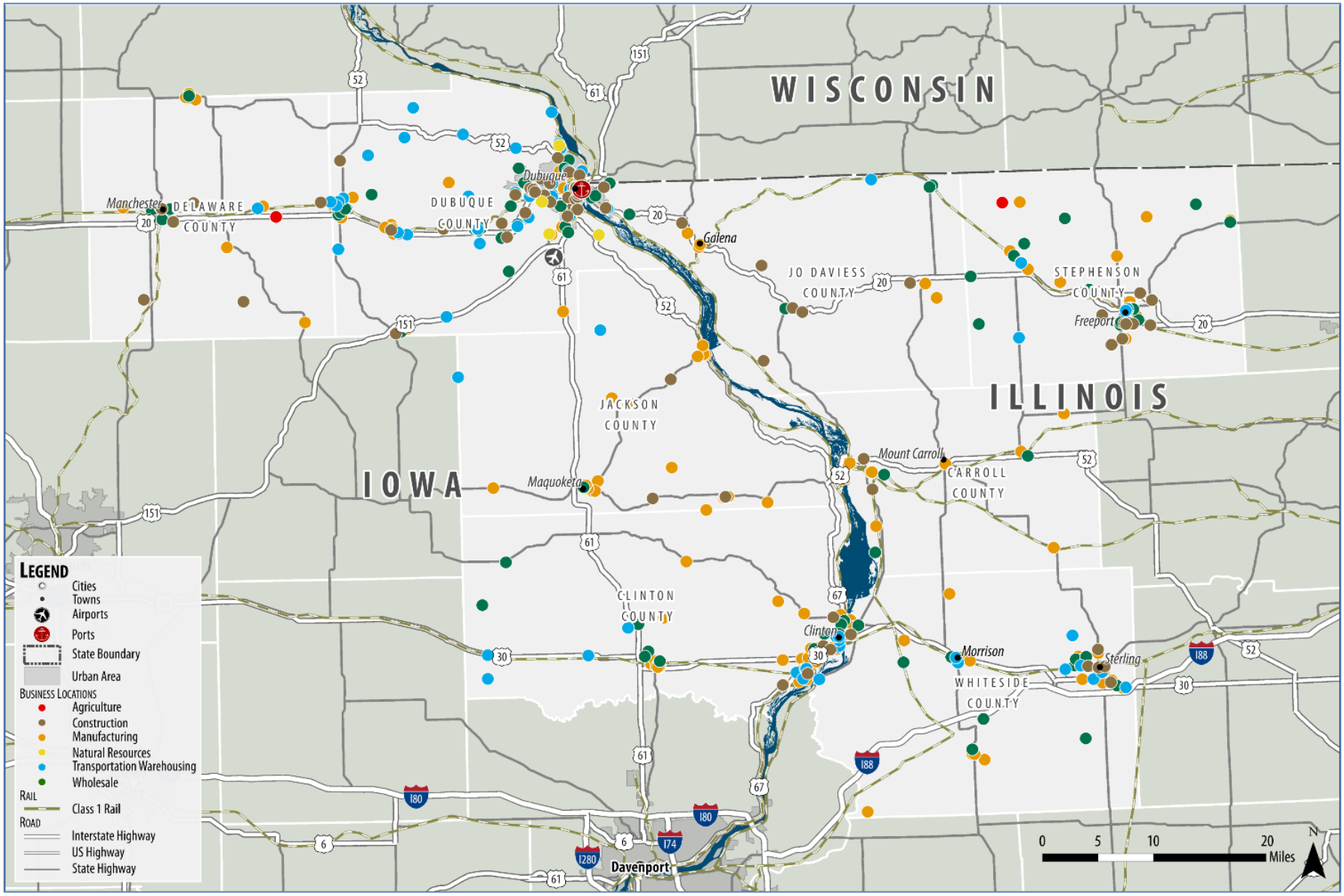
Key Question 1

What are the Region's freight system assets?

Why is this question important?

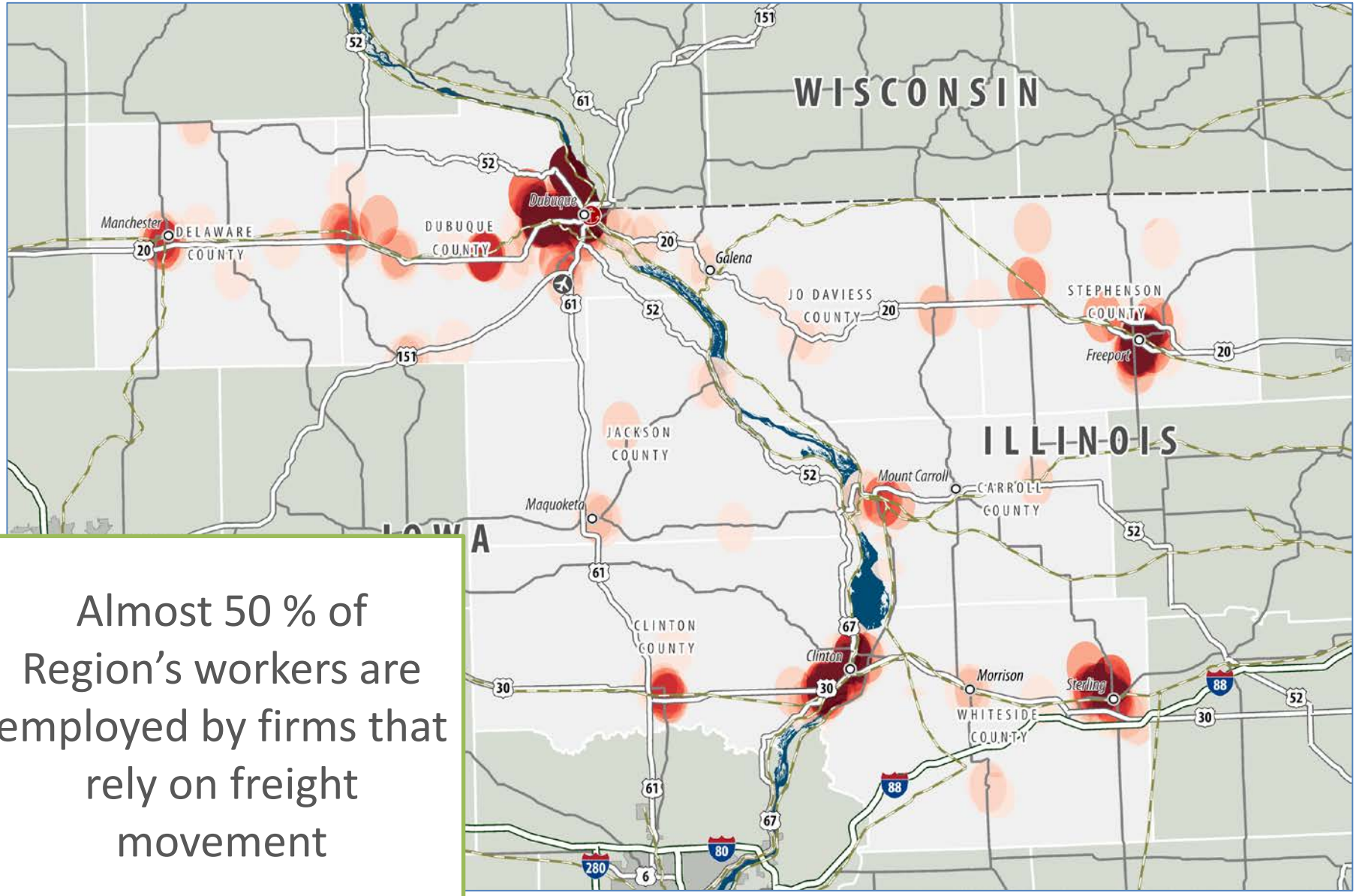
- This is the backbone of your Regional economy.
  - Key industries
  - Key facilities
  - Physical system

A Freight-Dependent Economy



Source: CPCS Analysis of ReferenceUSA, 2016

Freight-Related Employment Concentration



Almost 50 % of Region's workers are employed by firms that rely on freight movement

Source: CPCS Analysis of ReferenceUSA, 2016

Freight-Related Employment

NAICS	Firms with 20-49 Employees	Firms with 50-99 Employees	Firms with 100+ Employees
(11) Agriculture, Forestry, Fishing, and Hunting	3	2	1
(21) Mining, Quarrying, Oil and Gas Extraction	5	2	2
(22) Utilities	5	0	5
(23) Construction	87	12	24
(31-33) Manufacturing	144	49	92
(42) Wholesale Trade	69	24	117
(44-45) Retail Trade	191	44	52
(48-49) Transportation and Warehousing	81	16	10

Source: CPCS Analysis of ReferenceUSA, 2016

What the Region does Better (Location Quotient)

Industry	Carroll	Clinton	Delaware	Dubuque	Jackson	Jo Daviess	Stephenson	Whiteside
(11) Agriculture	ND	ND	1.58	ND	1.97	ND	2.66	ND
(21) Mining, Quarrying, Oil and Gas Extraction	ND	ND	NC	ND	NC	ND	NC	ND
(22) Utilities	ND	1.11	ND	0.66	ND	ND	ND	0.33
(23) Construction	0.9	0.9	1.25	0.86	0.97	1.3	1.36	0.6
(31-33) Manufacturing	2.13	2.28	3.18	1.68	1.65	1.6	2.3	2.02
(42) Wholesale trade	2.15	0.5	1.9	1.16	1.33	ND	0.67	0.96
(44-45) Retail trade	1.24	0.98	0.95	0.98	1.35	1.14	0.89	1.16
(48-49) Transportation, Warehousing	ND	ND	ND	2.07	1.17	ND	1.06	ND

Source: CPCS Analysis of Bureau of Labor Statistics, 2015
ND indicates that a quotient is not disclosable, and NC indicates quotients that could not be calculated.

Multimodal Freight Transportation System

The Region's transportation assets are aligned for the efficient movement of bulk goods.

31 specific facilities available that can transfer goods between modes

Key Question 2

What goods use the Regional freight system and how?

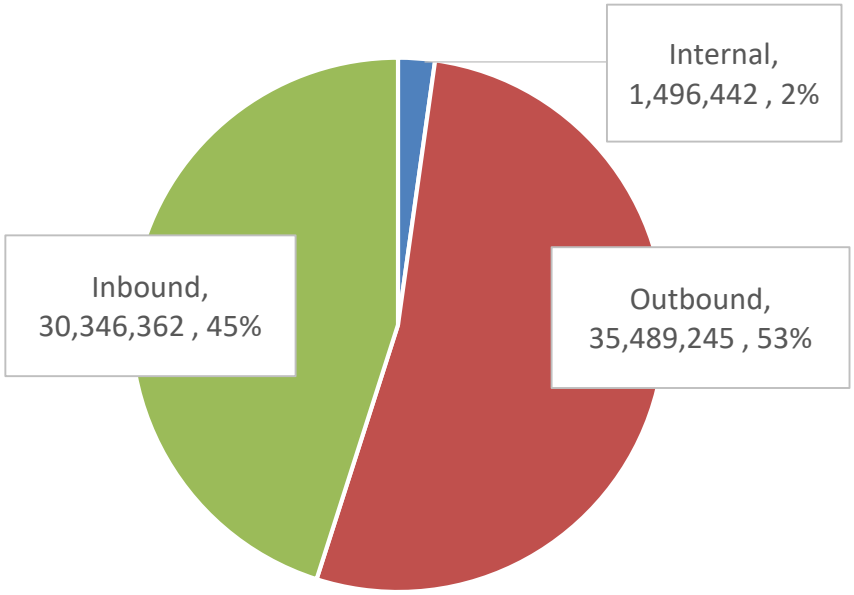
Why is this question important?

- This provides greater insight on your Regional economy.
  - The size of your economy.
  - The industrial niches that are most important to the Region.
  - The role the transportation system serves in the economy.

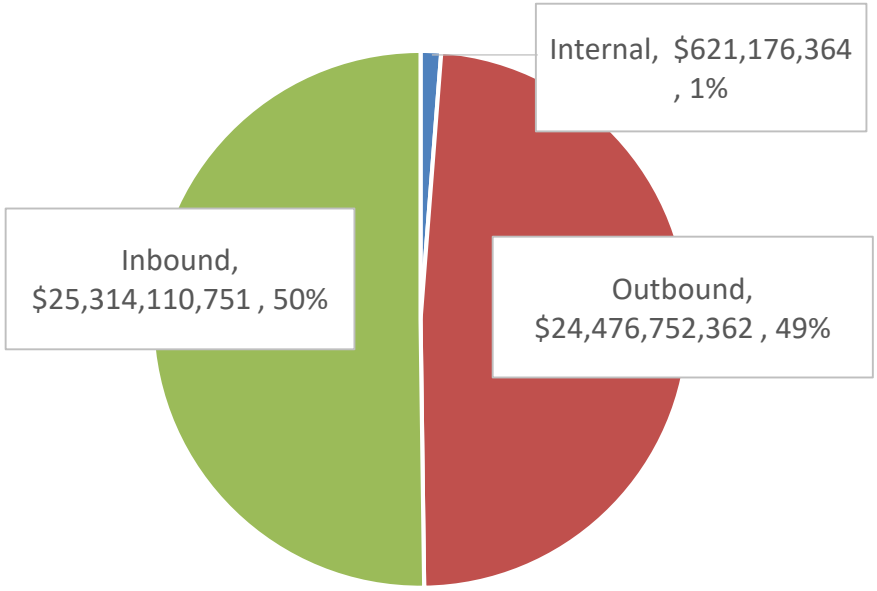
Eight County Tons and Value by Direction of Trade

The Region has fairly "balanced" flows with little internal trade

Tons by Direction (2014)
Total = 67.3 Million tons



Value by Direction (2014)
Total = $50.4 Billion

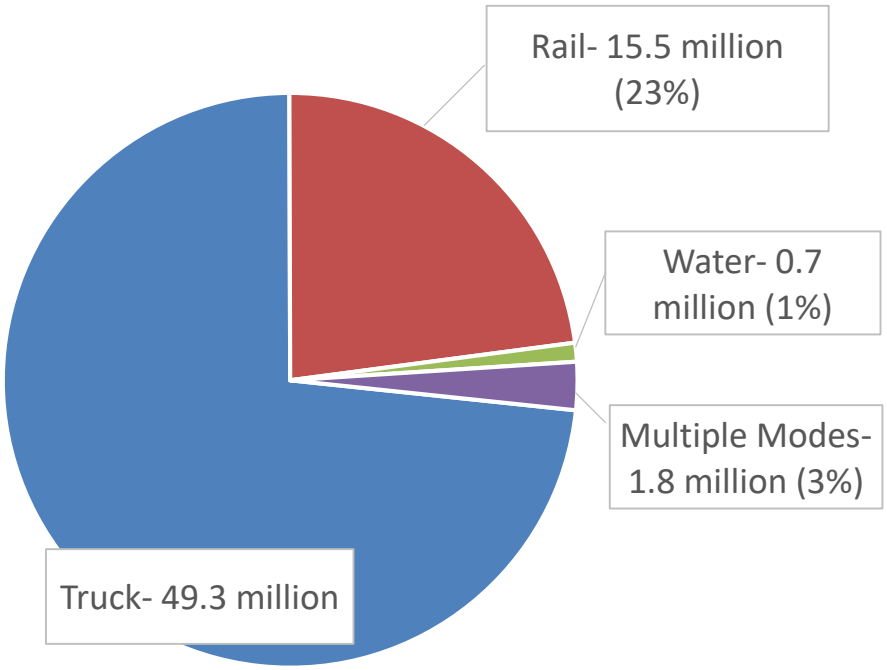


Source: WSP Analysis of FHWA Freight Analysis Framework version 4 (FAF4) data. Preliminary.

Eight County Tons and Value by Mode

Trucks represent 73% of tonnage and 82% of value, indicating trucks are used to carry higher-value, lower weight manufactured goods

Tons by Mode (2014)
Total = 67.3 Million tons



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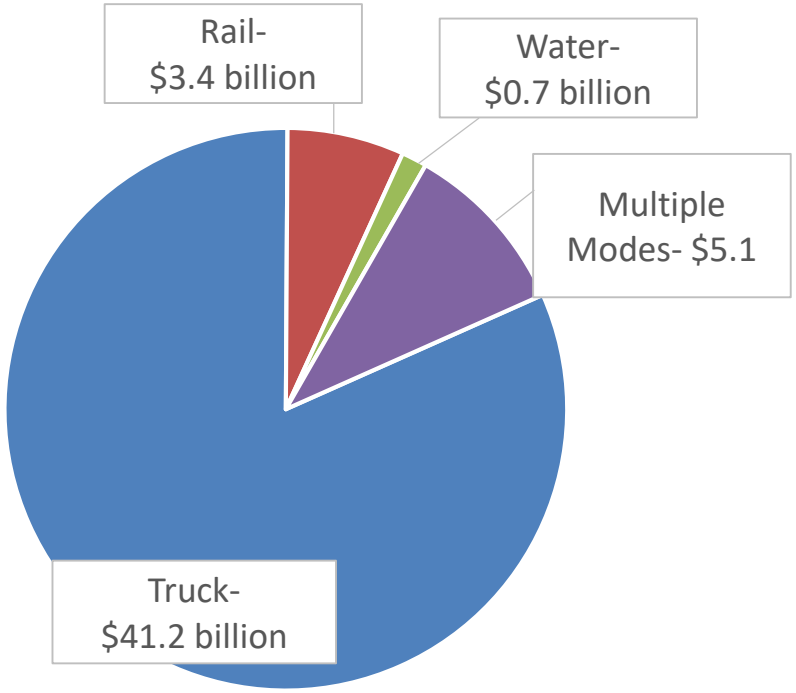
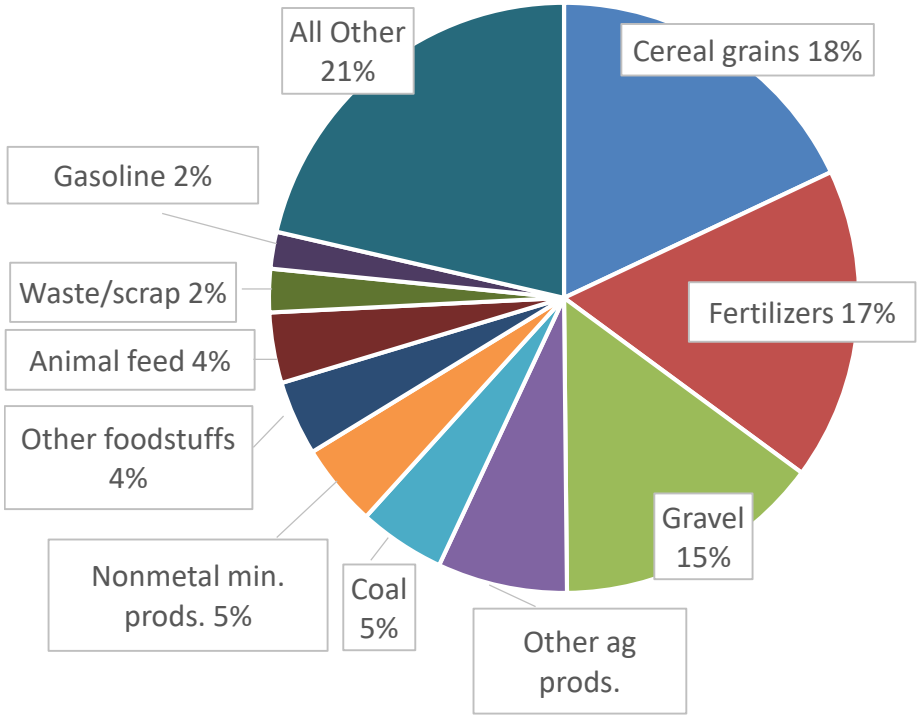


Source: WSP Analysis of FHWA Freight Analysis Framework version 4 (FAF4) data. Preliminary.

Eight County Tons and Value by Commodity

Top tonnage and value commodities are linked to the Region's key industries – manufacturing and agriculture

Tons by Commodity (2014)
Total = 67.3 Million tons



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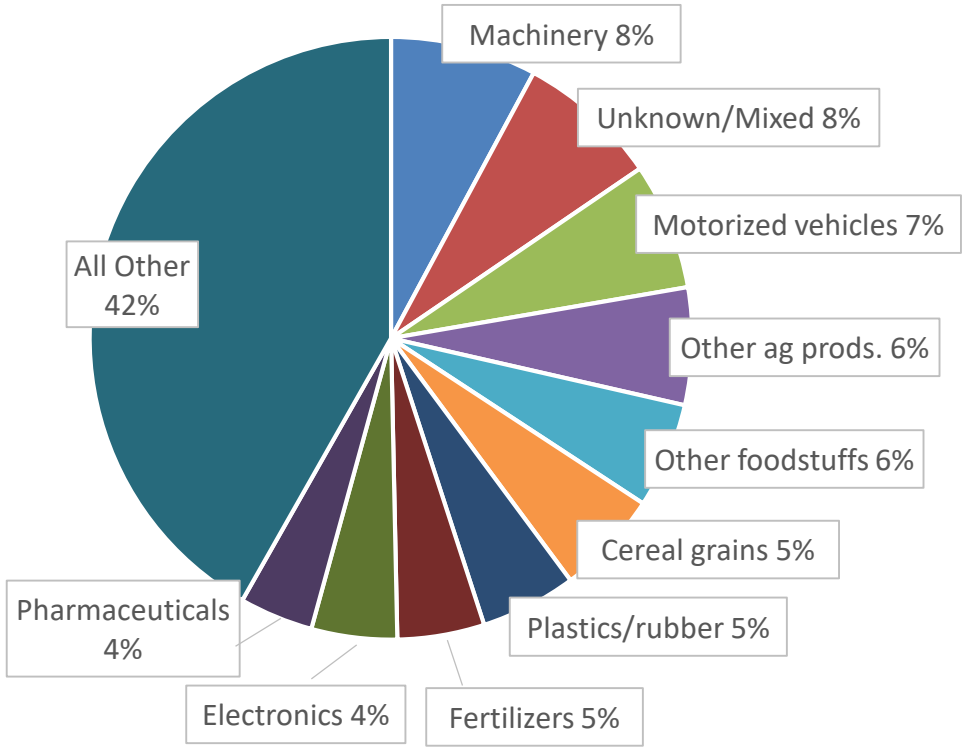

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Source: WSP Analysis of FHWA Freight Analysis Framework version 4 (FAF4) data. Preliminary.

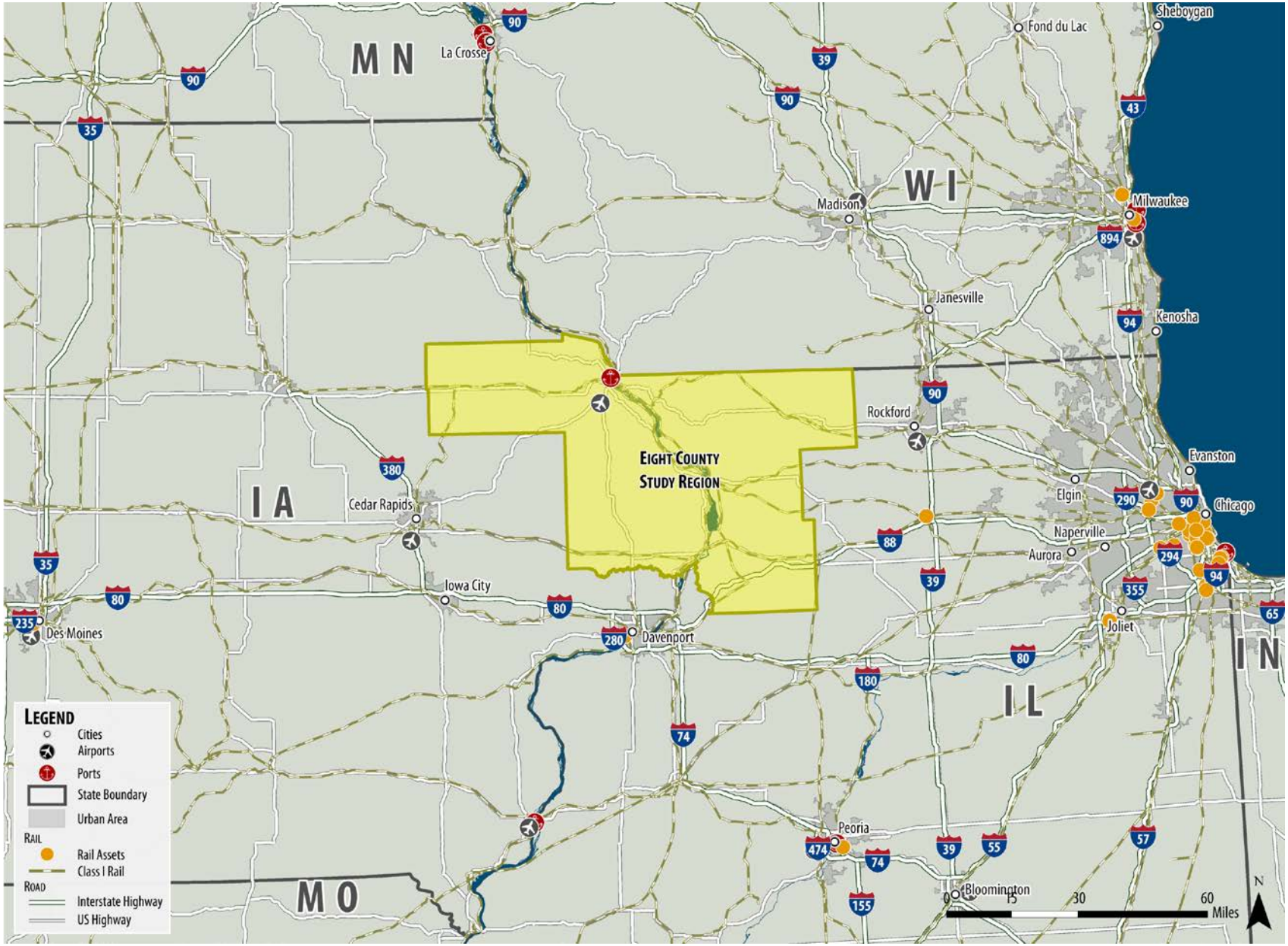
Key Question 3

What transportation connections are most critical for the Region's economy?

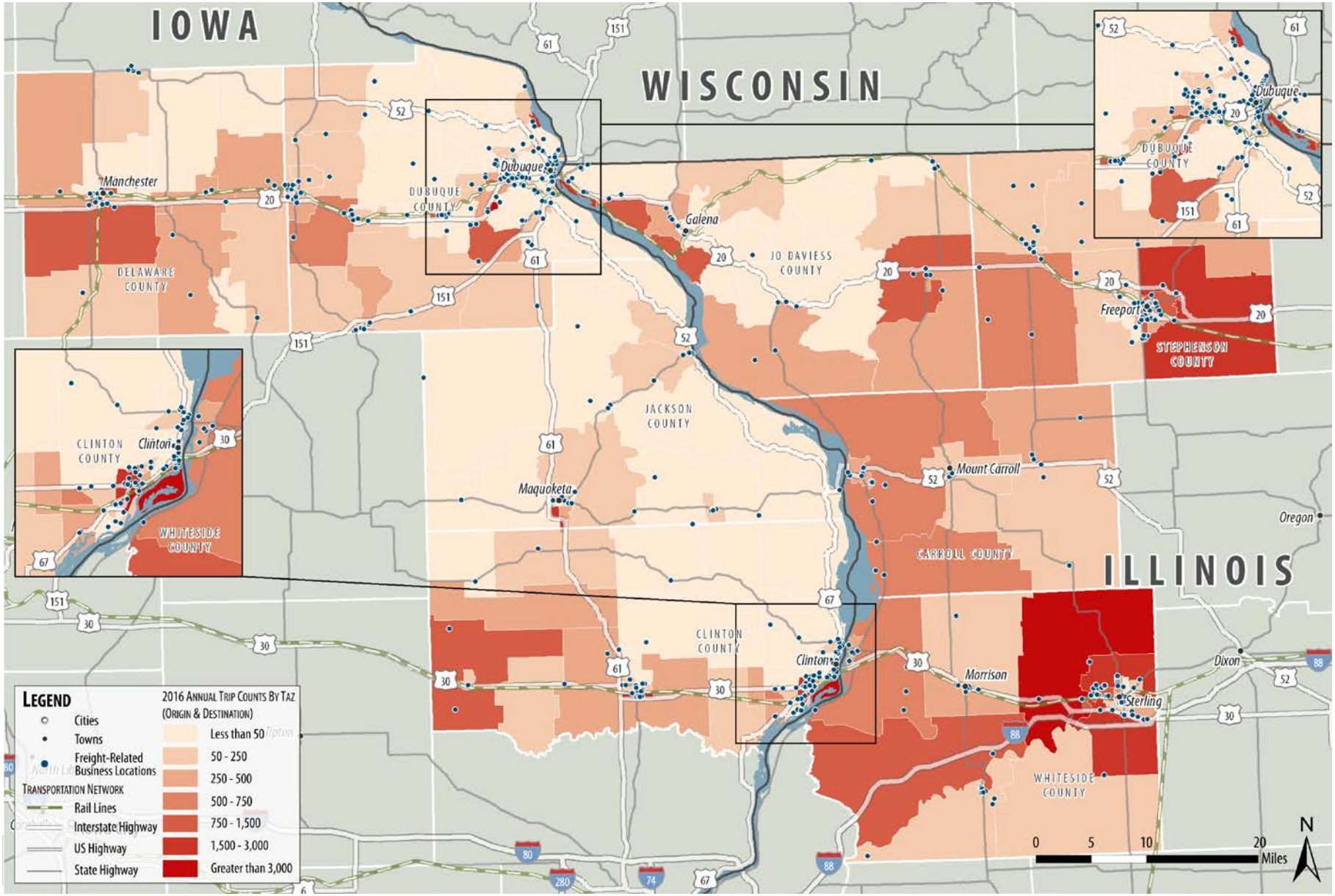
Why is this question important?

- This articulates the connections critical to your Regional economy.
  - Other regions
  - Trade lanes
  - Modes used

Eight County Proximity



Trip Ends by Analysis Zone

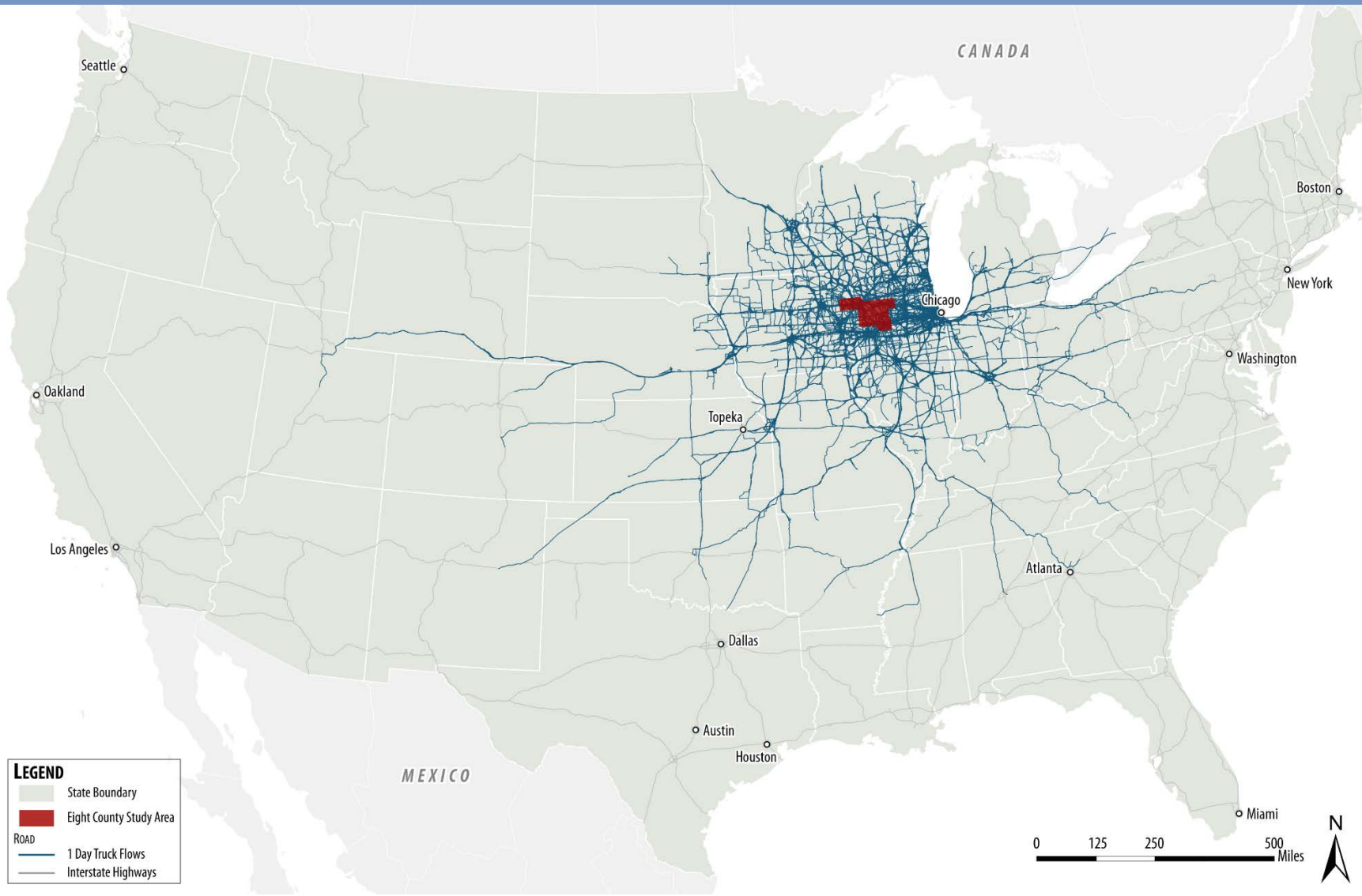


Source: ATRI FPM Program, American Transportation Research Institute, 2017

Trip Ends by Analysis Zone *(indexed by sq. miles/zone)*

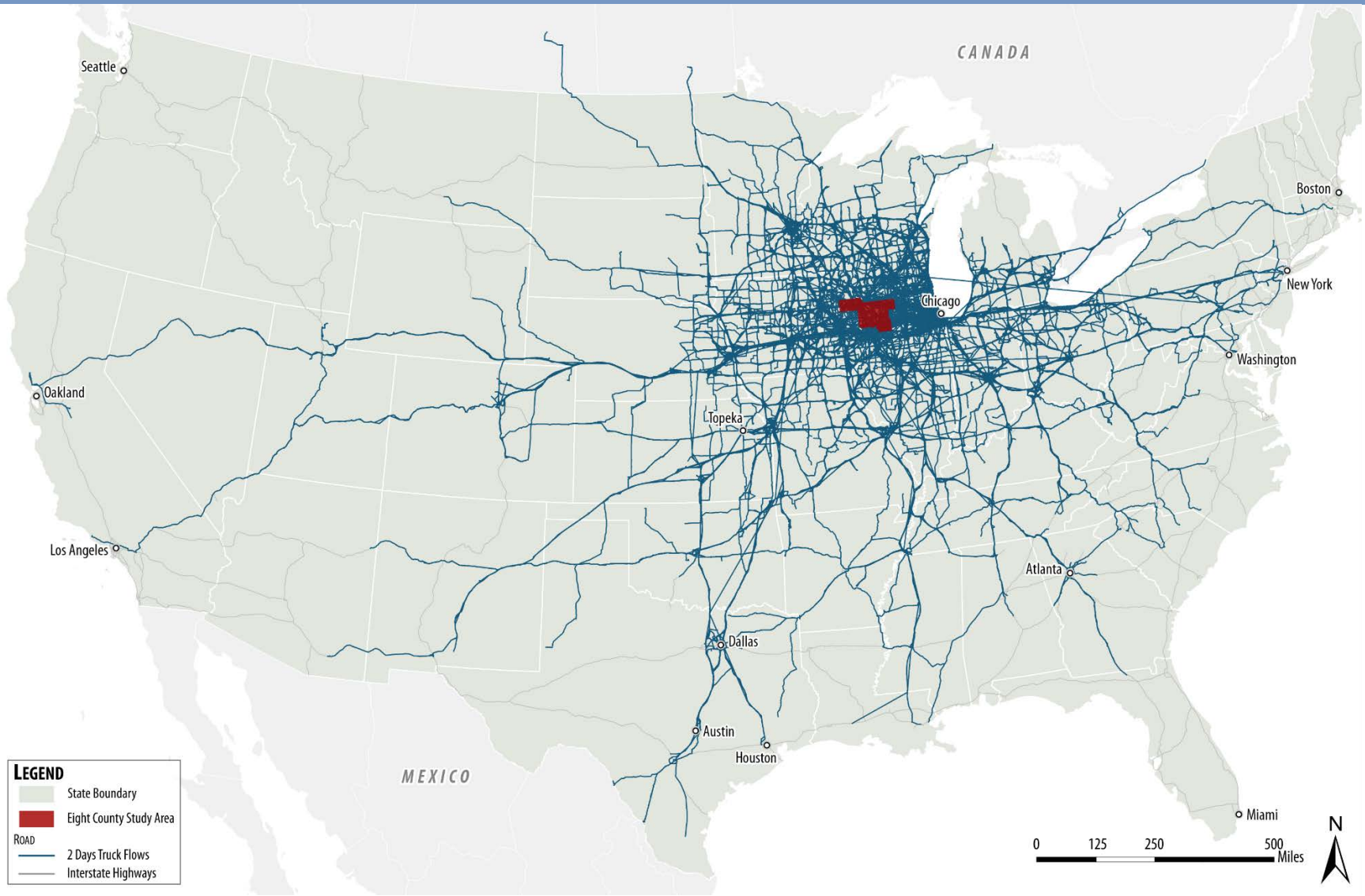
Source: ATRI FPM Program, American Transportation Research Institute, 2017

Within a 1-day truck drive from the Region…



Source: ATRI FPM Program, American Transportation Research Institute, 2017

Within a 2-day truck drive from the Region…



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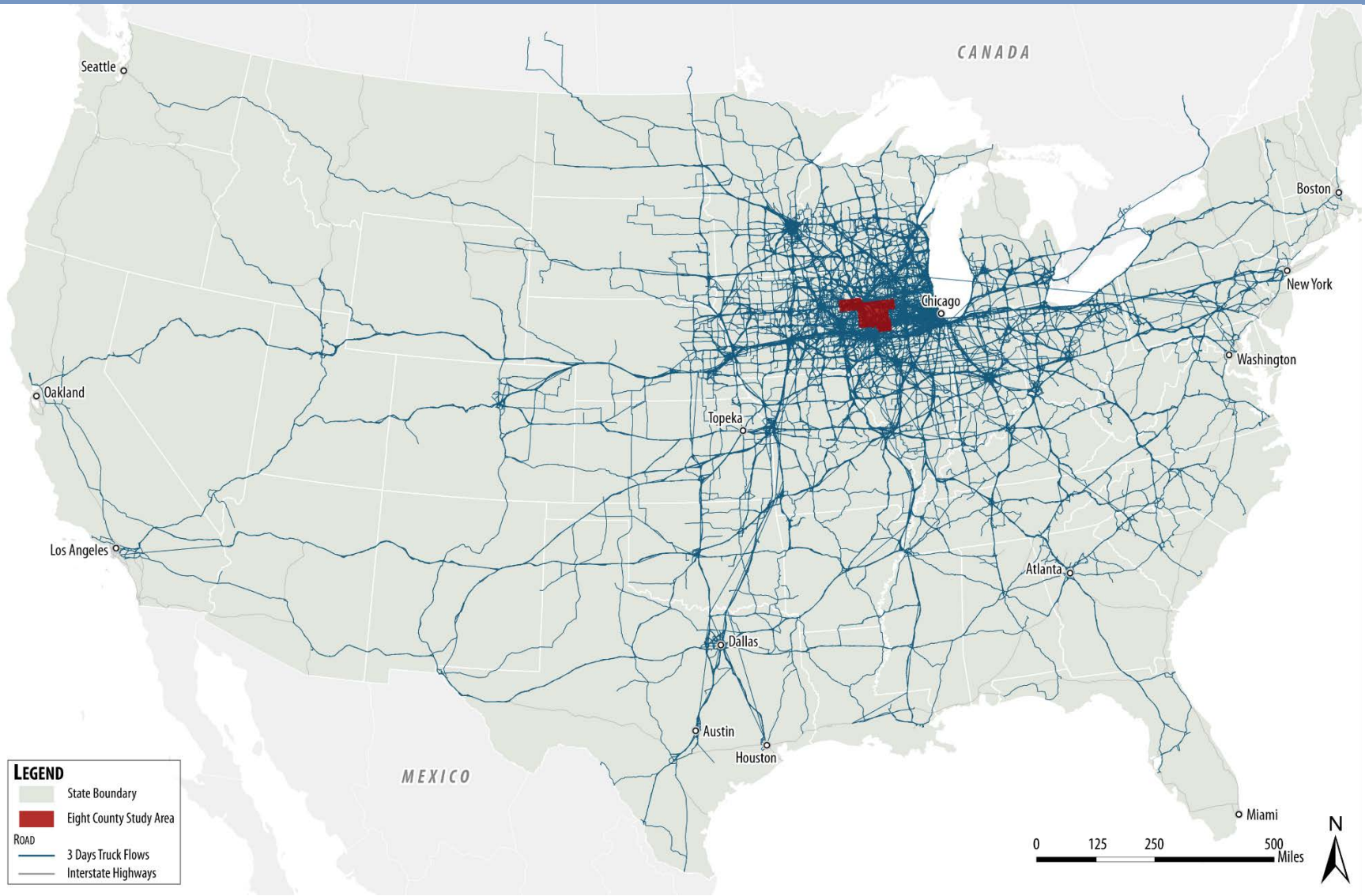
Source: ATRI FPM Program, American Transportation Research Institute, 2017

Within a 3-day truck drive from the Region…



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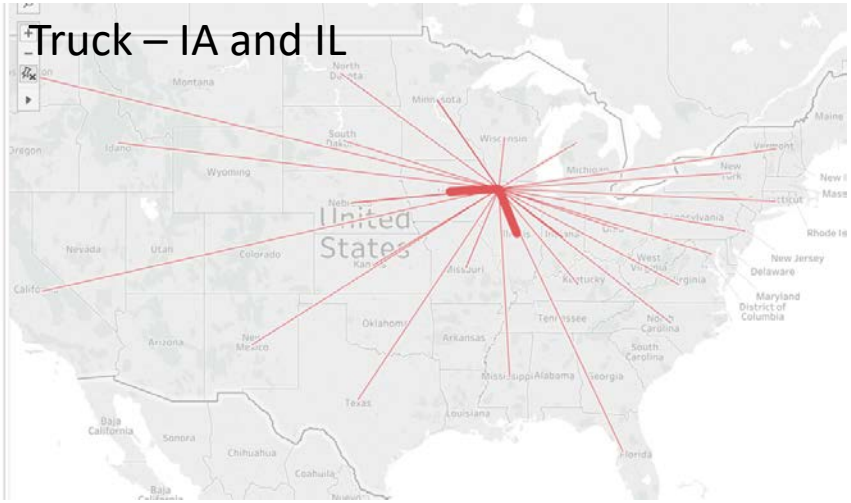
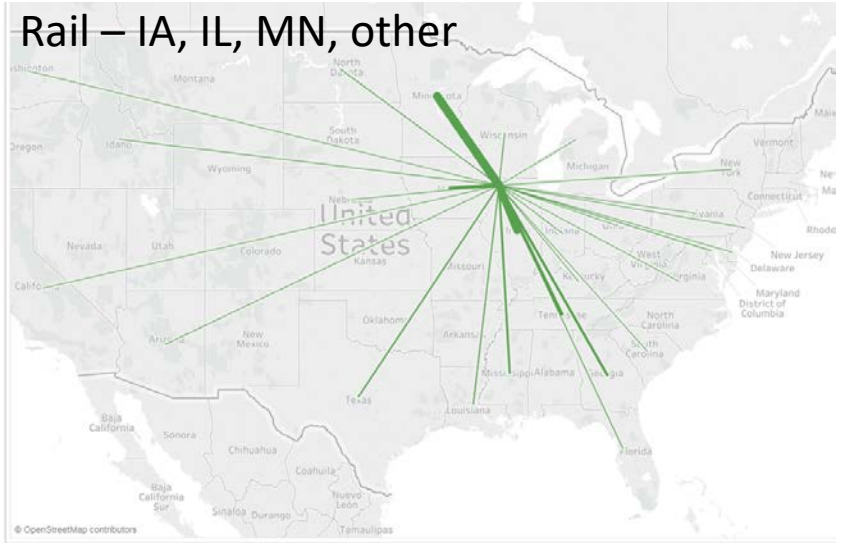
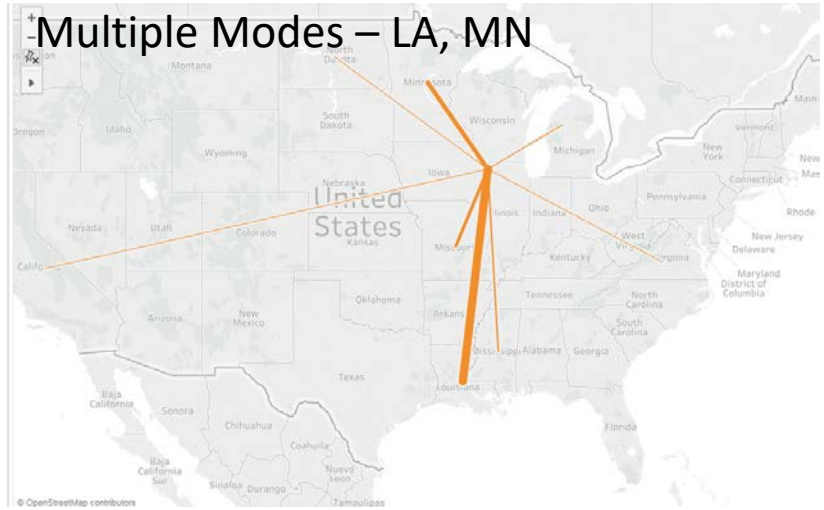
Source: ATRI FPM Program, American Transportation Research Institute, 2017

Example of Cereal Grains Tonnage Flows by Mode







(Both Directions), 2014

Source: WSP Analysis of FHWA Freight Analysis Framework version 4 (FAF4) data. Preliminary.

Key Question 4

What is the cost of using the Regional freight system?

Why is this question important?

- This informs the competiveness of the services provided in the Region.

Eight County Modal Usage

High reliance on truck and rail, low reliance on water

	Eight County Region 2014 Tonnage Share	US Total Tonnage Share (excluding Air, Pipeline, Other)	Eight County "Modal Quotient"
Truck	73.3%	79.6%	0.92
Rail	23.0%	12.4%	**1.85**
Multiple	2.7%	3.1%	0.88
Water	1.1%	5.0%	**0.21**

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Transportation Cost Results

The Eight County Region "freight bill" can be estimated at roughly $2 billion per year

	Rate per Ton-Mile	Ton-Miles, 2014	Estimated Transportation Cost
Truck	$ 0.108	13,056,538,943	$ 1,410,106,206
Rail	$ 0.083	6,159,485,019	$ 511,237,257
Multiple	$ 0.097	1,012,159,822	$ 98,179,503
Water	$ 0.050	385,064,490	$ 19,253,224
		Total	**$ 2,038,776,190**

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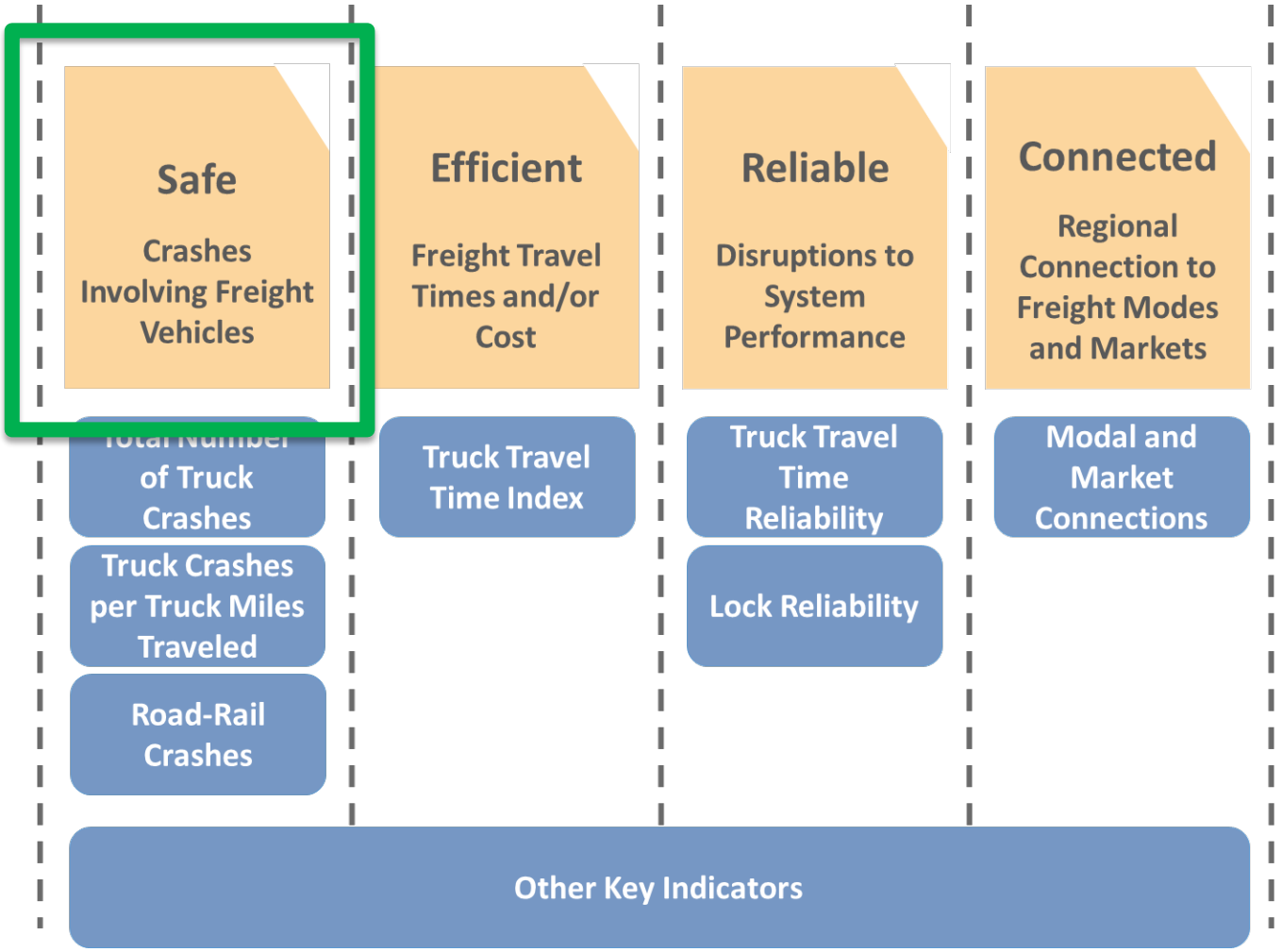
Key Question 5

What recommendations will enhance the Region's competitiveness?

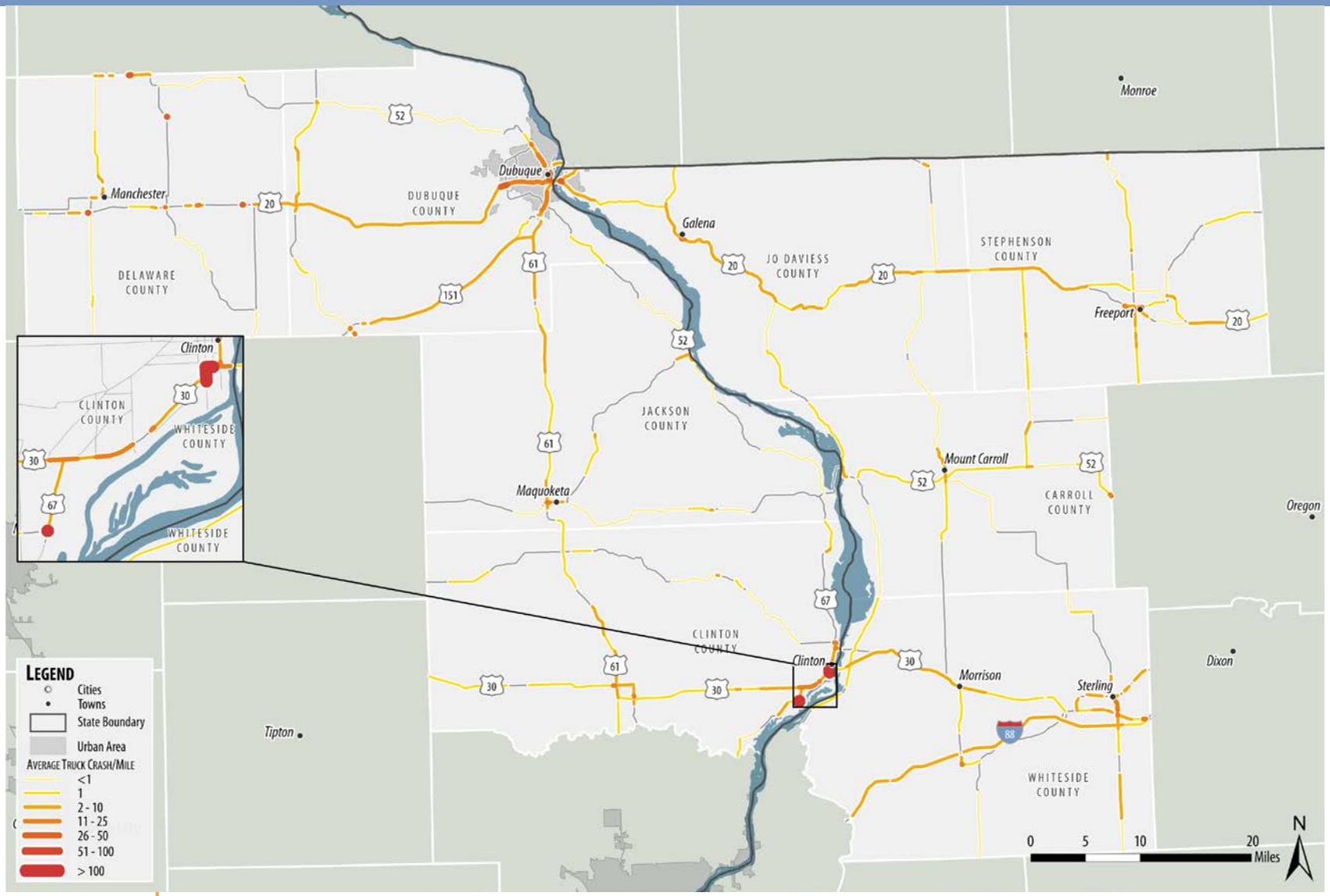
Why is this question important?

- A freight plan goal is to ***increase*** freight system safety, speed, reliability, and modal availability, and to ***decrease*** cost.

Freight System Needs Assessment



Safety: Truck Crashes per Mile



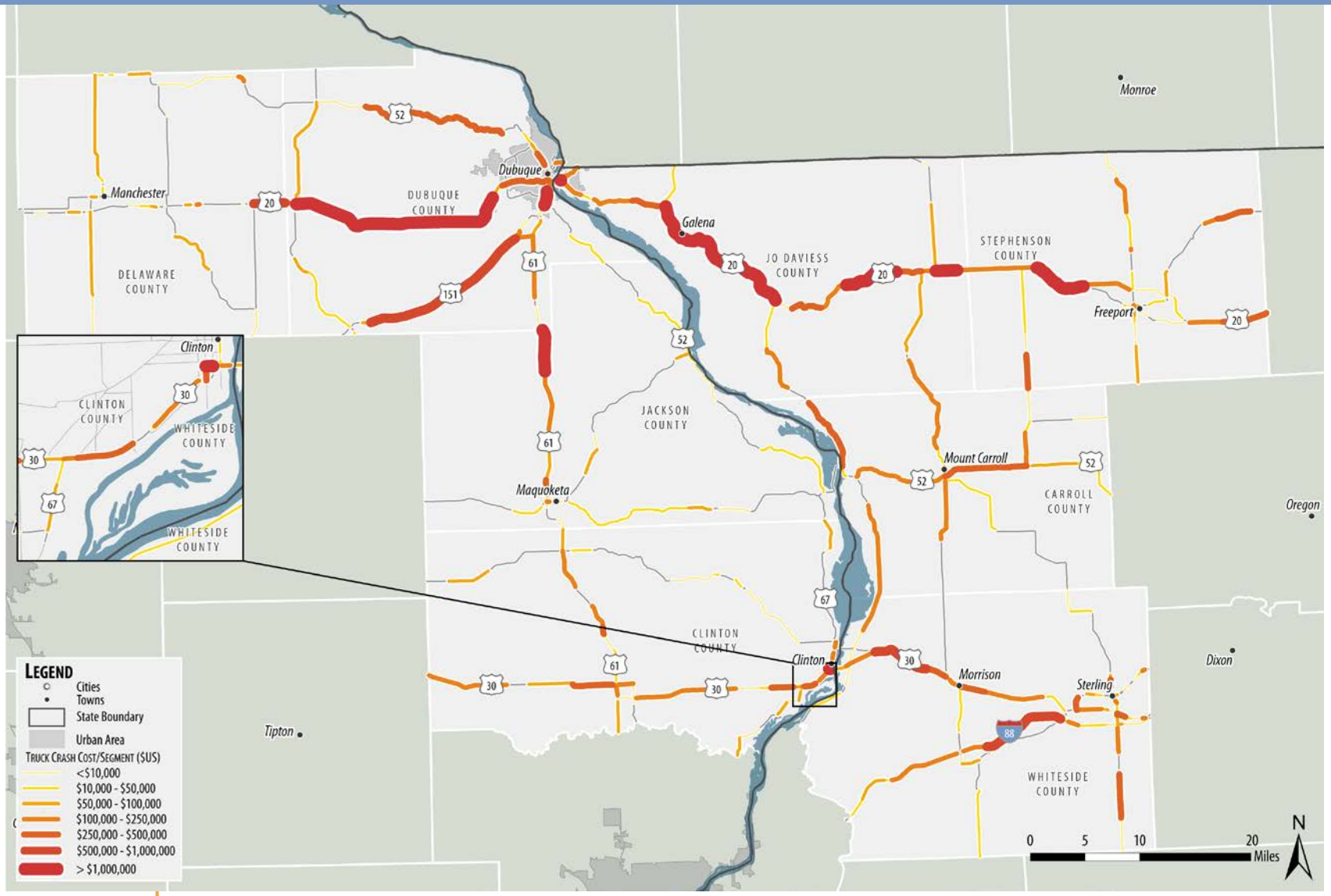
Safety: The Cost of Crashes in the Region

KABCO codes are assigned to crashes based on maximum level of injury.

Code	Definition	Associated Cost
K	Fatality	$4,008,900
A	Disabling Injury – Hospitalization required	$216,000
B	Evident Injury – Scrapes and bruises, no hospitalization required. "Can walk away."	$79,000
C	Possible Injury – No visible injury, but complaints of pain	$44,900
O	Property Damage Only	$7,400

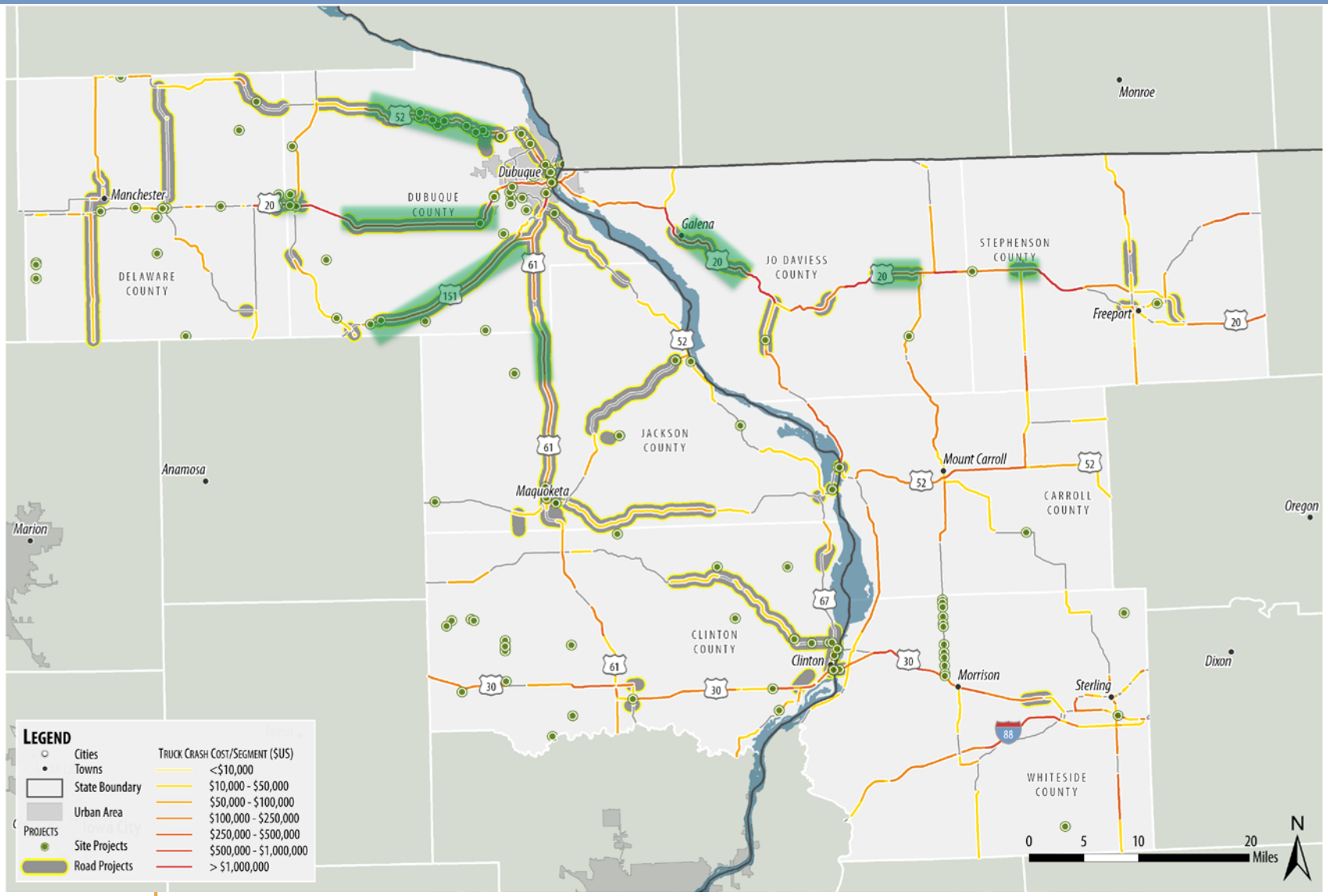
Source: Highway Safety Manual, First Edition, Draft 3.1. April 2009.

Safety: Areas of Greatest Truck Crash Cost/Severity



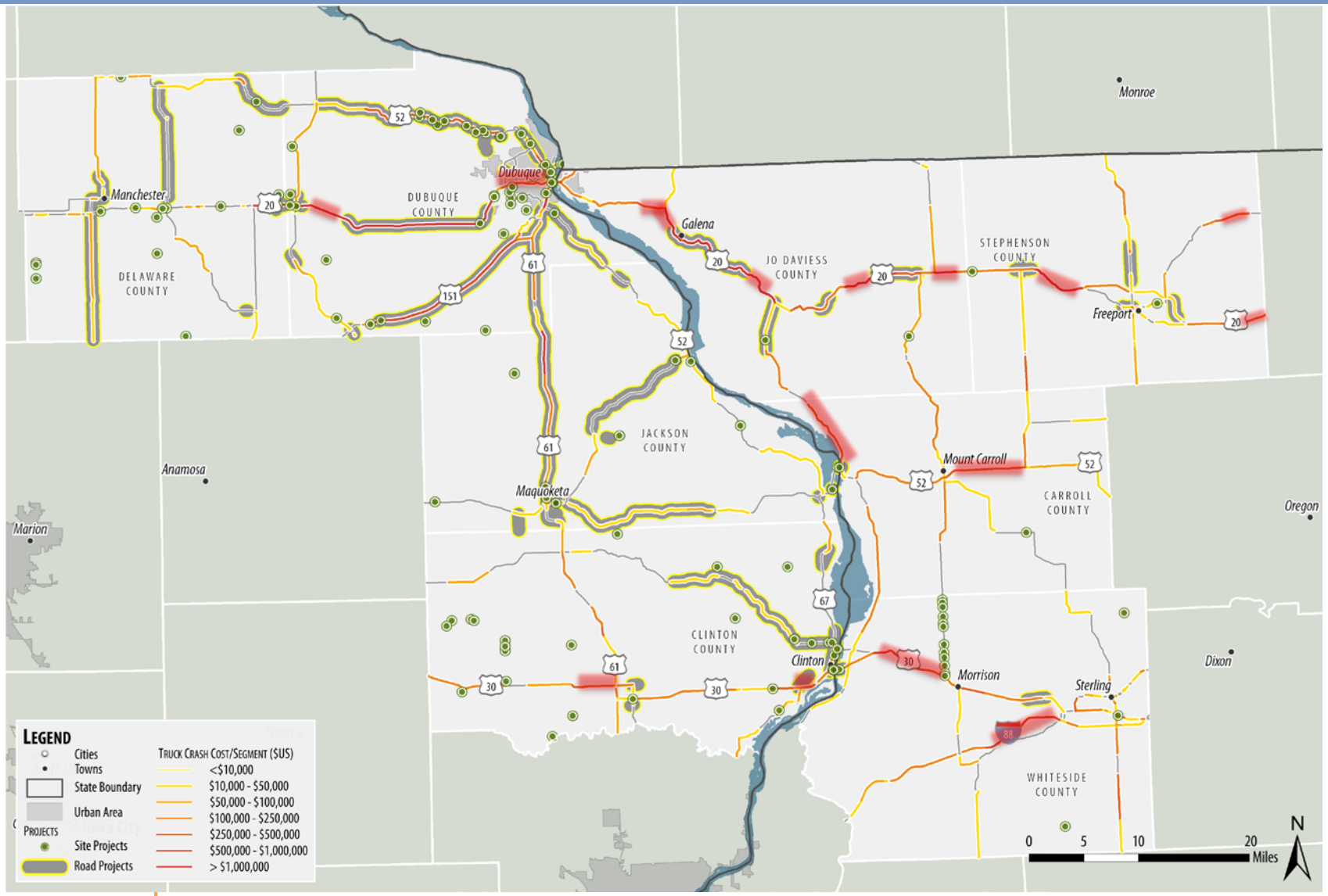
Note: Map shows crashes per segment, not per mile

Safety: Overlap with Previously ID'd Projects



Note: Segments with $500,000, or more, in costs are highlighted.

Safety: Gaps in Projects



Note: Segments with $500,000, or more, in costs are highlighted.

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Project Gaps

Shown with Safety and Congestion Data

Note: Black circles show overlap between safety and congestion project gaps.

Freight Study Recommendations

Projects

- Spot highway improvements to address congestion and safety
- Pavement improvements
- Bridge improvements
- New/improved intermodal and/or port facilities
- Transload/consolidation facilities
- Lock and dam improvements

Presentation Map

The Eight County Freight Study

Key Outcomes and Information to be Delivered

Next Steps

- **Benefit Cost Analyses**
- **Formalizing Recommendations**

Next Steps

- Formalize list of project recommendations
- Conduct benefit-cost analysis on select project types
- Coordinate with public and private sector stakeholders to vet and validate full slate of strategic recommendations
- Develop final Eight County Freight Study and tools

Benefit-Cost Analyses

Evaluate 3 Projects using BCA model from recent TIGER/INFRA grant solicitation

- **Road** – safety improvements to US 20
- **Water** – high-value, oversized manufactured goods port development
- **Rail** – Improved rail link to Cedar Rapids facility?

Feed results into state plans and state/federal grant programs

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Thank You

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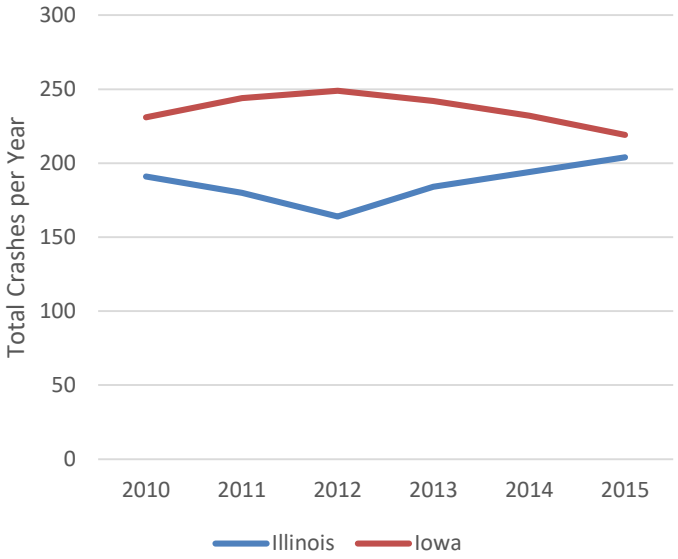
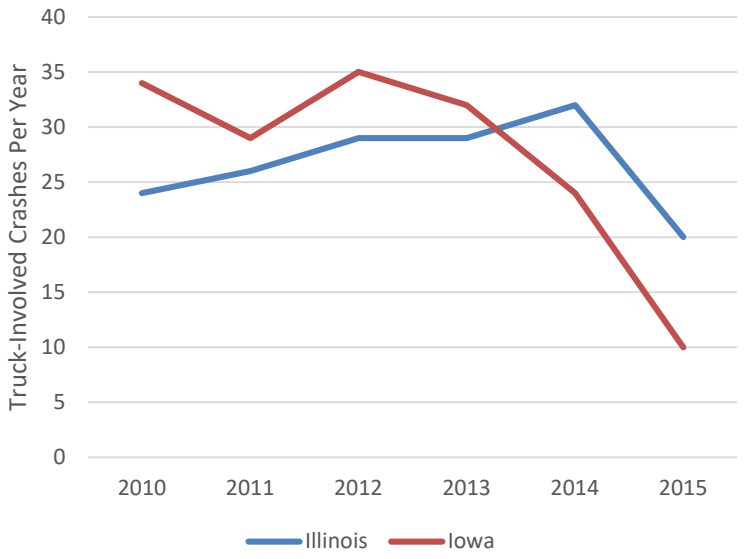
Gap Areas for Safety / Potential Project Locations

Highway	Area from Maps	Location Specifically Mentioned in Outreach?
US-20	Farley to Dyersville	No (US-20 mentioned as a need)
US-20	Mississippi River to N Cascade Road	No (US-20 mentioned as a need)
US-20	Menominee Road to E. Galena	No (US-20 mentioned as a need)
US-20	Tapley Woods east to IL-84 Junction	No (US-20 mentioned as a need)
US-20	Woodbine to Canyon Park Road	No (US-20 mentioned as a need)
US-20	County Hwy 6 to Business 20 Junction	No (US-20 mentioned as a need)
US-20	West of Freeport	No (US-20 mentioned as a need)
US-30	Grand Mound to US-61	No (US-30 mentioned as a need)
US-30	IL-136 to IL-78	No (US-30mentioned as a need)
US-30/US-67	Clinton	Yes (US-30mentioned as a need)
IL-84	Rush Road to Savanna	No
US-52	Mount Carroll to Lanark	No
I-88	IL-78 to Lincoln Road	No
IL-75	Dakota to Rock City	No

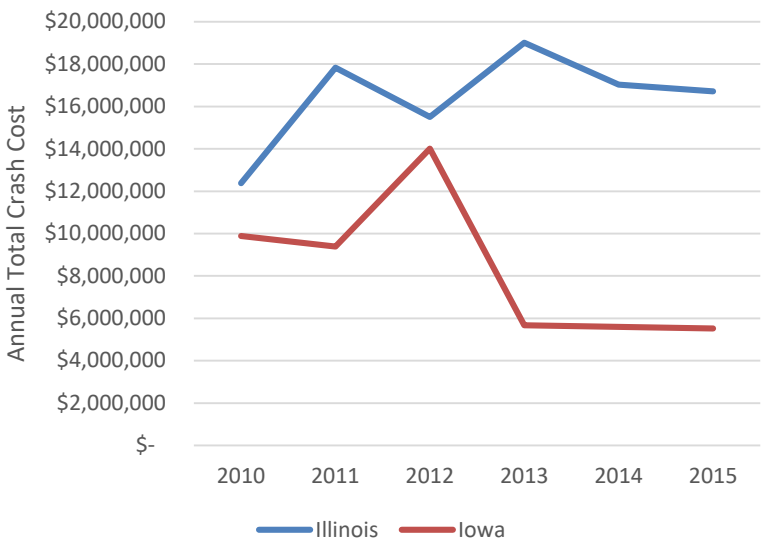
Count of US 20 Crashes

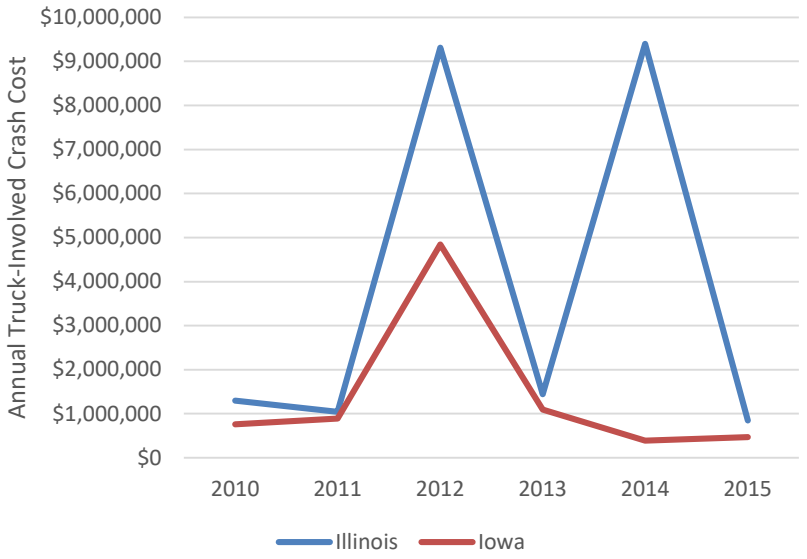




- Between 2010 and 2015:
  - US 20 had 2,534 crashes in total. 44% in Illinois, 56% in Iowa.
  - 324 (13%) of these crashes were truck-involved.
  - 160 (49%) of truck-involved crashes occurred in Illinois. 164 in Iowa.

Cost of US 20 Crashes





- Between 2010 and 2015:
  - US 20 total crash cost exceeded $148.5 million. 75% in IL, 25% in IA.
  - Truck involved crashes cost $31.8 million (21%).
  - Illinois had 73% of truck crash costs ($23m).

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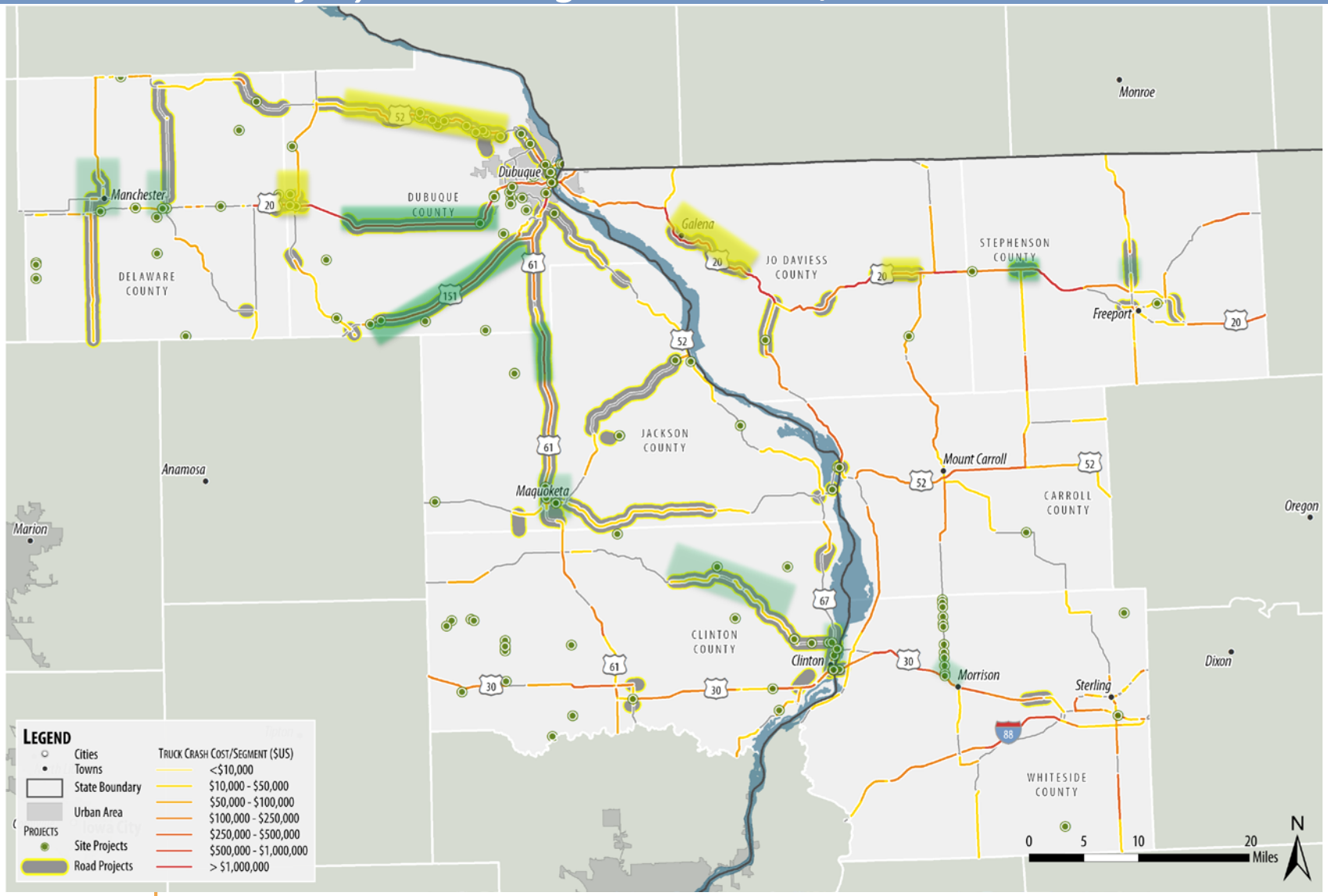
Previously Identified Project Overlaps

Shown with Safety and Congestion Data / Needs



Note: Yellow areas indicate overlap of both safety and congestion-relevant projects.

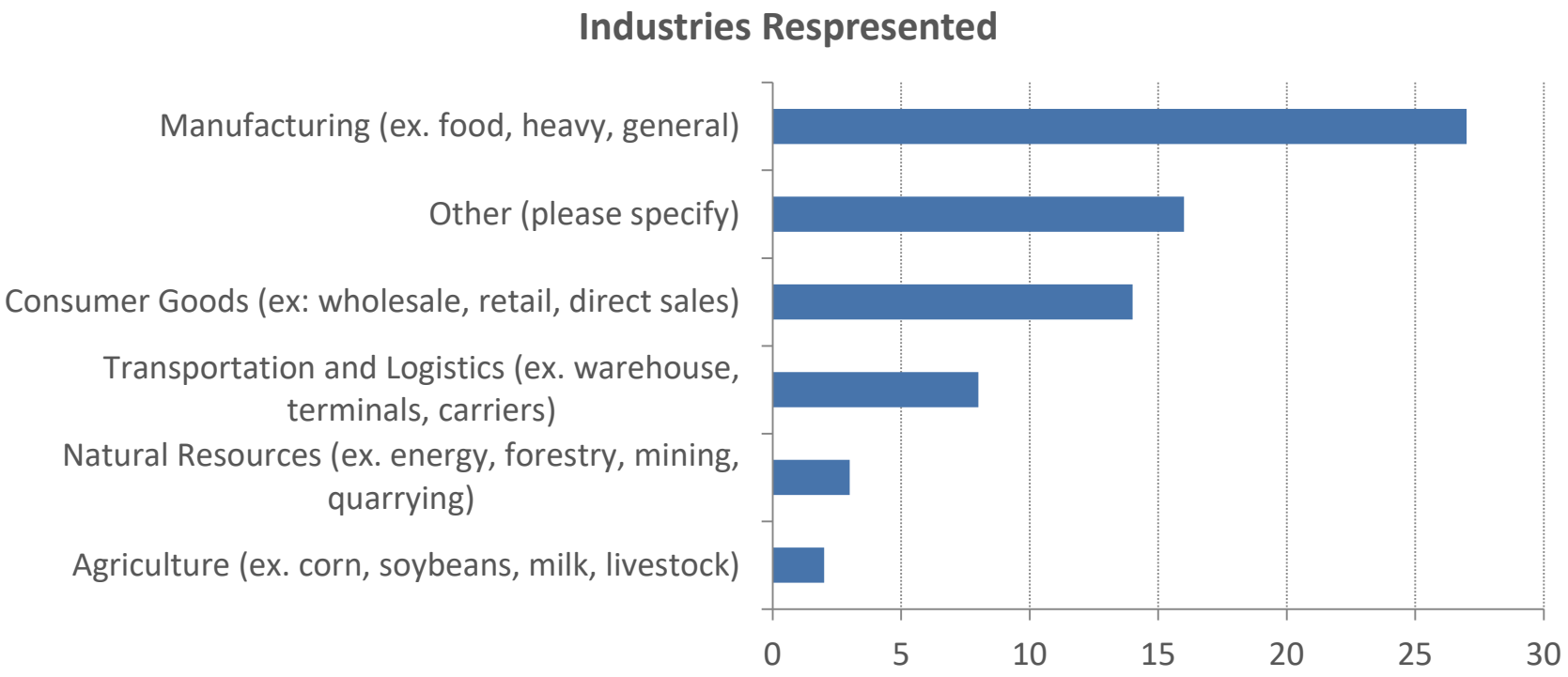
Stakeholder Insights

- Information Gathering
  - EDC stakeholder meetings
  - Consultant team one-on-ones
  - Survey Monkey online questionnaire
  - Steering Committee feedback

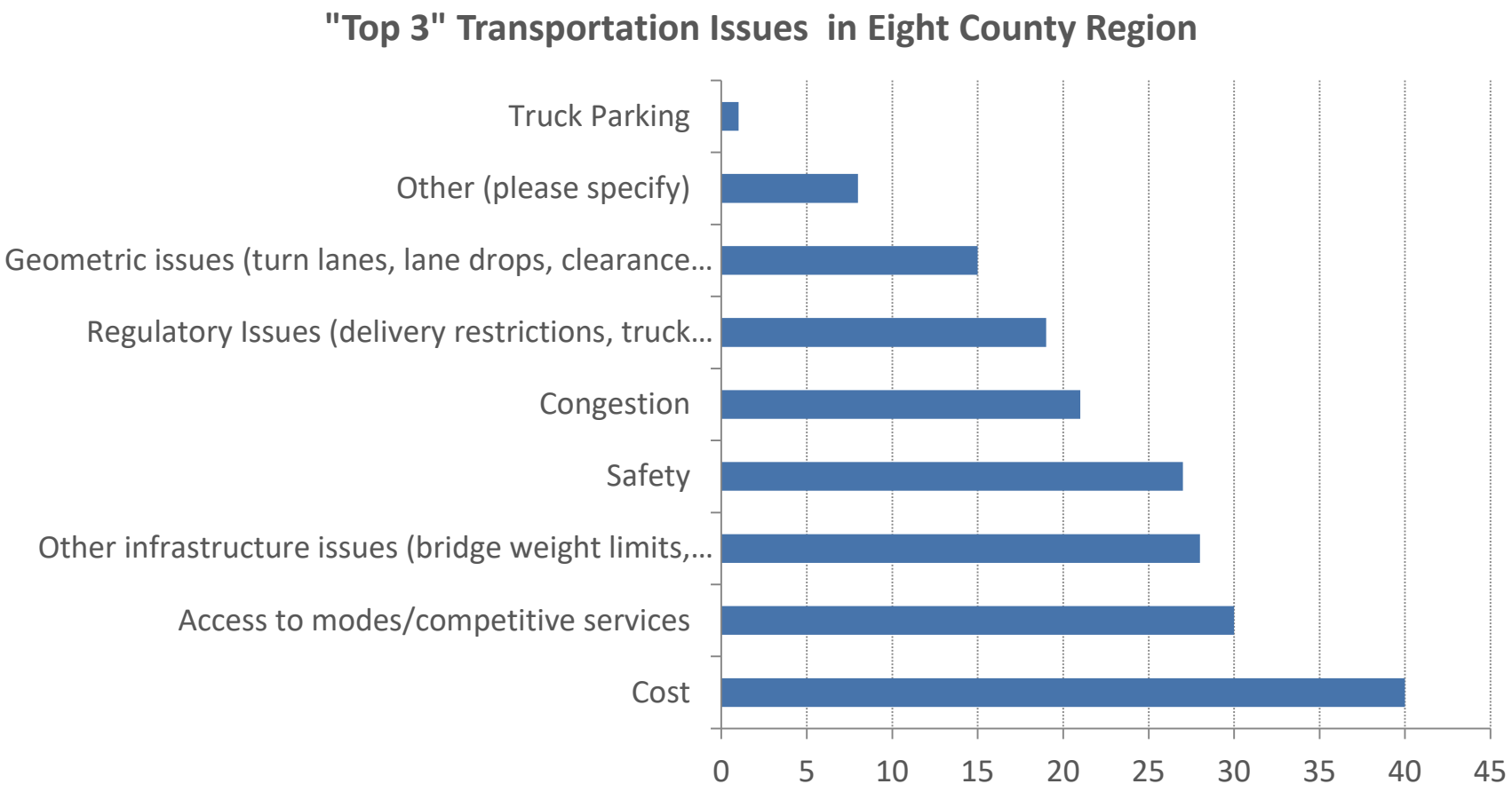
Stakeholder insights (qualitative data) will be compared against the performance assessment (quantitative data)

Industry Survey – Response Update

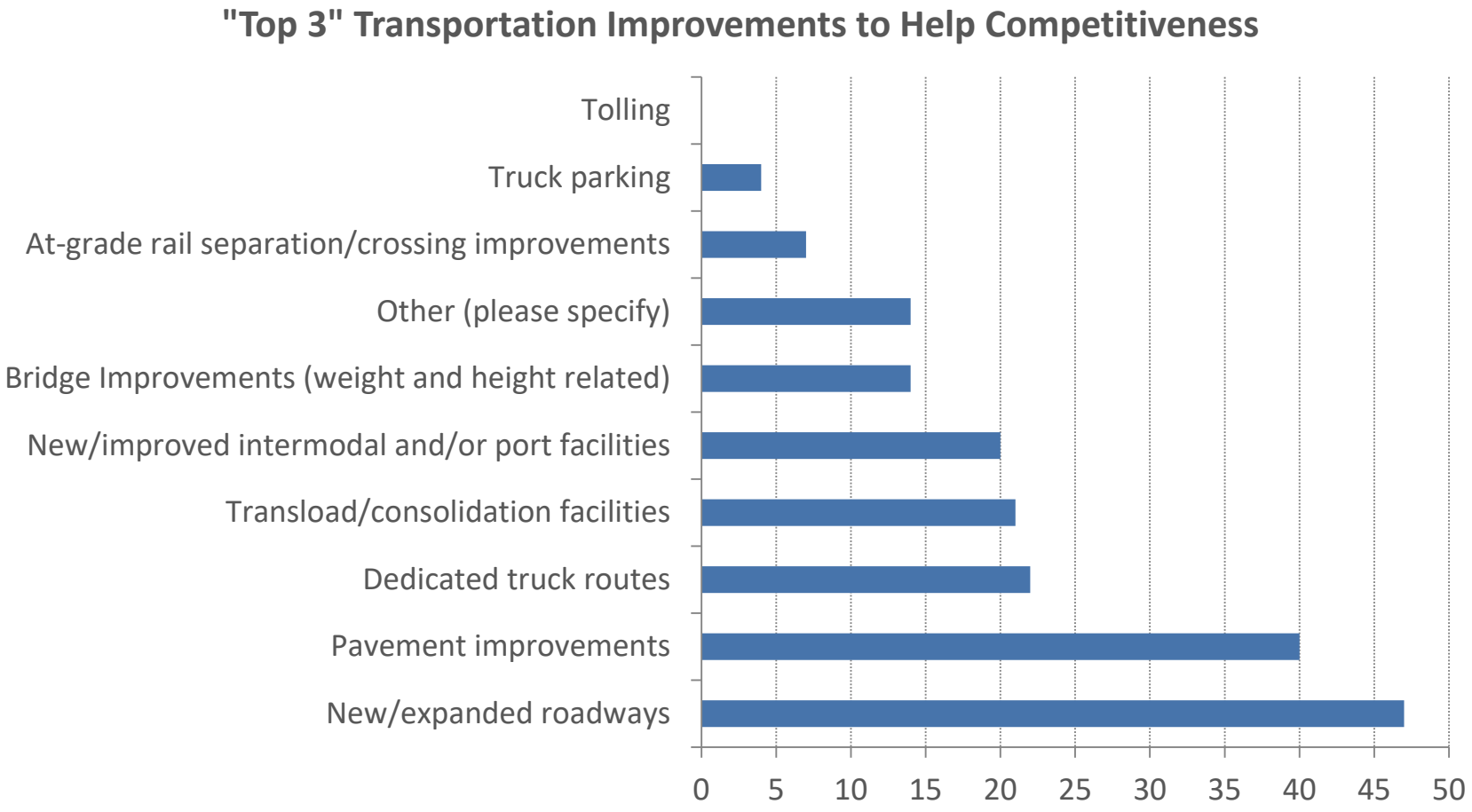
63 company responses



Industry Survey – Transportation System Performance



Industry Survey – Transportation System Performance



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