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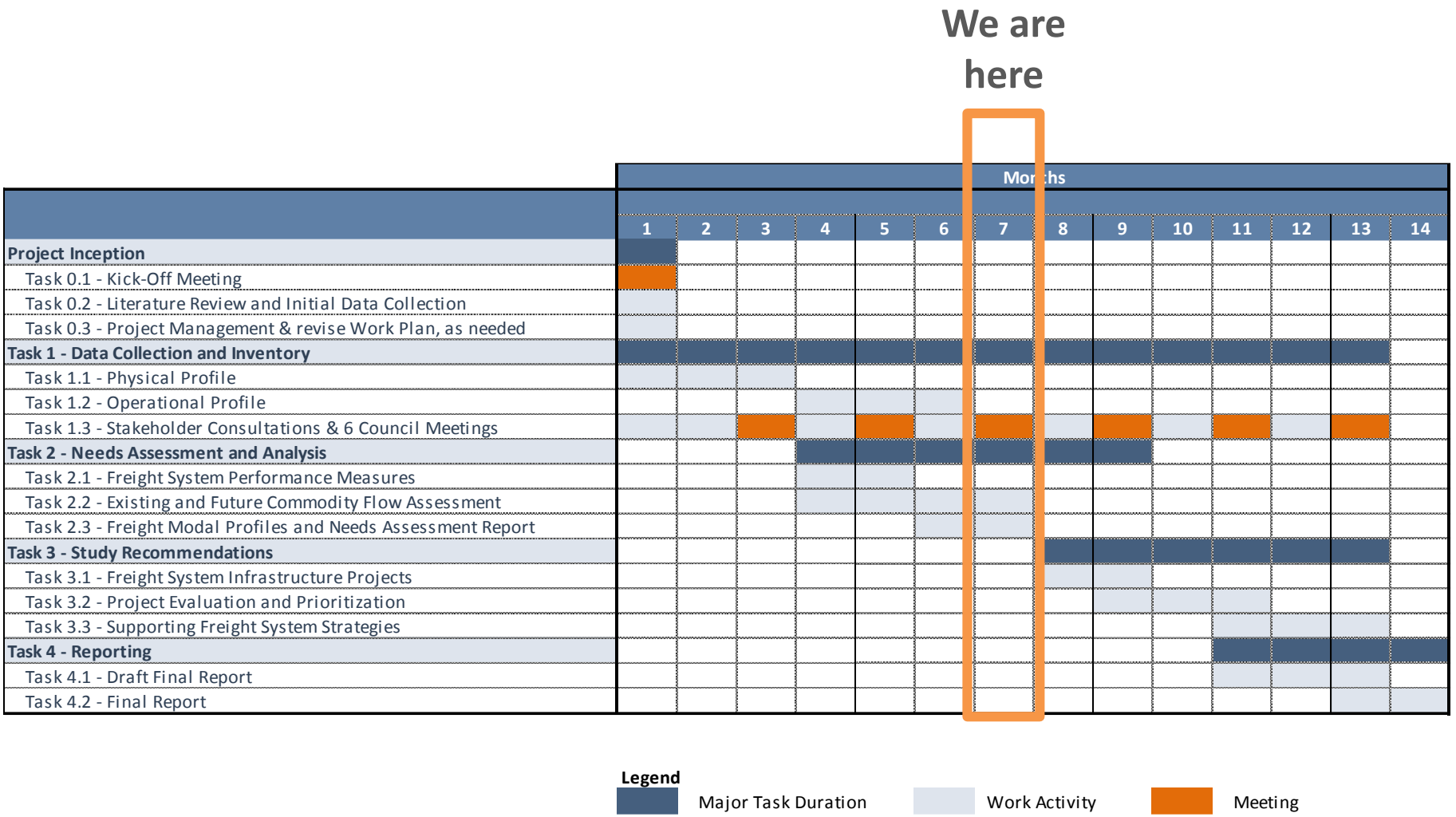
Eight County Freight Plan

East Central Intergovernmental Association &
Blackhawk Hills Regional Council

CPCS Team
July 10, 2017
Ingersoll Wetlands Learning Center
Thomson, IL

Work Plan Overview



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Items Under Review

Working Paper 1 – System Inventory

Working Paper 2 – Commodity Flow Analysis

- What are your initial impressions?
- What information will be most useful?
- What information is missing?

Presentation Map

Freight System Goals and Performance Measures

Data Analysis via a Visualization Tool

Summary of Stakeholder Findings

SWOT Discussion

Questions & Discussion

Freight Plan Vision

Outcomes

Impact Categories

The Eight County Multimodal Freight System supports **quality of life, growth** and enables **business retention** and **attraction**, by providing **safe, efficient,** and **reliable connection** to regional, national, and global markets today and in the future.

Freight Plan Goals

Vision

The Eight County Multimodal Freight System supports quality of life, growth and enables business retention and attraction, by providing safe, efficient, and reliable connection to regional, national, and global markets today and in the future.

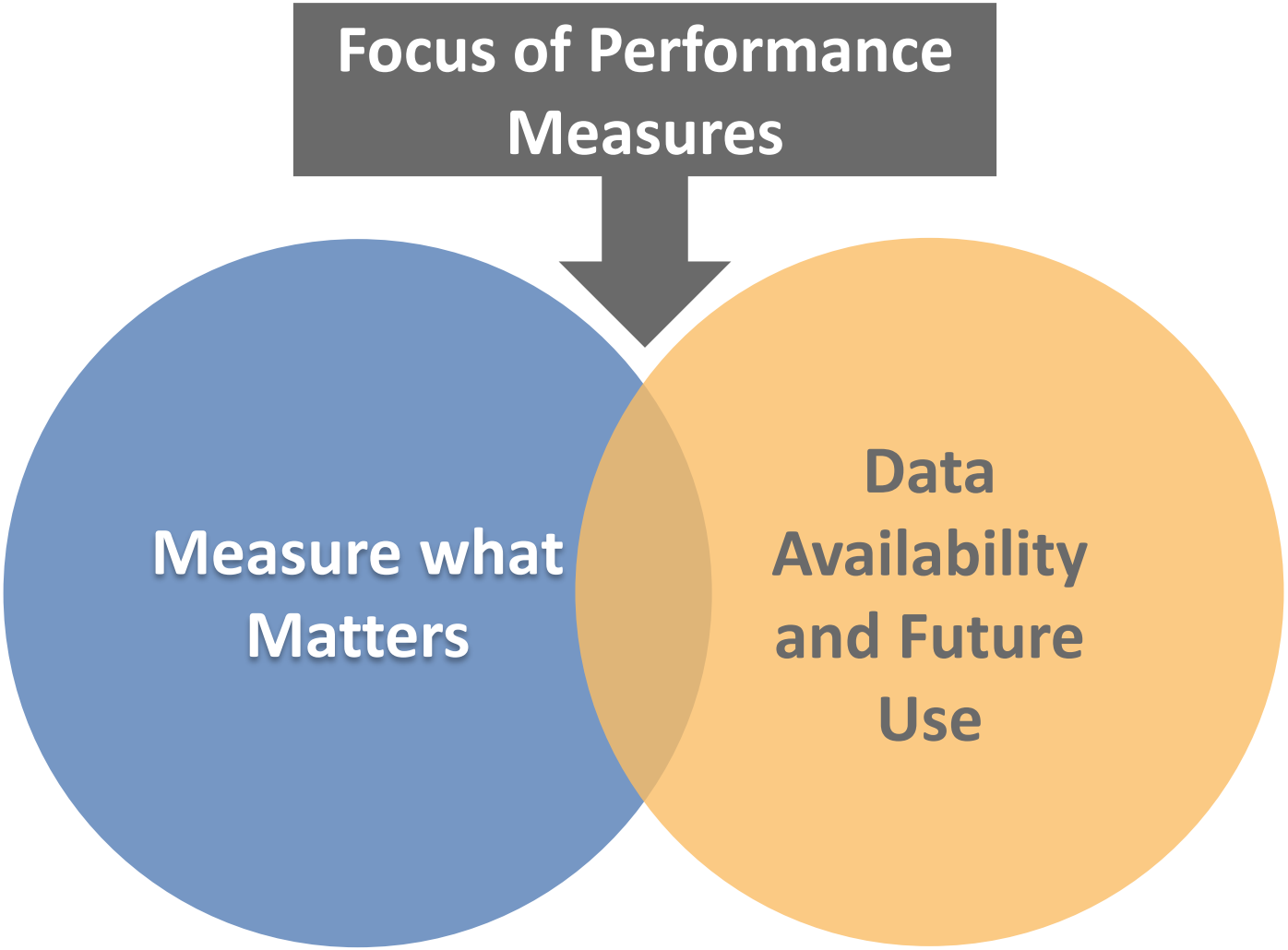
Goals

The Freight System enables Economic Growth and Development	The Freight System Meets Business Needs	The Freight System Aids the Attraction of New Businesses	Community Needs and Priorities are Met
Growth	Business Retention	Business Attraction	Quality of Life

Performance Measures

Reduce Accidents Involving Freight Vehicles	Reduce Freight Travel Times and/or Cost	Reduce Disruptions to System Performance	Improve Regional Connection to Freight Modes and Markets
Safe	Efficient	Reliable	Connection

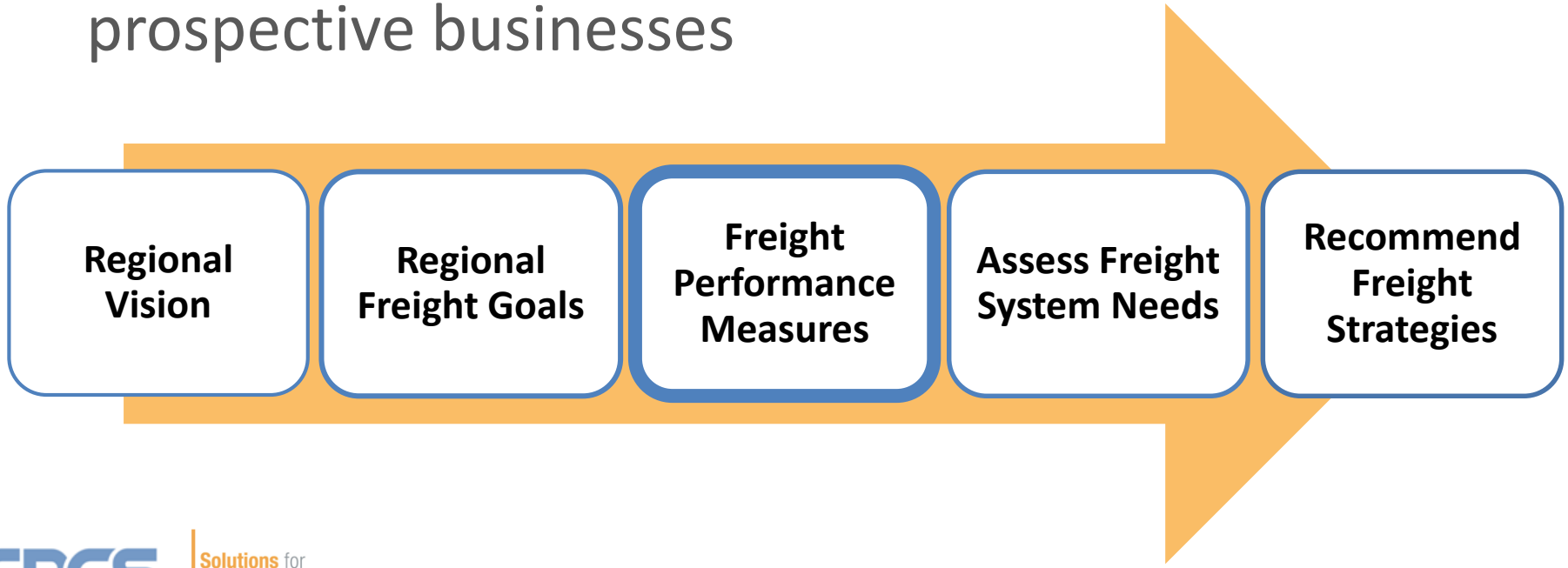
Selecting Performance Measures



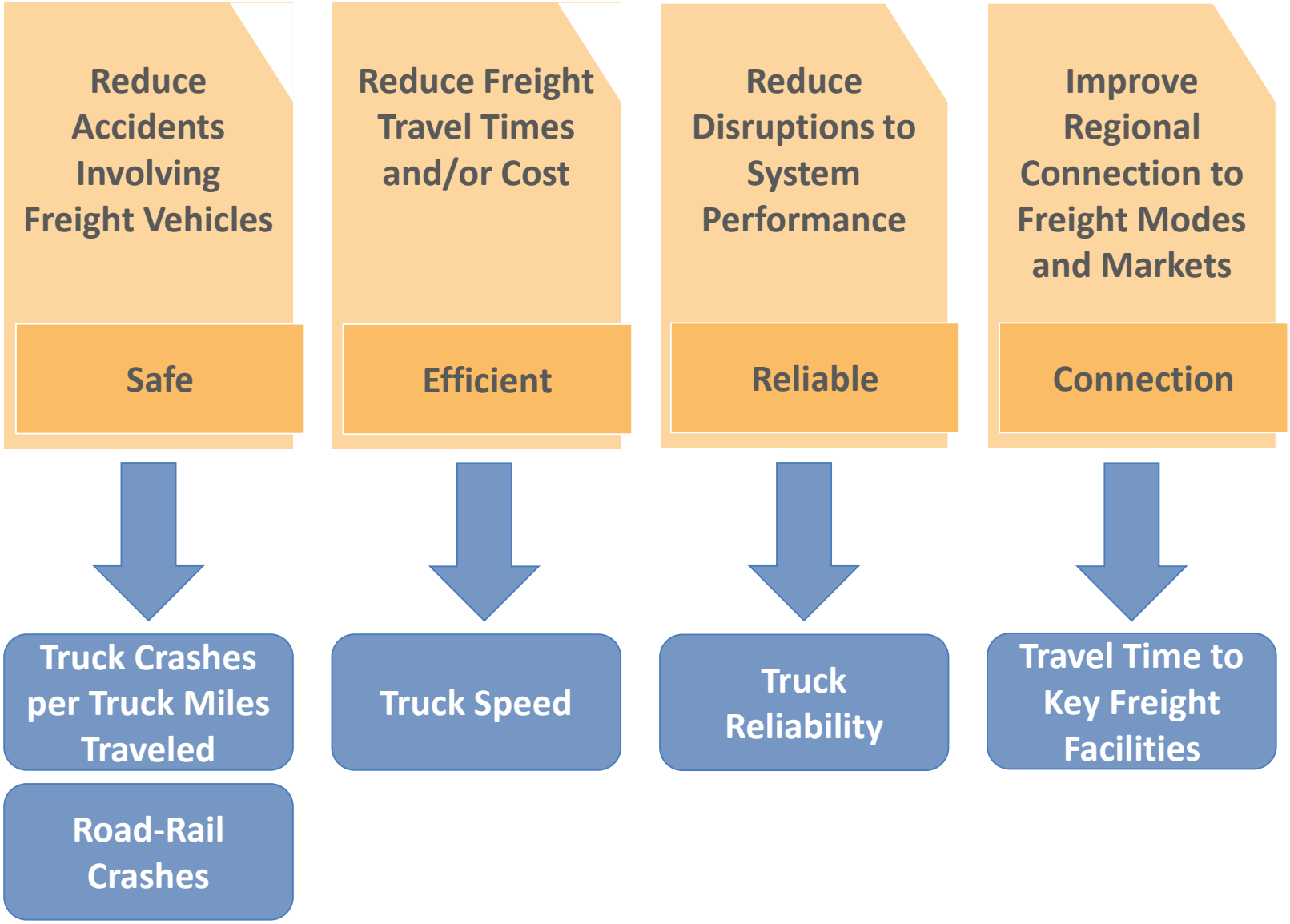
Freight Plan Performance Measures

Key Consideration of Performance Measures

- Establish a baseline
- Inform transportation needs assessment
- Demonstrate transportation system to prospective businesses



Proposed Performance Measures



Performance Measures

- What uses do you envision for performance measures beyond the freight plan?
- Do performance measures help fill data gaps to promote the region?
- Have we missed key performance measures?

Presentation Map

Freight System Goals and Performance Measures

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Purpose of Data Analysis and Visualization

- Common freight data issues
  - Availability
  - Transparency
  - Analysis consistency
  - Size and complexity
- Advantages of Tableau data visualization software
  - Commercial, like MS Office or GIS packages
  - Visual management of data fields and queries
  - Instant visual feedback
  - Transfer to/from text, spreadsheet, database, GIS, etc.
  - Licensed pay version and free “reader” version

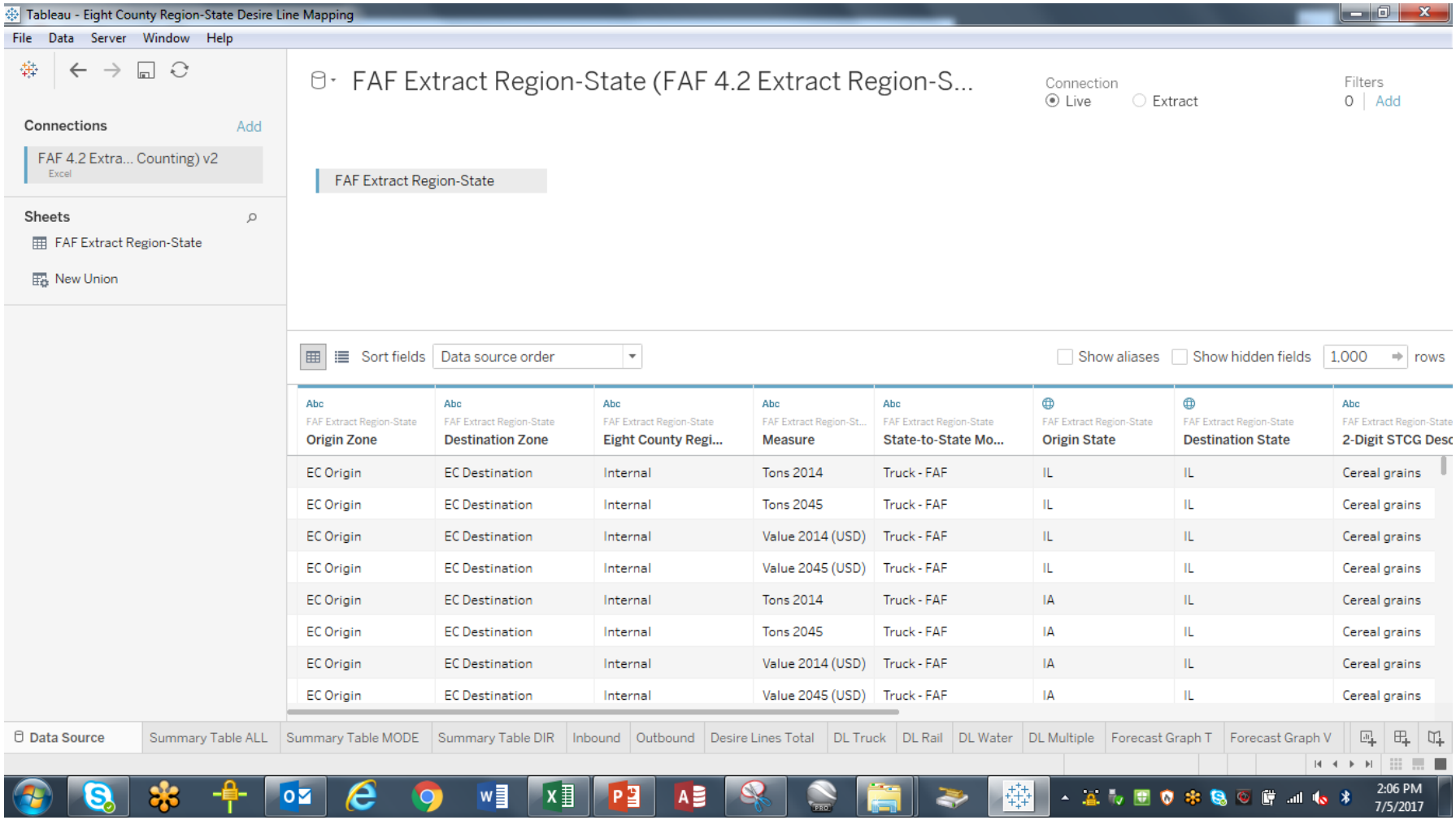
Use of Tableau to Date

- Commodity Flow Analysis
  - Imported large FAF Disaggregation file
  - Created smaller extract for Eight County Region
  - Appended enhanced information
  - Performed data queries
  - Extracted summary maps, tables, figures to word and ppt (for reports), and excel (for analysis)

Future Use of Tableau in this Project

- Create a full suite of Tableau "workbook" files containing key study data and analyses
  - FAF disaggregation
  - ATRI Truck GPS data
  - Industry location data
  - ECIA/BHRC traffic and safety data
  - Other performance metrics
- Files suitable for use in pay or free versions

Examples of Use in Commodity Flow Analysis



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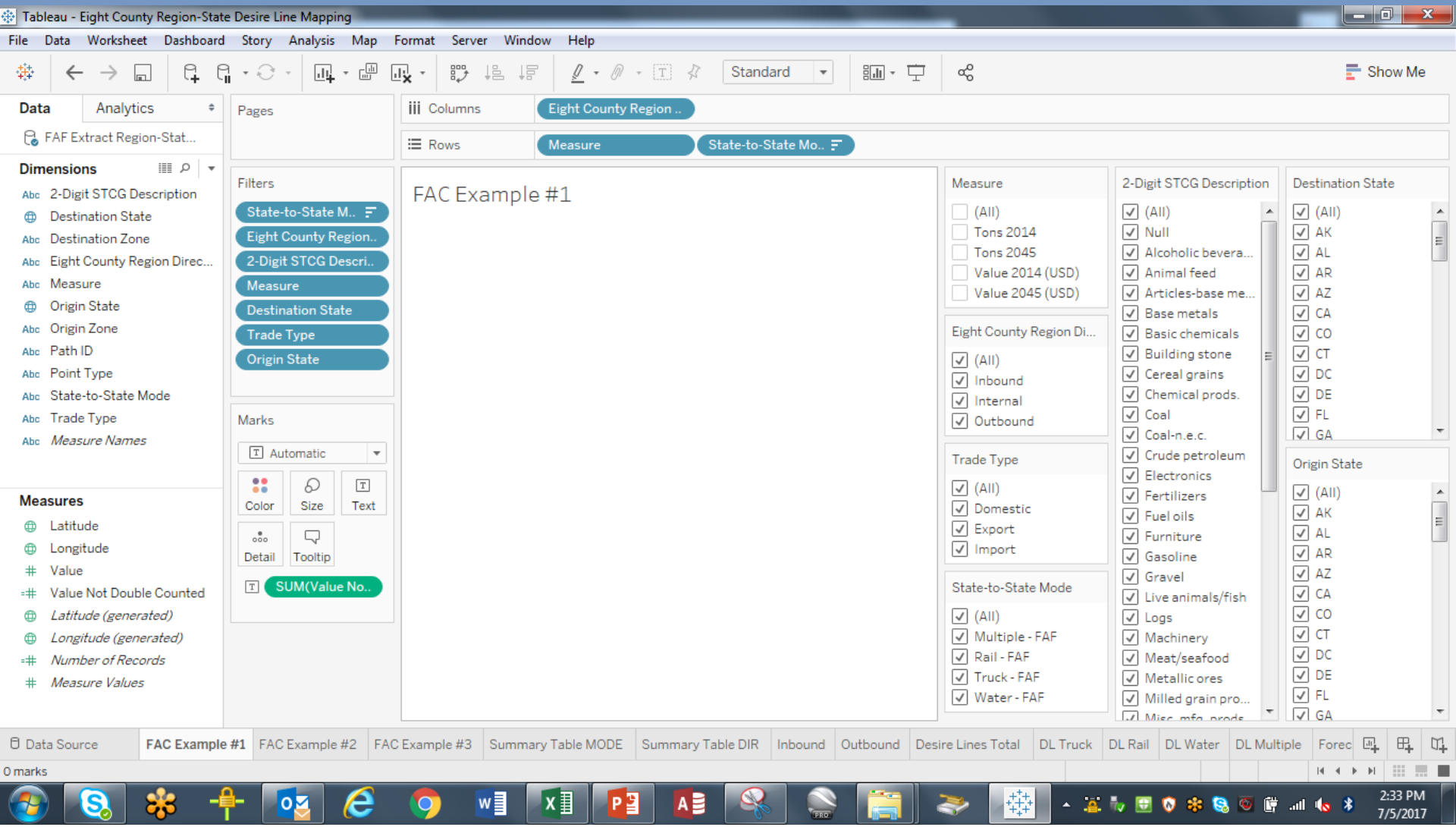
Data import

Examples of Use in Commodity Flow Analysis



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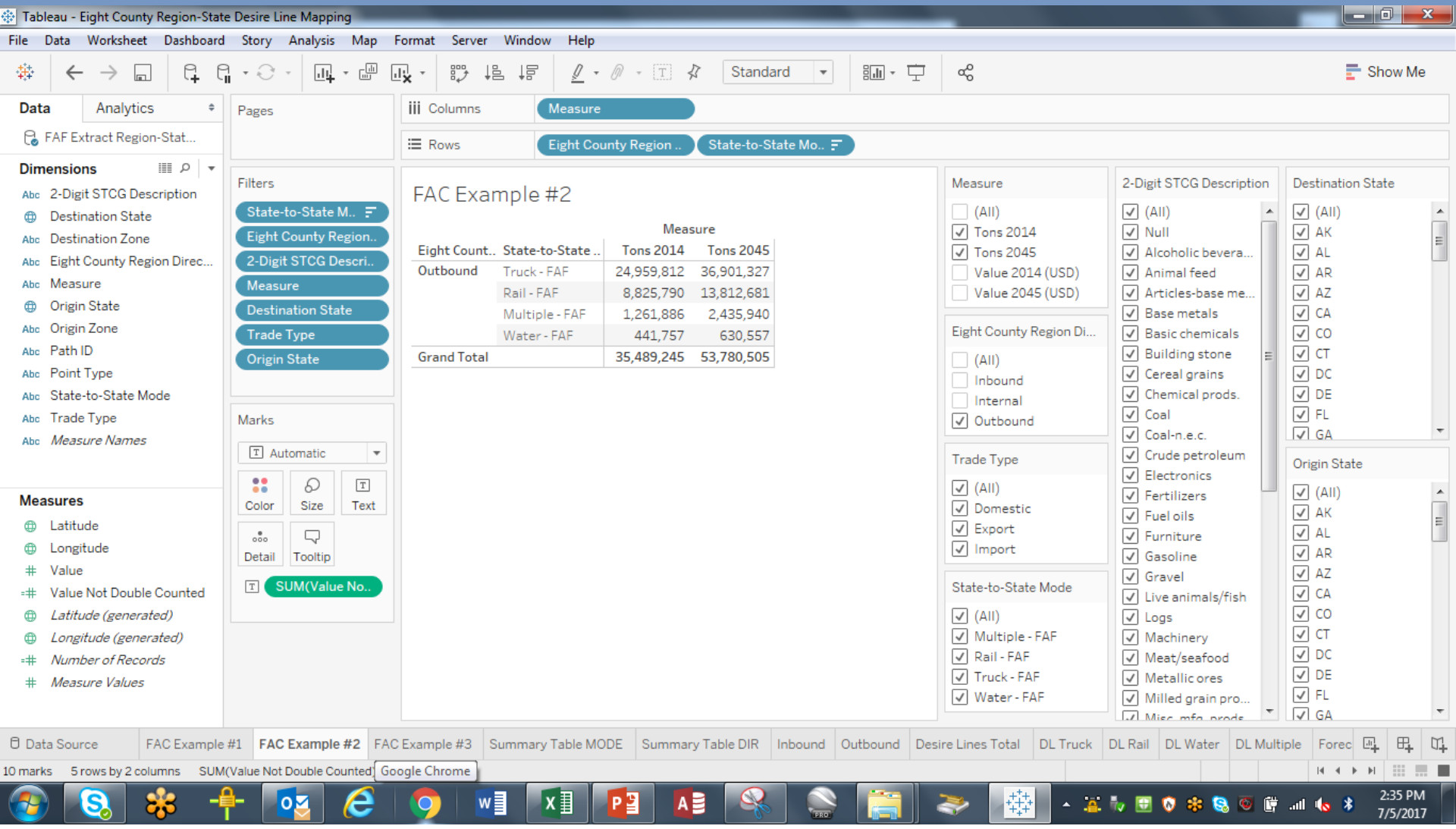
Data filtering

Examples of Use in Commodity Flow Analysis



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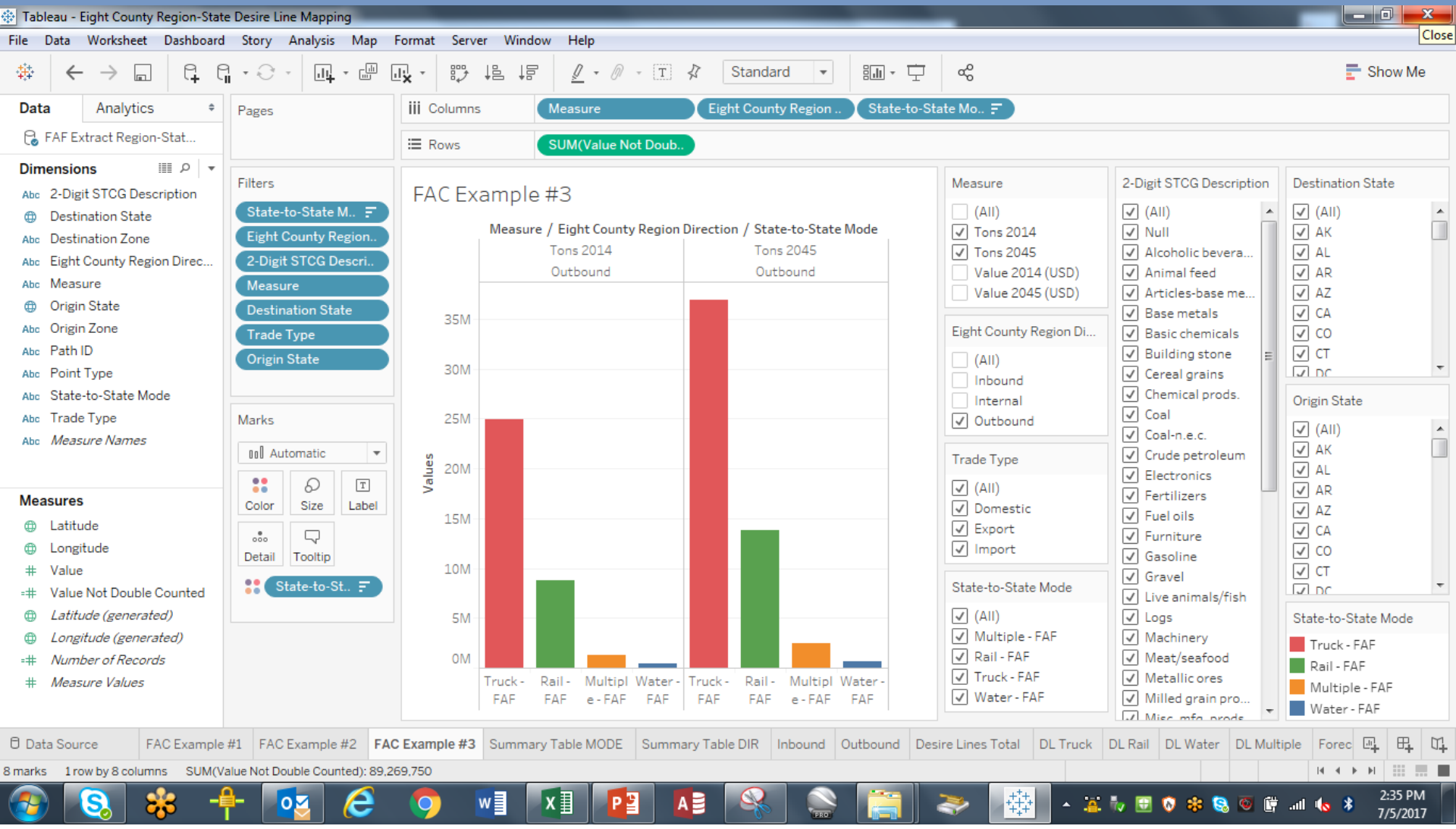
Tabular Display

Examples of Use in Commodity Flow Analysis



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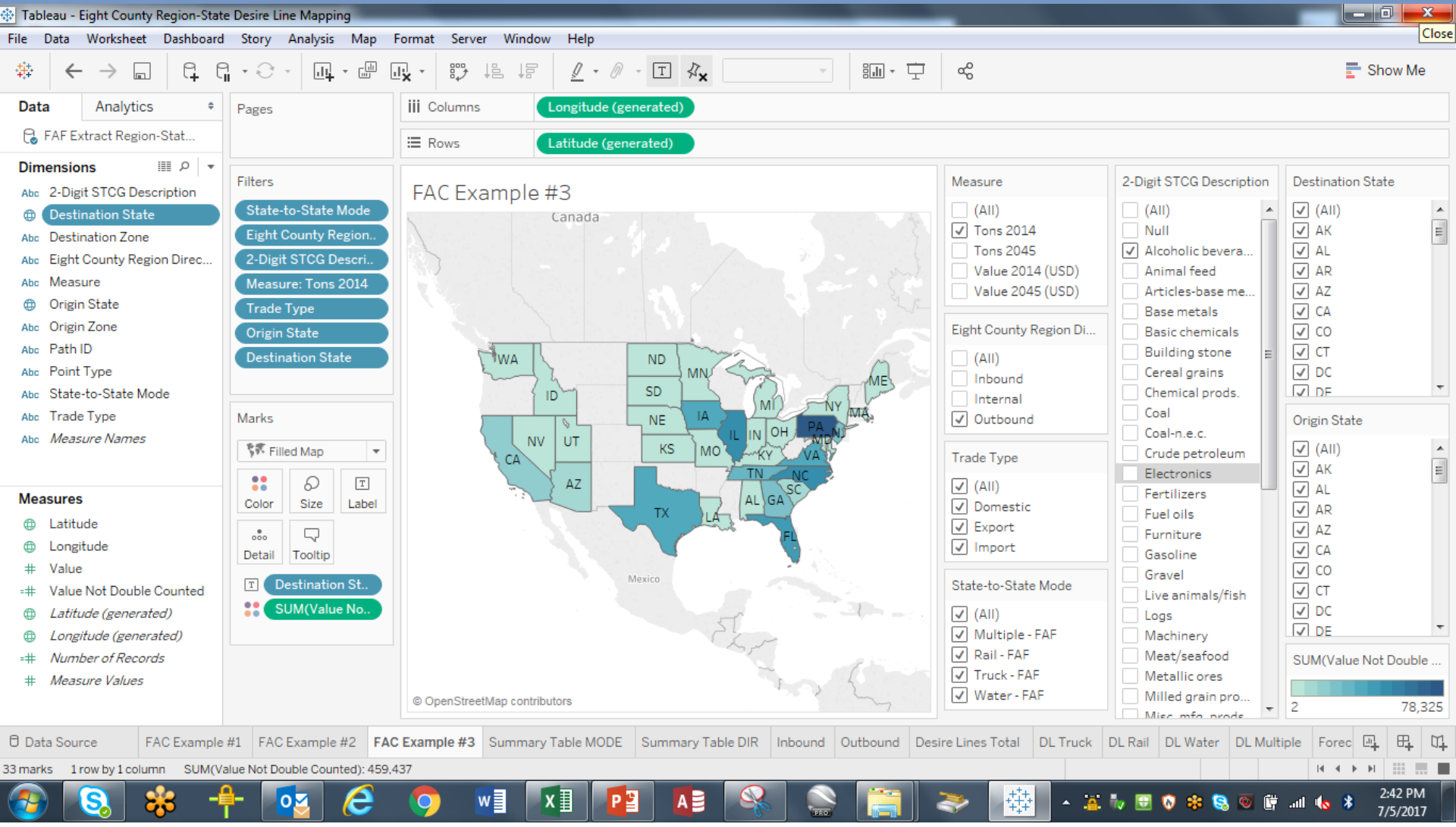
Graphic Display

Examples of Use in Commodity Flow Analysis



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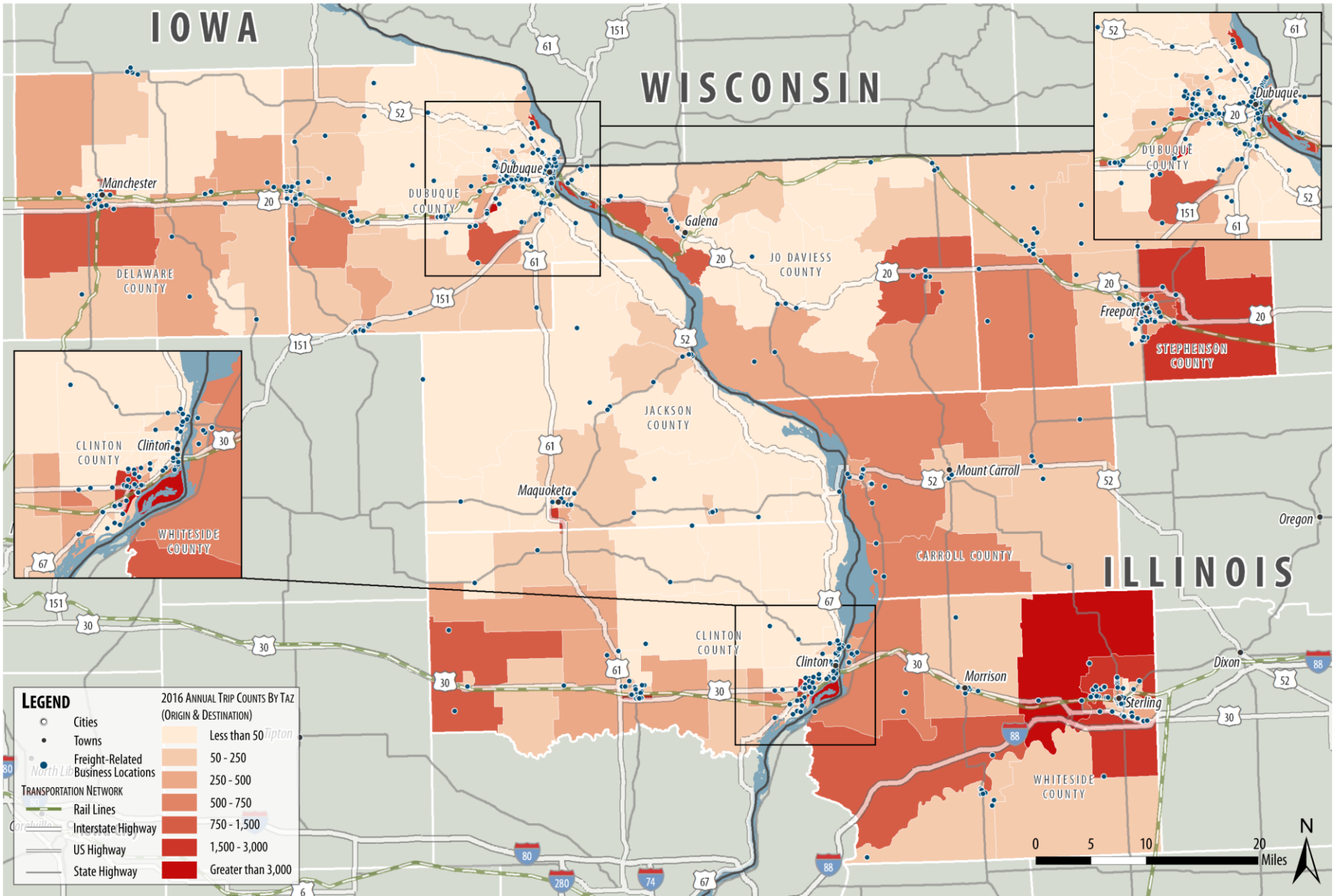
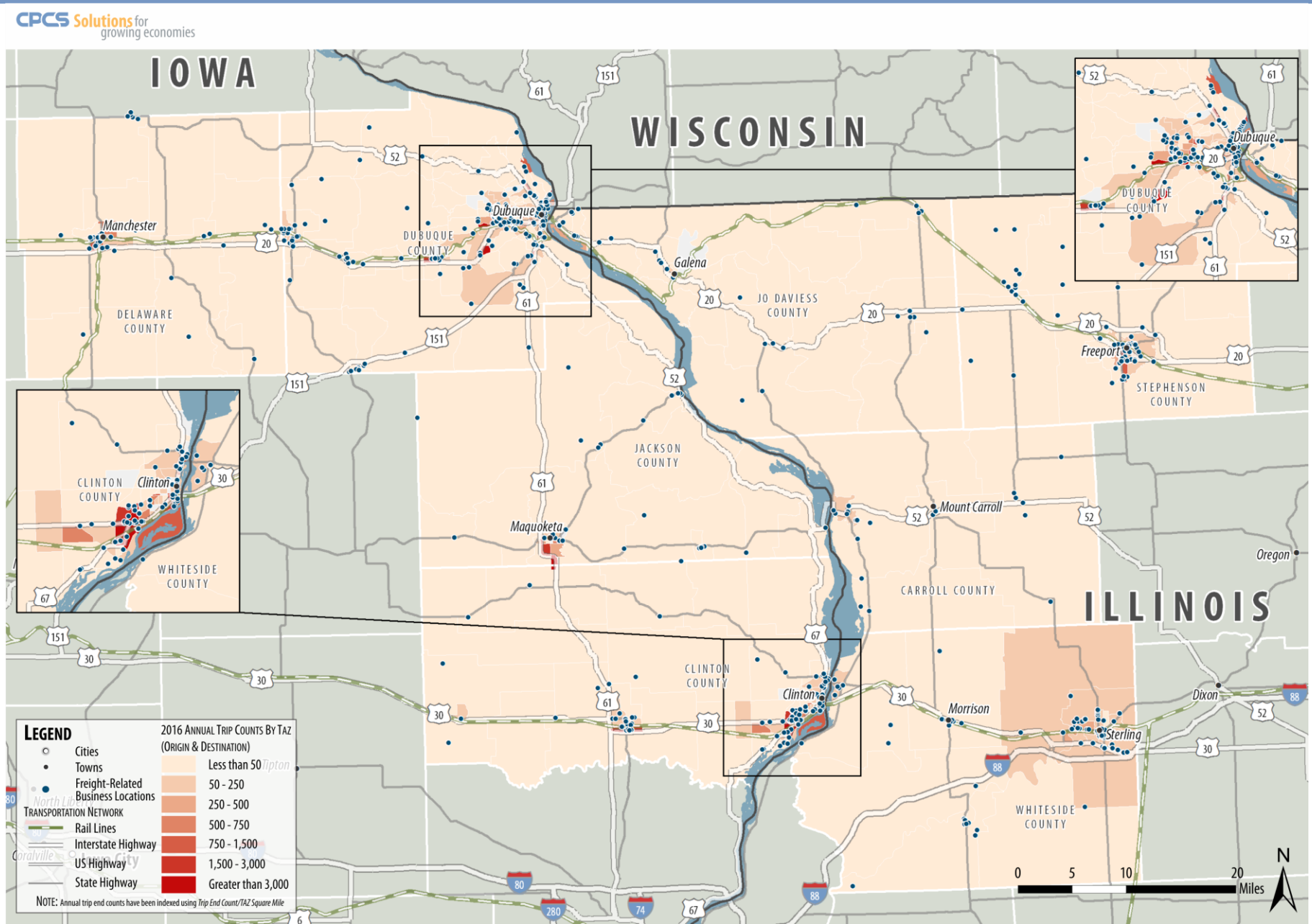
Geographic Display

Trip Ends by Analysis Zone



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



Examples of Use in Commodity Flow Analysis

Live Demo: Commodity Supply Chain Analysis

Discussion on Database Analysis and Visualization

Open Discussion

- Any questions about how Tableau works?
- Is this a good approach to data management and communication?
- Are there other datasets that stakeholders are interested in, beyond what we do in this study?
- What can we do to provide you with the most long-term value?

Following up on FAC Requests

- From our discussion of the Commodity Flow Analysis results, the FAC asked for additional information on:
  - Benchmarking of commodities and modes against national averages
  - Length of haul by mode
  - Freight transportation cost
- This is included in Working Paper 2 (recently submitted)

Commodity and Modal Benchmark Calculations

- Calculated two types of metrics
  - **"Commodity Quotient"** and **"Mode Quotient"**

    For each commodity class and mode, ratio of Eight County Region tonnage share and national tonnage share

  - **"Commodity Growth Quotient"** and **"Modal Growth Quotient"**

    For each commodity class and mode, ratio of Eight County Region tonnage growth (to 2045) and national tonnage growth

Leading Eight County Tonnage Commodities

	Eight County Region 2014 Tonnage Share	US Total Tonnage Share	Eight County "Commodity Quotient"	Eight County "Commodity Growth Quotient"
Cereal grains	18.0%	7.7%	**2.34**	**1.12**
Fertilizers	17.1%	1.6%	**10.70**	**0.95**
Gravel	14.7%	12.7%	1.16	1.07
Other ag prods.	7.1%	3.9%	**1.84**	**0.90**
Coal	4.8%	6.8%	0.70	**0.56**
Nonmetal min. prods.	4.6%	7.5%	0.61	1.17
Other foodstuffs	4.1%	4.9%	0.83	0.96
Animal feed	3.9%	2.3%	**1.65**	0.84
Waste/scrap	2.4%	4.6%	0.52	1.07
Gasoline	2.0%	5.4%	0.37	1.30

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Leading Eight County Value Commodities

	Eight County Region 2014 Tonnage Share	US Total Tonnage Share	Eight County "Commodity Quotient"	Eight County "Commodity Growth Quotient"
Machinery	0.6%	0.9%	**0.69**	0.84
Unknown/Mixed	1.4%	2.7%	**0.53**	0.90
Motorized vehicles	0.6%	1.3%	**0.45**	0.97
Other ag prods.	7.1%	3.9%	1.84	0.90
Other foodstuffs	4.1%	4.9%	0.83	0.96
Cereal grains	18.0%	7.7%	2.34	1.12
Plastics/rubber	1.2%	1.7%	0.70	0.80
Fertilizers	17.1%	1.6%	10.70	0.95
Electronics	0.2%	0.5%	0.34	0.77
Pharmaceuticals	0.0%	0.1%	0.30	0.84

Eight County Modes

- High reliance on rail, low reliance on water

	Eight County Region 2014 Tonnage Share	US Total Tonnage Share (excluding Air, Pipeline, Other)	Eight County "Modal Quotient"	Eight County "Modal Growth Quotient"
Truck	73.3%	79.6%	0.92	1.00
Rail	23.0%	12.4%	**1.85**	1.04
Multiple	2.7%	3.1%	0.88	1.00
Water	1.1%	5.0%	**0.21**	1.09

Length of Haul Calculations

- National estimates
  - Ton-mileage by mode comes directly from Freight Analysis Framework
- Eight County Region estimates
  - Created state-to-state mileage tables from FAF ton-mileage and tonnage data
  - Adjusted IA-IA, IL-IL, and IA-IL mileage to reflect geographic location of the Eight County Regions (first approximation)
  - For each mode and state O-D pair, multiplied tons times the mileage table, and summed the results to get total ton-miles
  - Divided by total tons to get average miles per trip

Length of Haul Results

- Longer distance for truck and water, shorter distance for rail and multiple modes

	Eight County Region Average Miles per Trip	US Total Average Miles per Trip
Truck	265	177
Rail	399	802
Multiple	557	811
Water	540	453

Transportation Cost Calculations

- National benchmarks
  - Per ton-mile estimates from work in progress for AASHTO and other data sources
  - Reflect cost of empty movements
  - Reflect cost of truck drayage, where required
    - Trucking at one or both ends of rail or barge trips
- The Eight County Region's "freight bill"
  - National benchmarks times ton-miles

Transportation Cost Calculations – Caveats

- Availability
  - Prices assume a service is available at market price
    - Can be assumed when looking at actual tonnage
    - Not always the case for rail or water -- models break when a railroad or barge operator declines
- Variability
  - Prices for any given shipper may vary widely!
    - Volume, consistency of volume, trip length, trip reliability (potential delays from congestion), one-way or two-way revenue loads, labor/equipment cost and availability, cost of equipment provided to shippers, cost of special equipment or handling, fuel costs, regulatory compliance/other costs, seasonality, competing carriers or modes, etc.

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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Discussion on Benchmarking Results

Open Discussion

- Any questions about the process or results?
- Any other outstanding issues to explore?

Presentation Map

Freight System Goals and Performance Measures

Data Analysis via a Visualization Tool

Summary of Stakeholder Findings

SWOT Discussion

Questions & Discussion

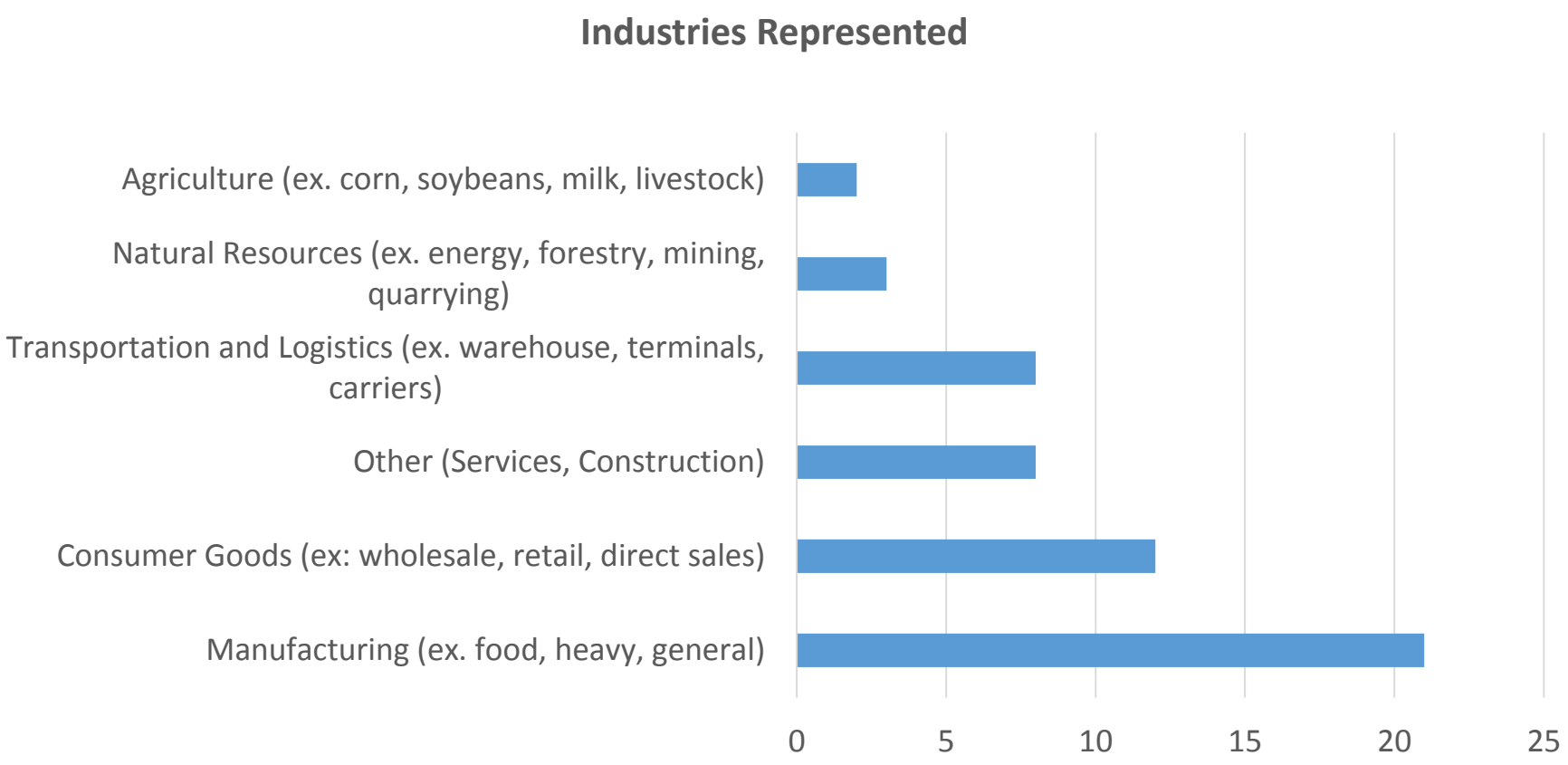
Stakeholder Insights

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

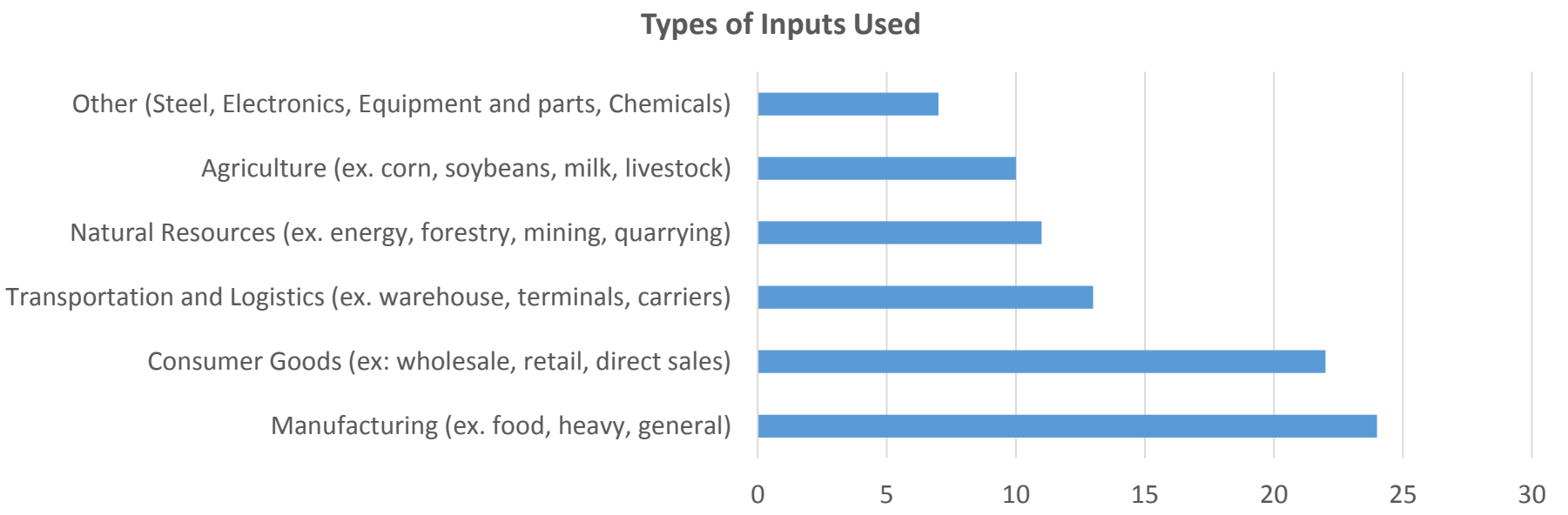
Stakeholder insights (qualitative data) will be compared against the performance assessment (quantitative data)

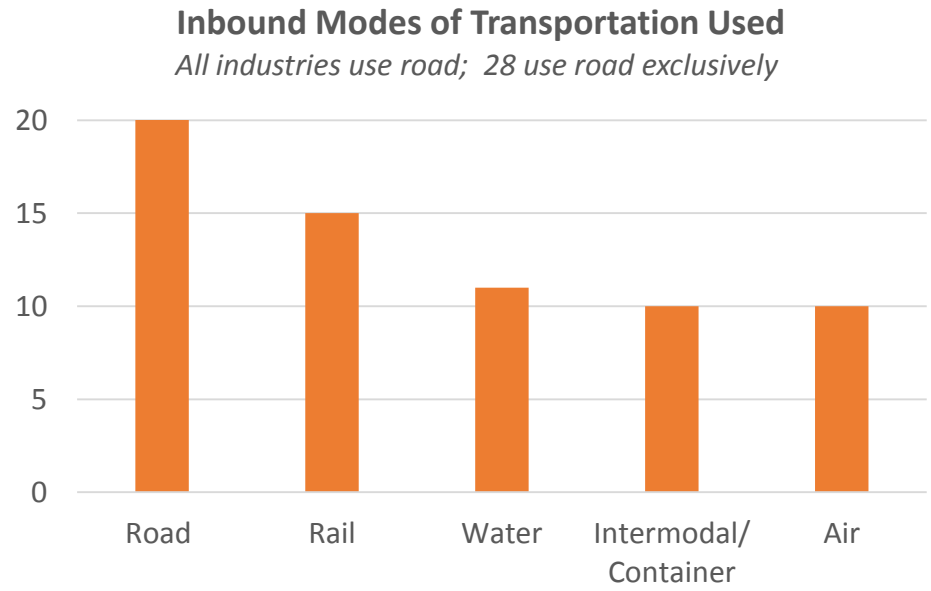
Industry Survey – Response Update

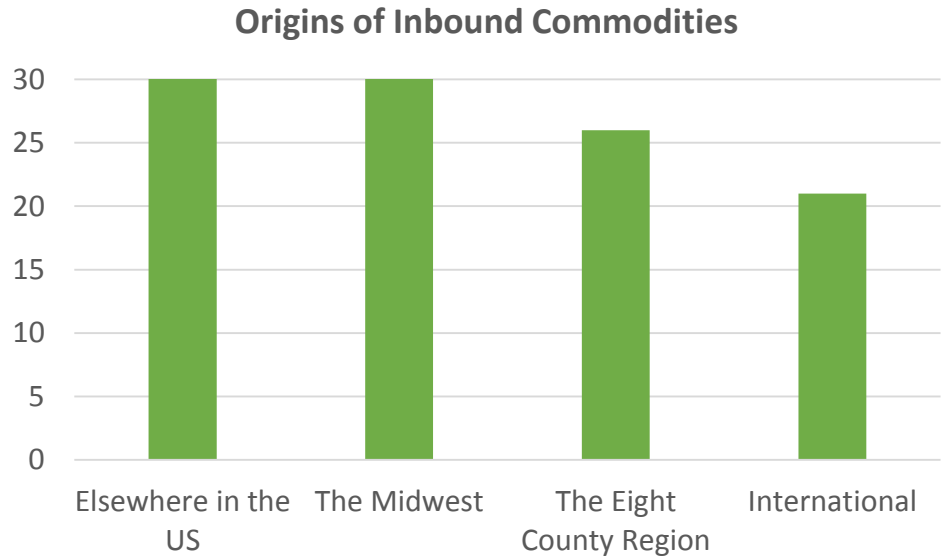
54 company responses



Industry Survey – Profile of Inbound Flows

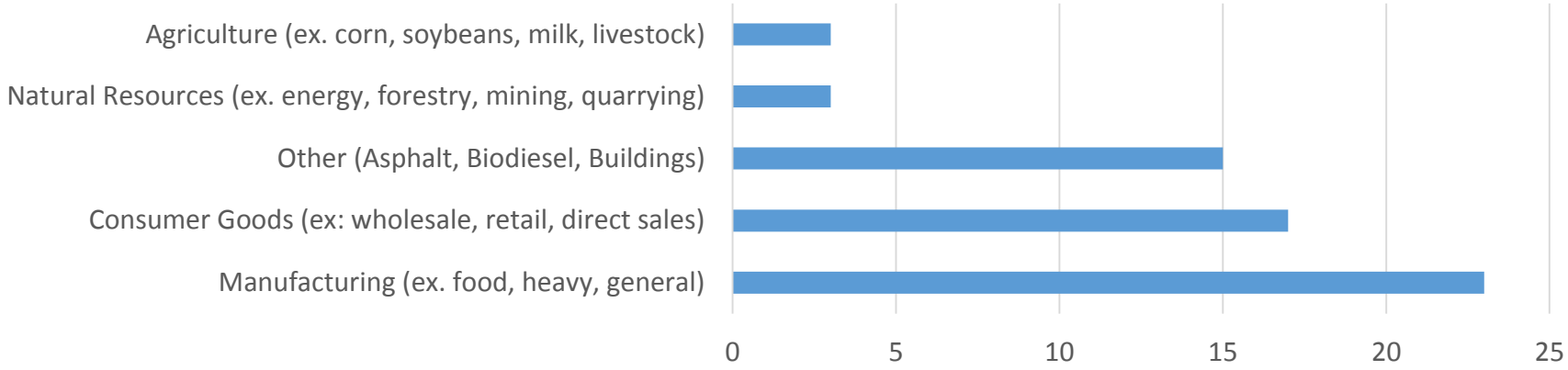




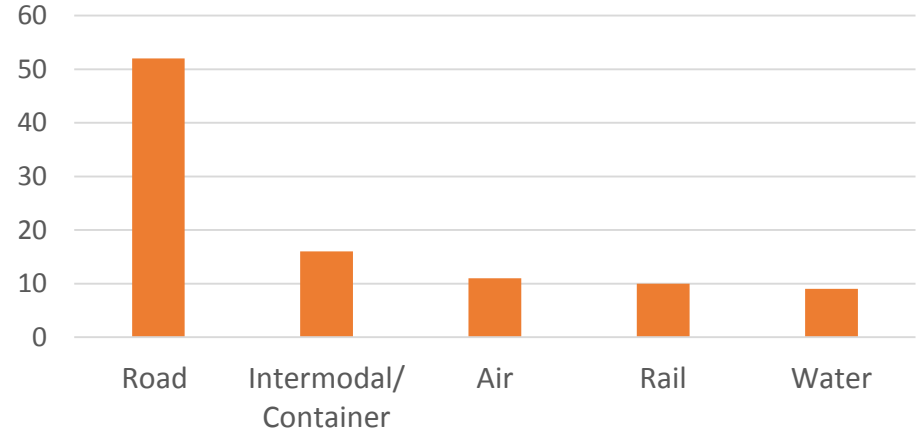


Industry Survey – Profile of Outbound Flows

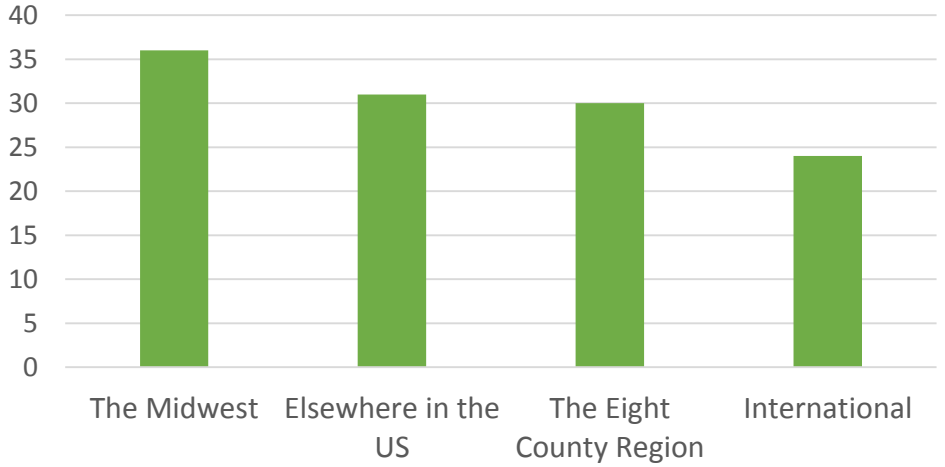
Types of Goods Produced
(Goods Producing Companies Only;
Four companies produce more than one type of Good)



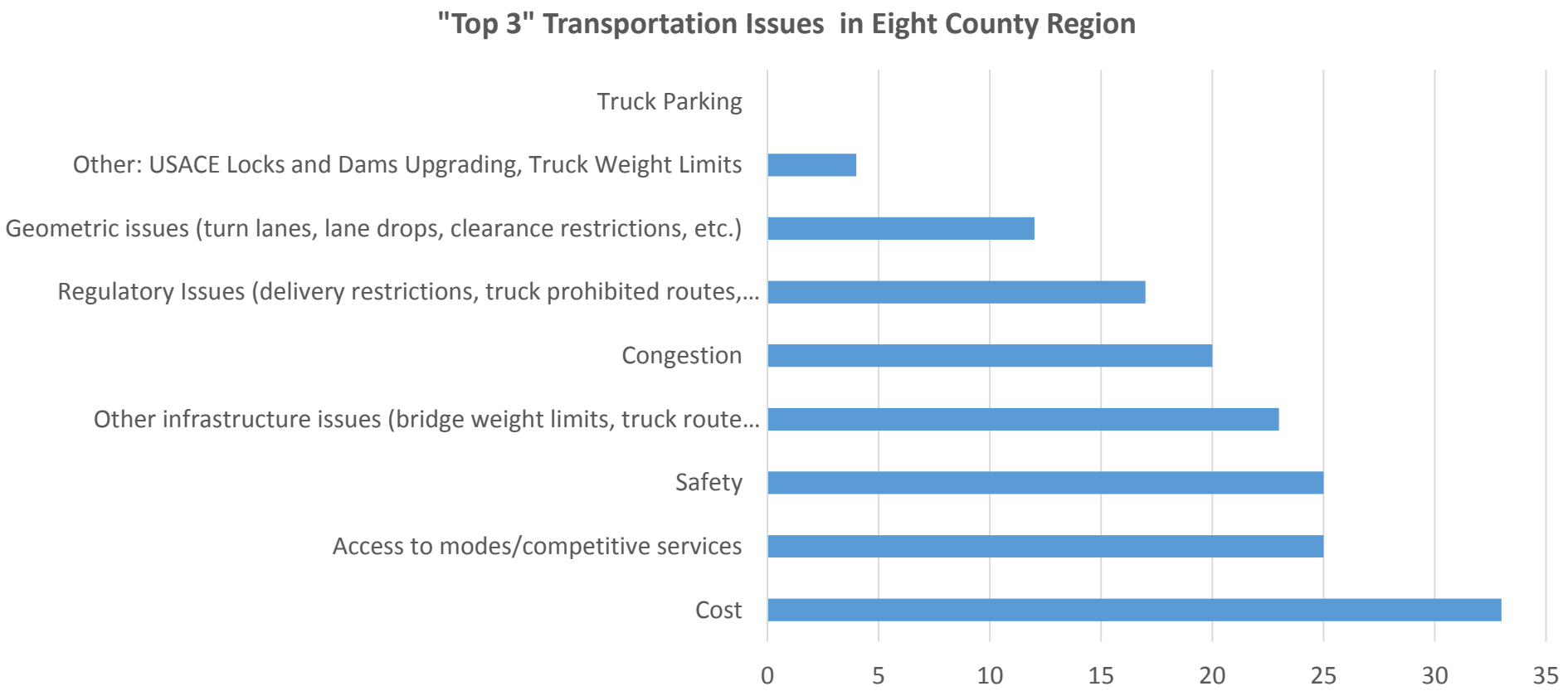
Outbound Modes of Transportation Used
(For 52 Goods-Producing Industries, all of whom use road)



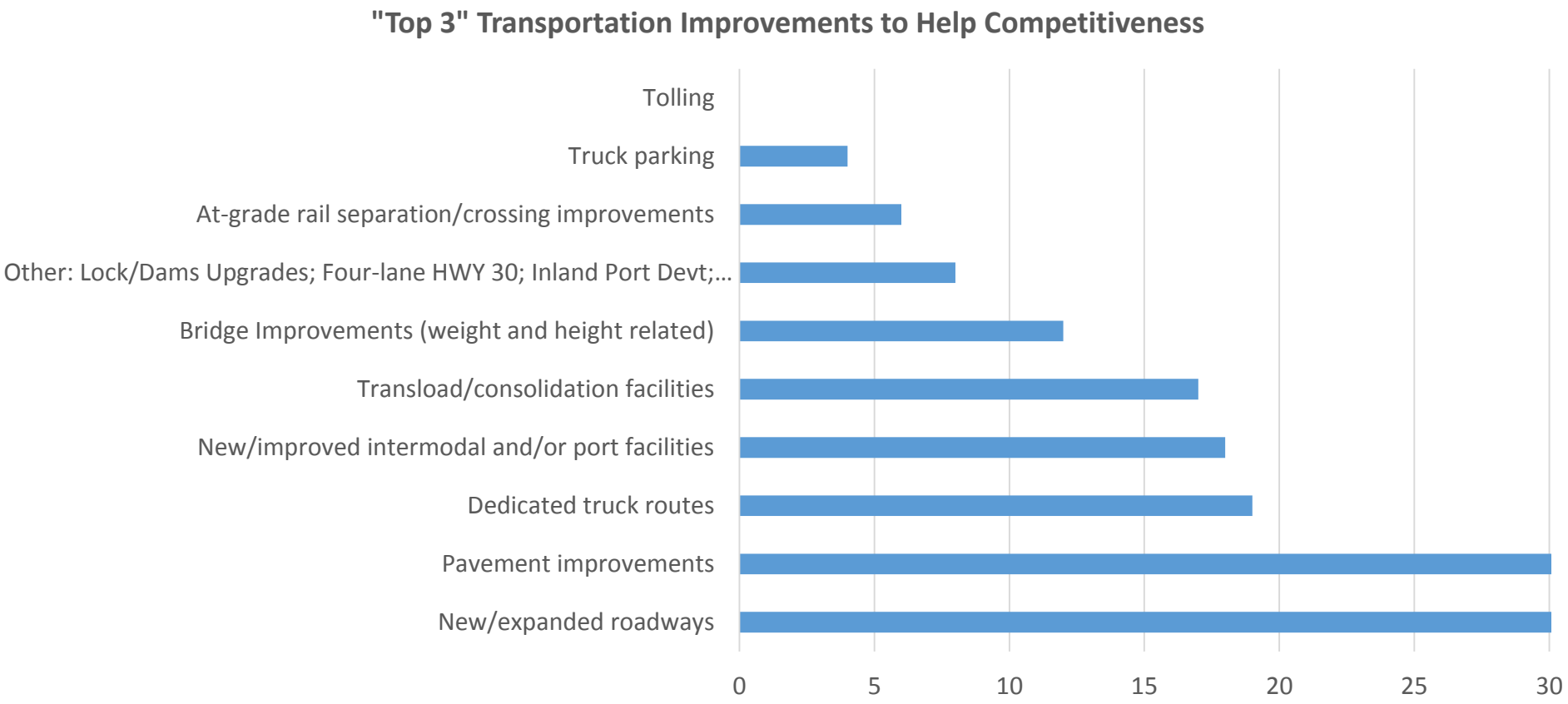
Destination of Outbound Commodities
(For 52 Goods-producing companies only)



Industry Survey – Transportation System Performance



Industry Survey – Transportation System Performance



Stakeholder Identified Freight Hot Spots

- **US 20** – *upgrade to 4 lanes, safety improvements (passing lanes)*
- **US 30** – *upgrade to 4 lanes, safety improvements (pavement and geometrics)*
- **IL 73** – *poor condition, safety improvements (passing lanes)*
- **Stagecoach Trail** – *should be a truck route*
- **IL 64** – *poor condition, narrow shoulders*
- **IA 136** – *poor condition, narrow shoulders*
- **IA 64** – *poor condition*

Presentation Map

Freight System Goals and Performance Measures

Data Analysis via a Visualization Tool

Summary of Stakeholder Findings

SWOT Discussion

Questions & Discussion

Strengths

- Relatively stable population
- Steady increases in income
- Diverse industrial base, including manufacturing and agriculture
- Diverse manufacturing sector
- Multimodal freight assets
- Freight system designed to transport bulk goods

- What did we miss?

Weaknesses

- Lack of skilled and semi-skilled employees
- Bridges, river crossings
- Distance to major intermodal and transfer facilities
- Cost of using the system

- What did we miss?

Opportunities

- Continue/expand Upper Mississippi Manufacturing Innovation Center
- Postsecondary workforce programs
- On- and Near-shoring
- Value-added agriculture
- Embrace technology

- What did we miss?

Threats

- Lower population growth compared to peer regions
- Relatively low unemployment driven by shrinking workforce
- The importance of manufacturing for the Region appears to be decreasing
- Automation (manufacturing-related)
- Ability to sell products (crops) on the global market
- Infrastructure failure – locks and dams
- Connected and autonomous vehicles
- Sea level rise

- What did we miss?

Open Discussion

- What is your perspective on the greatest freight system needs?
  - Projects? Policy? Partnerships? Other?
- What is your perspective on the greatest freight system opportunities?
  - By mode? By industry? Other?

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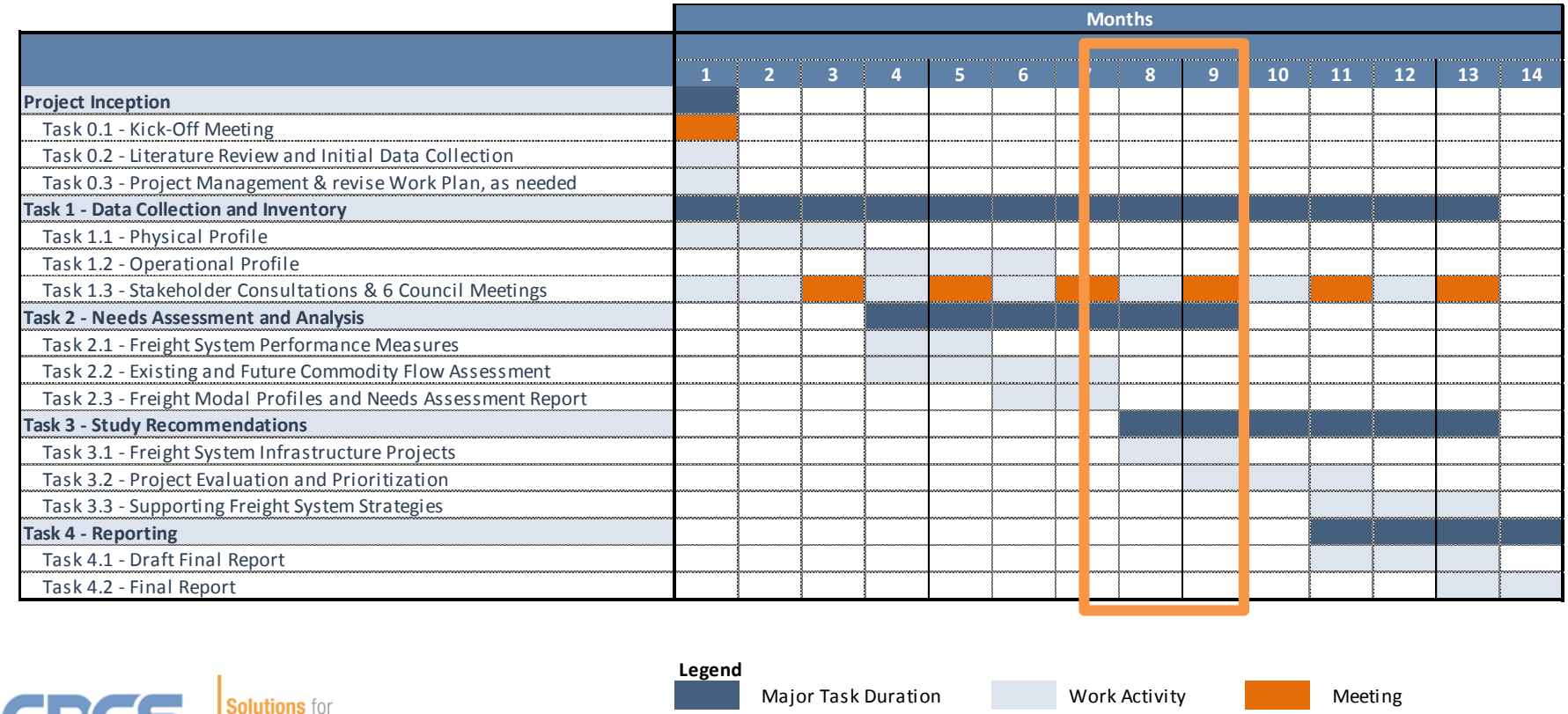
Open Discussion

- Are we getting close to providing the information you need to make decisions?
- Do you more clearly understand Regional supply chains?
- What information gaps still exist?

Our Next Steps…

- Complete freight system needs assessment
- Begin identifying freight projects
- Consider a process to evaluate freight projects



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Thank You

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