



HEARTLAND FREIGHT TECHNOLOGY PLAN

September 25, 2020

MAFC Annual Meeting Virtual Session

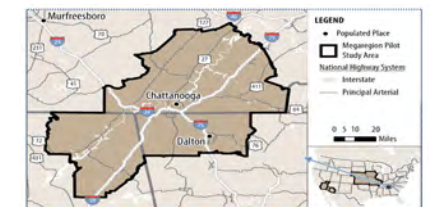
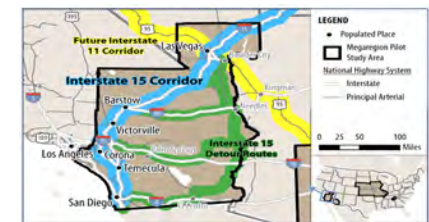
BACKGROUND

- FHWA Workshop on Multi-Jurisdictional Coordination
- Megaregions
- National Economic Partnership (NEP)
- Impetus for the Central Plains/Heartland Region



National Economic Partnership

- Sun Corridor Value Impact Analysis – Maricopa Assoc. of Governments
- Interstate 15 Freight Mobility Enhancement Plan – Nevada DOT
- Future Freight Movement along Freight Alley, “The Greater Chattanooga Region” – Tennessee DOT



Heartland Freight Technology Plan

- Engage key regional public and private freight stakeholders
- Examine freight connections between regional metropolitan areas and states
- Assess potential impacts of emerging freight technologies such as autonomous and connected vehicles, vehicle-to-vehicle and vehicle-to-infrastructure systems, etc.



Partners – “CONSORTIUM”

6 MPOS

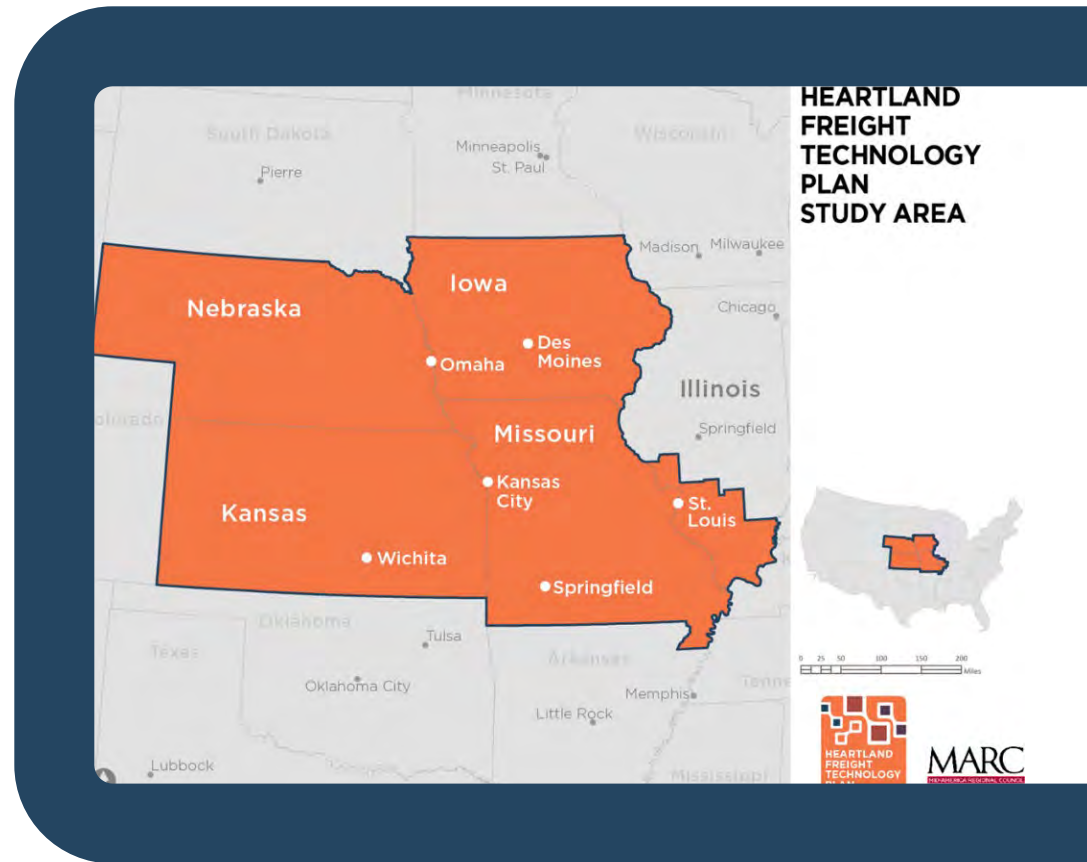
- Kansas City (MARC)
- Springfield (OTO)
- Wichita (WAMPO)
- St. Louis (EWG)
- Omaha (MAPA)
- Des Moines (DMAMPO)

5 State DOTs

- MoDOT
- KDOT
- Nebraska DOT
- IDOT
- Illinois DOT

Heartland Civic Collaborative

Supported by WSP consulting team



SCOPE

- Develop regional recommendations to harmonize implementation of emerging freight technologies including autonomous freight delivery systems, truck parking systems, blockchain, etc.
- Provide recommendations for public and private data management and sharing arrangements to promote efficient interoperability of freight technology systems within the region



TIMELINE

Stakeholder
Engagement
Plan

**November
2019**

Regional
Connections
Technical Memo

**February
2020**

SWOT Analysis
and Policy
Recommendations

May 2020

Guidebook and
Data Sharing
Templates

Aug 2020

Final
Report

Sept 2020



TASK 1: STAKEHOLDER ENGAGEMENT



- Stakeholder database was established & maintained throughout project
 - More than 300 regional contacts
- Stakeholder Interviews
- Project Survey
- Technology & Regulation Workshop
- Data Workshop

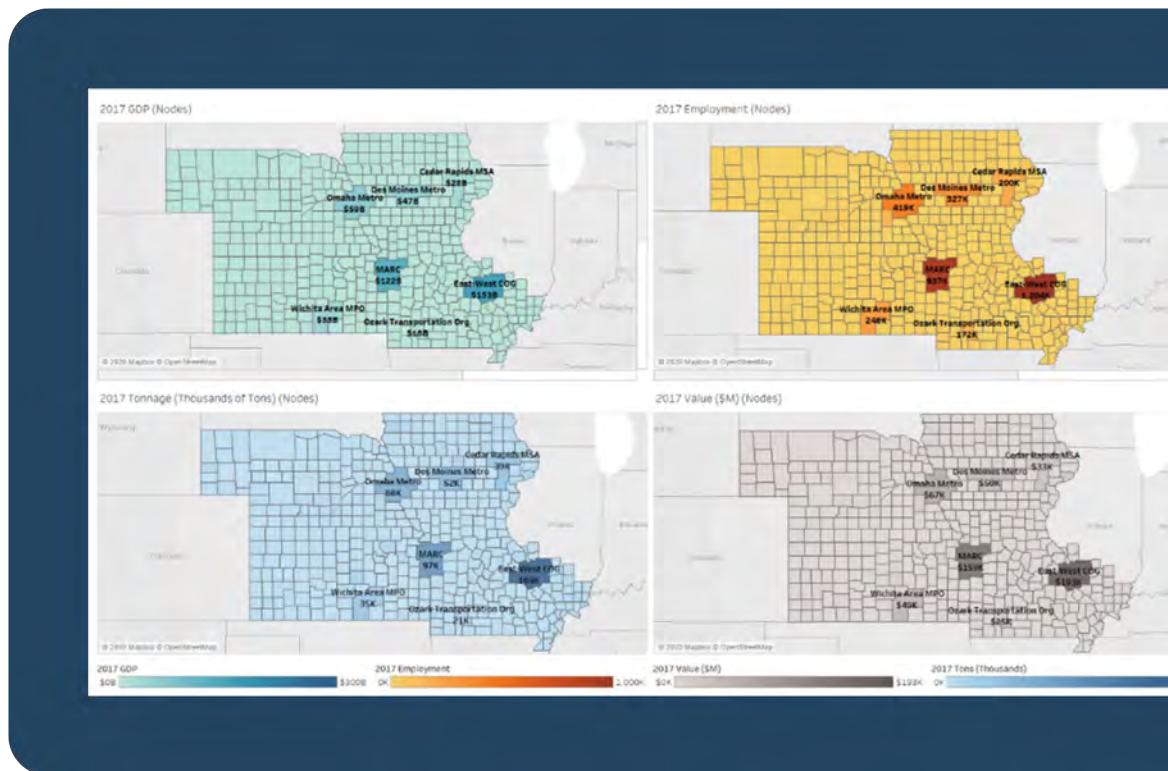
TASK 2: ECONOMIC CONNECTIONS

- Priority freight nodes/corridors:

- GDP
- Employment
- Freight Value
- Tonnage

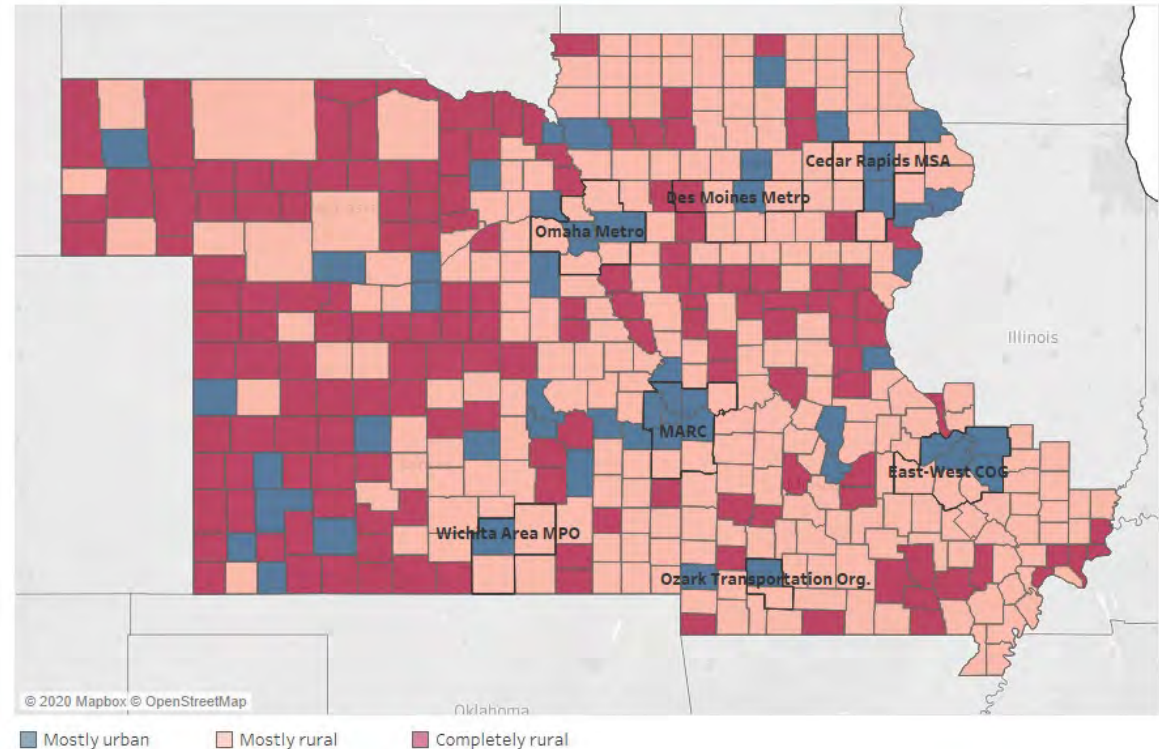
- Key Industries:

- Manufacturing
- Wholesale trade
- Retail trade
- Construction
- Transportation
- Agriculture



Study Area Rural-Urban Split

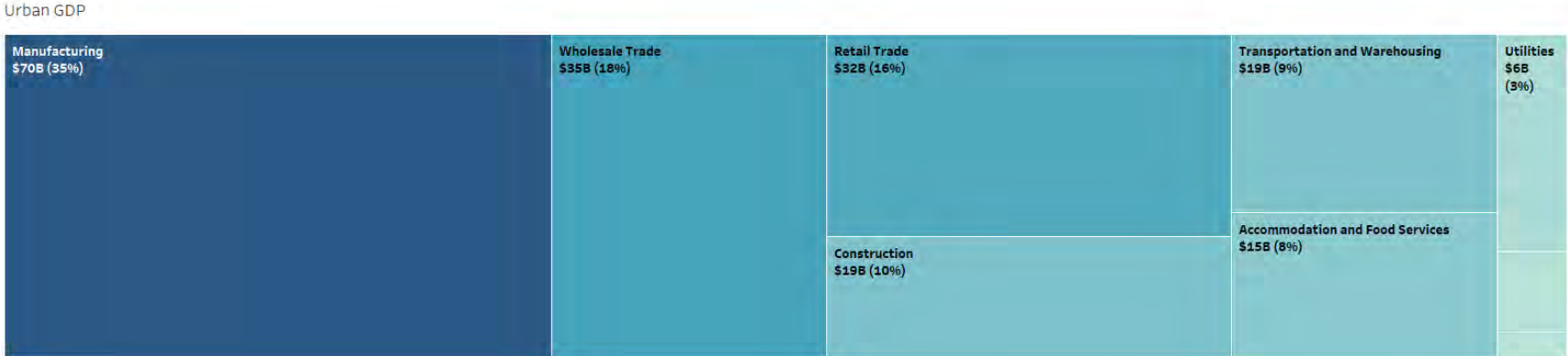
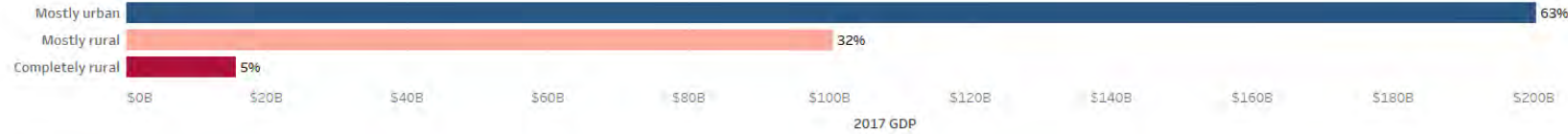
- Category definitions from American Community Survey based on percent rural population of county:
 - Mostly Urban – 0-50%
 - Mostly Rural – 50%-99%
 - Completely Rural – 100%



Heartland Region GDP for Freight-Intensive Industries

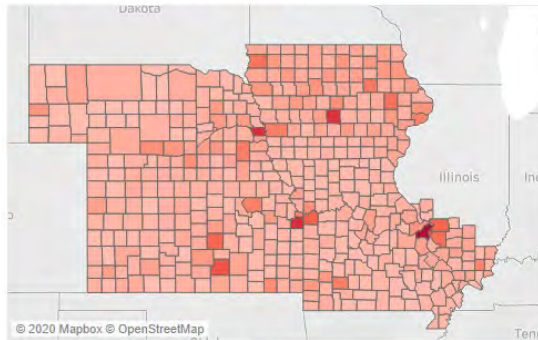


Urban-Rural Industry split for freight-intensive industries

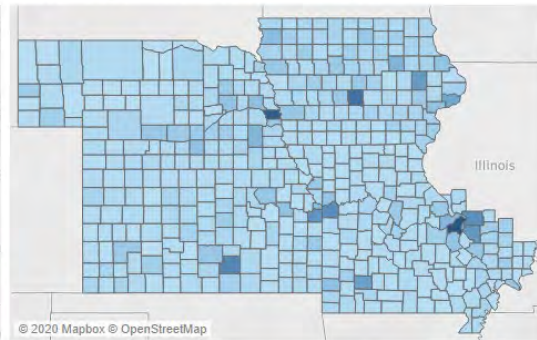


- Manufacturing dominates both urban and rural industries across the Heartland region
- Rural areas have significant contributions from the agricultural industry
- Other important industries include trade (wholesale and retail), construction and transportation

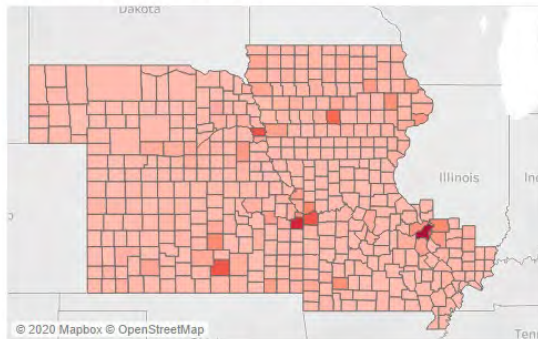
Major Origins (2017 Tonnage)



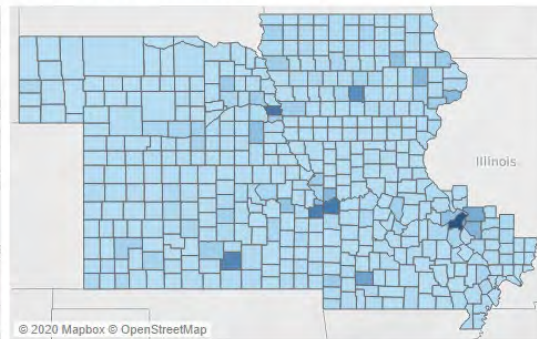
Major Destinations (2017 Tonnage)



Major Origins (2017 \$M)



Major Destinations (2017 \$M)



2017 Tons (Thousands)



2017 Tons (Thousands)



Value (in \$M)



Value (\$M)



Major Freight Origins and Destinations

Regional Node Commodity Profile

- Top commodities for regional nodes by value
- Motorized vehicles, mixed freight and pharmaceuticals are the top 3 commodities overall by value for identified nodes
- Wichita Area MPO has significant contributions from coal and transportation equipment freight
- Rest of Heartland region trades in cereal grain, other foodstuffs and agriculture-related commodities

	East-West COG	MARC	Omaha MPO	Des Moines MPO	Wichita Area MPO	Ozark Transportation Org	Cedar Rapids MSA
Motorized vehicles	9%	16%	9%	13%	7%	7%	9%
Mixed freight	6%	10%	5%	11%	4%	15%	9%
Pharmaceuticals	12%	5%	8%	2%	1%	6%	1%
Electronics	6%	8%	4%	7%	5%	6%	9%
Machinery	4%	7%	5%	9%	6%	7%	8%
Plastics/rubber	3%	6%	3%	6%	4%	6%	6%
Misc. mfg. prods.	6%	5%	2%	3%	3%	4%	4%
Chemical prods.	5%	3%	4%	5%	2%	10%	4%
Other foodstuffs	4%	3%	5%	5%	2%	6%	5%
Coal-n.e.c.	4%	2%	2%	1%	13%	3%	1%
Base metals	5%	2%	2%	2%	2%	2%	2%
Cereal grains	2%	2%	4%	4%	5%	0%	5%
Meat/seafood	1%	2%	9%	4%	3%	1%	4%
Other ag prods.	4%	1%	3%	3%	1%	1%	4%
Live animals/fish	0%	1%	3%	2%	3%	0%	2%
Animal feed	0%	1%	2%	2%	1%	0%	3%
Other Commodities	30%	27%	29%	23%	39%	26%	24%

Regional Node Trade Partners by Truck

Rank of Tonnage (in/out/intra)

MPO	Trade Partner				
	Itself	5 MPOs	Rest of State	Rest of Heartland	External US & Foreign
East-West COG	2	4	1	5	3
MARC	1	4	2	5	3
Omaha Metro	3	5	2	1	4
Des Moines Metro	3	4	1	5	2
Wichita Area MPO	2	4	1	5	3
Ozark Transportation Org.	4	3	1	5	2

Percentage of Tonnage (in/out/intra)

MPO	Trade Partner				
	Itself	5 MPOs	Rest of State	Rest of Heartland	External US & Foreign
East-West COG	36%	4%	37%	2%	21%
MARC	35%	6%	32%	4%	24%
Omaha Metro	19%	5%	22%	39%	15%
Des Moines Metro	7%	5%	70%	2%	15%
Wichita Area MPO	25%	3%	53%	2%	18%
Ozark Transportation Org.	5%	10%	58%	4%	23%

Rank of Value (in/out/intra)

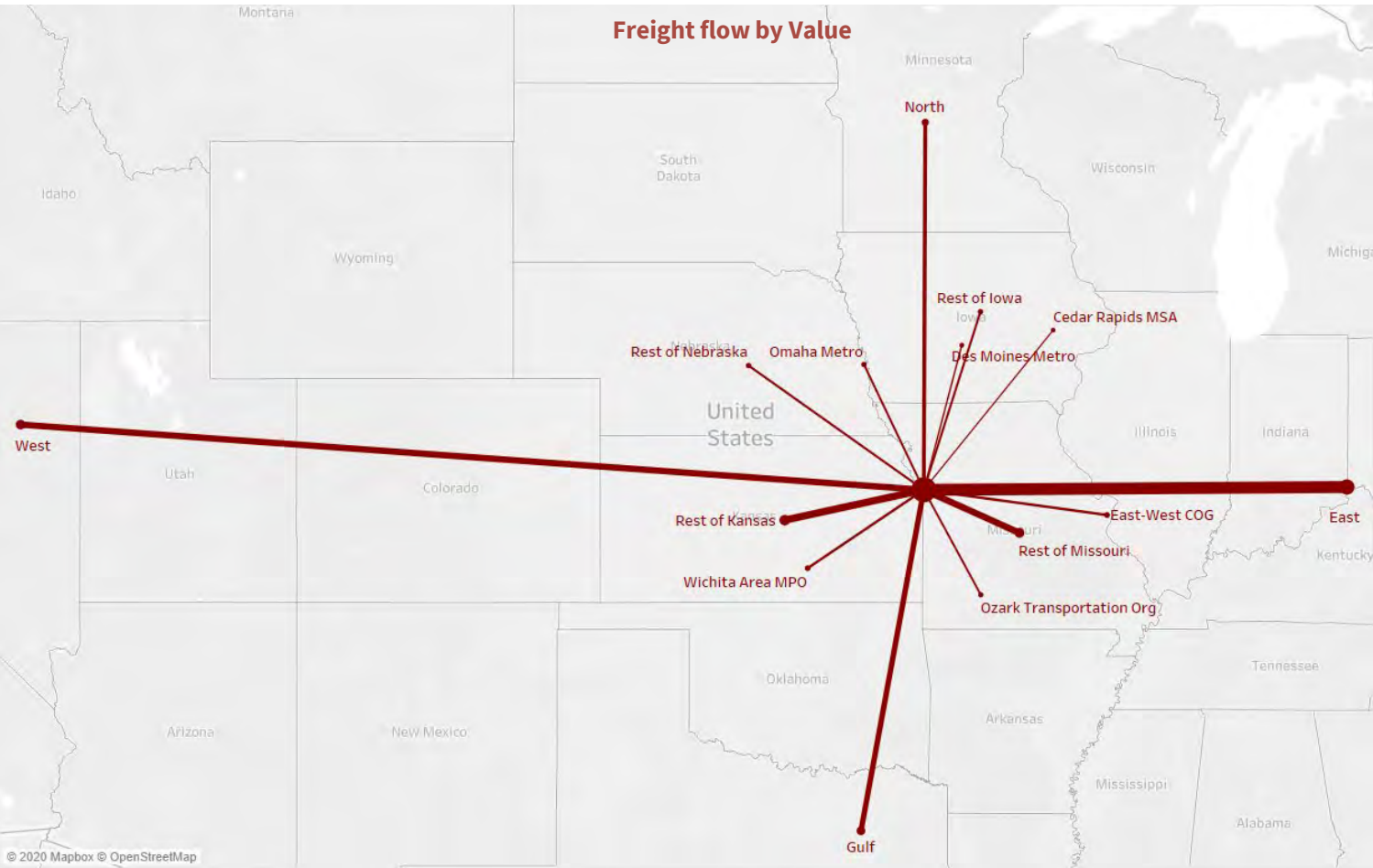
MPO	Trade Partner				
	Itself	5 MPOs	Rest of State	Rest of Heartland	External US & Foreign
East-West COG	3	4	2	5	1
MARC	2	4	3	5	1
Omaha Metro	4	5	3	2	1
Des Moines Metro	5	3	2	4	1
Wichita Area MPO	3	4	1	5	2
Ozark Transportation Org.	5	3	2	4	1

Percent of Value (in/out/intra)

MPO	Trade Partner				
	Itself	5 MPOs	Rest of State	Rest of Heartland	External US & Foreign
East-West COG	24%	5%	26%	2%	43%
MARC	20%	7%	19%	4%	49%
Omaha Metro	12%	6%	15%	30%	38%
Des Moines Metro	4%	7%	36%	5%	49%
Wichita Area MPO	14%	7%	38%	3%	38%
Ozark Transportation Org.	3%	16%	29%	7%	46%

- By tonnage, all nodes primarily trade with their respective states, followed by intra-node trade and trade with the rest of the U.S.
- By value, all nodes have most exposure to trade with the rest of the U.S. and foreign trade
- Regionwide and inter-nodal service is relatively weak
- Implications for network and technology

Freight flow by Value



MARC Trade Partners

- Trade partners visualized by value of freight moved
- Thickness of segment determines proportion of freight flow relative to other trade partners
- Rest of U.S. split into 4 groups
 - North – WI, MN, ND, SD
 - Gulf – AR, OK, LA, TX
 - West – Rest of states west of Mississippi river
 - East – Rest of states east of Mississippi river

TASK 3: FREIGHT TECHNOLOGY MATURITY

- Priority:
 - Safety - Advanced Driver Assistance Systems
 - Energy - Truck Electrification
- Watchlist:
 - Automation
 - Big Data
 - Data, Information & Communication
 - Digital Supply Chain
 - Enforcement & Inspection
 - Intermodalism



TASK 3: REGULATORY STRATEGIES

- Key Recommendations:
 - Continue consortium for implementation and investigate opportunities to house the plan within a larger agency
 - Integrate the HFTP as the source for statewide and regional freight plans as it relates to freight technology
 - Focus on implementation of near-term technologies like truck electrification and Advanced Driver Assist Systems
 - Maintain technology watchlist



TASK 4: DATA SHARING & MANAGEMENT

- Key Recommendations:
 - Formalize a data working group within consortium, specifically including technical members
 - Develop a formal data governance structure – strive for a more systematic structure to manage agreements.
 - Consolidate and share the region's existing freight data resources. Work to develop data, metadata and quality priorities and standards for each data set
 - Consider developing a regional data portal for data sharing
 - Data agreements to reference and build from



Visit the Website

www.heartlandfreightplan.org

Heartland Freight Technology Plan



A national hub for agriculture, manufacturing and freight distribution, the Central Plains/Heartland Region includes the states of southwestern Illinois, Iowa, Kansas, Missouri and Nebraska.

Together, we are embarking on a freight technology plan for the region that will deliver:

- A prioritization framework for new technologies.
- Goals and strategies for harmonizing regulation.
- Recommendations for data management and sharing.
- A blueprint for action and implementation.

Understanding regional linkages requires vision, foresight and keen awareness of strengths associated with a shared regional vision. We will be looking for partnerships to assist in information sharing. Creation of the freight technology plan will follow this sequence.

GET INVOLVED
PROJECT UPDATES
PARTNERS
TIMELINE
FACT SHEET

Economic connections between Heartland metropolitan areas and states

The team will work to define the major economic and industrial connections critical to freight flow within the region. An approach to access these connections in other regions will be developed to support the overall economic benefit of efficient freight movement.

Harmonize regional regulatory objectives and strategies

The team will develop an approach to identify and assess emerging freight technologies as well as provide recommendations for harmonizing policies for transportation agencies in the region.

Regional data sharing and management

A guidebook and templates for regional data sharing and management will be created that highlight best practices for public/private data sharing. A methodology for evaluating, prioritizing and leveraging data technology will be created to promote efficiency within the region.

The plan is part of FHWA's National Economic Partnership (NEP) grant program and is being developed through a partnership of six MPOs, five state DOTs, the Heartland Civic Collaborative and other academic, business and industry leaders.

Final Report and other deliverables posted here this Fall!

Lessons Learned/Cross-Cutting Issues

- Importance of champion & institutional structure to organize and maintain momentum
- Rubric for nodes, corridors and industries
- Technology maturity model
- Data sharing/management practices and agreements

Next Steps

- Continued Partnerships
- On-going analysis/monitoring of data sharing opportunity
- Stronger bonds of cross jurisdictional partnerships

