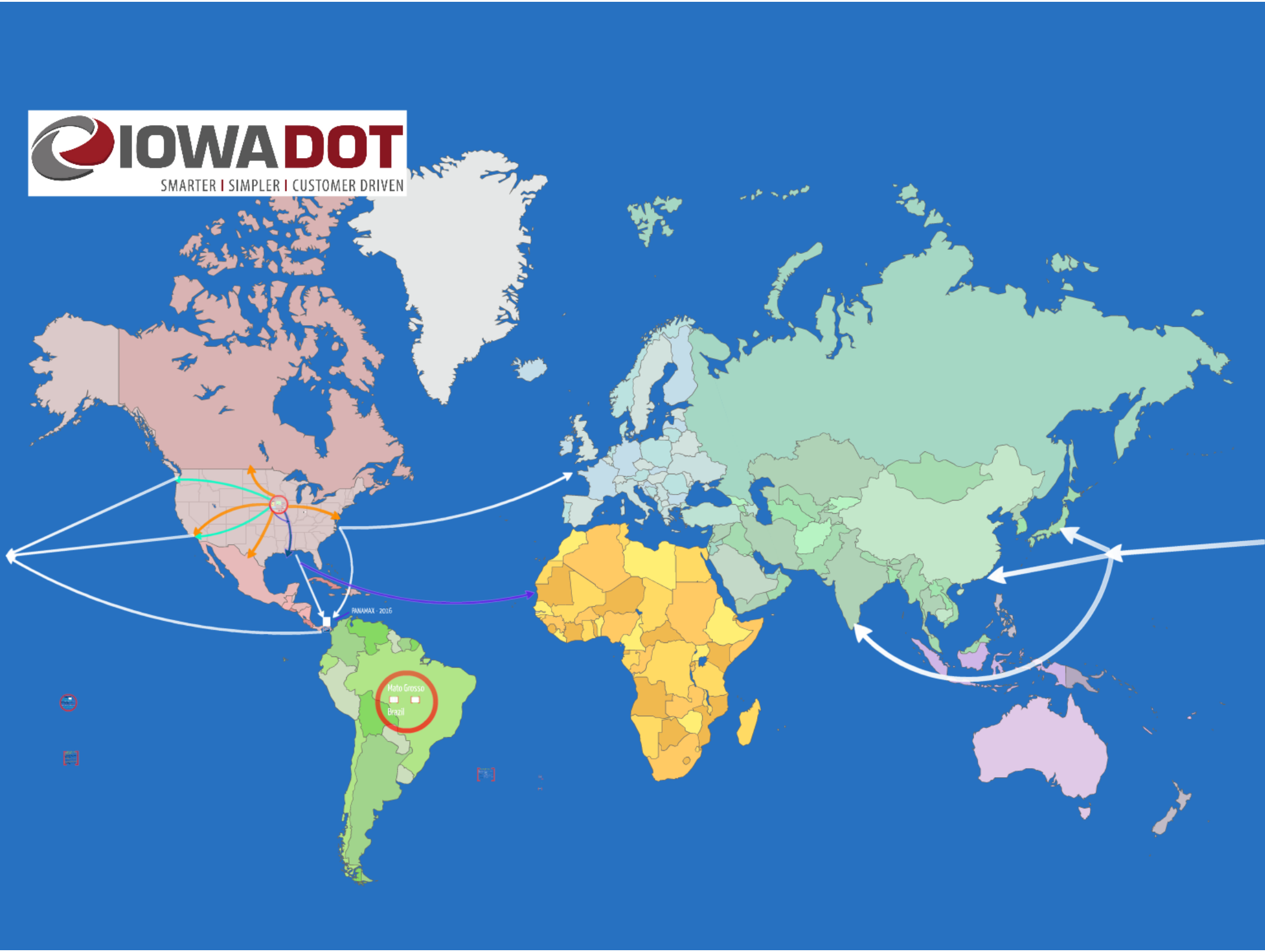
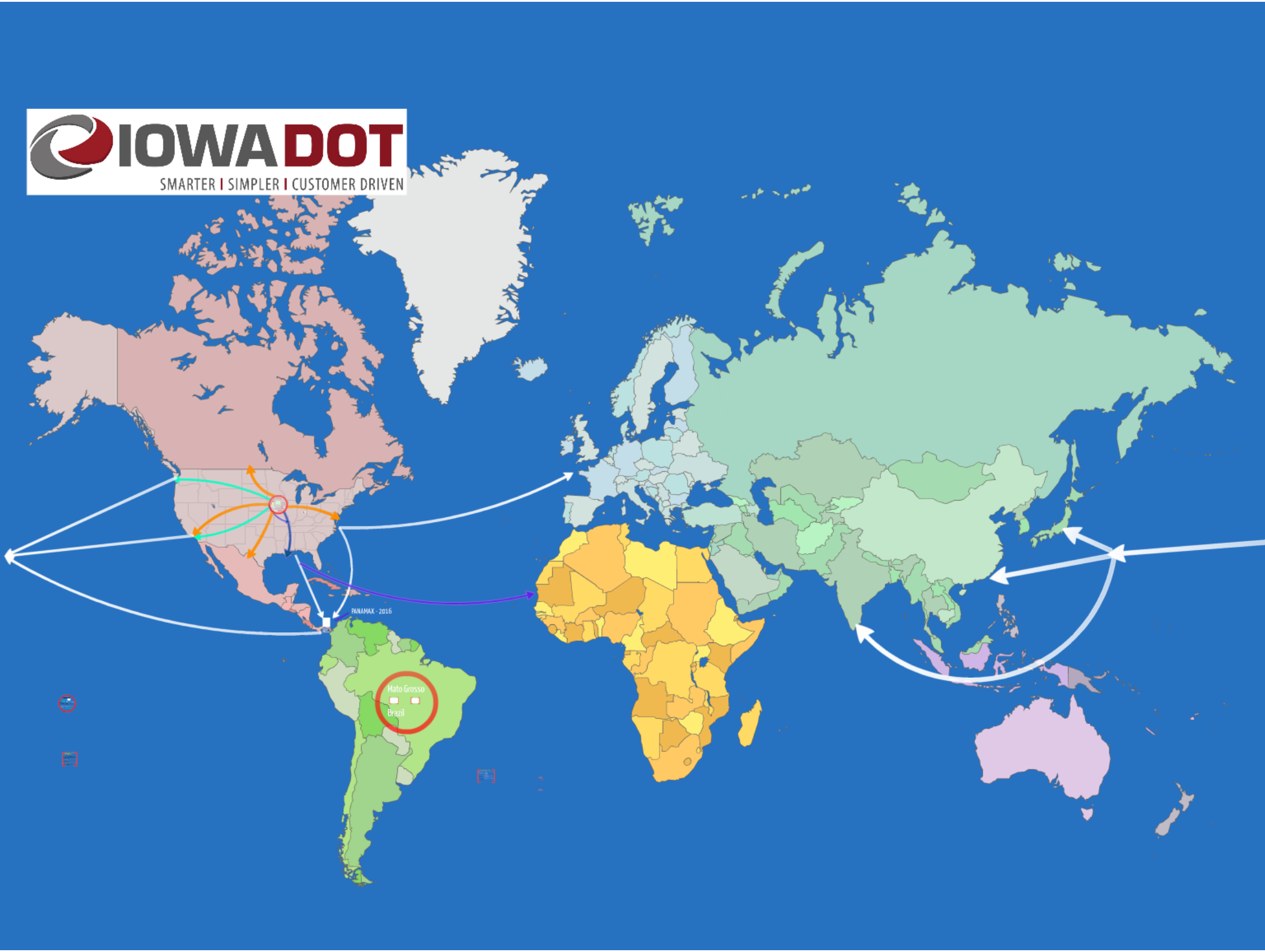

IOWA DOT
SMARTER I SIMPLER I CUSTOMER DRIVEN
PANAMAX - 2016
Mato Grosso
Brazil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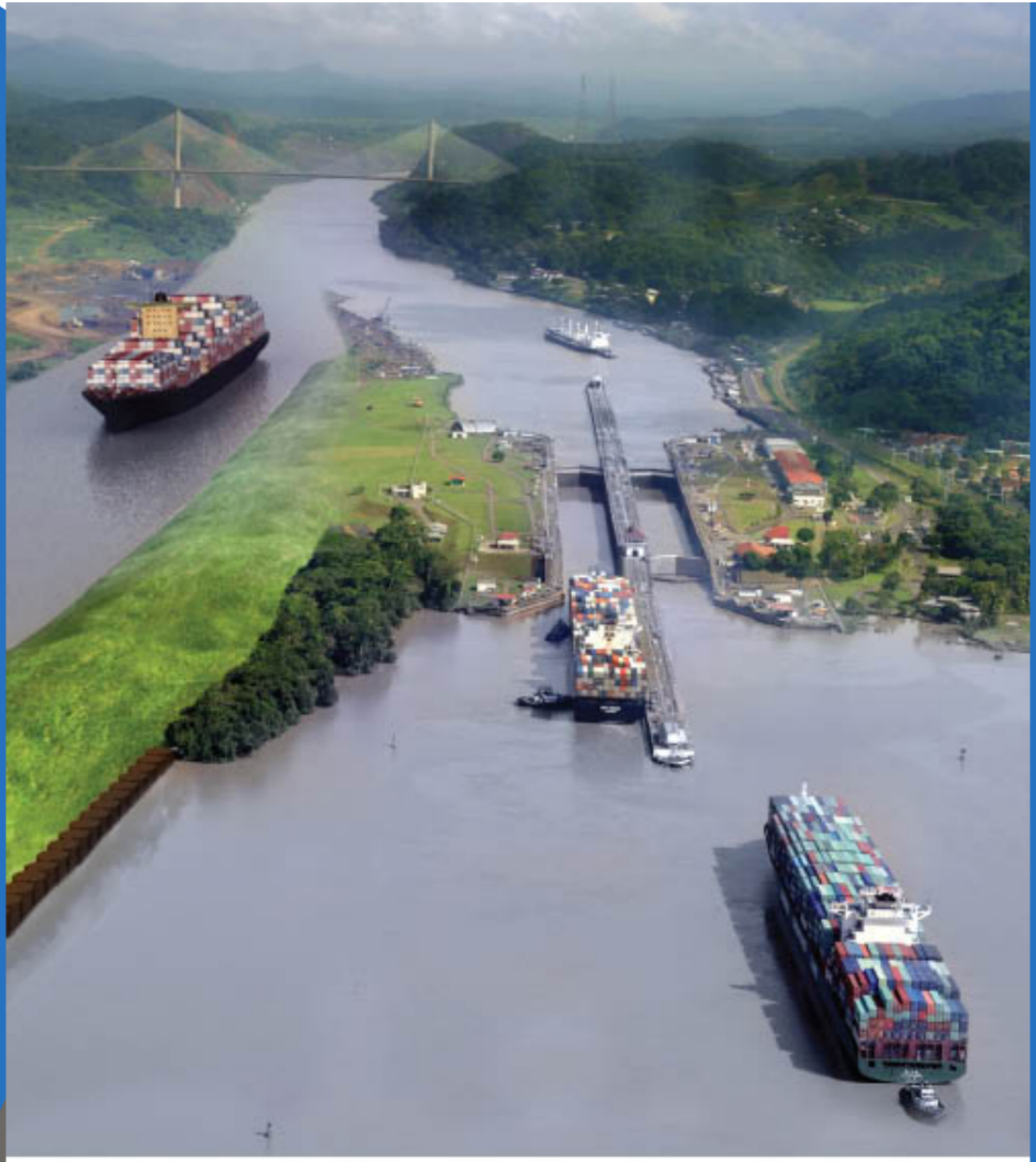
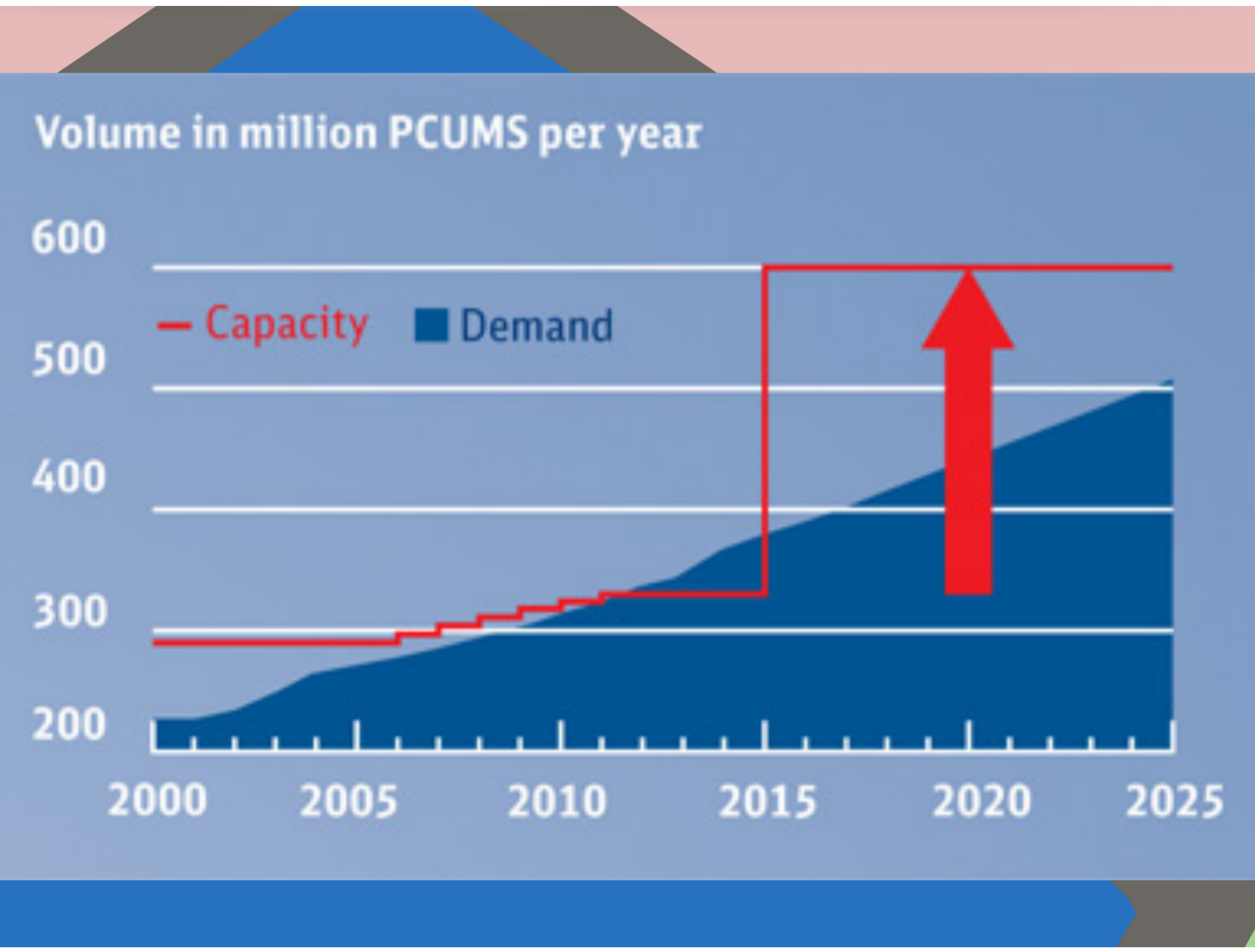
Mato Grosso
Brazil



This is a rendering of the new channel that will connect the third set of locks in the Pacific to the Gaillard Cut. The new Borinquen Dam separates the existing channel (at right) from the new channel built to handle post Panamax ships.


Volume in million PCUMS per year
600
500
400
300
200
Capacity
Demand
2000
2005
2010
2015
2020
2025

Economics of

Producer State = 

$18.5 Billion exports 2012

$1.1 billion - $2.5 billion in transportation costs

84% of Iowa Exporters are Small to Medium-sized companies

"Freight is our competitive advantage.."

2008-2012 Manufactured Exports grew 20%

95% of customers for Iowa products are outside the US

Modern Infrastructure for Modern Agriculture & Manufacturing

Predictability + Reliability = Performance; Logistics Management

21st Century Farm-to-Market System: Develop a new comprehensive transportation system to move products to global marketplace seamlessly on Road, Rail, and Water

Improved flow from:

Point of Origin to Point of Consumption

Tomorrow's Agricultural Transportation System needs to be smaller but built to a higher level

Freight Corridors enriching ability to transfer products easily from mode to mode - road, rail, water, air

Safety – Mobility – Economics focused on competitive edge for Iowa's businesses and citizens.

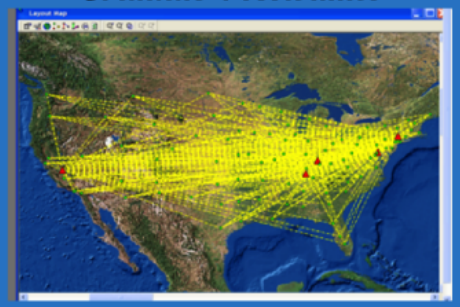
Linking Transportation and Economics

Supply Chain Network Design =

Discipline to determine the optimal location and size of facilities and the flow through network

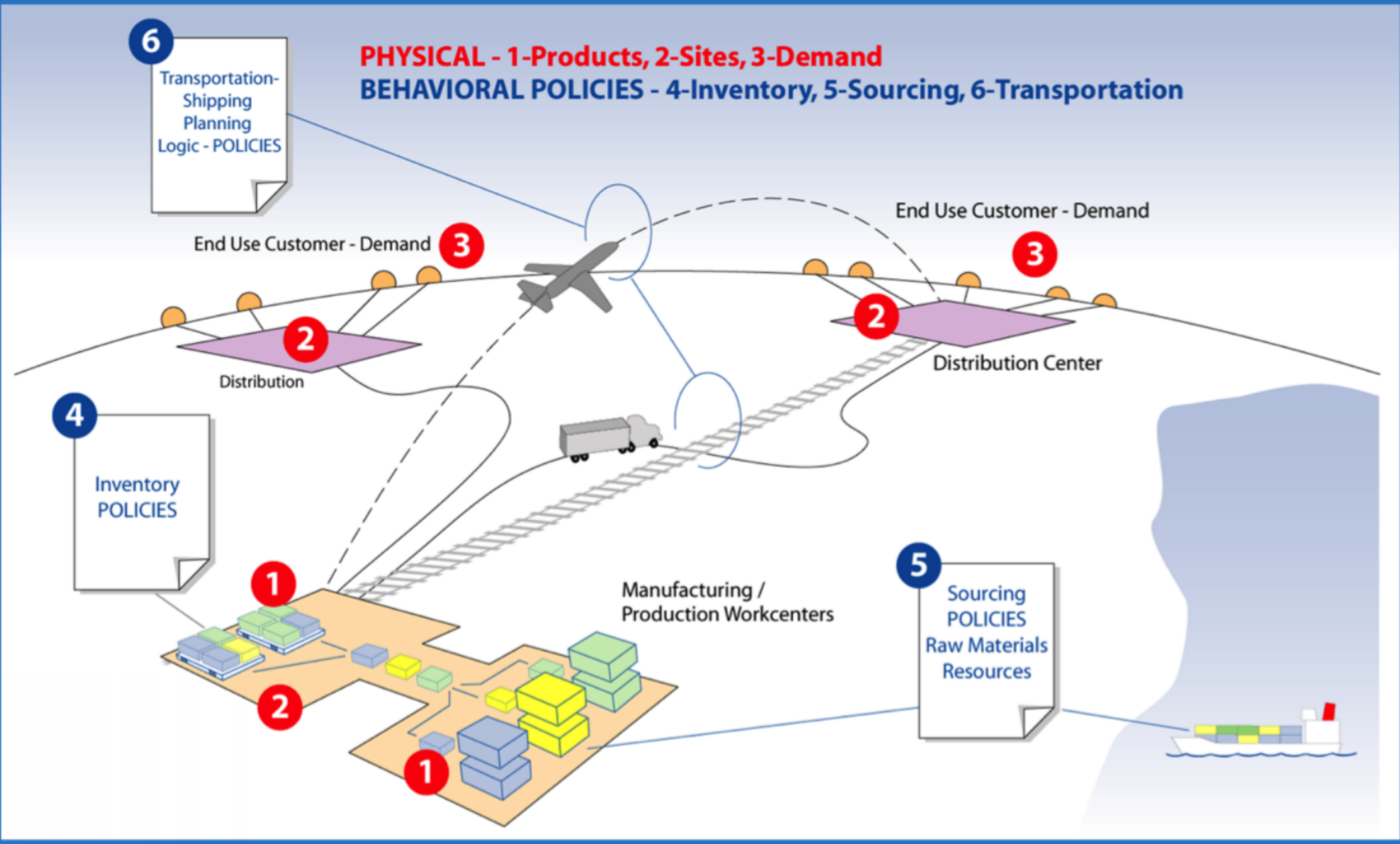
Demand-Based Supply Chain Optimization=

Evaluate Possibilities



Define Optimal Solutions

- Applies supply chain network and optimization techniques to Freight transportation network
- Focuses on end users' demand
- Identifies opportunities to use lower cost modes and additional infrastructure elements to enable lower cost routes that meet constraints

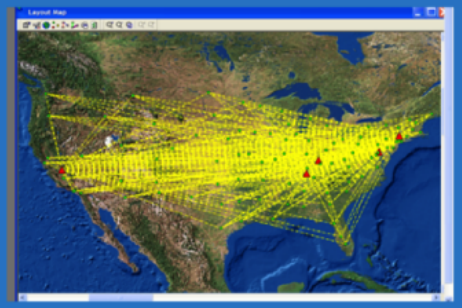

6
Transportation-
Shipping
Planning
Logic - POLICIES
PHYSICAL - 1-Products, 2-Sites, 3-Demand
BEHAVIORAL POLICIES - 4-Inventory, 5-Sourcing, 6-Transportation
End Use Customer - Demand
3
End Use Customer - Demand
3
2
Distribution
2
Distribution Center
4
Inventory
POLICIES
1
Manufacturing /
Production Workcenters
5
Sourcing
POLICIES
Raw Materials
Resources
2
1

Supply Chain Network Design =

Discipline to determine the optimal location and size of facilities and the flow through network

Demand-Based Supply Chain Optimization=

Evaluate Possibilities



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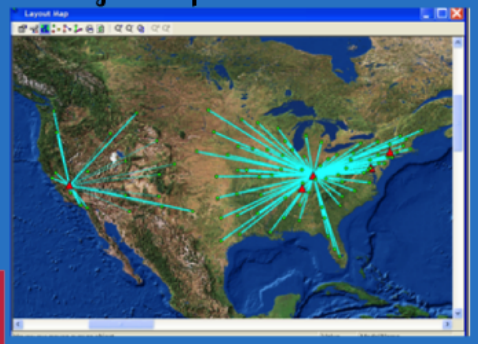


In Process:

- Iowa Statewide Freight Transportation Network Optimization
- Iowa Supply Chain Business Intelligence (BI) Priorities and Data Warehouse
- Business Analytic Capabilities
- Value added Supply Chain Design for Iowa Companies (Small and Mid-sized) linked to Transportation Improvements
- Energy Transportation - Propane (Underway), Economic Opportunities & Preparedness

unties

ounties and their 40 foreign trading partners

ties

- Business Ana
- Value added S
  Transportatio
- Energy Transp

What Data?

Demand Data

- Domestic
  - FAF3.4 freight flow data disaggregated to all 3,143 U.S. counties
  - Modes included: Truck, Rail, Water, and Intermodal
  - 43 commodities
- Import/Export
  - Iowa 2010 import/export data disaggregated to 99 Iowa counties and their 40 foreign trading partners
  - Modes included: Truck, Rail, Water, and Intermodal
  - 43 commodities
- Demand data is disaggregated to 4 seasons
- All origin and destination sites are geocoded

Network Capacity Data

- Freight transportation capacity (in tonnage) for all 99 Iowa counties
- Networks included: primary roads, rail, and inland waterway

a disaggregated to all 3,143 U.S. counties
l, Water, and Intermodal

t/export data disaggregated to 99 Iowa counties and their 40 foreign

Network Capacity Data

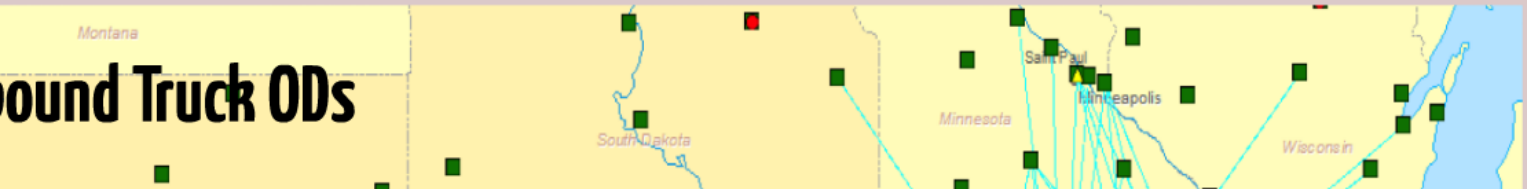
- Freight transportation capacity (in tonnage) for all 99 lo
- Networks included: primary roads, rail, and inland waterv

Demand Forecast Data

- Domestic
  - FAF3.4 2040 forecast data disaggregated to all 3,143 U.S. counties
  - Modes included: Truck, Rail, Water, and Intermodal
  - 43 commodities
- Import/Export
  - Iowa 2040 forecast import/export data disaggregated to 99 Iowa counties and their 40 foreign trading partners
  - Modes included: Truck, Rail, Water, and Intermodal
- 43 commodities

Transportation Cost Benchmark Data

- Full Truckload (FTL) shipment distance and cost data for multiple equipment types
- Less-Than-Truckload (LTL) shipment distance and cost data for multiple equipment types
- Rail shipment distance and cost data for multiple equipment types
- Barge shipment cost data in 4 seasons (winter, spring, summer, and fall)
- Intermodal shipment cost data
- Ocean container shipment cost data for import/export
- A number of socio-economic datasets for data disaggregation



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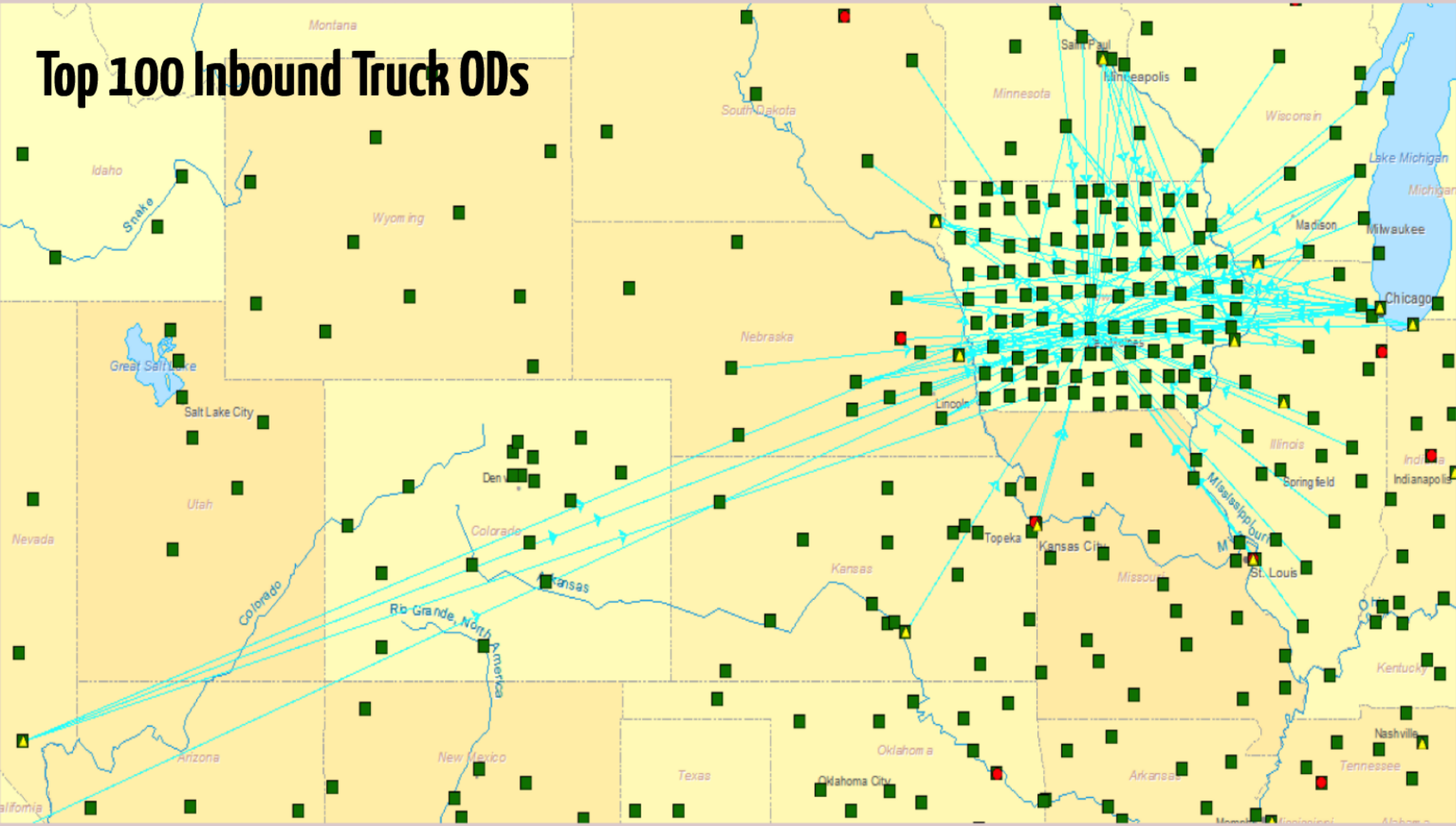
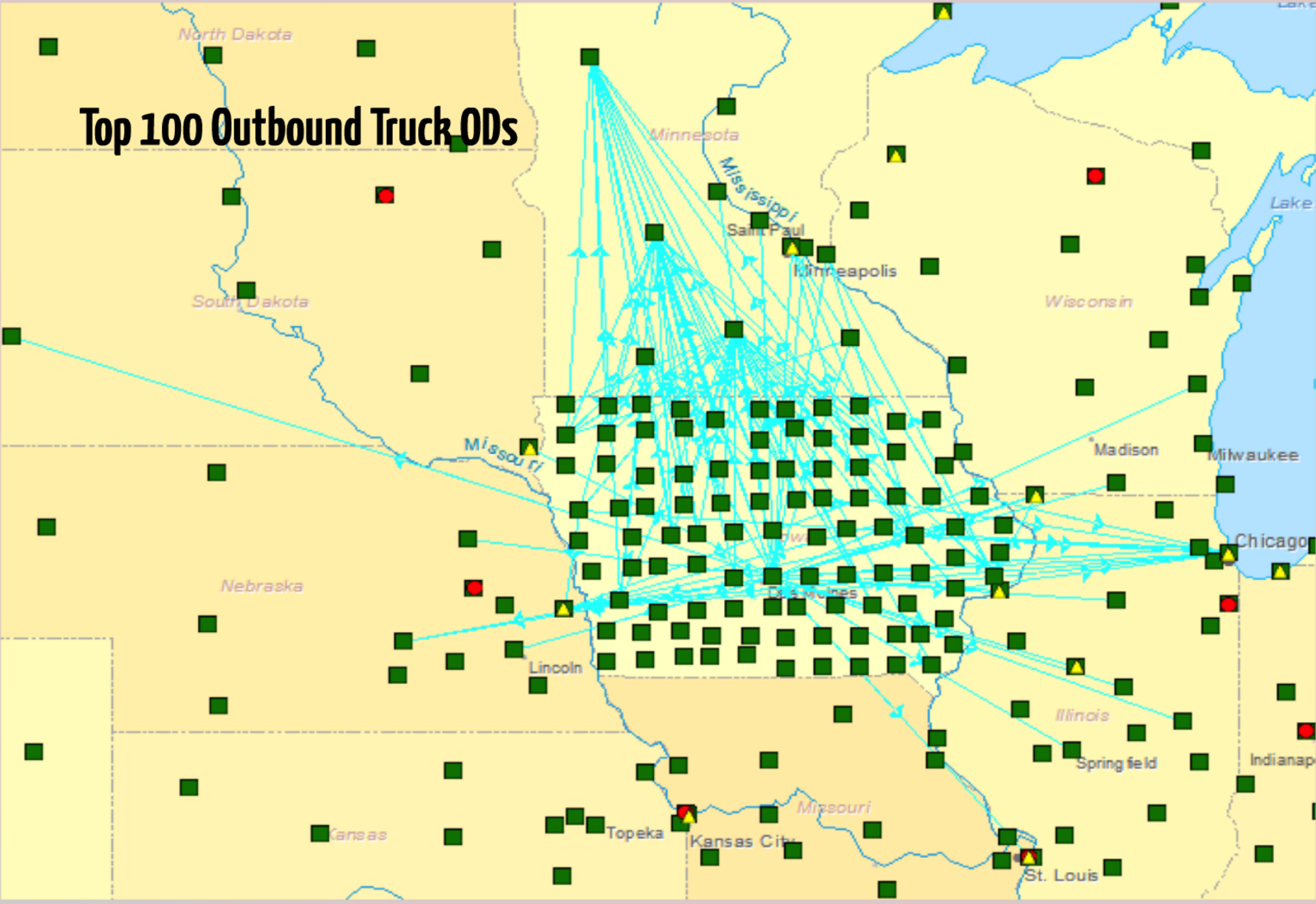
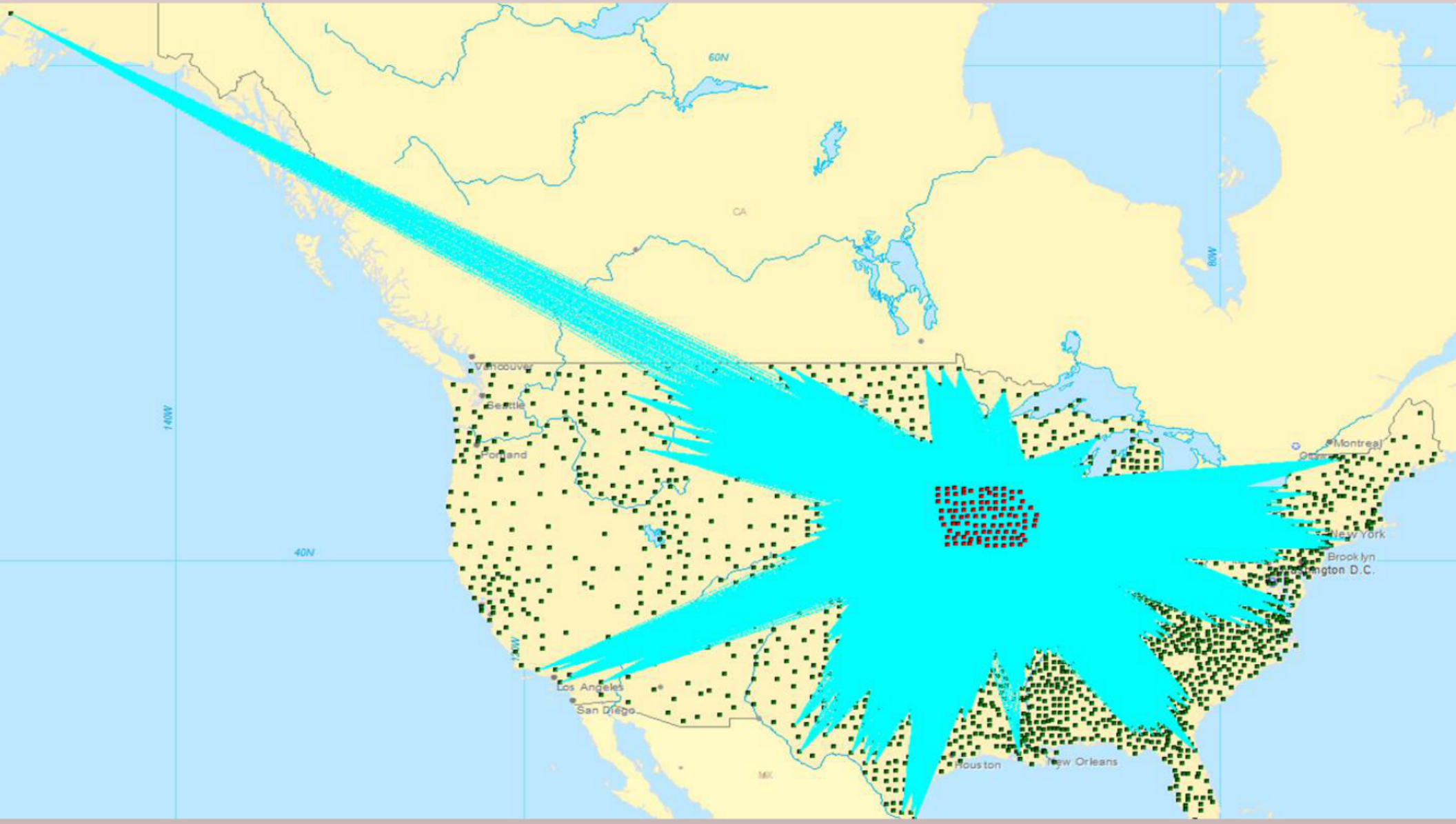
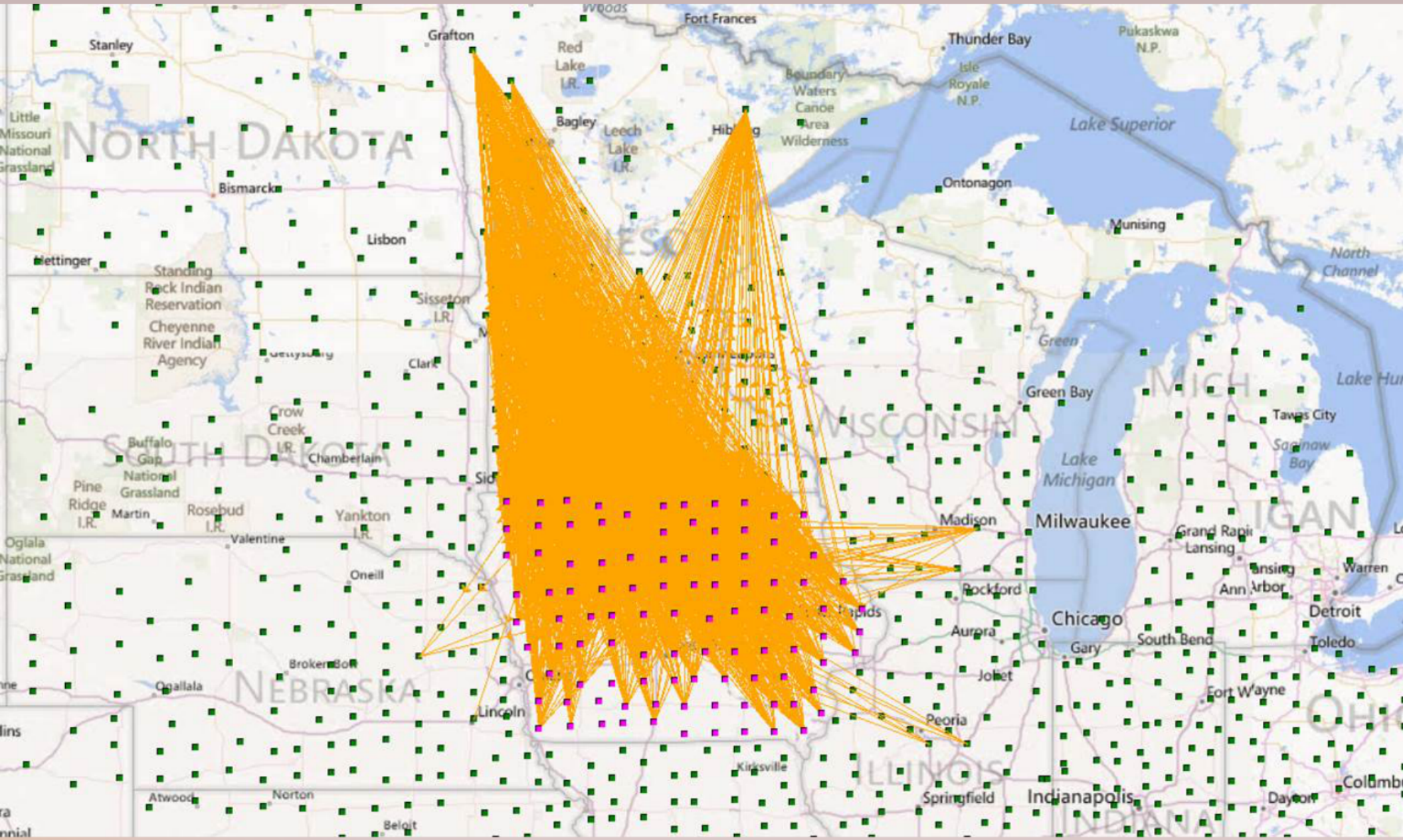



Top 100 Outbound Truck ODs
North Dakota
South Dakota
Minnesota
Mississippi
Saint Paul
Minneapolis
Wisconsin
Lake
Missouri
Madison
Milwaukee
Chicago
Nebraska
Lincoln
Illinois
Springfield
Indianap
Missouri
Kansas
Topeka
Kansas City
St. Louis


60N
CA
80W
140W
40N
120W
Vancouver
Seattle
Portland
Montreal
New York
Brooklyn
Washington D.C.
Los Angeles
San Diego
Houston
New Orleans
MX


Grafton
Fort Frances
Thunder Bay
Pukaskwa N.P.
Stanley
Red Lake I.R.
Boundary Waters Canoe Area Wilderness
Isle Royale N.P.
Lake Superior
Bagley
Leech Lake I.R.
NORTH DAKOTA
Bismarck
Ontonagon
Munising
Lisbon
Standing Rock Indian Reservation
Cheyenne River Indian Agency
Sisseton I.R.
Clark
Green Bay
Crow Creek I.R.
Buffalo Gap National Grassland
Chamberlain
Pine Ridge I.R.
Martin
Rosebud I.R.
Yankton I.R.
Valentine
Oglala National Grassland
Oneill
Madison
Milwaukee
Rockford
Aurora
Chicago
Gary
South Bend
Detroit
Toledo
Broken Bow
Ogallala
NEBRASKA
Lincoln
Joliet
Peoria
Fort Wayne
Kirksville
Atwood
Norton
Beloit
Springfield
Indianapolis
Dayton
Columbus
Lansing
Ann Arbor
Warren
Tawas City
Saginaw Bay
Lake Michigan
North Channel

Polk Co. - 726,611
Wilkin Co. - 698,159
Redwood Co. - 684,883
Renville Co. - 567,287
Blue Earth Co. - 549,872
Total MN Counties = 11,668,756

Polk County, Minnesota:
CHS, Inc, Grain Elevator
Farmers Elevator & Trading Company, a $17 million grain elevator
Beltrami Farmer's Elevator, a $10 million grain elevator
Fosston Co-op Elevator Association

Wilkin County, Minnesota:
Minn-Kota Ag Products Inc., an $18 million grain elevator
Weaton-Dumont Coop Elevator
Red River Grain Company, a grain elevator

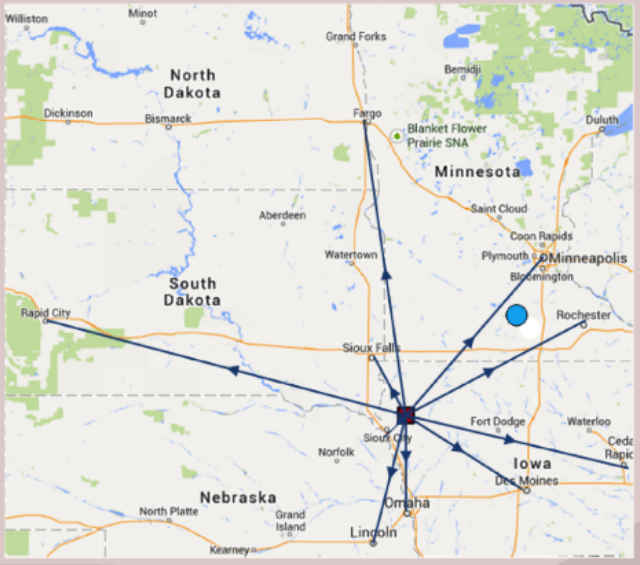
Redwood County, Minnesota:
Harvest Land Cooperative, a $263 million grain wholesaler
Highwater Ethanol, with sales over $156 million a year
Farmer's Cooperative Association, a $45 million grain elevator
Meadowland Farmers, a $40 million grain elevator with 3locations in the county
Morgan Grain and Feed Company, a $34 million grain wholesaler with 3 locations in the county

Renville County, Minnesota:
Co-Op County Farmer's Elevator, a $150 million grain elevator with 5 locations in the county
United Farmer's Cooperative, a $52 million grain wholesaler
Minnesota Energy Ethanol LP
United Mills, a $2 million cereal grain mill

Blue Earth County, Minnesota:
Purina Mills
Horizon Milling, a flour and other grains milling company
Archer Daniels Midland
Big Gain Inc., a $31 million in sales livestock feed company.
Protein Sources LLP, a $17 million in sales feed company.
Northstar Ethanol LLC, a $13 million in sales ethanol company

BI Example - Large-Box plans to build a perishables distribution center to serve IA, MN, NE, SD, and ND

- Site selection
- Cost analysis
  - Transportation network
  - Transportation costs
  - Supply chain labor costs
  - Construction costs
  - Facility costs



Business Analytic Capabilities

Economic and Business Development

- Supply chain cost analysis to recruit and retain businesses
- Iowa product demand analysis
- Strategic industries for new businesses
- Competitive analysis – Iowa product landed costs vs. competitors'
- Strategic site location analysis
- Industry Specific Supply Chain Design
- Supply chain design for agriculture, energy, etc.

Shipper Supply Chain Analysis

- Supply chain constraint analysis and optimization
- Supply chain cost benchmarking
- New plat/warehouse site selection
- Supplier performance/freight rate benchmarking

Transportation Company Investment Analysis

- Transportation demand analysis
- Market segmentation and cost analysis
- Demand forecast
- Site selection for new facilities

Transportation Network Management

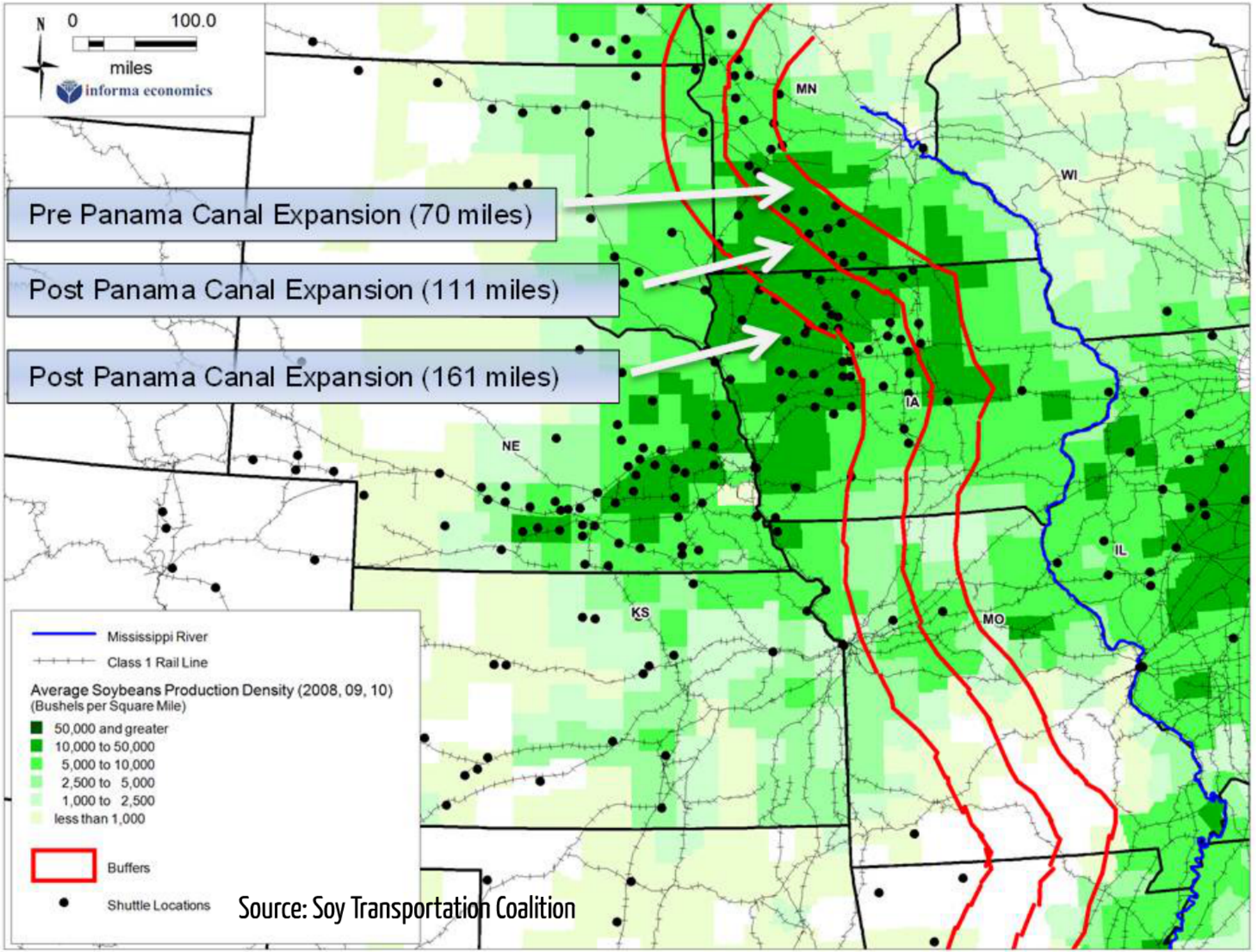
- Infrastructure inventory analysis
- Network capacity analysis
- Network utilization trend analysis
- Contingence-based planning and business impact assessment
- Value assessment of transportation network

Network Optimization

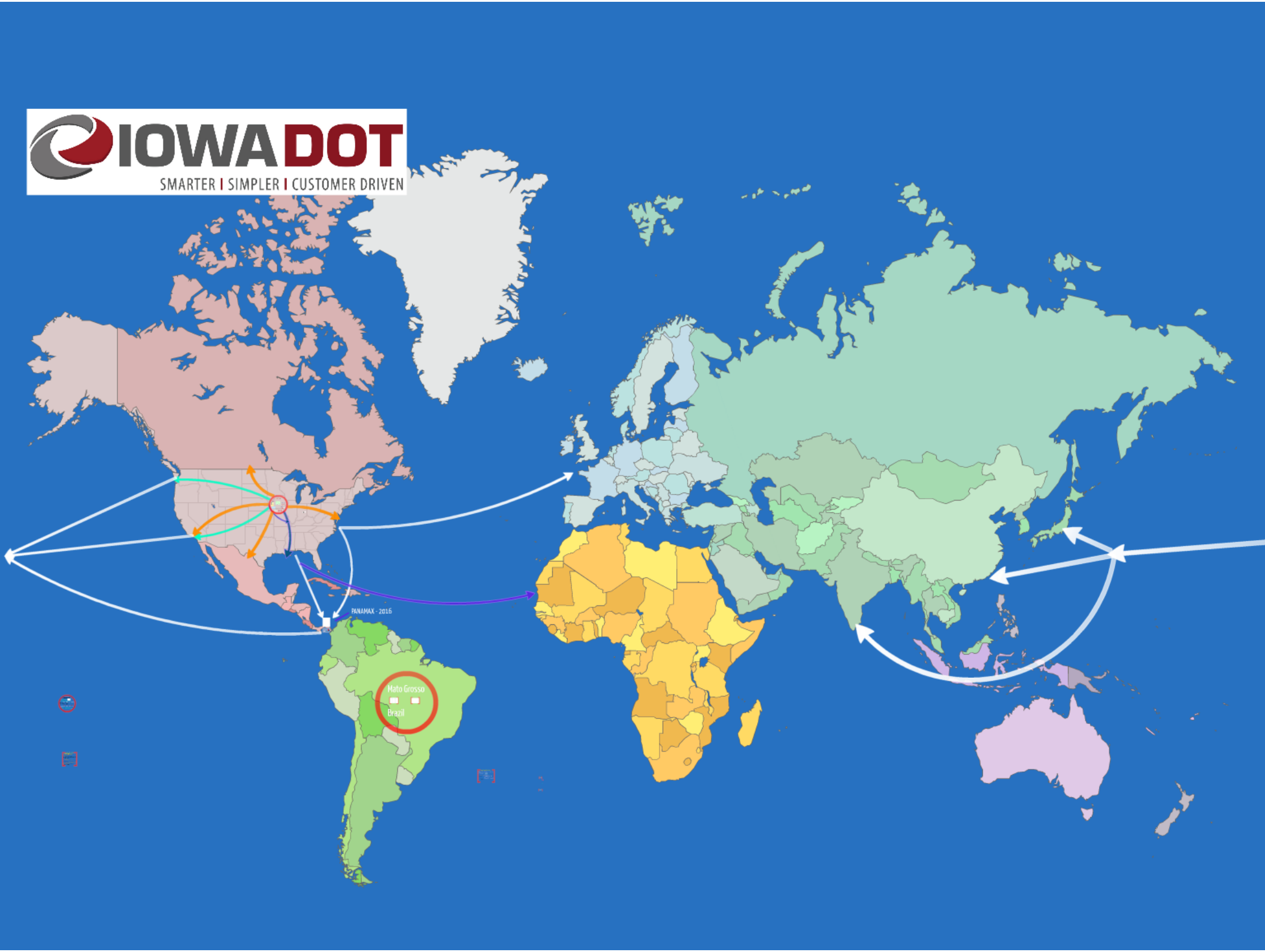
- Ongoing state-wide transportation network optimization
- Industry specific transportation network optimization
- Private sector supply chain network optimization

DOT Operational Key Performance Indicators (KPI) Analysis

- Trend analysis
- Slice and dice, drill down, roll up, and pivot analysis to understand constraints in transportation systems



Source: Soy Transportation Coalition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