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Development of a Freight Transportation Network Optimization Strategy – An Overview

August 19, 2015

consulting & technology

Project Background

- ***Vision**: To effectively identify and prioritize investment opportunities for an optimized freight transportation network to lower transportation costs and promote business growth in Iowa.*
- Iowa DOT can optimize statewide freight transportation network to reduce transportation costs
  - Traditional approaches focus more on capacity planning
  - Traditional methods don't quantify cost saving opportunities in a multimodal network
- This project uses a demand-based supply chain network design and optimization approach to Iowa DOT planning

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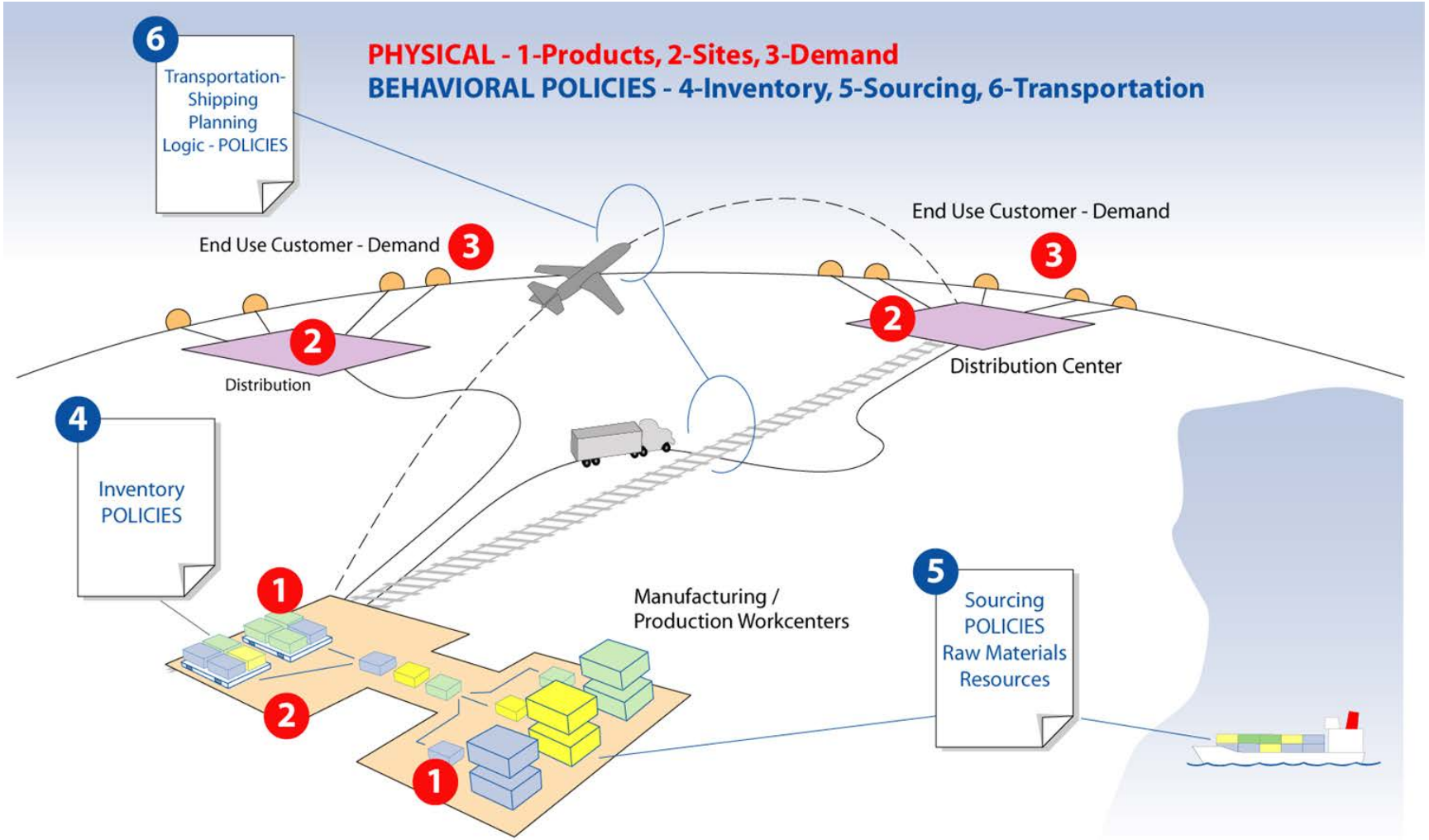
Supply Chain Network and Optimization

- ~80% of the landed costs are locked in with the supply chain network



Optimization Analysis

- Quantitative Analysis
  - Cost, lead time requirement, capacity, etc.
  - Economic viability
  - Improved network resilience
- Qualitative Analysis
  - Strategic alignment
  - Increasing network capacity and resiliency
  - Tax incentive / funding availability
  - Job creation and local buy-in
  - Service levels / transportation time
  - Road mile reduction
  - Project implementation risks

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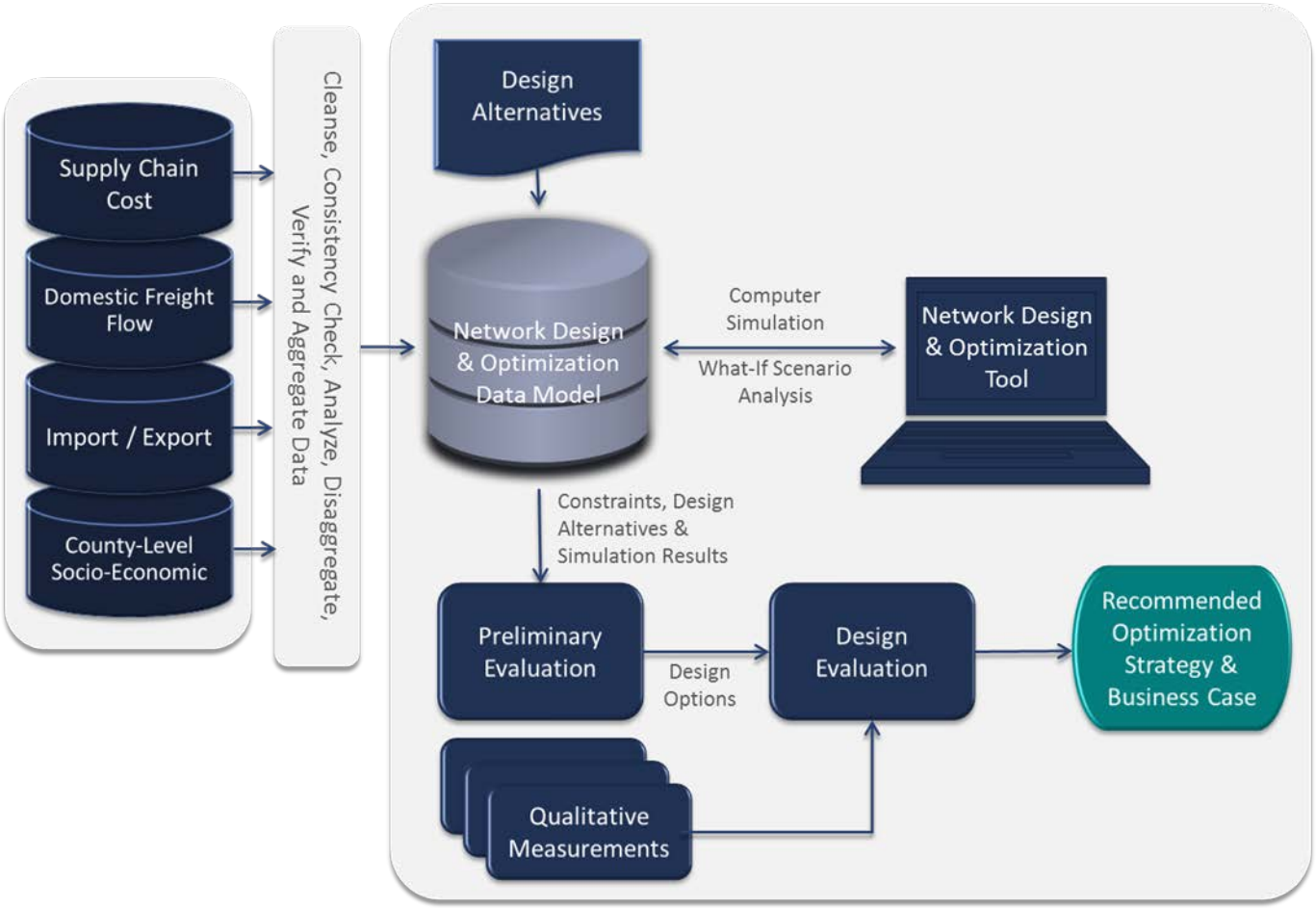
Business Architecture Overview



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Benefits of Multi-Modal Freight Optimization

- Determine the highest value multi modal infrastructure public and private investments that are measured by:
  - lowering the cost of transportation
  - Increases transportation responsiveness and predictability
  - Incent business expansion
- Identify commercial freight road networks that are irrelevant
- Reduce road freight truck traffic
- Improve transportation network resiliency

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Case Study 1 – Cross Dock Facility

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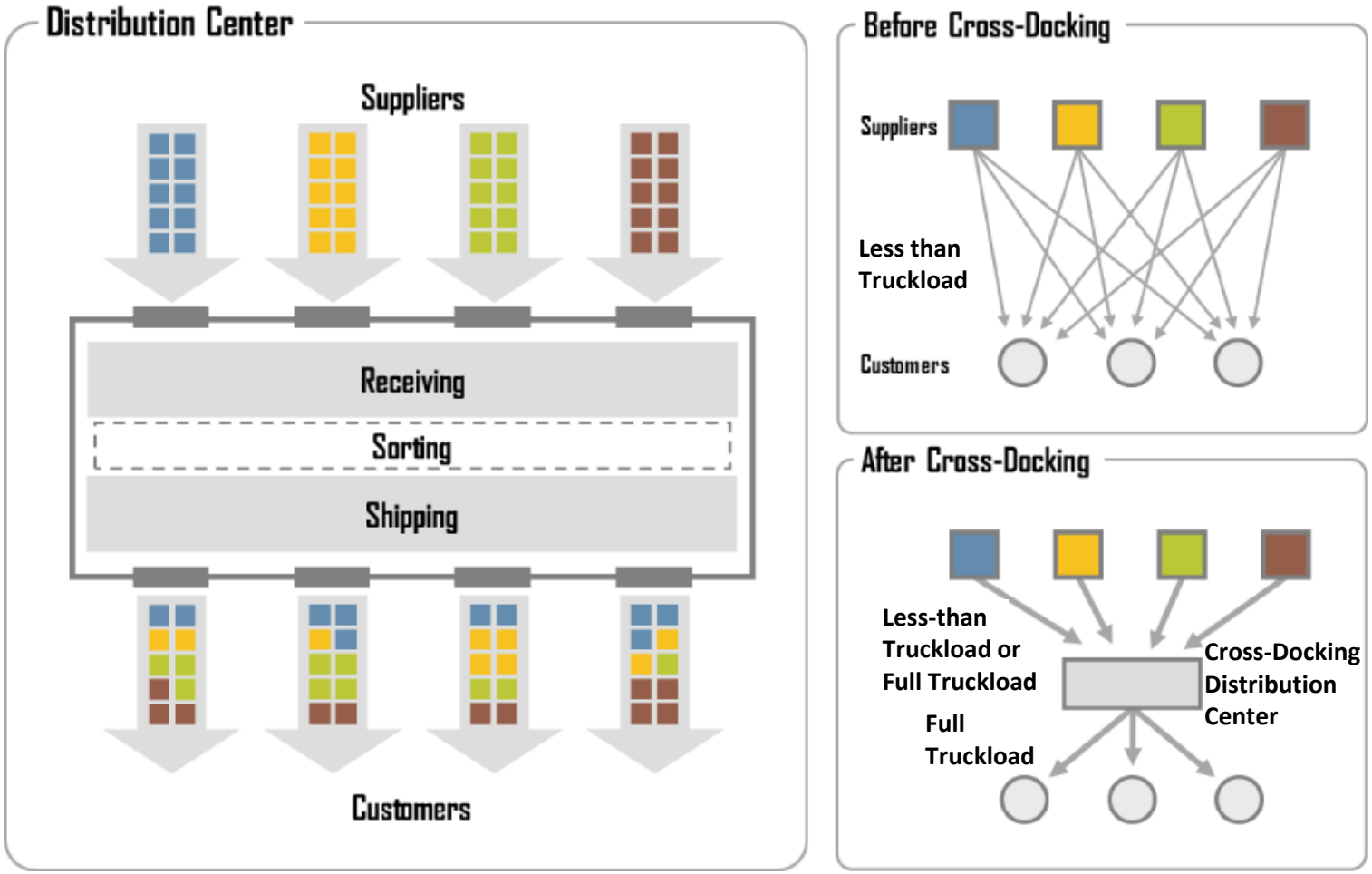
Cross Dock Overview



Case Study 1 - Cross-Dock Opportunity Analysis

- Evaluated total cost saving opportunities in four regions
- Region 1 has the highest cost saving, but Regions 2 & 3 are more viable options because of existing access to interstate highways
- Selected Region 2 as the primary site candidate with the concept to co-locate cross-dock and intermodal facilities in a logistics park

Location	Total Annual Saving Opportunity
Region 1	$909 Million
Region 2	$883 Million
Region 3	$908 Million
Region 4	$713 Million

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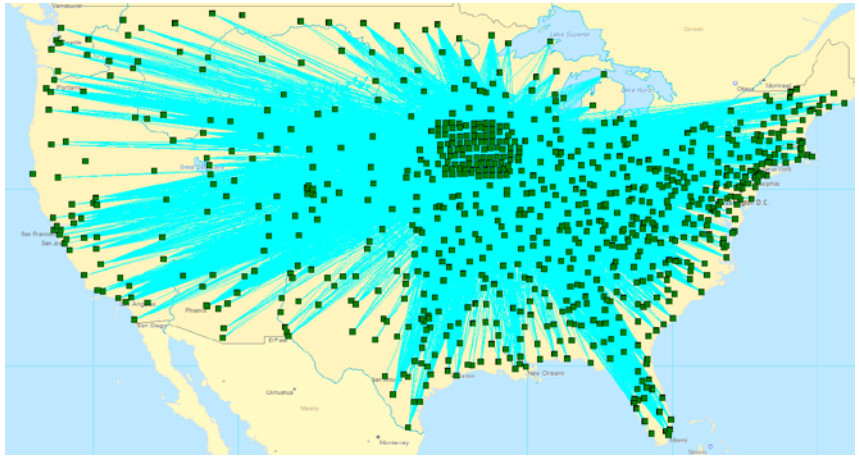
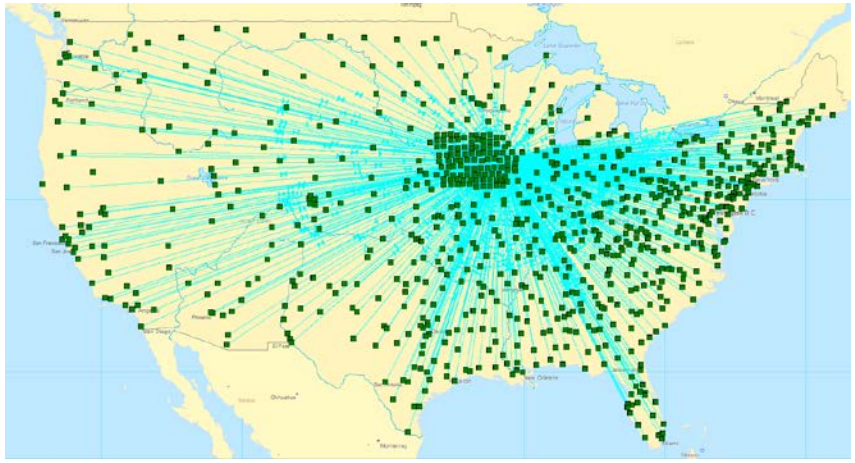
Case Study 1 - Cross-Dock Network Impact

Current State



Future State



- Benefits:
  - Leverage freight consolidation to reduce transportation costs
  - Reduce long distance truck traffic and improve environmental sustainability

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Case Study 2 - Intermodal Facility

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Opportunity Size – Focusing on High Volume Origin-Destination Pairs

The total market opportunity for high volume Origin-Destination pairs: $289 million net annual savings

Item	Opportunity
Annual Gross Transportation Saving	$412 Million
Empty Container Reposition Cost	($123 Million)
Total Outbound Container Number	247,000
Total Inbound Container Number	42,000
Total Container Shortage	205,000
Annual Net Saving	**$289 Million**
Annual Lift Number	**494,000**

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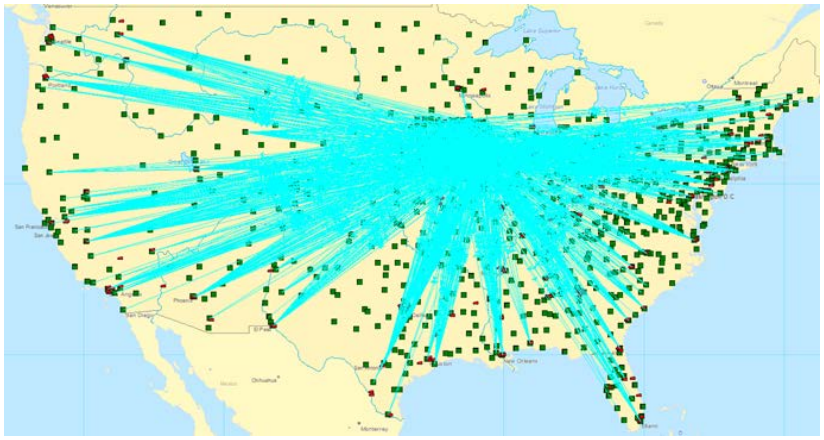
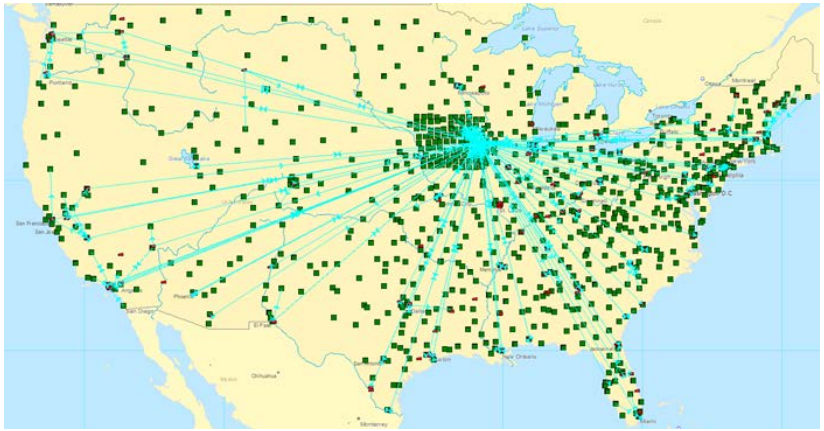
Case Study 2 – IM Facility Network Impact

Current State



Future State



- Optimization Benefits:
  - Leverage rail network to reduce transportation costs
  - Reduce truck traffic and improve environmental sustainability

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Questions

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