

Michigan's Global Supply Chain and Job Creation Opportunity: Roles for Transportation Professionals

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The Latest in Supply Chain Innovations

- Overview of Michigan's global supply chain and job creation opportunity
- Summary of results and key implementation measurements
- Private sector thinking including metrics
- Transportation professionals roles of creating value for the private sector

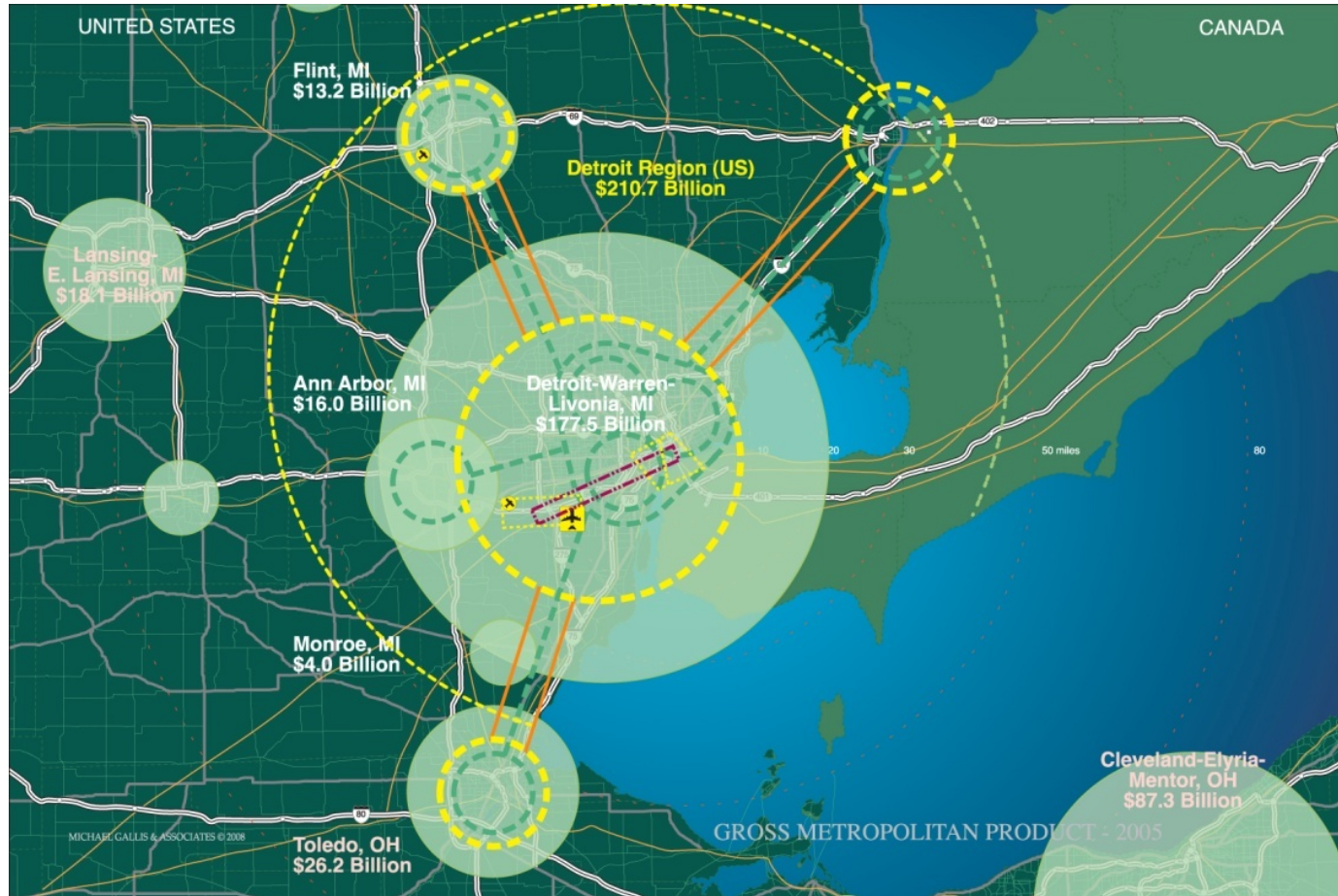
Summary of NEI Grant Results

Global Supply Chain and Job Creation Opportunity

- Phase I: MSU with WSU and DRC
 - Opportunity Assessment to determine potential of utilizing global supply chain innovations to improve economic development and create jobs in the State of Michigan.
 - Results of Phase I showed conservative estimate of over \$10B in economic development and 66,000 new jobs created.
- Phase II: MSU with WSU and DRC
 - Pilot approach with partners to seed job creation opportunity.
 - Design the “regional intermediary” and governance structure for the “supply chain hub”.
 - Education, sharing of findings, and communication.

Great Lakes Region: A Connected Region and Interdependent Economy

Highway and Rail Corridors



Map: Courtesy of Gallis and Associates

Michigan's World Class SCM Hub

- World class cross-border distribution hub
- Lowest overall cost to serve for industry partners
- Superior customer service for industry partners and their respective customers
- State of the art supply chain technology
- Excellent management and labor talent
- Win-win-win relationships with industry partners, service providers, and supply chain hub

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Summary of Results: Timeline

- 2008 – Creation of MI Supply Chain Development Commission
- 2008 – Proposed Aerotropolis initiative to create airport region related jobs
- 2009 – Creation of TranslinkedD initiative by DRC
- **2009 – Phase I Funding start-up for MSU/WSU/DRC supply chain research by New Economy Initiative**
- 2010 – Business Leaders of Michigan identifies TDL and supply chain hub as key initiative
- **2011 – Great Lakes International Trade and Transport Hub (GLITTH) Formed**
- 2011 – Michigan Governor Snyder Administration identifies TDL sector and SCM hub as key initiatives
- 2011 – GLITTH Summit stressing the need for integration and multi-state and multi-nation collaboration
- **2012 – MEDC, MDOT and MDARD are leading next steps for State of MI TDL strategy**

Metrics to Track Job Creation Success

Proposed Economic Development Metrics:

- Number of new jobs created by industry (Both Direct & Indirect jobs)
- Economic activity benefits by industry (Dollars)
- The number of new businesses attracted
- Business retention rate (New and Existing)
- Investment amounts with ratio: Public vs. Private
- Inbound/Outbound shipments (Volume and Value)

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The Supply Chain Revolution has Reshaped Private Sector Strategic Thinking

- **Supply Chain Management**
 - Consists of firms collaborating to leverage strategic positioning and to improve operating efficiency
- **Supply Chain Strategy**
 - Is a channel and business organizational arrangement based on acknowledge dependency and collaboration
- **Logistics**
 - The work required to move and geographically position inventory



Private Sector Supply Chain Design Questions

- Manufacturing plant location decisions
- Number and location of distribution centers
- Customers served from each distribution center
- Products stocked at each location
- Locations to serve international markets
- Service providers used to meet customer demand
- Value-added services to meet market requirements

Transportation Resources Associated with Private Sector Supply Chain Design Questions

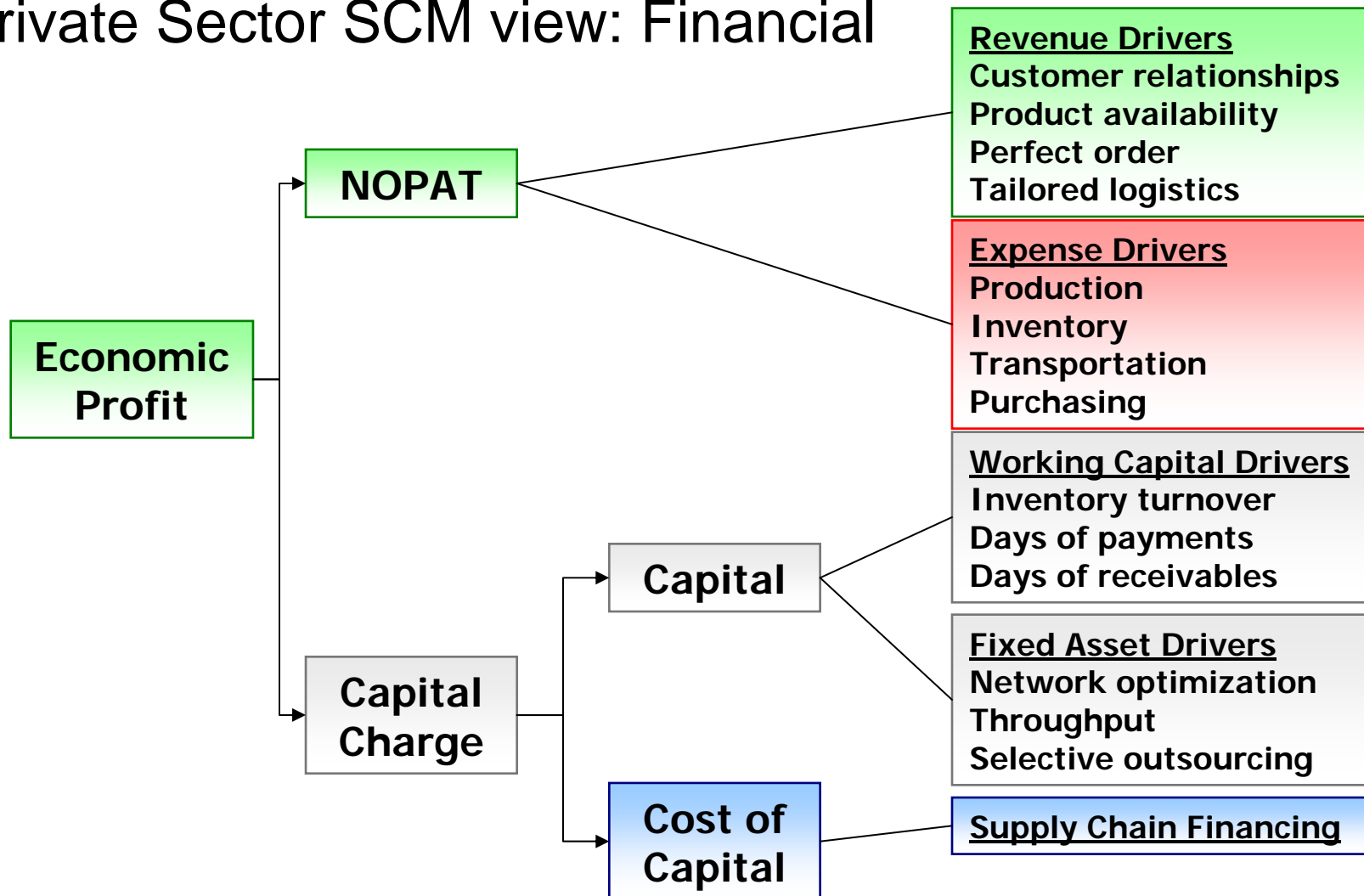
- Among these design activities, which are influenced by transportation resources?
 - Recurrent and non-recurrent congestion
 - Condition of infrastructure
 - Intermodal integration
 - Opportunities for freight and activity consolidation
- ***What other influences do transportation resources have on the supply chain design?***

Private Sector Supply Chain Value Adds

- Reduced operating cost
- Increased revenue
 - Fill rate
 - Extended offerings
 - Location
 - Mix
 - Product/Service/Solution
 - Customization
 - New product introduction
- Asset utilization
 - Facilities
 - Production
 - Transportation

Private Sector Supply Chain Management

Private Sector SCM view: Financial



Private Sector Supply Chain Measurement Categories

- Cost
- Customer service
- Quality
- Productivity
- Asset management

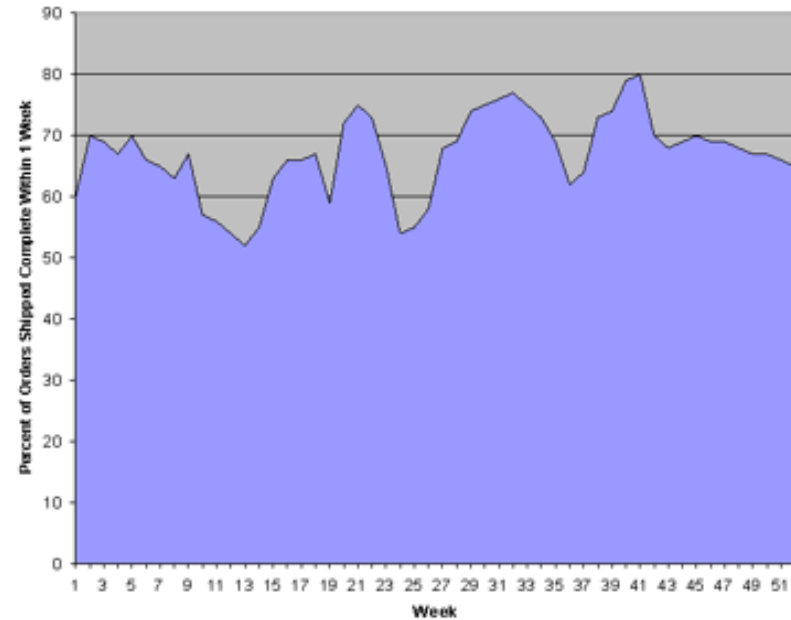


Cost is the most direct reflection of supply chain performance

- Typically measured in total dollars spent
- Total logistics cost (aka total landed cost)
 - Sum of order processing + inventory + transportation + warehousing and materials handling + facility network
 - Few organizations have ability to measure total cost
- Common to report cost as a
 - Percentage of sales volume
 - E.g. transportation cost as 15% of sales volume
 - Cost per unit of volume
 - E.g. loading cost as \$5.50 per order

Customer service specific measures

- Availability
 - Organization's **fill rate**
 - Item fill rate
 - Line fill rate
 - Value fill rate
 - Order fill rate
- Operational performance
 - **Average order cycle time** is average number of days elapsed between order receipt and delivery to customer
 - Order cycle consistency
 - On-time delivery



Quality measures often include service reliability performance

- Accuracy of work activities performed
- Damage frequency is the ratio of number of damaged units to the total number of units
- Number of customer returns of damaged or defective goods
- Number of instances when information is not available on request
- Number of instances when inaccurate information is discovered



Productivity measurements

- Labor productivity
 - Units shipped per employee
 - Units received per employee
- Asset utilization
- Equipment downtime



Asset management considers utilization of capital investments in facilities, equipment and inventory

- Facilities and equipment
 - Capacity utilization
 - E.g. warehouse utilization of 80% is not shipping all it is capable of shipping
 - Downtime is the percentage of hours that equipment is not utilized
 - E.g. forklift with a 2% annual downtime
- Inventory
 - **Inventory turnover rate** is most common measure of performance
 - **Days of supply** is the amount available to meet forecasted sales volume
 - E.g. 50 days of supply (100 units per day forecast and 5000 units on hand)
- Return on assets and return on investment

Private sector SCM metrics by category

Cost Management	Customer Service	Quality	Productivity	Asset Management
Total cost	Fill rate	Damage frequency	Units shipped per employee	Inventory turns
Cost per unit	Stockouts	Order entry accuracy	Units per labor dollar	Inventory levels, number of days of supply
Cost as a percentage of sales	Shipping errors	Picking/shipping accuracy	Orders per sales representative	Obsolete inventory
Inbound freight	On-time delivery	Document/invoicing accuracy	Comparison to historical standard	Return on net assets
Outbound freight	Back orders	Information availability	Goal programs	Return on investment
Administrative	Cycle time	Information accuracy	Productivity index	Inventory classification (ABC)
Warehouse order processing	Delivery consistency	Number of credit claims	Equipment downtime	Economic value-added (EVA)
Direct labor	Response time to inquiries	Number of customer returns	Order entry productivity	
Comparison of actual versus budget	Response accuracy		Warehouse labor productivity	
Cost trend analysis	Complete orders		Transportation labor productivity	
Direct product profitability	Customer complaints			
Customer segment profitability	Sales force complaints			
Inventory carrying	Overall reliability			
Cost of returned goods	Overall satisfaction			
Cost of damage				
Cost of service failures				
Cost of back order				

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Transportation's Role in Economic Development and Job Creation

- How can transportation help/hinder private sector value creation and public sector economic development?
 - Condition of infrastructure
 - Integration across modes
 - Removal of congestion/delays
 - Increased reliability
 - Prioritize infrastructure investments that enhance cross-border and intermodal activity
 - Motivating freight to be unloaded/loaded in the state through value-added activities
- What other ideas do you have for transportation to stimulate economic development and create jobs?