

**ACSCC
Freight Policy Subcommittee
Supply Chain Measures**

Progress Report

September 11, 2013

DRAFT: SEPTEMBER 11, 2013

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Freight Policy Subcommittee Assignment

- **What metrics and priorities need to be included in the MAP-21 freight conditions and performance report and national strategy to enhance trade flows?**
 - » **What would be the elements of a national strategy with the greatest impact on supply chain performance?**
 - » **What performance measures have the greatest value in assessing supply chain performance?**
 - **Most useful measures?**
 - **Data available to support the measures?**
 - **Cost to provide them?**
 - **Substitutes available?**

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Supply Chain Performance Measures Approach

- 1. Define a common supply chain architecture**
 - » Key links and nodes (“lanes” and “transfer points”)
- 2. Identify the supply chain links and nodes whose performance should be measured and tracked**
 - » Key “pain points”
- 3. Recommend performance measures and metrics**
- 4. Suggest data sources for metrics**

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Scope

- **Address performance of supply chains**
 - » ...not performance of modes, networks, environmental impacts, etc., as such
- **Address performance of public and quasi-public links and nodes**
 - » ...include ports, highways, rail lines, airports, etc., but not manufacturing, warehousing, distribution nodes...
- **Use measures that are common across supply chains and “drill down”**
- **Focus on high-level performance of representative supply chains to inform national policy**
 - » ...key industries, national coverage, major trade lanes, but do not duplicate firm-, carrier- and agency-level analysis

1. Common Supply Chain Architecture

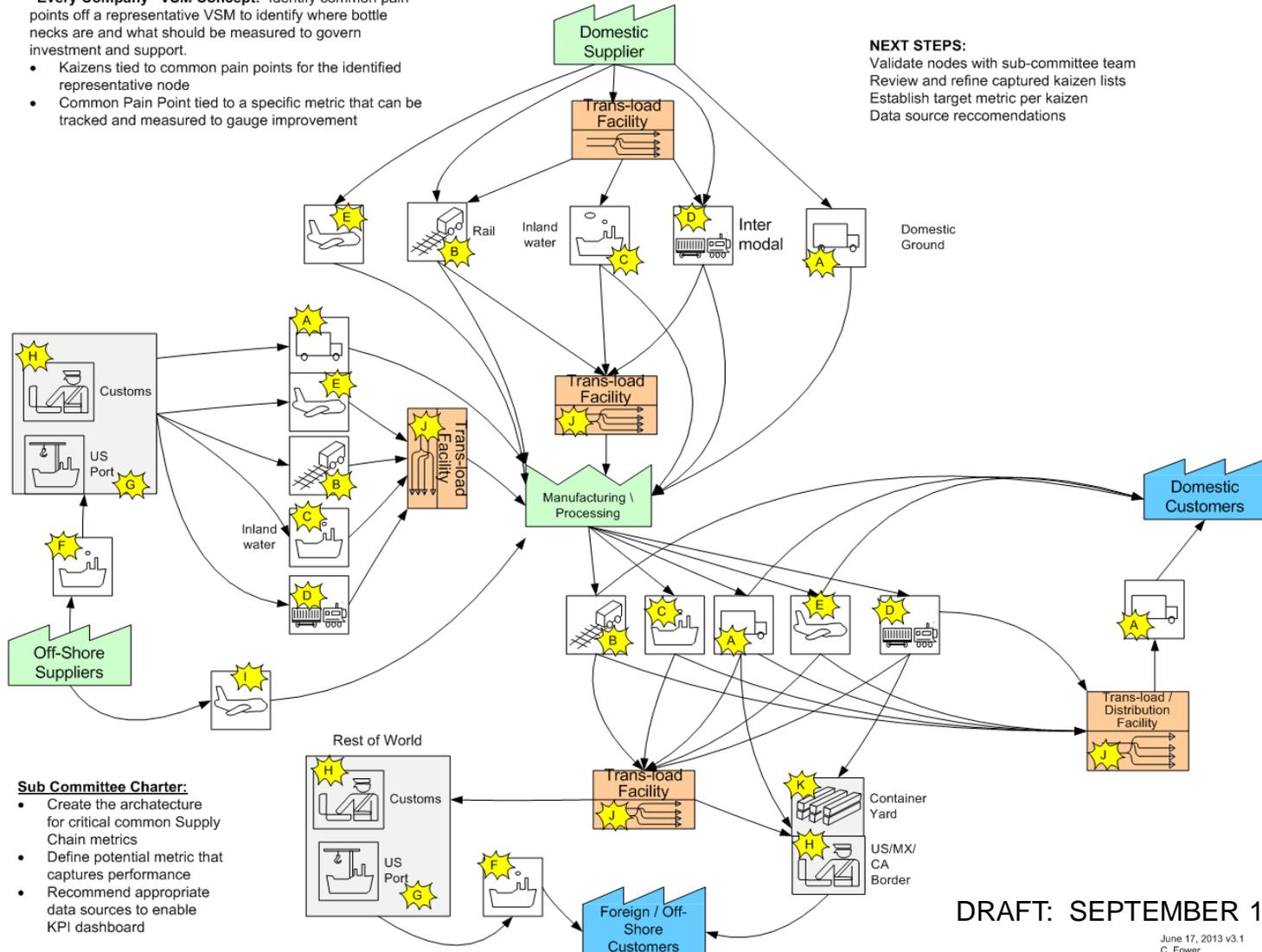
Key Links and Nodes

"Every Company" VSM Concept: Identify common pain points off a representative VSM to identify where bottle necks are and what should be measured to govern investment and support.

- Kaizens tied to common pain points for the identified representative node
- Common Pain Point tied to a specific metric that can be tracked and measured to gauge improvement

NEXT STEPS:

- Validate nodes with sub-committee team
- Review and refine captured kaizen lists
- Establish target metric per kaizen
- Data source recommendations



Sub Committee Charter:

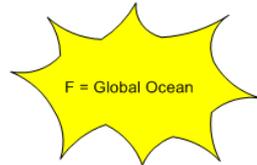
- Create the architecture for critical common Supply Chain metrics
- Define potential metric that captures performance
- Recommend appropriate data sources to enable KPI dashboard

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2. Supply Chain Links and Nodes to be Measured (“Pain Points”)



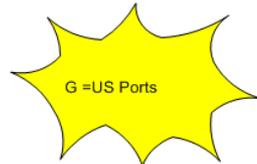
- Driver shortages
- HOS restrictions limiting productivity
- Fuel volatility
- Disparate State TL weight restrictions limit asset utilization
- Significant urban congestion
Chicago, NY, LA, Atlanta
- Lack of a single communication portal on traffic and road conditions



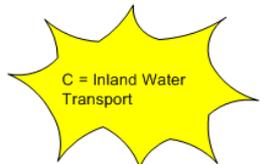
- Limited ice rated vessels for cold weather ports
- Volatile bunker fuel costs
- Limited pre-clearance processes delay unload and transfer times
- Worker shortage



- Speed & in-transit delays
- Limited effective short haul lines
- Insufficient rail sidings
- Too few transload hubs
- Limited infrastructure in key hubs
South East, Dakotas
- Limited visibility for in-transit products



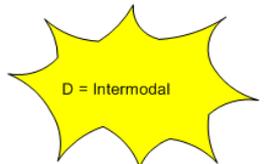
- Limited infrastructure at some ports restrict vessel & cargo types
- Labor disputes impede flow and cause unscheduled delays
- Difficulty managing seasonal spikes
- Significant congestion at major ports with little or no visibility to bottlenecks
- Systems and infrastructure limitations impede efficiency, resulting in unloading delays
- Facility and infrastructure improvements needed to capitalize on Panama Canal expansion to pull freight out of Central American ports
- Lack of common performance metrics to forecast choke points for effective redirection of cargo



- Failing Lock systems
- Dredging needs for key freight conduits
- Limited intermodal transfer infrastructure
- Limited asset availability
- Limited interconnectivity to major ground transportation hubs



- Lack of systems integration cause clearance delays and status updates
- Lack of expedient issue escalation and resolution process
- Limited physical infrastructure to accommodate volumes
Detroit, Port Huron, MI, El Paso, TX, Buffalo
- Current infrastructure has difficulty processing oversized cargo
- Short and unpredictable hours of operations
- Lack of carrier interchange agreements cause significant delays in trailer exchanges into and out of Mexico and Canada
- No preferred shipper status to expedite the flow of high volume O/D pairs
- Lack of inter-agency integration increases processing times for:
Duty drawbacks, FTZ approvals, shipment in bond



- Weight restrictions limit asset utilization
- Rail speed
- Lack of robust transloading infrastructure make modal selecting a non option for many shippers
- Limited capacity of drivers and equipment



- Limited transload and logistics parks / infrastructure reduces mode selection and increases costs
- Weak workforce training contributing to worker skill set gaps
- Limited FTZ and Bonded Facility zones
- No streamlined FTZ and Bond processes



- Kaizen A
- Kaizen B



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3. Performance Measures and Metrics

Measure	Metric	Example
Transit time	Travel time in days	3.2 days
Transit time reliability	Travel time reliability	+/- 0.5 days
Safety	OSHA DART rate	4.1
Cost	Dollars	\$2,250
Risk*	Incidents of loss and damage	0.5%

* See other areas of risk on page 16.

Note: environmental and regulatory factors can influence all of the above

Example: Big Box Retail Supply Chain

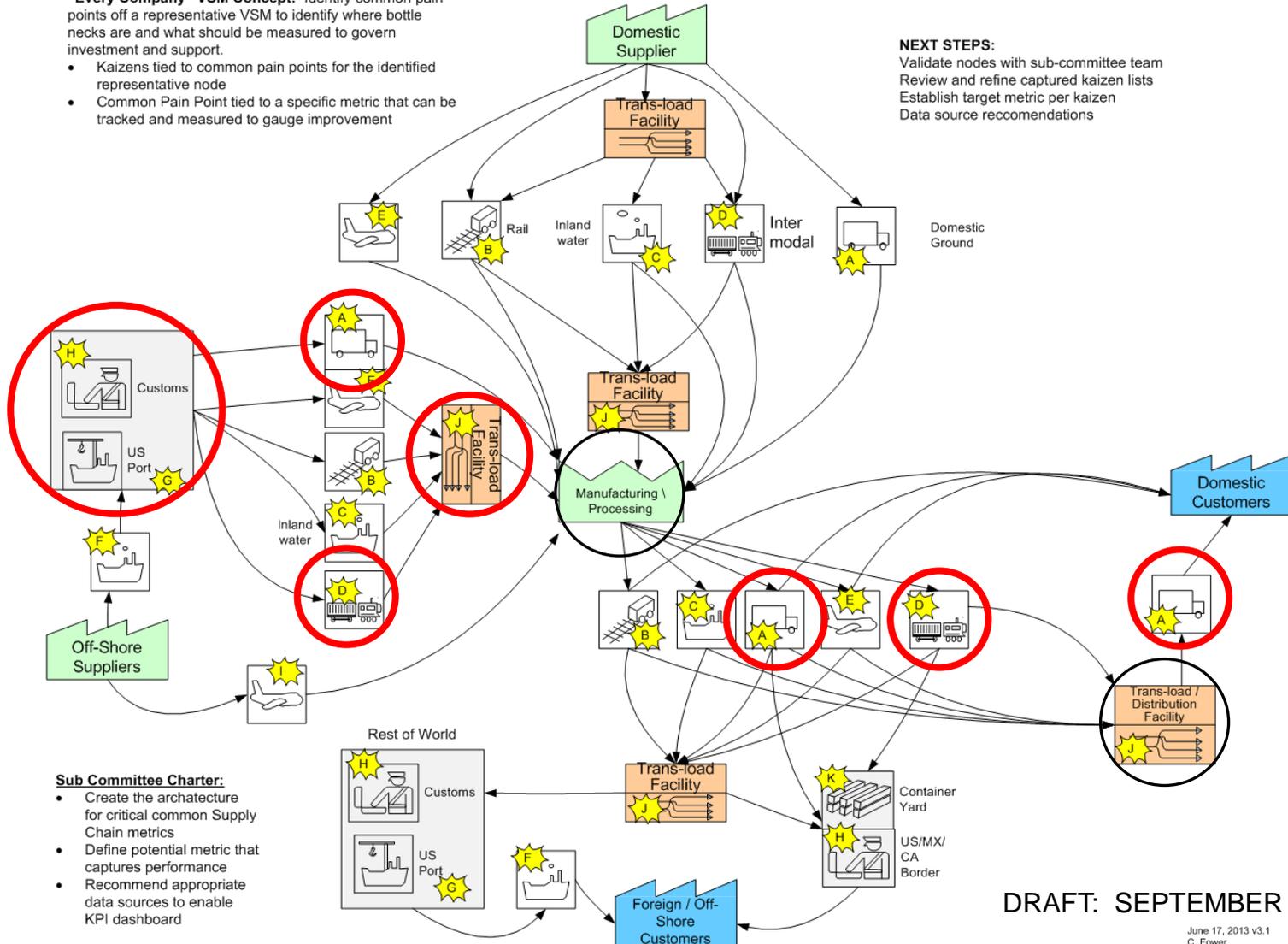
Key Links and Nodes

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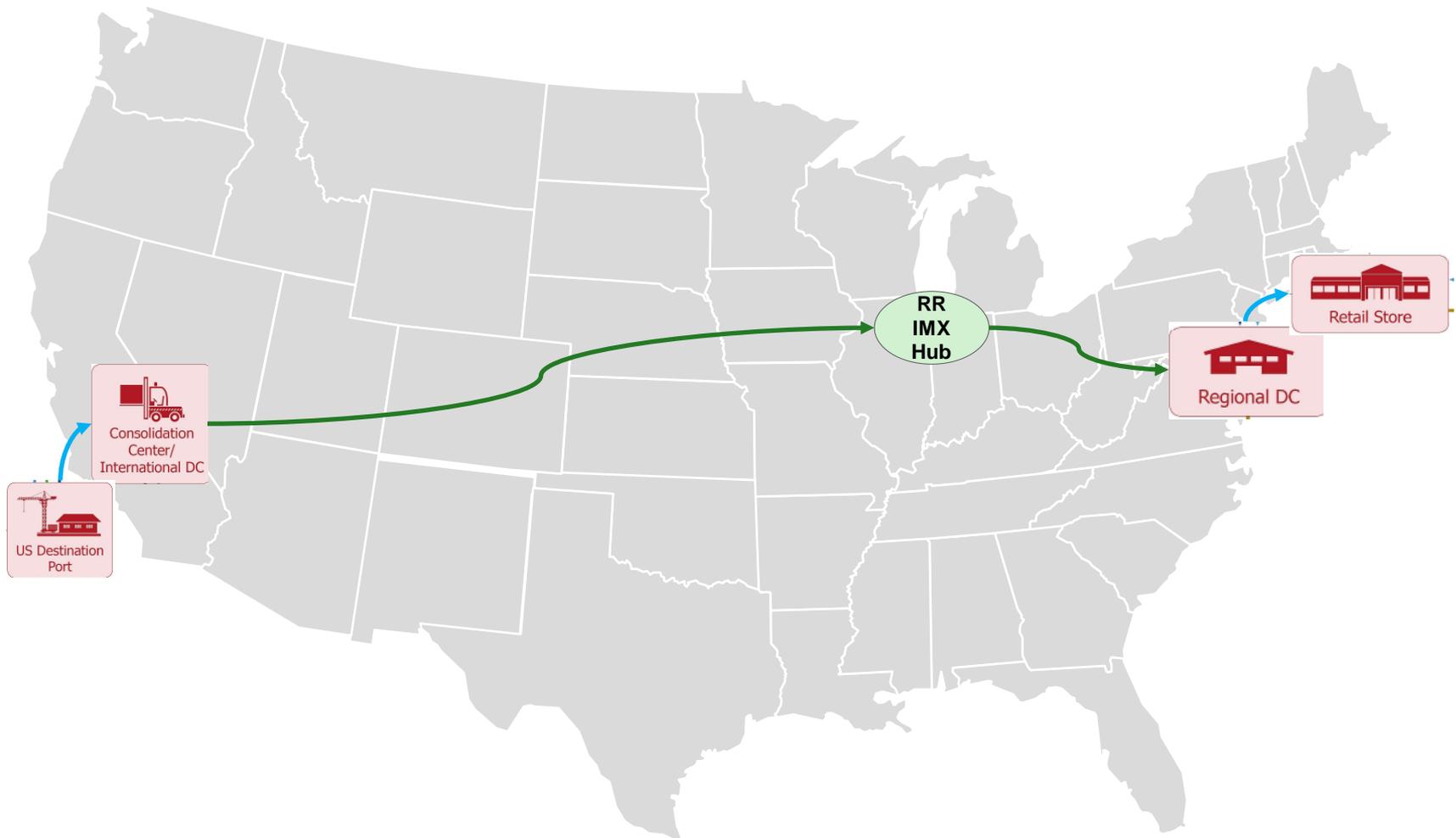
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June 17, 2013 v3.1
C. Fowler

Big Box Retail Supply Chain *(highly simplified example)*

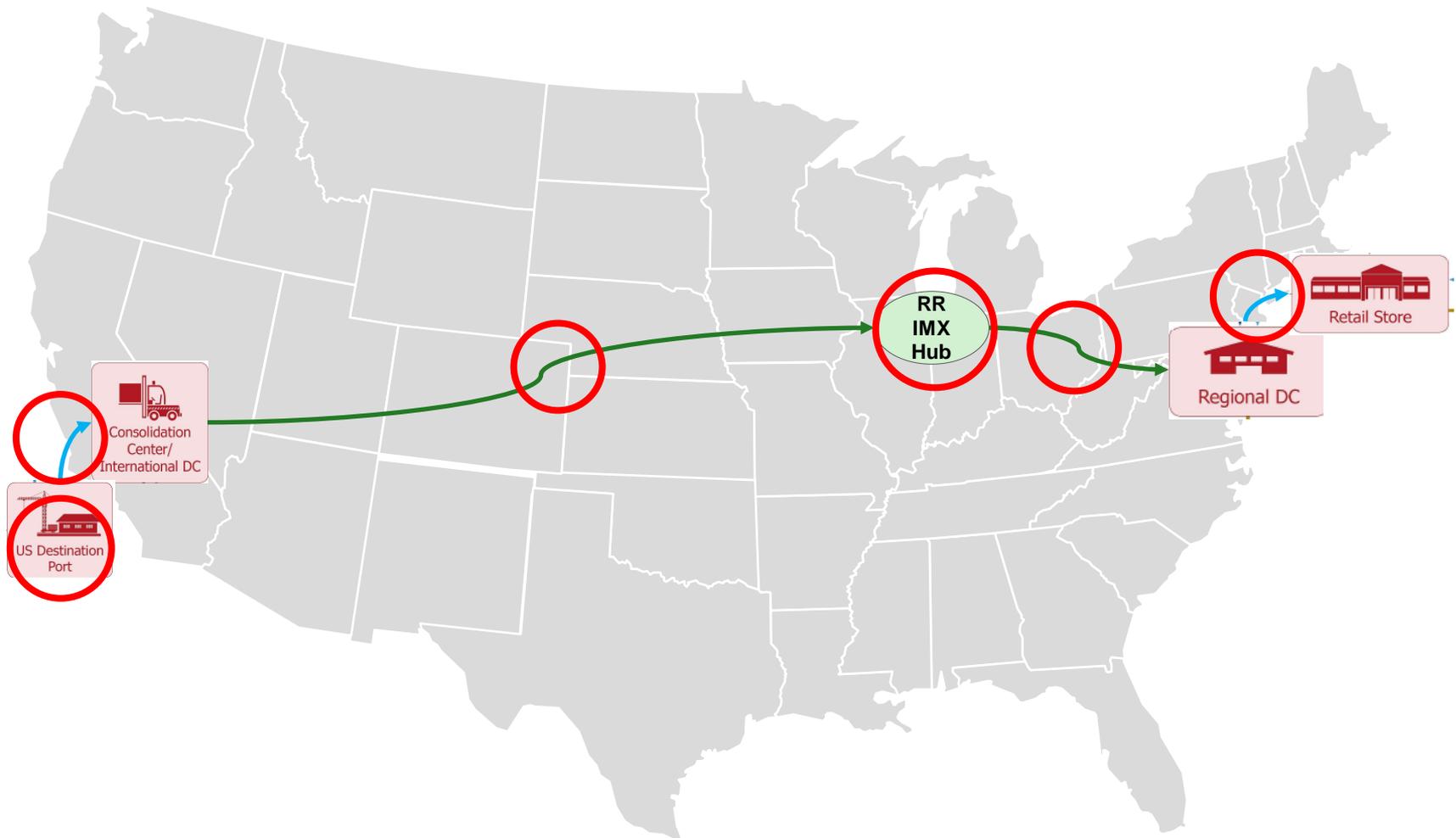
West Coast Imports to East Coast Markets



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Big Box Retail Supply Chain *(highly simplified example)*

Links and Nodes to be Measured



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Big Box Retail Supply Chain *(highly simplified example)*

Transit Time/Dwell Time Measures (hypothetical data)

Supply Chain Links and Nodes	Transit Time/ Dwell Time (Days)
West Coast Port	4.2
Dray Move	0.5
Transload or Consolidation Center**	n/a
Dray Move	0.5
...	

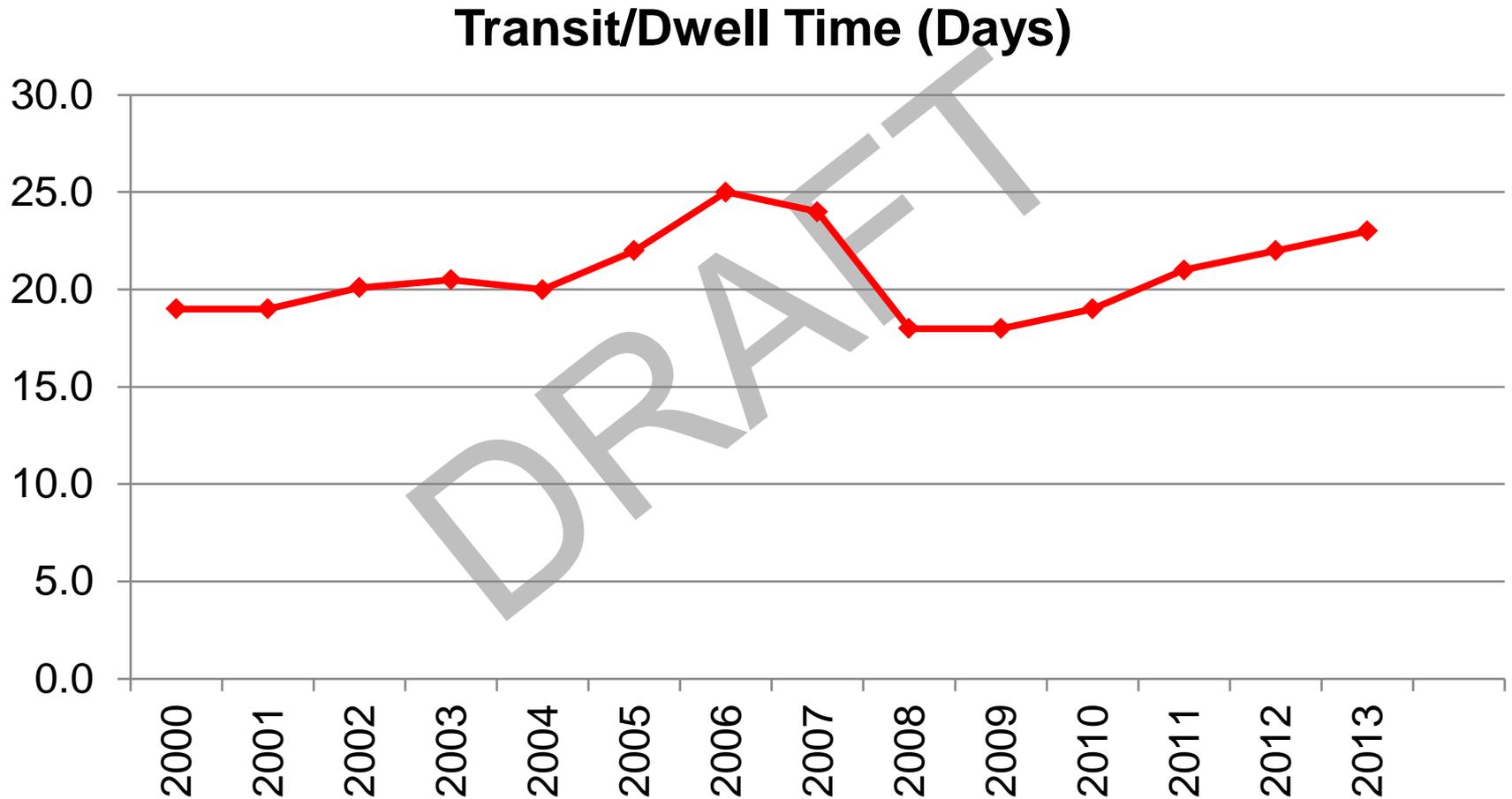
Big Box Retail Supply Chain *(highly simplified example)*

Supply Chain Performance *(hypothetical data)*

Supply Chain Links and Nodes	Transit Time/ Dwell Time (Days)	Reliability	Safety (OSHA DART Score)	Transport Cost
West Coast Port	4.2	50%	4.4	\$000
Dray Move	0.5	10%	5.7	\$000
Transload or Consolidation Center**	n/a	n/a	n/a	n/a
Dray Move	0.5	10%	5.7	\$000
West Coast Rail Intermodal Terminal	0.5	10%	2.7	\$000
Rail Move	3	15%	3.0	\$000
Midwest Rail Intermodal Interchange	0.5	20%	2.9	\$000
Rail Move	2	15%	3.0	\$000
East Coast Rail Intermodal Terminal	0.5	10%	2.5	\$000
Dray Move	0.5	20%	5.7	\$000
East Coast Regional Distribution Center**	n/a	n/a	n/a	n/a
Truck P&D Move	0.5	20%	6.4	\$000
Retail Store	n/a	n/a	n/a	n/a
Totals	Sum	Weighted Value	Weighted Value	Sum

Big Box Retail Supply Chain Performance

Trend 2000-2013 *(hypothetical data)*



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Representative Supply Chains

- **Retail – Import and distribution of consumer goods chains**
 - » From POLALB to Chicago and NYC...
- **Food – Processed food production and distribution chains**
 - » Within Mid-Atlantic states...
- **Autos – Interplant parts movement and finished auto distribution chains**
 - » Within Southeast states...
 - » Between the Southeast and Midwest...
- **Agriculture – Grain production and export chains**
 - » Between Mississippi Valley states and Gulf ports...
- **Energy – Oil extraction, transport and refining chains**
 - » Between Dakotas and Philadelphia refineries

Partial listing
See full table

4. Data Sources and Availability

Mode	Link or Node	Performance Measure	Metric	Example	Data Sources	Data Availability
TRUCK						
Truck Line-Haul Move						
		Transit time	Travel time in days	3.2	FHWA/ATRI, HERE, INRIX	Public
		Transit time reliability	Travel time variability	+/- 0.5	<i>Calculated</i>	Public
		Safety	DART rate	4.1	OSHA DART, FARS	Public
		Cost	Dollars	\$2,250	Industry	Commercial
Truck Pick-up and Delivery Move						
		Transit time	Travel time in days	0.1	TTI data (INRIX-based)	Public
		Transit time reliability	Travel time variability	+/- 0.2	<i>Calculated</i>	Public
		Safety	DART rate	4.9	OSHA DART	Public
		Cost	Dollars	\$250	Industry	Commercial
Truck Terminal						
		Dwell time	Dwell time in days	0.15	Industry	Commercial
		Dwell time variability	Dwell time variability	+/- 0.2	<i>Calculated</i>	Commercial
		Safety	DART rate	5.7	OSHA DART	Public
		Cost	Dollars	\$50	Industry	Commercial
US Border Road Crossing/Customs Clearance						
		Dwell time	Dwell time in days	0.25	DHS, FHWA	Public
		Dwell time variability	Dwell time variability	+/- 0.25	<i>Calculated</i>	Public
		Safety	DART rate	3	OSHA DART	Public
		Cost	Dollars	\$200	Industry	Commercial or Public

Supply Chain “Risk”

- **Supply chain risk is an important aspect of supply chain performance and competitiveness, but metrics are not always real time or shipment specific like the other criteria**
- **Three general areas of supply chain risk:**
 - » **Risk of cargo loss and damage from accidents, poor handling or theft**
 - » **Risk of disruption (e.g., from nature, labor, political forces), which causes supply chain manager to have alternative routes/contingencies for short term response**
 - Example: Fluctuating water levels in inland waterway system
 - » **Risk of capacity expansion delays (e.g., from physical, regulatory limitations and delays) which causes the supply chain manager to develop alternative routes and sources for long term**
 - Example: Environmental and NIMBY delays to permitting of export facilities
- **Metrics or a method to identify pain points of supply chain risk are to be developed**

Next Steps

- **Recommend representative supply chains and locations for pilots**
- **Investigate strategies for measuring supply chain “risk”**
- **Define measurement time period (e.g., annual)**
- **Identify best-value data sources (e.g., public and/or commercial suppliers)**

Move from measures to solutions