How To Support Your Supply Chain Operations with Lean Inbound Logistics

with

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Vice President, LeanCor Supply Chain Group
Instructor, GT Supply Chain & Logistics Institute

Supply Chain Management Series

Lean Inbound Logistics

September 29-30, 2014 | Hyatt Regency (Savannah, GA)

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Georgia Tech Supply Chain & Logistics Institute
Stewart School of Industrial & Systems Engineering

LeanCor SUPPLY CHAIN GROUP

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Career Focus Areas:

Entire career committed to third party logistics. Over 17 years of third party logistics experience with a specific focus in Japanese production system environments such as Toyota USA, Toyota Canada, Toyota Europe, Kubota, Yamaha, Suzuki, and Subaru.

Vice President, LeanCor Supply Chain Group:

LeanCor is a trusted supply chain partner that delivers operational improvement and measureable financial results. Unlike other 3PL providers, LeanCor offers a unique combination of training, consulting, and outsourced logistics services. "We *Teach*. We *Consult*. We *Do*."

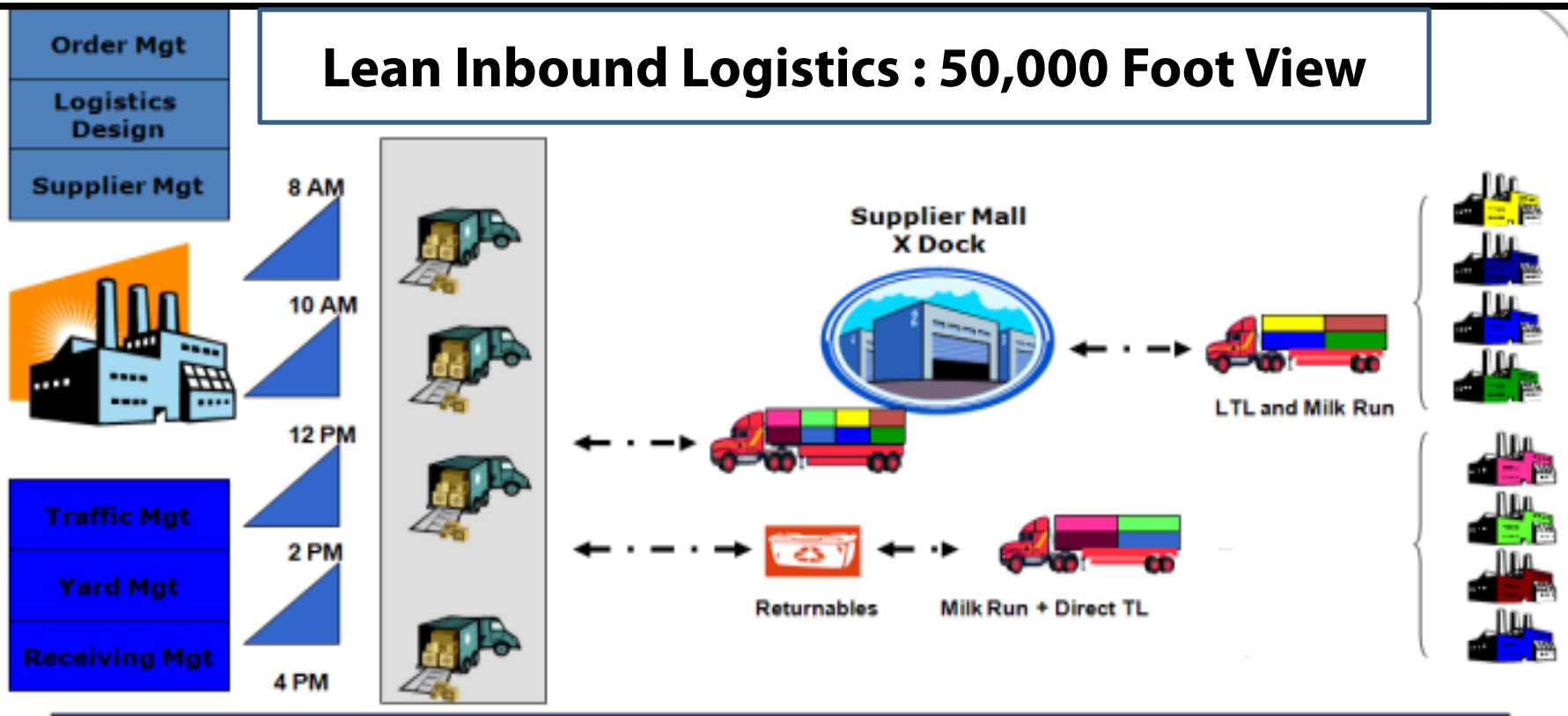
Lean Supply Chain Instructor:

Georgia Tech Supply Chain and Logistics Institute

Cross-Industry Experience:

Automotive, Consumer Goods, Industrial Manufacturing, Retail, Food and Beverage

Lean Inbound Logistics : 50,000 Foot View



Plan
- ✓ Order Visibility
- ✓ Pilot Selection
- ✓ Milk Run Design
- ✓ Packaging
- ✓ Carrier Selection
- ✓ Communication Plan

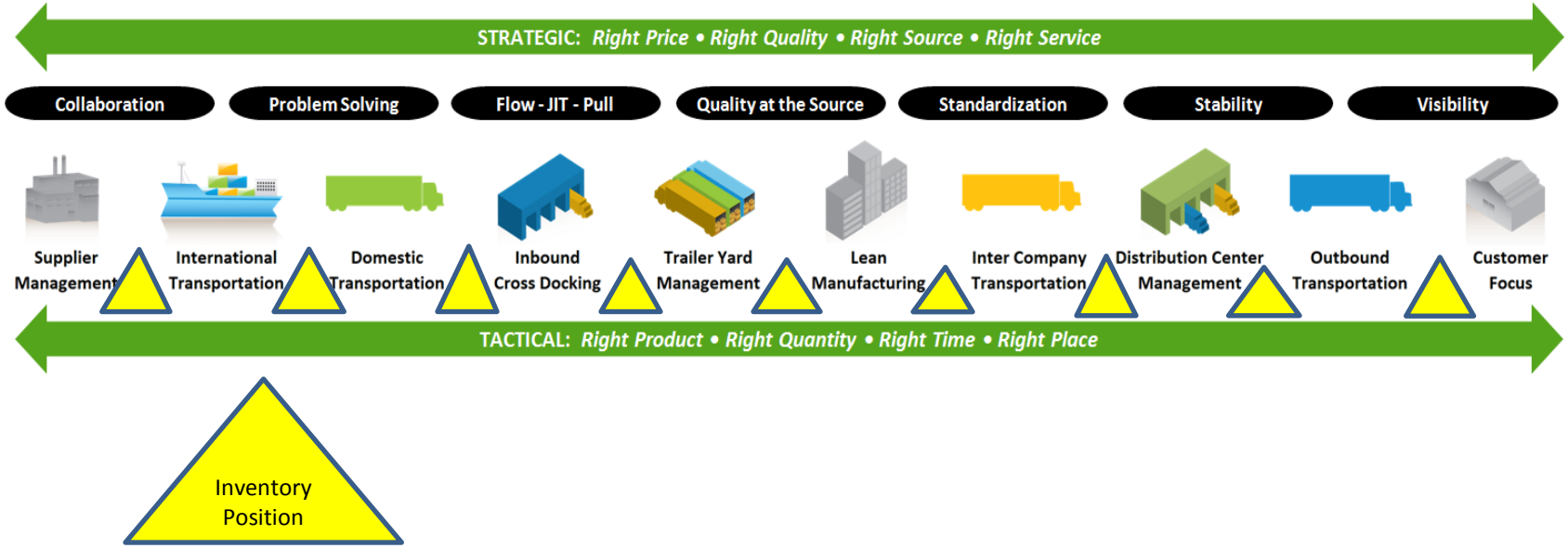
Do
- ✓ Route Management
- ✓ Pick-Up Notification
- ✓ Contingency Mgmt
- ✓ Yard Control
- ✓ Receiving Schedule

Check
- ✓ Window Compliance
- ✓ Supplier Fill Rate
- ✓ Carrier Performance
- ✓ Cube Utilization
- ✓ Time, Quality, Cost

Act
- ✓ Regular Ops PDCA
- ✓ Failure Mode Analysis
- ✓ Root Cause Analysis
- ✓ Project Management
- ✓ Pilot Expansion
- ✓ Train, Train, Train!

Inbound Logistics as Part of the Overall Supply Chain Strategy

- Total Cost of Fulfillment: Build models and lead and make decisions based on Total Cost of Fulfillment.
- Recognize that all decisions have unintended consequences and as leaders we must become *systems thinkers.*



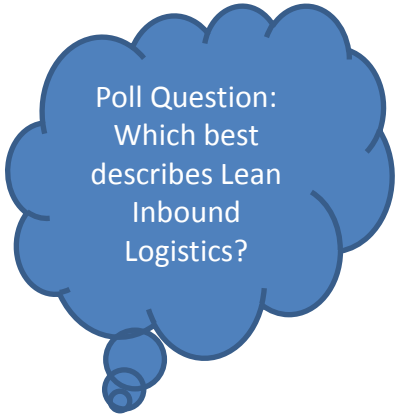
Inbound Logistics & The Fulfillment Stream: Understanding the Challenges

- 80% of supply chain activities are invisible to those accountable
- Multiple suppliers, multiple customers, multiple third parties
- High variability in material behavior, transportation modes
- High variability in lead time, supply and demand
- High variability in supplier performance and capability
- The extended network is not always visible
- Data are not always abundant

Lean vs Traditional Inbound Logistics

Definition A:

- Suppliers provide visibility to shipments
- Routes are designed and tendered daily
- Rate per mile is rigorously managed
- Cost per supplier is rigorously managed
- Incorrect shipment quantities are managed at delivery



Definition B:

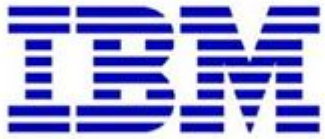
- Shipping days are communicated to each supplier
- Network is designed by engineers and is adjusted based on plan vs. actual
- Total landed cost is rigorously managed
- Incorrect shipment quantities are managed at pick-up

Step 1: Make Demand Visible, Select Your Pilot

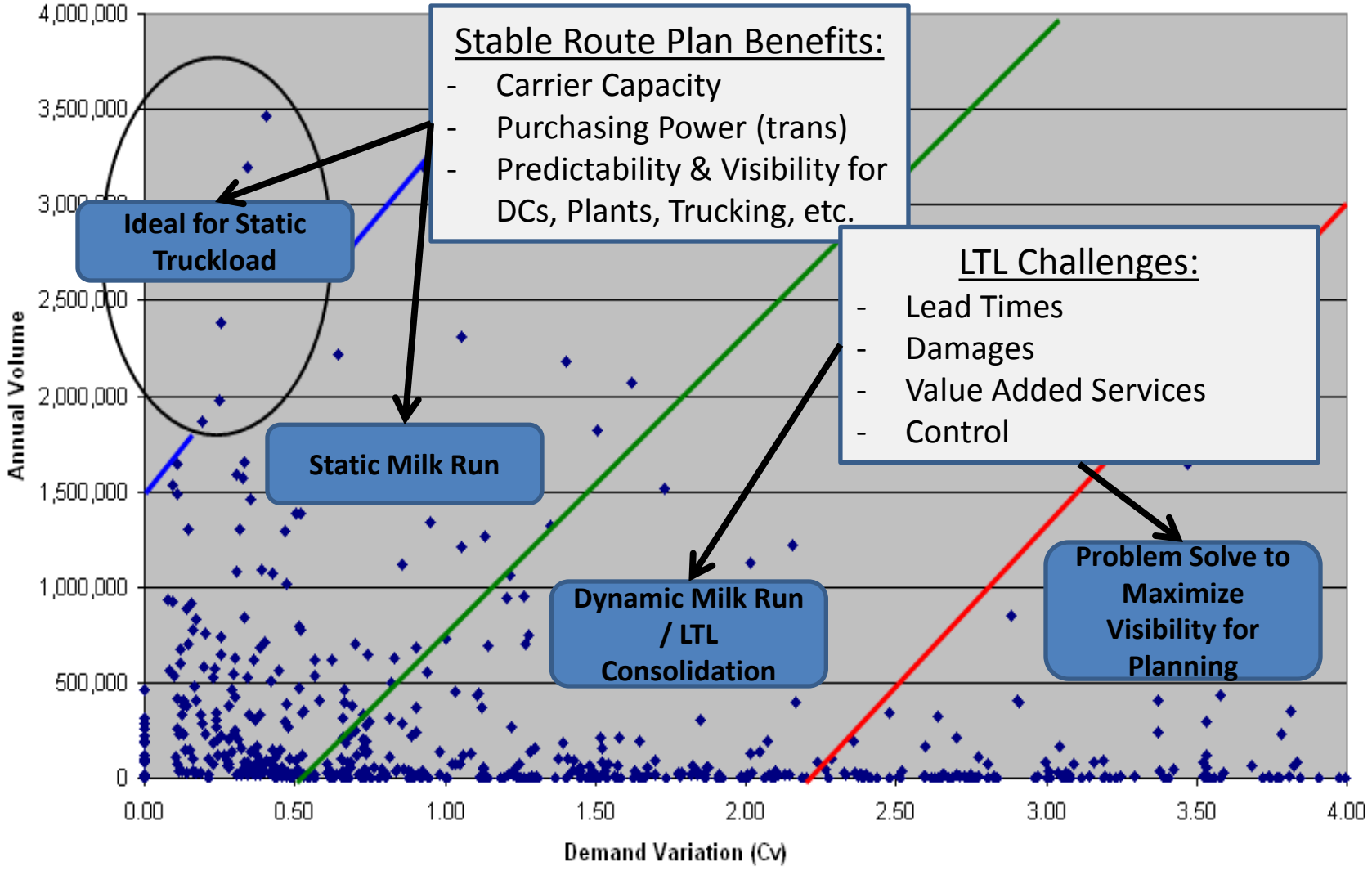
A TMS must easily integrate with our other systems

- Provide visibility to data in real-time for proactive problem solving
- Find value in your transportation
  - Opportunity to ensure **optimal routing** in terms of customer business rules and service (i.e. transportation cost)
  - Connect transportation to **manufacturing and inventory strateg**

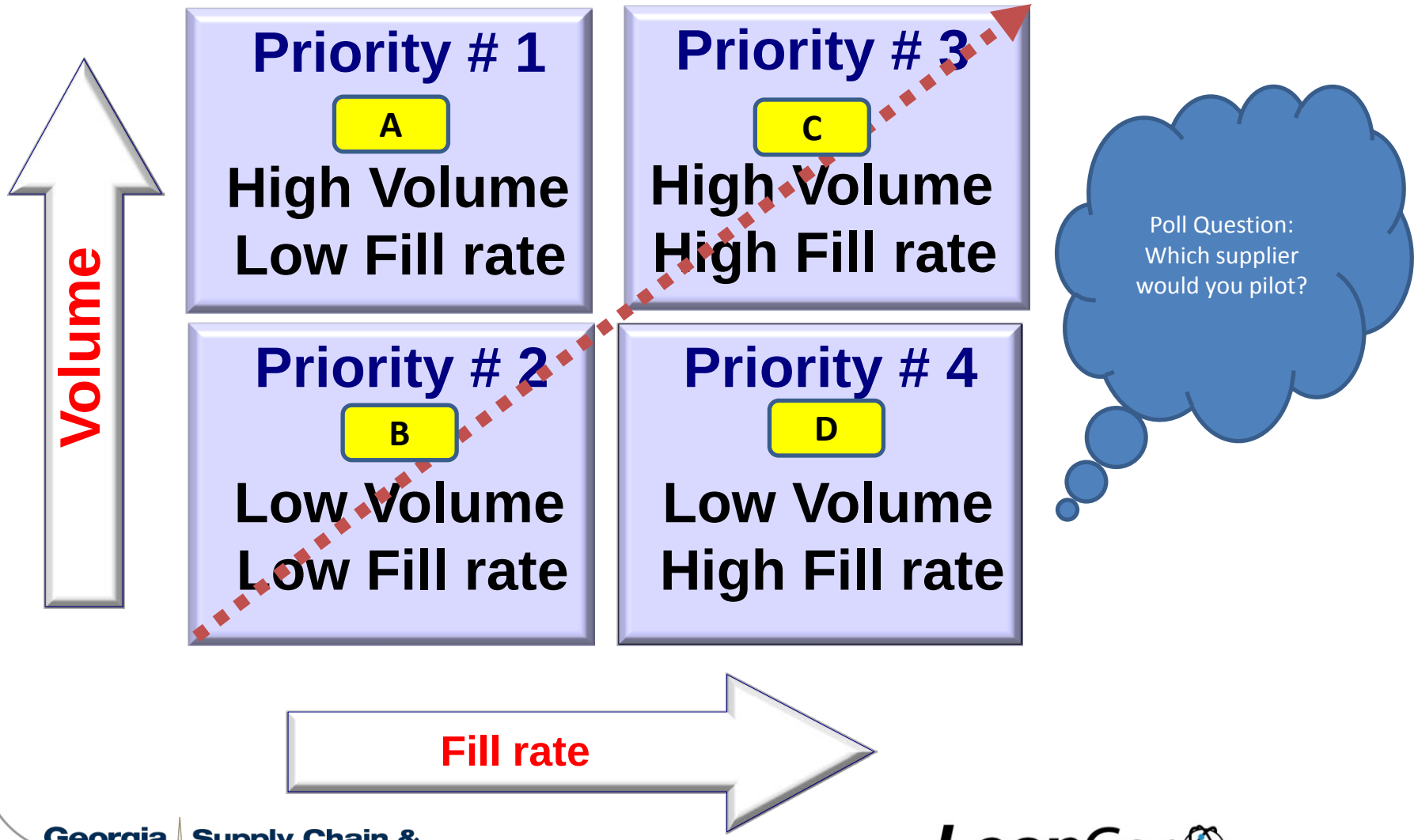
Poll Question:
A: Forecast data drives our inbound material flow
B: Demand data drives our inbound material flow



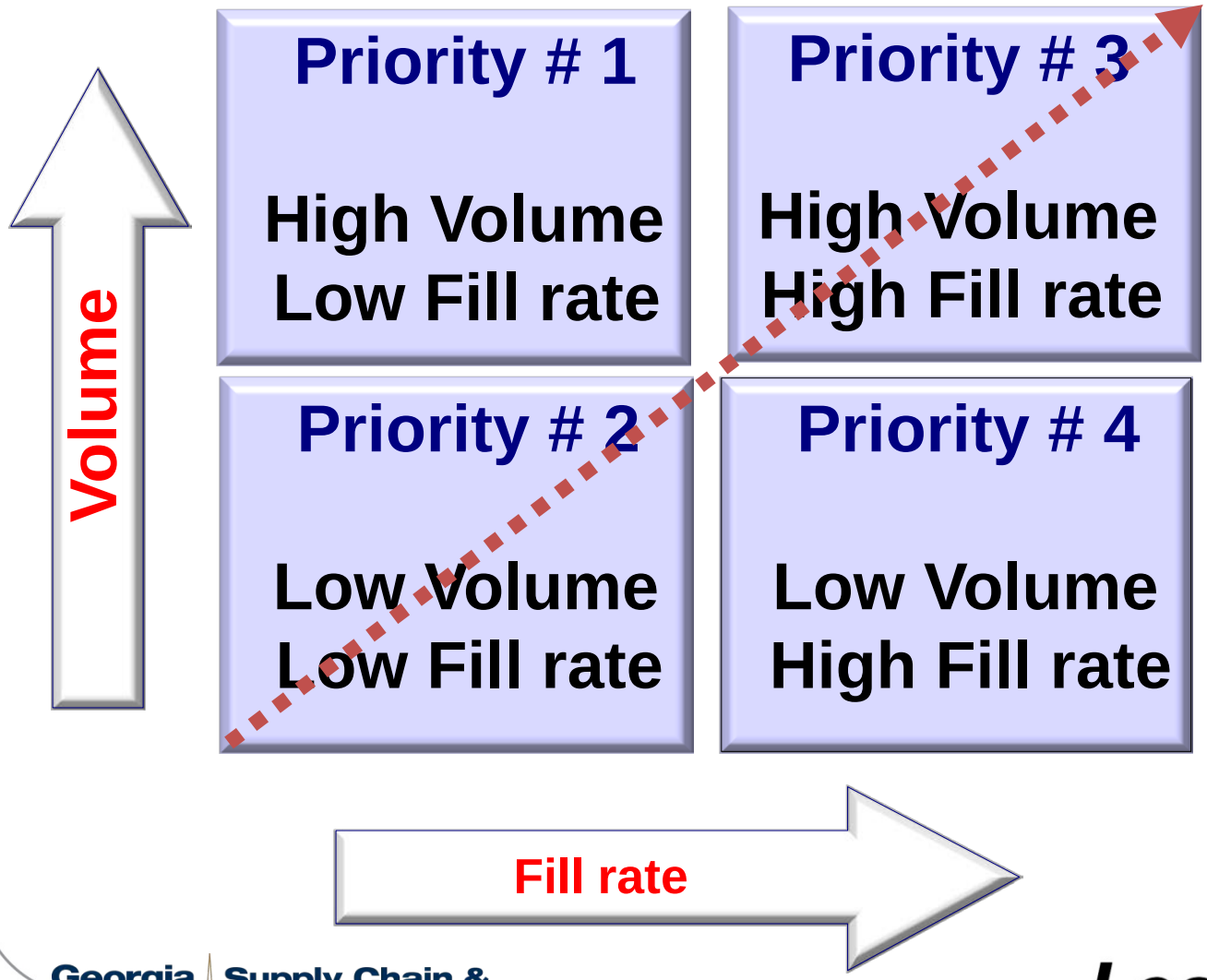
Pilot Selection: Find Stability



Of These 4 Suppliers, Where Would You Start?



Pilot Selection: Solve Material Flow Problems



Step 2: Route Design & Plan For Every Part (PFEP)

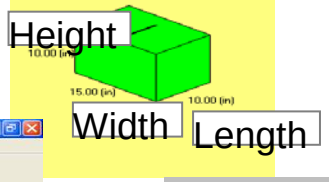
- Central database of all critical information required to make business decisions relative to material flow

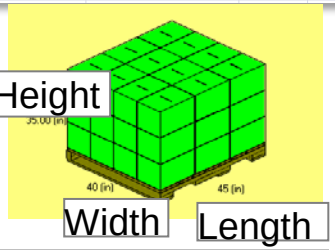
- Planned Pull systems: connects consumption through replenishment

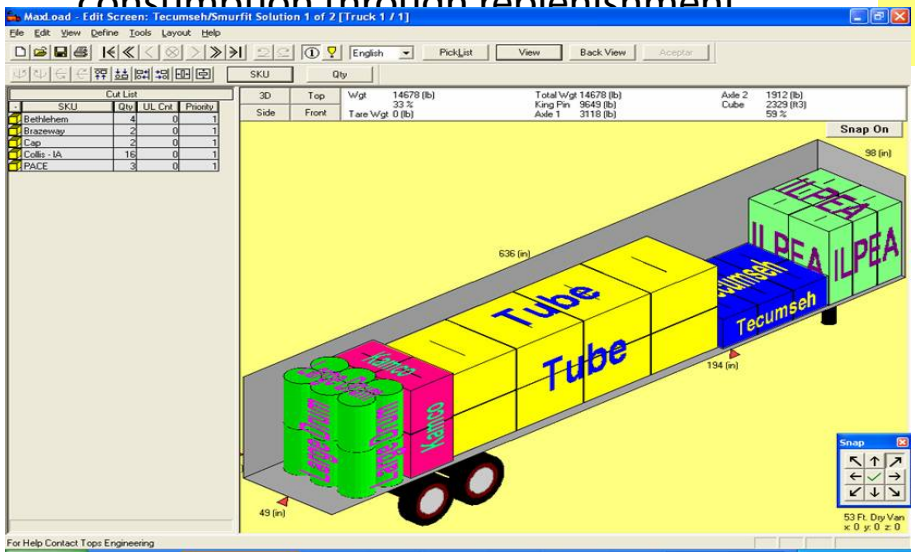
GENERAL DATA								
Destination Plant Part #	Plant Name	(Supplier #)	Supplier Name	Part Description	Average Daily Usage (pcs.)	Container Type (card board box, tote, bulk bin, barrel, skid pack, etc.)	Container Length (IN)	Container Width (IN)
1255896	North	496	LeanCor	Lean Six Sigma Logistics Literature	1296	Box	15	10
1246655	South	496	LeanCor	Lean Brochures	864	Box	15	10
1948				Sigma Logistics DVDs	2592			10

Part Data (Dimensions)

Pallet Data







53' Dry Van Utilization:

Traditional Transportation Design:

- ✓ 26 Floor Spots (standard skids)
- ✓ 44,000 Pounds

Lean Transportation Design:

Liquid Cube = 52.5'x98.5"x110"
= 52.5'x8.17'x8.67'
= 3948 Cubic Feet
= 146.21 Cubic Yards

Design Cube = 52.5'x98"x104"
= 52.5'x8.17'x8.67'
= 3719 Cubic Feet
= 137.73 Cubic Yards

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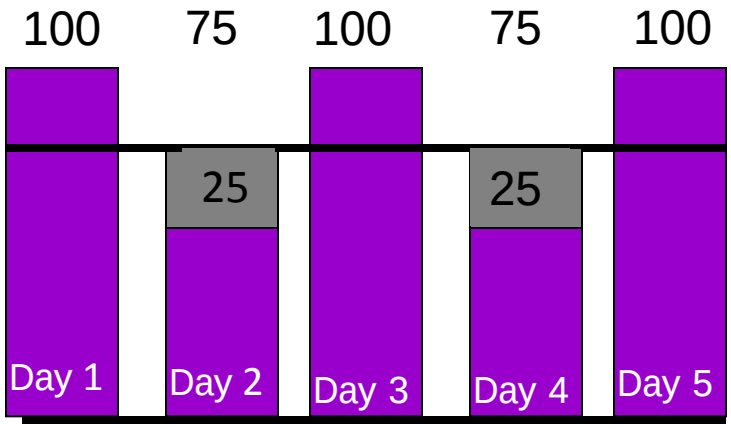
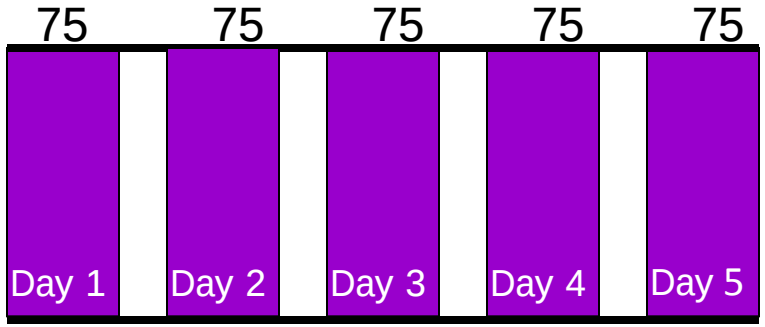
Lean Logistics Concept 1 of 3: Lot Size

Customer Daily Requirements = x75



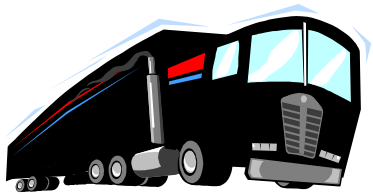
Order Lot Size = 50



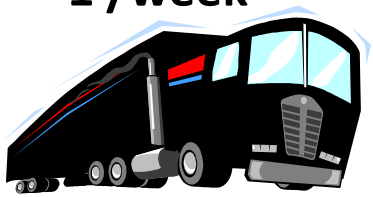
Order Lot Size = 25

What Happens Here? What are the Implementation Challenges?

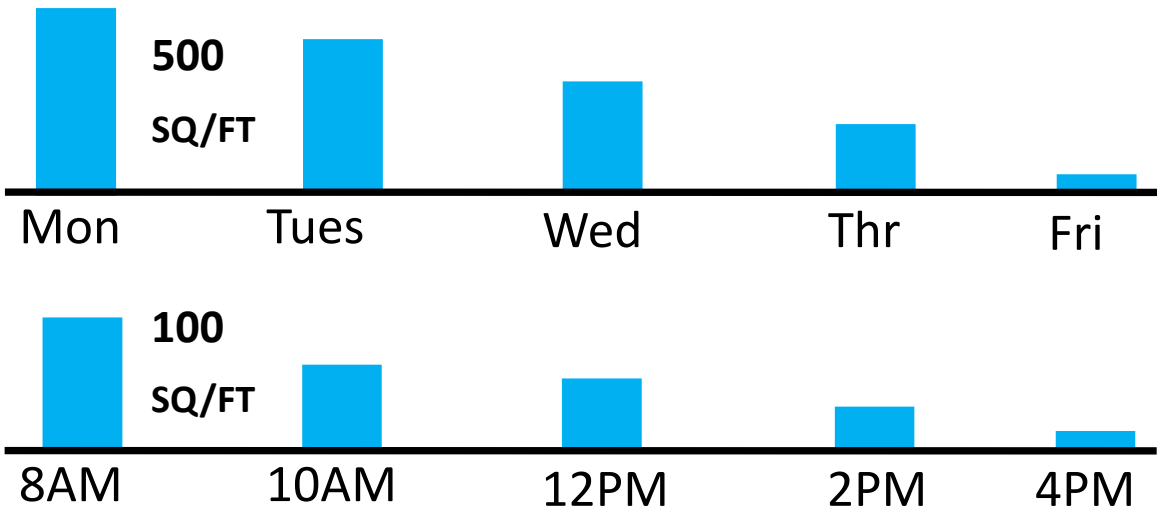
Lean Logistics Concept 2 of 3: Frequency



1 /week

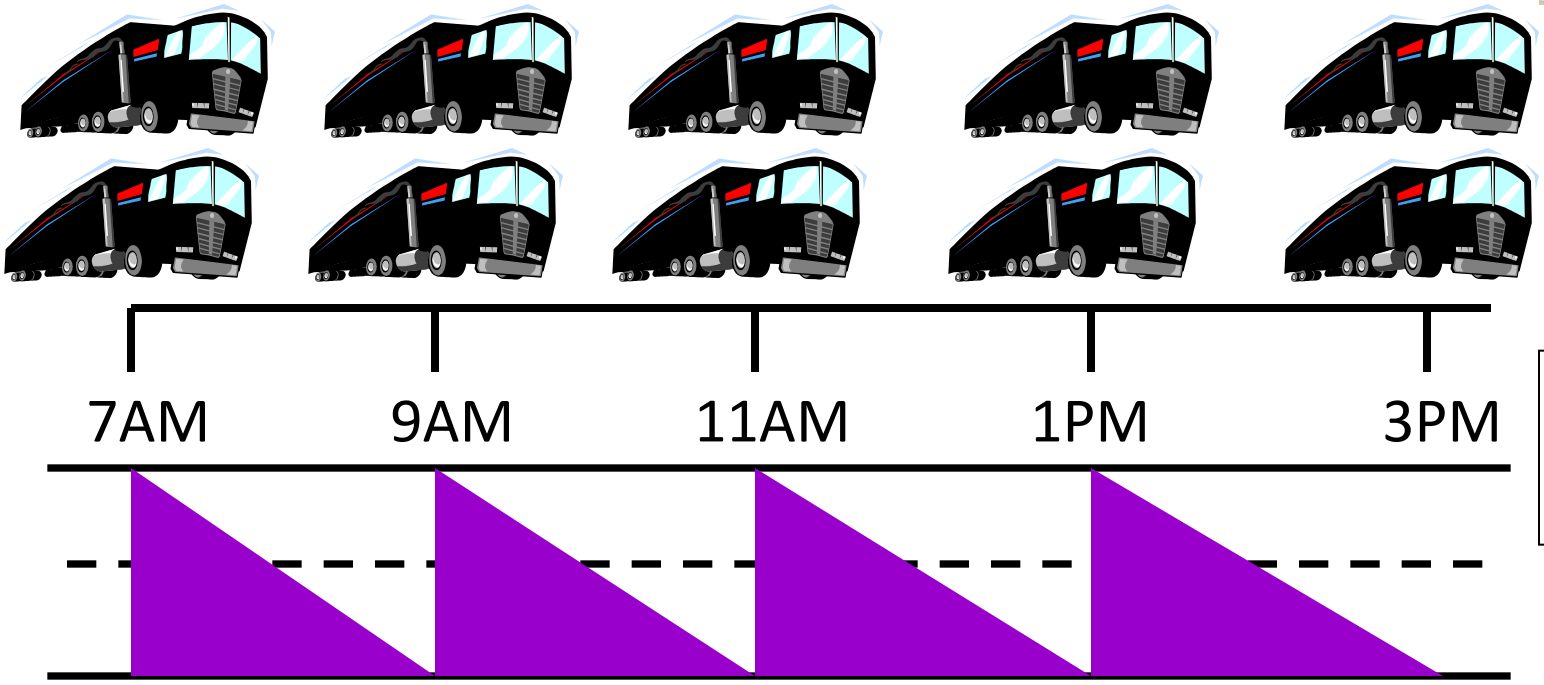


1 /day



Delivery Frequency Analysis					
1 Truck Load = 1 Week Store / Distribution Center Requirements					
	Monthly	**Weekly**	**Daily**	**2X Day**	**4X Day**
Delivery Frequency (One Part or SKU #)					
Space Used for Inventory (SQ Feet)	*2000*	*500*	*100*	*50*	*25*
Average Days on Hand (Days Inventory)	*10*	*2.5*	*0.5*	*0.25*	*0.125*
Minimum Order Lead Time	*1 month*	*1 week*	*1 day*	*12 hours*	*6 hours*
Percent Improvement from Increased Frequency					
Space Used for Inventory (SQ Feet)		*75%*	*80%*	*50%*	*50%*
Average Days on Hand (Days Inventory)		*75%*	*80%*	*50%*	*50%*
Minimum Order Lead Time		*75%*	*80%*	*50%*	*50%*

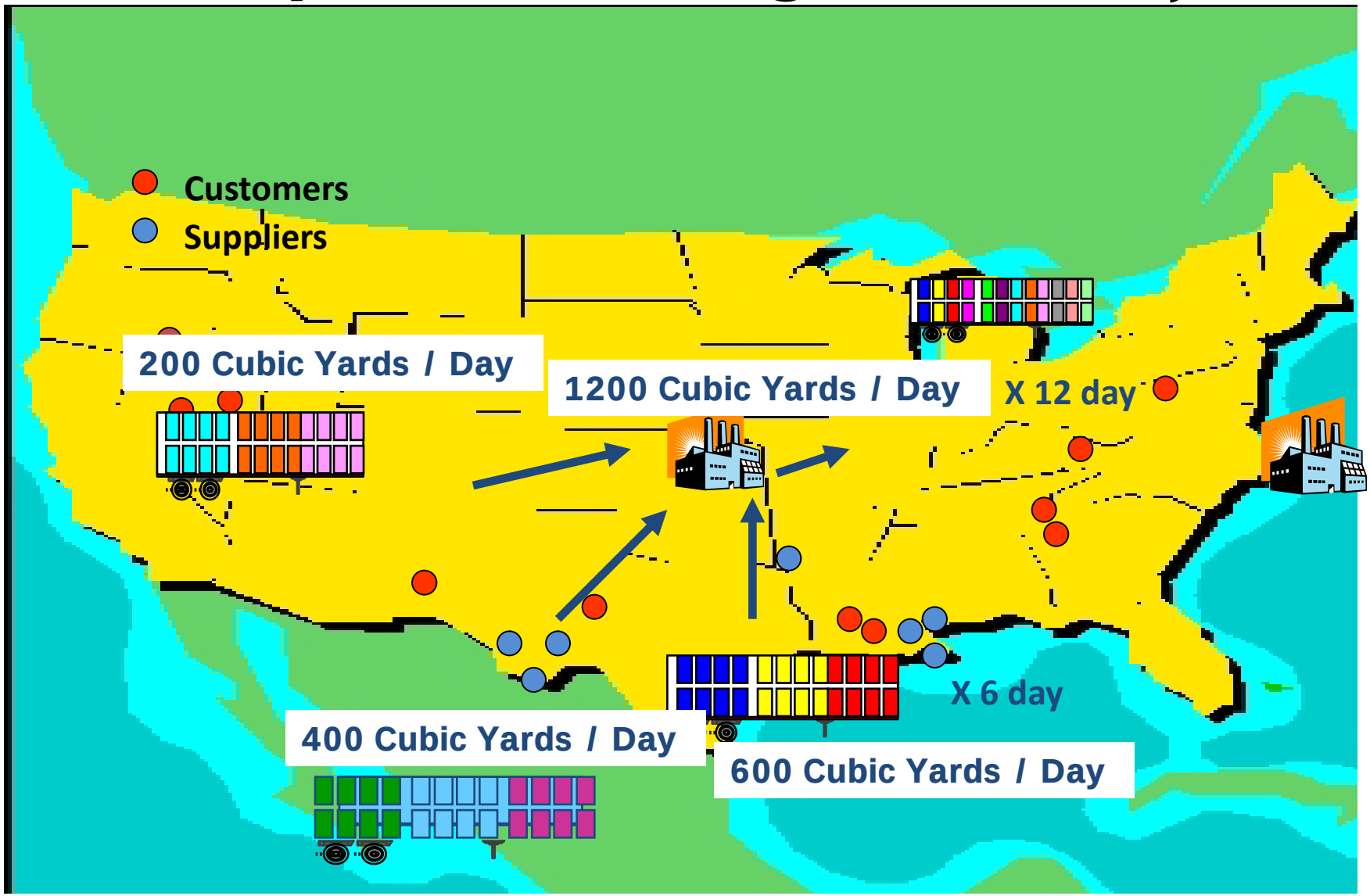
Lean Logistics Concept 3 of 3: Level Flow



One Shift Material Handling

Where can we use this concept tomorrow?

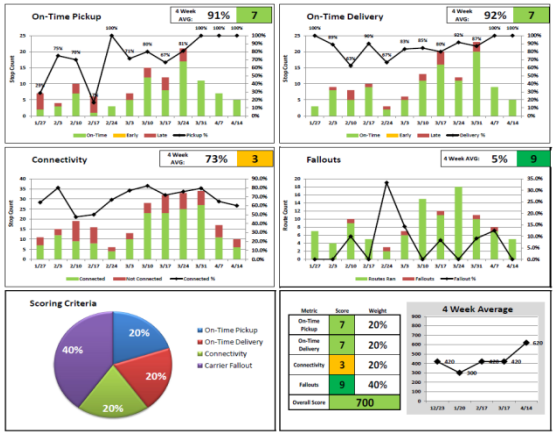
Transportation Design & Velocity



Step 3 and Beyond: PDCA

- Disciplined Route Management
- Disciplined PO / Supplier Management through real-time communication
- Disciplined Carrier Management Program
- Total Cost Management

Do - Check - Adjust



Part #	Supplier Name	Avg. Daily Usage	Parts per Container	Length (IN) / Container	Width (IN) / Container	Depth (IN) / Container	Cubic Inches used per day	Cubic Feet ("1728")	Cubic Yards/Day ("27")
111	Supplier 1	2500	5	24	20	12	2880000	1666.67	61.73
222	Supplier 1	64000	1000	12	10	12	92160	53.33	1.98
333	Supplier 1	64000	1000	12	10	12	92160	53.33	1.98
444	Supplier 1	1500	25	24	20	12	345600	200.00	7.41
								TOTAL	73.09
555	Supplier 2	3200	1	12	10	12	4608000	2666.67	98.77
666	Supplier 2	3500	20	16	20	24	1344000	777.78	28.81
777	Supplier 2	3000	50	24	20	12	345600	200.00	7.41
888	Supplier 2	7500	10	12	10	12	1080000	625.00	23.15
999	Supplier 2	5500	25	16	20	24	1689600	977.78	36.21
								TOTAL	194.34
								Route Total	267.43
								Design Cube	137.73
								Frequency	1.94

Trailer Utilization

Liquid Cube = *52.5 feet long x 98.5 inches wide x 110 inches high*
= *52.5 feet long x 8.2 feet wide x 9.17 feet high* = **3948 Cubic Feet**
= *3948 Cubic Feet / 27* = **146.21 Cubic Yards**

Design Cube = *52.5 feet long x 98 inches wide x 104 inches high*
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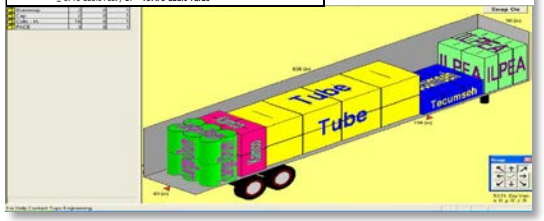

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PDCA: Lean Logistics Measurement Systems

Purpose:

- Create metrics that add value to monitoring and improving processes.

Outcomes:

- Identify key metrics that can be collected to monitor performance and identify gaps.
- Establish key targets for metrics that maintain, promote, or make visible instability or stability.
- Define purpose for each metric, that purpose should drive action.

Examples:

On-Time Pickup and Delivery:

Cost impact: prevents overtime on loading/shipping docks, increases customer satisfaction and prevents line-down scenarios, stability in this metric leads to reduced inventory

Pickup/Delivery Frequency:

Cost impact: can lead to increased logistics cost, must be paired with decreases in inventory

Trailer Utilization:

Cost impact: full trucks lead to fewer trucks, reduces transportation cost

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- **September 29-30** | Georgia Tech Supply Chain and Logistics Institute (Atlanta, GA)
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  - Map a current inbound logistics network
  - Appreciate the distinct nature of the inbound logistics network as a link to suppliers and manufacturing facilities and part of the overall value chain
  - Calculate total logistics costs
  - Design a future state network based on lean principles
  - Learn techniques in transportation management, supplier management, and materials planning to achieve improved material flow balances and reduced overall costs
  - Learn the keys to strategic supplier management
  - Understand how lean guiding principles serve as the strategic pathway to lean inbound logistics
  - Understand Milk-Run development and mode selection
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Q&A

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