

# Success Through A Highly Integrated Supply Chain: Toyota North America

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Mr. Matt Greene

Assistant Manager – Purchasing, TEMA

Mr. Steve Hagan

Assistant Manager – PCL, TEMA

Mr. Kevin Thornberry

Assistant Manager, PCL, TEMA



# Here Are Your Speakers!

Dr. Karl Manrodt

- Current Roles at Georgia Southern University:
  - Associate Professor, Department of Management, Marketing and Logistics
  - Co-Director, Southern Center for Logistics & Intermodal Transportation
- Published:
  - Customer Responsive Management: The Flexible Advantage, 1992
  - Keeping Score: Measuring the Business Value of Logistics in the Supply Chain, 1999
- Degrees Include:
  - B.A. in Philosophy and Psychology, Wartburg College
  - M.S. in Logistics, Wright State University
  - Ph.D., University of Tennessee



# Here Are Your Speakers!

Mr. Matt Greene

- Assistant Manager of PCL, TEMA
  - Responsibilities:
    - Manage procurement of North American Returnable Packaging & Logistics Services
    - Develop & manage strategies for commercial, process & operational kaizen for packaging & logistics
  - Education:
    - Harvard University, BA Mechanical Engineering - 1994



# Here Are Your Speakers!

## Mr. Steve Hagan

- Assistant Manager of PCL, TEMA
  - Responsibilities:
    - Overall mgmt of Midwest Logistics Network Ops
    - Lead process kaizen and problem solving
    - Cost Management
    - Established new Mexico Plant's supply chain (04)
  - Education:
    - The Ohio State University, BSBA - 1999



# Here Are Your Speakers!

## Mr. Kevin Thornberry

- Assistant Manager, TEMA Logistics Planning – Supply Chain Design
  - Responsibilities include:
    - Lead supply chain kaizen with focus on reducing costs, lead time and removing unnecessary complexities
    - Lead development of logistics support systems
    - North American Logistics Workshop Lead
  - Education:
    - Xavier University, MBA - 1999
    - Eastern Kentucky University, BBA Finance - 1994



# This Session Will...

- Define supply chain integration and why it is an enabler to Toyota's success
- Discuss the information and material flows within the Toyota supply chain
- Share how integration and collaboration can lead to cost reduction and service improvements
- Reveal how managing through Key Performance Indicators (KPIs) is effective and efficient

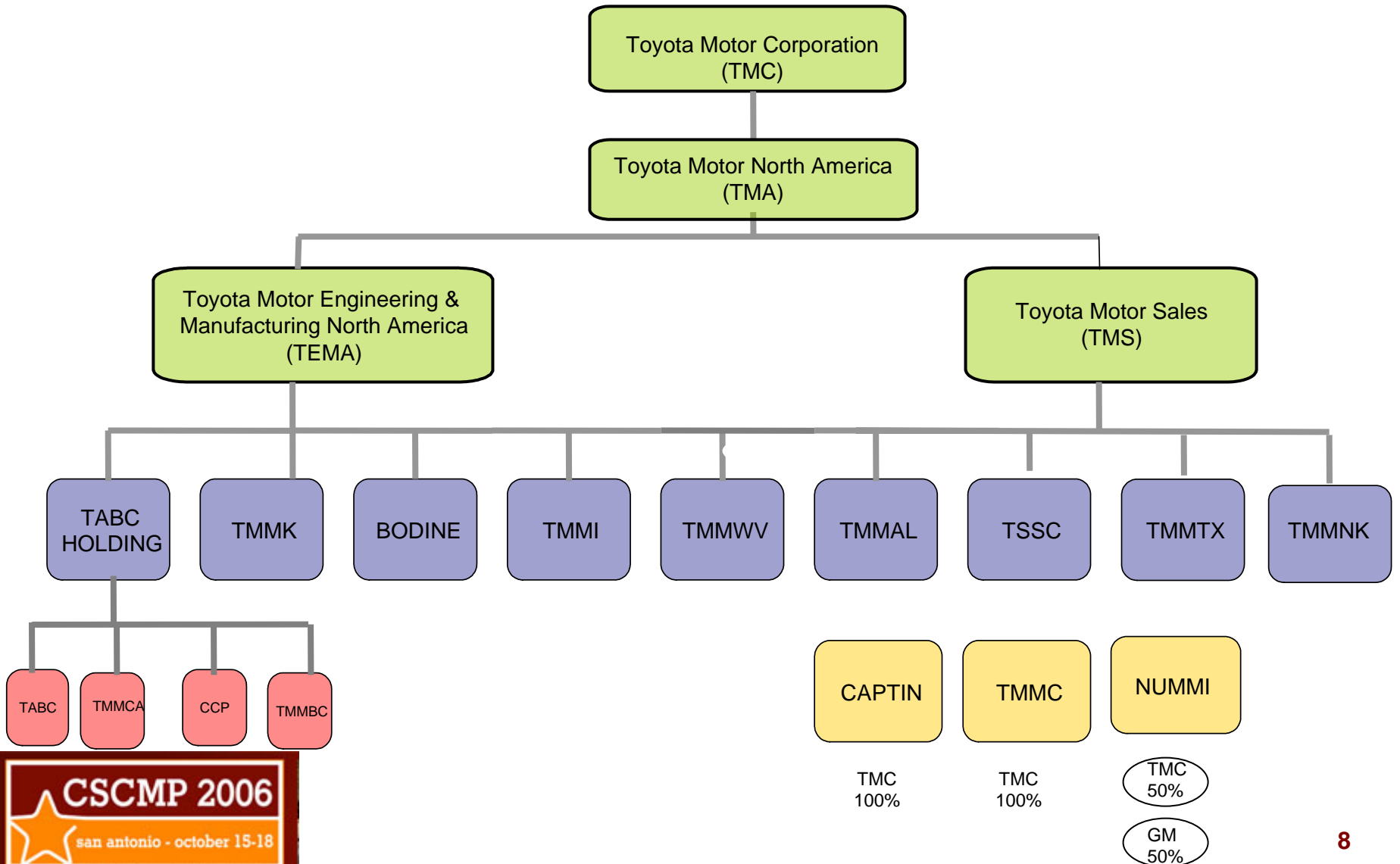


# This Session Will Not...

- Define or discuss basic lean terms, principles, or philosophies
- Be entirely presentation based



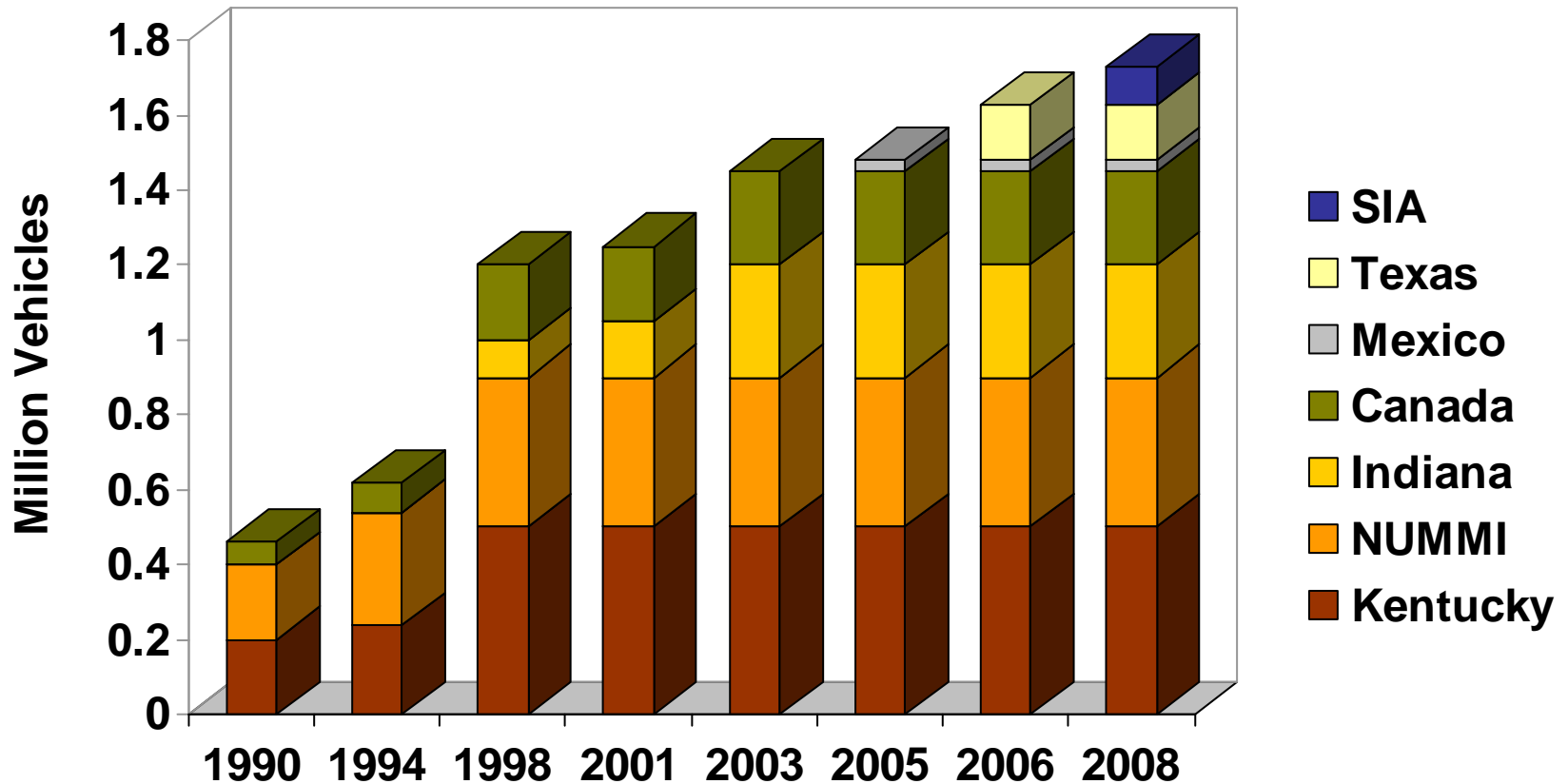
# Corporate Organization





# North American Capacity

Capacity: Nearly 2 Million in 2008

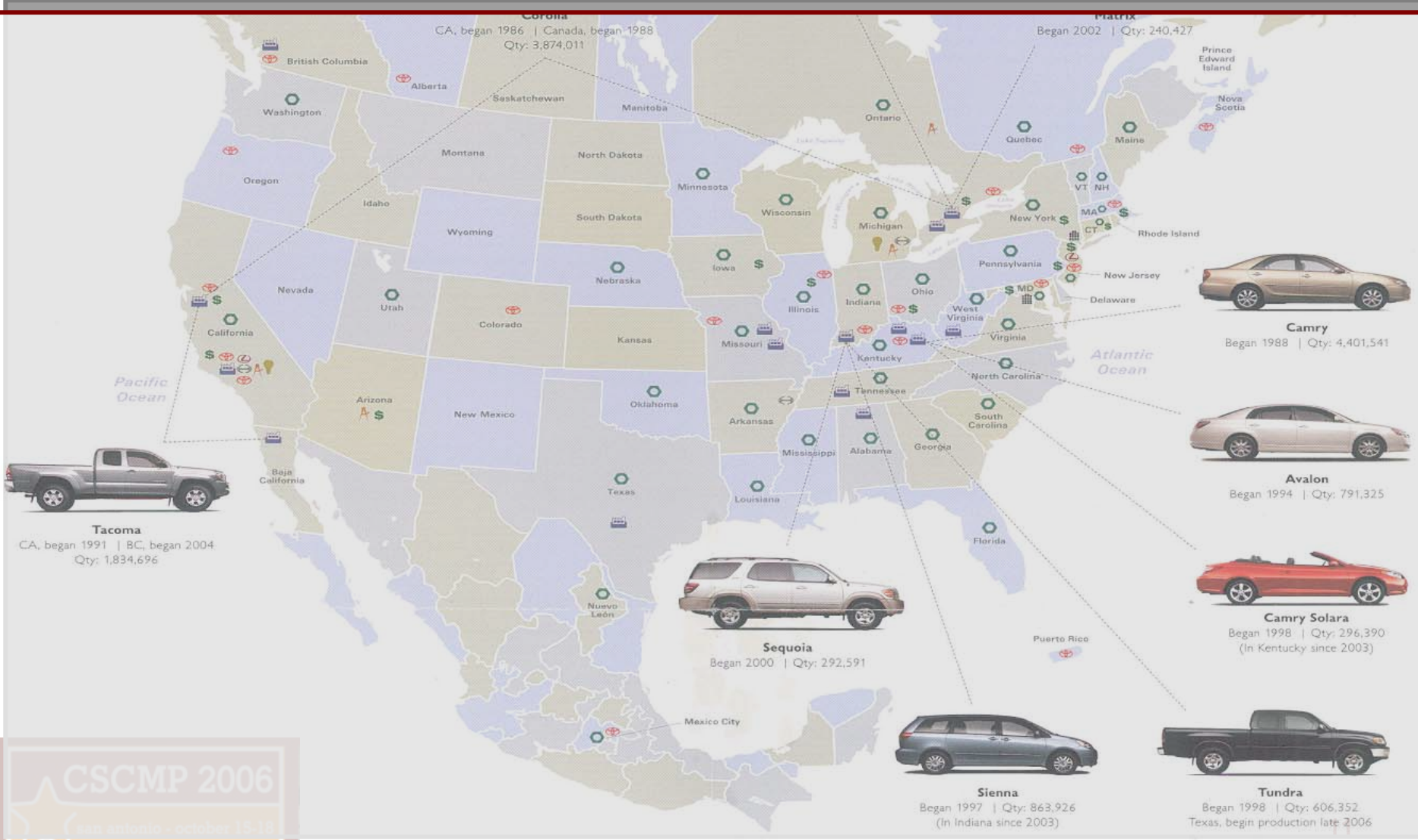


# Toyota's Supply Chain Overview

- ~\$600M Parts Logistics Budget N. America.
- ~750+ Suppliers in US, Canada and Mx.
- ~2000+ Route Runs, ~ 835,000 miles per day
- 11 Toyota Plant Customers in Network
- 5 Core Trucking Logistics Partners
- 2 Core Consolidation (Cross Dock) Logistics Partners
- TEMA = Centralized Design for plants



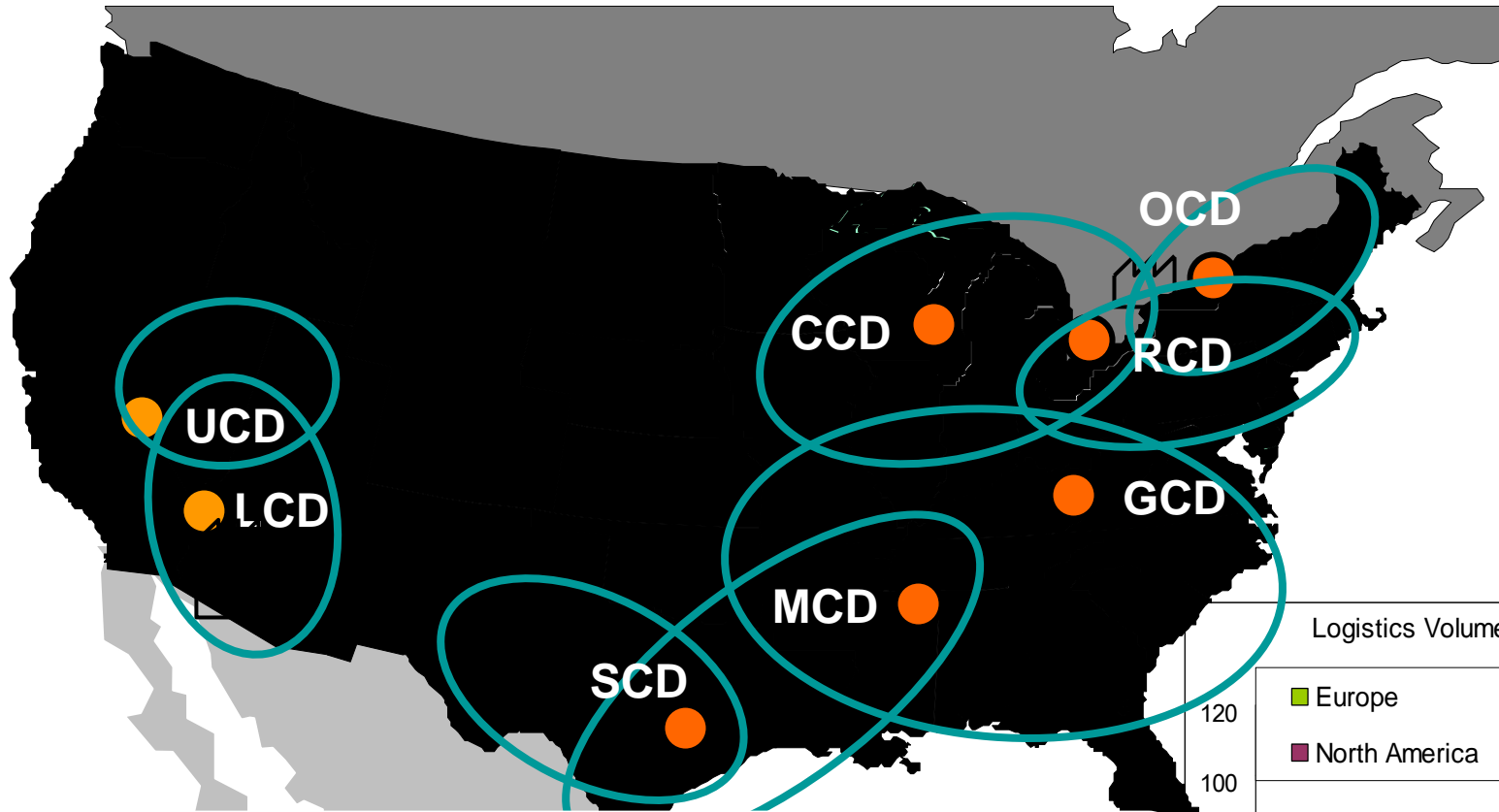
# Toyota's North American Operations



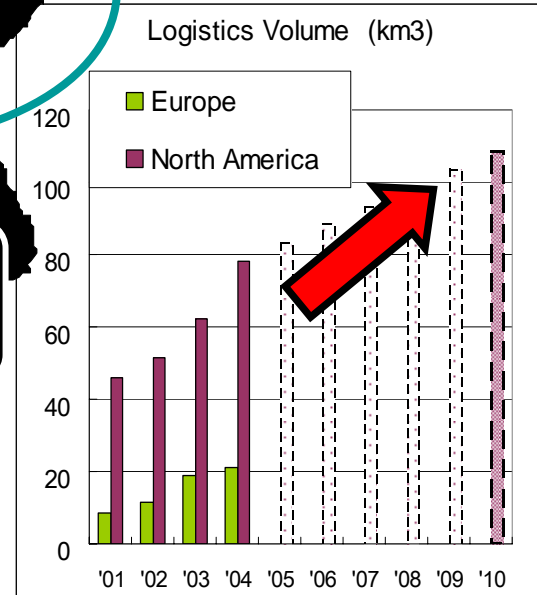
CSCMP 2006  
 San Antonio - October 15-18

supply chain's premier event

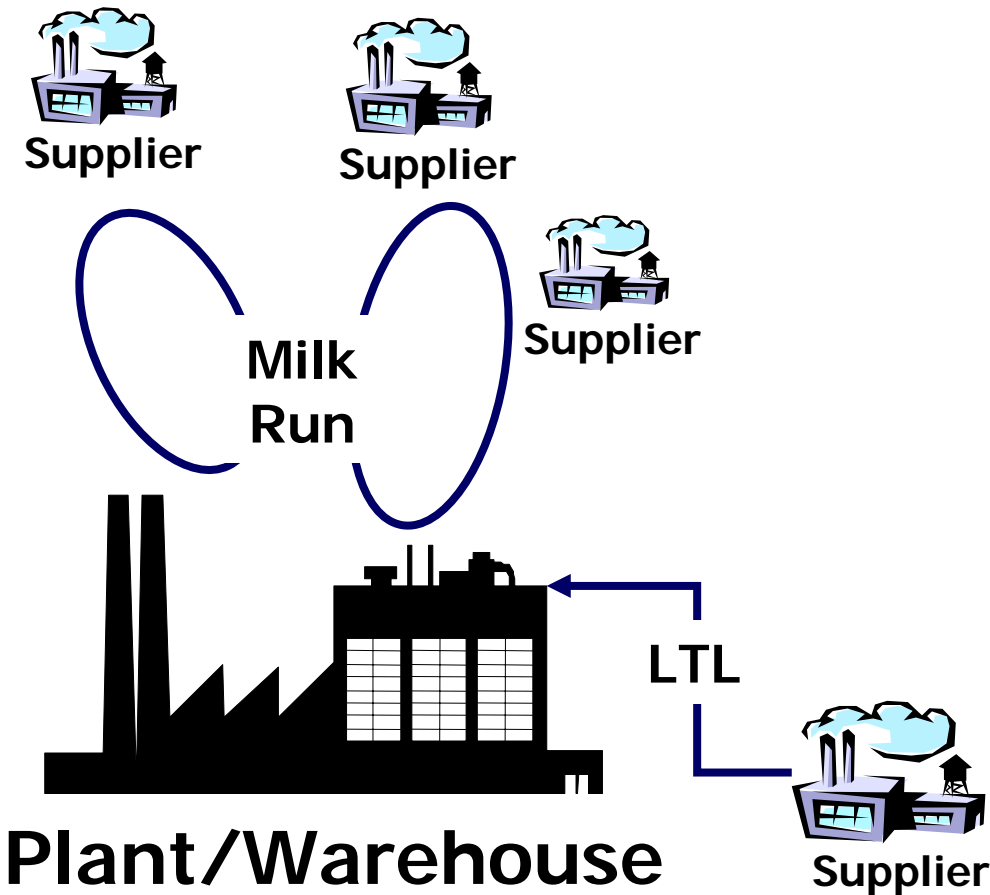
# Toyota's Logistics Network



**Increasing Volume**  
(Supplier Localization + More Plants + production)



# Traditional Manufacturing Logistics

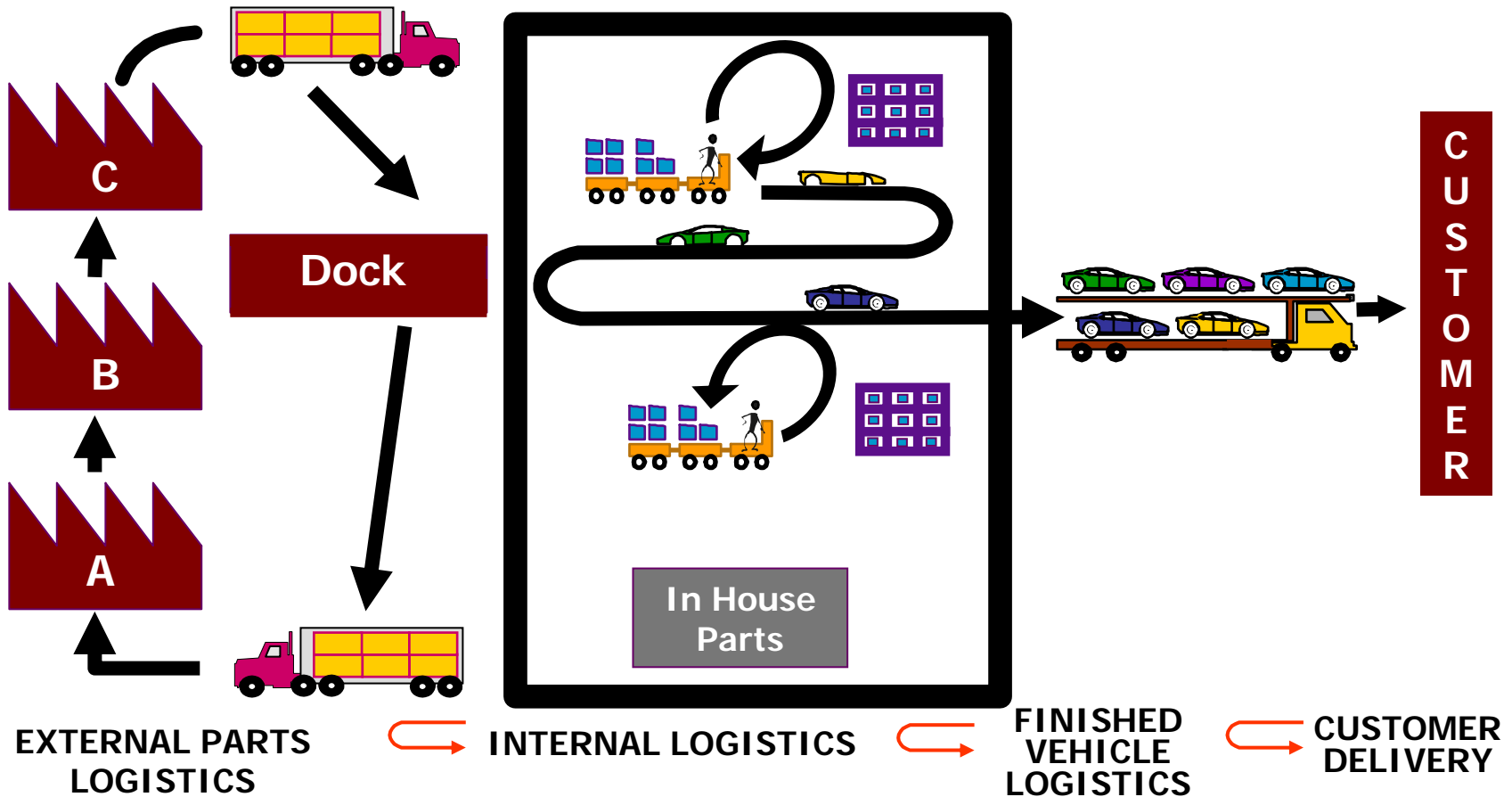


## Problems:

- High in-house inventories
  - Much double handling
  - Stores required
- Low Frequency delivery & uneven flow
- High mileage routes
- Complex plant unload required

# TPS Logistics

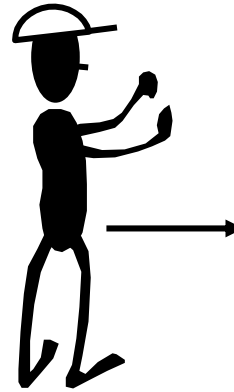
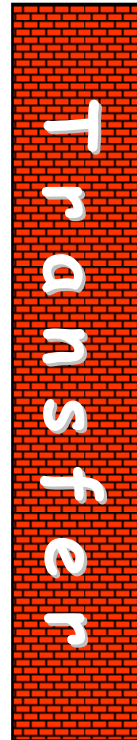
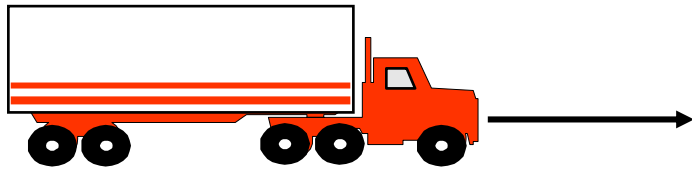
*Key: One Production System Flow*



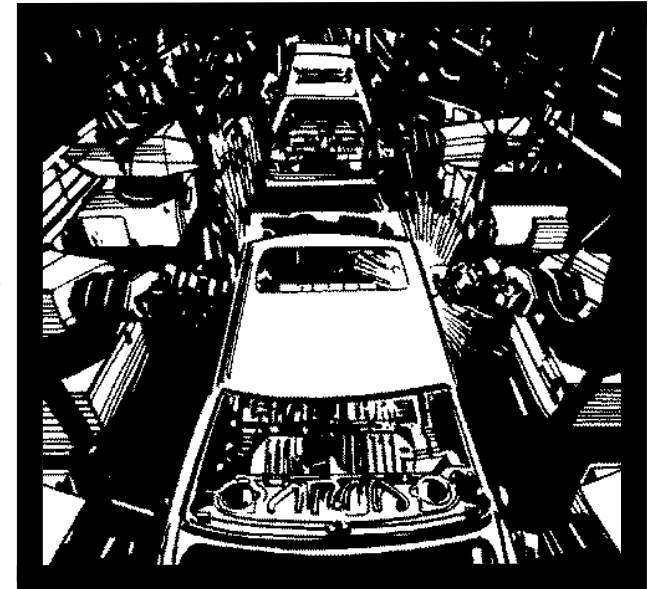
*Continuous Flow - No "warehouse" time:  
Strong Logistics Partners + Relationships Required*

# Not TPS Logistics

Logistics



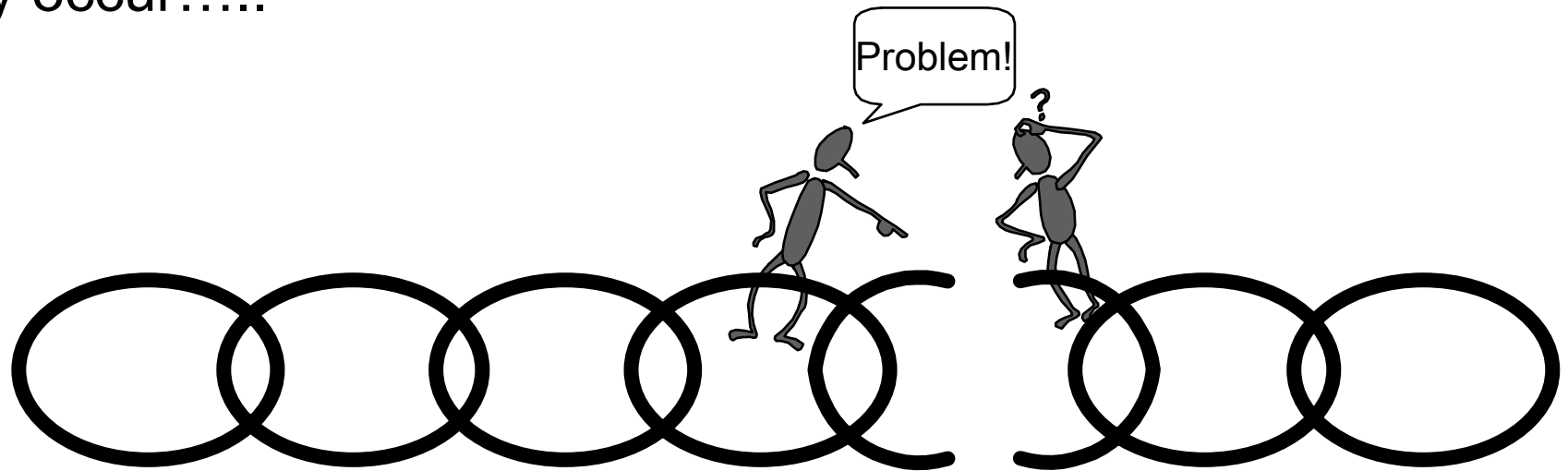
Production



Logistics Not Connected To Production

# TPS Logistics

Supply chain team members can quickly & easily see problems as they occur.....



... And make countermeasures immediately.

*“Lower the water to see the rocks”.*



# The Need to Integrate

## *Integration is:*

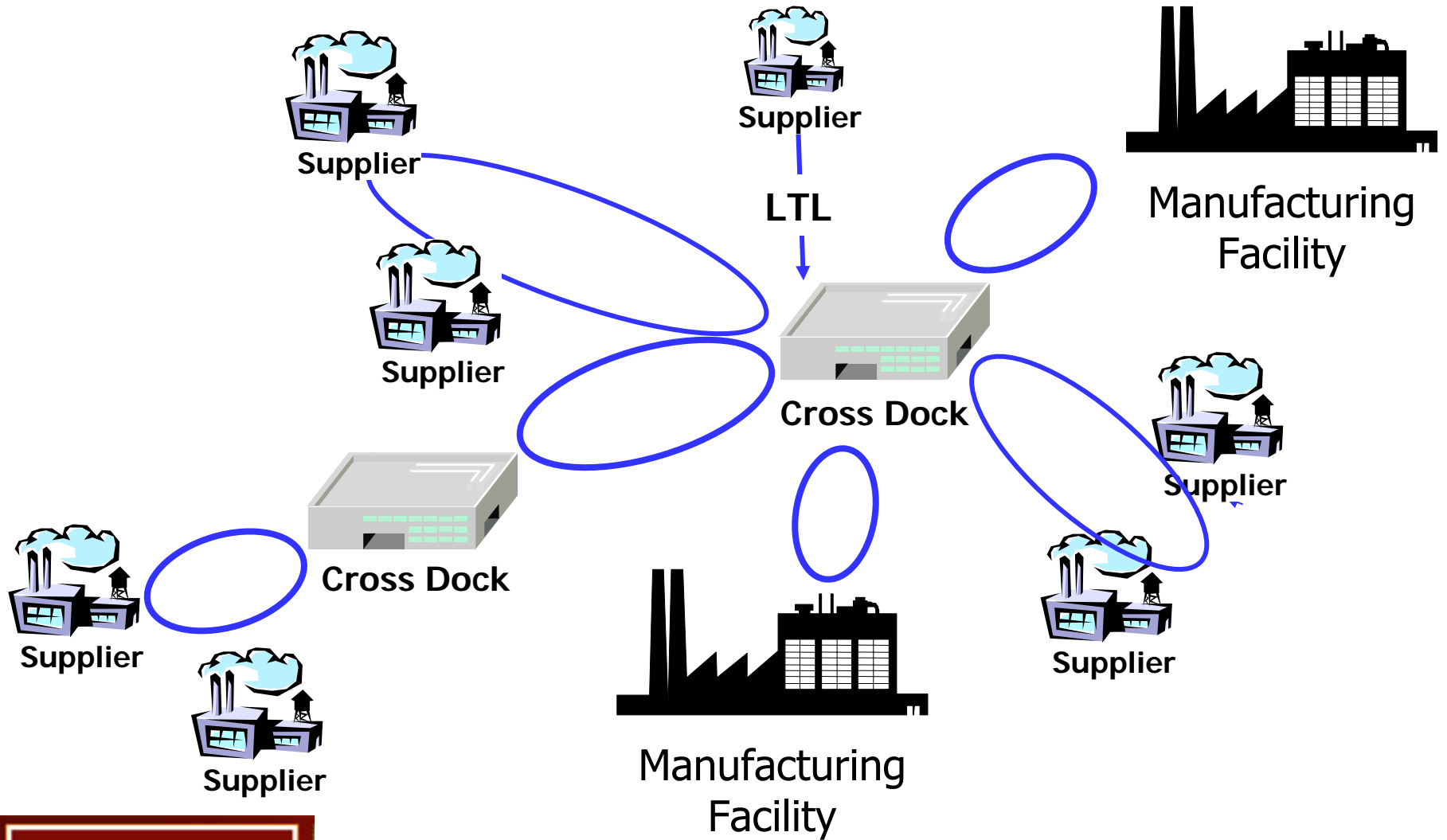
Combining and coordinating separate parts or elements into a unified whole

## *Value:*

- Mileage reduction
- Small lot & high frequency delivery
  - Minimize internal stores inventories
  - Quicker reaction to abnormal
  - Even, spaced out pickups at parts suppliers (smooth production)
- Create environment for dedicated dock delivery (simple)
  - No multi-stop plant unloads

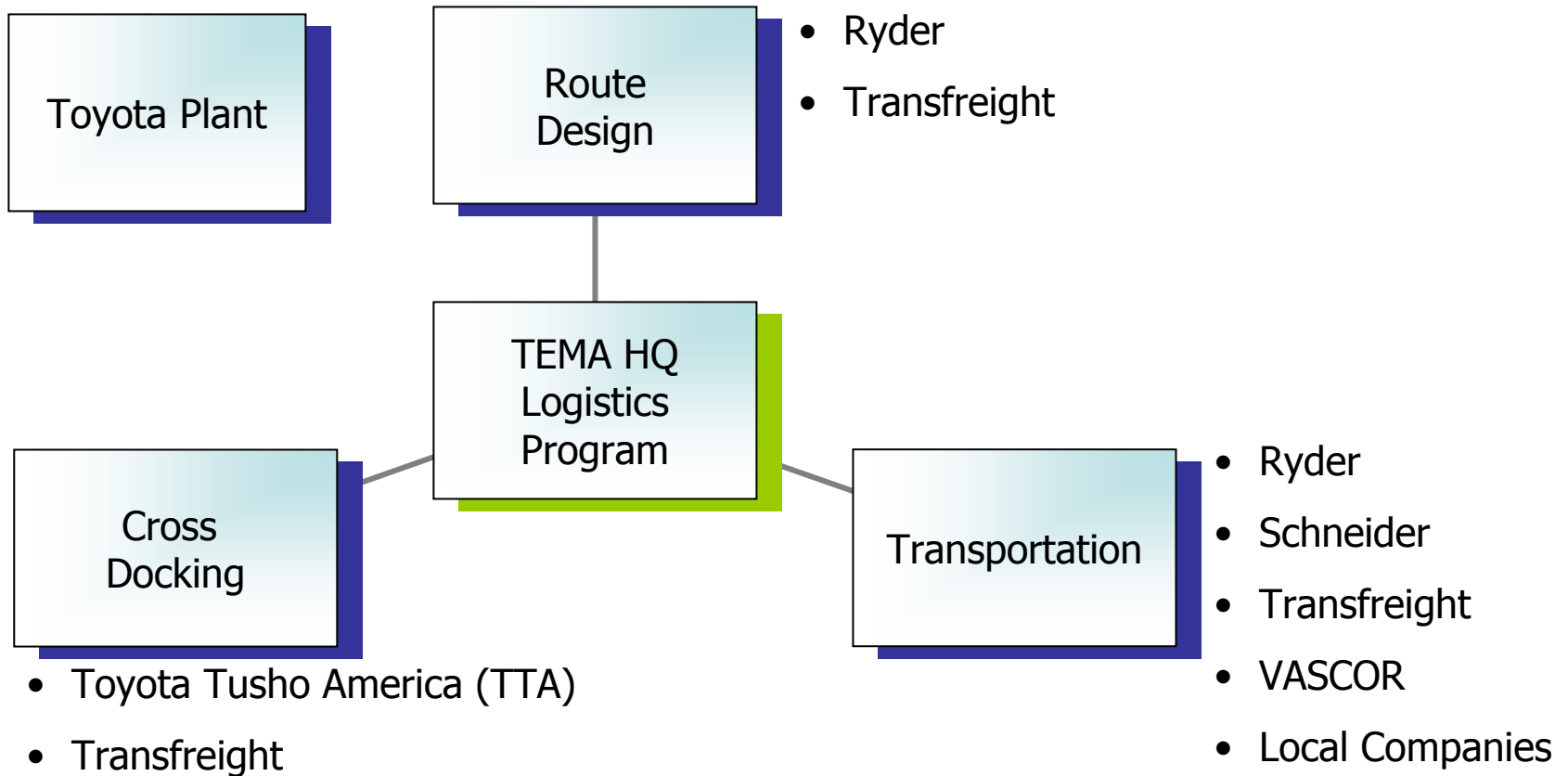


# Integrated Manufacturing Logistics



# Collaboration for a World Class Supply Chain

*Collaboration is: To work together in a joint intellectual effort*



# How Is The Relationship Built?

- Complete understanding of both Toyota's business needs & LP's capabilities
- Commitment by both parties to achieve excellence
  - Shared values
  - Continued learning
- Shared ownership of processes - development & execution
- Joint problem solving and kaizen to improve overall condition
- Effective & open communication
- Reward & recognition



# Different from Other Auto OEMs

- Toyota invests in a handful of providers only
  - LP grows with Toyota
- Others mostly for short term result (e.g. lowest cost)
- Others may not invest in LP learning
  - Culture
  - Train the trainer
  - Global Production Center
- Toyota allows LP to own & manage processes
- Others use directive not collaborative communication
  - No joint problem solving or shared working groups



# Building the Relationship: Communication

- Annual Pricing Review (APR)
- Annual Purchasing Policy (APP)
- Benchmarking
- Commercial Working Group
- Daily Problem Reporting
- “Go & See” Initiatives
- Incident Reporting
- Logistics Kaizen Workshop
- Value Analysis (VA) Program

*Working  
Towards  
Self-Reliance!*



# Annual Pricing Review (APR)

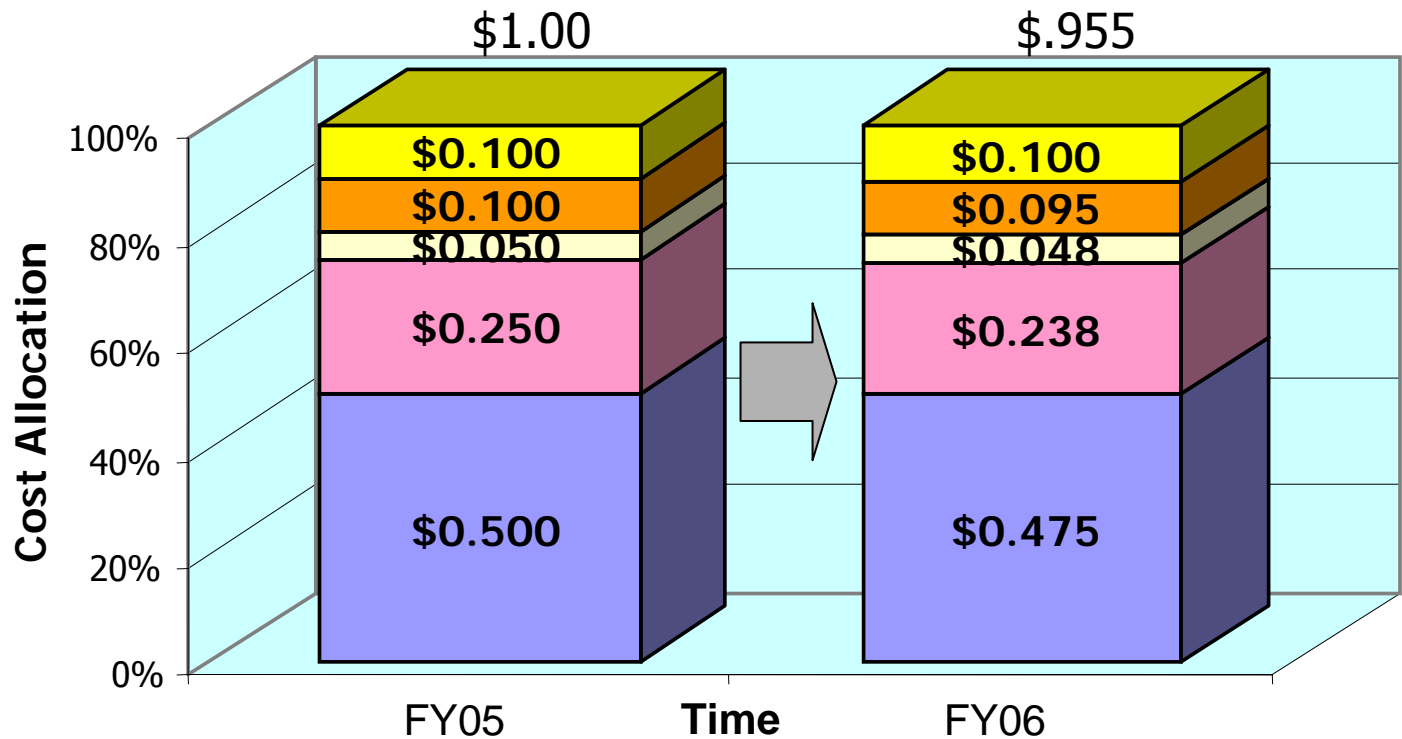
- Reestablish pricing for each existing business unit
  - LP's are given cost reduction targets
  - LP's provide unit cost detail with explanation of all variances above target levels
  - Excessive price changes and wide variances between LP's can lead to DOB (division of business) changes
- Toyota supports LP's when challenges to meet cost reduction targets are present
  - Review of LP business model
  - Foster dialogue amongst LP's to generate cost savings ideas
  - LP's are provided unit pricing information to benchmark



# Annual Pricing Review (APR) Model

- Margin
- Overhead
- Utilities
- Equipment
- Labor

## Cost Reduction - Pricing Model



Focus on cost reduction by looking at each cost element, not margin



# CASE STUDY

- **LOGISTICS KAIZEN  
WORKSHOP**

– JOINT COLLABORATIVE EFFORT  
AT WORK



# Logistics Kaizen Workshop

- TEMA, NAMC, LP joint kaizen activity focusing on logistics opportunities
  1. Supply chain development – *routing efficiency, flexibility*
  2. Packaging – *design, reuse, standardization*
  3. Operations – *productivity, quality of service*
- Purpose: Provide a forum for problem areas (themes) to be addressed
  - Cost Reduction
  - New Model Management
  - Team member development
- Create team environment, share workload & knowledge and create ownership amongst all participants

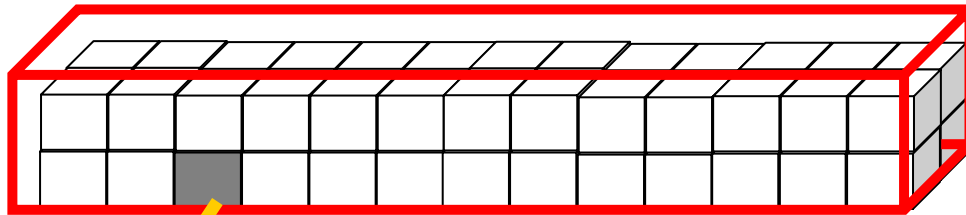


# Example #1 – Trailer Efficiency

Cost = Mile X **M3** X Rate

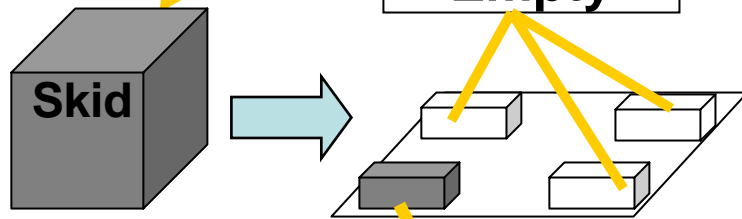
**M3**= trailer efficiency X skid efficiency X box efficiency

## 1. Trailer



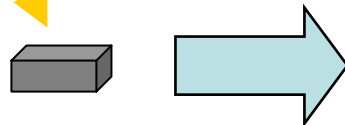
- Optimize Routing
- Improve Stackability

## 2. Skid



- Optimize Order Frequency
- Optimize Palletization

## 3. Box




- Maximize QPC
- Minimize Box Size
- Optimize Part Orientation



# Example #2 - Common Rack

- **Focus:** Reduce Packaging Investment Cost
- **Method:** Study/Design Common rack with one team
- **Team:** TMMAL, TMMTX, TMMI, NUMMI, TMMBC, TEMA

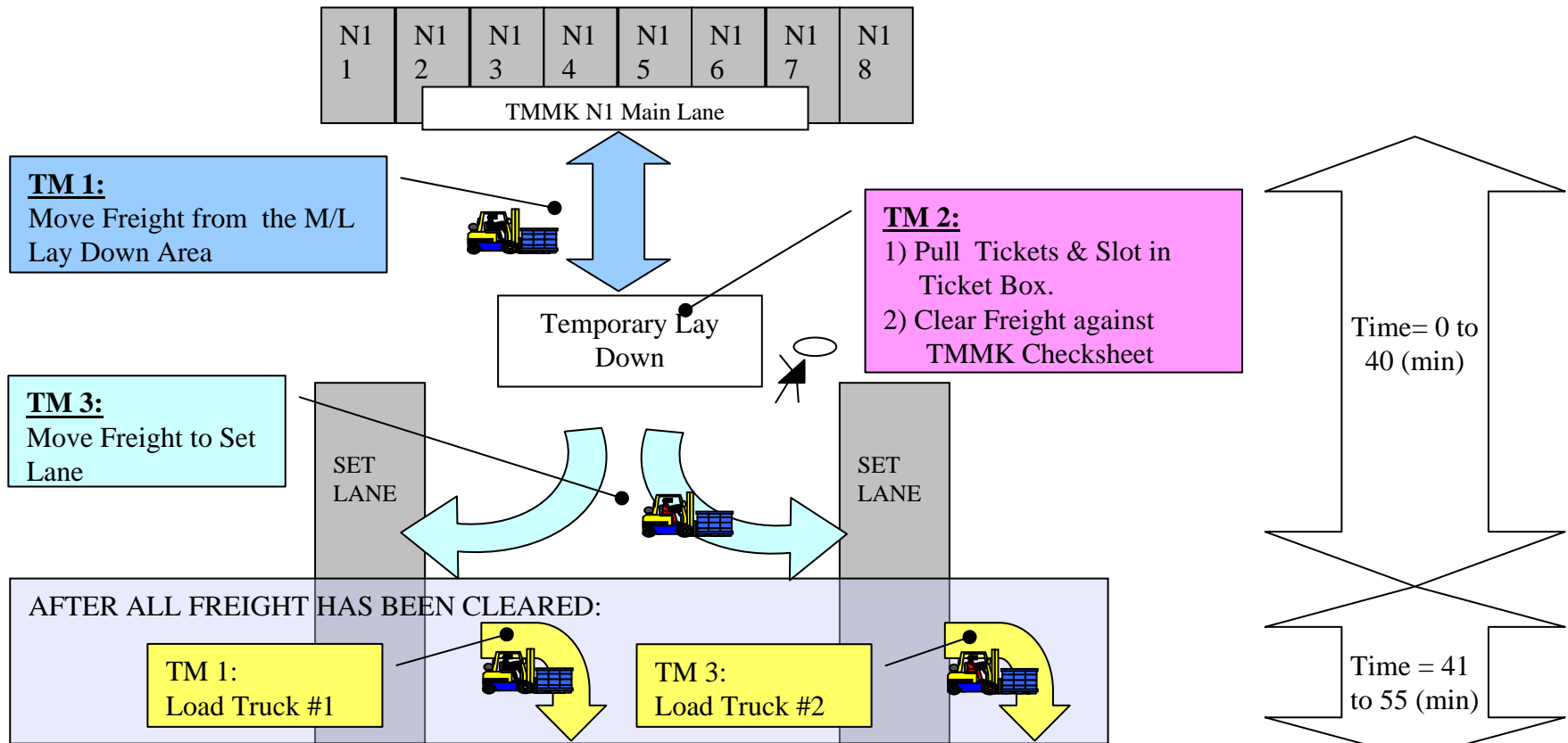
<p><b><u>Old:</u></b> 4 Unique Racks</p> <p>TMMI RACK</p> <p>TMMTX RACK</p> <p>NUMMI RACK</p> <p>TMMBC RACK</p>	<p><b><u>New:</u></b> 1 Common Rack</p> 	<p><b><u>Key Points:</u></b></p> <ol style="list-style-type: none"><li>1) Focused Team Activity to reduce cost</li><li>2) Developed OP for future common pkg Development</li></ol>
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- **Results:** Reduce Investment Cost by \$1.2M; increase flexibility with common design; increase opportunity for re-use

# Example #3 – Operations Efficiency

**Cost = Mile X M3 X Rate**

GCD – TMMK M/R Process Kaizen  
 –Before Significant wait time

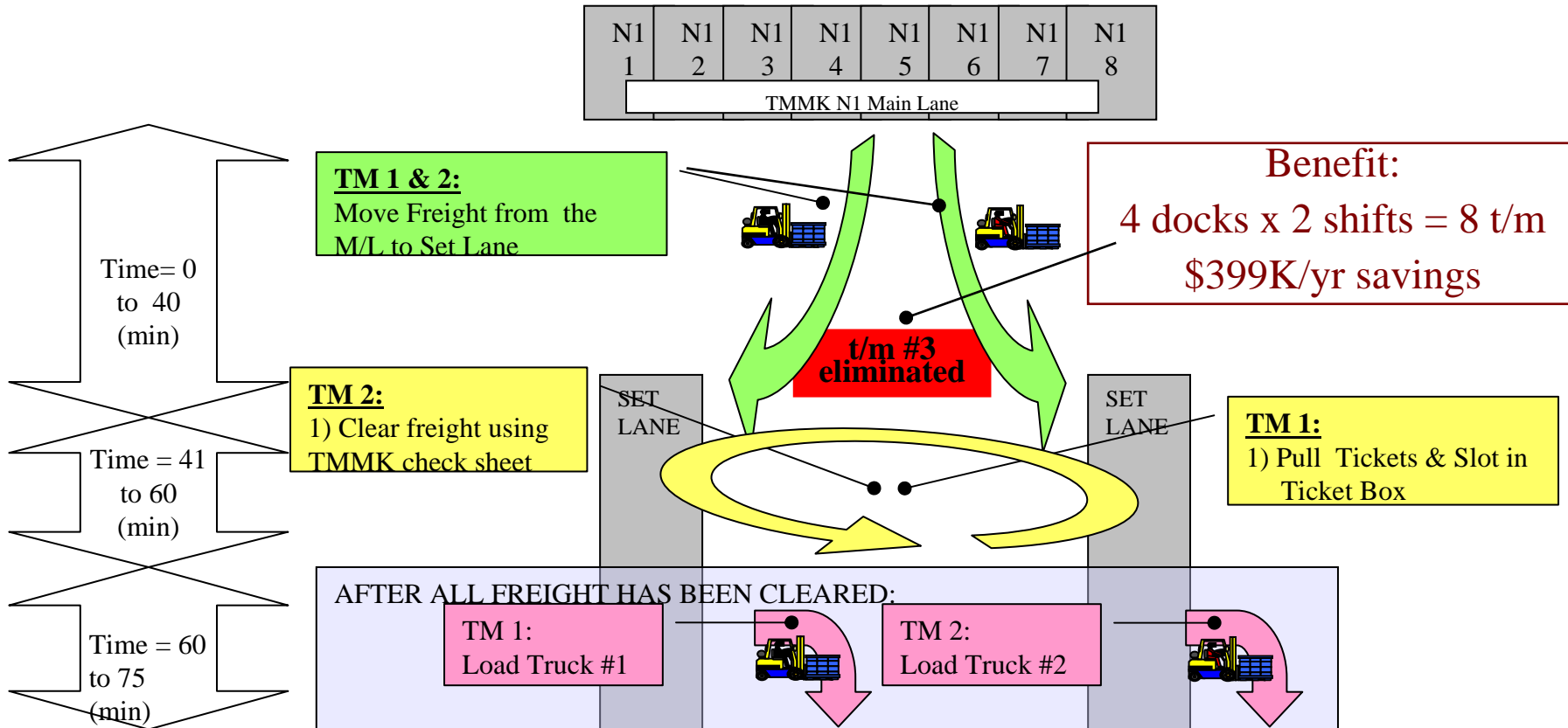


WAIT for Next Cycle



# Cont. – Operations Efficiency

## GCD – TMMK M/R Process Kaizen -After Level work load



# Logistics Workshop Results FY06

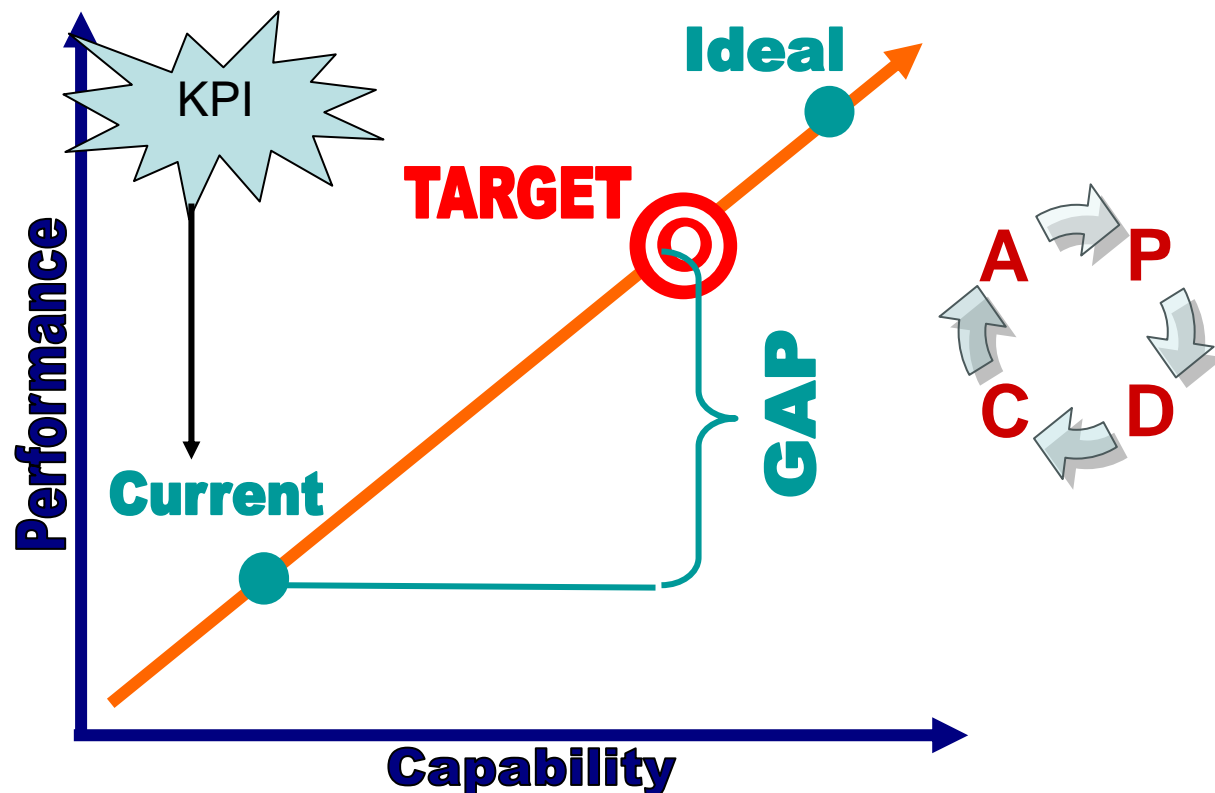
***\$48.6M REDUCTION YTD***

KAIZEN AREA	ANNUAL PLAN TARGET	YTD TARGET	CURRENT STATUS	EVAL
<b>PLANNING</b> <i>Route Kaizen / Mileage Red.</i>	\$20.0M	\$15M	\$21.9M	◎
<b>PACKAGING</b> <i>Reuse / Sourcing / Pkg Oper.</i>	\$32.1M	\$23.5M	\$24.7M	○
<b>OPERATIONS</b> <i>Crossdock Kaizen</i>	\$3.4M	\$2.5M	\$2.0M	△
<b>TOTAL</b>	\$45.5M	\$41.0M	\$48.6M	◎



# Managing Through KPIs

- **What is a KPI:** A key performance indicator (KPI) is a quantifiable measurement that reflects the critical success factors of an organization.





# Managing Through KPIs cont.

## Why Are They used:

To define and measure progress toward organizational goals.  
KPIs provide a clear picture of current condition.

## •Sample KPIs:

### Project Management

1. Cost Planning (\$/veh)
2. % PKG Re-use
3. M3/veh

### Logistics Planning

1. M3/trailer
2. Miles/veh
3. Miles/stop

### Logistics Operations

1. On-time arrival
2. M3/tm
3. Qty of mis-shipments

## Keypoint:

- KPI support our pursuit to the ultimate goal



# THANK YOU

