

Powering a Digital Supply Chain Transformation

Chad Steighner

Vice President Information Technology
Johnson Controls Power Solutions

Corey Graven

Executive Director, Supply Chain N.A.
Johnson Controls Power Solutions

velocity

CONNECT + ACCELERATE + INNOVATE





**POWERING
TODAY,
INTO
TOMORROW.**

OUR BUSINESS AT A GLANCE

MILWAUKEE

HANNOVER, GERMANY

SHANGHAI, CHINA

55

MANUFACTURING,
RECYCLING & DISTRIBUTION
CENTERS WORLDWIDE

SERVING
CUSTOMERS IN

150+

COUNTRIES

6 R&D
FACILITIES

16 R&D
PARTNERSHIPS

154M

BATTERIES
SOLD IN 2018

\$8.0B

REVENUE
IN 2018

● GLOBAL HEADQUARTERS

● REGIONAL HEADQUARTERS

OUR BUSINESS AT A GLANCE



15,000

TEAM MEMBERS



THE BROADEST AND MOST EFFICIENT PORTFOLIO OF BATTERIES

STANDARD
LEAD-ACID

ADVANCED
LEAD-ACID

LITHIUM-ION



1 IN 3

VEHICLES IN
THE WORLD IS
POWERED BY
OUR BATTERIES



WORLD'S LARGEST
AUTOMOTIVE BATTERY
RECYCLER



UP TO
99%

OF THE MATERIALS IN
OUR BATTERIES CAN
BE RECOVERED,
RECYCLED, AND
REMADE



8K

BATTERIES RECYCLED
GLOBALLY, EVERY
HOUR, EVERY DAY IN
OUR NETWORK



BY USING RECYCLED
RAW MATERIALS

90%

LOWER ENERGY AND
GREENHOUSE GAS
EMISSIONS

OUR BRANDS INCLUDE:



THE ULTIMATE POWER SOURCE®

Delkor



130+ YEAR

TRADITION

OF INNOVATION & GROWTH

Megatrends are shaping the future of the automotive industry and the current pace of change is massive.



INCREASING ELECTRICAL LOADS

Safety
Comfort and Convenience
Emissions



EMERGING MARKET GROWTH

Urbanization
Growing Middle Class



Higher demands on emissions, safety, comfort and convenience are driving increasing electrical loads.

- EMISSIONS
- COMFORT AND CONVENIENCE
- SAFETY



NORTH AMERICA PRODUCTS AND CHANNELS

Standard Flooded



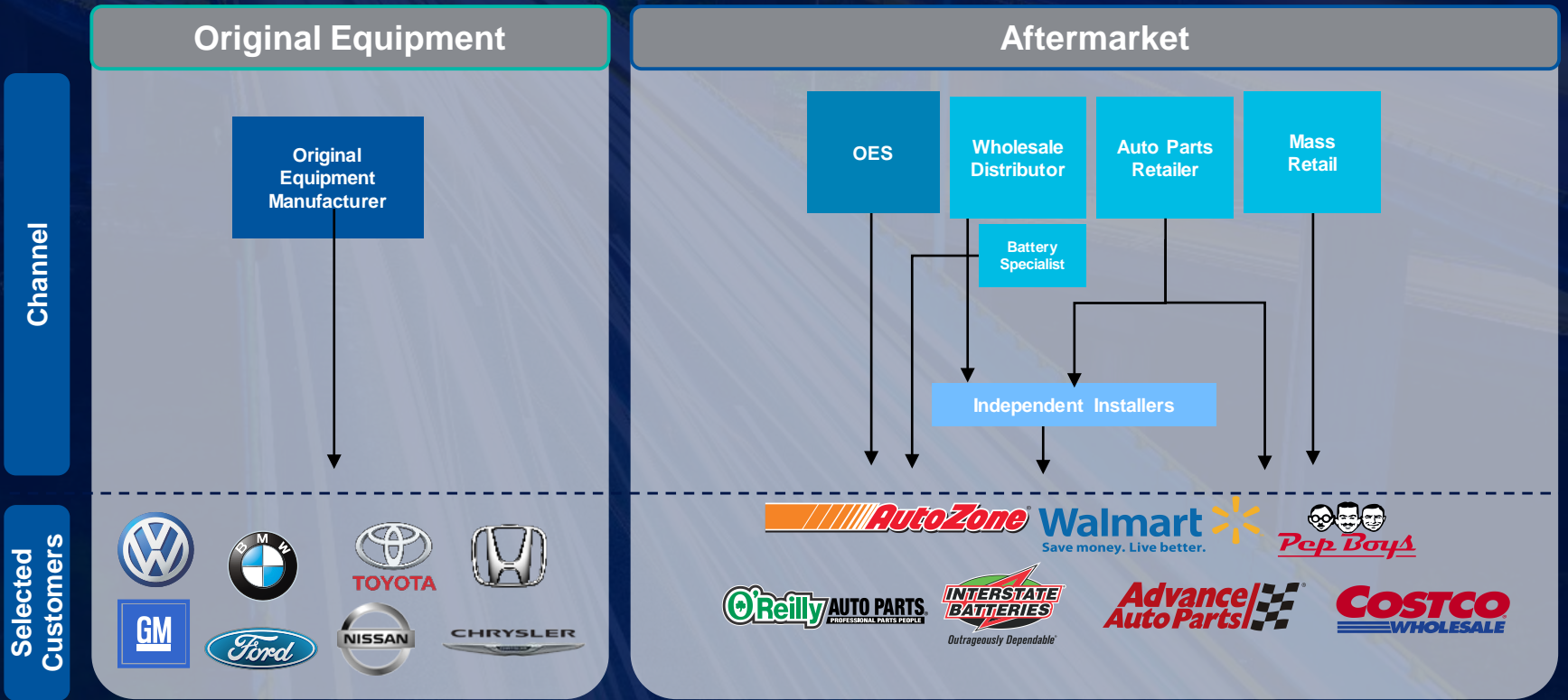
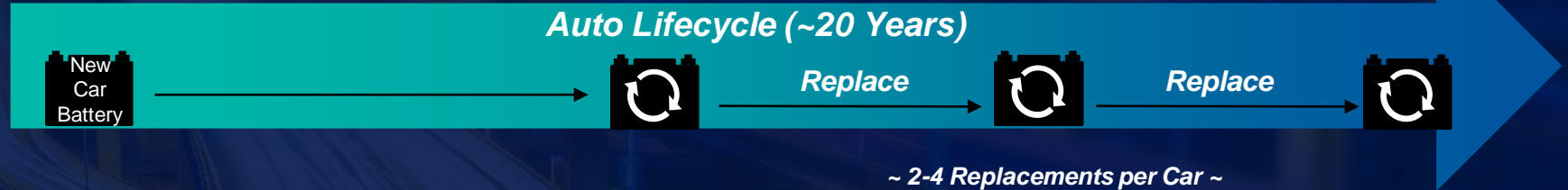
Advanced Lead-Acid



EFB



AGM



NORTH AMERICA SUPPLY CHAIN NETWORK



U.S. NETWORK STATISTICS

Ship-To Locations = 6,509

Unique Lanes = 12,915

Inbound Miles = 37,014,371

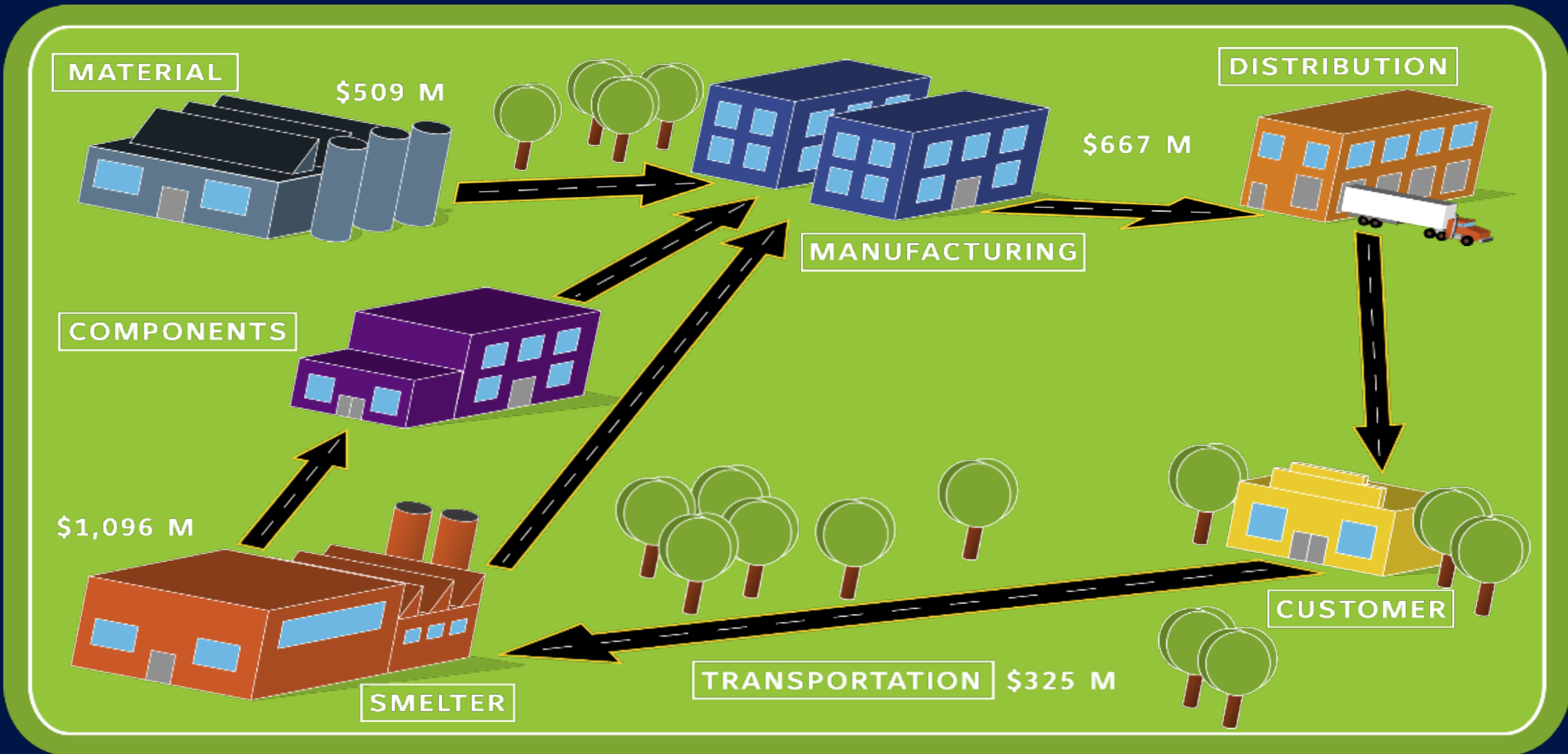
Outbound Miles = 72,756,703

Border Crossings = 41,000

Manufactured SKUs = 548

Decorated SKUs = 3,343

POWER SOLUTIONS CLOSED LOOP SUPPLY CHAIN



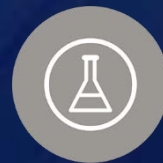
Managing seasonality

- Demand sensing improves forecast of seasonal demand
- Inventory policy tuned to seasonal items
- Integrated planning enables demand driven supply chain response



Linking operational plan with long range plan

- Frequent sync-up of long range strategic plan and operational plan
- Scenario analysis enables optimal decision making



Improving service levels, lead time and reducing transportation costs

- Reduce planning lead time
- Responsive to the changing demand
- More accurate positioning of inventory
- Optimal truck loads and routes while meeting customer service levels



Optimizing inventory level

- Enables inventory optimization across multiple distribution and multi-tier manufacturing stages
- Integrated inventory planning model that optimizes frequently to achieve sustained results



\$50M+ OF INEFFICIENCIES THROUGHOUT THE SUPPLY CHAIN

DEMAND
PLANNING
CHALLENGES

UNCONSTRAINED,
REGIONAL SUPPLY
PLANNING

NO SUPPLY CHAIN
VISIBILITY
FRAGMENTED
ENTERPRISE DATA

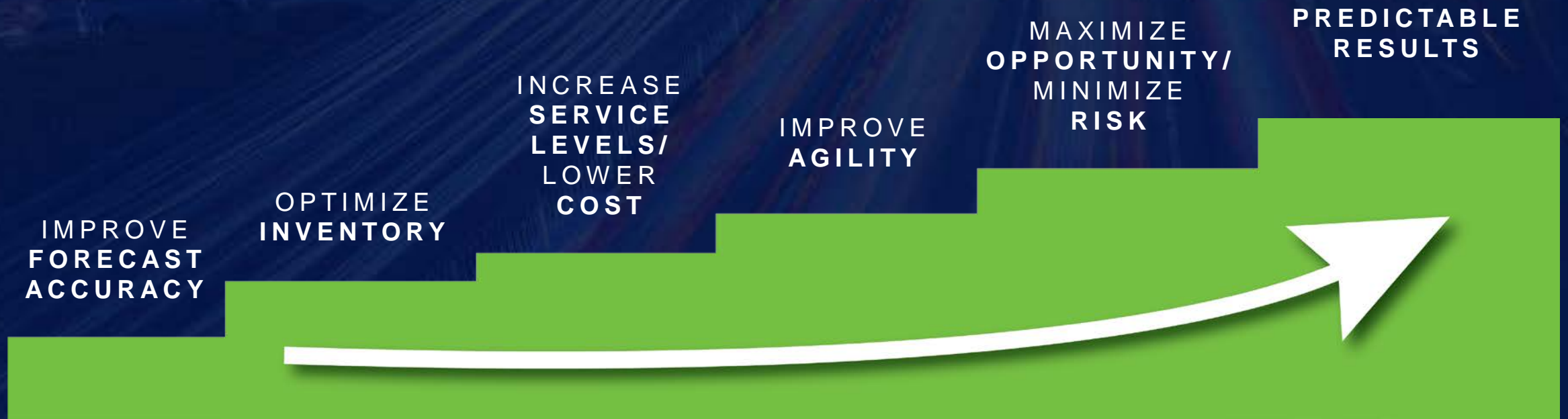
VOLUMETRIC &
FINANCIAL
FORECASTING

INEFFICIENT
COMPONENT
PLANNING

LACK OF INVENTORY
PLANNING AND
OPTIMIZATION
CAPABILITIES



BENEFITS OF S&OP OVER TIME



INTEGRATED S&OP SUMMARY TIMELINE

2018

2019

2020

Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar

DEMAND PLANNING

SUPPLY PLANNING

INVENTORY PLANNING

RECYCLING PLANNING

S&OP EFFECTIVENESS



REDUCE FORECAST BIAS TO +/- 5% AND FORECAST ERROR BY 15-20 PTS

ACTION TAKEN



- ✔ Root cause analysis
- ✔ Metric evaluation and redesign
- ✔ Prepare, cleanse and test source data
- ✔ SKU prioritization
- ✔ Implement data automation
- ✔ Generate dashboard to guide customer meetings

IT

- ✔ Upgrade Logility Demand Planning and use of AdapLink integration
- ✔ Product data quality management using Power BI
- ✔ Proof of Concept for alternate source of data – shipments v orders v POS

WORK IN PROCESS



- Tune statistical models
- Configure Logility alerts
- Conduct Logility modeling training
- Logility hierarchy re-design
- Deploy alternate sources of history

IT

- Automate POS data integration from EDW to Logility Demand Planning
- Create forecast metrics report in Power BI
- Logility hierarchy redesign and data integration realignment

NEXT STEPS



- Predictive/machine learning models
- Expanded data acquisition
- Improve value of customer collaboration
- Root cause reporting and analytics
- Team competency development, training, and supporting structure to sustain performance and results

IT

- Expand automation of POS data integration for additional customers
- Predictive model building using multiple variables in MS Azure

REDUCE TRANSPORTATION COSTS BY 10-15%, IMPROVE SERVICE LEVELS BY 5-10 PTS



ACTION TAKEN



- ✔ Project resource re-deployment
- ✔ Design and data sourcing validation
- ✔ Data cleansing
- ✔ Change management plan
- ✔ System integration and UAT
- ✔ Kicked off pilot of constrained centralized planning model

IT

- ✔ Automated data feeds from ERP to Logility Supply Planning
- ✔ Logility Supply Planning pilot
- ✔ ERP reporting for data quality management

WORK IN PROCESS



- Establish master data management team
- Continuing rollouts
- Customer communications
- Reporting and analytics development

IT

- Master data quality and transaction data aging dashboard via Power BI
- Upload supply plan results into ERP
- Logility Supply Planning roll out across US/MX

NEXT STEPS



- Full North American rollout of centralized planning model
- Interface automation
- Continuous improvement
- Team competency development, training, and supporting structure to sustain performance and results
- Leverage segmentation model to optimize assembly

IT

- Automation of supply plan results into ERP
- Supply plan adherence reporting in Power BI
- Supply plan master data integration
- Product life cycle streamline in PLM/ERP



IMPROVE QUALITY OF INVENTORY BY 25-30%

ACTION TAKEN



- ✔ Metric evaluation and redesign
- ✔ Prepare, cleanse and test source data
- ✔ SKU Segmentation
- ✔ Inventory target definition driving supply planning

IT

- ✔ QOI reporting via analytics platform
- ✔ Obsolescence reporting via analytics

WORK IN PROCESS



- Establish inventory policies
- Continuous improvement of Excel based model
- Root cause reporting and analytics
- Prioritize levers to address inventory optimization opportunities

IT

- Leverage time phased safety stock in Logility Inventory & Supply Planning

NEXT STEPS



- Evaluate and transition to multi-echelon inventory optimization tool
- Team competency development, training, and supporting structure to sustain performance and results

IT

- Evaluate multi-echelon inventory optimization solutions

REDUCE CORE TRANSPORTATION COSTS BY 10%



ACTION TAKEN



- ✔ Kicked off Recycling Supply Chain improvement team
- ✔ Re-deployed short term planning model and weekly core flow meeting
- ✔ Re-deployed monthly cross-functional review of execution to prior month plan

IT

- ✔ Mobile truck driver app to record pickup quantity/weight real-time into ERP
- ✔ Tablet app for core warehouse receipts/shipments real-time ERP integration

WORK IN PROCESS



- Develop reporting and analytics (visibility)
- Refine KPI's/ business process for internal and 3PL's

IT

- Multi-leg delivery/pickup tracking
- Enable customer portal pickup requests and visibility to status

NEXT STEPS



- Future toolset evaluation and implementation – core return forecasting (Logility Demand Planning)
- ERP integration for reverse logistics and sub-contract manufacturing

IT

- Support and execute on toolset selection

BENEFITS OF S&OP OVER TIME



REDUCE FORECAST BIAS TO +/- 5% AND FORECAST ERROR BY 15-20 PTS

REDUCE CORE TRANSPORTATION COSTS BY 10%

REDUCE TRANSPORTATION COSTS BY 10-15% AND IMPROVE SERVICE LEVELS BY 5-10 PTS

IMPROVE QUALITY OF INVENTORY BY 25-30%

} \$50M+



MORE
PREDICTABILITY
AND
VISIBILITY



SHIFT FROM
SILOS TO
A HOLISTIC
APPROACH



EMPHASIS ON
MASTER
DATA QUALITY



FOCUS ON **RESOURCES & TALENT**



**POWERING
TODAY,
INTO
TOMORROW.**