SOLVE FOR X.

Evolution of AGVS What's Available And What's to Come

Presented by:

Bryan Knott – Global Prod Mgmt Dematic

Mark Longacre – Mktg Manager - JBT

Abstract

AGV systems have quickly become a disruptive force leading the way to Intralogistics 4.0. Industry estimates forecast double digit growth of AGVs through 2020. This educational seminar outlines both simple, AGV applications as well as the more challenging ones. Attendees of varying experience will gain a better understanding of where to begin and what is possible in the world of AGVs.

Who we are

AGVS
Automatic Guided Vehicle Systems

- Group of 18 leading AGV/C system and component suppliers
- Mission - promote the growth and effective use of automatic guided vehicle systems (AGVS) in manufacturing, warehousing, distribution and other key markets

AutoGuide
Automatic Guided Vehicle Systems
A HEARTLAND COMPANY

Battery Watering Technologies
The leader in battery watering technology™

DAIFUKU
DAIFUKU NORTH AMERICA

DEMATIC
Creating Logistics Results

egemin
AUTOMATION

ELETTRIC80

EnerSys
Power/Full Solutions

FLOW-RITE

GRENZEBACH

JBT

KOLLMORGEN

OCEANEERING
Connecting What's Needed with What's Next™

RAYMOND

Rockwell Automation

SICK
Sensor Intelligence.

swisslog

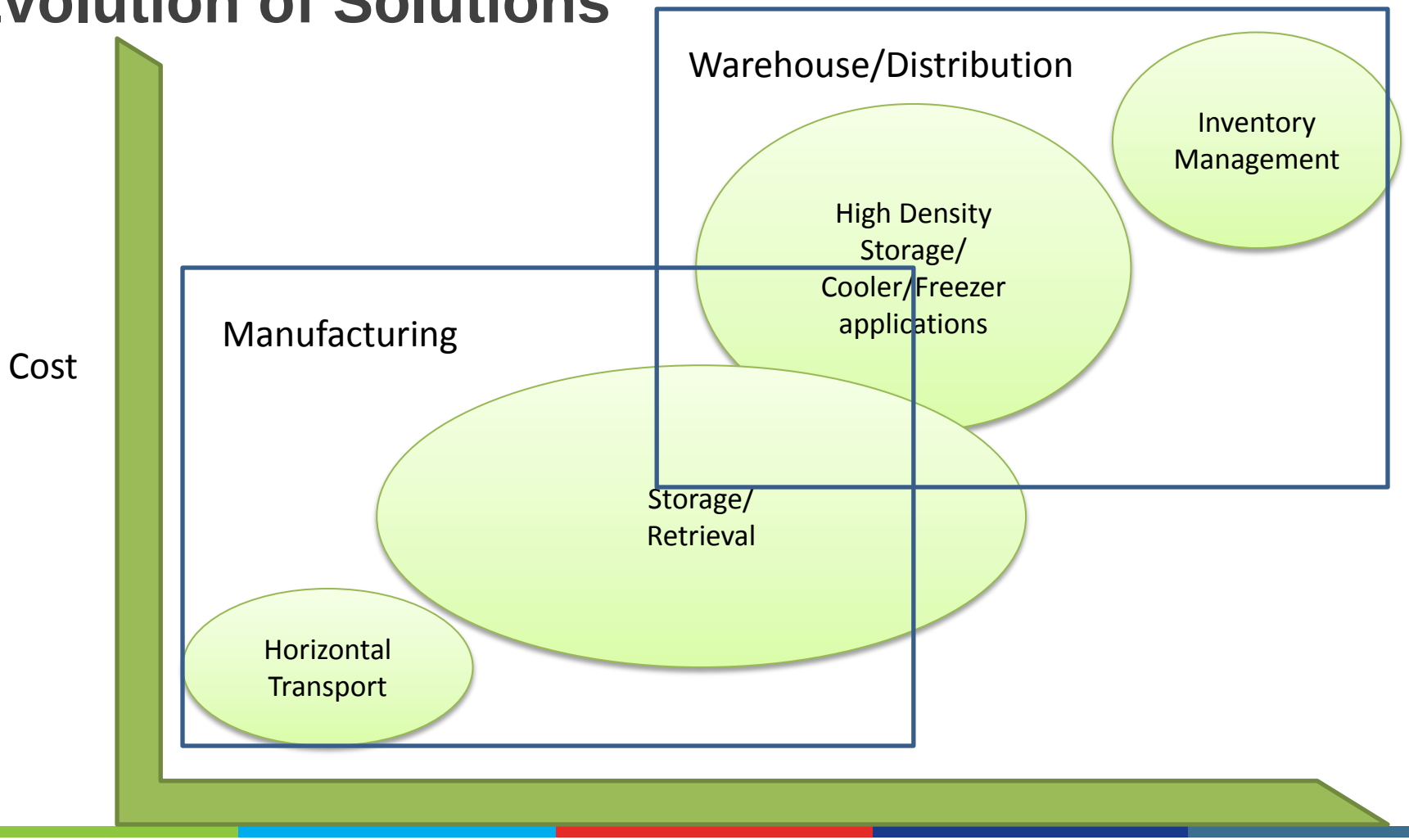
TOYOTA
MATERIAL HANDLING U.S.A.

TRANSBOTICS

History of AGVs

- Modified tow-tractor in 1953 for grocery warehouse
- Traditionally Unit loads (pallets)
- Evolved into manufacturing workstreams
  - Unit load carts
  - Tow carts
  - Counterbalanced trucks
- Modern growth in warehousing and distribution facilities
  - Narrow aisle (reach style trucks)
  - Very narrow aisle (VNA trucks)

Evolution of Solutions



What's available…

- Applications
  - Horizontal transport of pallets, cases, totes
  - Storage and retrieval of materials
  - Inventory management, replenishment for distribution and order fulfillment
- Safety – Share work space with people and manual vehicles
- Integration – tightly integrated with WMS, ERP
- Navigation – single or multiple systems without changes to environment

Historically, AGVs have been more purpose-built for each project encountered – the trend today is to more modular and "standardized" products – similar to their ForkTruck ancestors where they can be easily "configured" for unique projects.

Horizontal Transport

Project Description/Features

- Assembly line fulfillment
- Tunnel under jack-pin style AGC
- Spot guidance augmented by Inertial Navigation
- Traffic Management optimization
- Transports loads of over 5,000 lbs.

Project Benefits

- Improved productivity & operations
- Improved safety
- Requires minimal space
- Reduced labor costs
- Increased facility throughput
- Rapid ROI

Horizontal Transport

Objective

- Deliver steel sheets to laser cutting machine
- Deliver components to work stations
- Negotiate tight layout with disrupting operations

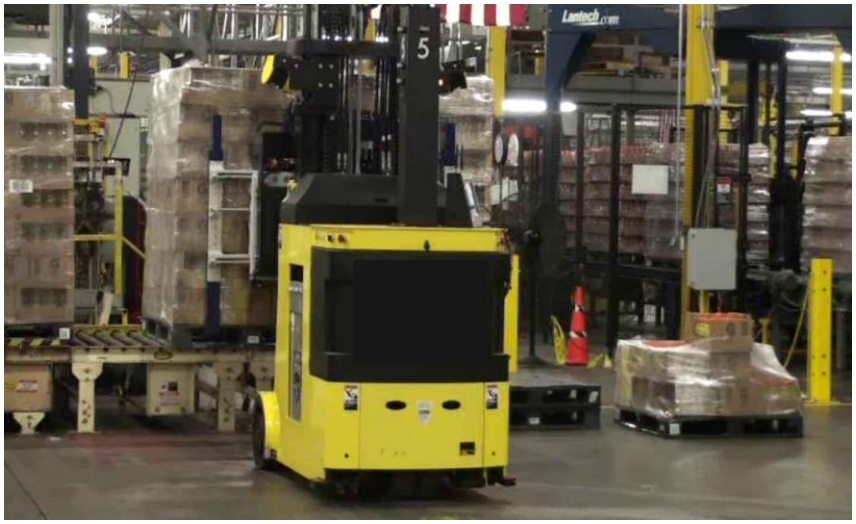
Solution

- Unit load, lift deck AGVs
- Wireless navigation, di-directional travel
- Call/send pushbutton stations

Results

- Timely delivery of steel and components
- No modifications to existing equipment
- Two way travel in and out of machining area

EOL to Storage or Shipping



Project Description

- Pick up full pallets of bottled beverages from 12 stretch wrappers
- Deliver to storage lanes or directly into outbound trucks

Solution

- 20 AGVs with single double attachment
- Integrated to WMS

Results

- 2 year payback
- Reduced plant and product damage
- Eliminated “lost” product and product returns

Receiving & Putaway

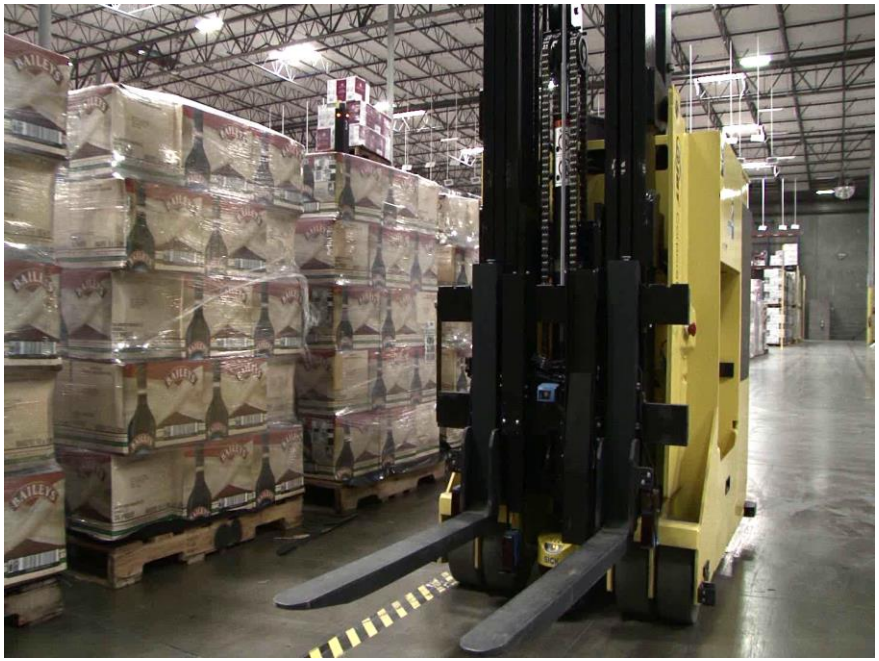
Project Description/Features

- Transport of finished goods to the warehouse
- 10+ Laser Guided Tugger AGVs (65,000 lb cap)
- IP-65 rated for outdoor operation
- Integrated with AS/RS and WMS
- Automated hitch engagement

Project Benefits

- Improved safety
- Reduced labor costs
- Improved material tracking
- Increased facility throughput
- Rapid ROI

Storage & Retrieval



Project Description

- Automate storage/retrieval in 780,000 sq. ft. DC containing 700,000 cases

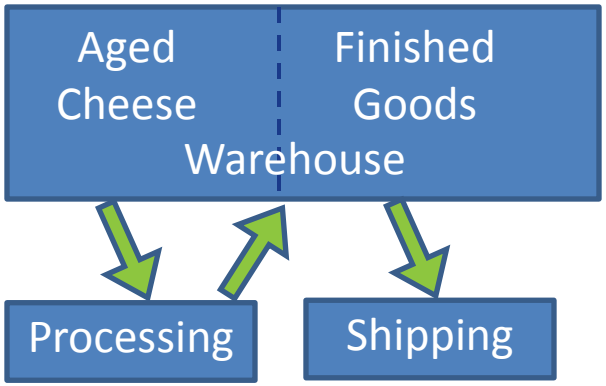
Solution

- 5 laser guided AGVs store/retrieve product in lanes
- AGV mounted bar code scanner identifies product
- Integrated with WMS

Results

- Improved inventory accuracy
- Reduction in breakage & energy costs
- Flexibility/scalability/mobility
- Payback 1.5 years

Inventory/Materials Management



Project Description

- Automate product movement in dairy warehouse
  - Aged cheese from warehouse to processing area
  - Processed cheese to warehouse
  - Finished goods to shipping

Solution

- 10 laser guided AGVs operating in chilled areas
- AGV system installed in phases

Results

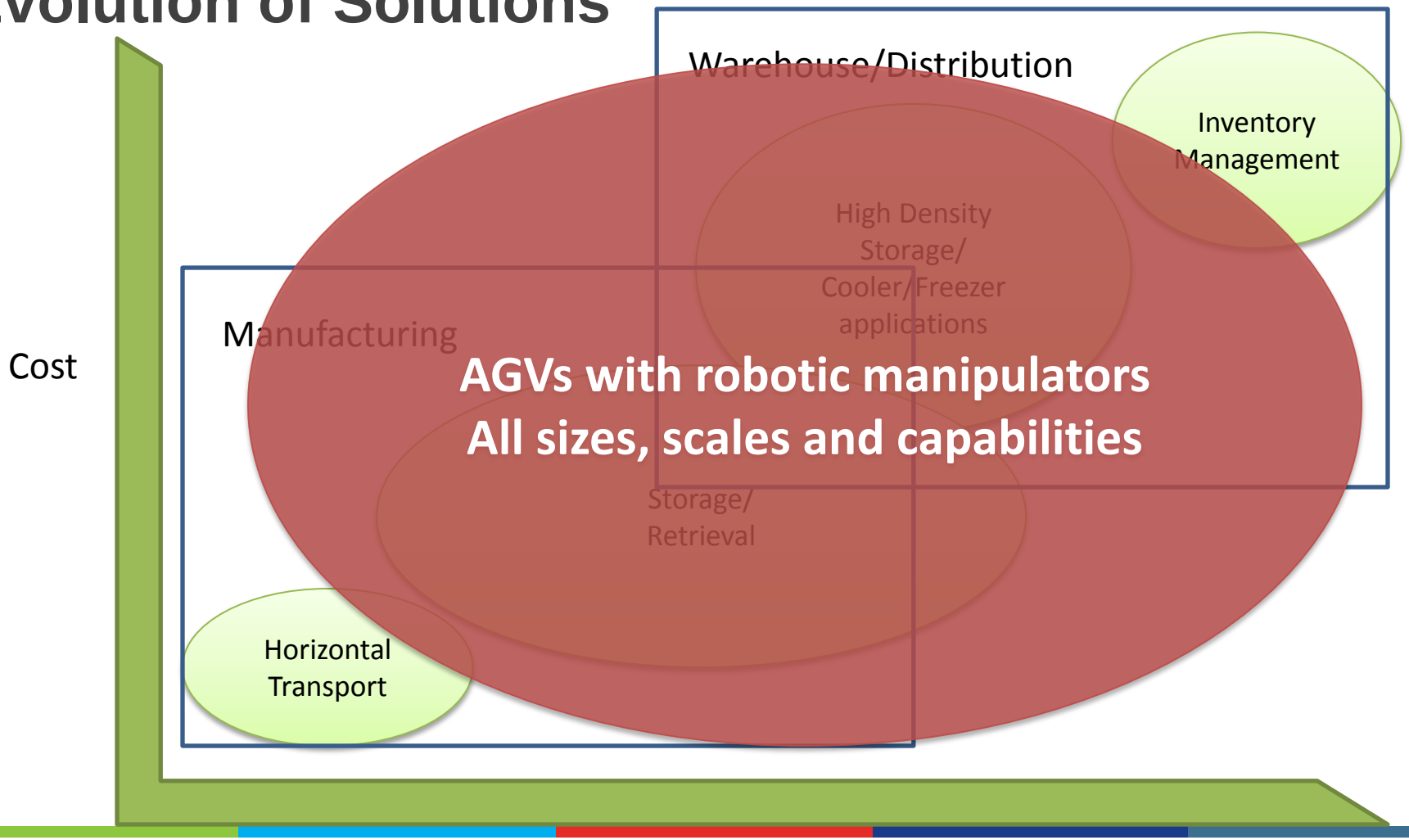
- Under 2 year payback
- Reduced labor and product damage costs
- System is flexible for future changes

What's to come…

- Applications – more complex load handling attachments
  - Items (eaches), small tote handling
  - Interfacing with other intralogistics 4.0 technologies
    - Buffer systems, Goods to person, Person to goods, Robots to goods/person

- Safety – Obstacle monitoring vs detection
- Integration – across the complete enterprise
- Navigation – no knowledge of environment
- Full "lights-out" warehousing and order fulfillment solutions – 90% reduction in overall labor requirements

Evolution of Solutions

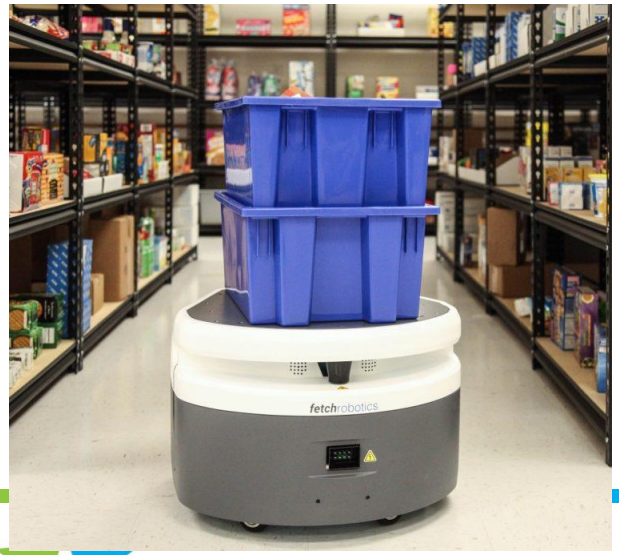


The beginning…

- Returning to where it all started
- Navigation and control were disruptors
- Kiva recognized as trend setter
- Amazon paid $750M for the patents and technologies
- Disruption not willing to share with market

Segment is exploding

- Initial entry is manual picking/putting to totes
- Over 10 unique companies at Modex 2016
- Labor efficiency increases in automating longer transport to packing/shipping operations (keep the pickers picking)



The trend continues…

- Fully automated picking and “teaches” movement throughout the supply chain
- Convergence of robotics and AGV mobility to address increasing labor challenges
- Bleeding edge, lots of concepts, who pushes All-In first?

The Amazon Picking Challenge

The Wild West of Automation

- Powerful Technology being Generated
- Lots of Venture Capital Funding Available
- Market Growth Projections are Huge

- There will be Winners and there will be Losers

For More Information:

Speaker emails:

Bryan.Knott@Dematic.com

Website: www.dematic.com

Mark.Longacre@JBTC.com

website: www.jbtc.com

Or visit ProMat Booths ##### & #####