

INTERNATIONAL ASSOCIATION OF



BAGGAGE SYSTEM COMPANIES

Technology & Innovation

Mobile Robots

January 12, 2017

Goals of Session

- Highlight goals and typical issues with baggage handling systems
- Introduce Mobile Robot technology
- Mobile Robot applications

Goals of Baggage Handling Systems

1. Deliver all bags to the plane on time
2. Accurately sort bags efficiently
3. Facilitate bag screening in an efficient manner
4. High Reliability and Maintainability
5. Minimize Capital and Operating Expenses



Traditional Baggage Handling Means

Traditional Baggage Handling System Equipment



Belt Conveyor



Tilt Tray Sorter



ICS



DCV

Other Baggage Handling Equipment



Tug



Hand Carts

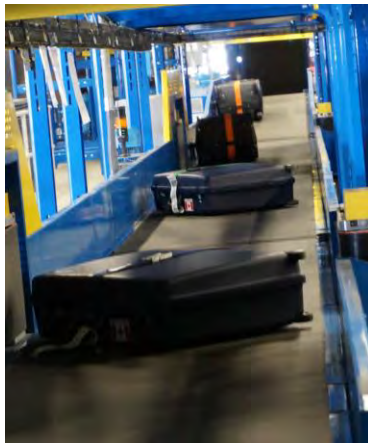


Belt Loader

Traditional Belt Conveyors

Benefits

- Tried and true
- Robust design
- Simplicity
- Lots of experience



Common Issues

- Bag jams
- Bag tracking accuracy
- Lack built in redundancy
- Difficult to reconfigure
- Constructed for future demand
- Noisy
- Dirty
- Energy hogs
- Access and Egress

Mobile Robot Applications



Parts Delivery



Assembly Systems

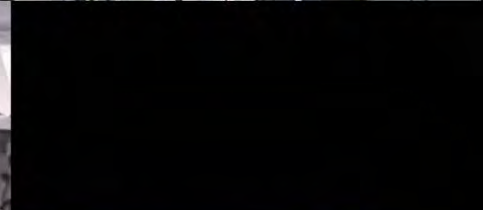
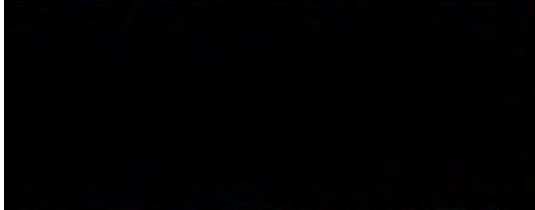
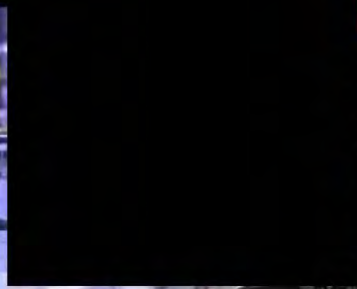


Warehouse Material Handling Systems



Finished Goods Delivery

IABSC



Top Reasons for Mobile Robots

1. Lowest **Cost of Ownership** Over Other Systems
2. Solves **Ergonomic** Issues in Operations
3. Provides Unmatched **Flexibility** in the Process
4. Reduces Non-Value Added Labor
5. Eliminates Unnecessary Lift Assist Devices
6. Ease of **Expansion**
7. **Invest for Current Demand** / Expand with Demand
8. **Reduces Installation** and Commissioning Time
9. **Positive Part Tracking**
10. Eliminates Fixed Monuments

Possible Uses for Mobile Robots at Airports

1. Check-In
2. Bag Transport
3. Security Screening
4. Baggage Search Operations
5. Buffering
6. ULD Handling



Traditional CBRA Room Challenges

- Ergonomics - “No Lift”
- Rigid Construction
- Limited Expandability
- Accessibility and Egress
- Noise





Mobile Inspection Table Key Benefits

- **Design**
 - Flexible
 - Redundancy
 - Cross utilization of search positions
 - Reduced CBRA room size >25%
 - Future expansion
 - Room accessibility / Egress
- **Implementation**
 - Reduced installation time >50%
 - Fast and easy to expand

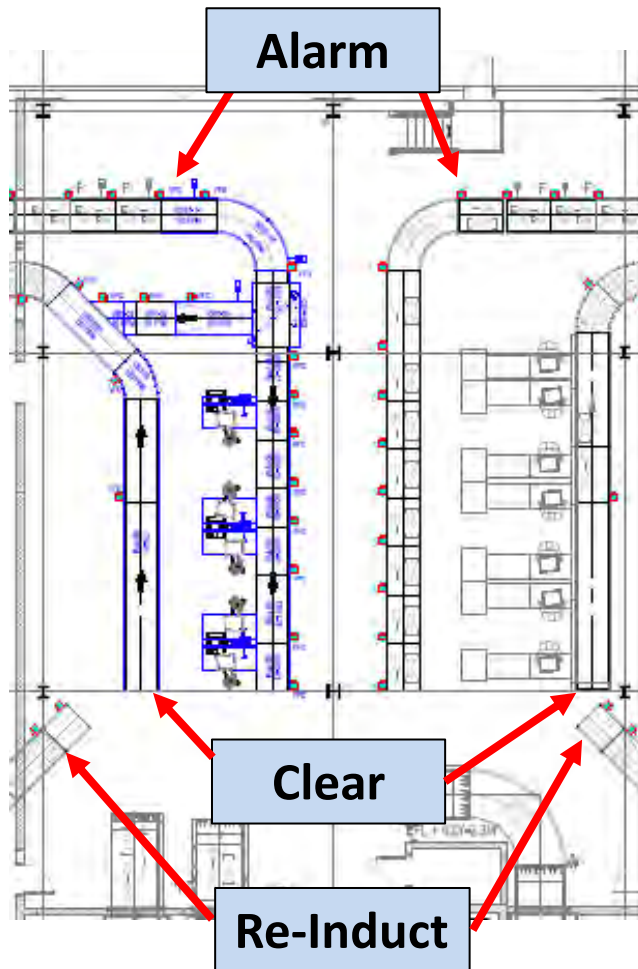


Mobile Inspection Table Key Benefits

- **Utilization**
 - “Goods to Person” efficiency
 - Ergonomic
 - Positive Bag Tracking
 - Significant Noise Reduction
 - Energy Savings >60%
 - Offline maintenance



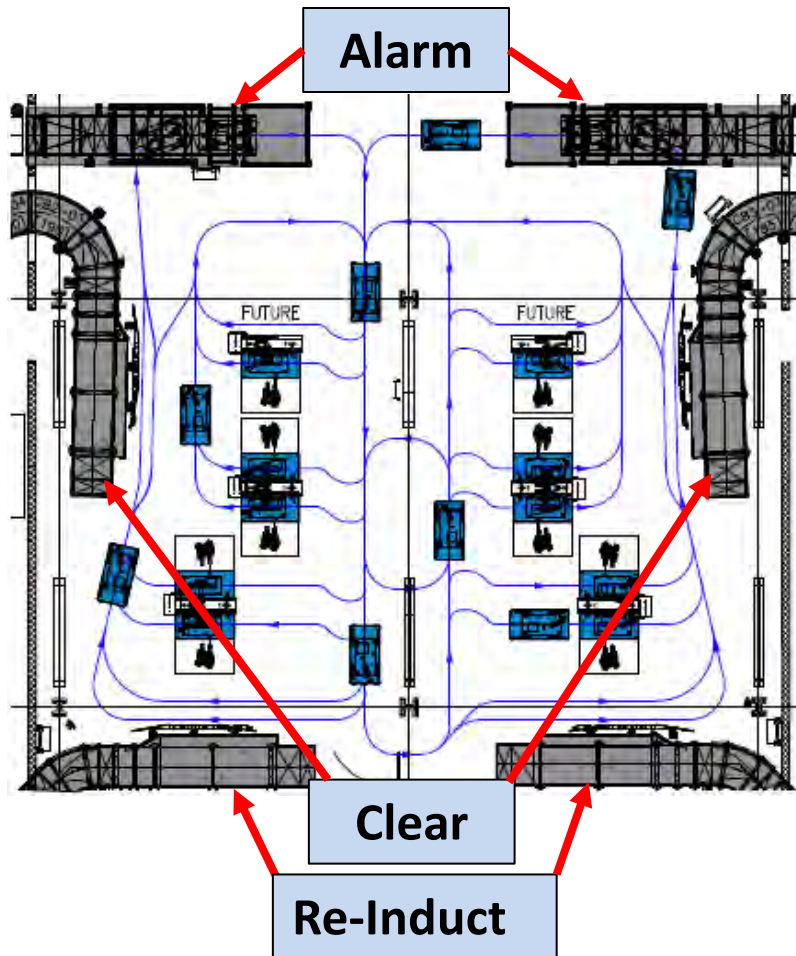
Case Study #1: Shared CBRA



- **Limitations**

- Room accessibility / egress
- Underutilized search positions
- Lifting required to re-induct bag
- Room Access

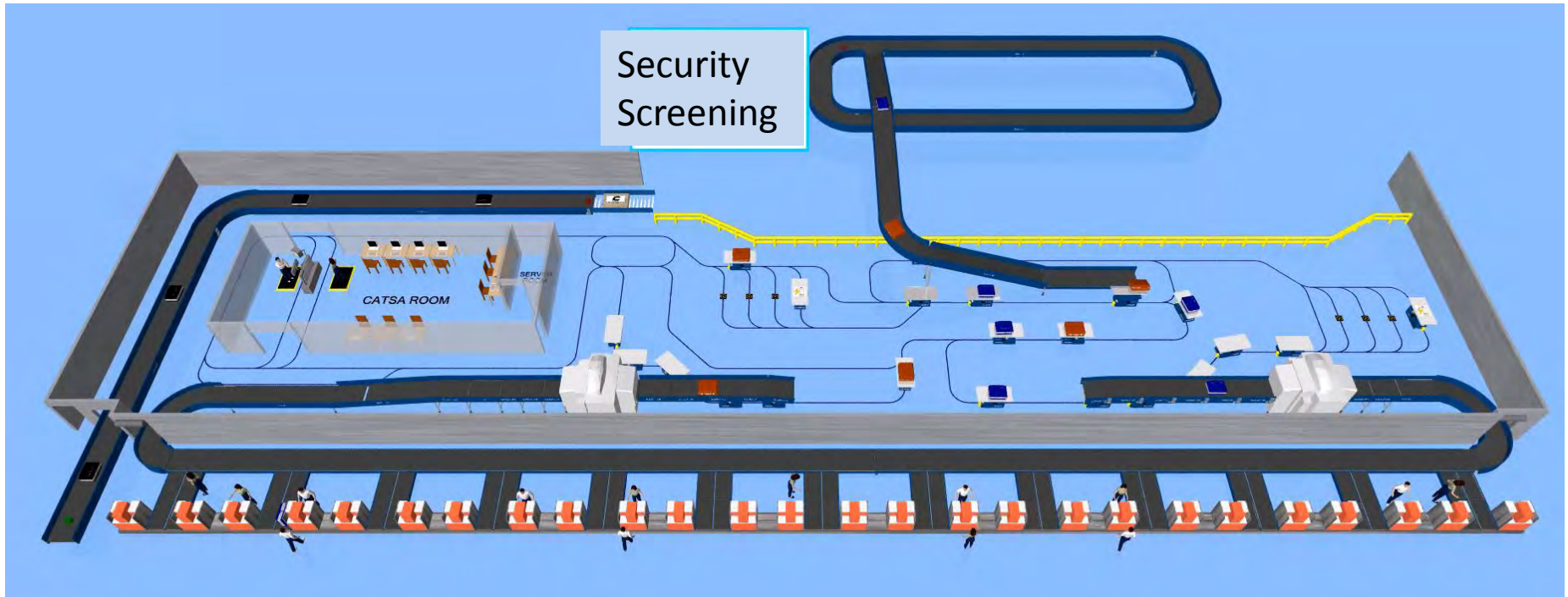
Case Study #1: Shared CBRA



- **Benefits**

- Cross utilize all search positions
- No Lifting required to re-induct bag
- Room for additional buffer capacity
- Open Room Access

Case Study #2: Security Screening



Closing Summary

- North American BHS technology has been slow to evolve in the past 20+ years
- The Industry can benefit from technologies used in European Airports and in Material Handling
- Essential to utilize equipment in the right application