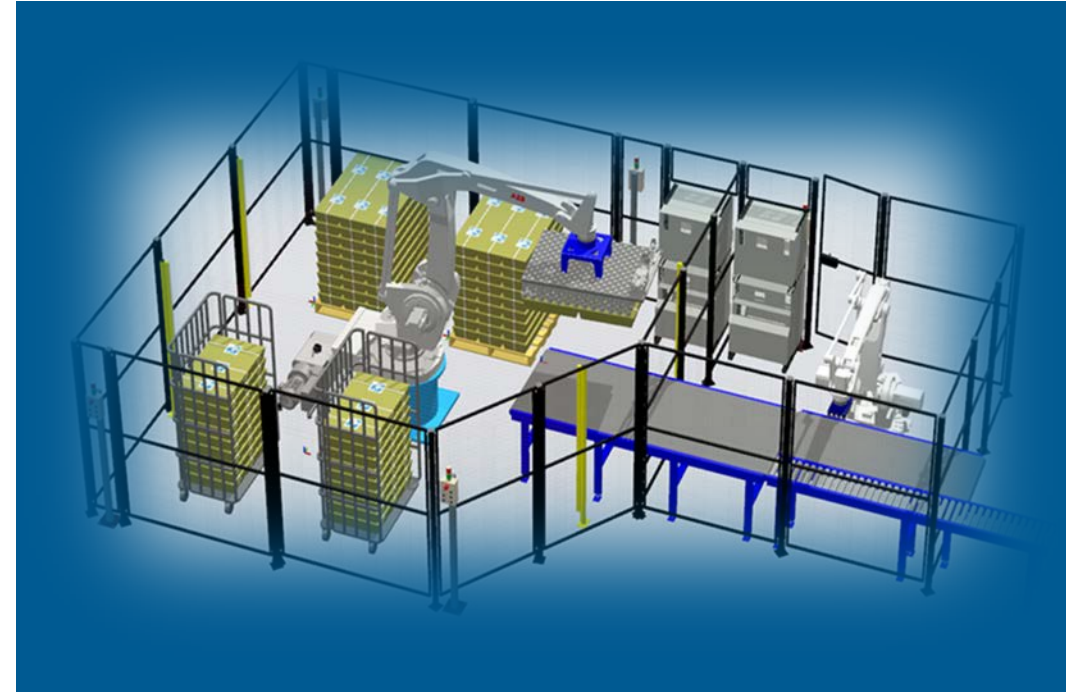


Robotics and Machine Vision



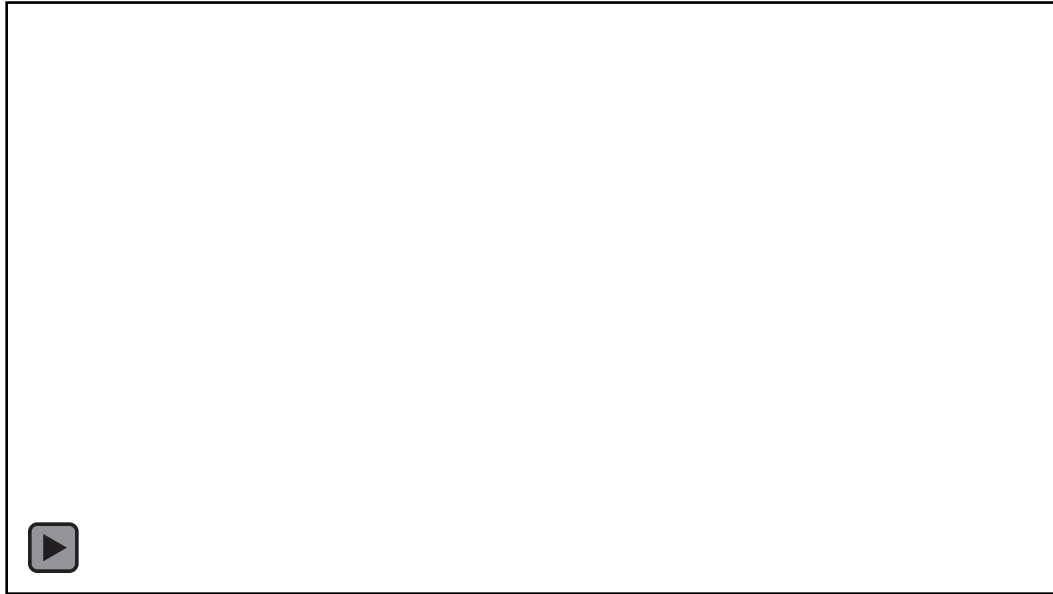
Agile Automation for Best-In-Class Mail and Package Processing

- State-of-the-art machine vision and learning is enabling the application of industry-standard technology to work within the Postal Service environment
 - We see every kind of package
 - We operate in hundreds of different buildings
 - We have a broad diversity of package shapes
- Robotics and smart automation is being applied in three areas
 - Adding vision-guided robotic automation to existing package processing platforms
 - Autonomous vehicles to move packages and letters
 - Autonomous robots sorting packages



Adding Vision-Guided Robotic Automation to Existing Package Processing Platforms

- Improve package sorter operational availability
 - Self-learning machine-vision technology
 - Standard industrial robots
 - Innovative end-of-arm tooling robot “hands”



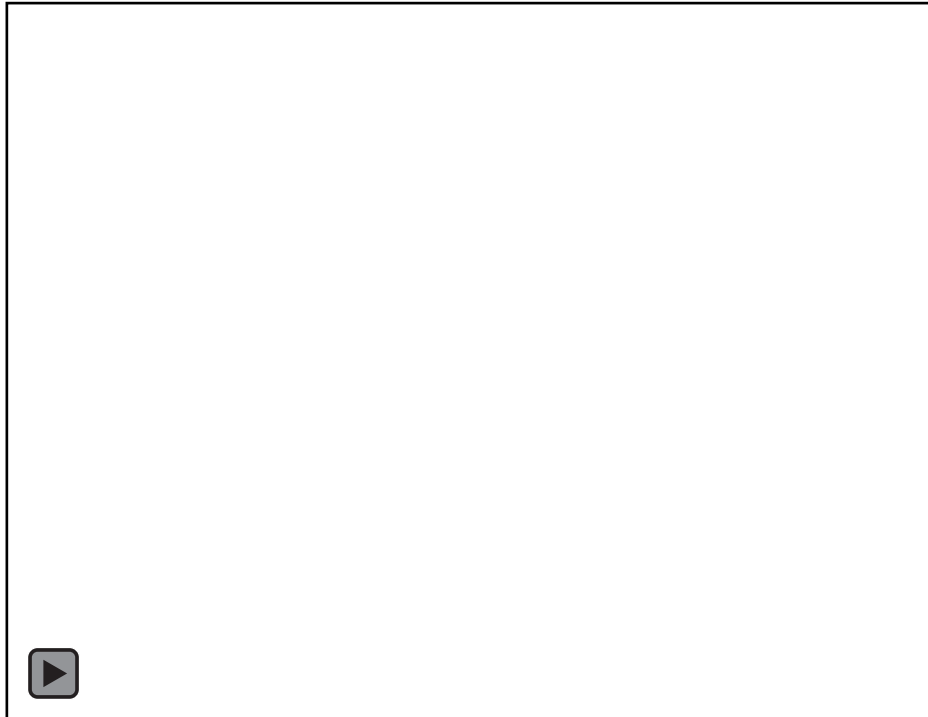
Autonomous Vehicles to Move Packages and Letters

- The Postal Service currently has over 300 Automatic Guided Vehicles (AGVs) in operation
- The next generation equipment can operate in an autonomous swarm
- The enhanced obstacle avoidance and omni-directional movement allows this generation of vehicles to operate effectively, even in crowded hybrid environments full of people, mail, and conventional fork trucks



Autonomous Robots Sorting Packages

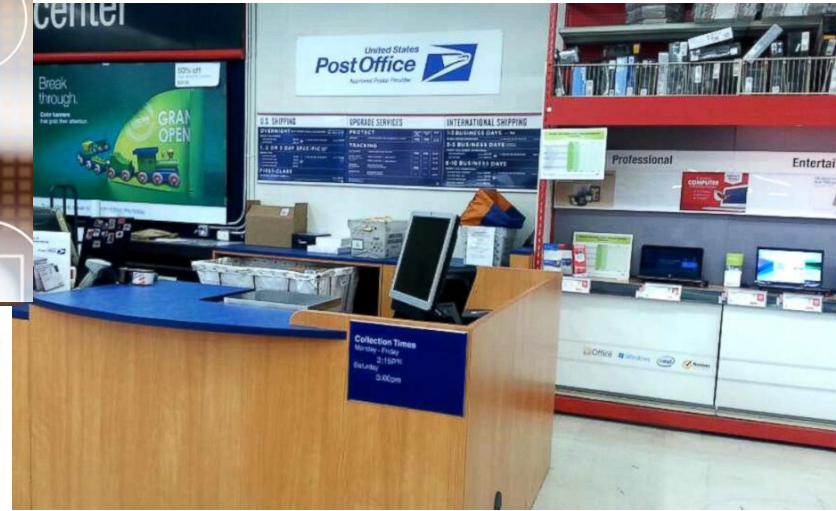
- A fleet of autonomous mobile robots roams through a matrix of containers sorting packages
- Replaces a manual operation
- System can be modified, expanded, and relocated simply and quickly
- Includes a scanning solution to increase visibility



Modernizing Retail Experience

Modernized Retail Post Office Network

- USPS's 10-Year Plan contains a broad range of ambitious retail goals. Correctly prioritized and executed, it will transform the Post Office.
- **Expand Services and Increase Post Office Accessibility to Better Serve Local Communities**
 - Streamline and draw customers to Self-Service through contactless, rapid label printing and package drop-off
 - Leverage Label Broker, offering additional print services
 - Expand identity services (Passport, fingerprint capture, and in-person proofing)
 - Revamp Parcel Lockers for customer ease of use and convenience
 - Emphasize solutions for small to medium businesses such as micro-warehousing and shipping
 - Draw customers in with strategic marketing on new Retail innovations



Improving the Automation Environment

Delivery Point Sequencing (DPS) Optimization: Overview



86.1B DPS Vol./YR



2.6B Carrier Route Vol./YR



2.0B Manual Vol./YR



Adding 1.3M DP/YR

DPS Improvements

- Improve quality of mail sortation
- Increase volume of letter mail pieces sorted to delivery point
- Communicate Weekly
- Ongoing Training

Data Driven Solutions

- Develop KPI and compare baseline to current values
- Pilot sites
- National deployment initiatives

Future State/Activities

- Clear backlog of Missing Delivery Points and No Record addresses
- Sort program software enhancements to automatically include backflow bins

DPS Optimization: Initiatives

- Identifying root causes of mail falling out of DPS
- Analyzing and streamlining mail flow processes
- Refining and updating Address Database
- Reducing At Risk Metrics
- Implementing software enhancements
- Reducing No Record Undeliverable As Addressed (UAA)



Automation Mail: Barcode with Padded Zeros

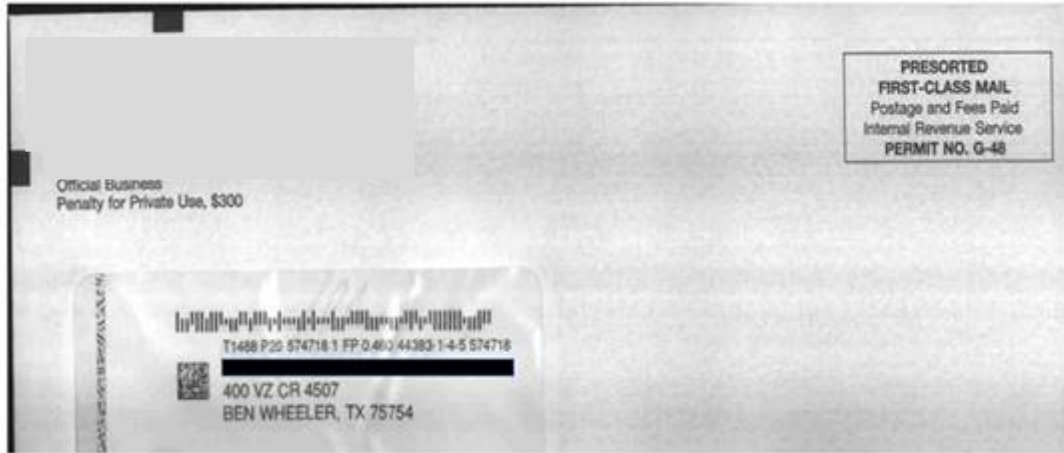


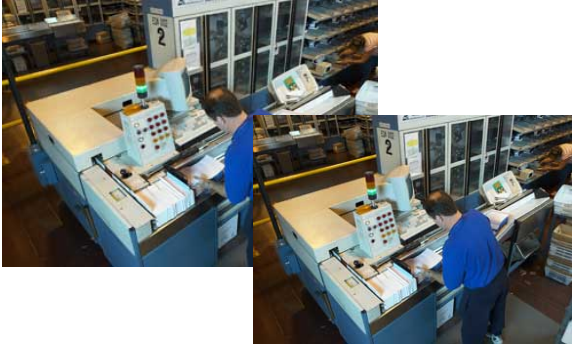
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75099	001	076	483	75801-000000	n/a	42	3	3	Wed Apr 28 12:17:30	483FMM00.EBF	
75099	020	006	918	75801-000000	75801-	47	3	3	Wed Apr 28 17:53:27	LV75801U.EBF	

Delivery Point Sequencing (DPS) Optimization: Manual vs. DPS Processing

Manual



Incoming mail is sorted on DBCS machines. Non-DPS mail consists of rejects and mail sorted only to 5- or 9-digit addresses



Clerk receives non-DPS mail at the Delivery Office



Clerk separates the mail for each carrier



Carriers case each delivery point before departing for their route

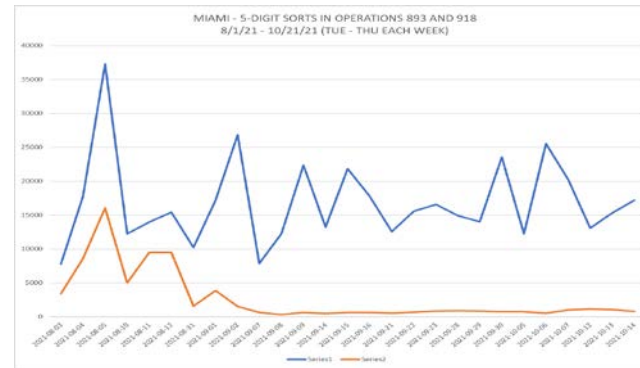
Backflow for 5-digit mail



Incoming mail is sorted on DBCS and 5-digit barcoded mail sent to Bin 6



Bin 6 mail staged and processed on DIOSS machines for upgrade. Then sent to DPS runs



Extra Backflow process reduces 5-digit Residue/Reject mail in DPS Pass 1

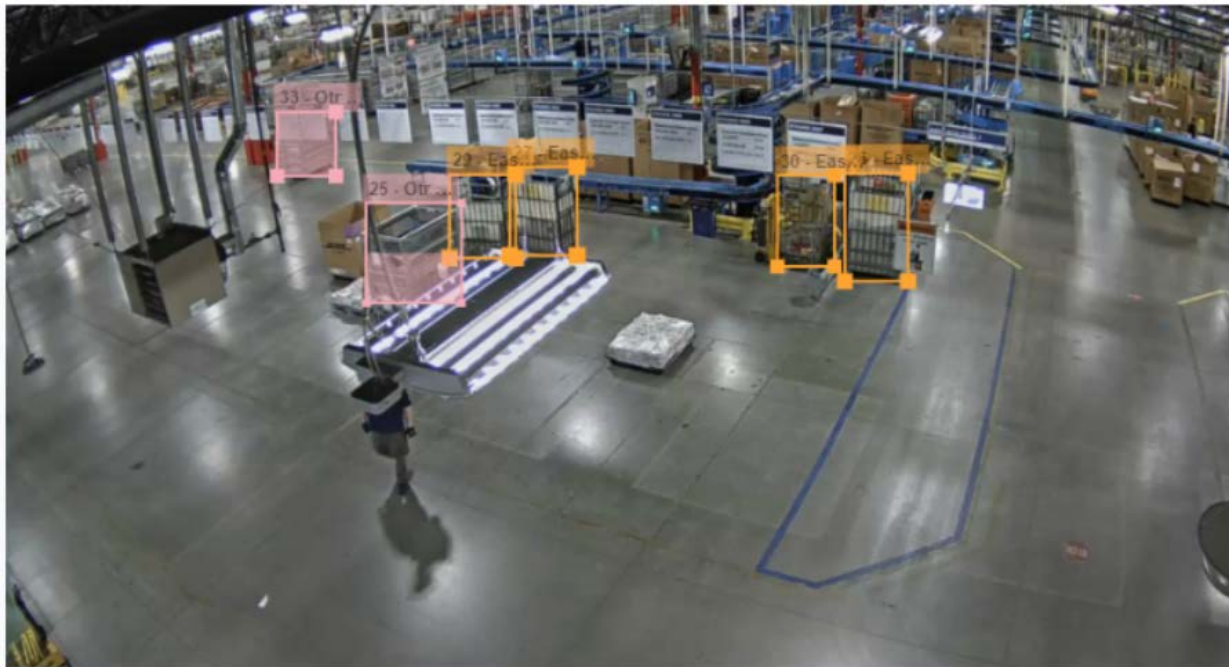


Fewer pieces handled by Clerks and Carriers

Camera and Machine Vision Technologies

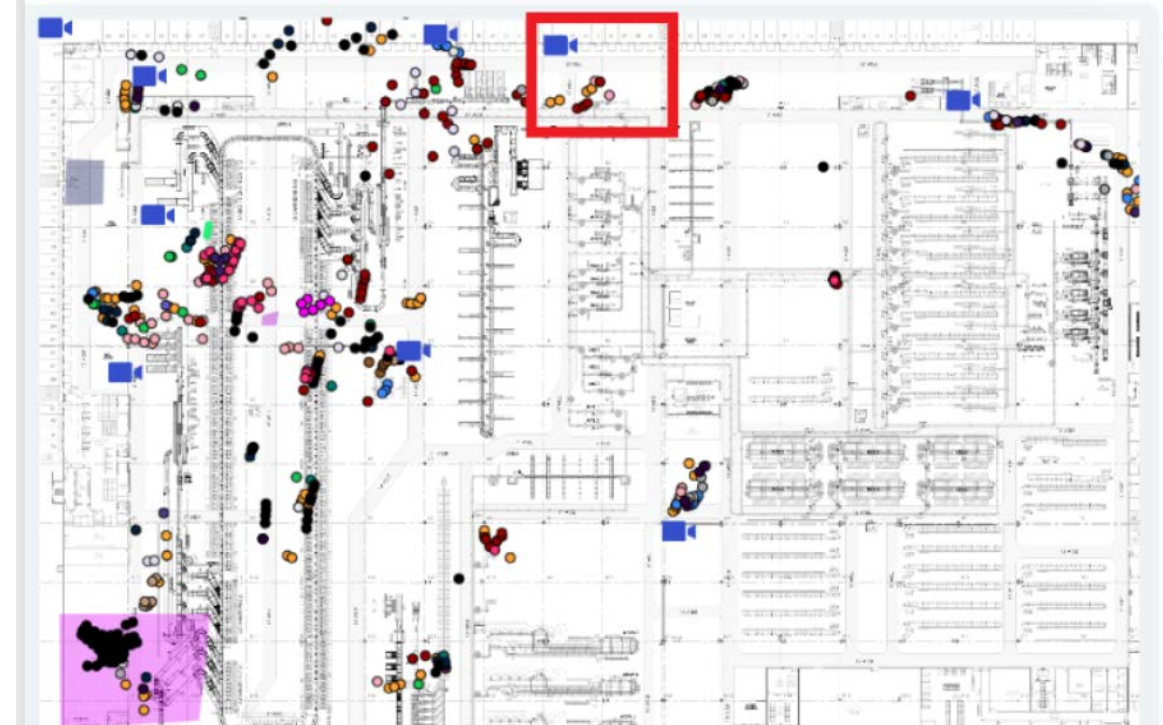
Phase 1 (Peak 2021)

- Real-time visibility
- Peak season remote management through camera views in 44 PSA and 30 Priority sites



Phase 2 (Peak 2022)

- AI analyzes images to recognize programmed thresholds
- Local management notified through centralized dashboards



Conclusion

Delivering for America: 10-Year Plan

CTO is the Facilitator of Change

- **Over \$40 Billion in Capital Investments that align with our Initiatives/Business Lines**
 - \$20 billion towards our mail and package processing network, including USPS facility space upgrades and procurement of new processing equipment
 - \$19 billion towards our retail and delivery network, including upgrades to retail lobby spaces and acquisition of a Next Generation Delivery Vehicle fleet
 - \$2 billion in technology upgrades, including upgrades to major IT systems

