Internal Measurement
through
Informed Visibility™

PRC Technical Conference

UNITED STATES POSTAL SERVICE®

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- Informed Visibility Overview
- External First-Class Mail Overview
- Internal Measurement Overview
- Comparison of Current and Future States

Informed Visibility™ (IV)

IV is an enterprise system that will be a real-time single source of mail and mail aggregate information.

IV will leverage data to provide business intelligence for USPS functional groups and the mailing industry, providing:

- Mail Inventory Management of Mail and Packages

- Predictive Workloads on Mail and Packages

- End-to-End Tracking of Mail

- Event-Driven Internal Measurement of all Mail

- Real-Time Service Performance Diagnostics

- Ease of Use

for Mail Processing

- **Mail Inventory Management and Predictive Workloads**
  - Inbound, On-hand, and Ready to Process Inventory (volumes, location in process, mail make-up and service window)
  - Inventory based Run Plans (resources needed, run start time, expected throughput, expected end of run)
  - Real-Time Processing Status (throughput, cycle-time, mail at risk, service performance, and alerts)
  - Outbound Inventory (maximizing transportation)

IV will automatically create an optimized Run Plan for the day's workload, based on actual mail volume, allowing improved utilization and efficiency

IV's forecasting capability will enable the planning of resources days in advance

for Transportation

- **Real-time monitoring of inventory**
  - Alerts for missing containers at unload or load
  - Arrival profile and Dispatch ready profile

- **Real-time monitoring of transportation status and locations**

- **Real-time simplified data capture for mail aggregates (handling units, containers and transportation)**

IV will optimize transportation utilization by coordinating schedules to align with dispatch ready volumes

IV will provide alerting mechanisms for transportation variances allowing operations to proactively adjust

for Delivery

- **Mail Inventory Management and Predictive Workloads**
  - Real-time Volume Arrival Profile
  - Inbound, On-hand, and Out for Delivery Inventory by route
  - Facilitates Optimized Dynamic routing and workload balancing
  - Facilitates automated volume recording
  - Generates Carrier Manifest by route (accountables, trays, bundles, etc.)

IV forecasting capability will enable the planning of resources in advance

IV mail volume data for all routes can assist in replacement of current legacy systems

Existing
External First-Class Mail (EXFC) Overview

- The External First-Class Mail measurement system (EXFC) is an external system maintained by a contracted third party vendor

- EXFC measures the transit time from deposit of mail into a collection box or lobby chute until its delivery to a home or business for single-piece First-Class Mail letters/cards and flats

- EXFC uses test mail pieces designed to represent characteristics and flow of single-piece First-Class Mail

- Roughly 1,200 independent contractors called "droppers" seed pieces into randomly selected collection boxes and nearly 14,000 "reporters" receive EXFC test mail and report the receipt date

- The EXFC system covers 892 3-Digit ZIP Code areas

- The EXFC sample design for single-piece First-Class Mail is based on destinating mail volume targets by district and service standard

- Average mail volume calculated from 12 prior months ODIS data is used to determine the origin-destination EXFC test pieces

- The minimum destinating mail volume targets for most districts are currently

  - Two-Day – 3,735 pieces
  - Three-To-Five-Day – 4,185 pieces

- In FY15 Q2 approximately 580,000 pieces will be used for EXFC reporting (out of the ~6 Billion single-piece FCM pieces)

- Service performance scores are determined by the extrapolation of the EXFC test/sample pieces

- Scores are calculated as weighted averages where each test piece is weighted by ODIS volumes to represent the population of single-piece First-Class Mail

- Margins of error for performance estimates are based on a 95% confidence interval

- National level error margins for FY15 Q1 quarterly score were

    +/- 0.13% for Two-Day

    +/- 0.21% for Three-To-Five-Day

- Margins of error vary more greatly at the Area and District levels for origin/destination composite scores

| FY15 Q1 Precision	Two-Day	Three-To-Five-Day
Area Average +/- Range	0.32%	0.38%
Area Maximum +/- Range	0.43%	0.46%
District Average +/- Range	0.81%	1.09%
District Maximum +/- Range	1.59%	2.28%

Internal Measurement Overview

for Service Performance Measurement

- **End-to-End Measurement**
  - One Consolidated Mail Measurement System (single-piece and presort)
  - Measuring Nearly All Mail
  - Event-driven Service Scores

IV leverages Mail Visibility providing a more comprehensive view of USPS service performance measurement

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FIRST MILE
(SAMPLING)
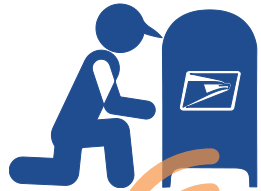
PROCESSING

LAST MILE
(SAMPLING)

MPE Scan rates in the high 90s

MPE   MPE   MPE

MDD ✱

Existing

IV

Processing Scores

MDD

✱

Not scanning every piece with device.

Encrypted Sampling Request (GPS based)

Encrypted Sampling Request (GPS based)

IV

RANDOM SCAN SELECTION

System polls 3-digit combos to ensure statistical precision.

Two Stage Approach

1. Scans of the collection box will be used to estimate the percent of mail collected on time.

    ▪ Boxes collected at or after the last pickup time for the day will have 100% of the estimated density counted as on-time collection.

    ▪ Boxes collected before the last pickup time will have a portion, x, of the estimated density counted as collected on time and 100-x counted as missed collection.

    ▪ If no scheduled collection is made, 100% of the estimated density would be counted as missed collection.

2. Carrier scans of mail pieces at randomly selected collection points will be used to determine the profile of mail from collection to first processing operation.

    ▪ Carriers will scan barcodes (IBI and IMb).

    ▪ The barcodes will be matched with scan data in IV to determine the first mile factor.

- **Collection Point Management System (CPMS) data**
  - CPMS data store has all collection box locations, to include:
    - Unique CPMS barcode
    - Pickup Times
  - USPS is capturing latitude and longitude for each collection box.
  - USPS will compare CPMS scan location to collection box location, to validate scan integrity.

- The estimates for collection timeliness and time from collection to first processing operation will be combined with collection box density data to calculate the first mile profile for each origin plant, representing the percentage of mail spending x days in first mile by first processing operation type:

First Mile Profile for Single-Piece FCM Letters/Cards

Origin Plant	FPO Type	Days in First Mile			
		0 Days	**1 Day**	**2 Days**	**3 Days**
Plant 1	Type 1	xx.xx%	xx.xx%	xx.xx%	xx.xx%
Plant 1	Type 2	xx.xx%	xx.xx%	xx.xx%	xx.xx%
Plant 1	Type 3	xx.xx%	xx.xx%	xx.xx%	xx.xx%

How challenging will it be to locate barcoded pieces at collection points?

- A study conducted in May 2012 in Northern Virginia yielded these results

    - 92% of collection boxes contained at least one piece with IMb; 75% of boxes contained more than three pieces with IMb

    - Of boxes sampled, the average total pieces per box was 25, with approximately 30% of pieces having an IMb

- Processing Duration Profiles for single-piece FCM letters/cards and single-piece FCM flats measured through MPE scans will be developed to estimate transit time from first processing operation through final automated processing operation

Processing Duration Profile – Single-Piece FCM Letters/Cards

Origin Plant	Destination 3-Digit ZIP	Service Standard	FPO Type	LPO Type	Mail Volume with Processing Duration			
					1 Day	2 Days	3 Days	X Days
Plant 1	006	2	1	1	nnn	nnn	nnn	nnn
Plant 1	006	2	2	1	nnn	nnn	nnn	nnn
Plant 1	006	2	3	1	nnn	nnn	nnn	nnn
Plant 1	006	2	1	2	nnn	nnn	nnn	nnn
Plant 1	006	2	2	2	nnn	nnn	nnn	nnn
Plant 1	006	2	3	2	nnn	nnn	nnn	nnn

- Every delivery day, delivery points will be randomly selected within each district by 3-digit ZIP Code, in proportion to the delivery points in the district.

- Carriers will be prompted to scan the barcode on mail pieces for the delivery point when he/she is within close proximity to the delivery point.

- The barcodes will be matched with scan data in IV to determine a last mile factor.

- The transit time between the anticipated delivery date based on final processing operation and actual delivery will be calculated for each piece to develop last mile profiles for the destination 3-Digit ZIP Code.

Last Mile Profile for Single-Piece FCM Letters/Cards

Destination 3-Digit ZIP Code	LPO Type	Days in Last Mile				
		-1 Days	**0 Days**	**1 Day**	**2 Days**	**X Days**
006	Type 1	xx.xx%	xx.xx%	xx.xx%	xx.xx%	xx.xx%
006	Type 2	xx.xx%	xx.xx%	xx.xx%	xx.xx%	xx.xx%
006	Type 3	xx.xx%	xx.xx%	xx.xx%	xx.xx%	xx.xx%

- To calculate the overall transit time for Single-Piece FCM, First Mile, Processing Duration and Last Mile profiles will be combined together, using the following approach:
  - Take all combinations of First Mile and Processing Duration for the origin plant and first processing operation type by multiplying the First Mile percentage estimates by the mail volumes, and adding together days in First Mile and Processing Duration time for each combination
  - Next, match the results with the Last Mile profile by destination 3-Digit ZIP Code and last processing operation type in the same manner to compute the volume of mail estimated to have total transit days as represented by:

  Total Transit Days = Days in First Mile + Processing Duration + Days in Last Mile

- The On Time Performance score is the total estimated volume of mail with Total Transit Days less than or equal to the service standard divided by the total measured pieces

- The calculation methodology assumes that transit time in First Mile, Processing Duration, and Last Mile are independent.

BARCODE EXAMPLES

FIRST MILE

PROCESSING

LAST MILE

MPE Scan rates in the high 90s

⚙ MPE ⚙ ⚙ MPE ⚙ ⚙ MPE ⚙

MDD

MDD

263,386 MDD devices are expected to be deployed by end of FY15

IBI

IMb

**LEGACY
EXTRA SERVICE**

IMb

ID Tag

FICS ID Tag

IBI

IMpb

**LEGACY
EXTRA SERVICE**

IMb

FICS ID Tag

IMpb

**LEGACY
EXTRA SERVICE**

Comparison of Current and Future States

First-Class Mail – Single-Piece

	Letters	Flats	Parcels
Current State	EXFC	EXFC	Start: Acceptance Scan Stop: USPS Tracking delivery scan
Future State	First Mile: CPMS Scan and Carrier Scan of Sample Mailpieces from Randomly Selected Collection Points Processing Duration: First processing scan to last processing scan Last Mile: Carrier Scan of Mailpieces from Randomly Selected Delivery Points	First Mile: CPMS Scan and Carrier Scan of Sample Mailpieces from Randomly Selected Collection Points Processing Duration: First processing scan to last processing scan Last Mile: Carrier Scan of Mailpieces from Randomly Selected Delivery Points	Start: Acceptance Scan Stop: USPS Tracking delivery scan

First-Class Mail – Presort

	Letters	**Flats**	**Parcels**
Current State	Start: Documented Arrival Time at Postal facility Stop: External Reporting	Start: Documented Arrival Time at Postal facility Stop: External Reporting	N/A
Future State	Processing Duration: Start-the-Clock to last processing scan Last Mile: Carrier Scan of Mailpieces from Randomly Selected Delivery Points	Processing Duration: Start-the-Clock to last processing scan Last Mile: Carrier Scan of Mailpieces from Randomly Selected Delivery Points	N/A

First-Class Mail – Single-Piece International

	Letters	**Flats**	**Parcels**
Current State	IMMS	EXFC as proxy	Single-Piece First-Class Mail parcels as proxy for Inbound International
Future State	Same as Current State	Same as Current State	Same as Current State

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Periodicals

	Letters	**Flats**	**Parcels**
Current State	Start: Documented Arrival Time at Postal facility Stop: External Reporting	Start: Documented Arrival Time at Postal facility Stop: External Reporting	N/A
Future State	Processing Duration: Start-the-Clock to last processing scan Last Mile: Carrier Scan of Mailpieces from Randomly Selected Delivery Points	Processing Duration: Start-the-Clock to last processing scan Last Mile: Carrier Scan of Mailpieces from Randomly Selected Delivery Points	N/A

Standard Mail

	Letters	Flats	Parcels
Current State	**Automation:** Start: Documented Arrival Time at Postal facility Stop: External Reporting **Non-automation:** Start-the-Clock: Wall barcode scan Stop-the-Clock: Wall barcode scan	**Automation:** Start: Documented Arrival Time at Postal facility Stop: External Reporting **Non-automation:** Start-the-Clock: Wall barcode scan Stop-the-Clock: Wall barcode scan	Start: Documented Arrival Time at Postal facility Stop: USPS Tracking delivery scan
Future State	**Automation:** Processing Duration: Start-the-Clock to last processing scan Last Mile: Carrier Scan of Mailpieces from Randomly Selected Delivery Points **Non-automation:** Start-the-Clock: Wall barcode scan Stop-the-Clock: Wall barcode scan	**Automation:** Processing Duration: Start-the-Clock to last processing scan Last Mile: Carrier Scan of Mailpieces from Randomly Selected Delivery Points **Non-automation:** Start-the-Clock: Wall barcode scan Stop-the-Clock: Wall barcode scan	Start: Documented Arrival Time at Postal facility Stop: Wall barcode scan Last Mile: Carrier Scan of Mailpieces from Randomly Selected Delivery Points

Package Services – Single-Piece

	Letters	Flats	Parcels
Current State	N/A	N/A	Start: Acceptance Scan Stop: USPS Tracking delivery scan
Future State	N/A	N/A	Same as Current State

Package Services – Presort

	Letters	Flats	Parcels
Current State	N/A	Start: Documented Arrival Time at Postal facility Stop: External Reporting	Start: Documented Arrival Time at Postal facility Stop: USPS Tracking delivery scan
Future State	N/A	Processing Duration: Start-the-Clock to last processing scan Last Mile: Carrier Scan of Mailpieces from Randomly Selected Delivery Points	Same as Current State