Postal Regulatory Commission
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UNITED STATES POSTAL SERVICE

INTERNAL SERVICE PERFORMANCE MEASUREMENT PLAN UPDATE

PRC Technical Conference

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August 26, 2016

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Agenda

- Background
- Internal SPM Milestones
- Barcoded and Non-Barcoded Mail
- First Mile Measurement
- Processing Duration
- Last Mile Measurement
- Overall Service Performance Calculation
- Statistical Validity
- Service Performance Report Comparison
- Planned Improvements

Background

Internal Measurement through Informed Visibility

On January 29, 2015, the Service Performance Measurement (SPM) Plan was published through the Postal Regulatory Commission (PRC) for public comment

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

2015

PRC issued order No. 2336 (initiated by Docket No. PI2015-1) and invited the public to comment on the proposed SPM plan **1/29/15**

Initial comments from public inquiry **4/8/15**

Reply Comments from Public Inquiry **4/22/15**

Chairman Information Request (CHIR) #3 **5/1/15**

USPS submitted Statistical Design Plan **8/25/15**

Chairman Information Request (CHIR) #4,5,6 **11/18/15**

Chairman Information Request (CHIR) #1 **3/24/15**

USPS submitted revised SPM Plan to PRC for review **3/24/15**

Chairman Information Request (CHIR) #2 **3/26/15**

PRC issues interim order on SPM Plan **6/17/15**

PRC Technical Conference #2 **10/28/15**

2016

PRC Technical Conference #3 **8/26/16**

Internal SPM Milestones

Legend
- Completed
- Upcoming

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

2015 | 2016 | 2017

Implemented Sampling Training Video
11/10/2015

IMDAS scanner enabled for Post Office box and collection route sampling
2/6/16

Delivery sampling cap increased from 5 to 15
2/16/16

Sampling workload increased to 3M requests per week to help train field
2/20/16

MDD modified to capture FICS ID tag
3/12/16

Implemented MyPO notifications for in-office PO Box sampling

Modified MDD voice to instruct scanning of Flats first for delivery sampling
3/7/16

Implemented Last Mile Diagnostic tool
3/30/16

Sampling workload decreased to 1.3M requests per week
4/2/16

IMD/MDD download mechanism updated to improve delivery and collection sampling
5/16/16

Implemented First Mile Diagnostic tool
8/10/16

Include Margin of Error in Reports

Include Retail Profile in SPFC Overall Score
10/14/16

Implement new SPFC Flat Collection Sampling Process
Q1 FY17

Q2 USPS Internal Service Performance Measurement

Nation

~3.5M
collection samples

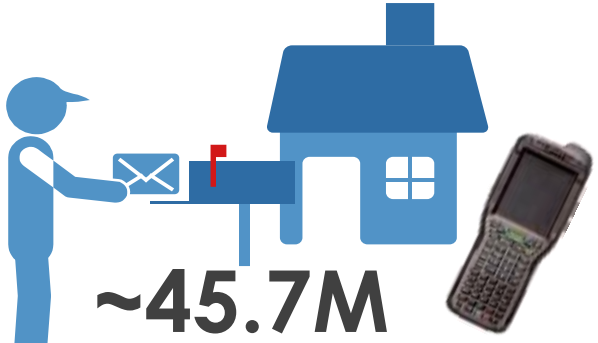
~75K
clerks trained

400k Employees Trained on Scanning and Sampling

~83.4B
scans

from 11.5K
automation equipment

~325K
carriers trained



~45.7M
delivery samples

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Single-Piece First Class® Mail Flow
Barcoded and Non-Barcoded Mail

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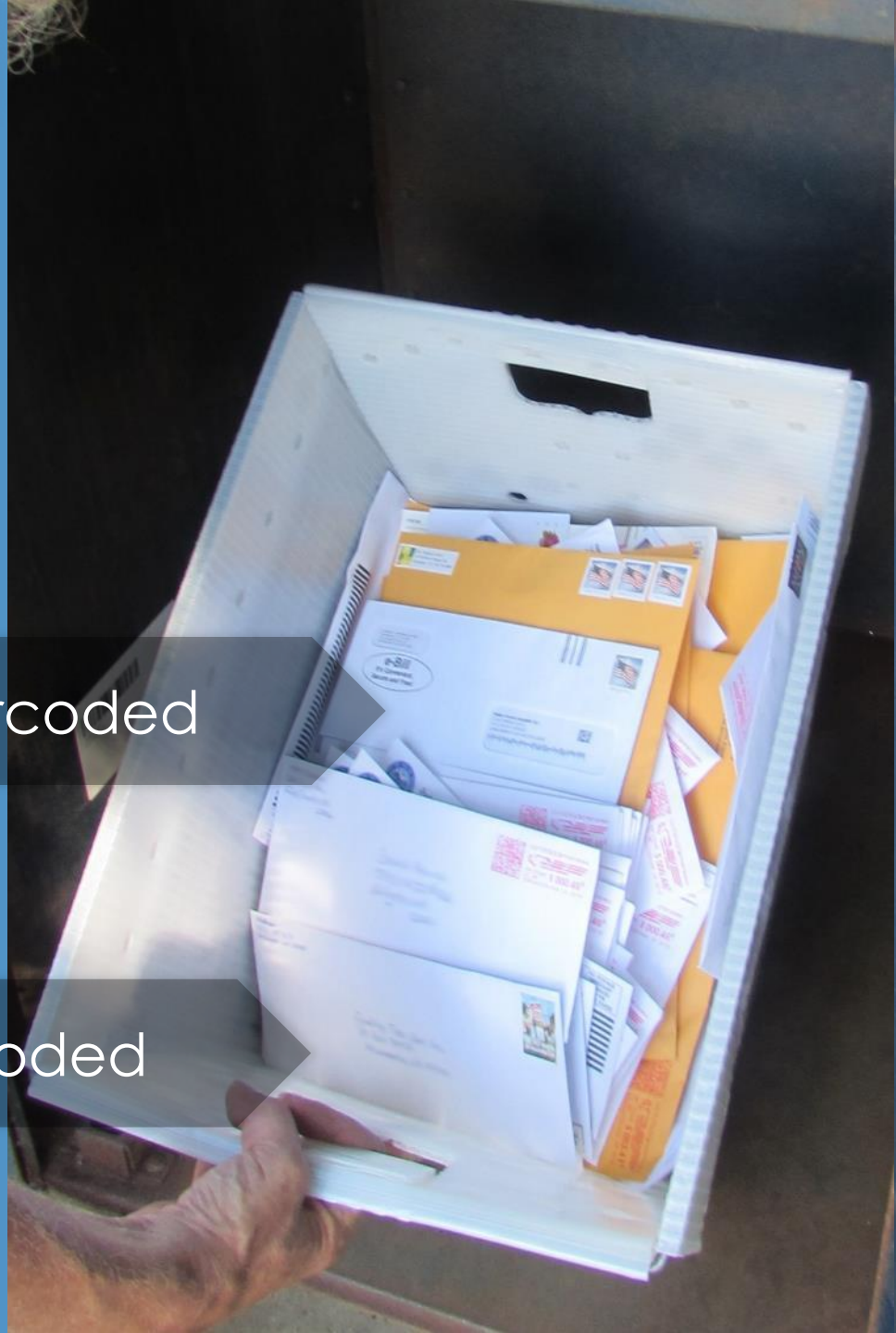
Collection points receive both Barcoded and Non-Barcoded Single Piece First-Class mailpieces

Barcoded mailpieces are sampled for 'Start-the-Clock' in First Mile



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Both Barcoded and Non-Barcoded pieces are consolidated into the same containers for efficient transport

not barcoded

barcoded

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Containers with both Barcoded and Non-Barcoded pieces are loaded onto the same equipment for cancellation

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Cancellation equipment culls and faces Barcoded and Non-Barcoded mailpieces

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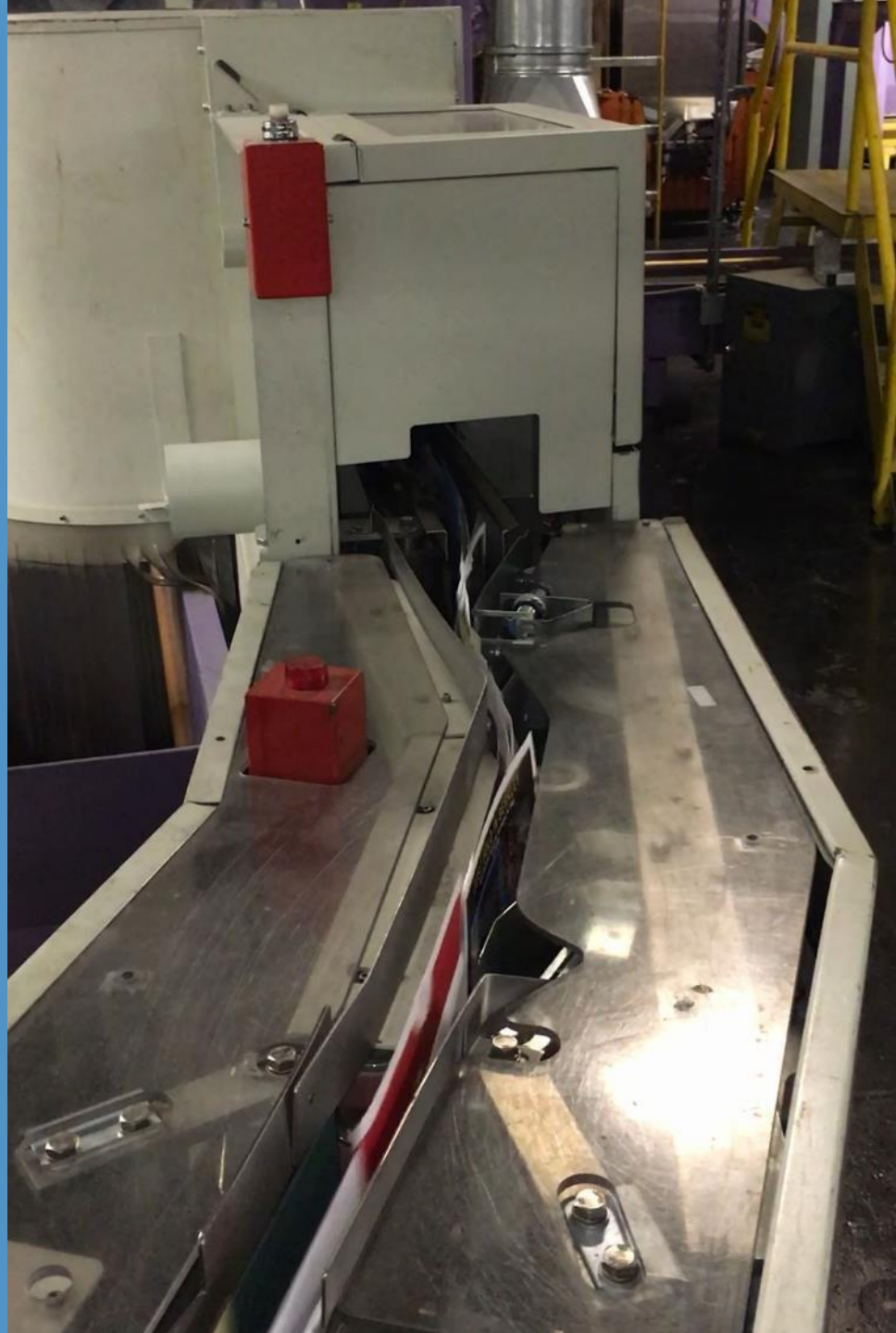
Processing equipment applies a USPS barcode on Non-Barcoded Mail

The equipment scan event 'Stop-the-Clock' for First Mile samples and 'Start-the-Clock' for Processing Duration on barcoded mail



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Processing equipment sorts barcoded mail for further downstream processing

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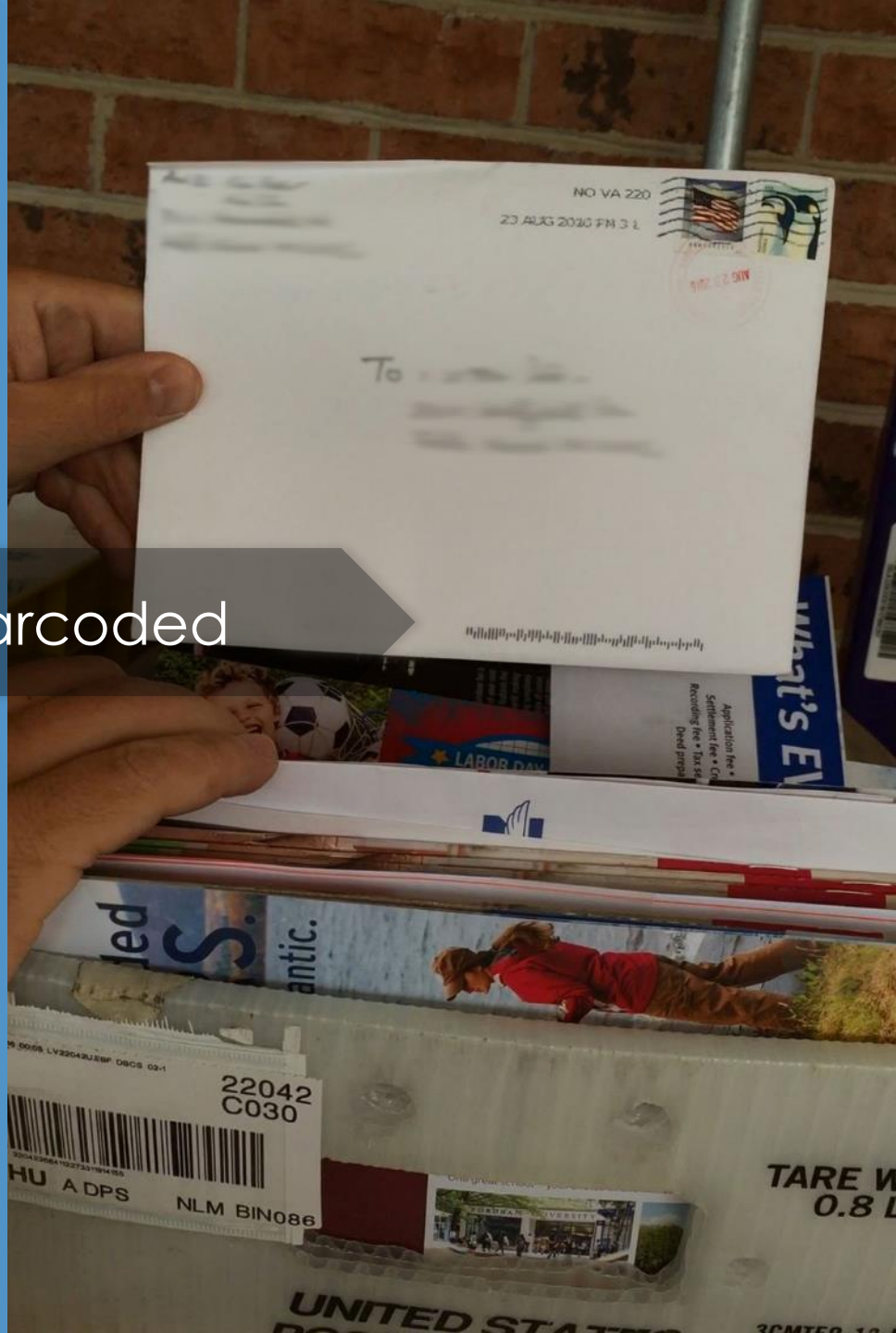
Originally Non-Barcoded pieces entered at collection points now have USPS barcode for Last Mile Sampling



barcoded

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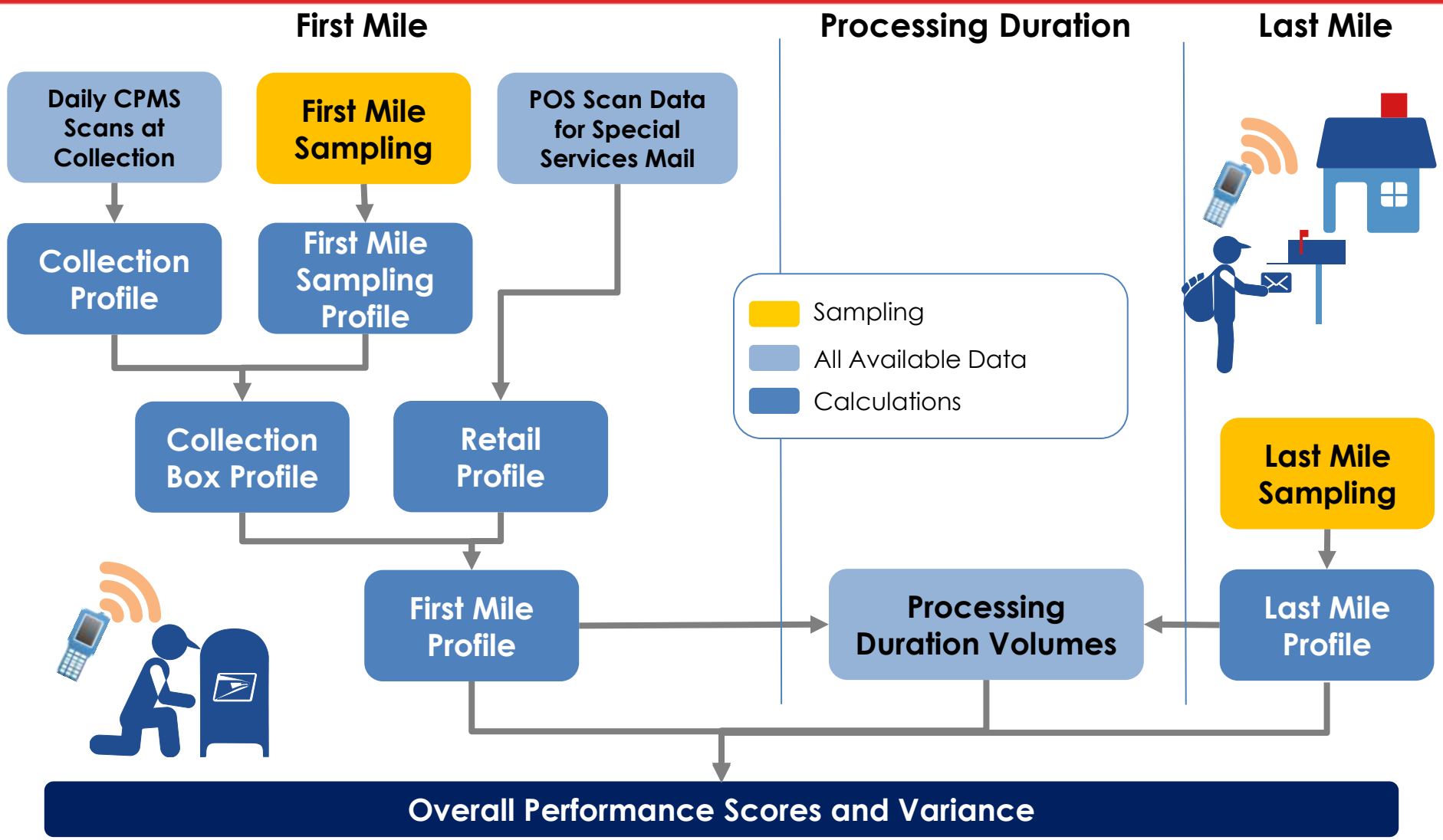
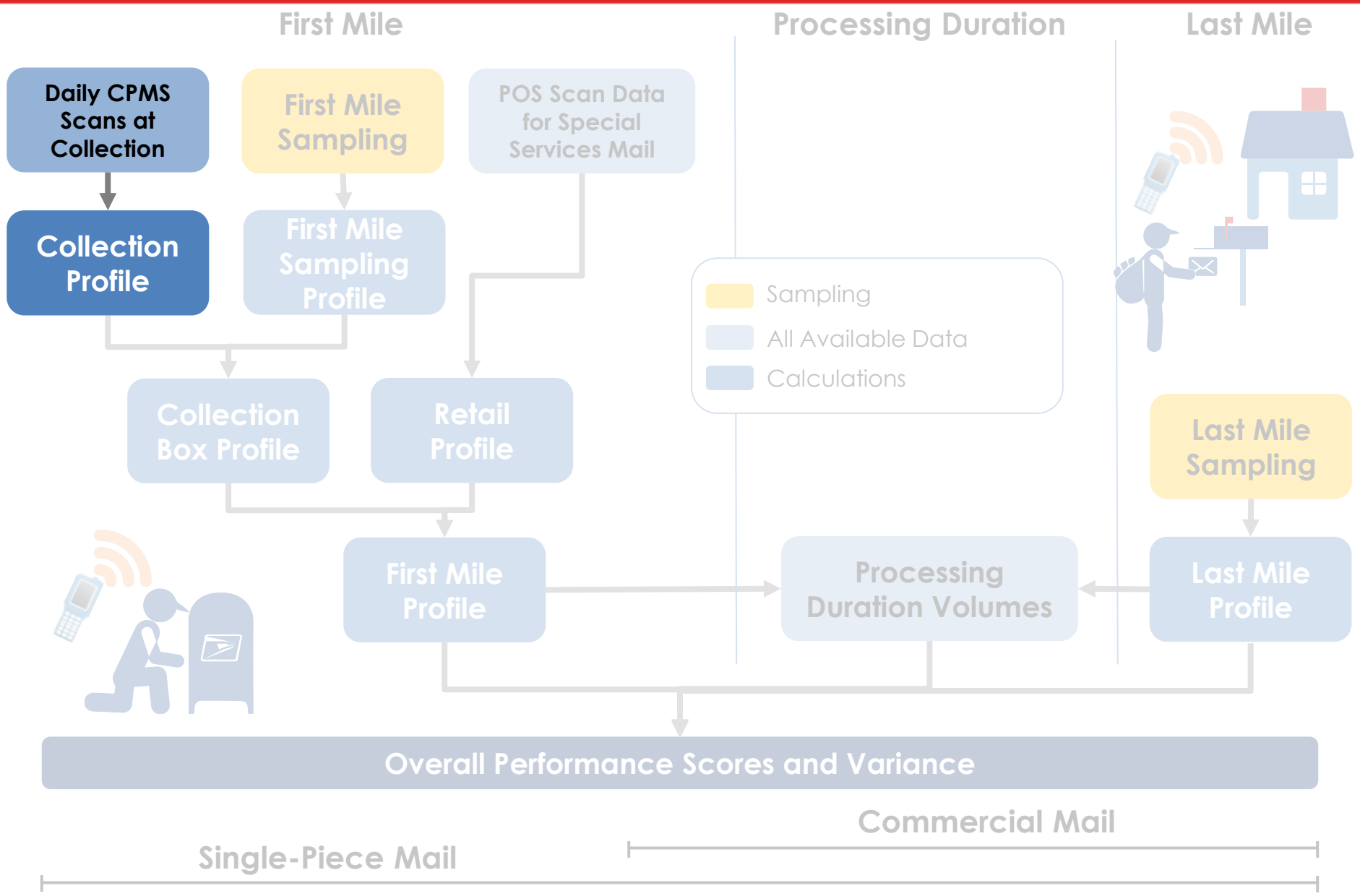
Internal SPM - Q2 and Q3

Service Performance Measurement



Service Performance Measurement



First Mile Collection Profile

Daily CPMS Scans at Collection

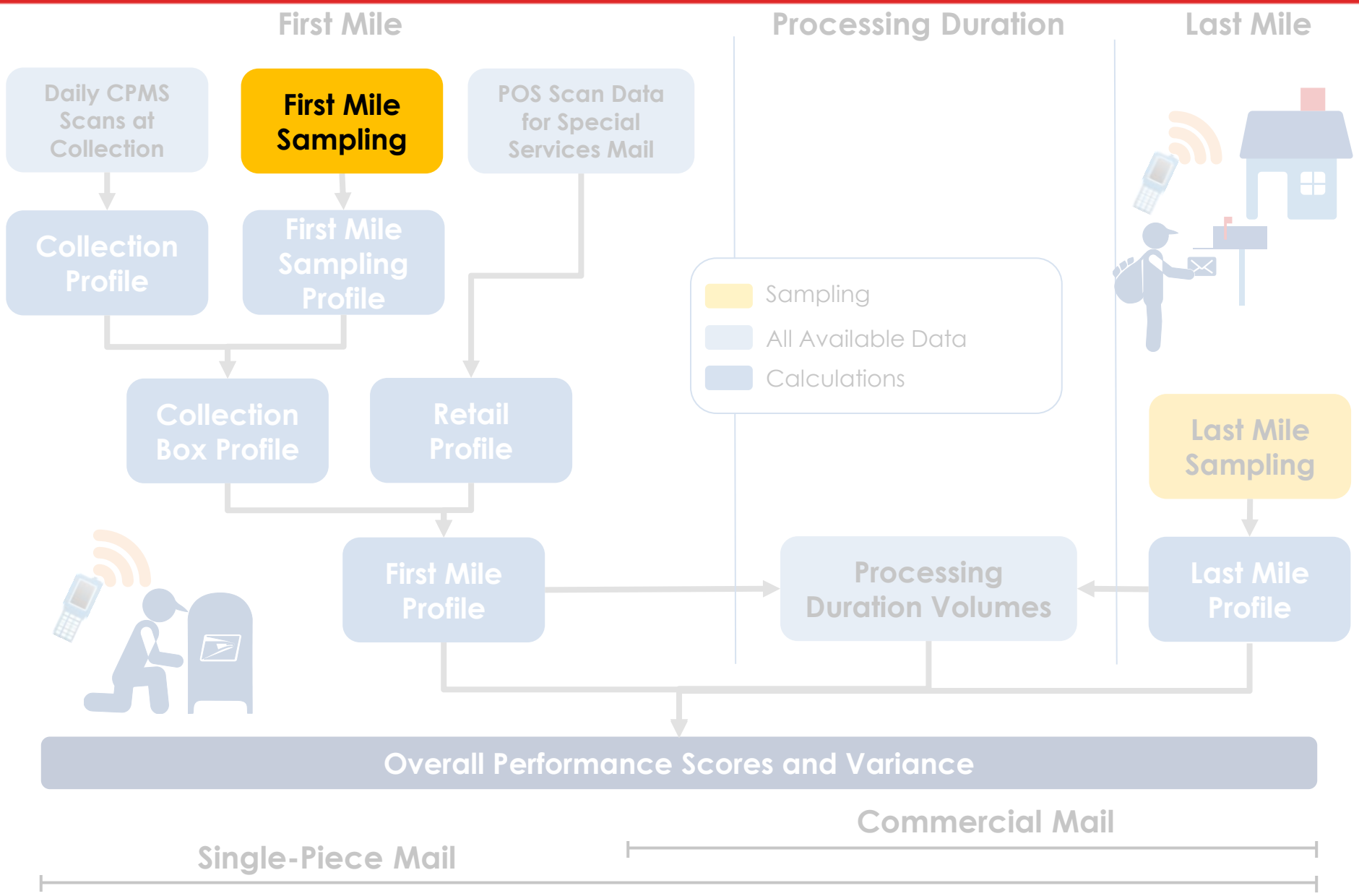
↓

Collection Profile

Collection Point Scanning (Triggered by CPMS Barcode) is used to create First Mile Collection Profile

- CPMS Scans are used to calculate whether the full expected density was collected
  - Scan Time compared to Scheduled Pick-up Time
  - Density volumes from annual density tests
- Accounts for early and missed collections
- Methodology has remained as designed

Service Performance Measurement



First Mile Sampling

Postal employees scan flats and letters at randomly selected collection points

- Collection boxes and Postal Lobby Chutes are randomly selected for sampling
- Two sampling groups have been defined for First Mile sampling:

Letters/cards

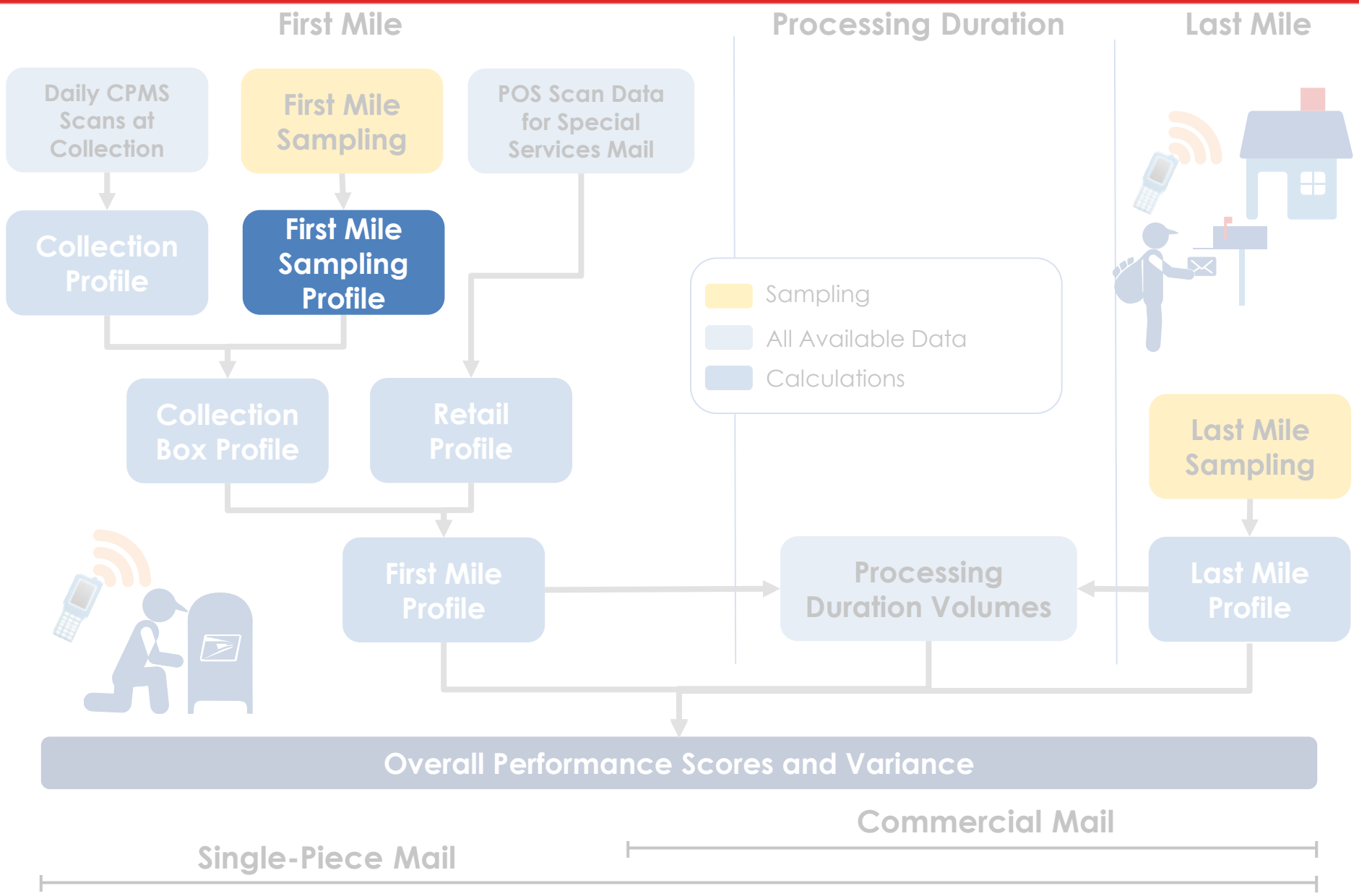
Flats

First Mile Sampling

Lessons Learned

- Office scanners (IMDAS) needed software enhancements to ensure full coverage of collection sampling
- Initial design for load of sampling work orders on devices impacted sampling capture rate
- Strobe scanning is needed to capture red colored barcodes
- Field Training is critical to capture license plate barcodes and achieve sampling targets
- SPFC Flats volume in blue collection boxes are scarce. Alternative methodology needed to capture samples

Service Performance Measurement

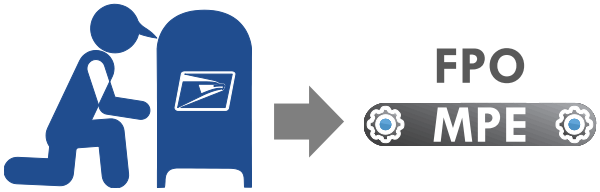


First Mile Sampling Profile

First Mile Sampling Profile

First Mile Sampling Profile based on:

anticipated induction date *minus* **date of sampling**



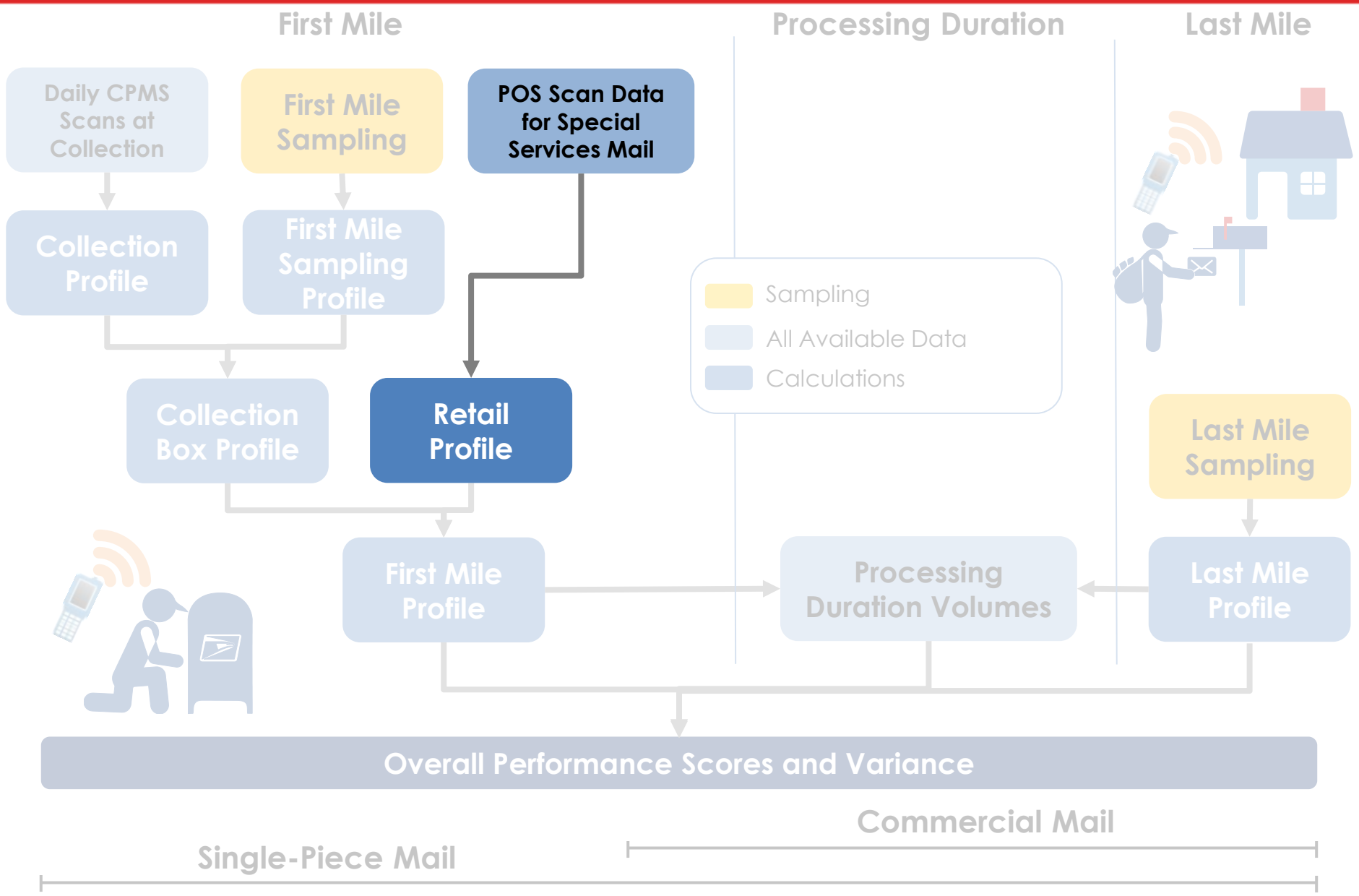
- First Mile Sampling Profile is aggregated based on origin district, collection date, mail shape, and first processing operation (FPO) type.
  - FPO1 – outgoing processing operations (the expected initial processing)
  - FPO2 – all other processing operations
- First Mile Sampling Profile is calculated as the weighted average proportion of pieces having *k* days prior to first processing, with *k* ranging from -1 to 30

First Mile Sampling Profile

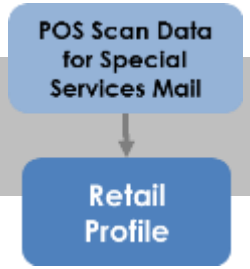
Lessons Learned

- Proxy data is needed when technical issues impact sampling requests being sent to devices
- Need to improve accuracy of First Processing Operation (FPO) assignment

Service Performance Measurement

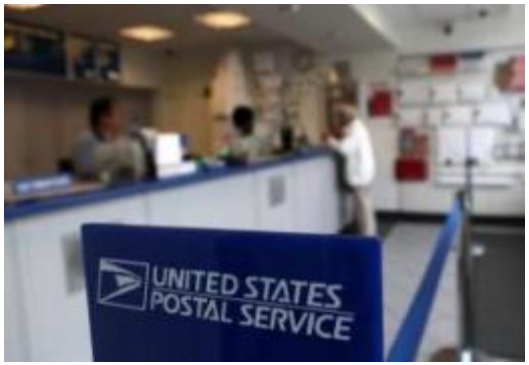


First Mile Retail Mail Profile



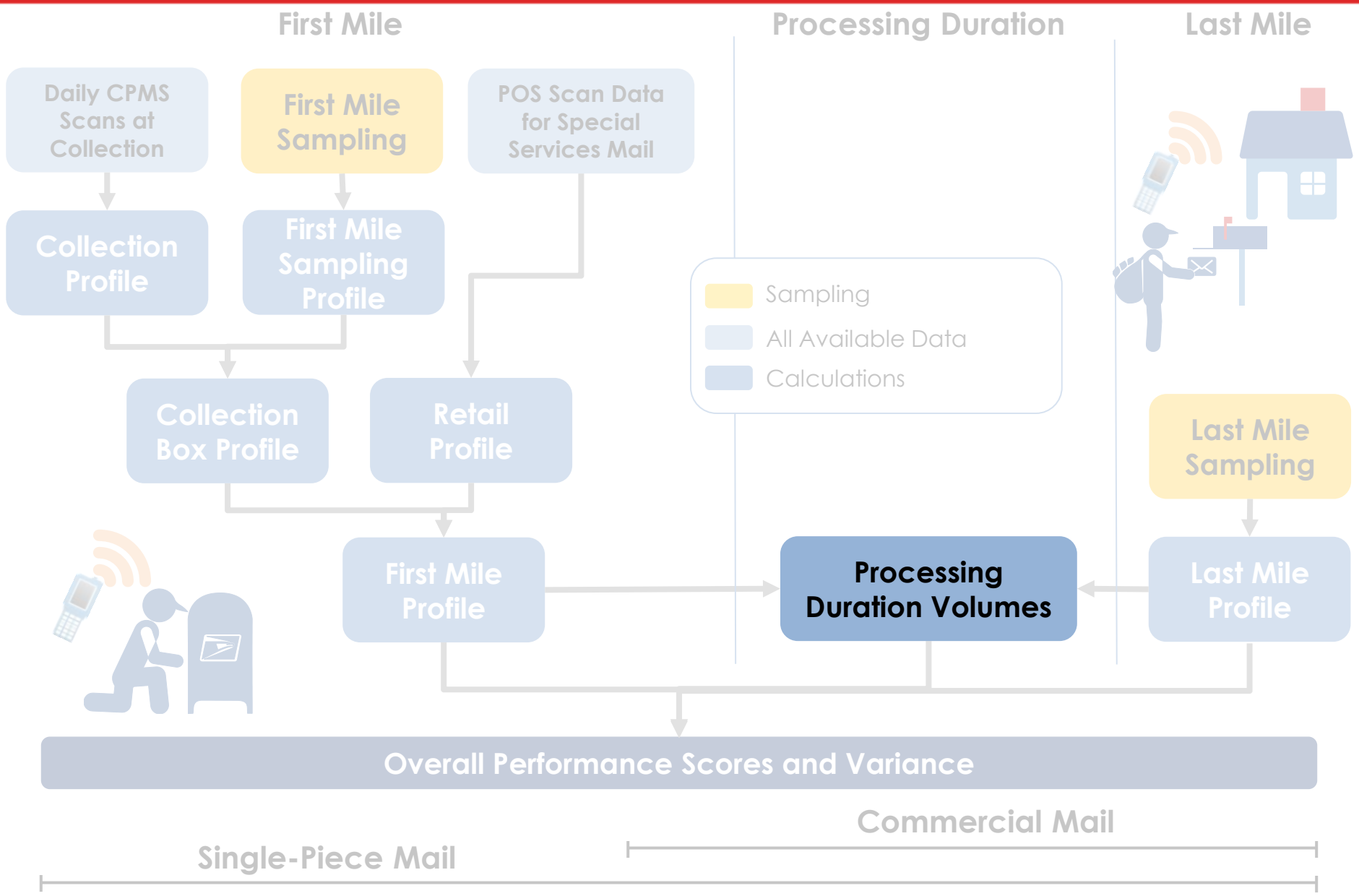
Point of Sale (POS) scan data will be matched with scans from first processing operation

- POS scan data for mail with Special Services (e.g., Certified Mail) will be used to measure the First Mile for retail channel



- Retail Profile will be calculated for each origin district, anticipated induction date, FPO grouping for letters/cards and flats as the proportion of retail mail with *k* days in First Mile, where *k* ranges from -1 to 30
- Software development will be completed in Q4 FY16

Service Performance Measurement



Processing Duration

Processing Duration Volumes

Processing Duration is measured from first processing operation or Start-the-Clock to last processing operation

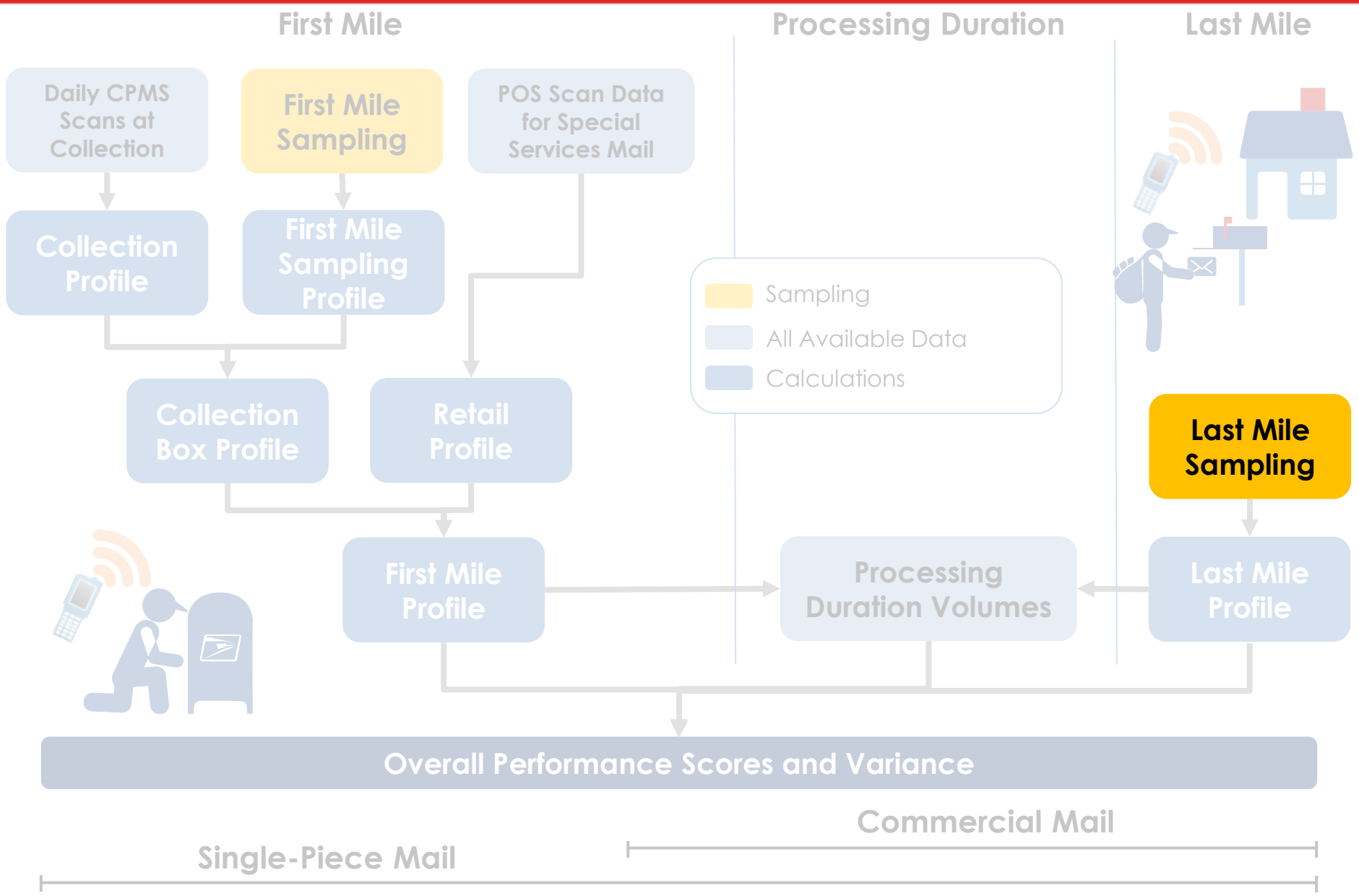
- Single-Piece First-Class Mail
  - Anticipated Induction Date through Anticipated Delivery Date
- Commercial mail
  - Start-the-Clock to Anticipated Delivery Date
- Processing Duration is measured for all mail for which we have the required information to measure performance accurately
- More than 22 billion pieces were measured for both Q2 and Q3

Processing Duration Volumes

Lessons Learned

- Leveraging all barcodes captured through automation improves the identification of unique SPFC mail pieces

Service Performance Measurement



Last Mile Sampling

Last Mile Sampling

Postal employees scan flats and letters at randomly selected delivery points

- Delivery points are randomly selected
  - All delivery points have a probability of being selected
  - Delivery points with higher expected volumes have proportionally greater chances of selection
  - There is a configurable maximum number of pieces to scan at a delivery point
  - Seven sampling groups have been defined for Last Mile measurement

First-Class Mail flats

Presort First-Class Mail letters/cards

Single-piece First-Class Mail remittance letters/cards

Single-piece First-Class Mail non-remittance letters/cards

Periodicals

Standard Mail letters/cards

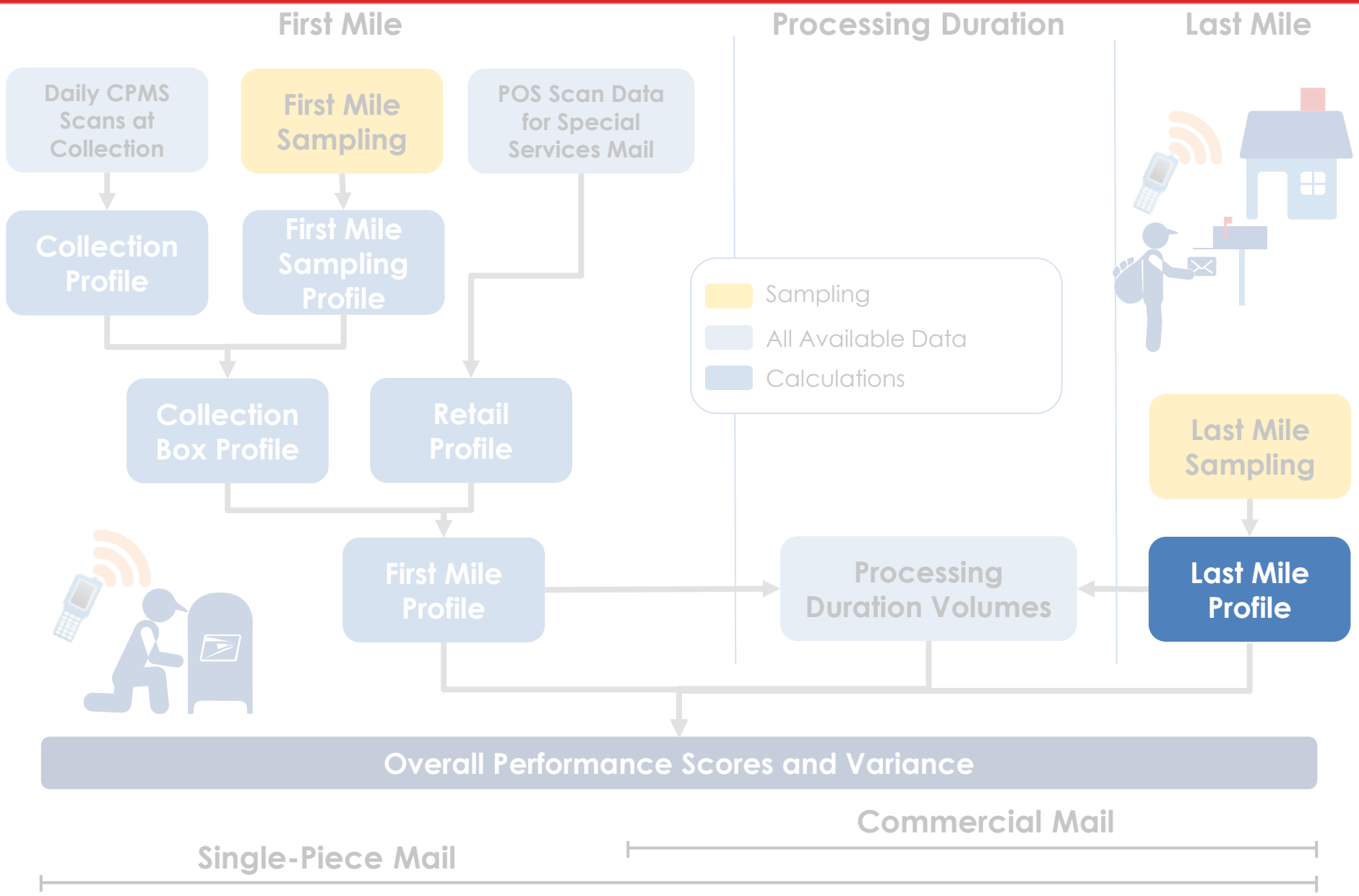
Standard Mail and Bound Printed Matter flats

Last Mile Sampling

Lessons Learned

- Sampling model is impacted if Mail inventory data is not current
- More Training on Standard Operating Procedures needed to ensure sampling at PO box addresses is completed during distribution and does not include previously delivered pieces
- Procedures are needed to improve sampling yield for SPFC Remittance mail
- Initial design for load of sampling work orders on devices impacted sampling capture rate
- Accuracy of address geo-coordinates impacts success rate of sampling triggers
- Improvements to scanner software are needed to improve trigger and capture rates
- Field training is critical to achieving sampling targets and capturing usable sample data across all product types for internal SPM

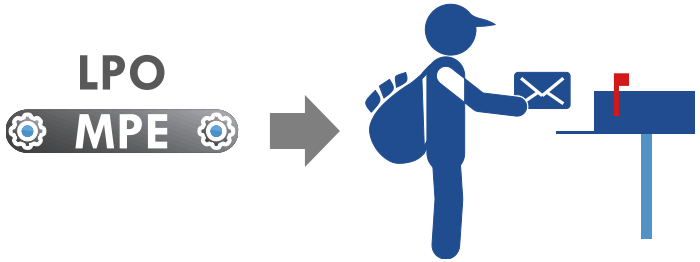
Service Performance Measurement



Last Mile Profile

Last Mile Profile

Last Mile Profile based on: **sample date** *minus* **anticipated date of delivery** *minus* **# of non-delivery days** (Sunday)



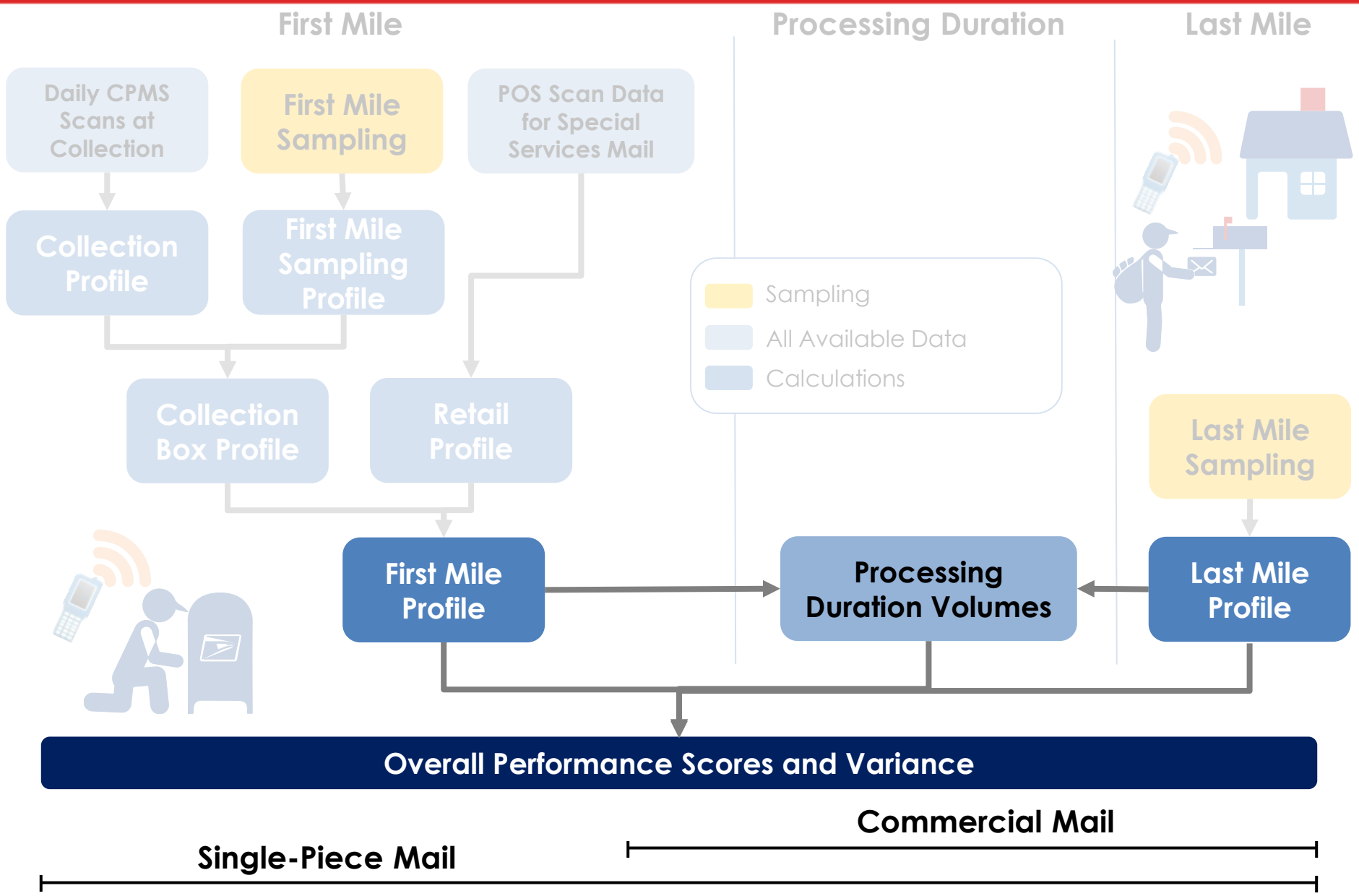
- Last Mile Profile is aggregated based on destination district, Anticipated Delivery Date, Days Left to meet service standard, and Sampling Group
- Last Mile Profile is calculated as the weighted average proportion of pieces with *k* days in Last Mile, with *k* ranging from -1 to 30

Last Mile Profile

Lessons Learned

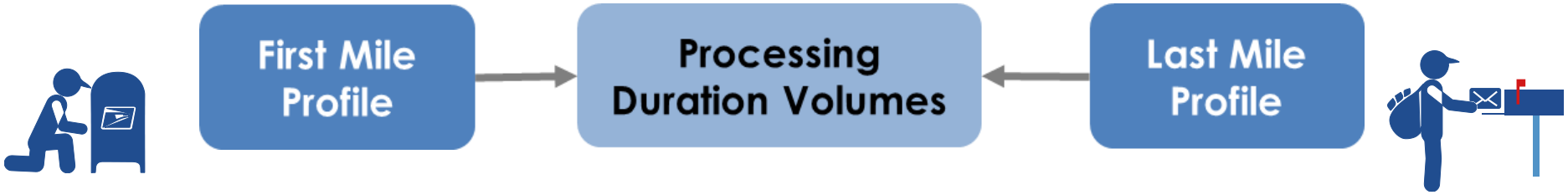
- Proxy data is needed when technical issues impact sampling requests being sent to devices

Service Performance Measurement

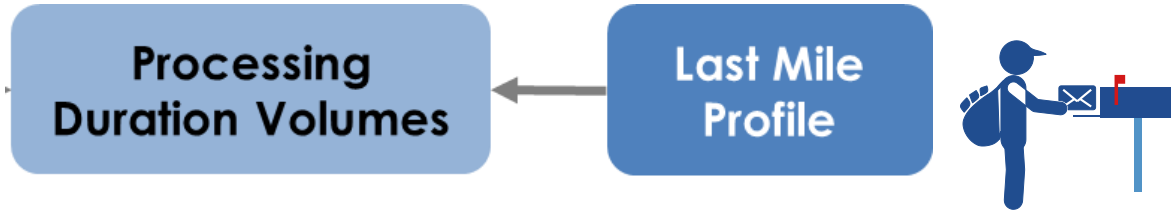


Overall Service Performance Calculation

Single-Piece First-Class Mail performance scores combine data from 3 segments:



Commercial Mail performance scores combine data from 2 segments:



- Approach includes calculations for
  - On-time service performance
  - Service variance (+1, +2, +3 Days)
  - Margins of error for 95% confidence intervals

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Internal SPM Sampling and Statistics

Statistical Validity

- "When evaluating a model, at least two broad standards are relevant. One is whether the model is consistent with the data. The other is whether the model is consistent with the 'real world'."

  ~Kenneth A. Bollen – Fellow of the American Statistical Assn

- Key metrics identified to assess validity of the service performance scores
  - **Response rates and coverage metrics** – used to determine if there are potential measurement accuracy issues resulting from under/over coverage of population characteristics
  - **Success rates in meeting sampling targets and statistical precision targets**
  - **Relative comparisons**– comparing component and overall scores between internal SPM and legacy systems

- Different survey/sampling methods produce different results

Internal SPM vs Legacy Comparisons

- Scores in legacy systems and Internal SPM will not be identical
  - Methodologies differ substantively
  - All of the measurement methodologies are based on samples to some extent
  - All are subject to sampling and non-sampling errors
- Goals of comparisons
  - Understand how the internal SPM system is working relative to the design
  - Verify that the differences observed are not a result of a internal SPM software defects or measurement methodology requirements
  - Confirm that statistically significant differences can be explained through analysis, and/or that issues identified are resolved

Q3 Single Piece First Class First Mile Sampling Statistics

First Mile Metrics for FY16 Q3 – Single-Piece First-Class Letters

First Mile Metrics	Internal SPM	Legacy
Measured Pieces in First Mile	1,477,006	401,836
Unique Collection Boxes Used	95,714	18,307
Unique 5-Digit ZIP Codes Used	24,565	7,980
Sampling Target Compliance Rate	99.8%	100.0%
Sampling Response Rate	64.0%	93.1%
Coverage Rate of Included 3-Digit ZIP Codes	99.9%	100.0%
Coverage Rate of Major Box Locations (Business, PO Lobby, PO Outside, Residential)	100.0%	82.1%
Coverage Rate for Valid Samples in First Mile for Every District and Every Collection Date	97.2%	98.4%
Collection On-Time Score	99.8%	Not Applicable
First Mile Impact Score	-1.3%	-0.4%

Q3 Last Mile Sampling Statistics

Last Mile Metrics for FY16 Q3 – Single-Piece First-Class Letters

Last Mile Metrics	Internal SPM	Legacy
Measured Pieces in Last Mile	2,944,182	401,836
Unique Delivery Points Sampled*	5,289,910	16,596
5-Digit ZIP Codes Sampled	27,588	8,814
Sampling Target Compliance Rate	98.4%	100.0%
Sampling Response Rate	66.6%**	96.1%
Coverage Rate of Included 3-Digit ZIP Codes	99.6%	100.0%
Coverage Rate for Valid Samples for every district and every delivery date	97.7%	100.0%
Last Mile Impact Score	-3.4%	-1.9%

*Unique Delivery Points Sampled represents the total number of delivery points from which a valid piece from any sampling group was obtained.

**Does not include sampling requests that were not triggered or carrier was already past the delivery address

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PRC Service Performance Report Comparison
Internal SPM vs. Legacy
Q2 and Q3 FY16

Note: Legacy SPM is the Official source of USPS Service Performance scores

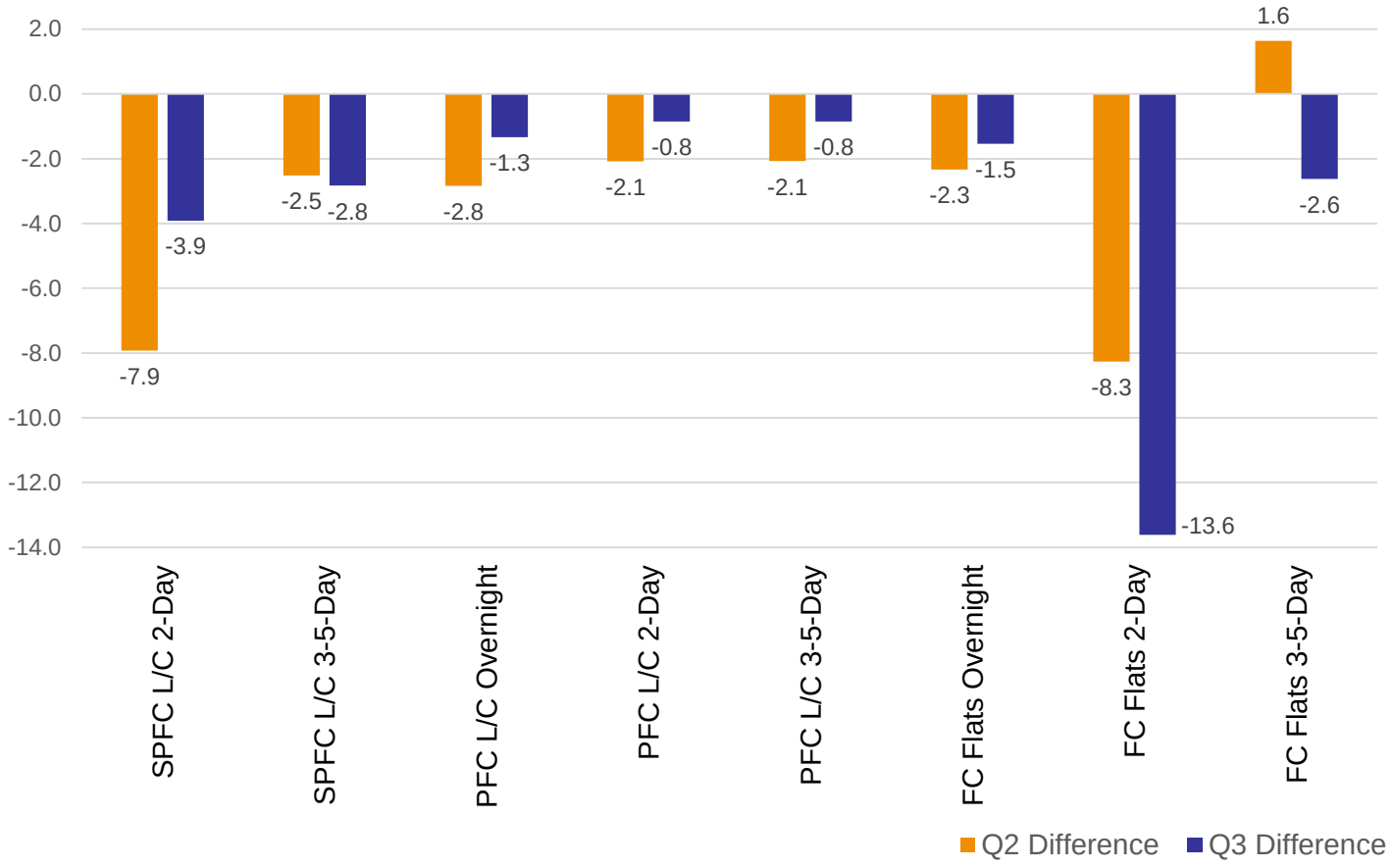
Overview

- PRC Reports were generated for FY16 Q2 and Q3 by:
  - Legacy systems:
    - BIDS/IMAPS for Commercial Mail
    - EXFC for Single-Piece First-Class Mail
  - Internal Service Performance Measurement (SPM) through the Informed Visibility™ system

Note: Legacy SPM is the Official source of USPS Service Performance scores

First-Class Mail Score Comparison Internal SPM vs Legacy SPM

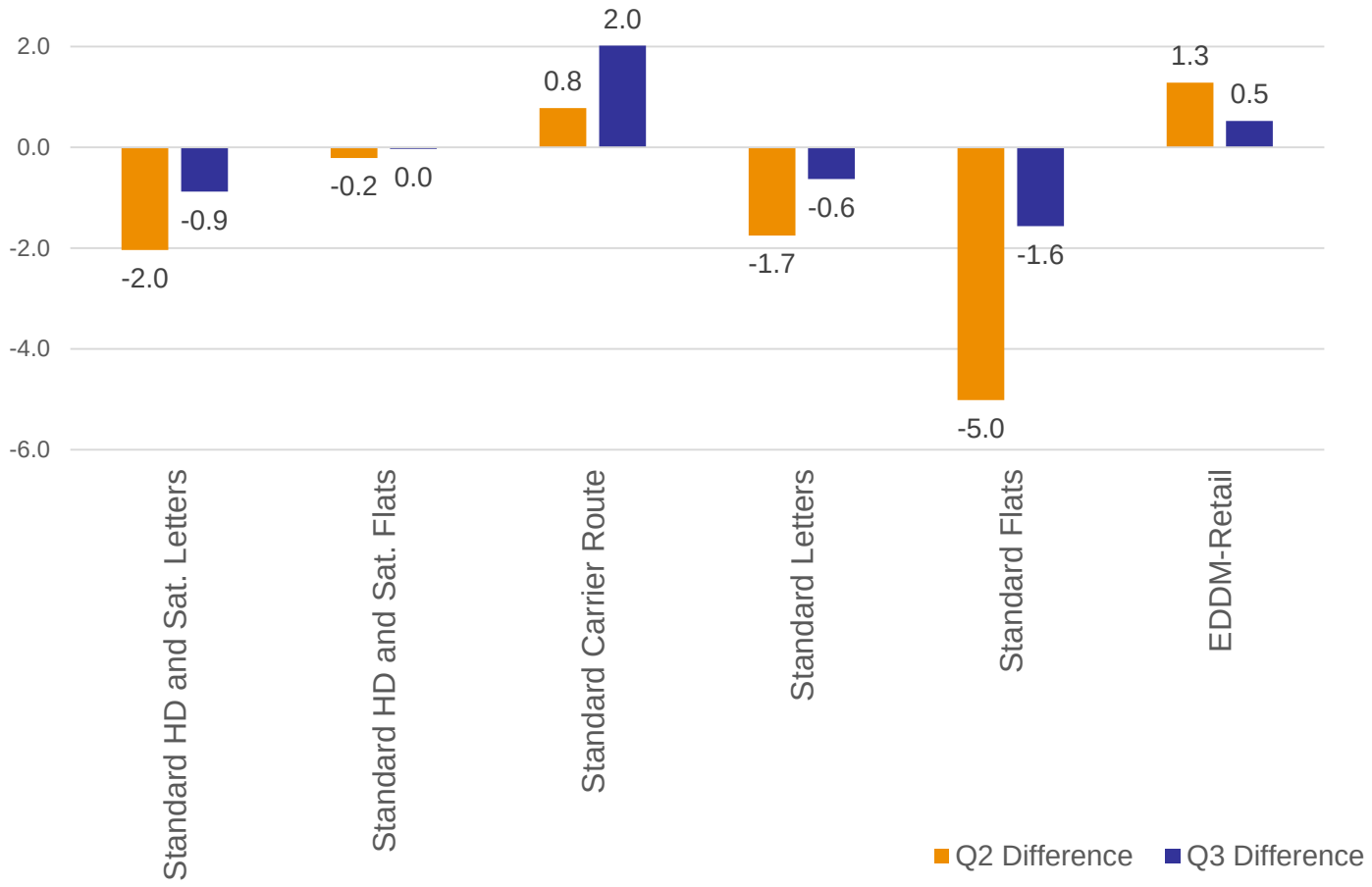
FY16 Q2 and Q3 National First-Class Mail Score Difference between Internal SPM and Legacy SPM



Note: Negative differences occur when Internal SPM results are lower than Legacy SPM results
Legacy SPM is the Official source of USPS Service Performance scores

Standard Mail Score Comparison Internal SPM vs Legacy SPM

FY16 Q2 and Q3 National Standard Mail Score Difference between Internal SPM and Legacy SPM



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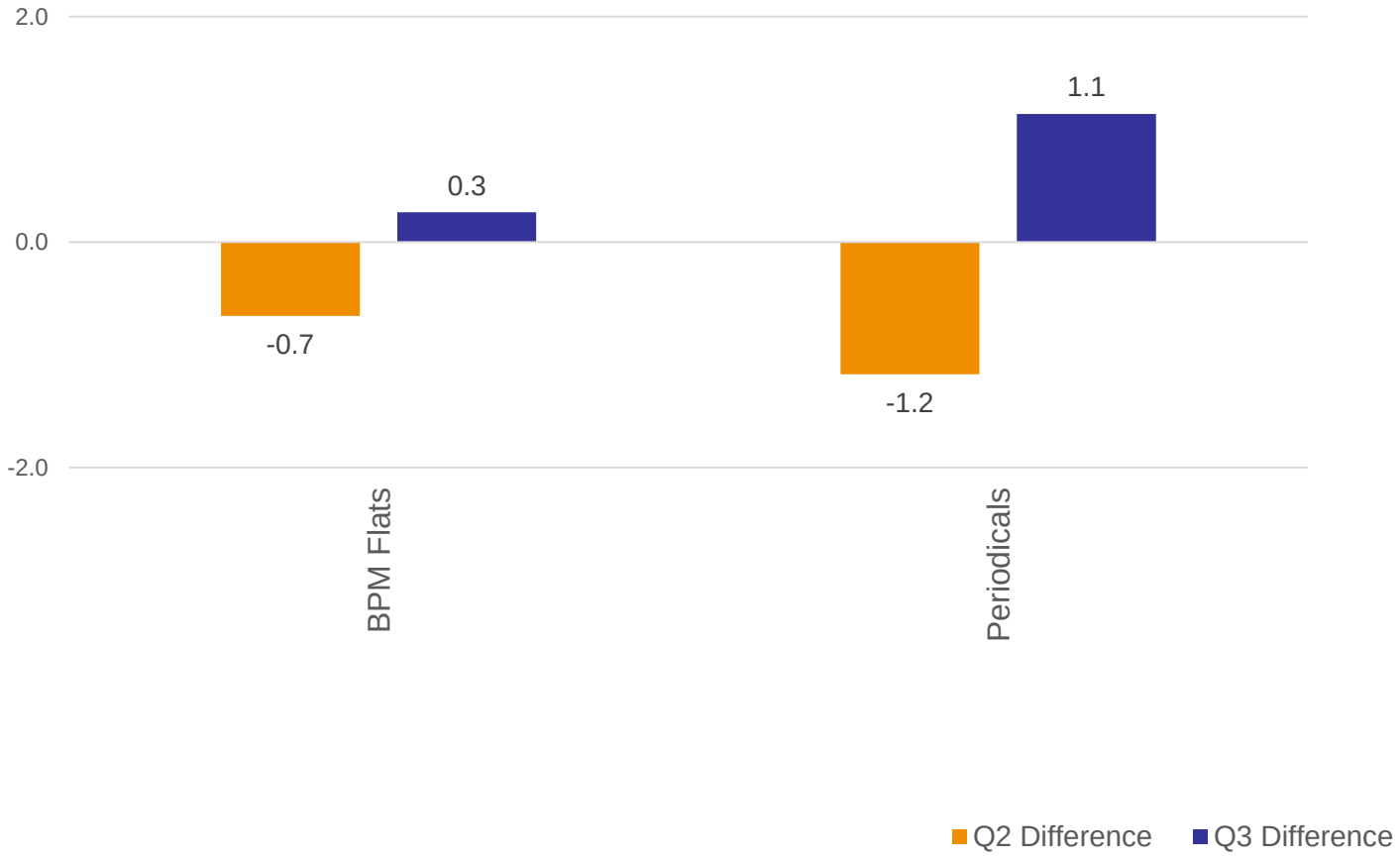
Periodical and BPM Flats Score Comparison
Internal SPM vs Legacy SPM

FY16 Q2 and Q3 National Periodicals and Bound Printed Matter Flats Score Difference between Internal SPM and Legacy SPM



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Legacy SPM is the Official source of USPS Service Performance scores

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Internal SPM
Planned Improvements

Internal SPM Planned Improvements

- Provide margin-of-error for all products measured with internal SPM (10/14/16)
- Enhance First Mile measurement of SPFC by including pieces inducted at retail locations (10/14/16)
- Enable Mobile Delivery Device (MDD) scanners to capture red colored barcodes (Q1 FY17)
- Implement new SPFC Flats collection sampling process (Q1 FY17)
- Expand Last Mile sampling to include caller service remittance mail pieces (Q2 FY17)

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Questions