INTERNAL SERVICE PERFORMANCE MEASUREMENT PLAN UPDATE

PRC Technical Conference

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Background

Internal SPM Milestones

Barcoded and Non-Barcode Mail

First Mile Measurement

Processing Duration

Last Mile Measurement

Overall Service Performance Calculation

Statistical Validity

Service Performance Report Comparison

Planned Improvements
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.
Internal SPM Milestones

- Implemented MyPO notifications for in-office PO Box sampling
  - 3/7/16

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

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

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

- Implemented Sampling Training Video
  - 11/10/2015

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

- Implemented First Mile Diagnostic tool
  - 8/10/16

- 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

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

- Implemented Last Mile Diagnostic tool
  - 3/30/16

- Include Margin of Error in Reports
  - 10/14/16

- Include Retail Profile in SPFC Overall Score
  - Q1 FY17

Legend
- Completed
- Upcoming
~3.5M collection samples

~75K clerks trained

~83.4B scans

from 11.5K automation equipment

~325K carriers trained

~45.7M delivery samples

400k Employees Trained on Scanning and Sampling

Q2 USPS Internal Service Performance Measurement
Single-Piece First Class® Mail Flow
Barcoded and Non-Barcoded Mail
Collection points receive both Barcoded and Non-Barcoded Single Piece First-Class mailpieces.

Barcoded mailpieces are sampled for ‘Start-the-Clock’ in First Mile.
Both Barcoded and Non-Barcoded pieces are consolidated into the same containers for efficient transport.
Containers with both Barcoded and Non-Barcoded pieces are loaded onto the same equipment for cancellation.
Cancellation equipment culls and faces Barcoded and Non-Barcoded mailpieces
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
Processing equipment sorts barcoded mail for further downstream processing
Originally Non-Barcoded pieces entered at collection points now have USPS barcode for Last Mile Sampling
Internal SPM - Q2 and Q3
Service Performance Measurement

First Mile
- Daily CPMS Scans at Collection
  - Collection Profile
    - Collection Box Profile
    - First Mile Profile
      - First Mile Sampling Profile
    - Retail Profile

Processing Duration
- POS Scan Data for Special Services Mail
  - Processing Duration Volumes
    - Sampling
    - All Available Data
    - Calculations

Last Mile
- Last Mile Sampling
  - Last Mile Profile

Overall Performance Scores and Variance

Single-Piece Mail

Commercial Mail
Service Performance Measurement

First Mile

- Daily CPMS Scans at Collection
- Collection Profile
  - Collection Box Profile
  - Retail Profile
  - First Mile Profile
  - First Mile Sampling Profile
  - POS Scan Data for Special Services Mail

Processing Duration

- Processing Duration Volumes
  - Sampling
  - All Available Data
  - Calculations

Last Mile

- Last Mile Sampling
- Last Mile Profile

Overall Performance Scores and Variance

Single-Piece Mail

Commercial Mail
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

- Daily CPMS Scans at Collection
- Collection Profile
- First Mile Sampling Profile
- Collection Box Profile
- First Mile Sampling Profile
- First Mile Profile
- POS Scan Data for Special Services Mail

Processing Duration

- Processing Duration Volumes
- All Available Data
- Calculations

Last Mile

- Last Mile Sampling
- Last Mile Profile
- Commercial Mail
- Single-Piece Mail

Overall Performance Scores and Variance
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
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
- Daily CPMS Scans at Collection
- Collection Profile
  - Collection Box Profile
  - Retail Profile
  - First Mile Profile
    - First Mile Sampling Profile
- First Mile Sampling
- POS Scan Data for Special Services Mail

Processing Duration
- All Available Data
- Calculations

Last Mile
- Last Mile Sampling
- Last Mile Profile

Overall Performance Scores and Variance

Single-Piece Mail

Commercial Mail
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.
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
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

First Mile

- Daily CPMS Scans at Collection
- Collection Profile
  - First Mile Sampling Profile
- Collection Box Profile
- Retail Profile
  - First Mile Profile

Processing Duration

- POS Scan Data for Special Services Mail

Last Mile

- Last Mile Sampling

Processing Duration Volumes

Overall Performance Scores and Variance

Single-Piece Mail
- Commercial Mail

- Single-Piece Mail
- Commercial Mail
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
Lessons Learned

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

First Mile
- Daily CPMS Scans at Collection
  - Collection Profile
  - First Mile Sampling Profile
  - POS Scan Data for Special Services Mail

Processing Duration
- Calculations

Last Mile
- Sampling
- All Available Data

Overall Performance Scores and Variance

Single-Piece Mail

Commercial Mail
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
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

First Mile

- Daily CPMS Scans at Collection
  - Collection Profile
    - Collection Box Profile
    - First Mile Sampling Profile
    - Retail Profile
      - First Mile Profile

Processing Duration

Last Mile Sampling

- Last Mile Profile

Overall Performance Scores and Variance

Single-Piece Mail

Commercial Mail

- Processing Duration Volumes
  - Processing Duration
    - Sampling
    - All Available Data
    - Calculations

- Last Mile Sampling

First Mile Sampling

POS Scan Data for Special Services Mail

First Mile Profile
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.
Lessons Learned

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

First Mile

- Daily CPMS Scans at Collection
  - Collection Profile
    - Collection Box Profile
    - Retail Profile
    - First Mile Sampling Profile

- First Mile Sampling

- POS Scan Data for Special Services Mail
  - POS Scan Data

Processing Duration

- All Available Data
  - Calculations
  - Sampling

Last Mile

- Last Mile Sampling

- Last Mile Profile

Overall Performance Scores and Variance

Single-Piece Mail

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

- First Mile Profile
- Processing Duration Volumes
- Last Mile Profile

Commercial Mail performance scores combine data from 2 segments:

- Processing Duration Volumes
- Last Mile Profile

Approach includes calculations for:
- On-time service performance
- Service variance (+1, +2, +3 Days)
- Margins of error for 95% confidence intervals
Internal SPM Sampling and Statistics
“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
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
# First Mile Metrics for FY16 Q3 – Single-Piece First-Class Letters

<table>
<thead>
<tr>
<th>First Mile Metrics</th>
<th>Internal SPM</th>
<th>Legacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured Pieces in First Mile</td>
<td>1,477,006</td>
<td>401,836</td>
</tr>
<tr>
<td>Unique Collection Boxes Used</td>
<td>95,714</td>
<td>18,307</td>
</tr>
<tr>
<td>Unique 5-Digit ZIP Codes Used</td>
<td>24,565</td>
<td>7,980</td>
</tr>
<tr>
<td>Sampling Target Compliance Rate</td>
<td>99.8%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Sampling Response Rate</td>
<td>64.0%</td>
<td>93.1%</td>
</tr>
<tr>
<td>Coverage Rate of Included 3-Digit ZIP Codes</td>
<td>99.9%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Coverage Rate of Major Box Locations (Business, PO Lobby, PO Outside, Residential)</td>
<td>100.0%</td>
<td>82.1%</td>
</tr>
<tr>
<td>Coverage Rate for Valid Samples in First Mile for Every District and Every Collection Date</td>
<td>97.2%</td>
<td>98.4%</td>
</tr>
<tr>
<td>Collection On-Time Score</td>
<td>99.8%</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>First Mile Impact Score</td>
<td>-1.3%</td>
<td>-0.4%</td>
</tr>
</tbody>
</table>
### Q3 Last Mile Sampling Statistics

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

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

*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.
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
• PRC Reports were generated for FY16 Q2 and Q3 by:
  • Legacy systems:
    o BIDS/IMAPS for Commercial Mail
    o 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
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.
FY16 Q2 and Q3 National Standard 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.
FY16 Q2 and Q3 National Periodicals and Bound Printed Matter Flats 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
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)
Questions