Audit Report

Use of IMb for First-Class Mail Letters' Processing Costs

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Highlights

Objective

The U.S. Postal Service implemented use of Intelligent Mail barcodes (IMb) in September 2006, to sort and track individual letters, cards, and flats. The technology offers greater versatility by allowing many services to be requested and embedded in one barcode. The Postal Service obtains reports related to IMb data from various systems, including its data analytics platform, the Informed Visibility (IV) system. The system provides data and analytics to external and internal customers to enable greater visibility of mailpieces.

The Postal Service has made efforts to leverage IMb data in costing. In July 2017, the Postal Service petitioned the Postal Regulatory Commission (PRC) to update the transportation cost model for Parcel Select/Parcel Return Service mail based on new information obtained from IMb data. The PRC approved the change in November 2017, stating the change should improve the quality and accuracy of the cost estimates.

Our objective was to assess whether the Postal Service can leverage IMb data in the IV system to enhance the accuracy and reliability of mail processing costs for First-Class Mail letters.

What the OIG Found

Although the Postal Service has explored uses of IMb data in costing, opportunities exist to further leverage IMb and other mailpiece data in the IV system to improve the accuracy and reliability of cost estimates for First-Class Mail letters. Specifically:

■ IMb and IV technologies could strengthen data collection and analysis for costing, cost modeling, and cost attribution. However, the Postal Service has not fully leveraged these technologies since implementation. It did not have a strategic plan or timeline to evaluate how IMb and IV could support more efficient costing procedures and increase visibility of product costs. Management stated IMb and IV are operational technologies that are not currently designed to capture data for costing; therefore, they have not developed a plan to use IMb data for costing strategies. IMb scan data is also not readily accessible to costing personnel in a useable format within the IV system.

Mailing industry representatives stated that IMb, when first introduced, was marketed as a technology that would create operational efficiencies, increase mailpiece visibility, and provide new data points that could be used to improve costing. In addition, the Postal Service's business case for IMb stated it would provide enhanced data analytics and end-to-end mailpiece visibility to support costing strategies and product pricing. Further, the business case for IV stated the Postal Service planned to use IV to drive cost savings and optimize financial performance, among other things.

"The Postal Service could enhance the accuracy and reliability of mail processing unit cost estimates for First-Class Mail letters by further leveraging IMb data from IV."

■ The Postal Service could enhance the accuracy and reliability of mail processing unit cost estimates for First-Class Mail letters by leveraging IMb data from IV. The First-Class Mail letters cost model does not precisely capture the costs of certain mail processing activities. During site visits, we identified the following nonstandard or unexpected mail flows for First-Class Mail letters that resulted in alternative or additional processing steps.

● Plant personnel sometimes run letters on flats mail processing equipment (MPE). This allows personnel to process more letter mail when letters are too large or thick to run on letter MPE, letter machines are already at capacity, or flats machines are idle.

● The same letters are sometimes processed multiple times under the same operation on MPE. This can occur due to equipment failures, incorrect tray labels, improper handling of forwarded mail, or incorrect mailpiece barcodes or Zone Improvement Plan (ZIP) Codes.

- Plant personnel do not always run automation letters on MPE. Consequently, these letters skip the mail processing steps they are expected to receive. This can occur because personnel may not have time to process all letters on MPE before the mail needs to leave the plant to meet service performance goals.

The cost model does not precisely capture or explicitly model the costs of these mail flows because these nonstandard operational activities should not be occurring. Leveraging IMb data from IV could enhance the accuracy and reliability of mail processing cost estimates by capturing these nonstandard activities.

Management stated they apply an adjustment factor to capture mail processing costs for mail flows not explicitly modeled. This adjustment is applied evenly to all model mail product categories. However, we believe these costs may affect each price category differently, depending on which categories are likely to follow nonstandard mail flows. Applying an evenly distributed adjustment factor across all categories in the model may distort actual costs incurred by individual mail product categories.

The Postal Service and PRC rely on accurate and reliable cost estimates to make informed operational and pricing decisions. Precise cost estimates support improved price setting decisions that ensure prices comply with the law and cover actual costs incurred. IMb and IV could potentially provide a clearer understanding of cost drivers at the product level by increasing visibility and granularity of cost information. These opportunities could reduce the need for less efficient and more costly data collection and statistical sampling.

What the OIG Recommended

We recommended management:

- Develop a strategic plan to assess how IMb and IV technologies can be used to support costing and, based on the assessment, determine how and when the technologies can be used to improve costing.

- Create and provide access to detailed IMb data reports or dashboards in IV for use by costing personnel.

- Use IMb and IV technologies to assess the impact of unexpected or nonstandard mail flows on First-Class Mail letter cost model estimates and, based on the evaluation, consider filing a petition with the PRC to use IMb and IV data to update the model.
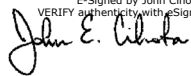
Transmittal Letter

OFFICE OF INSPECTOR GENERAL
UNITED STATES POSTAL SERVICE

September 25, 2018

MEMORANDUM FOR: SHARON D. OWENS, VICE PRESIDENT,
PRICING AND COSTING

E-Signed by John Cihota
VERIFY authenticity with eSign Desktop

John E. Cihota

FROM: John E. Cihota
Deputy Assistant Inspector General
  for Finance and Pricing

SUBJECT: Audit Report – Use of IMb for First-Class Mail Letters'
Processing Costs (Report Number CP-AR-18-007)

This report presents the results of our audit of the Use of IMb for First-Class Mail Letters' Processing Costs (Project Number 18BG009CP000).

We appreciate the cooperation and courtesies provided by your staff. If you have any questions or need additional information, please contact Sherry Fullwood, Director, Cost and Pricing, or me at 703-248-2100.

Attachment

cc: Corporate Audit Response Management

Results

Introduction/Objective

This report presents the results of our self-initiated audit of the Use of Intelligent Mail barcode (IMb) for First-Class Mail Letters' Processing Costs (Project Number 18BG009CP000). We performed the audit as part of our mandate under the Postal Accountability and Enhancement Act of 2006 (PAEA)[1] to regularly audit the data collection systems and procedures used to collect information and prepare reports.[2] Our objective was to assess whether the U.S. Postal Service can leverage IMb data within the Informed Visibility (IV) system to enhance the accuracy and reliability of mail processing costs for First-Class Mail letters. See Appendix A for more information about this audit.

Background

The Postal Service implemented the use of IMb in September 2006. Unlike predecessor barcodes, IMb is used to sort and track individual letters, cards, and flats. The technology offers greater versatility by allowing many services to be requested and embedded within one barcode. The IMb is applied to First-Class Mail letters and flats, Marketing Mail letters and flats, Periodicals, Bound Printed Matter flats, and qualified Business Reply Mail/Permit Mail. The IMb encodes up to 31 digits of mailpiece data into 65 vertical bars. The bars capture the following mailpiece characteristics and identifying information:

- Barcode identification (ID) denotes the presort level of the mailpiece.

- Service type: identifies the class of mail, service requests, and/or automation rate[3] discount.

- Mailer ID is a six- or nine-digit number that uniquely identifies the mail owner or mailing agent.

- Serial/sequence number uniquely identifies the mailpiece to facilitate tracking and may identify the addressee to the mailer.

- Delivery point denotes the Zone Improvement Plan (ZIP) Code used for sorting and routing the mail. This code is required to obtain the automation rate discount.

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Delivery point denotes the Zone Improvement Plan (ZIP) Code used for sorting and routing the mail. This code is required to obtain the automation rate discount.

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1   39 U.S.C. §§ 101 et seq.
2   39 U.S.C. § 3652(a).
3   The price charged for a mail class, product, or product category.

The Postal Service obtains reports related to IMb scan data from various systems, to include its IV system. IV is the Postal Service's data analytics platform. It provides data and analytics to external and internal customers, enabling greater visibility of mailpieces. The Postal Service planned to use this information to help strengthen market competitiveness, create new opportunities for revenue growth, drive cost savings, retain customers, and optimize operational and financial performance.

The Postal Service has made efforts to leverage IMb data in costing. In July 2017, the Postal Service petitioned the Postal Regulatory Commission (PRC)[4] to update the transportation cost model for Parcel Select/Parcel Return Service mail based on new information obtained from IMb data. Specifically, through analysis of the data, management identified circumstances when unexpected transportation costs were incurred for Parcel Select/Parcel Return Service price categories.[5] For example, the original cost model included assumptions that parcels would not travel on certain transportation routes. However, IMb data revealed that some parcels were transported on unexpected modes of transportation. With this information, the Postal Service proposed revisions to the cost model to more accurately reflect current operations. The PRC approved this change in November 2017, stating the change should improve the quality and accuracy of the cost estimates.

Finding #1: Strategic Plan for Use of IMb in Costing

Although the Postal Service has explored using IMb data in costing, opportunities exist to further leverage IMb and other mailpiece data in the IV system to improve the accuracy and reliability of cost estimates. Specifically, these technologies could potentially enhance the efficiency and precision of data collection, cost modeling, and cost attribution. However, the Postal Service has not fully leveraged IMb and IV technologies to enhance costing procedures since the implementation of the technologies.

"Management does not have a strategic plan or timeline to evaluate how IMb and IV technologies could be enhanced and used to support costing."

Management does not have a strategic plan or timeline to evaluate how IMb and IV technologies could be enhanced and used to support costing. A strategic plan would guide efforts to:

- Review current data and capabilities and develop use cases.

- Identify needed enhancements and data requirements.

- Establish partnerships and collaborate with IMb and IV system owners to address current limitations of the technologies for costing.

- Explore and test potential enhancements to costing methodologies using the data.

- Enable management to develop timelines and milestones for using IMb data to improve cost model estimates, data collection and sampling procedures, and other costing methodologies.

Management stated IMb and IV are operational technologies that are not currently designed to capture data for costing; therefore, they do not have a strategic plan to evaluate and use the technologies to support costing strategies. To use the IMb scan data for costing, management stated the following enhancements would be needed:

- The data would need to be more complete and reliable. Currently, IMb is not applied to all mailpieces, the reliability of the data has not been assessed, and there has not been a determination of whether the data meets PRC standards for costing.

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4   The PRC is an independent establishment of the executive branch of the U.S. government that has regulatory oversight over many aspects of the Postal Service, including the development and maintenance of regulations for pricing and performance measures.

5   A price category is a subdivision of a class or product by type of price, such as single-piece, presorted, and automation prices, or retail, Commercial Base, and Commercial Plus prices. For example, the First-Class Mail product Presorted Letters/Postcards has three price categories: nonmachinable, machinable, and automation.

- More data elements are needed for costing. Management stated the barcode does not capture many mailpiece characteristics.

- IMb scan data is not readily available in a format useful for costing. Management stated they currently do not have access to IMb scan data and it is not available in a medium that is conducive to their needs.

- IMb does not currently provide visibility of activities related to manually worked mailpieces, which is a significant component of costing.

Management also stated that any changes to costing methodologies must be approved by the PRC, and the PRC is satisfied with current cost models and methodologies.

According to mailing industry representatives, the Postal Service marketed the IMb as a technology that would create operational efficiencies, enhance mailpiece visibility, and provide new data points that could be leveraged to improve costing. In addition, the decision analysis report (DAR)[6] for IMb stated the technology would provide enhanced data analytics and end-to-end visibility that could be used to support costing strategies and product pricing. Further, the DAR for the IV platform stated the Postal Service planned to use IV to drive cost savings and optimize financial performance, among other things.

The Postal Service's *2009 Intelligent Mail Corporate Plan* cited a corporate strategy to use Intelligent Mail analytics to gain operational insight that would provide a better understanding of product cost drivers. In the 2007 update to the *2006 – 2010 Strategic Transformation Plan*, the Postal Service identified a strategy to improve cost management by expanding the use of IMb to achieve more detailed, granular, and timely cost information. A strategic plan to evaluate how IMb and IV technologies could improve costing would help the Postal Service accomplish these goals.

During our audit, we found several opportunities to use existing IMb and IV technologies to enhance current costing procedures. For example:

- The electronic documentation that mailers provide for business mailings contains additional data that could be beneficial for costing as it relates to presort mailpieces (for example, piece barcode, mail class, rate category, weight, and piece dimensions). This data flows into the IV system and can be linked with IMb scan data. The integration of electronic documentation data with IMb data elements could address some data limitation concerns.

- The Postal Service is currently piloting a program to leverage handheld scanners and barcodes to gain visibility of mailpieces in manual operations. If successful, this program may be an efficient source of valuable information on manually worked mailpieces for product costing that could supplement data collection via costly field studies and statistical sampling.

- The creation of a portal where authorized costing personnel could access secured IMb data from IV in a user-friendly format could address data accessibility challenges. A plan to coordinate cross-functional collaboration with the Corporate Reporting group would assist costing personnel in this effort. For example, the functional groups could work together to develop business requirements and build data reports or dashboards with key costing metrics and parameters.

We acknowledge that the Postal Service may not be able to rely exclusively on IMb data to attribute costs to products. Cost estimates are determined based on general ledger account balances that are distributed to product categories using statistical data on employee activities and mailpiece handlings. However, the IMb data provides unprecedented visibility and information on individual mailpieces and mail flows when coupled with other data attributes within the IV system. This data could add value to and create efficiencies in costing and validation processes. For example, personnel could potentially use the data to more frequently update cost model inputs and assumptions without the need for costly field studies.

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6   A DAR is a document developed to justify a project investment and to assist in making decisions concerning the use of Postal Service funds.

A strategic plan to leverage IMb data and IV in costing would support the following:

- Guide personnel in their efforts to evaluate and potentially incorporate available data in cost modeling and estimation. While changes to costing methodologies would require PRC review and approval, the PRC does not require pre-approval for the Postal Service to plan and explore new ways to calculate and validate product cost estimates.

Ensure management sets goals, priorities, and timelines that enable them to focus resources on exploring the use of the technologies in costing, and to partner with the appropriate parties to address and find solutions for the challenges and data limitations identified above.

- Help the Postal Service maintain a timely assessment of how personnel could use IMb and IV technologies for product costing in the future.

Management relies on accurate and reliable cost estimates to make informed pricing decisions. For example, the Postal Service's Pricing group uses cost avoidance estimates derived from the First-Class Mail letters cost model to set economically sound workshare discounts[7] for First-Class Mail letters. The PRC relies on the cost avoidance estimates to make a reliable determination of whether workshare discounts for First-Class Mail letters comply with PAEA mandates[8] and further the efficiency, volume, and service goals of the Postal Service. Therefore, the Postal Service should develop a plan to explore opportunities to leverage IMb and IV technologies to ensure cost models reflect current operational activities and cost estimates capture all costs incurred by products.

> ### Recommendation #1
> **The Vice President, Pricing and Costing,** should develop a strategic plan to assess how Intelligent Mail barcode and Informed Visibility technologies can be enhanced to support costing and, based on that assessment, determine how and when the technologies can be leveraged to improve costing.
>
> ### Recommendation #2
> **The Vice President, Pricing and Costing, should coordinate with the Vice President, Enterprise Analytics,** to create and provide access to detailed Intelligent Mail barcode data reports or dashboards in Informed Visibility for use by costing personnel.

Finding #2: Use of IMb for First-Class Mail Letters Cost Model

Opportunities exist for the Postal Service to leverage IMb data from the IV system to enhance the accuracy and reliability of mail processing unit cost estimates for First-Class Mail letters. The Postal Service uses the First-Class Mail letters cost model to estimate unit costs of mail processing activities for all associated price categories, such as Metered Letters and Automation 5-Digit Presort Letters. During our site visits,[9] we identified three nonstandard or unexpected mail flows that resulted in alternative or additional processing steps for First-Class Mail letters. We found the First-Class Mail letters cost model does not precisely capture the costs of these activities.

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7   A workshare discount is a postage discount the Postal Service provides to mailers to presort, pre-barcode, handle, or transport their mail.
8   PAEA mandates that, with certain exceptions, the PRC ensure workshare discounts do not exceed the cost avoided by the Postal Service as a result of the workshare activity.
9   We visited 15 postal facilities in four Postal Service areas and interviewed in-plant managers, supervisors, operations support specialists, operations industrial engineers, clerks, and mailhandlers to determine the various expected and unexpected mail flows for First-Class Mail letters.

Letters Processed on Flats Machines

We found that plant personnel sometimes run letters on flats mail processing equipment (MPE), such as the Automated Flats Sorting Machine (AFSM)[10] or Upgraded Flats Sorting Machine (UFSM).[11] This nonstandard activity occurred because some letters that are too large or too thick are processed on flats MPE, such as the Delivery Barcode Sorter (DBCS).[12] In addition, field personnel stated that if letter machines are at capacity and flats machines are idle, they would run letters on flats MPE to increase timeliness of mail processing.

We reviewed IMb scan data[13] from IV for First-Class Mail letters run on AFSM and UFSM machines in May 2018.[14] We determined 327,019 First-Class Mail letters were processed on flats machines, as shown in Table 1.[15] While this processing step may be necessary to meet operational needs, it is not explicitly captured in the First-Class Mail letters cost model. This may indicate that processing costs associated with flats MPE are not being fully accounted for at the First-Class Mail price category level.

Table 1. First-Class Mail Letters Processed on AFSM and UFSM Machines in May 2018

First-Class Mail Letters	Number of Unique Pieces on Flats MPE	Number of Scans on Flats MPE
Presort	284,118	519,183
Single-Piece	42,901	63,291
Total	**327,019**	**582,474**

Source: The U.S. Postal Service Office of Inspector General (OIG) analysis of May 2018 IMb scan data received from the Postal Service's Corporate Reporting group.

Letters Repeating Processing Steps or Looping Between a Plant and Delivery Unit

We found that letters sometimes repeat processing steps within the plant and/or between the plant and destination delivery unit (DDU). This can occur due to equipment mechanical failures such as double-feeds or incorrect decoding of the address elements.

We also found that plant personnel sometimes re-run letters on MPE because the addresses on mailpieces within a tray do not match the zone identified on the tray label. These letters get sorted to a rejection bin. The rejected letters are re-run on the DBCS during the appropriate sort plan, resulting in additional processing steps. This occurs because mailers sometimes affix the wrong barcodes on the trays or fail to update tray labels when they reuse the trays.

Further, letters are sometimes sent back and forth between the plant and DDU, resulting in repeat processing before getting delivered to the appropriate destination. This can occur due to computerized forwarding system (CFS)[16] mail that was not handled correctly. Postal Service personnel stated mail may loop between the plant and DDU multiple times before being corrected. Looping mail can occur due to an incorrect barcode or an incorrect ZIP Code (for example, the barcode or ZIP Code does not match the address). If the barcode or ZIP Code is left uncorrected in an automated processing environment, the mail will continue to be sent to the wrong destination, creating unnecessary duplicative processing.

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10 The AFSM is an automated machine that processes flat-sized mail. The system feeds mail via automatic feeders, acquires images of script and typed mail for video-encoding, and processes mail using optical character recognition (OCR) technology.
11 The UFSM is a flat-sorting machine that can handle pieces beyond the size range of the AFSM.
12 The DBCS is an automated letter sorting machine that is used for letter-size mail already barcoded either by mailers or by the Postal Service on other MPE. The high-speed multi-level DBCS can sort mail in carrier walk sequence, eliminating additional sorting at the delivery unit.
13 This data does not represent the universe of all First-Class Mail letters because not all First-Class Mail letters receive scans on automated equipment. Further, our data represents scan data from AFSM and UFSM machines only.
14 Some mailpieces with a mailing or induction date of May 2018 may have received processing scans in June 2018.
15 Due to the size of the data, we did not obtain the total universe of First-Class Mail letters scanned on automated equipment in May 2018 to determine the magnitude of this issue.
16 The CFS is a centralized, computerized address label-generating operation that performs address correction services and forwards or returns undeliverable-as-addressed (UAA) mail that cannot be processed in the

We reviewed IMb scan data[17] from IV for First-Class Mail letters run on DBCS and DBCS Input/Output Subsystem (DIOSS)[18] machines in May 2018.[19] We determined over 24 million First-Class Mail letters looped within a plant and over 15 million looped between a plant and DDU, as shown in Table 2.[20] While reprocessing of First-Class Mail letters may be inevitable in the operational environment, the First-Class Mail letters cost model could be improved by explicitly factoring in the materiality of this type of mail processing deviation. This would ensure the costs for these duplicative processing steps are more accurately accounted for in First-Class Mail price categories.

Table 2. First-Class Mail Letters that Repeated Processing Steps on DBCS or DIOSS Machines in May 2018

First-Class Mail Letters	Number of Unique Pieces that Repeated Steps[21]	Number of Repeated Scans
Presort	6,760,107	27,879,207
Single-Piece	17,305,912	21,353,916
Looped within Plant Total	24,066,019	49,233,123
Presort	14,850,027	22,390,083
Single-Piece	157,619	598,976
Looped between Plant and DDU Total	15,007,646	22,989,059

Source: OIG analysis of May 2018 IMb scan data received from the Postal Service's Corporate Reporting group.

Letters Missing Processing Steps

We found that Postal Service plant personnel do not always run automation letters on MPE. Letters are sometimes sent directly to the DDU as raw mail that has not been sorted to delivery point sequence (DPS),[22] although the pieces should have been processed on automated equipment (and may have received automation workshare rates). Consequently, the automation letters skip the mail processing steps they were expected to receive at the plant. This occurs because plant personnel may not have time to process all letters on automated equipment before the mail needs to leave the plant to meet service performance goals.

The Postal Service's First-Class Mail letters cost model does not precisely capture the costs of these nonstandard mail flows by individual price category. Management does not explicitly model these nonstandard mail flows because these operational activities should not occur to worksharED First-Class Mail letters. Specifically, these mail flows represent processing irregularities that would ordinarily not apply to worksharED First-Class Mail letters in the mailstream.

Management stated that there are too many operational failures, nuances, and nonstandard procedures to reasonably model all First-Class Mail processing

"The Postal Service's First-Class Mail letters cost model does not precisely capture the costs of these nonstandard mail flows by individual price category."

Postal Automated Redirection System (PARS). PARS is a system that can intercept UAA mail during processing on an Advanced Facer Canceler System, DBCS Input/Output Subsystem, or DBCS by matching a change-of-address record in the national database with the name and delivery address on the mail.

17 This data does not represent the universe of all First-Class Mail letters because not all First-Class Mail letters receive scans on automated equipment. Further, our data represents scan data from DBCS and DIOSS machines only.

18 The DIOSS is a multifunction letter mail processing system based on the DBCS with additional components for OCR, image lift, and application of barcodes on back-end processed mail. This machine also performs delivery point sequencing operations.

19 Some mailpieces with a mailing or induction date of May 2018 may have received processing scans in June 2018.

20 Due to the size of the data, we did not obtain the total universe of First-Class Mail letters that looped on DBCS and DIOSS machines within a plant or between a plant and DDU in May 2018 to determine the magnitude of this issue.

21 First-Class Mail letters with unique barcodes that received more than one scan on the same MPE and in the same operation.

22 DPS is an automated process of sorting mail by carrier routes into delivery order, eliminating the need for carriers to sort the mail manually in the delivery unit prior to departure to their routes.

activities. Instead, they apply an adjustment factor to capture costs for nonstandard activities that are not explicitly modeled. This adjustment factor is applied evenly to all price categories in the model, as shown in Table 3. However, we believe the additional costs from nonstandard activities may apply differently to each price category, depending on which categories are likely to follow the nonstandard mail flows. Thus, the application of an evenly distributed adjustment factor across all price categories in the model may distort the actual costs incurred by individual mail product categories.

Table 3. Fiscal Year (FY) 2017 Adjusted First-Class Presort Letter Unit Mail Processing Costs

Rate Category	Base Model Unit Cost[23]	CRA Adjustment Factor	CRA-Adjusted Unit Cost[24]
Metered Letters	5.006	2.104	10.530
Nonautomation Nonmachinable Mixed Area Distribution Center (ADC)	18.796	1.630	30.639
Nonautomation Nonmachinable ADC	15.240	1.630	24.842
Nonautomation Nonmachinable 3-Digit	12.219	1.630	19.917
Nonautomation Nonmachinable 5-Digit	6.337	1.630	10.330
Nonautomation Machinable Mixed Automated Area Distribution Center (AADC)	5.029	1.630	8.197

Rate Category	Base Model Unit Cost[23]	CRA Adjustment Factor	CRA-Adjusted Unit Cost[24]
Nonautomation Machinable AADC	3.760	1.630	6.129
Nonautomation Machinable 3-Digit	3.760	1.630	6.129
Nonautomation Machinable 5-Digit	3.760	1.630	6.129
Automation Mixed AADC	4.798	1.630	7.821
Automation AADC	3.957	1.630	6.451
Automation 3-Digit	3.586	1.630	5.846
Automation 5-Digit	2.195	1.630	3.579
Automation 5-Digit Carrier Sequence Barcode Sorter[25]/Manual	1.312	1.630	2.138

Source: PRC-LR-ACR2017-3, *FY 2017 – First-Class Mail library* reference in PRC Docket Number ACR2017.

The purpose of the First-Class Mail letters cost model is to disaggregate *Cost and Revenue Analysis* (CRA)[26] line-item costs into the individual First-Class Mail price categories. In addition, the adjustment factors over the past five fiscal years indicate that a significant proportion of costs are not explicitly modeled, as shown in Table 4. For example, between FYs 2013 and 2017, cost estimates for First-Class Mail Presort Letters had to be increased by the lowest factor of 1.630 (about 63 percent) in FY 2017 to the highest factor of 1.875 (about 88 percent) in FY 2015 to align with CRA mail processing costs. By not explicitly modeling for unexpected mail flows and mail processing activities, the estimates may not fully capture disaggregated costs at the individual price category level.

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23 Based on a simulation of 10,000 pieces in the mail flow model.
24 Does not include workshare related and non-workshare related fixed unit costs.
25 An automated machine that sorts an individual carrier's mail, allowing the mail to go directly from the automation equipment in delivery sequence to the carrier for delivery to postal customers. These machines, designed for delivery units with 10 or more routes, are being phased out.
26 The CRA is a report that shows revenue and types of costs for all mail classes, products, and services. CRA data is used to support proposed changes to postage prices.

Table 4. FYs 2013-2017 CRA Adjustment Factors for First-Class Mail Letters Cost Model

First-Class Mail Letters Rate Category Type	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
First-Class Presort Letters	1.709	1.795	1.875	1.701	1.630
First-Class Bulk Metered Letters	1.923	1.821	1.683	1.996	2.104
First-Class Single-Piece Letters	1.923	1.821	1.683	1.996	2.104

Source: PRC Dockets Number ACR2013 through ACR2017.

The Postal Service relies on accurate and reliable mail processing cost estimates to determine avoided costs and set workshare discounts that comply with PAEA. We understand the Postal Service may not be able to capture all unexpected activities in its cost models. However, the cost models should capture as many cost drivers as possible to maximize the precision of cost estimate calculations, which are used to support pricing decisions that comply with the law and cover actual costs incurred. In addition, although nonstandard mail flows may not directly correlate with workshared mail, these alternative processing activities may be incurring additional (or less) costs for specific workshare rate categories. Management should consider evaluating those mail flows to identify the extent to which unexpected and nonstandard processing activities are driving up (or curtailing) costs. This will enable the Postal Service to make more informed pricing and operational decisions.

The IMb is a vehicle for tracking mailpieces and gaining visibility into mail flows. IMb data could assist cost model analysts in identifying cost drivers at the product or price category level and updating mail flow assumptions to more closely align with the current operational environment. The First-Class Mail letters cost model could be improved if the Postal Service leveraged IMb and IV technologies to more precisely incorporate nonstandard and unexpected mail flows in calculations of model cost estimates at the price category level.

Recommendation #3

The Vice President, Pricing and Costing, should use Intelligent Mail barcode and Informed Visibility technologies to evaluate the impact of unexpected or nonstandard mail flows on First-Class Mail letter cost model estimates and, based on the evaluation, consider filing a petition with the Postal Regulatory Commission to use Intelligent Mail barcode and Informed Visibility data to update the model.

Management's Comments

Management agreed with all recommendations presented in this report. Regarding recommendation 1, management will develop a strategic plan to assess how IMb and IV can be used to support costing. As part of the development, they will review the completeness and accuracy of the data to ensure it meets PRC standards. They expect to complete this by September 30, 2019.

Regarding recommendation 2, costing personnel will work with Enterprise Analytics personnel to get access to IMb and IV data by June 30, 2019.

Regarding recommendation 3, management will take OIG's findings and conduct further research to determine the cost of processing First-Class Mail letters and cards using unexpected or nonstandard mail flows. Based on the research, they will determine whether to file a petition with PRC to use IMb or IV data for these processes. They expect completion by June 30, 2019.

Additionally, management believed that context was needed in conjunction with tables 1 and 2. Therefore, management added Revenue, Pieces, and Weight (RPW) report volume data to illustrate the magnitude of the data analysis results presented in this report.

See Appendix B for management's comments in their entirety.

Evaluation of Management's Comments

The OIG considers management's comments responsive to the recommendations in the report, and the corrective actions taken should resolve the issues.

Regarding managements addition to the tables in the report, we agree the RPW volume data is available in the public domain. However, RPW volume data may include mailpieces that were not run on automated equipment and, therefore, not captured in the IMb scan data used to conduct data analysis. Consequently, the OIG did not believe RPW volume data would be an accurate measure of total magnitude.

All recommendations require OIG concurrence before closure. Consequently, the OIG requests written confirmation when corrective action(s) are completed. All recommendation should not be closed in the Postal Service's follow-up tracking system until the OIG provides written confirmation that the recommendations can be closed.

Appendices

Click on the appendix title below to navigate to the section content.

Appendix A: Additional Information

Scope and Methodology

The scope of our audit was to evaluate the FY 2017 First-Class Mail letters cost model to determine how IMb data from the IV system could be used to enhance the accuracy and reliability of cost estimates. Specifically, we reviewed May 2018 IMb scan data for First-Class Mail letter workshare price categories to assess how the data could be incorporated in the model to improve mail processing cost estimates. We examined the mail flows identified in the FY 2017 First-Class Mail letters cost model and conducted site visits to evaluate the assumptions in the model. We focused on First-Class Mail letters because about 45 percent of mail processing costs for IMb mail categories were attributed to First-Class Mail letters in FY 2017, as shown in Figure 1. In addition, mail processing costs comprised about 25 percent of total attributable costs[27] in FY 2017.
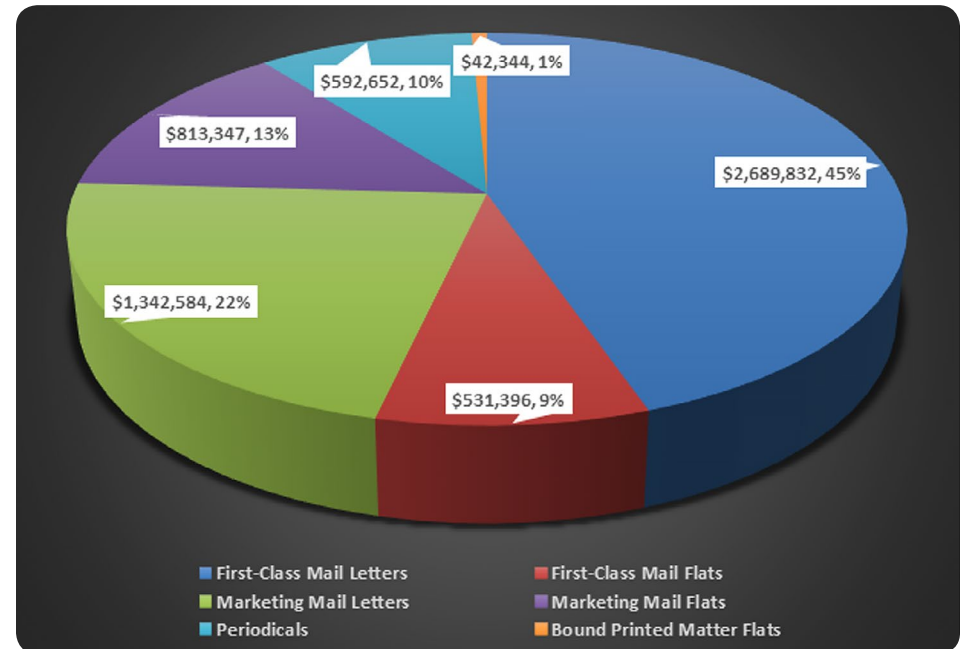
To accomplish our audit objective, we:

- Conducted interviews with Postal Service officials to understand how IMb and IV data has been used in costing to-date and to discuss how the technologies could be leveraged for costing in the future.

- Reviewed relevant policies and procedures related to IMb, IV, other systems with scan data, and mail processing for First-Class Mail letters to determine what data is available and identify relevant data metrics and processes.

- Reviewed the FY 2017 *Annual Compliance Report* (ACR)[28] and *Annual Compliance Determination* (ACD)[29] to identify potential issues with or uses of IMb data as well as potential risk areas in mail processing for First-Class Mail letters.

- Reviewed applicable PRC filings related to IMb to assess how the data has been used and can be further leveraged for product costing.

- Reviewed relevant prior audits and management actions related to the integrity of IMb data.

Figure 1. FY 2017 Attributable Labor Mail Processing Costs for IMb Mail Categories (in Thousands)

Source: FY 2017 *Cost Segments and Components Report.*

- Visited a mail service provider and met with mailing industry representatives to gain an understanding of mailers' perspectives on current and potential uses of IMb. We also observed how IMb software works, inquired about problems that may arise with the application and readability of IMb, and discussed how mailers use IV data reports to maintain visibility of IMb mailpieces.

- Analyzed the First-Class Mail letters cost model to identify assumptions, mail flows, and inputs used to estimate unit costs.

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27 Attributable costs are those that are directly or indirectly caused by product or service.
28 The ACR analyzes cost, revenue, rates, and quality of service for all products and determines whether revenue for each mail class and service type covers its attributable costs.
29 The ACD is a report issued by the PRC in response to the ACR submitted by the Postal Service. In the ACD, the PRC determines whether any price or fee in effect during the year under review were not in compliance with applicable provisions and whether any service standards were not met.

- Obtained and analyzed relevant data from the Electronic Data Warehouse,[30] IV, ACR filings, and other sources to determine greatest areas of impact, conduct trend analyses, and select site visit locations.

- Visited Postal Service facilities to gain an understanding of mail flows for First-Class Mail letters and to evaluate whether cost model assumptions and inputs aligned with the operational environment in the field. We also visited a facility to observe a pilot program leveraging handheld scanners and barcodes to gain visibility of mailpieces in manual operations. Specifically, we conducted site visits at the following locations:

  - **Capital Metro Area** – Northern Virginia Processing and Distribution Center (P&DC); and Richmond, VA, P&DC.

  - **Great Lakes Area** – Cardiss Collins P&DC, IL; South Suburban P&DC, IL; Chicago, IL, Central Carrier Annex; and Loop Carrier Annex, IL.

  - **Northeastern Area** – Dominick V. Daniels P&DC, NJ; Nixon Station, NJ; Parsippany, NJ, Main Post Office; and West New York, NJ, Main Post Office.

  - **Southern Area** – Tampa, FL, P&DC; Tampa, FL, Business Mail Entry Unit; Tampa, FL, Carrier Annex; Town and Country, FL, Post Office Branch; and Ybor City, FL, Station.

  We analyzed DPS leakage[31] ratios, automation and manual workhours, and service performance scores to select facilities to visit. We used these factors because they may have indicated potential mail flow abnormalities that may not have been captured in the First-Class Mail letters cost model. We visited delivery units to identify how mail was arriving at those facilities and to determine if there were indications of unexpected or nonstandard mail processing activities that had occurred at the destinating plant.

- Determined whether the Postal Service had a strategic plan for leveraging IMb data in costing.

- Analyzed IMb data and assessed whether current model assumptions, mail flows, and inputs could be enhanced based on the data analysis and observations made in the field.

- Used the OIG Management Operating Data System (MODS)[32] risk model to review exception reports for errors in reported work hours or volume. The OIG MODS risk model exception reports identify (1) work hours recorded in an operation with no mail volume, or (2) mail volume recorded in an operation with no workhours. We found that 216 of 367 (about 59 percent) MODS operations used in the First-Class Mail letters cost model had reporting errors in FY 2017. Reporting errors in these operations could impact the accuracy of cost estimates derived, in part, from the data collected for these activities.

We conducted this performance audit from March through September 2018, in accordance with generally accepted government auditing standards and included such tests of internal controls as we considered necessary under the circumstances. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. We discussed our observations and conclusions with management on September 17, 2018, and included their comments where appropriate.

We assessed the reliability of computer-generated IMb scan data from the IV system by performing logical tests of completeness on key data elements, reviewing technical documentation on IMb data and the IV system, and interviewing Postal Service officials and external stakeholders knowledgeable about the IMb and IV technologies. We determined that the data were sufficiently reliable for the purposes of this report.

Prior Audit Coverage

The OIG did not identify any prior audits or reviews directly related to the objective of this audit within the last five years.

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30 A repository for all data and the central source for information on retail, financial, and operational performance.
31 DPS leakage shows the amount of mail that is not being processed by automation equipment into carrier walk sequence.
32 MODS is a systematic approach to gather, store, and report data on workload, workhours, and machine utilization.

Appendix B: Management's Comments

SHARON OWENS
VICE PRESIDENT, PRICING AND COSTING

UNITED STATES POSTAL SERVICE

September 21, 2018

MONIQUE COLTER,
DIRECTOR, AUDIT OPERATIONS

SUBJECT: Use of IMb for First-Class Mail Letters' Processing Costs (Report No. CP-AR-18-DRAFT
Project No. 18BG009CP000)

Postal Service Headquarters has reviewed the findings and recommendations outlined in the Office of Inspector General (OIG) report entitled: Use of IMb for First-Class Mail Letters' Processing Costs.

Management generally agrees with the OIG's findings that the Postal Service should periodically investigate various available data sources to determine if material improvements can be made to the inputs currently used in the First-Class Mail Letters cost model. However, in addition to the management's response to each of the three recommendations, there is one additional comment from management regarding the contents of the report.

OIG Report: Tables 1 and 2, Pages 6 and 8, respectively (sources and footnotes omitted):

Table 1. First-Class Mail Letters Processed on AFSM and UFSM Machines in May 2018

First-Class Mail Letters	Number of Unique Pieces on Flats MPE	Number of Scans on Flats MPE
Presort	284,118	519,183
Single-Piece	42,901	63,291
Total	327,019	582,474

Table 2. First-Class Mail Letters that Repeated Processing Steps on DBCS or DIOSS Machines in May 2018

First-Class Mail Letters	Number of Unique Pieces that Repeated Steps	Number of Repeated Scans
Presort	6,760,107	27,879,207
Single-Piece	17,305,912	21,353,916
Looped within Plant Total	24,066,019	49,233,123
Presort	14,850,027	22,390,083
Single-Piece	157,619	598,976
Looped between Plant and DDU Total	15,007,646	22,989,059

Management Comment: Management believes that context is needed in conjunction with the figures displayed in Tables 1 and 2. Accordingly, management suggests that two columns be added to each table. One column will include the estimated volume of First-Class Mail Presort and Single-Piece letters and cards for May 2018,

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which is readily available in the public domain.[1] The other column will calculate the proportion of the total volume that either was processed on flats equipment (Table 1) or experienced an irregular mail flow (Table 2). The following revised tables include the suggestions. Management believes that the proportions in the rightmost columns of Revised Tables 1 and 2 make it abundantly clear that a minimal amount of First-Class Mail letter volume is either processed on flats equipment or encounters irregular mail flows. However, this is not clear from the report because no perspective was provided as to the number of First-Class Mail Presort and Single-Piece letters and cards that were processed in May 2018.

Revised Table 1. First-Class Mail Letters Processed on AFSM and UFSM Machines in May 2018

First-Class Mail Letters	Number of Unique Pieces on Flats MPE	Number of Scans on Flats MPE	RPW Estimated Volume May 2018[1]	Proportion of Volume Processed on Flats Equipment
Presort	284,118	519,183	3,026,466,939	0.009%
Single-Piece	42,901	63,291	1,331,814,364	0.003%
Total	327,019	582,474	4,358,281,303	0.008%

Revised Table 2. First-Class Mail Letters that Repeated Processing Steps on DBCS or DIOSS Machines in May 2018

First-Class Mail Letters	Number of Unique Pieces that Repeated Steps	Number of Repeated Scans	RPW Estimated Volume May 2018[1]	Proportion of Volume with Repeated Steps
Presort	6,760,107	27,879,207	3,026,466,939	0.223%
Single-Piece	17,305,912	21,353,916	1,331,814,364	1.299%
Looped within Plant Total	24,066,019	49,233,123	4,358,281,303	0.552%
Presort	14,850,027	22,390,083	3,026,466,939	0.491%
Single-Piece	157,619	598,976	1,331,814,364	0.012%
Looped between Plant and DDU Total	15,007,646	22,989,059	4,358,281,303	0.344%

Recommendation #1:
The **Vice President, Pricing and Costing**, should develop a strategic plan to assess how Intelligent Mail barcode and Informed Visibility technologies can be enhanced to support costing and, based on that assessment, determine how and when the technologies can be leveraged to improve costing.

Management Response/Action Plan:
Management agrees with this recommendation. Management will develop a strategic plan to assess how Intelligent Mail barcode and Informed Visibility technologies can be used to support costing. Management first needs to carefully review the completeness and accuracy of the IMb and IV data for First-Class Mail letters to ensure it meets Commission standards. After management establishes that IMb and IV data are sufficiently accurate and defensible to intense scrutiny from the Commission and interested parties, management will then review the data flows for incremental opportunities to use IMb and IV data in the First-Class Mail letters cost

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[1] Source: FY 2018 Q3 RPW Report. Because the Postal Service only publishes separate estimates for First-Class Mail Presort letters and cards and First-Class Single-Piece letters and cards quarterly, an estimate for May 2018 was computed by taking the corresponding FY2018 Q3 volumes and dividing by three.

model, similar to what was done in an update to the transportation cost model for Parcel Select/Parcel Return Service in 2017.[2]

Target Implementation Date for developing strategic plan: September 2019

Responsible Official: Manager, Cost Attribution

Recommendation #2: The **Vice President, Pricing and Costing, should coordinate with the Vice President, Enterprise Analytics**, to create and provide access to detailed Intelligent Mail barcode data reports or dashboards in Informed Visibility for use by costing personnel.

Management Response/Action Plan
Management agrees with this recommendation. The Vice President of Pricing and Costing will coordinate with the Vice President of Enterprise Analytics to ensure that costing personnel have access to the IMb and IV data.

Target Implementation Date for costing personnel to obtain access to data: June 2019

Responsible Officials: Vice President, Pricing and Costing; and Vice President, Enterprise Analytics

Recommendation #3:
The **Vice President, Pricing and Costing**, should use Intelligent Mail barcode and Informed Visibility technologies to evaluate the impact of unexpected or nonstandard mail flows on First-Class Mail letter cost model estimates and, based on the evaluation, consider filing a petition with the Postal Regulatory Commission to use Intelligent Mail barcode and Informed Visibility data to update the model.

Management Response/Action Plan:
Management agrees with this recommendation. Management is in the process of carefully reviewing the OIG's research and findings on irregular mail flows for First-Class Mail letters and cards. Management plans to further the research by estimating the cost impacts of First-Class Mail letters and cards either processed on flats equipment or encountering irregular mail flows. After the cost impacts are accurately quantified, management will decide whether filing a petition using IMb and IV data to model irregular mail flows is warranted.

Target Implementation Date for deciding whether to file a petition with the Commission: June 2019

Responsible Official: Manager, Cost Attribution

Sharon Owens
Sharon Owens

cc: Corporate Audit Response Management

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[2] See Docket No. RM2017-10, Proposal Six, Order No. 4228, November 20, 2018.