



POSTAL REGULATORY COMMISSION

# Flats Operations Study Report

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**April 6, 2023**

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# EXECUTIVE SUMMARY

Flat-shaped mail or “flats” refers to large envelopes, magazines, and other flexible, rectangular mail that meet certain criteria.<sup>1</sup> Service performance and operational efficiency for flats has historically been below that for other types of mail.

Section 206 of the Postal Service Reform Act (PSRA) required the Commission to conduct a Flats Operations Study (“Flats Study”) not later than 1 year after enactment of the Act:<sup>2</sup>

(a) Flats Operations Study.—:

(1) In General.—The Postal Regulatory Commission, in consultation with the Inspector General of the United States Postal Service, shall conduct a study to—

(A) comprehensively identify the causes of inefficiencies in the collection, sorting, transportation, and delivery of Flats; and

(B) quantify the effects of the volume trends, investments decisions, excess capacity, and operational inefficiencies of the Postal Service on the direct and indirect costs of the Postal Service that are attributable to Flats.

The Commission’s Flats Study identifies causes of inefficiencies in the collection, sorting, transportation, and delivery of flats. In addition, the Flats Study quantifies the effects of the volume trends, certain investment decisions, excess capacity, and operational inefficiencies of the Postal Service on costs that are attributable to flats. To carry out the Flats Study, the Commission collected and reviewed flats data provided by the Postal Service. Commission staff also visited Postal Service facilities over a period of 4 months (from July to October of 2022), visited mailers’ facilities in November of 2022, contracted with an operations expert, and consulted with the Office of Inspector General.

The principal findings of this Flats Study are:

- In FY 2022, the cost coverage (revenue divided by attributable cost) for all flats products increased. However, unit attributable costs also increased for the majority of flats products.

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<sup>1</sup> A flat-shaped mailpiece must have one dimension that is greater than 6-1/8 inches high or 11-½ inches long or ¼ inch thick and cannot be more than 12 inches high x 15 inches long x ¾ inch thick. United States Postal Service, *Publication 32, Glossary of Postal Terms*, July 1, 2016, at 88, available at [https://postalpro.usps.com/storages/2016-04/pub32\\_glossary.pdf](https://postalpro.usps.com/storages/2016-04/pub32_glossary.pdf).

<sup>2</sup> Postal Service Reform Act of 2022, Pub. L. 117-108, § 206(a), 136 Stat. 1127 (2022), available at <https://www.congress.gov/117/plaws/publ108/PLAW-117publ108.pdf>.

- Since FY 2010, the total volume of all flats products has decreased by 43.4 percent or an average of 4.6 percent annually.
- Six pinch points (as identified by the Commission in previous ACDs) continue to contribute to cost and service issues for flats: (1) bundle processing; (2) automated processing; (3) manual sorting; (4) allied operations; (5) transportation; and (6) last mile/delivery.
- Reported bundle breakage rates likely underestimate true bundle breakage because only bundles that break on bundle sorters are reported; however, bundles break, or are treated as if they will break, during other processing stages.
- Bundle breakage often results in inefficient manual processing of individual flats.
- How bundles are prepared and presented to the Postal Service significantly impacts bundle breakage rates. Better coordination between the Postal Service and mailers is necessary to improve bundle integrity.
- Due to the lack of machine counts and clocking errors, measurement of both workhours and volumes in manual flats sorting are unreliable. The lack of reliable volume or workhour data represents a tremendous loss of opportunity to track or use this data in any meaningful way.
- Lack of relevant data prevents effective communication between mailers, facility staff, and Postal Service Headquarters, inhibiting corrective action.
- Insufficient data, coupled with data quality issues, makes it difficult to assess the Postal Service's ability to improve flats processing efficiency.
- The Postal Service does not always understand the sources of flats processing inefficiencies or track volumes that cause inefficient operations.
- Recent operational plans, such as decommissioning Flats Sequencing System (FSS) machines and the creation of sorting and delivery centers (S&DCs), will likely impact flats costs.

The PSRA requires the Postal Service, within 6 months, either to develop and implement a plan to remedy each inefficiency identified in the Flats Study or else to provide an explanation as to why remedying such inefficiency is impracticable. Based on the findings of the Flats Study, the Commission provides the following suggestions to the Postal Service for consideration as it develops its plan. Specifically, the Postal Service should consider:

- Continuing the combination of increasing revenue and reducing costs until unit revenue exceeds unit attributable cost for each non-compensatory flats product.
- Continuing to study the causes, impacts, and ways to reduce bundle breakage; enhancing the reporting and tracking of bundle irregularities; and working with mailers to ensure corrective actions are implemented when irregularities are shared.

- Further assessing the quality of its data, particularly as it relates to volume, workhours, and productivity, and exploring cost effective ways to improve that quality.
- Implementing initiatives to reduce mail processing costs.
- Identifying mail processing facilities with extreme (unusually high or low) productivity values and those with quarterly productivity values based on a large number of missing workhours or volume; targeting those sites to improve their reporting or explaining why the provided productivity is accurate for a given facility.
- Developing an accurate method to track flat-shaped mail that is manually processed. Once there is an accurate measurement of such flat-shaped mail, the Postal Service should consider developing a specific plan to: (1) continue to decrease the quantity of flat-shaped mailpieces processed manually, and (2) achieve a proportional reduction in unit mail processing costs for manual operations.
- Including in its plan specific, achievable goals to reduce costs associated with allied operations, transportation, and delivery of flats.
- Quantifying the impact of any initiatives on costs to ensure its efforts are effective.

The Commission will continue to work with the Postal Service and the postal community to address these challenges.

# CHAPTER I. PURPOSE AND SCOPE OF THE FLATS STUDY

## A. Section 206 of the Postal Service Reform Act of 2022

Section 206 of the PSRA requires the Commission, in consultation with the Inspector General of the United States Postal Service, to conduct a Flats Operations Study (Flats Study). Pub. L. No. 117-108, § 206(a)(1), 136 Stat. 1127, 1148 (2022). A report on the findings of the study is due to Congress and the Postmaster General “[n]ot later than one year after the date of the enactment of this Act.” *Id.* § 206(a)(3). In accordance with this statutory requirement, the report is due by April 6, 2023.

The Flats Study includes two major parts. The first part involves analytical research and empirical studies to “comprehensively identify the causes of inefficiencies in the collection, sorting, transportation, and delivery of Flats.” *Id.* § 206(a)(1)(A). The second part involves formal data and quantitative analysis to “quantify the effects of the volume trends, investment decisions, excess capacity, and operational inefficiencies of the Postal Service on the direct and indirect costs of the Postal Service that are attributable to Flats.” *Id.* § 206(a)(1)(B).

The Commission consulted with the USPS Office of Inspector General (OIG) through review of OIG audits related to manual processing, discussions regarding site visits, and periodic dialogue related to preliminary findings.

## B. Summary of the Report

In the Executive Summary, the Commission presents its findings from the study in this report. In Chapter II, the Commission discusses the financial performance of flats since FY 2008 and summarizes actions taken by the Commission to increase transparency and assist the Postal Service in developing a comprehensive plan to improve flats service performance and cost coverage.

In Chapter III, the Commission analyzes common causes of inefficiencies in flats operations, using data provided by the Postal Service and observations from facility visits. The Commission also provides newly identified causes of inefficiencies and describes the impact of facility management decisions on efficiency.

In Chapter IV, the Commission analyzes the impact of different factors on flats costs. The Commission reviews volume trends, excess capacity, and operational factors. The

Commission also analyzes flats costs for categories such as mail processing, delivery, and transportation.

Based on the Commission's analysis, the Commission provides recommendations in Chapter V for the Postal Service to consider as it develops its plan to remedy these issues.



## CHAPTER II. BACKGROUND

This chapter provides a brief history of the financial performance of flat-shaped mail and summary of Commission flats rules and directives.<sup>3</sup>

### A. Flats Volume and Financial Performance

#### 1. Financial Performance in FY 2021-FY 2022

The Postal Service has eight mail products that consist of more than 80 percent flat-shaped mail (flats products).<sup>4</sup> As Figure II-1 shows, in FY 2021, five of these flats products did not generate sufficient revenue to cover their attributable costs:<sup>5</sup> First-Class Mail Flats, USPS Marketing Mail Flats, USPS Marketing Mail Carrier Route, Outside County Periodicals, and In-County Periodicals. These products are considered “non-compensatory,” while products whose revenues cover their attributable costs are considered “compensatory.”

**Figure II-1**  
**Compensatory and Non-Compensatory Flats Products, FY 2021<sup>6</sup>**

Compensatory Flats Products	Non-Compensatory Flats Products
<p><b>USPS Marketing Mail:</b> High Density and Saturation Flats and Parcels Every Door Direct Mail—Retail</p> <p><b>Package Services:</b> Bound Printed Matter Flats</p>	<p><b>First-Class Mail</b> Flats</p> <p><b>USPS Marketing Mail</b> Carrier Route Flats</p> <p><b>Periodicals</b> In-County Outside County</p>

<sup>3</sup> The Commission uses the terms “flats,” “flat-shaped mail,” and “flats products” interchangeably throughout this report.

<sup>4</sup> These flats products span four Market Dominant mail classes: First-Class Mail, USPS Marketing Mail, Periodicals, and Package Services. See Figure II-1.

<sup>5</sup> Prior to FY 2017, attributable cost of a product was defined as the sum of volume variable cost plus product specific cost. Due to methodological changes in FY 2017, attributable cost is now presented as the sum of “volume variable and product specific cost, plus the product’s inframarginal cost calculated as part of the estimation of the product’s incremental cost.” Docket No. ACR2017, United States Postal FY 2017 *Annual Compliance Report*, December 29, 2017, at 4 (FY 2017 ACR). Computationally, the attributable cost of each individual product should match the incremental cost of the same product. *Id.*

<sup>6</sup> Source: Docket No. ACR2021, *Annual Compliance Determination*, March 29, 2022, at 229 (FY 2021 ACD).

In FY 2022, the cost coverage (revenue divided by attributable cost) of all flats products increased. *See* Table II-1. In FY 2021, new rate authorities were introduced that allowed the Postal Service more pricing flexibility.<sup>7</sup> Since many of the rate increases that used these new authorities were not implemented until the end of FY 2021, their impact on the cost coverage of flats products did not occur until FY 2022. In the instant report, a product is classified as non-compensatory if its revenue did not cover its attributable cost in FY 2021 (the year prior to the issuance of the PSRA). For this reason, First-Class Mail Flats is among non-compensatory products even though the product was compensatory in FY 2022 and in all the PAEA years prior to FY 2021.

**Table II-1**  
**Cost Coverage of Flats Products, FY 2021–FY 2022<sup>8</sup>**

		FY 2021	FY 2022	Change
Compensatory	USPS Marketing Mail Every Door Direct Mail—Retail	248.3%	263.9%	15.6%
	USPS Marketing Mail High Density and Saturation Flats and Parcels	125.4%	132.5%	7.0%
	Package Services Bound Printed Matter Flats	117.3%	124.7%	7.4%
Non-Compensatory	First-Class Mail Flats	98.9%	108.8%	9.9%
	USPS Marketing Mail Carrier Route	94.6%	99.4%	4.8%
	USPS Marketing Mail Flats	60.3%	66.7%	6.4%
	Outside County Periodicals	53.9%	61.9%	8.1%
	In-County Periodicals	45.0%	49.1%	4.1%

Note: All numbers in all tables are rounded.

Cost coverage improved for each flats product in FY 2022. However, as shown in Table II-2, the unit attributable costs have also increased for all but three flats products: (1) USPS Marketing Mail Every Door Direct Mail—Retail (EDDM-R), (2) Outside County Periodicals; and (3) In-County Periodicals. Therefore, part of the overall improvement in cost coverage is due to an increase in revenue rather than a decrease in attributable cost, and therefore primarily due to the new rate authorities. In addition, as shown in Section IV.B.2., the repeal of the requirement that USPS annually prepay future retirement health benefits has

<sup>7</sup> See Docket No. RM2017-3, Order Adopting Final Rules for the System of Regulating Rates and Classes for Market Dominant Products, November 30, 2020 (Order No. 5763).

<sup>8</sup> Source: See Docket No. ACR2021, Library Reference USPS-FY21-1, Public Cost and Revenue Analysis (PCRA) Report, December 29, 2021, PDF file "USPS-FY21-1 Preface.CRA.Report.pdf" (FY 2021 Public CRA Report); Docket No. ACR2022, Library Reference USPS-FY22-1, Public Cost and Revenue Analysis Report (PCRA), December 29, 2022, PDF file "USPS-FY22-1 Preface.PCRA.Report.pdf" (FY 2022 Public CRA Report).

had a one-time exogenous effect of dampening increases in unit attributable cost in FY 2022.

**Table II-2  
Unit Attributable Costs (\$) of Flats Products, FY 2021–FY 2022<sup>9</sup>**

		FY 2021	FY 2022	% Change
Compensatory	USPS Marketing Mail Every Door Direct Mail—Retail	0.078	0.075	-3.0%
	USPS Marketing Mail High Density and Saturation Flats and Parcels	0.143	0.143	0.3% <sup>10</sup>
	Package Services Bound Printed Matter Flats	0.658	0.696	5.7%
Non-Compensatory	First-Class Mail Flats	1.326	1.340	1.0%
	USPS Marketing Mail Carrier Route	0.286	0.306	7.0%
	USPS Marketing Mail Flats	0.717	0.722	0.7%
	Outside County Periodicals	0.514	0.494	-3.9%
	In County Periodicals	0.242	0.241	-0.3%

## 2. Financial Performance Over PAEA Era<sup>11</sup>

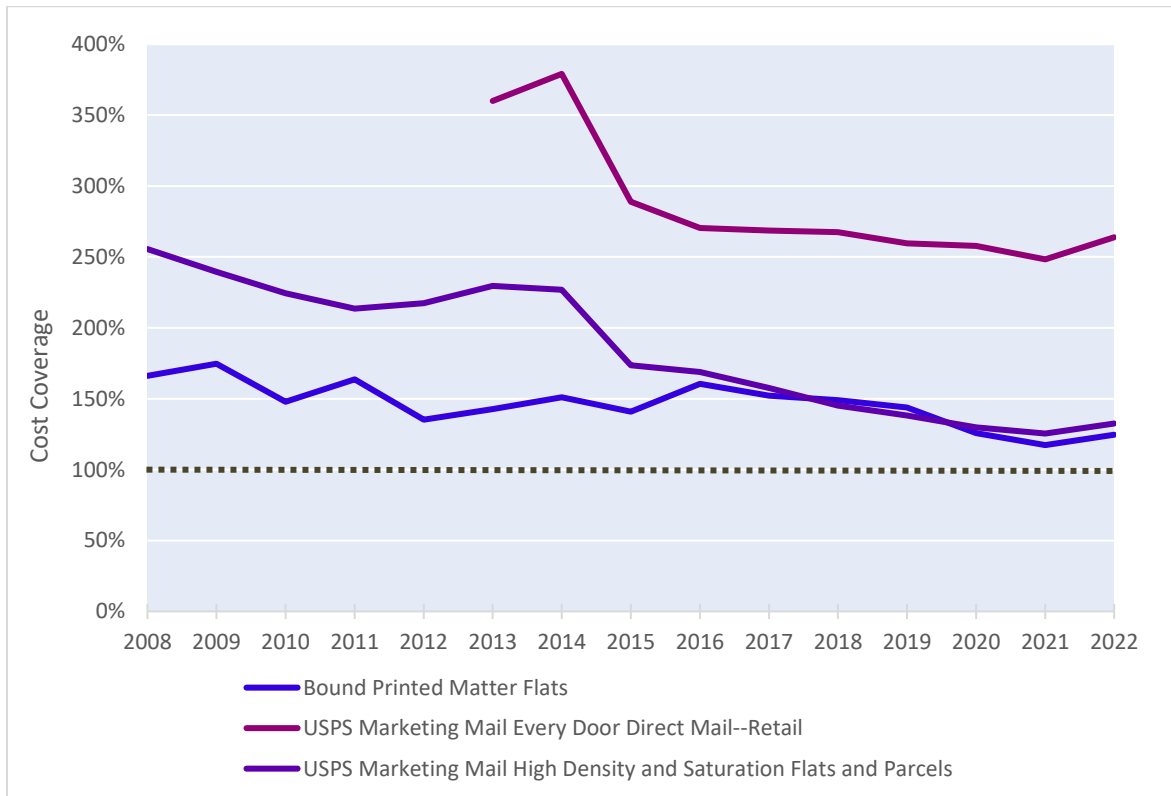
Prior to the new rate authorities, the cost coverage of both compensatory flats products and non-compensatory flats products had been falling consistently since FY 2016. This is shown in Figure II-2 and Figure II-3.

<sup>9</sup> Source: See FY 2021 Public CRA Report; FY 2022 Public CRA Report.

<sup>10</sup> While the dollar-denominated unit attributable cost for USPS Marketing Mail High Density and Saturation Flats and Parcels does not appear to change, this is only due to rounding all unit costs to three digits.

<sup>11</sup> “PAEA Era” refers to the period of time impacted by the enactment of the Postal Accountability and Enhancement Act (PAEA) in 2006. See Pub. L. 109-435, 120 Stat. 3198 (2006). Since most key PAEA provisions were implemented in December 2007, this report refers to “PAEA Era” as FY 2008 through FY 2022.

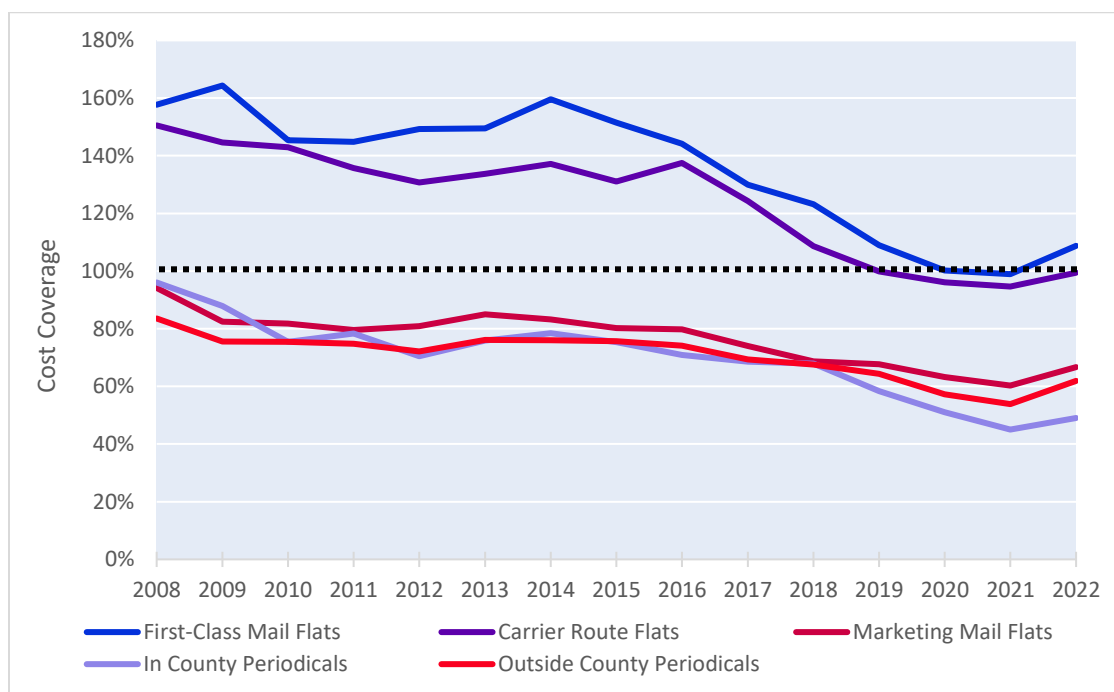
**Figure II-2  
Cost Coverage of Compensatory Flats Products, FY 2008–FY 2022<sup>12</sup>**



Note: EDDM-R was introduced in FY 2013 so there is no data prior to this year.

<sup>12</sup> Source: See Docket No. ACR2022, Library Reference PRC-LR-ACR2022-1, March 29, 2023; Docket No. ACR2021, Library Reference PRC-LR-ACR2021-1, March 29, 2022; Docket No. ACR2020, Library Reference PRC-LR-ARC2020-1, March 29, 2021; Docket No. ACR2019, Library Reference PRC-LR-ACR2019-1, March 25, 2020; Docket No. ACR2018, Library Reference PRC-LR-ARC2018-1, April 12, 2019; Docket No. ACR2017, Library Reference PRC-LR-ACR2017-1, March 29, 2018; Docket No. ACR2016, Library Reference PRC-LR-ACR2016/1, March 28, 2017; Docket No. ACR2015, Library Reference PRC-LR-ACR2015-1, March 28, 2016; Docket No. ACR2014, Library Reference PRC-LR-ARC2014-1, March 27, 2015; Docket No. ACR2013, Library Reference PRC-ACR2013-LR1, March 27, 2014; Docket No. ACR2012, Library Reference PRC-ARC2012-LR-1, March 28, 2013; Docket No. ACR2011, Library Reference PRC-ACR2011-LR-1, March 28, 2012; Docket No. ACR2010, Library Reference PRC-ARC2010-LR-1, March 29, 2011; Docket No. ACR2009, Library Reference PRC-ACR2009-LR-1, March 29, 2010; Docket No. ACR2008, Library Reference PRC-ARC2008-LR-1, March 30, 2009.

**Figure II-3  
Cost Coverage of Non-Compensatory Flats Products, FY 2008–FY 2022<sup>13</sup>**



Both First-Class Mail Flats and Carrier Route Flats were compensatory until recently. First-Class Mail Flats became non-compensatory for the first time in FY 2021, while Carrier Route Flats has not covered its cost since FY 2019. With the new rate authorities, the cost coverage for First-Class Mail Flats improved to 108.8 percent and the cost coverage for Carrier Route Flats improved to 99.4 percent in FY 2022.

USPS Marketing Mail Flats and both Periodicals products have not covered their attributable costs since FY 2008. The cost coverage of these products had been relatively steady from FY 2010 through FY 2016 (around 82 percent for USPS Marketing Mail Flats and 75 percent for each Periodicals product) but steadily declined since FY 2016 until the new rate authorities were exercised in FY 2021.

While cost coverage highlights a product’s individual performance, the product’s overall contribution to institutional costs (contribution) provides insight to its importance in the Postal Service’s financial position. A product’s overall contribution is defined as the product’s total revenue minus its total attributable cost. For example, USPS Marketing Mail

<sup>13</sup> Source: See Docket No. ACR2022, Library Reference PRC-LR-ARC2022-1; Docket No. ACR2021, Library Reference PRC-LR-ACR2021-1; Docket No. ACR2020, Library Reference PRC-LR-ARC2020-1; Docket No. ACR2019, Library Reference PRC-LR-ACR2019-1; Docket No. ACR2018, Library Reference PRC-LR-ARC2018-1; Docket No. ACR2017, Library Reference PRC-LR-ACR2017-1; Docket No. ACR2016, Library Reference PRC-LR-ACR2016/1; Docket No. ACR2015, Library Reference PRC-LR-ACR2015-1; Docket No. ACR2014, Library Reference PRC-LR-ARC2014-1; Docket No. ACR2013, Library Reference PRC-ACR2013-LR1; Docket No. ACR2012, Library Reference PRC-ARC2012-LR-1; Docket No. ACR2011, Library Reference PRC-ACR2011-LR-1; Docket No. ACR2010, Library Reference PRC-ARC2010-LR-1; Docket No. ACR2009, Library Reference PRC-ACR2009-LR-1; Docket No. ACR2008, Library Reference PRC-ARC2008-LR-1.

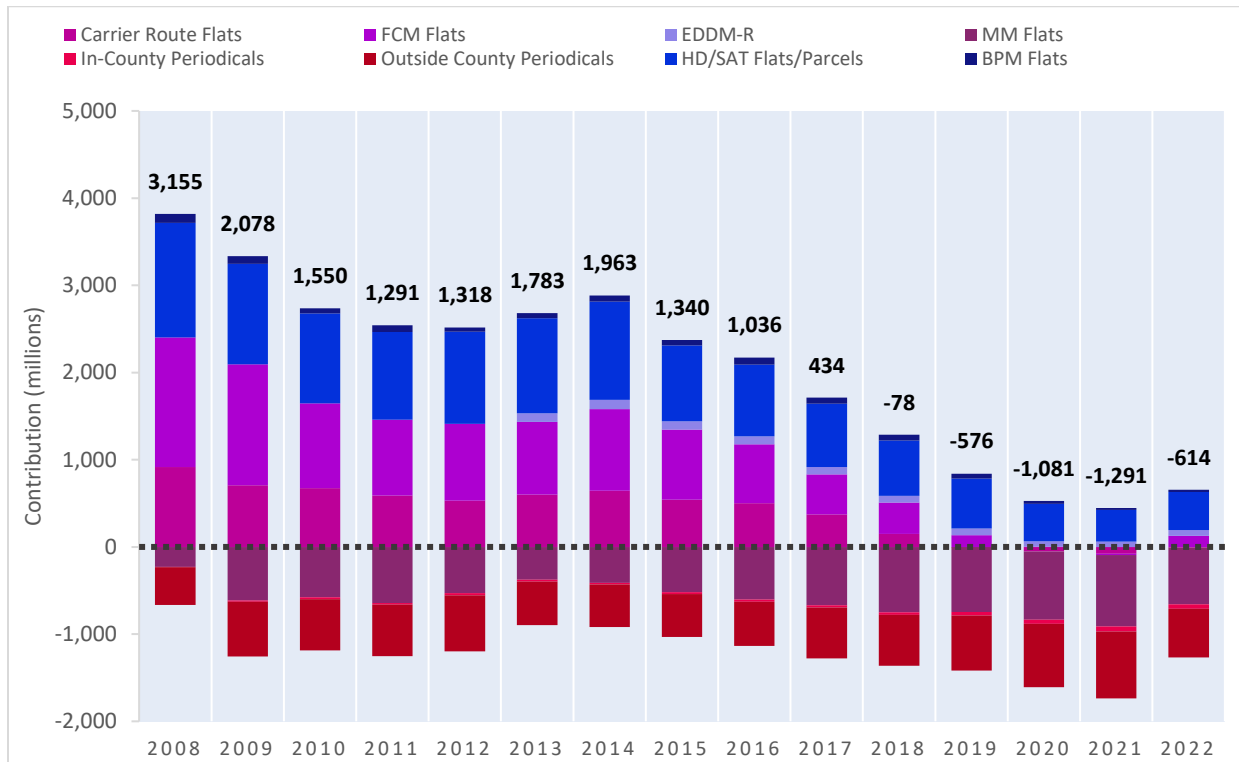
EDDM-R consistently has higher cost coverage than other flats products. However, because both the unit attributable cost and the price are low, the unit contribution is low. This, coupled with low volume results in a small overall contribution. Similarly, the Bound Printed Matter (BPM) Flats product is covering its attributable cost but has a very low contribution. The only flats product that has a significant positive contribution is USPS Marketing Mail High Density and Saturation Flats and Parcels.

As shown in Figure II-4, the total contribution of all flats products has been negative since FY 2018.<sup>14</sup> This appears to be largely due to a decline in the overall contribution of First-Class Mail Flats and Carrier Route Flats as their volumes fall. Until recent years, both of these products had a significant positive contribution. In FY 2008, First-Class Mail Flats and Carrier Route Flats together had a positive contribution of more than \$2.4 billion, which helped generate a net positive contribution of more than \$3.1 billion for overall flats products. The net negative contribution of flats products in the last five years is also due to an increase in the negative contribution of USPS Marketing Mail Flats and Outside County Periodicals. At its lowest point in FY 2021, flats products had a net negative contribution of more than \$1.29 billion. In FY 2022, there was a significant improvement in flats contribution, which cut the net negative contribution of flats products to \$614 million.

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<sup>14</sup> The numbers above the bars represent the total contribution of all flats products for a given fiscal year.

**Figure II-4  
Combined Contribution of Flats Products, FY 2008–FY 2022<sup>15</sup>**



The decline in contribution is, in large part, driven by both a steady decline in total volume and an increase in unit attributable cost. *See* Figure II-5. Unit cost in this figure has been adjusted for inflation using FY 2021 as the base year. Total volume of all flats products has fallen by approximately 4 to 6 percent on average each year since FY 2016, except between FY 2019 and FY 2020, when volume fell by 14 percent. *See* Figure II-5.

Total unit attributable cost for all flats products combined has been steadily increasing since FY 2014, even when adjusted for inflation.<sup>16</sup>

<sup>15</sup> Source: *See* Docket No. ACR2022, Library Reference PRC-LR-ARC2022-1; Docket No. ACR2021, Library Reference PRC-LR-ACR2021-1; Docket No. ACR2020, Library Reference PRC-LR-ARC2020-1; Docket No. ACR2019, Library Reference PRC-LR-ACR2019-1; Docket No. ACR2018, Library Reference PRC-LR-ARC2018-1; Docket No. ACR2017, Library Reference PRC-LR-ACR2017-1; Docket No. ACR2016, Library Reference PRC-LR-ACR2016/1; Docket No. ACR2015, Library Reference PRC-LR-ACR2015-1; Docket No. ACR2014, Library Reference PRC-LR-ARC2014-1; Docket No. ACR2013, Library Reference PRC-ACR2013-LR1; Docket No. ACR2012, Library Reference PRC-ARC2012-LR-1; Docket No. ACR2011, Library Reference PRC-ACR2011-LR-1; Docket No. ACR2010, Library Reference PRC-ARC2010-LR-1; Docket No. ACR2009, Library Reference PRC-ACR2009-LR-1; Docket No. ACR2008, Library Reference PRC-ARC2008-LR-1.

<sup>16</sup> This trend does not continue in FY 2022. From FY 2021 to FY 2022, unit attributable cost for all flats products combined increased by only 0.11 cents in nominal terms, which was a 2.5 cent decrease in real terms (due to a 7.9 percent inflation rate).

**Figure II-5  
Total Flats Volume and Unit Attributable Cost, FY 2008–FY 2022<sup>17</sup>**

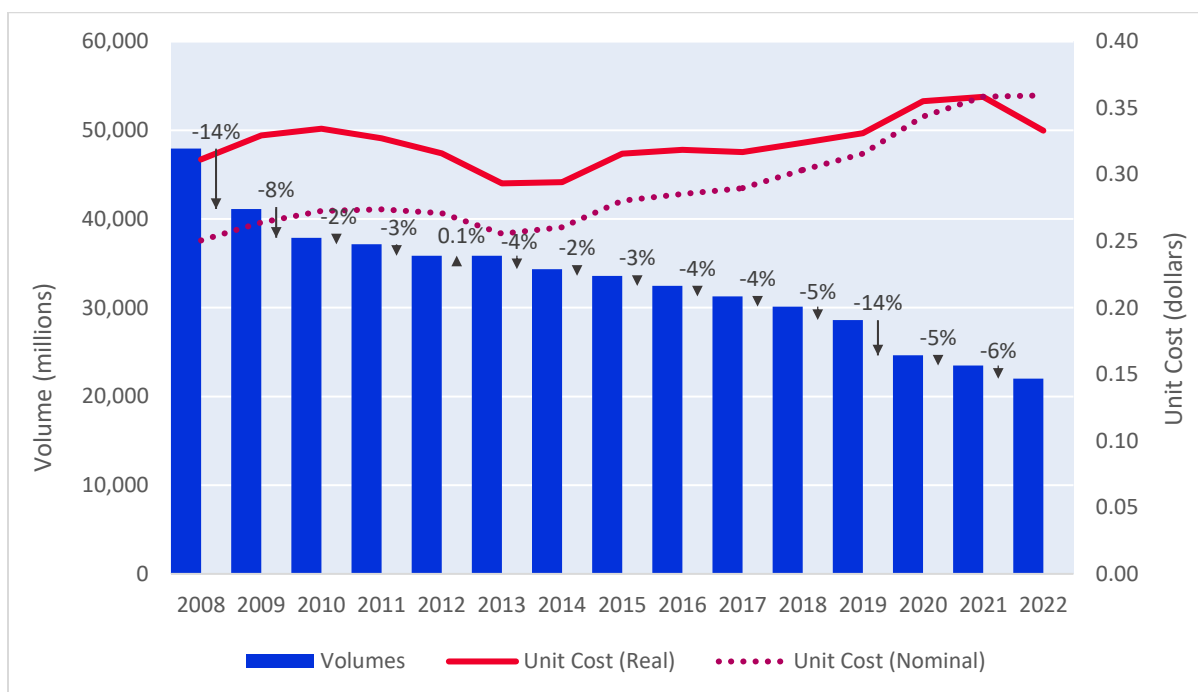


Table II-3 provides the percent change in volume since FY 2010 for each flats product individually, groups of compensatory and non-compensatory flats products, and total volume of all flats products combined. Since FY 2010, the total volume of all flats products combined has decreased by 43.4 percent, or an average of 4.6 percent annually.<sup>18</sup> Compensatory flats products have had a 19.7 percent decline in volume since FY 2010 compared to the 54.7 percent decline in volume of non-compensatory flats products. This is because USPS Marketing Mail High Density and Saturation Flats and Parcels, which only

<sup>17</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; Docket No. ACR2020, Library Reference USPS-FY20-1, Public Cost and Revenue Analysis (PCRA) Report, December 29, 2020, PDF file “USPS-FY20-1 Preface.CRA.Report.pdf” (FY 2020 Public CRA Report); Docket No. ACR2019, Library Reference USPS-FY19-1, Public Cost and Revenue Analysis (PCRA) Report, December 27, 2019, PDF file “USPS-FY19-1.pdf” (FY 2019 Public CRA Report); Docket No. ACR2018, Library Reference USPS-FY18-1, Public Cost and Revenue Analysis (PCRA) Report, December 28, 2018, PDF file “USPS-FY18-1.pdf” (FY 2018 Public CRA Report); Docket No. ACR2017, Library Reference USPS-FY17-1, Public Cost and Revenue Analysis (PCRA) Report, December 29, 2017, PDF file “USPS-FY17-1 Preface.pdf” (FY 2017 Public CRA Report); Docket No. ACR2016, Library Reference USPS-FY16-1, Public Cost and Revenue Analysis (PCRA) Report, December 29, 2016, PDF file “USPS-FY16-1 Preface.pdf” (FY 2016 Public CRA Report); Docket No. ACR2015, Library Reference USPS-FY15-1, Public Cost and Revenue Analysis (PCRA) Report, December 29, 2015, PDF file “USPS-FY15-1 Preface.pdf” (FY 2015 Public CRA Report); Docket No. ACR2014, Library Reference USPS-FY14-1, Public Cost and Revenue Analysis (PCRA) Report, December 29, 2014, PDF file “USPS-FY14-1.Preface.pdf” (FY 2014 Public CRA Report); Docket No. ACR2013, Library Reference USPS-FY13-1, Public Cost and Revenue Analysis (PCRA) Report, December 27, 2013, PDF file “Preface.FY13-1.Public.CRA.Rev.2-6-14.pdf” (FY 2013 Public CRA Report); Docket No. ACR2012, Library Reference USPS-FY12-1, Public Cost and Revenue Analysis (PCRA) Report, December 28, 2012, PDF file “REV\_USPS-FY12-1.Preface.pdf” (FY 2012 Public CRA Report); Docket No. ACR2011, Library Reference USPS-FY11-1, Public Cost and Revenue Analysis (PCRA) Report, December 29, 2011, PDF file “USPS-FY11-1.pdf” (FY 2011 Public CRA Report); Docket No. ACR2010, Library Reference USPS-FY10-1, Public Cost and Revenue Analysis (PCRA) Report, December 29, 2010, document “USPS-FY10-1.doc” (FY 2010 Public CRA Report); Docket No. ACR2009, Library Reference USPS-FY09-1, Public Cost and Revenue Analysis (PCRA) Report, December 29, 2009, document “USPS-FY09-1.doc” (FY 2009 Public CRA Report); Docket No. ACR2008, Library Reference USPS-FY08-1, Public Cost and Revenue Analysis (PCRA) Report, December 29, 2008, document “USPS-FY08-1.doc” (FY 2008 Public CRA Report); U.S. Department of Labor, U.S. Bureau of Labor Statistics, available at <https://www.bls.gov>.

<sup>18</sup> This calculation includes FY 2013 EDDM-R volumes in FY 2010 total flats volume since EDDM-R was not introduced until FY 2013.



had a decline of 17 percent, makes up the majority of the volume of compensatory flats. The volume of non-compensatory flats is not significantly determined by a single product. The volumes of all flats products, other than USPS Marketing Mail High Density and Saturation Flats and Parcels have decreased at least 37 percent since FY 2010. USPS Marketing Mail Flats experienced the largest decline in volume (62.0 percent since FY 2010). *See* Table II-3.

In FY 2010, the cumulative volume of the five non-compensatory products was more than twice as much as the total volume of the three compensatory products. *See* Table II-3. By FY 2022, however, the cumulative volume of the non-compensatory flats had substantially declined, and the volume share of these products was only 18 percent higher than that of compensatory flats products.<sup>19</sup> Section IV.A.1. focuses on the volume and unit cost trends of non-compensatory flats because this decline in volume is dramatic, and these flats products collectively had a negative contribution of more than \$1.7 billion in FY 2021.<sup>20</sup>

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<sup>19</sup> Note that while volume mix has shifted toward “compensatory” flats products, the products are categorized by whether they were compensatory or non-compensatory in FY 2021. This means that First-Class Mail Flats and Carrier Route Flats, which were compensatory until recent years, are included in the non-compensatory group in this discussion. Because of this, a shift of volume mix toward “compensatory” products did not improve contribution, especially combined with unit attributable cost increases in both non-compensatory and compensatory flats products.

<sup>20</sup> Commission calculations using data from Docket No. ACR2021, Library Reference PRC-LR-ACR2021-1, March 29, 2022, folder “PRC-LR-ACR2021-1,” Excel file “FY21 Summary LR-1.xlsx, tab “Total All Mail (Appendix A),” cells E23, E30, E32 E39, E40.

**Table II-3**  
**Volume by Product, FY 2010 and FY 2022<sup>21</sup>**

		FY 2010	FY 2022	% Change
<b>Compensatory</b>	USPS Marketing Mail Every Door Direct Mail—Retail <sup>22</sup>	974,774,141	512,153,287	-47.0%
	USPS Marketing Mail High Density and Saturation Flats and Parcels	11,363,444,416	9,440,570,824	-17.0%
	Package Services Bound Printed Matter Flats	229,751,608	137,776,384	-40.0%
	<b>Total Compensatory</b>	<b>12,567,970,165</b>	<b>10,090,500,495</b>	<b>-19.7%</b>
<b>Non-Compensatory</b>	First-Class Mail Flats	2,483,991,704	1,091,016,219	-56.0%
	USPS Marketing Mail Carrier Route	9,473,616,956	4,718,228,310	-50.0%
	USPS Marketing Mail Flats	7,067,654,358	2,693,530,387	-62.0%
	Outside County Periodicals	6,574,014,264	2,965,609,879	-55.0%
	In County Periodicals	695,455,322	434,754,069	-37.0%
	<b>Total Non-Compensatory</b>	<b>26,294,732,604</b>	<b>11,903,138,864</b>	<b>-54.7%</b>
<b>Total Flats</b>		<b>38,862,702,769</b>	<b>21,993,639,359</b>	<b>-43.4%</b>

Table II-4 provides nominal unit attributable costs for non-compensatory flats products for FY 2010 and FY 2022. For comparison, the cumulative change in inflation from FY 2010 to FY 2022 was approximately 32 percent.<sup>23</sup> Collectively, the unit attributable cost of non-compensatory flats products has increased by 51.3 percent while volume decreased by 54.7 percent. Section IV.A.1. includes a more detailed discussion of volumes and unit attributable costs of individual non-compensatory flats products. Section IV.B. includes a detailed analysis of flats unit costs (overall and for each non-compensatory product) in mail processing, transportation, and delivery functional categories.

<sup>21</sup> Source: Commission calculations using data from FY 2010 Public CRA Report and FY 2022 Public CRA Report for all products but one. For USPS Marketing Mail EDDM-R, the Commission uses data from FY 2013 Public CRA Report (since the FY 2013 was the first year when the product was introduced) and FY 2022 Public CRA Report.

<sup>22</sup> For USPS Marketing Mail EDDM-R, this row represents FY 2013 volumes and percent change since FY 2013.

<sup>23</sup> Commission calculations using data from the U.S. Department of Labor, U.S. Bureau of Labor Statistics, available at <https://www.bls.gov>.

**Table II-4**  
**Nominal Unit Attributable Cost (\$) of Non-Compensatory Flats Products,**  
**FY 2010 and FY 2022<sup>24</sup>**

		FY 2010	FY 2022	Change	% Change
<b>Non-Compensatory</b>	First-Class Mail Flats	0.865	1.340	0.475	55.0%
	USPS Marketing Mail Carrier Route	0.165	0.306	0.140	84.9%
	USPS Marketing Mail Flats	0.448	0.722	0.274	61.1%
	Outside County Periodicals	0.364	0.494	0.130	35.9%
	In County Periodicals	0.142	0.241	0.099	70.1%
<b>Total Non-Compensatory Flats</b>		<b>0.357</b>	<b>0.539</b>	<b>0.183</b>	<b>51.3%</b>

## B. Flats Commission Rules and Directives

In analyzing the Postal Service's challenges in processing and delivering flats profitably during the PAEA era, the Commission issued various recommendations, directives, reporting requirements, and rules to increase transparency and assist the Postal Service in developing a comprehensive plan to improve flats service performance and cost coverage.

### 1. ACD Recommendations & Directives

Since 2009, the Commission has consistently recommended in its ACDs that the Postal Service improve the financial performance of flats.<sup>25</sup> In addition, the Commission has directed the Postal Service to provide information regarding operational changes for flats designed to reduce costs and improve costing methodologies in both Periodicals and USPS Marketing Mail Flats.<sup>26</sup>

<sup>24</sup> Source: Commission calculations using data from FY 2010 Public CRA Report and FY 2022 Public CRA Report.

<sup>25</sup> See Docket No. ACR2008, *Annual Compliance Determination*, March 30, 2009, at 54, 58-60 (FY 2008 ACD); Docket No. ACR2009, *Annual Compliance Determination*, March 29, 2010, at 65, 75, 87-89 (FY 2009 ACD); Docket No. ACR2010, *Annual Compliance Determination*, March 29, 2011, at 93-94, 103-07 (FY 2010 ACD); Docket No. ACR2011, *Annual Compliance Determination*, March 28, 2012, at 106, 117-19 (FY 2011 ACD); Docket No. ACR2012, *Annual Compliance Determination*, March 28, 2013, at 89, 92-97, 109-16 (FY 2012 ACD); Docket No. ACR2013, *Annual Compliance Determination*, March 27, 2014, at 44-45, 53-55 (FY 2013 ACD); Docket No. ACR2014, *Annual Compliance Determination*, March 27, 201, at 40-41, 47-48 (FY 2014 ACD).

<sup>26</sup> The Commission also directed the Postal Service to make efforts to improve service performance for flats and explain why other efforts have not been effective. See FY 2014 ACD at 109.

a. USPS Marketing Mail Flats<sup>27</sup>

In the FY 2010 ACD, after 3 years of increasing negative contribution from USPS Marketing Mail Flats, the Commission determined that USPS Marketing Mail Flats prices in effect in FY 2010 did not comply with 39 U.S.C. § 101(d), and directed the Postal Service to increase the cost coverage of the USPS Marketing Mail Flats product through a combination of cost reductions and above-average price adjustments, consistent with the price cap requirements, until such time that revenues exceed attributable costs. FY 2010 ACD at 106. In addition, the Postal Service was directed to provide in each of its subsequent Annual Compliance Reports (ACRs) the following information: (1) a description of operational changes designed to reduce flats costs in the previous fiscal year and an estimation of the financial effect of such changes; (2) a description of all costing methodology or measurement improvements made in the previous fiscal year and estimated financial effects of such changes; (3) a statement summarizing the historical and current fiscal year subsidy of each flats product; and (4) the estimated timeline for phasing out this subsidy. *Id.* at 107. Consistent with the Commission's directive, in subsequent Market Dominant price adjustments, the Postal Service was required to report the following information: (1) an explanation of how the proposed prices will move the flats cost coverage toward 100 percent; and (2) a statement estimating the effect that the proposed prices will have in reducing the subsidy of the flats product.<sup>28</sup>

In its FY 2012, FY 2013, and FY 2014 ACDs, the Commission found that the Postal Service had made progress towards addressing the issues raised in the FY 2010 ACD and concluded that no additional remedial actions beyond those prescribed in the FY 2010 directive were required.<sup>29</sup>

Cost coverage remained an issue for USPS Marketing Mail Flats. During FY 2015, the Commission stated that the Postal Service took several steps to address the continuing cost coverage shortfall, such as above-consumer price index (CPI) price increases and operational initiatives to reduce costs.<sup>30</sup> However, the Commission found that the Postal Service did not fully comply with the FY 2010 directive and directed the Postal Service to continue to propose above-average price increases, reduce cost, and provide the required documentation of those efforts in future ACRs. FY 2015 ACD at 64. The Commission also recommended that the Postal Service take further action by preparing a report on flats. *Id.*

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<sup>27</sup> USPS Marketing Mail was previously known as Standard Mail. It was renamed on April 3, 2017. See 81 Fed. Reg. 93606 (Dec. 21, 2016).

<sup>28</sup> *Id.* The Postal Service appealed the Commission's FY 2010 ACD findings and directive. See *USPS v. Postal Regul. Comm'n*, 676 F.3d 1105 (D.C. Cir. 2012). Although the court rejected the Postal Service's contention that the Commission acted outside the scope of its statutory authority, the court remanded the case to the Commission "for a definition of the circumstances that trigger [section] 101(d)'s failsafe protection, and for an explanation of why the particular remedy imposed here is appropriate to ameliorate that extremity...." *USPS*, 676 F.3d at 1109. In response, the Commission issued Order No. 1427, clarifying that its analysis of the circumstances that would trigger 39 U.S.C. § 101(d) depended on the totality of circumstances. Docket No. ACR2010-R, Order on Remand, August 9, 2012, at 4 (Order No. 1427).

<sup>29</sup> See FY 2012 ACD at 116; FY 2013 ACD at 54; FY 2014 ACD at 47.

<sup>30</sup> Docket No. ACR2015, *Annual Compliance Determination*, March 28, 2016, at 63 (FY 2015 ACD).

As cost coverage continued to decline in FY 2018, FY 2019, and FY 2020, the Commission again found USPS Marketing Mail Flats to be in violation of 39 U.S.C. § 101(d) and directed the Postal Service propose above-average price increases for USPS Marketing Mail Flats in applicable price adjustment proceedings.<sup>31</sup>

b. Periodicals

Like USPS Marketing Mail Flats, the Periodicals class (which includes two products that are both flats) has consistently failed to cover cost, and the Commission has repeatedly encouraged the Postal Service to improve Periodicals cost coverage.<sup>32</sup> In FY 2010, the Commission worked with the Postal Service to produce the Periodicals Mail Study,<sup>33</sup> in which the Commission and the Postal Service described initiatives designed to reduce the cost of flats, including, among others, reducing bundle breakage, enhancing pallet integrity, and lowering transportation costs. For a complete discussion of the initiatives, please see Periodicals Mail Study at 81-99.

However, the trend of Periodicals failing to cover cost continued with the Commission later finding that “the Postal Service need[ed] to take further action to reverse Periodicals negative net revenue trend.” FY 2012 ACD at 18. The Commission directed the Postal Service to “leverage its pricing flexibility to improve Periodicals bundle and container pricing to incent more efficient mailer preparation and increase contribution from Periodicals.” *Id.* at 101.

In the FY 2013 ACD, the Commission found that the Postal Service was unable to report on the success of initiatives developed from the Periodicals Mail Study that were designed to lower the cost of Periodicals. FY 2013 ACD at 45. The Commission, therefore, required the Postal Service to quantify the financial impact of implementing the operational strategies outlined in the Periodicals Mail Study and develop metrics to track progress in subsequent ACRs. *Id.*

In the FY 2014 ACD, the Commission directed the Postal Service to provide a detailed analysis of the progress made in improving Periodicals cost coverage and report on:

- the impact of leveraging its pricing flexibility to improve the efficiency of Periodicals pricing;

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<sup>31</sup> See Docket No. ACR2018, *Annual Compliance Determination*, April 12, 2019, at 70-72 (FY 2018 ACD); Docket No. ACR2019, *Annual Compliance Determination*, March 25, 2020, at 42-43 (FY 2019 ACD); Docket No. ACR2020, *Annual Compliance Determination*, March 29, 2021, at 40-42 (FY 2020 ACD).

<sup>32</sup> See FY 2009 ACD at 75; FY 2010 ACD at 94; FY 2011 ACD at 105-106; FY 2012 ACD at 95-97; FY 2013 ACD at 44-45; FY 2014 ACD at 40-41; FY 2015 ACD at 50-51; Docket No. ACR2016, *Annual Compliance Determination*, March 28, 2017, at 47-48 (FY 2016 ACD); Docket No. ACR2017, *Annual Compliance Determination*, March 29, 2018, at 50 (FY 2017 ACD); FY 2018 ACD at 46; FY 2019 ACD at 25; FY 2020 ACD at 20.

<sup>33</sup> Periodicals Mail Study, *Joint Report of the United States Postal Service and Postal Regulatory Commission*, September 2011 (Periodicals Mail Study). The Periodicals Mail Study responds to section 708 of the PAEA, which directs the Postal Service and the Commission to jointly address the quality of data for attributing costs and opportunities for operational efficiencies, including pricing incentives. See Periodicals Mail Study at 5.

- the progress in developing metrics to assess the cost savings impact of operational strategies;
- the impact of the implementation of operational strategies outlined in the Periodicals Mail Study; and
- the progress in implementing pricing strategies outlined in the Periodicals Mail Study.

FY 2014 ACD at 40.

After finding that the Postal Service failed to meaningfully address the directive to report on the progress in improving pricing efficiency, the Commission instructed the Postal Service to file a Periodicals Pricing Report that analyzes how pricing decisions impact cost, contribution, and revenue.<sup>34</sup> The Postal Service filed updated versions of the Periodicals Pricing Report through FY 2021.<sup>35</sup>

c. FY 2015 Directive

Recognizing that obstacles to the improvement of cost coverage apply to both Periodicals and USPS Marketing Mail Flats, the Commission devoted an entire chapter in the FY 2015 ACD to further explore potential causes for issues related to flats. FY 2015 ACD at 160. In that chapter, the Commission directed the Postal Service to take steps to better define the scope of the problems and potential solutions. *See id.* The Commission identified and analyzed six “pinch points” that contribute to cost and service issues for flats:

- Bundle processing,
- Automated processing,
- Manual sorting,
- Allied operations,
- Transportation, and
- Last mile/delivery.

FY 2015 ACD at 165-80. These pinch points are discussed in more detail in Sections III.B.1. and III.B.4.

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<sup>34</sup> FY 2015 ACD at 23-24; *see* Docket No. ACR2015, Third Response of the United States Postal Service to Commission Requests for Additional Information in the FY 2015 Annual Compliance Determination, Report Responding to Periodicals Pricing Directives, July 26, 2016 (Docket No. ACR2015, Postal Service Third Response).

<sup>35</sup> *See* Docket No. ACR2016, Library Reference USPS-FY16-44, December 29, 2016, PDF file “USPS-FY16-44.pdf;” Docket No. ACR2017, Library Reference USPS-FY17-44, December 29, 2017, PDF file “USPS-FY17-44 Preface.pdf;” Docket No. ACR2018, Library Reference USPS-FY18-44, December 28, 2018, PDF file “USPS-FY18-44 Preface.pdf;” Docket No. ACR2019, Library Reference USPS-FY19-44, December 27, 2019, PDF file “USPS-FY19-44.pdf;” Docket No. ACR2020, Library Reference USPS-FY20-44, December 29, 2020, PDF file “USPS-FY20-44 Preface.Report.pdf” (Update to Periodicals Pricing Report); Docket No. ACR2021, Library Reference USPS-FY21-44, December 29, 2021, PDF file “USPS-FY21-44 Preface.Report.pdf.”

Using data available at the time, the Commission identified and discussed flats cost and service issues for each individual pinch point. *See* FY 2015 ACD at 165-80. However, the Commission acknowledged that there was a “lack of comprehensive data,” which prevented the Postal Service and the Commission from measuring the impact of specific initiatives designed to improve cost and service issues for flats. *Id.* at 180.

The Commission directed the Postal Service to identify a method to measure, track, and report the cost and service performance issues relating to each individual pinch point identified by the Commission at the most granular level practicable. *Id.* at 181. To increase transparency, the Commission requested certain information in support of the identified method, such as:

- available data to support methods to measure, track, and report on cost and service issues related to flats,
- information on the cost to produce and aggregate current data,
- additional data that would be needed to support a method to measure, track and report on cost and service issues related to flats and the cost to produce that data, and
- the identification of information necessary to develop, implement, monitor, and quantify results for a comprehensive plan to improve flats service performance and cost coverage if an ideal data system were available.

*Id.*

In each subsequent ACD, the Commission continued to express concerns with the issues related to flats.<sup>36</sup> The Commission also provided the Postal Service with recommendations specific to each pinch point and continued to call for the Postal Service to work to quantify the impact of its operational initiatives on costs to ensure its efforts were productive. *See* FY 2020 ACD at 236, 241; FY 2021 ACD at 228.

## 2. Reporting Requirements

In 2017, the Commission announced that it planned to initiate a strategic rulemaking to develop proposed reporting requirements related to flats operational cost and service issues. FY 2016 ACD at 171. The reporting requirements were to facilitate measuring, tracking, and reporting cost and service issues and also to explore potential enhancements to the Postal Service’s data systems.<sup>37</sup> After reviewing additional information from the Postal Service regarding its data systems and capabilities, as well as comments from interested parties, the Commission finalized rules for the Postal Service to provide additional information to improve transparency into the cost and service performance

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<sup>36</sup> *See, e.g.*, FY 2016 ACD at 158-71; FY 2017 ACD at 174-82; FY 2018 ACD at 213-23; FY 2019 ACD at 155-75; FY 2020 ACD at 236-62.

<sup>37</sup> Docket No. RM2018-1, Advance Notice of Proposed Rulemaking to Develop Data Enhancements and Reporting Requirements for Flats Issues, October 4, 2017, at 1 (Order No. 4142).

issues, as well as increase the accountability of the Postal Service related to flats operational initiatives.<sup>38</sup>

These reporting requirements seek information readily available and previously provided or proposed by the Postal Service, based on filings by the Postal Service in the FY 2015 ACD, the FY 2016 ACD, the FY 2017 ACD, and Order No. 5004 at 8. The information falls into four categories: (1) analysis of consolidated cost and service data; (2) analysis of costs by operationally relevant groupings; (3) analysis of data related to individual pinch points; and (4) analysis to estimate the impact of operational changes. *Id.* The Postal Service has provided the required information since the rules went into effect, and the Commission has analyzed the data in Chapter 6 of the FY 2019 ACD and Chapter VI of the FY 2020 ACD and FY 2021 ACDs.<sup>39</sup>

### 3. New Ratemaking Rules for Non-Compensatory Classes and Products

In addition to directing above-average price adjustments and analyzing data in its ACDs, the Commission evaluated non-compensatory products in its statutory review of the ratemaking system. *See* 39 U.S.C. § 3622(d)(3). Based on this review, the Commission found that rates which failed to cover the attributable costs of the products or mail classes to which they applied undermined the Postal Service's financial integrity and were unreasonable, and thus inconsistent with objectives 5 and 8 of section 3622(b)'s statutory objectives.<sup>40</sup>

To improve cost coverage for non-compensatory classes and products, the Commission adopted new regulations granting additional rate authority to non-compensatory classes and more strictly governing how rate authority must be used for non-compensatory products in compensatory classes. Order No. 5763 at 181-97. In particular, 39 C.F.R. part 3030, subpart G permits an additional 2 percentage points of rate authority for any class of mail where the attributable cost for that class exceeds the revenue from that class. 39 C.F.R. § 3030.222(a). The use of this additional rate authority is optional and may be implemented at the Postal Service's discretion. *Id.* In addition, the regulations have requirements specific to products classified as non-compensatory within classes that are compensatory overall. For those products, the rates must increase by a minimum of 2 percentage points above the average percentage increase for that class.<sup>41</sup> The regulations also provide that rates may not be reduced for any non-compensatory product. *Id.* § 3030.127(b).

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<sup>38</sup> Docket No. RM2018-1, Notice of Proposed Rulemaking for Reporting Requirements Related to Flats, March 1, 2019, at 7 (Order No. 5004); Docket No. RM2018-1, Order Adopting Final Rules on Reporting Requirements Related to Flats, May 8, 2019, at 2-3 (Order No. 5086).

<sup>39</sup> FY 2019 ACD at 155; FY 2020 ACD at 236; FY 2021 ACD at 278.

<sup>40</sup> Docket No. RM2017-3, Notice of Proposed Rulemaking for the System for Regulating Rates and Classes for Market Dominant Products, December 1, 2017, at 76 (Order No. 4258).

<sup>41</sup> *Id.* § 3030.221. This requirement does not apply to a non-compensatory product for which the Commission has determined that the Postal Service lacks independent authority to set rates (such as rates set by treaty obligation). *Id.*



## 4. FY 2021 ACD Directives and Recommendations

The FY 2021 ACD was the first ACD to evaluate compliance under the new rules for non-compensatory products and classes. FY 2021 ACD at 8. The Commission found that the Periodicals class (In-County and Outside County), First-Class Mail Flats, USPS Marketing Mail Flats, and USPS Marketing Mail Carrier Route were non-compensatory in FY 2021. *Id.* at 26. The Commission stated that flats products lost \$1.291 billion in FY 2021. *Id.* at 229.

In accordance with the rules, the Commission directed the Postal Service to increase the price for the non-compensatory products by at least 2 percentage points above the average percentage increase for that class.<sup>42</sup> The Commission also encouraged the Postal Service to continue to maximize its usage of rate authority granted under 39 C.F.R. 3030.222 and to maximize its revenue by strategically pricing Periodicals. FY 2021 ACD at 31.

Furthermore, after analyzing Postal Service reports and finding that the Postal Service continued to face significant challenges in processing and delivering flats in a cost-effective manner, the Commission provided directives and recommendations to the Postal Service regarding specific plans to resolve both cost and service issues for flat-shaped products. FY 2021 ACD at 228. For example, the Commission recommended that the Postal Service continue to estimate and report the additional cost that bundle breakage adds to flats processing. FY ACD 2021, Appendix A at 23. In addition, the Commission required the Postal Service to implement initiatives to reduce mail processing costs and to develop an accurate method to track flat-shaped mail that is manually processed. *Id.* The Commission also directed the Postal Service to develop plans to reduce costs associated with allied operations, and to reduce costs associated with transporting and delivering flats. *Id.* at 23-24.

The Commission continued to express its concerns regarding the financial performance of flats products in its FY 2022 ACD.<sup>43</sup> Finding that its past directives have, to a large extent, been eclipsed by recent regulatory changes, the Commission rescinded those past directives related to USPS Marketing Mail Flats and USPS Marketing Mail Carrier Route for FY 2023. FY 2022 ACD at 48-49. In addition, the Commission urged the Postal Service to continue to pursue revenue increases and cost reduction efforts in order to improve the financial performance of non-compensatory flats products. *Id.* at 36, 48-49, 52-53.

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<sup>42</sup> See, e.g., FY 2021 ACD at 49, 61, 65; 39 C.F.R. § 3030.221.

<sup>43</sup> Docket No. ACR2022, *Annual Compliance Determination*, March 29, 2023, at 28-53 (FY 2022 ACD).

# CHAPTER III. CAUSES OF INEFFICIENCIES IN FLATS OPERATIONS

## A. Introduction

For years, in response to statutory requirements and Commission directives, the Postal Service has been designing and implementing operational and pricing initiatives, but the Postal Service “has been unable to [either] quantify the expected impact of those operational initiatives and changes” or “isolate those impacts to specific products.” FY 2021 ACD at 31, 60. The Commission has previously identified multiple factors that likely contributed to the steady increase in the unit cost and decrease in contribution of flats (*e.g.*, bundle breakage, inefficiency of manual sorting, and low productivity of automated equipment). *See* FY 2015 ACD at 165.

Commission staff visited a number of Postal Service’s and mailer’s facilities. To analyze the causes of inefficiencies more thoroughly, and potentially identify new factors in addition to the previously discussed inefficiency factors within “pinch points,” Commission staff visited Postal Service operational facilities in the period between July and October of 2022.<sup>44</sup> To understand the full cycle of flats mail operations (including collection, sortation, transportation, and delivery of flats), Commission staff visited postal facilities of different types as well as mailer’s facilities. To learn more about facility-specific differences in postal operations, Commission staff visited facilities with different levels of productivity, low and high rates of bundle breakage and different levels of processed volume (*e.g.*, small, medium, and large). It took approximately 4 months to complete the field work at the postal facilities. Parallel to the field work, the Commission reviewed flats data provided by the Postal Service in prior ACRs as well as additional and more detailed data requested through information requests in Docket No. SS2022-1. The Commission also contracted with an expert in postal operations to assist the Commission in interpreting information gathered during the site visits. This chapter summarizes what the Commission learned about flats operations from the facility visits and evaluates the major factors contributing to inefficiencies in flats operations.

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<sup>44</sup> For the purposes of carrying out the Flats Study, the Postal Service shall provide “A) access to Postal Service facilities to personnel of the Postal Regulatory Commission and B) information and records necessary to conduct such study....” PSRA § 206(a)(2)(A).

## B. Analysis of Flats Operations at the Facility Level

### 1. Summary of the Preliminary Facility-Level Data Analysis

#### a. Definitions of Pinch Points and Data Used for Analysis of These Pinch Points

The Commission receives a variety of flats-related datasets as part of its analysis of flats cost and service issues in the ACD.<sup>45</sup> Each dataset corresponds with a “pinch point” operation originally identified by the Commission as part of the FY 2015 ACD. FY 2015 ACD at 165. Pinch points are “functions where the Postal Service is not operating at maximum efficiency from a cost or service perspective.” *Id.* The six pinch points that the Commission previously identified are: bundle processing, automated processing, manual sorting, allied operations, transportation, and last mile/delivery.<sup>46</sup> These pinch points are briefly discussed below.

*Bundle processing.* Bundles are plastic-wrapped or banded groups of presorted mailpieces. FY 2015 ACD at 166. Presorted mail has been sorted by a mailer prior to being inducted into the mail system. A bundle of presorted mail can move through the processing system as a single bundle until it reaches the destination postal facility to which it is sorted. In exchange for performing some of the work of presortation, the mailer receives a workshare discount. FY 2021 ACD at 14. The majority of flats require bundle sortation on bundle processing equipment. Inefficiency occurs when bundles break before they are processed at the destination postal facility. FY 2015 ACD at 166. When Postal Service employees unload pallets that contain bundles of flats and perform a bundle sort, the material holding the flats bundle can break. *Id.* at 166-67. When a bundle breaks, the Postal Service has to process individual mailpieces that were formerly bundled together, thereby increasing mail processing costs and diminishing or eliminating the value of presortation. *Id.* at 167. As discussed in detail in Section III.B.4.a., bundle breakage is directly linked to the quality of the bundles, how they were presented to the Postal Service, the methods used to unload the bundles, and how they are handled during processing.

*Automated processing.* Individual flats mailpieces are sorted on Automated Flats Sorting Machines (AFSMs) and FSS machines. During automated processing on these machines, the Postal Service does not always achieve high levels of productivity. Productivity for these machines has been declining. *See* FY 2021 ACD at 249. As productivity declines, the cost efficiency of Postal Service’s operations also declines. Productivity in processing operations

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<sup>45</sup> *See, e.g.*, Docket No. ACR2021, Library Reference USPS-FY21-NP31, December 29, 2021; Docket No. ACR2021, Library Reference USPS-FY21-45, December 29, 2021.

<sup>46</sup> *See* FY 2015 ACD at 165; FY 2016 ACD at 158; FY 2017 ACD at 174; FY 2018 ACD at 213; FY 2019 ACD at 161; FY 2020 ACD at 244; FY 2021 ACD at 241-42.

is specifically referring to the units of output per unit of input: in this case, the number of mailpieces processed per workhour. Considering that productivity is a function of volume and workhours, it would be reasonable to assume that when higher volume is processed on a machine, productivity will be higher than machines that process lower volumes.

However, previous Commission analysis has shown that there is no evidence to support the Postal Service's theory that productivity decline is linked to volume declines. *Id.* at 255. As the Postal Service stated "[d]ifferences in productivities from plant to plant may arise due to a number of other factors—many of which are difficult or impossible to quantify."<sup>47</sup>

*Manual sorting.* When compared with automated processing, manual processing tends to be more costly and time consuming. FY 2015 ACD at 171. Manual processing of flats is another pinch point because a relatively high percentage of flats (up to 7 percent) continue to be diverted to manual processing, resulting in higher costs and poorer service.<sup>48</sup>

*Allied operations.* These operations occur throughout the mail processing and delivery workflow. FY 2015 ACD at 173. Allied operations are mail processing activities that involve preparing the mail for pallet, bundle, or piece processing and include platform operations, such as unloading trucks and moving pallets to mail processing equipment. During allied operations, the Postal Service is not always achieving high levels of productivity. *Id.* Declines in the productivity of allied operations can lead to increases in mail processing costs. *Id.*

*Transportation.* After flats are processed, they must be transported either to another mail processing facility for additional sortation or transported to a destination delivery unit (DDU) for delivery.<sup>49</sup> The Postal Service generally transports all shapes of mail together. *Id.* Delayed arrivals, delayed departures, and some other factors decrease efficiency of operations in transportation.

*Last mile/delivery.* This function encompasses all activities related to last mile operations, when mailpieces arrive at the delivery unit, and involve in-office time (when carriers are in a delivery unit preparing and manually sorting mail prior to delivery) and street time (when carriers are on the street actually delivering mail). FY 2015 ACD at 177. As with transportation, there are a number of potential inefficiencies during last-mile operations.

The Commission developed the datasets for the instant study using data from multiple datasets provided by the Postal Service. For more details of the tools and methodology used, see Appendix A, Sections III.B.1. and III.B.2. Analysis. The final dataset developed by the Commission included the bundle breakage and automation processing data for each machine at each facility. Data was quarterly and spanned from FY 2016 through FY 2021. *Id.*

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<sup>47</sup> Docket No. ACR2019 Status Reports at 6-7.

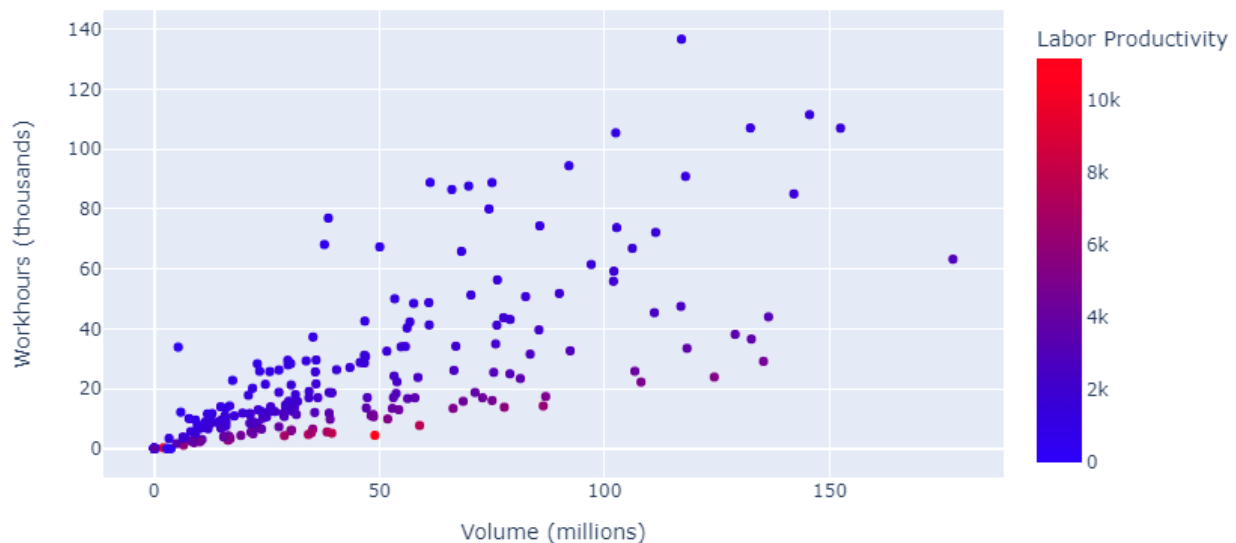
<sup>48</sup> *Id.* See Responses of the United States Postal Service to Questions 1-4 of Chairman's Information Request No. 7, January 26, 2023, question 2.b. (Response to CHIR No. 7).

<sup>49</sup> *Id.* at 176. For purposes of the instant study, analysis of DDUs is limited to the analysis of delivery units, such as Post Offices.

b. Initial Analysis of Automated Operations at the Mail Processing Facilities

There are two types of mail processing facilities that sort mail on automated equipment: (1) Processing and Distribution Centers (P&DCs) and (2) Network Distribution Centers (NDCs). A P&DC is “an organizational entity, subordinate to an area with a significant responsibility for the processing and distribution of mail for a geographic area. A P&DC may have one or more reporting facilities.”<sup>50</sup> An NDC is another “organizational entity, generally subordinate to an area, within a three-tier system of distribution of [USPS Marketing] Mail, periodicals, and packages. Some NDCs serve as consolidation points for truckload volumes.” *Id.* NDCs are generally larger than P&DCs. The Commission analyzed data on processed flats mail volumes, workhours, and productivity for flats operations at these facilities. Figures III-1 and III-2 present the FY 2021 flats volumes and workhours at the facility level for all facilities with AFSM and FSS machines. The Postal Service operated 93 FSS machines in FY 2021, which is significantly fewer than the 407 AFSMs it operated in the same fiscal year. Volume measures the number of mailpieces processed on an AFSM or a FSS, respectively. Workhours are hours of work performed by mail clerks. The color of the dots in Figures III-1 and III-2 correspond to the level of labor productivity. On a more productive machine, the same (or larger) amount of volume can be processed during fewer workhours than on a less productive machine. Red dots correspond to machines that are highly productive while blue dots correspond to machines with low productivity.

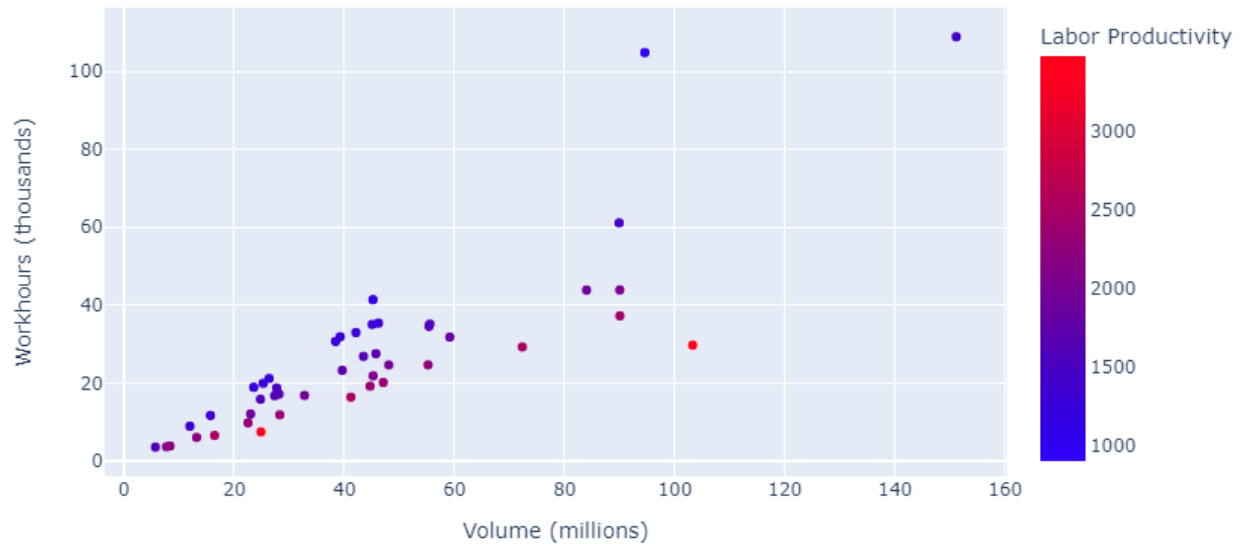
**Figure III-1**  
**AFSM Volume and Workhours<sup>51</sup>**



<sup>50</sup> See United States Postal Service, ELM 53 -Employee and Labor Relations Manual, § 113.3, Sept. 2022, available at <https://about.usps.com/manuals/elm/elmc1.pdf>.

<sup>51</sup> Source: Docket No. ACR2021, Library Reference USPS-FY21-NP31, December 29, 2021, Excel file “NONPUBLIC MP Variance FY17\_21.xlsx.”

**Figure III-2**  
**FSS Volume and Workhours<sup>52</sup>**



As shown in Figures III-1 and III-2, volume and workhours have a strong relationship (correlation) for both AFSM and FSS machines.<sup>53</sup> Correlation is a statistical term that identifies a relationship between two sets of observations (or two variables) when “no conclusions about causality can safely be made.”<sup>54</sup> A correlation coefficient that provides a measure of correlation “can range in value from -1.00 to +1.00,” where a correlation coefficient of +1.00 indicates a perfect positive relationship between two variables. *Id.* at 125-26. In this context, there appears to be a strong relationship between volume and workhours (0.74 and 0.86, respectively).

Figures III-1 and III-2 illustrate that at the facility level, the relationship between volume processed on AFSM and FSS equipment and productivity is not strong. This is the issue that the Commission has discussed starting with its FY 2019 ACD.<sup>55</sup> The Commission’s analysis of volume and productivity data performed within the instant study shows that there are more machines that do not process much flats volumes but still have high productivities than machines that process high flats volume and also have high productivities. For example, the AFSM with the highest labor productivity processes 50 million pieces, which is 16 percent above the average volume for all AFSMs.

<sup>52</sup> Source: Commission calculations using data from Docket No. ACR2021, Library Reference USPS-FY21-NP31, December 29, 2021, Excel file “NONPUBLIC MP Variance FY17\_21.xlsx.”

<sup>53</sup> Commission calculations using data from Docket No. ACR2021, Library Reference USPS-FY21-NP31, Excel file “NONPUBLIC MP Variance FY17\_21.xlsx.”

<sup>54</sup> S.K. Kachigan, *Multivariate Statistical Analysis, A Conceptual Introduction*, (2nd ed. 1991), at 4, 125.

<sup>55</sup> See FY 2019 ACD at 167-68; FY 2020 ACD at 253; FY 2021 ACD at 251-55.

Figure III-2 illustrates that, for FSS, the correlation between volume and labor productivity is even lower. Some highly productive FSS machines process only 25 million pieces while others process 104 million pieces. *See* Figure III-2. For FSS machines that process more than 80 million pieces, there is a broad range of labor productivities. Both figures demonstrate that at higher volumes, there is a larger range of productivities.

The Commission's analysis shows that the majority of AFSM productivities range from 1,200 to 3,400 pieces per workhour. Although workhours for AFSMs generally increase when volumes increase, productivity levels might differ at different volume levels.

The majority of FSS productivities range from 1,300 to 2,100 pieces per workhour. Workhours for FSS machines also increase with volume, but there is a stronger correlation between volume and workhours for FSS machines than for AFSMs.

The Postal Service reported that from FY 2009 through FY 2021, USPS Marketing Mail Flats volume declined from 7.8 billion pieces to 2.9 billion pieces, and the overall AFSM productivity fell from 3,114 pieces per workhour to 1,951 pieces per workhour.<sup>56</sup> Furthermore, between FY 2020 and FY 2021, AFSM and FSS productivity declined by approximately 3 and 4 percent, respectively. FY 2021 ACD at 52.

Figures III-1 and III-2 demonstrate that high volume facilities are not necessarily more productive with respect to workhours. Figures III-1 and III-2 also demonstrate that at higher volumes, there is a larger range of productivities.

### c. Analysis of the Surface Transfer Centers

Surface Transfer Centers (STCs) "are mail consolidation and re-distribution facilities that assist the Postal Service in maximizing the utilization of vehicles and their capacity to transport mail."<sup>57</sup> STCs do not handle individual mailpieces, but instead serve as an intermediary between other mail processing facilities. The Postal Service often refers to them as hubs.<sup>58</sup> There were 13 STCs in FY 2021.<sup>59</sup>

Among other factors, delayed truck arrivals and departures affect hubs' costs and performance. The Commission analysis of the Postal Service data confirms that on-time arrival and on-time departure percentages are highly correlated. *See* Appendix A, Sections III.B.1. and III.B.2. Analysis, Figure A-5.

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<sup>56</sup> FY 2021 ACR at 20; FY 2021 ACD at 52-53.

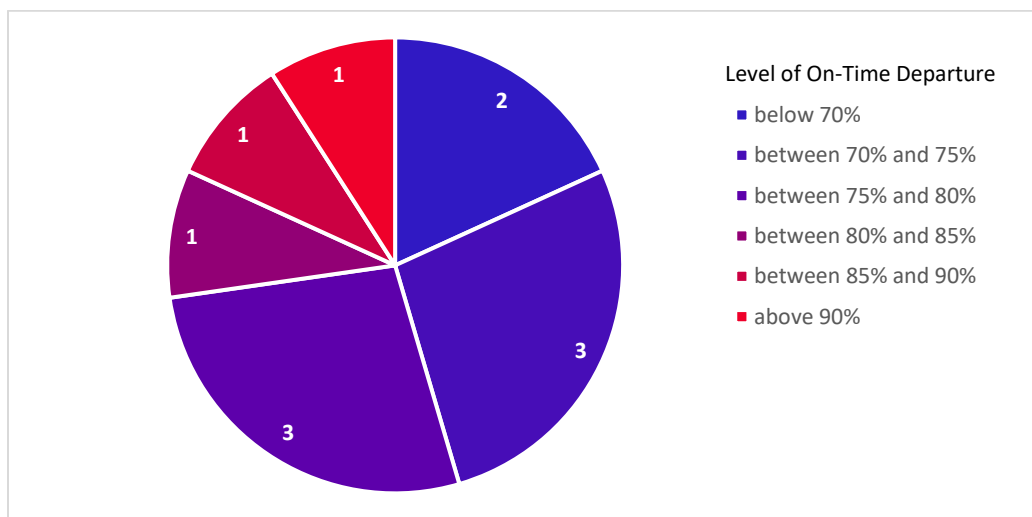
<sup>57</sup> United States Postal Service, Office of Inspector General, Report No. 21-111-R21, Contractor Security Clearances at Surface Transfer Centers, September 29, 2021, at 1, available at <https://www.uspsaig.gov/sites/default/files/reports/2023-01/21-111-R21.pdf> (OIG Report No. 21-111-R21).

<sup>58</sup> United States Postal Service, Postal Pro, Service Hubs and Facilities, available at <https://postalpro.usps.com/operations/service-hubs-and-facilities>, accessed on 03/30/2023.

<sup>59</sup> Responses of the United States Postal Service to Questions 1-6 of Chairman's Information Request No. 2, September 14, 2022, question 1, Excel file "CHIR.2.UPDATE\_CHIR 1\_Q4\_Q6 and Q7J\_NONPUBLIC.xlsx" (Response to CHIR No. 2).

Figure III-3 illustrates the on-time departure levels at 11 of the 13 STC facilities. On-time departure measures the percentage of mail that departs from the facility on time.

**Figure III-3**  
**Surface Transfer Centers (actual counts) by Level of On-Time Departure, FY 2021<sup>60</sup>**



As Figure III-3 shows, only 3 STCs have an on-time departure rate greater than 80 percent, and only one STC has it above 90 percent. For the majority of STC facilities, between 70 percent and 80 percent of scheduled trips depart on-time. Two facilities had an on-time departure rate of less than 70 percent.

#### d. Analysis of Destination Delivery Units

The Commission also analyzed data for DDUs before conducting facility visits. The Commission limited its analysis of DDUs to delivery units, which are post offices, stations, or branches that carry out mail delivery functions.<sup>61</sup> Every DDU serves (or delivers mail to) at least one 5-digit ZIP Code area. Every 5-digit ZIP Code area is further divided into smaller units to which mail destinate: namely, carrier routes. Delivery units can service city routes, rural routes, or a mix of both. City routes serve geographic locations within the boundaries of a post office, while rural routes generally serve areas falling outside these boundaries.<sup>62</sup> Figure III-4 shows the portions of the Postal Service's delivery units that service each type of route and a mix of routes. While the majority of post offices delivers solely to rural routes, there are over roughly 142,000 city routes and 81,000 rural routes.

<sup>60</sup> Source: Commission calculations using data from Docket No. ACR2021, Library Reference USPS-FY21-NP31, Excel file "NonPublic SV Data\_FY17\_FY21.xlsx." Two out of thirteen STC facilities were excluded due to discrepancies between the Postal Service's dataset.

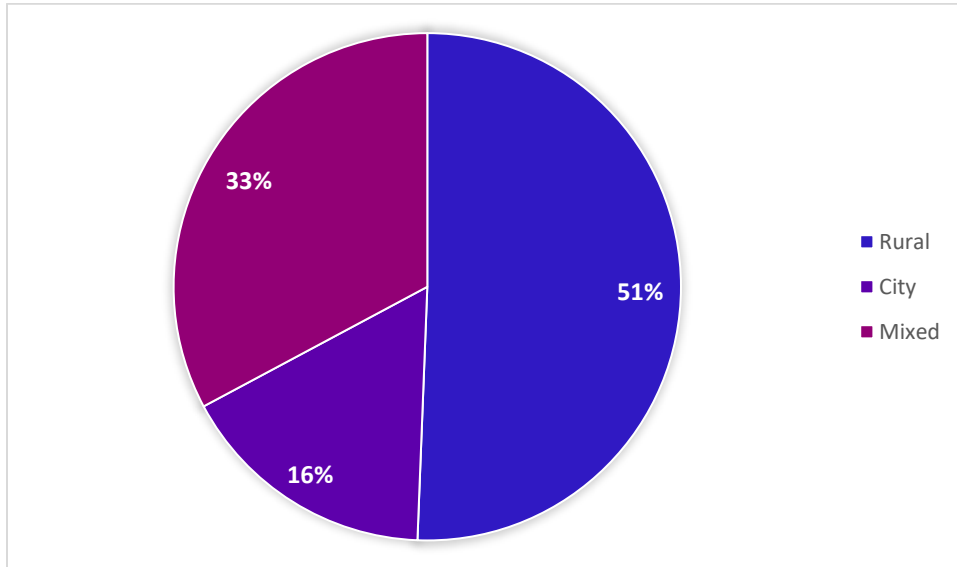
<sup>61</sup> United States Postal Service, Publication 804 – Drop Shipment Procedures for Destination Entry, October 2013, Appendix F Glossary, available at [https://about.usps.com/publications/pub804/pub804\\_f.htm](https://about.usps.com/publications/pub804/pub804_f.htm).

<sup>62</sup> Postal Regulatory Commission, Rural Delivery and the Universal Service Obligation: A Quantitative Investigation, July 31, 1992, at 3, available at <https://www.prc.gov/sites/default/files/papers/rural.pdf>.



Geographic analysis of delivery units that service a mix of city and rural routes shows that they tend to be further from urban areas than delivery units that service strictly city routes.

**Figure III-4**  
**Delivery Units by Type of Routes<sup>63</sup>**



<sup>63</sup> Source: See Response to CHIR No. 1, question 7; see also Library Reference SS2022-1/NP1, August 16, 2021, Excel file "Delivery Units - CHIR 1\_Q7\_A thru I and K\_NONPUBLIC.xlsx."

**Figure III-5**  
**Delivery Units by the Number of Serviced ZIP Codes<sup>64</sup>**

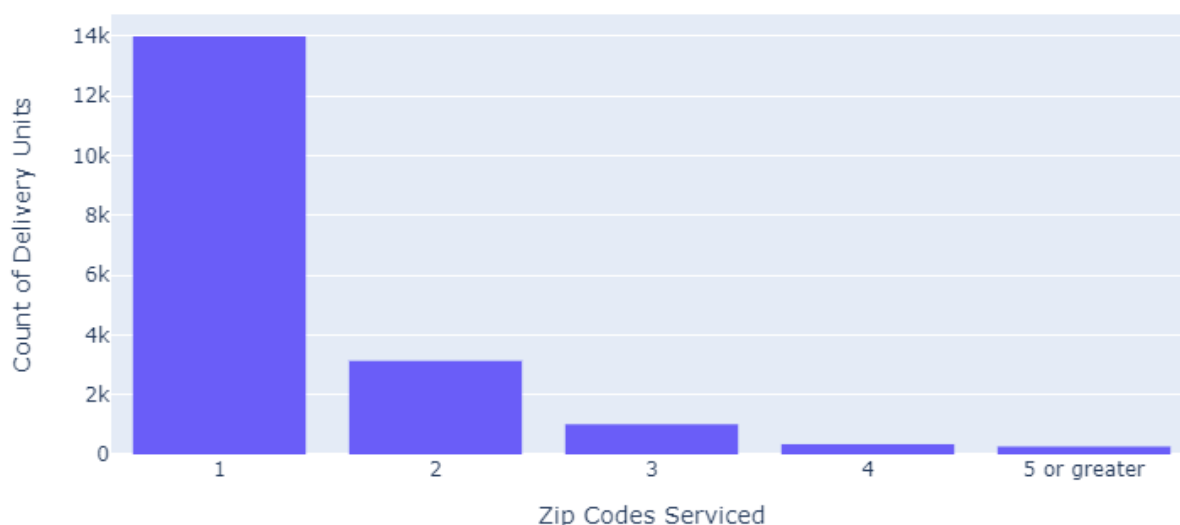


Figure III-5 illustrates how many 5-digit ZIP Codes are serviced by each delivery unit. Most delivery units (approximately 74 percent), service a single ZIP Code.<sup>65</sup> Seventeen percent of delivery units service two ZIP Codes, and just a few hundred delivery units service four ZIP Codes or five or more ZIP Codes.

## 2. Methodology for Selecting Facilities for Site Visits

The primary objective of the facility visits was to understand the causes of inefficiencies in flats mail operations. As discussed in Section III.B.1., the Commission previously identified and discussed in detail the causes of inefficiencies through the perspective of pinch points first identified in the FY 2015 ACD. *See* Section III.B.1.; *see also* FY 2015 ACD at 165. However, the Commission determined that the causes of inefficiencies should not be explored solely through formal data analysis of facility-level datasets on mail processing, bundle breakage, and transportation provided with the Postal Service’s ACR. As the Postal Service consistently noted, mail processing facilities differ in terms of facility layouts, management decisions, and relationships with nearby facilities. *See, e.g.*, FY 2021 ACD at 252. The Commission sought additional empirical and qualitative information on these specific characteristics through facility visits. To follow up on observations made during the facility visits, the Commission issued a series of questions seeking clarification from the Postal Service and consulted with an expert on postal operations.

<sup>64</sup> Source: *See* Library Reference SS2022-1/NP1, Excel file “Delivery Units - CHIR 1\_Q7\_A thru I and K\_NONPUBLIC.xlsx.”

<sup>65</sup> Commission calculations using data from Response to CHIR No. 1, question 7, Excel file “CHIR 1\_Q7\_A thru I and K\_PUBLIC.xlsx.”

When selecting facilities to visit, the Commission used multiple criteria. To better understand the broad range of activities performed by the Postal Service at every stage of the flats mail delivery process, the Commission sought to visit facilities of different types: STCs, mail processing facilities sorting both individual mailpieces and bundles (NDCs and P&DCs), and DDUs.

Each facility type performs a different and specialized role in moving mail from origin to destination. For mail processing sites (P&DCs and NDCs), the Commission focused primarily on the level of labor productivity of automated equipment and bundle breakage during flats processing. The Commission sought to observe all types of flats mail processing machines. Specifically for bundle processing, the Commission sought to observe operations on machines that process high volumes of bundles such as the Automated Package and Parcel Sorter (APPS) and the Small Package and Bundle Sorter Tracking System (SPBSTS) machines. The Commission chose the facilities that had both high and low rates of broken bundles.

The Commission also wanted to ensure that it would observe operations on both types of flats processing machines (AFSM and FSS). The Commission considered facilities with different levels of volumes and different levels of productivity on both types of mail processing equipment.

For STCs, the Commission was primarily concerned with transportation-related metrics, including, but not limited to, causes of transportation delays, misrouted trucks, and contracted transportation costs.

Appendix A, Sections III.B.1. and III.B.2. Analysis provides the details of the facility-level data analysis that the Commission used to select mail processing facilities for visits.

When visiting DDUs, the Commission focused on delivery costs and relationships with upstream P&DCs visited by the Commission. The Commission also selected delivery units that serve different arrays of routes (*i.e.*, rural routes only, city routes only, and both city and rural routes; serve just one ZIP Code or several ZIP Codes).

In addition to observing flats processing and other operations, the Commission interviewed facility managers to discover why certain facilities were above or below average in terms of productivity or bundle breakage. These interviews provided the Commission an opportunity to understand what the facilities with relatively high productivity or low bundle breakage were doing differently, and how other facilities would be able to learn from best practices. The Commission also visited some facilities that had close network ties to one another to observe network effects and possibly learn about inefficiencies across interrelated points in the Postal Service network.

Prior to conducting facility visits, the Commission developed questions spanning topics in every pinch point. The Commission then conducted trial visits to three facilities: (1) P&DC 1; (2) STC 1; and (3) DDU 1. Using the information received from facility managers during

trial visits, the Commission refined its initial interview questions for future use during facility visits. In addition, after conducting trial facility visits, the Commission refined its facility visit criteria and selected a few additional sites that had good network ties with each other. The Commission also visited facilities in the Mid-Atlantic, Northeastern, and Midwest regions.

### 3. Summary of the Site Visits

Following the first three trial visits, Commission staff visited eight mail processing facilities, two DDUs, and one hub or STC. In addition to Postal Service sites, Commission staff visited the processing facilities of two private-sector mailers. Representatives from the Postal Service and private mailers' facilities guided Commission staff through their operations to the extent possible, answered questions, and shared insights into their flats' operations.

For postal facility visits, Sections III.B.3.a. through III.B.3.c. summarize collected observations by core activities that were performed at the facilities: mail processing operations (*see* Section III.B.3.a.), mail consolidation for transportation in the Postal Service network (*see* Section III.B.3.b.), and last mile delivery (*see* Section III.B.3.c.). Observations gathered at visits to mailers' facilities are summarized in Section III.B.3.d.

#### a. Mail Processing Sites

Including the trial visits, Commission staff visited two types of mail processing facilities, two NDCs and seven P&DCs.

Discussions with management at various sites indicated that there has been a general redesign of the network in response to increases in package volumes and declines in letters and flats volumes in recent years. This redesign has resulted in limited processing operations at some facilities. Some mail processing sites that the Commission staff visited processed all mail shapes while others performed processing operations only for certain mail shapes (*e.g.*, letters and flats or flats bundles and packages). Operations at some sites were limited to only certain mail classes (*e.g.*, USPS Marketing Mail and Periodicals or First-Class Mail) or sort levels,<sup>66</sup> or a combination of those and other characteristics.<sup>67</sup>

Commission staff observed that the limited processing operations were supported by a complex surface transportation network, which moved mail between the interconnected operations that were performed at different sites. For example, facility A sent its successfully sorted flats bundles to facility B for subsequent processing but sent all bundles that broke, or were treated as broken, to a different facility (facility C) for processing. Each of the two truck trips was less full than if all bundles (successfully processed and broken) were sent to the same facility for subsequent processing. Moving mail between sites

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<sup>66</sup> For example, a site might sort mail only to the 3-digit ZIP Code level, corresponding to the 3-digit destination ZIP Code of sorted mail, or only to the 5-digit ZIP Code level.

<sup>67</sup> For example, sites limited their processing operations to only outgoing mail (mail that destined outside the service area of the mail processing facility) or only incoming mail (mail that destined within the service area of the mail processing facility), or to processing of intact flats bundles only and transporting broken bundle to other facilities for processing.

increased the time mail spent in allied operations. *See* Section III.B.4.d. and Section III.C.3. for more details. The Commission observes that separating processing operations in this manner might lead to increases in the cost related to transporting mail between sites because more trips are made, and because the trips are on potentially emptier trucks. Maximizing truck space used by mail is the goal of efficient transportation operations.

Commission staff also observed that performing different processing operations at different sites made facilities interdependent. For example, mail processing operations at facility A were scheduled based on schedules for mail processing operations at facilities B and C, which fed volumes into facility A's operations. Any deviations from planned schedules at one facility meant deviations from planned schedules for interconnected operations performed at other facilities. In these situations, managers were faced with decisions, which often involved trade-offs. For example, processing of mail at facility A was delayed. The management at the receiving facility (facility B) decided to wait for delayed mail from the feeding facility (facility A). During that time, the machine and employees at facility B were idle, and machine and employee workhour productivities suffered. Waiting to process delayed mail resulted in this mail being dispatched to DDUs within the committed time; for this mail, there was no negative impact on service performance. However, all subsequent operations at facility B were delayed, which had cascading effects on interconnected operations at facilities that expected mail from facility B for processing. Some of that mail may have had to be diverted to other modes of transportation than intended, such as from prescheduled, contracted trips paying preset rates per mile, to extra trips that had to be ordered at a much higher rate per mile.

Observations and discussions with management at various sites indicated major inefficiencies related to bundle processing, particularly bundle breakage and manual handling, which was needed to prepare flats from broken bundles for subsequent processing. Bundle breakage is discussed in more detail in Section III.B.4.a. Individual flats mailpieces from broken bundles represented only one source of flats that required manual work to prepare for additional processing. Facilities also employed a practice of having bundles bypass processing on machines if facility staff deemed them likely to break. Bundles deemed not strong enough to withstand sorting on a machine without breaking were intentionally opened and treated as broken bundles. Although this intentional bundle breakage might mitigate some productivity loss, it also ensured that these bundles received less efficient manual processing.

During the site visits, Commission staff also learned that some large shipments of bundled flats are not compatible with flats sorting equipment, even though these shipments qualified for substantial discounts based on the expectation that they would avoid manual sorting or sequencing work by the Postal Service. These shipments were meant for automated sortation on the FSS machines.<sup>68</sup> Instead, they were sorted manually at DDUs.

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<sup>68</sup> FSS sorts mailpieces to the sequence in which mail carrier delivers mail along their routes. Flats presorted by mailers for sortation on FSS qualify for the deepest discounts, because they eliminate the need for mail carriers to manually sort mail in the sequence of delivery points along their routes.

Certain facility personnel commented that the Domestic Mail Manual (DMM)<sup>69</sup> standards were inaccurate as to what mail was able to be processed on FSS. Even for pieces that complied with DMM standards, facilities described how the quality of the paper used in the flats has declined, causing machines to jam or entire flats shipments to be rejected from the automated flats processing machines. All mail that is not sorted on automated equipment requires manual sorting, and once a mailpiece is diverted from automated processing, it is manually processed downstream as well. The Postal Service does not track mail that pays automation rates but bypasses machine sortation.

The Commission notes that without tracking the data on flats mailpieces with irregularities, the true prevalence of the issue of flats that cannot be processed on automated equipment is unknown, and the discrepancy between the revenues that the Postal Service received and the costs it incurred for these unknown volumes cannot be estimated.

Other than financial and service performance implications related to manually sorting flats, Commission staff saw that the increase in workload this mail caused led to attrition due to the difficulty of the job. Management also described other difficulties retaining existing employees. Hiring new staff meant new and, at least temporarily, low-skilled workers. From facility visits and discussions with management, Commission staff learned that morale, skill level, and management support contribute significantly to a facility's efficiency and productivity. Consequently, difficulties retaining staff negatively affect the efficiency of the whole facility.

#### b. Surface Transfer Centers

The main functions of STCs are mail consolidation and cross-docking. Mail consolidation involves combining mail from several containers and placing it into fewer, fuller containers. Cross-docking involves combining containers with the same destination and transporting them on the same trucks.<sup>70</sup> In other words, STCs work to move fuller containers on fuller trucks.

The two STCs that Commission staff visited were contracted operations.<sup>71</sup> However, both STCs had Postal Service employees on site to monitor the timeliness of STCs' operations and to coordinate between the contractors and Postal Service Headquarters.

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<sup>69</sup> See United States Postal Service, Mailing Standards of the United States Postal Service, Domestic Mail Manual (DMM) (2023), available at <https://pe.usps.com/DMM300/Index>.

<sup>70</sup> Cross-docking did not involve opening containers and moving mail. Rather, the term "cross-docking" refers to containers changing docks. For example, a container from origin A arrives at an STC, and is unloaded onto dock number 1. Another container arrives from origin B and is unloaded onto dock number 2. The two containers are headed for the same destination – destination C. A truck for destination C departs from dock 10. Cross-docking involves moving containers headed for destination C from docks 1 and 2 onto dock 10, where they will be loaded onto the same truck.

<sup>71</sup> In FY 2021, the Postal Service operated about half of its 13 STCs; the other half were contracted operations. The Postal Service representative at one of the visited STCs explained that during FY 2022, the Postal Service stopped operating STCs and contracted out operations at all facilities that it previously operated.

Of the flats products, only First-Class Mail Flats move through STCs. The focus of these STC visits was to analyze potential inefficiencies of routing First-Class Mail Flats through STCs. Commission staff also focused on the impact this practice has on the time First-Class Mail Flats spend in transit, and on their transportation costs. Potential inefficiencies include waiting for mail to arrive at the STC for consolidation, insufficient capacity to fit First-Class Mail Flats on scheduled transportation departing from STCs, the associated delayed arrivals of such mail at downstream processing facilities via alternative transportation options, and the cost of such alternative transportation arrangements.

The Postal Service representatives described contractors' operations as generally very efficient and timely, with consolidation and cross-docking times strictly monitored and penalties assessed for delays.

However, the Postal Service representatives explained that there were delays on long-distance transportation, describing some trips as routinely delayed. The most common causes of delays included origin postal facilities dispatching mail late and delays associated with switching drivers at the relay points.

Since most trips that STCs operated were round trips, delayed inbound trucks meant that mail that the STC had ready to load onto the return portion of the trip would also arrive late at the destination. As for delays related to relay points, an STC representative explained that the United States Department of Transportation regulations require drivers to rest at regular intervals, and for a certain amount of time. Having one dedicated driver on a trip would require adding rest time to drive time, potentially doubling trip time. Switching drivers at relay points eliminated the need for rest time. The representative added that STCs were exploring an option of team driving to prevent delays related to relay points. With team driving, two drivers on a truck would alternate their drive and rest times.

In case of delayed incoming trucks, a Postal Service representative decided whether to order extra transportation for outgoing mail. Extra transportation is unscheduled transportation, ordered on an as-needed basis.

Another situation that called for decisions to order extra transportation is where scheduled outgoing trucks are filled to capacity with First-Class packages, with no space remaining for First-Class Mail Flats.

The Postal Service representatives explained that decisions to order extra transportation were based on critical entry times (CETs) at destination facilities. CETs represent the latest times mail can arrive at mail processing facilities to be processed and delivered within the stated service standard.

Representatives at the STCs acknowledged that extra transportation was expensive, and trucks were frequently not full when they left the STC. They described combining mail for several destinations on extra trucks and adding stops to extra trips, to justify the costs. However, they added that this was not routinely done because every added trip stop

increased the risk of delay for the extra trip. In summary, routing First-Class Mail Flats through STCs introduces potential inefficiencies in terms of service performance and transportation cost.

c. Destination Delivery Units

Every DDU serves at least one 5-digit ZIP code area, and every 5-digit ZIP code area is divided into smaller units, so-called carrier routes. Typically, one mail carrier delivers mail along one carrier route with several delivery points. DDUs ordinarily receive mail from destination processing facilities that has been sorted either by carrier route (but not in the precise delivery point sequence (DPS)) or in delivery point sequence.<sup>72</sup>

Flats that were not sorted at mail processing facilities on automated equipment, whether to carrier route and/or in delivery point sequence, were sorted and/or sequenced manually at DDUs.

Every mail processing facility that Commission staff visited described regularly receiving shipments of flats that bypassed machine processing and that were sent directly to DDUs to be processed by hand.

The management at the DDU, where Commission staff saw such shipments on the day of the visit, described acute staffing shortages and difficulty retaining employees because of workloads that shipments like these caused. The management also commented that delivering these flats on time was not possible.

d. Mailers' Facilities

The visits to mailers' facilities and the discussions with their management showed that effective communication with customers has important productivity implications. The mailers said that the effectiveness of their communication lay in management's understanding their own operations, including sources of potential inefficiencies. Management also described frequent contact with customers, which included customer education on mail preparation. In addition to benefiting mailers' own operating efficiency, the mailer indicated that this communication style improved the degree to which mail was prepared to mail-preparation quality standards (as specified in the DMM) prior to induction into the Postal Service's network.

Mailers expressed their willingness to do their part in addressing the Postal Service's flats cost issues. However, they also expressed concerns about a lack of effective communication with the Postal Service. Most notably, mailers did not find that the feedback from the Postal Service included relevant data that mailers needed to understand the specifics of any gaps in their mail preparation quality, or data that would allow tracking shipments to their own operations.

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<sup>72</sup> This is the finest level of sortation. The sequence of delivery points in which mail carrier delivers mail along a carrier route is predetermined.



## 4. Common Causes of Inefficiencies (Analysis of Pinch Points)

### a. Bundle Breakage During Bundle Processing

Mailers assemble flats into bundles in different presort levels, based on shared destination. For example, flats in a bundle might destinate in the same 3-digit ZIP Code area (“3-digit bundles”), or the same 5-digit ZIP Code area (“5-digit bundles”), or on the same carrier route (“carrier route bundles”) along which a mail carrier delivers mail. Flats that do not share a common destination area can also be bundled together (“mixed bundles”).

Mailers place presorted bundles in postal containers before entering them into the postal network. Flat bundles can be placed on pallets or included in sacks (collectively, “containers”). Similar to combining flats in a bundle, bundles are combined in containers in different presort levels. For example, a 3-digit pallet can include carrier route, 5-digit, or 3-digit bundles that destinate within the same 3-digit ZIP Code area, and a 5-digit pallet would include bundles for different carrier routes that destinate in the same 5-digit ZIP Code area. Mixed bundles, described above, are included on mixed pallets or in mixed sacks.

Mailers can enter their presorted bundles in presorted containers at mail processing facilities that serve the area where bundles originate, referred to as origin entry. Alternatively, mailers can enter bundles into the network at mail processing facilities that serve the area where bundles destinate, referred to as destination entry.<sup>73</sup> Entry facilities can include NDCs, Area Distribution Centers (ADCs), P&DCs, or DDUs. Mail preparation standards for the numerous bundle and container presort levels and mail entry points are defined in the DMM.<sup>74</sup> For example, a 5-digit pallet can enter the postal network at an origin or destination mail processing facility, but a mixed sack or pallet can only be entered into the postal network at an origin facility.

Based on presort level and entry, flats bundles receive different amounts of processing and transportation in the postal processing and transportation networks. For example, a 5-digit container entered at an origin facility might be transported intact through the postal network and require mail processing only at the destination P&DC, before dispatch to DDUs. By contrast, a mixed bundle on a mixed pallet needs processing at origin to sort the constituent pieces or bundles for transportation through the network, traversing different destination mail processing facilities before individual pieces from a mixed bundle can be distributed to their respective destinations.

Mail processing facilities sort flats for dispatch to other mail processing facilities, where the flats will destinate, and they sort flats that destinate within their service areas for dispatch

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<sup>73</sup> The Postal Service has rules regarding specific dropship locations for mailers.

<sup>74</sup> For example, mail preparation standards for commercial Marketing Mail volumes can be found at DMM § 245, available at <https://pe.usps.com/text/dmm300/245.htm>.

to local DDUs. Flats that destinate in service areas of other mail processing facilities are referred to as outgoing flats. Flats that destinate within the service area of the mail processing facility are referred to as incoming or destinating flats.

Outgoing flats, whether bundled or individual, must be sorted to the 3-digit ZIP Code level corresponding to mail processing facilities of destinations. Incoming flats, whether bundled or individual, must be sorted to at least the 5-digit ZIP Code level before they can be dispatched to DDUs for delivery.<sup>75</sup> In efficient mail processing operations, flats that can be sorted on automated equipment are sorted to finer levels: carrier route or DPS, depending on the equipment available at mail processing sites.

When a bundle comes apart, it is referred to as bundle breakage. When bundles with different destinations break at the same time, the value of presortation is lost because the mailpieces become mixed together.

Bundle breakage has been identified as one of the major sources of inefficiencies in flats processing, and the Commission has required the Postal Service to report bundle breakage rates since FY 2015.<sup>76</sup>

Mixed flats from broken bundles require additional sorting, some of which is done manually. For example, when bundles break while being sorted on a bundle sorter to 5-digit destination ZIP Codes, the constituent pieces require two levels of sorting: first to the 3-digit level, which is the level at which the bundles were inducted into the machine, and then to the 5-digit level, which is the level to which bundles would have been sorted on a bundle sorter, had they not broken. This disrupts planned operations at mail processing facilities because additional work is required that would not be done if the bundles had stayed intact and their sorting finalized on automated bundle sorters.

Bundles can break during transit or while being processed. Facilities mix flats from bundles that break prior to automated sorting with bundles that break during sorting on bundle sorting equipment. However, the bundle breakage rates that the Postal Service has reported include only bundles that broke during processing on bundle sorters, and do not include any bundles that broke before processing. Consequently, the reported bundle breakage rates are likely underestimated.

Managers described two main factors affecting bundle breakage during sorting on automated equipment: (1) the type of processing equipment; and (2) the ability of bundles to remain intact (bundle integrity).

According to managers, most bundles break when they are inducted (fed) onto the conveyor belt from the dumper. Dumpers are large containers with many bundles in them

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<sup>75</sup> This is because every DDU serves at least one 5-digit ZIP code area.

<sup>76</sup> FY 2015 ACD at 166-67; FY 2016 ACD at 161-62; FY 2017 ACD at 175-76; FY 2018 ACD at 215-16; FY 2019 ACD at 162-64; FY 2020 ACD at 244-48; FY 2021 ACD at 242-47.

that are ready for sorting. From the many bundles included in dumpers, one bundle is selected at a time and fed onto the equipment's conveyor belt. This is referred to as singulation. The singulation process involves bundles falling from the dumper onto the conveyor belt.

Managers described equipment designed to process both packages and bundles as generally "gentler" than equipment designed for processing packages only. This was due to the height that bundles fell from during singulation.

Staff at facilities described the Automated Parcel and Bundle Sorter (APBS), the only equipment designed for processing packages and bundles, as most gentle during singulation, with only a 6-inch drop from the dumper.

**Picture III-1**  
**APBS—Bundles Inducted From the Dumper Onto a Conveyor Belt**



Facility staff described APPS as "more violent" than APBS, with bundles tumbling a lot in the dumper and dropping 2 feet during the singulation process. This can result in bundles losing their integrity.

**Picture III-2**

**APPS–Singulated Bundles Fed onto a Conveyor Belt Move Toward a Scanner (Left Picture) and Will be Directed into Appropriate Bins Based on Their Scanned Destinations (Right Picture)**



Management at one facility described recently switching processing of bundles from the APPS to the Automated Delivery Unit Sorter (ADUS), citing lower bundle breakage rates for ADUS, compared to APPS.

Only one facility that Commission staff visited operated the Small Package Sorting System (SPSS).

**Picture III-3**  
**SPSS—Bundles on Feeding Belts Being Fed Onto SPSS**



The facility's management emphasized that SPSS was not designed to handle bundles. The machine had the highest drop of all equipment Commission staff observed, with a 3-foot fall from the dumper.

As for bundle integrity, facility staff commented about strapping and wrapping materials used to band and wrap flats into bundles. For strapping, material mattered, and so did the number of straps and their tension. Some mailers repeatedly send their bundles strapped with rubber bands or wire, which are not permitted materials. Some bundles need extra strapping to prevent flats inside from shifting and falling out. The number of flats included in bundles affected breakage as well. Too many pieces can cause strapping to break, while very low numbers of flats included in bundles can cause the strapping material to be ineffective. The tension of the straps could be compromised during previous handling, such as transportation to the mail processing facility.<sup>77</sup>

For wrapping material, facility staff described breakage related to the quality of material, with thinner materials more likely to break. However, the size and weight of bundles mattered as well. Some bundles were wrapped (and strapped) according to DMM-prescribed standards but were too large and/or heavy for the material to support them. Staff at some facilities also commented on large and/or heavy bundles often causing breakage of smaller bundles during singulation. Management at a few facilities stated that

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<sup>77</sup> The DMM includes standards for preparing bundles of flats. The DMM standards relate to physical dimensions, weight, strapping and wrapping materials to use, and their tension, among other things. See DMM § 203, available at <https://pe.usps.com/text/dmm300/203.htm>.

they would have liked DMM bundle preparation standards to include standards for the quality of wrapping material. They specified that higher-quality shrink-wrap or polywrap would break less easily.

Management at one facility explained that identification of improperly strapped and/or wrapped bundles at the time of their induction into the network was difficult because mailers frequently placed such bundles on the bottom of pallets, or in sacks. However, the facility's management provided no details on whether improperly strapped and/or wrapped bundles would have been accepted if they were identified upon visual inspection of mailers' shipments.

Facilities' management added that, even with correctly used strapping and wrapping materials, bundle integrity could be compromised for bundles that were handled and transported multiple times prior to arriving at their facilities. Management at one site with a high bundle breakage rate explained that their high breakage was only partially related to the facility's use of SPSS equipment and attributed at least some of the breakage to the amount of previous handling their bundles received. Specifically, prior to coming to the facility for sorting to the 5-digit level, bundles were processed to the 3-digit level on another mail processing facility's APPS. As such, the mailer transports these bundles to the mail processing facility where they enter the postal network (entry facility), whereupon the bundles undergo sorting and other handling at the entry facility and subsequent transportation to the subject facility for sorting on SPSS equipment. The various handlings involve unloading bundles from mailers' trucks, moving them to the entry facility's processing floor, withstanding the "more violent" singulation process on APPS during sortation at the entry facility, loading onto truck for transportation to the subject facility, unloading from trucks, and moving to processing floor.

Staff at Postal Service facilities explained that mixed bundles traverse the most facilities and receive the most handling before bundles are opened and individual pieces from mixed bundles are ready for sortation to destination. This hurts their integrity. Additionally, transportation and handling are more likely to weaken the integrity of bundles included in sacks, as compared with bundles secured on pallets.

Additionally, bundle content matters. All facilities confirmed that bundle preparation quality is far worse for USPS Marketing Mail bundles than for Periodicals bundles. Co-mail bundles were described as most likely to break.

Co-mail bundles combine mailpieces of different types or titles or from different mail classes to create a larger bundle.<sup>78</sup> Mailers prepare co-mail bundles to qualify for deeper discounts associated with worksharing. For example, bundles must contain a minimum

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<sup>78</sup> Only USPS Marketing Mail, Periodicals, and BPM Flats can be included in bundles and combined in co-mail bundles. First-Class Mail Flats cannot be bundled and are included in trays.

number of pieces, as prescribed in the DMM, to qualify for workshare discounts.<sup>79</sup> If a mailer prepares bundles of a single magazine title, they may only have enough pieces per bundle to qualify for a 3-digit discount. However, if the mailer combines the magazines with department store catalogues with the same destinations, they may have a sufficient number of pieces to create 5-digit bundles. Bundles presorted to the 5-digit level qualify for deeper discounts than 3-digit bundles, because the Postal Service avoids the cost of sorting from the 3- to 5-digit level, and the associated cost avoided by the Postal Service is reflected in the workshare discount. As volumes decline, co-mailing becomes more valuable to the mailer.

According to management at Postal Service facilities, co-mail bundles might include flats of different dimensions, which sometimes causes the pieces inside the bundles to shift and threaten their integrity. Co-mail bundles also tend to be too big and too heavy for their strapping and wrapping materials, which makes them more likely to become loose or break during transportation, machine processing, or other handling. Some facilities increased staffing for certain co-mail shipments that were scheduled to arrive at their sites.

At every P&DC visited, management explained that their goal was to prevent bundle breakage during automated bundle processing. To accomplish this goal, employees visually assessed bundles for their ability to withstand processing on the type of equipment operated at facilities. This visual inspection included assessing the type and quality of wrapping and strapping material; whether any pieces were shifting inside bundles; and the bundles' size, weight, and content. Management described their employees as very experienced in recognizing bundles that are likely to break and that should accordingly bypass machine processing. Staff at the facilities referred to them as "loose bundles."

The equipment operated at the sites mattered when employees made these determinations for individual bundles. For example, the APPS has a side feeder, which can be used to feed bundles to the conveyor belt manually. Manually feeding bundles deemed likely to break during singulation on the APPS can minimize the number of bundles bypassing automated sorting and increase the number of bundles finalized on the APPS. However, it is not clear whether all facilities with APPS used the option to manually feed bundles consistently.

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<sup>79</sup> For standards applicable to co-mail bundles, see DMM section 705.15.0, available at <https://pe.usps.com/text/DMM300/705.htm#ep1420438>.

**Picture III-4**  
**Bundle That Bypassed Sorting on APPS Because It Was Strapped with Rubber Bands**



Having loose bundles bypass sorting on automated equipment might represent an inefficiency, because loose bundles are treated as broken bundles. In other words, loose bundles are opened, their pieces are mixed with flats from broken bundles and the constituent flats are manually prepared for individual processing. However, the extent of any inefficiency depends on how likely bundles bypassing machines are to break. For example, for bundles almost certain to break, the bundles would likely receive inefficient manual processing regardless. On the other hand, for bundles with only a 50 percent chance of breaking, bypassing machine sortation would impose inefficient manual handling for bundles that had a 50 percent chance of being finalized on automated equipment. Even so, allowing likely-to-break bundles to bypass automated processing may avoid other inefficiencies from the disruption that their breakage would cause in the processing of other bundles.

Another group of bundles treated as broken and loose bundles are “reject bundles.” These bundles cannot be finalized on bundle sorting equipment because of some irregularity. For example, Postal Service facilities management discussed bundles that are too heavy as being frequently rejected by the equipment. Additionally, management frequently mentioned that flash from the machine’s scanners causes glare for shrink-wrapped bundles. As a result, the scanners cannot read the bundles’ address labels or barcodes, and the bundles are rejected by the equipment.



**Picture III-5**  
**Containers with Bundles Rejected from APPS (on the Left) and with “No-Read” Rejects From ADUS (on the Right)**



Every visited facility employed the practice of having bundles bypass machine processing to prevent breakage. Commission staff asked the Postal Service to provide separate data for the number of bundles that broke during sorting on bundle sorters, number of bundles that broke prior to machine processing, the number of bundles that were rejected by the equipment during processing, and the number of bundles that bypassed machine processing because they were deemed likely to break.<sup>80</sup> The Postal Service responded that it only tracked bundles that broke during machine processing, since they were the only bundles that received machine scans. As noted above, the Postal Service does not track bundles that break before they could be processed on bundle sorters, or bundles that bypass the equipment.<sup>81</sup>

This suggests that the reported bundle breakage rates underestimate true bundle breakage.

b. Productivity of Flats Sorting on Automated Equipment

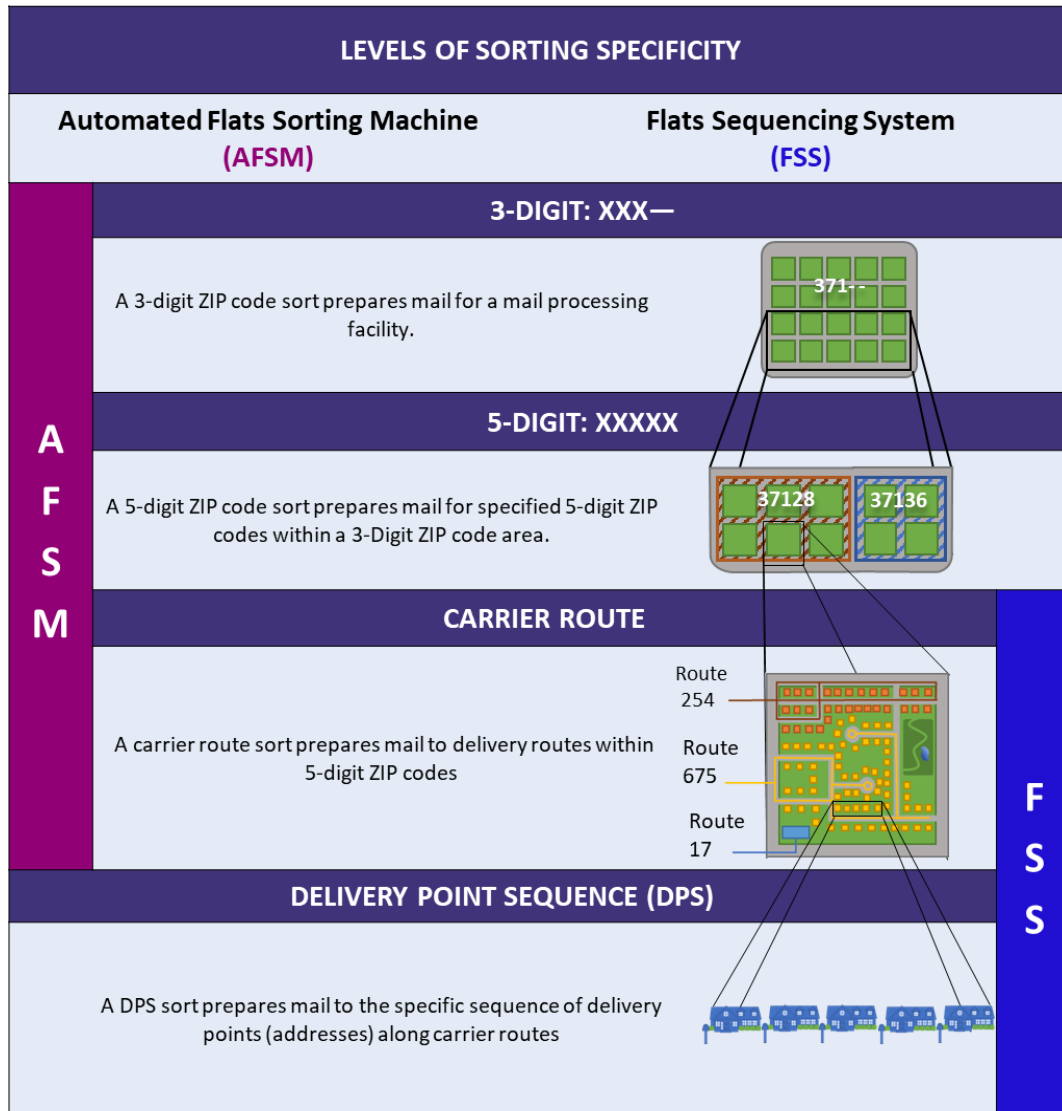
As Commission staff observed, one of the major differences between AFSM and FSS equipment was how deeply into the network each machine could sort to when preparing flats for the final delivery. A 3-digit sort prepares mail to a mail processing facility, a 5-digit sort prepares mail to a DDU, a carrier route sort prepares mail to the actual delivery route,

<sup>80</sup> Responses of the United States Postal Service to Questions 1-7 of Chairman’s Information Request No. 4, January 13, 2023, questions 4, 5 (Response to CHIR No. 4).

<sup>81</sup> Response to CHIR No. 4, questions 4.b., 5.d., 7.c.-d. See Responses of the United States Postal Service to Question 1-5 and 9 of Chairman’s Information Request No. 5, January 13, 2023, questions 1.a.-d., f.-g. (January 13 Response to CHIR No. 5).

and DPS prepares the mail to the specific address level. Postal Service facility staff explained that the AFSM’s finest sort level is carrier route. The FSS’s finest level is DPS.

**Figure III-6  
Levels of Sorting Specificity**



Flats sorted to carrier route must be manually placed by mail carriers into the order in which they are delivered along the carrier route. Each delivery route has an assigned case that has the sequence of individual delivery points in slots on the case. Flats sorted to DPS require no such additional in-office sequencing, but carriers still must merge them with the manually cased flats in order for the entire set of flats to be delivered in sequence. The

techniques for merging these two types of flats will vary depending upon whether they destinate on city or rural delivery routes, as well as upon the type of delivery route.<sup>82</sup>

The labor productivity of automated mail processing operations, defined as mailpieces processed per employee workhour, increases when the automated sortation systems are used effectively. Staffing levels for AFSM and FSS equipment are defined. When these staffing levels are adhered to, and they typically are, the effort to achieve productivity targets is focused upon achieving equipment throughput targets. Throughput targets are best achieved through a combination of efforts to properly prepare the flats for induction to the processing equipment, methods used to feed pieces to the equipment, and efforts to ensure the timely and proper removal of flats once they are sorted. Jams within the automated sortation are inevitable. Minimizing jams and ensuring timely clearance of jams also leads to improved throughput. Proper maintenance of the equipment is essential to attaining and maintaining high operational throughput.

The Postal Service has attributed productivity declines for both machines generally to significant declines in flats volumes.<sup>83</sup> The Postal Service also indicated that some of the AFSM productivity declines could be attributed to the deployment of FSS operations. *Id.* In April 2021, the Postal Service announced that due to declining flats volumes, it would start removing “unnecessary” flats equipment.<sup>84</sup> Commission staff observed FSS operations at four mail processing sites and AFSM operations at seven sites. Through these visits, Commission staff aimed to understand the impacts that flats volume declines and FSS equipment deployment might have had on automated flats processing productivity, as well as to gather insights that would help inform the expected impact that the removal of unnecessary flats equipment might have on automated flats processing productivity.<sup>85</sup>

#### (1) FSS Processing

Some mail processing facilities adjusted to declines in flats volume by running their FSS machines fewer days each week.<sup>86</sup> This way, on days when flats volumes were higher, machine capacity was better used. Better use of FSS capacity meant more flats processed per employee workhour, than the hourly rate achieved on low-volume days. By avoiding sorting flats on low-volume days, facilities were better able to maintain their FSS productivity levels.

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<sup>82</sup> For more information on the methods commonly used for casing and preparing mail for delivery on city carrier routes, see United States Postal Service, Handbook M-41, City Delivery Carriers Duties and Responsibilities, June 2019, at 20-24. For more information on the methods used for casing mail for delivery on rural carrier routes, see United States Postal Service, Handbook PO-603, Rural Carrier Duties and Responsibilities, September 2013, at 36-37.

<sup>83</sup> See, e.g., Docket No. ACR2014, Responses of the United States Postal Service to Questions 1-6, 8, 10, 12-13 and 15-22 of Chairman’s Information Request No. 2, January 23, 2015, question 8.e. (Docket No. ACR2014, Response to CHIR No. 2).

<sup>84</sup> See Docket No. ACR2021, Library Reference USPS-FY21-45, folder “Rule 3050.50 (f) Operational Changes Report,” PDF file “FY21 Paragraph (f) Report.pdf,” at 4-5. See also United States Postal Service, Office of Inspector General, Report No. 21-240-R22, Transfer of Mail Processing Operations from Selected Facilities, May 4, 2022, at 3, available at <https://www.uspsaig.gov/sites/default/files/reports/2023-01/21-240-R22.pdf> (OIG Report No. 21-240-R22).

<sup>85</sup> For two mail processing sites, FSS machines were removed shortly before the facility visits.

<sup>86</sup> At most of the visited facilities, management described running their FSS equipment 7 days a week at the time FSS was deployed. By the end of 2022, FSS equipment was operated between 2 and 7 days a week at sites that the Commission staff visited.

Postal Service mail processing staff explained that flats were not fed to FSS continuously, as they were prepared for induction to the machine. Instead, when all pieces for respective sort plans were ready, they were fed to the machine at once and the machine run started. This had a positive impact on FSS productivity.

**Picture III-6**  
**Flats in Trays Compatible with FSS Are Gathered for Sorting on FSS Equipment**



Many facilities also described upgrading USPS Marketing Mail flats that were not committed for a given day (that is, due to be sorted that day), and combining them with committed volumes, such as Periodicals. In this way, facilities were able to increase the number of flats sorted per machine run. At only one facility that Commission staff visited, an NDC, the manager reported that mail from different mail classes was never combined in any sortation or allied activities.

The operational expert with whom the Commission collaborated noted that combining different mail classes in incoming sort plans has long been a standard procedure used by mail processing facilities. First-Class Mail and Periodicals mailpieces have been combined with USPS Marketing Mail pieces based on the color-coding chart provided in Figure III-7.<sup>87</sup> There is a national color code policy for USPS Marketing Mail, which is “processed in sequence according to the color code commitment, with the oldest mail processed first. Delayed mail received from upstream facilities or operations should be queued to be processed in front of [USPS Marketing Mail] with a later commitment.”<sup>88</sup>

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<sup>87</sup> The color-coded chart shown in Figure III-7 was provided to Commission staff during a trial visit of P&DC 1. “Standard Mail” is an archaic term for USPS Marketing Mail.

<sup>88</sup> Docket No. N2014-1, Library Reference USPS-LR-N2014-1/16, Manual Responsive to PR/USPS-T1-14, January 24, 2014, at 2.

**Figure III-7  
USPS Marketing Mail Color Codes**

STANDARD MAIL COLOR CODE		Plant Delivery Matrix	
RECEIPT TIME	DAY OF RECEIPT	COLOR CODE APPLIED	THREE DAY DELIVERY
FRI16:01 – SAT16:00	SAT	GREEN	WED
SAT16:01 – SUN16:00	SUN	GREEN	WED
SUN16:01 – MON16:00	MON	VIOLET	THU
MON16:01 – TUE16:00	TUE	YELLOW	FRI
TUE16:01 – WED16:00	WED	PINK	SAT
WED16:01 – THU16:00	THU	BLUE	MON
THU16:01 – FRI16:00	FRI	ORANGE	TUE

Figure III-7 indicates days of the week that USPS Marketing Mail pieces must be processed and dispatched to DDUs, based on the days of the week that they are received at mail processing sites. As described above, however, a facility might upgrade non-committed USPS Marketing Mail flats received on a Monday for Tuesday or Wednesday dispatch, rather than for the Thursday dispatch that the color-coding would direct for 3-day delivery mail.

From discussions with management at the FSS sites, Commission staff learned that FSS machines have certain features that enable facility staff to minimize the impact of flats volume declines on FSS productivity. The process is described below.

Pieces are sorted on FSS machines to DPS according to their sort plans. Staff at Postal Service facilities explained that every FSS sort plan includes a unique combination of 5-digit ZIP Codes, to which pieces sorted to DPS destinate. They clarified that FSS sort plans are also referred to as FSS zones, or FSS schemes. FSS sort plan could include up to 30 thousand delivery points, which could be from several 5-digit ZIP Codes. Staff also explained that four or five 5-digit ZIP Codes could be included in a FSS sort plan.

Management at the visited facilities explained that as flats volumes declined, existing sort plans could be revised. Sort plan revisions involved eliminating delivery points with low flats volumes from them. Management also explained that new sort plans could be created,



most frequently by consolidating 5-digit ZIP Codes for several smaller towns in new sort plans.

The FSS machine could be run in two different modes, VM4 or VM2. In VM4 mode, flats for only one sort plan could be sorted in one FSS machine run. In VM2 mode, flats for two sort plans could be combined and sorted in one FSS machine run.

**Picture III-7**

**A Sign That Identifies Sort Plans to Combine in Visited Facility's FSS Run in VM2 Mode**



For sort plans with high flats volumes, such as those with ZIP Codes in highly populated urban areas, volumes were sufficiently high to run such sort plans separately, in VM4 mode, without reducing FSS productivity. For low-volume sort plans, such as those with ZIP Codes for smaller towns, staff at facilities explained that they combined two such sort plans in one machine run, with FSS operated in VM2 mode.

By combining sort plans, facilities were able to sort volumes for up to 60,000 delivery points in one machine run. Essentially, VM2 mode enabled facilities to expand the number of delivery points and thus to increase flats volumes processed in a machine run. This way, facilities could mitigate the negative impact of declining flats volumes on FSS productivity to some extent. Every facility that operated FSS equipment partially or fully switched to running FSS in VM2 mode due to declining flats volumes.

The manager at a mail processing site with high FSS productivity described the importance of creating optimal sort plans, which would enable optimal FSS operation in VM2 mode, and in turn, maximize FSS productivity. The manager explained that when sort plans were revised, flats volumes associated with eliminated delivery points should be minimized.

When flats are sorted on FSS, they pass through the machine twice. During the first pass, pieces are sorted from a 5-digit level to delivery point groups.<sup>89</sup> At the end of the first pass, the FSS automatically re-inducts grouped flats back into the machine for a second pass. At the end of the second pass, flats are sorted to DPS.

Creating optimal sort plans, which would ensure optimal FSS operation, is important to maximize the number of flats finalized on FSS to DPS and to ensure efficient processing of flats that qualified for the deepest discounts on the premise that they do not need manual casing. However, management at the facility with high FSS productivity added that the facility's optimal FSS operations and high productivity could not be attained without continuous staff support and training, and that retaining trained staff was also critical to ensure continued efficient operations.

As a very important factor in FSS productivity, facility staff described proper preparation of flats before inducting them into the machine so that machine jams were reduced. It was also important to feed the right volume into the machine, because both over- and under-feeding the machine was not optimal. Striking this balance requires proper staff training continuously. Management at one P&DC described higher FSS reject rates on days when inexperienced or poorly trained staff prepared mail for FSS processing.

Proper mail preparation, correct feeding of volume into the machine, and regular maintenance were particularly important because facilities reported a shortage of staff trained to fix FSS breakdowns. Management at one mail processing site described everyday machine breakdowns, sometimes lasting an entire day. This occurred despite the fact that this facility (and every visited facility) reported performing 4 hours of daily routine maintenance for its FSS equipment.

Machine breakdowns halt FSS operations and impact all interdependent operations. For example, staff was idle during FSS breakdowns but were not moved to other operations that may have been understaffed because the expectation was that repairs would not take long, and the staff needed to be ready to operate the machine when it was fixed. Breakdowns can also result in pieces not being finalized on FSS to DPS, which increased the need to manually case flats by the DDU's carriers. As noted above, manual casing for pieces that qualified for the deepest discounts, based on expected sortation to DPS on automated equipment, represented inefficient operation.

## (2) AFSM Processing

Flats that destinate in the service area of a mail processing facility must be sorted to at least the 5-digit ZIP Code level before they are dispatched to DDUs.<sup>90</sup> The different sorting that

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<sup>89</sup> For example, "a first delivery point group compris[es] a first delivery point on a first carrier route and a first delivery point on a second carrier route." United States Patent Application Publication, Pub. No. US 2005/0218046 A1, October 6, 2005, at 1 (United States Patent Application Publication, Pub. No. US 2005/0218046 A1), available at <https://patentimages.storage.googleapis.com/14/47/30/dc187c1f164899/US20050218046A1.pdf>.

<sup>90</sup> Flats that require manual sorting, are sorted to 5-digit ZIP Code level at mail processing facilities, *i.e.*, the minimum level required for dispatch to DDUs.

destinating flats receive on the AFSM is referred to as an “incoming sort.” Flats that destinate in another mail processing facility’s service area are sorted at mail processing facilities to the 3-digit ZIP Codes associated with their destination mail processing facilities, which is referred to as “outgoing sorts.” During the facility visits, Commission staff gathered the following information, which might at least partly explain the low productivity of sorting flats on the AFSM equipment.

*Ability to scale AFSM operations in response to flats volume declines.* Every facility that Commission staff visited had at least two AFSM machines. It appeared that management did not have the flexibility to operate the AFSM on high volume days only, as it did with the FSS. On the contrary, AFSM machines were running continuously during the day, except for 4 hours of daily maintenance that each machine received.<sup>91</sup>

This was because of the greater variety of sorting jobs that AFSM machines performed compared to FSS machines. While the FSS was designed to sort only destinating flats from 5-digit to DPS, AFSM sorts outgoing flats to the 3-digit level and incoming flats to the 5-digit and carrier route levels.

Flats of all types are “staged,” and flats within the USPS Marketing Mail class are color-coded in accordance with their service commitment. *See* Figure III-7. Thus, First-Class Mail Flats, Periodicals, and USPS Marketing Mail flats due for delivery were all combined and run together on the same program.<sup>92</sup> However, almost every site described combining USPS Marketing Mail flats that were not committed for the day with Periodicals and First-Class Mail Flats, to increase volumes sorted in their AFSM sort plans, and to improve overall AFSM productivity. This was consistent with the efforts the management at visited sites described making to improve capacity utilization and employee workhour productivity in FSS operations.

*Impact of FSS operations on AFSM productivity.* At facilities that served FSS zones, management noted that deployment of FSS negatively affected AFSM productivity. The reason was that when FSS-zone-destined flats were diverted from AFSM’s finest sorts (incoming sorts to carrier route), the respective sorts were not eliminated from the list of jobs that AFSM machines performed. According to staff at facilities and the Commission’s operational expert, the Postal Service standard operating procedures dictated that FSS rejects destinating to the zones with multiple ZIP Codes had to be re-run on AFSM to the extent possible before dispatching them to DDU’s.<sup>93</sup> As such, even though volumes were diverted from AFSM to FSS, AFSM continued to process flats pieces for the ZIP Codes included in FSS zones. How this impacted AFSM productivity is explained in more detail below.

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<sup>91</sup> The machines’ maintenance windows were staggered, so that one machine at a facility would always run.

<sup>92</sup> According to the operational expert retained by the Commission, the practice of combining all types of flats into single processing operations started when the first nationwide mechanical flats sorters were deployed in the 1980s.

<sup>93</sup> *See* United States Postal Service, Office of Inspector General, Report No. 21-131-R21, Manual Mail Processing Efficiency, September 21, 2021, at 12, available at <https://www.uspsaig.gov/sites/default/files/reports/2023-01/21-131-R21.pdf> (OIG Report No. 21-131-R21).



As explained in Section III.B.4.b.i., several 5-digit ZIP Codes can be included in one FSS sort plan. Moreover, FSS allows combining two sort plans in one machine run, further increasing the number of 5-digit ZIP Codes sorted on FSS in VM2 mode. All pieces, whether for one or two sort plans, were fed into FSS and sorted at the same time, in one machine run. As more 5-digit ZIP Codes have been added to FSS zones in response to flats volume declines (*see* Section III.B.4.b.i.), an increasing number of AFSM sort jobs processed FSS rejects only instead of all destinating flats volumes. The negative impact on AFSM productivity stems from the increased number of AFSM sort plans that were processing FSS reject volumes.

Discussions with facilities management revealed that FSS rejects that could be re-run on AFSM were limited. First, Commission staff learned that only rejects from the first pass on FSS can be re-run on AFSM. This is because during the first pass on FSS, pieces are sorted to groups of delivery points, which more or less resemble groups of delivery points pertaining to carrier routes. Such grouped rejects can be aggregated back to individual 5-digit ZIP Codes and re-run on AFSM's incoming sort to the carrier route level. However, since rejects from the second pass of the FSS machine runs were output from the sequencing process, reassembling pieces to 5-digit ZIP Codes for induction to AFSM would require substantially more manual labor. As such, staff at facilities explained that second pass rejects cannot be re-run on AFSM and are dispatched directly to DDUs.

Moreover, not all first pass FSS rejects can be re-run on AFSM. Mail processing staff explained that FSS machines separated rejects into bins based on the reason that the machine rejected them: (1) "out-of-sort" rejects, for flats destinating to delivery points that were not included in FSS sort plans run on a machine;<sup>94</sup> (2) "no-read" rejects, for flats with address labels or barcodes that the machine could not read;<sup>95</sup> and (3) mechanical rejects, related to issues with mailpiece dimensions or flexibility.<sup>96</sup> Commission staff also observed facility staff handling individual pieces that got jammed in the machine or that fell out during processing.

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<sup>94</sup> It is not clear whether sort plan revisions that involved removing low-volume delivery points from existing sort plans may have contributed to out-of-sort reject volumes.

<sup>95</sup> Causes of such rejects included issues with ink when barcodes were printed, or no address labels/barcodes printed/attached to cover pages of individual catalogues, and missing cover pages where address labels/barcodes were attached. Facility staff described the last example as occurring frequently and related to mailers using thin paper, which rips off easily when flats sorting equipment handles pieces.

<sup>96</sup> DMM includes criteria for physical standards that flats mailpiece must meet, such as minimum and maximum length, height, and thickness, ability to bend, uniform thickness (*i.e.*, no bumps or protrusions). *See* DMM §§ 201.4, 201.6.

**Picture III-8**  
**Examples of FSS Machine Rejects**



(Left: Bin with pieces that fell out or got jammed during FSS machine run. Right: “No-read” rejects from FSS)

Of the FSS rejects, “no-read” rejects cannot be re-run on an AFSM because, like FSS, the AFSM cannot read their address labels. Mechanical rejects can be related to an issue with mailpiece flexibility, *e.g.*, when a lotion sample inserted in a catalogue prevented sufficient bending and FSS rejected it. Mechanical rejects can also be related to paper quality. Staff frequently described AFSM as “more forgiving” than FSS. For example, some catalogues printed on thin paper are rejected by FSS but are acceptable to AFSM. On the other hand, inflexible catalogues might be unacceptable for both machines. As such, the specific mailpiece irregularity would determine which FSS rejects could be re-run on AFSM and which could not. As for “out-of-sort” rejects, no mailpiece irregularity is involved; as such, these would be acceptable for AFSM machine processing.

The nuances described above suggest that, as the number of AFSM sort jobs did not change, volumes for individual sort jobs may have been increasingly difficult to project, especially for those sort jobs maintained for FSS rejects.

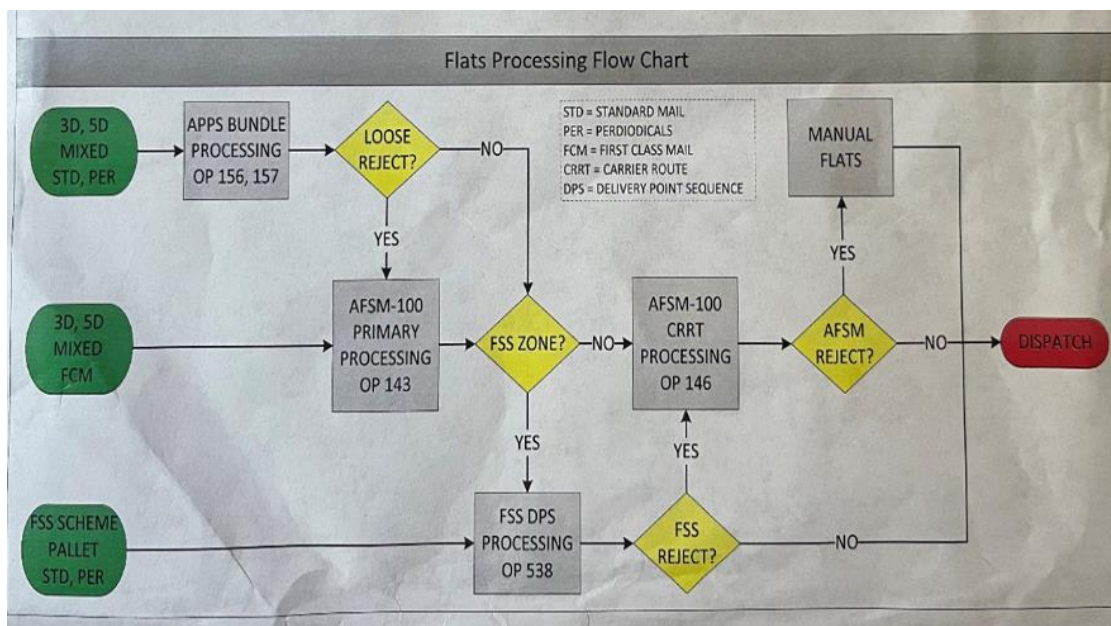
Facility staff described that when FSS reject volumes are low, such as those shown in Picture III-8, on the left, staff do not re-run them on AFSM and instead dispatched them to DDUs for manual sorting to carrier routes. Facility staff also described high- and low-productivity AFSM sort plans for FSS rejects, suggesting high and low “supply” of FSS reject volumes.

The negative impact on AFSM productivity stems not only from potentially low FSS reject volumes for some sort plans, but also from the time that it takes to set up and take down a sort plan on AFSM. At one site, the manager described that it took about 25 minutes to set up a sort plan and about 35 minutes to take one down. No pieces were sorted while employee workhours accrued during sort plan set up and clean up. The manager gave an example of an AFSM sort plan with only 2,000-3,000 FSS rejects, which took about 15 minutes to process on AFSM. Of the 75 minutes (25 minutes for set up + 15 minutes for sorting + 35 minutes for take down), during which several employees operated AFSM, only 15 minutes (*i.e.*, one-fifth) constituted “productive time.” As such, the more such sort plans that a facility runs, the more that FSS deployment harms its overall AFSM productivity. Moreover, the unpredictability of FSS reject volumes makes planning operations, including setting up operating windows for the different sort plans, difficult for sites that serve FSS zones.

*Impact of bundle breakage on AFSM productivity.* While FSS deployment impacted volumes in AFSM’s incoming sorts to carrier route, bundle breakage impacted volumes sorted in AFSM’s other sorts, outgoing sorts to the 3-digit level and incoming sorts to the 5-digit level. The difference is that FSS operations cause volumes to divert from AFSM, while bundle breakage increases flats volumes that need processing on AFSM.

In general, staff at visited sites explained that mixed flats from broken, loose, and reject bundles (loose flats) are manually sorted to the 3-digit ZIP Code level. Discussions with management also suggested that the facilities treat loose flats as Managed Mail Program (MMP) flats.

**Picture III-9**  
**An Example of Flats Processing Flow Chart**



A copy of a flats processing flow chart provided by management at a visited site indicates that loose and reject destinating USPS Marketing Mail and Periodicals flats bundles are processed with MMP flats. (“OP 143” stands for MODS operation code 143, which is for MMP flats.) The chart also shows that First-Class Mail Flats are included in the MMP.

Commission data analysis for the visited sites indicates that, other than P&DC 2, sites processed between 24 and 54 percent of flats via the MMP in FY 2021.<sup>97</sup> See Figure III-8.

**Figure III-8**  
**MMP and Non-MMP Flats Volumes (Total Pieces Fed, millions)**  
**Processed on AFSM at the Visited Sites in FY 2021<sup>98</sup>**

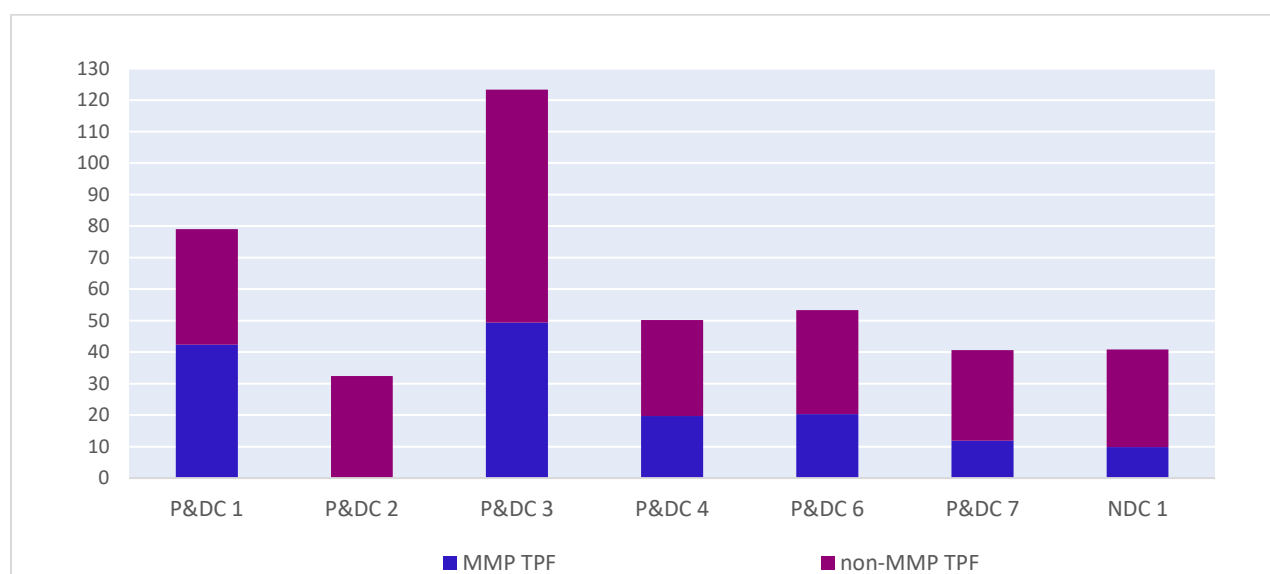


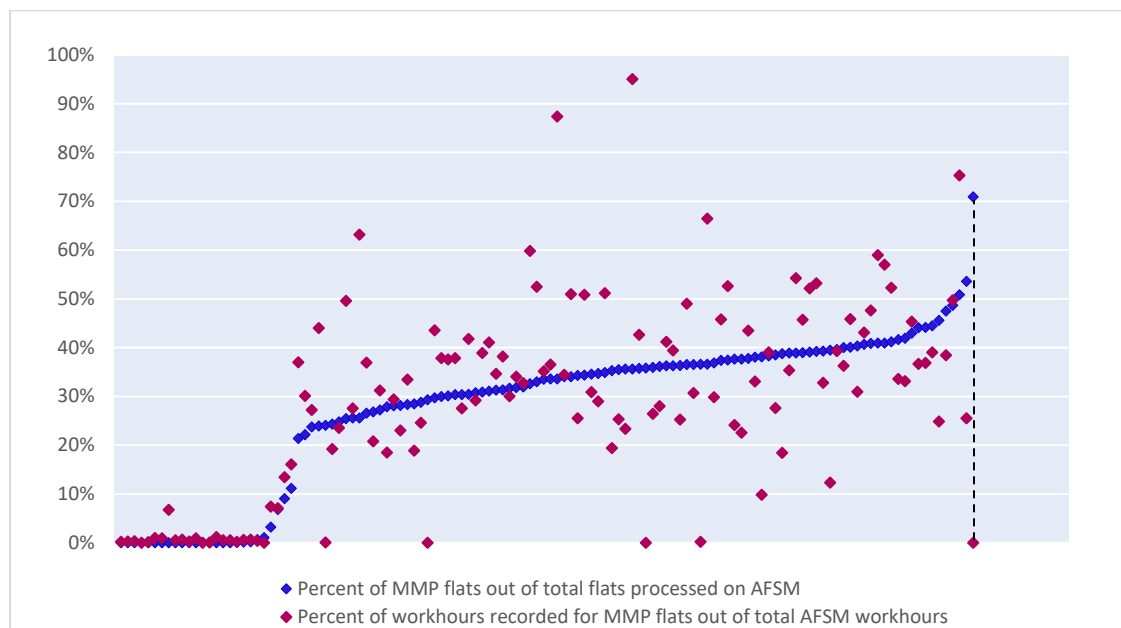
Figure III-9 shows that, of approximately 130 facilities that reported volumes and/or workhours under MMP operations in FY 2021, most processed between 20 and 50 percent of flats under MMP.<sup>99</sup>

<sup>97</sup> Docket No. ACR2021, Library Reference USPS-FY21-NP42, February 22, 2022, CSV file “modstour2021r-np.csv.”

<sup>98</sup> Docket No. ACR2021, Library Reference USPS-FY21-NP42, February 22, 2022, CSV file “modstour2021r-np.csv.”

<sup>99</sup> Source: In Figure III-9, mail processing facilities, identified by unique finance numbers, are included on the horizontal axis, but are not shown, due to the non-public nature of facility-level data. For example, values for facility number 126, of the 132 facilities for which data is included in the figure, are marked with a vertical line in Figure III-9. For this facility, 71 percent of flats volume and 0 percent of employee workhours were recorded in MMP operations, in FY 2021.

**Figure III-9**  
**Percentage of Volumes and Workhours Charged to MMP at Sites**  
**that Reported Volumes Under MMP Operations in FY 2021<sup>100</sup>**



The Commission followed up with the Postal Service to better understand what MMP is and the implications that merging loose mail with MMP might have on flats processing and costs. In its response, the Postal Service describes MMP as a distribution system, which includes First-Class Mail, destinating in specific ZIP Codes.<sup>101</sup> The Postal Service also refers to the routing of MMP flats as being defined in the National Distribution Labeling List logistics orders, but provides no other information on the differences in the routing, transportation modes, processing operations (*e.g.*, whether there are differences in sort plans) between flats in MMP flows and those in non-MMP flows. *Id.*

As for loose flats from outgoing USPS Marketing Mail and Periodicals bundles, facility staff explained that they sort them manually to the 3-digit level. Sites that the Commission staff visited and that processed originating First-Class Mail Flats described merging manually sorted outgoing loose flats with First-Class Mail Flats flows. This suggests that flats from broken or loose bundles are upgraded to the First-Class network and receive higher priority service than they would have received bundled as USPS Marketing Mail Flats or Periodicals.<sup>102</sup>

For incoming loose flats, manual sorting to the 3-digit ZIP Code level was necessary to prepare them for sortation to the 5-digit level on AFSM. Sortation to 5-digit level was

<sup>100</sup> Source: Docket No. ACR2021, Library Reference USPS-FY21-NP42, CSV file "modstour2021r-np.csv."

<sup>101</sup> Response to CHIR No. 7, question 3.

<sup>102</sup> See Section III.5. for a discussion on possible implications of merging loose mail with MMP flows.

meant to sort loose flats to the same level to which incoming bundles would have been sorted on bundle sorters had they not broken.

The manual preparation work needed to induct pieces to AFSM was too slow and pieces were fed manually into the machine as they were ready, and not all at once. As a result, the number of pieces sorted during the time that employees operate the machines (*i.e.*, while workhours accrued) is low.

The preparation work included manual sorting of loose flats to the 3-digit ZIP Code level, placing pieces in trays compatible with AFSM equipment, properly facing them, and properly aligning them in trays. Facing involves turning individual mailpieces so that their address labels faced the scanning device attached to the machine. If the scanner cannot read address labels as pieces were inducted to the machine, they are treated as “no-read rejects.”

The speed at which loose flats were prepared for induction into AFSM also depends on staff skill level. Management at one site partly attributed the facility’s low AFSM productivity to employees who were too slow to prepare loose mail and feed it into the machine. However, management also recounted that their facility had difficulty retaining already-trained employees and that newly employed staff lacked adequate skills. The facility’s employees cited the difficulty of their jobs were as a common reason for quitting.

While processing of loose flats on the AFSM increases volumes processed on the machine, the impact on AFSM productivity is not clear. This is partly because of the lack of data that would permit distinguishing volumes for First-Class Mail Flats from destinating loose flats volumes for other mail classes that are processed under MMP. Similarly, it is not possible to distinguish mail classes for volumes processed in outgoing sort plans. In addition, workhours charged to MMP operations do not follow reported MMP volumes, as illustrated for FY 2021 in Figure III-9. The Commission followed up with the Postal Service about determining the impact of loose flats processing from the available data.<sup>103</sup> The responses provided by the Postal Service indicate that some of the impact might be reflected in the time loose mail spends in allied operations. However, further research and analysis are needed to determine the impact that merging loose mail with MMP or into the First-Class network has on flats processing efficiency and costs.

*Impact of automated enhancements on AFSM productivity.* Level of automation also plays a role in AFSM productivity. An AFSM can be enhanced with Automated Induction (AI) system, an Automatic Tray Handling System (ATHS), or both. The AI system automates the process of feeding mailpieces into the machine. An AFSM without AI might need two or three clerks to manually feed the machine, while only one clerk is needed to monitor the automated feeding process.

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<sup>103</sup> January 13 Response to CHIR No. 5 question 1.a.-d.; Response to CHIR No. 7, question 2.



The ATHS reduces the number of employees, and workhours needed to operate the machine during sorting. In Picture III-10, trays with carrier route labels are filled with flats destinating on respective carrier routes during the AFSM's incoming secondary sort plan (where 5-digit flats are sorted to carrier route level). As trays are filled, the ATHS clears them from the machine and replaces full trays with empty trays. For AFSMs that are not equipped with an ATHS, staff clears trays and replaces them manually.

**Picture III-10**  
**AFSM with ATHS Enhancement**



Managers at sites with both AI and ATHS enhancements said that these automated systems made AFSM capable of processing volumes per machine hour at a rate comparable to the FSS. Staff at some sites with an AI system explained that they do not use it for sort plans with low volumes, such as low-volume FSS rejects. However, they added that manually feeding the AFSM is too slow. When mailpieces for a sort plan are not fed to the machine all at once, it takes longer to process them. During the run, facility staff must operate the equipment, regardless of how fast or slowly mailpieces are fed to the machine. As a result, slower manual feed leads to fewer pieces processed per employee workhour and lowers AFSM productivity.

*Impact of mailpiece irregularities on AFSM productivity and efficient flats processing.* In efficient processing operations, the proportion of machinable mailpieces sorted on mechanized flats sorting equipment is maximized, and the proportion of machine rejects, which need to be sorted manually, is minimized. Commission staff observed that the mailpiece quality impacts the proportion of flats that are finalized on an automated equipment.

The Postal Service staff at most facilities, described an AFSM as more “forgiving” than FSS, in that an AFSM is able to process pieces that FSS rejected. Most examples that staff provided included issues related to thin paper quality, particularly for USPS Marketing Mail flats. The Commission gathered specific examples of issues with mailpiece quality that

neither machine could process and that will need to be addressed to improve the efficiency of flats operations after decommissioning the FSS equipment at the facilities.

For example, Commission staff observed carts filled with trays of FSS rejects. These trays were labeled for dispatch to delivery units because they could not be re-run on the AFSM. This was because barcode labels on individual mailpieces could not be read, regardless of the equipment. Facility staff also noted that return mail would always be rejected. The reason was that return address labels failed to adequately cover the original barcodes, causing issues for equipment when scanning mailpiece labels. Another example was an entire shipment of catalogues that were manually sorted because they had lotion sample inserts, which neither FSS nor AFSM could accept.

The above examples resulted in inefficient manual sorting of flats to carrier route and manual casing to DPS, for mailpieces that were intended to receive these sortations on automated equipment. However, in each example, the inefficient processing involved different degrees of “wasted” resources. In the first example, flats went through the first pass on FSS, were rejected, and were identified by staff as requiring manual sorting, rather than being re-run on AFSM. Flats in the last example resulted in the most resources wasted because the facility’s staff was not able to detect sample inserts when preparing mail, which would have led staff to have the shipment bypass machine processing. Consequently, the entire shipment was run first on FSS and rejected, then re-run on AFSM and rejected. Only then was the shipment transported to destinating DDUs for manual sorting, with no time available to sort pieces and deliver them timely.

Adequate mailpiece quality is necessary to prevent inefficient use of resources and prevent manual sorting and casing of mail that qualifies for discounted prices based on supposedly avoided costs. The Commission’s operational expert described repeated discussions between the Postal Service and mailers over the years, including various proposals related to flats quality standards that would ensure machinability. However, the operational expert also commented on resistance from mailers, including mailers’ concerns that changed flats preparation quality standards might disqualify their pieces from presort discounts, or significantly reduce their discount levels.

### (3) Substitution of FSS by AFSM

The impact of FSS decommissioning on flats processing is difficult to predict because it depends on many factors. The Postal Service explains that it considered input from Retail and Delivery Operations but does not describe the input that it received.<sup>104</sup> Commission staff observed the most acute staff shortage at a DDU that served only FSS zones. That DDU received about 10 to 20 percent of flats sorted only to carrier route. These flats needed to be manually cased. The DDU also received regular shipments of machine incompatible Periodicals flats that were not sorted at the upstream facility and needed sorting to carrier route and casing. For this DDU, the discontinuance of FSS operations will impose

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<sup>104</sup> Response to CHIR No. 2, questions 3.c.-d.



substantial strain on staffing, as the remaining majority of flats received by the DDU will require the same manual casing.

As for mail processing facilities, the Postal Service explains that staffing strains related to the COVID-19 pandemic are ongoing and that running FSS and AFSM operations concurrently has also strained staffing. *Id.* The Postal Service claims that discontinuing FSS operations would allow it to properly staff AFSM operations and improve overall efficiencies. *Id.* The Commission's operational expert added that removal of FSS equipment would free up maintenance staff from previous FSS operations and that with some training, this staff might become available for other operations, such as AFSM.

At most sites where one or all FSS machines were decommissioned prior to our visits, management described no major impact on operations. As management explained, this was because mailers got advance notice about changes in FSS operations and started to presort their flats bundles to carrier route levels, instead of FSS schemes. Carrier route bundles need no additional processing and are moved directly to DDUs.

However, a manager at one site (P&DC 7), which never operated FSS equipment, described an increase in flats volumes related to the decommissioning of a FSS machine at another facility (P&DC 2). Prior to the decommissioning, P&DC 7 processed FSS rejects from P&DC 2's FSS operations. However, P&DC 7 management explained that it started receiving about 10 pallets of flats per day from P&DC 2 for processing to carrier route because P&DC 2 could not handle all of its daily flats volumes after one of its three FSS machines were decommissioned. For P&DC 7, management described a notable impact on operations, which the facility's management attributed to a combination of the recent increase in volume related to the FSS machine removal from P&DC 2, as well as a steady increase in the amount of loose mail and FSS rejects over past several years, coupled with a recent removal of one of its 3 AFSM machines.

At sites where FSS decommissioning had not yet occurred but was expected, management anticipated no substantial impacts and explained that their AFSM equipment had sufficient capacity available to absorb increased flats volumes. However, Commission staff also learned that these general expectations of no impact from FSS machine removals were based on Postal Service Headquarters projections for increases in flats volumes that would require sorting on AFSM at impacted sites. The Commission does not have information on site-specific projections for volume increases in AFSM operations.

Discussions with Postal Service facility staff also revealed some uncertainty. At one site, the manager stated that their AFSM equipment might not be able to handle more flats than Postal Service Headquarters had projected for this site. This was partly because the facility had one of its AFSM machines recently removed on the basis of declining flats volumes. Facility staff also expressed uncertainty related to the complexity that FSS sort plans revisions created for their AFSM operations. Management at one site was not confident that reverting to simpler, pre-FSS era sort plans would be smooth and immediate.

Discussions with mailers suggested that as flats volumes have declined, presorting bundles to finer levels to qualify for deeper discounts has become more difficult. Carrier route presort represents the finest presort level possible. As the name suggests, a carrier route bundle can include only flats for a single carrier route. FSS schemes represented opportunities for mailers to combine pieces for several carrier routes, from several 5-digit ZIP Codes, in FSS scheme bundles.

It is unclear why facilities expect that most FSS scheme bundles would be presorted to carrier routes following removal of FSS operations. It is also unclear how the Postal Service projected flats volume increases for each impacted site. No analysis of the operational or cost impacts of FSS decommissioning has been provided to the Commission, and it is not clear whether the Postal Service solicited inputs from mailers on its decision to decommission FSS operations.

c. Manual Sorting at Mail Processing Plants

Manual flats stations observed by Commission staff were not crowded with containers of broken bundles, trays of rejects from FSS or AFSM machines, or shipments of flats incompatible with flats sorting equipment. Most pieces that Commission staff saw manually sorted and cased (placed on shelves marked with destination labels) were newspapers. Most facilities' management described no changes in manually sorted flats in the past several years.

Facility staff explained that mail processing facilities manually sorted destinating flats for dispatch to DDUs. Most DDUs serve only one 5-digit ZIP Code area but a small portion of DDUs serves five or more 5-digit ZIP Codes. DDUs that serve multiple ZIP Codes tend to be located in areas with high population density and high delivery-point density, and many of them were included in FSS zones. For those DDUs, mail processing sites sort flats that require manual sorting to the 5-digit ZIP Code level. Once at DDUs, pieces are manually sorted to carrier routes (by clerks) and manually cased to DPS (by carriers).

Outgoing flats are manually sorted to the 3-digit level at mail processing facilities.

Staff described manually sorting non-machinable flats (such as newspapers), rejects from flats sorting equipment, and MMP flats. Discussions with management suggested that manually sorted non-machinable and reject flats are sorted separately from manually sorted MMP flats. Commission staff did not observe areas where MMP flats were manually sorted during the visits. Manual sorting of non-machinable flats is expected for those pieces that are entered into the postal network as non-machinable mail. Due to the less efficient manual sorting of non-machinable flats, non-machinable mail rates apply to these flats products by default.

**Picture III-11**  
**Manual Sorting Area at a Visited Site, with Mostly Newspapers**



As for rejects from flats sorting equipment, the inefficiency stems from the fact that the cost incurred by the Postal Service to sort them and prepare them for delivery is not recovered from the rates for which these pieces qualified when they were entered into the postal network. For example, flats presorted to FSS scheme qualify for the deepest discounts, because they are assumed to be processed to DPS on automated equipment and to require no manual work. However, where a mailpiece irregularity affects an entire shipment, postal employees may need to manually sort every piece in the shipment for delivery. Postal Service staff at visited sites frequently described mailpiece irregularities such as mailpieces being too thick or too thin—a flat mailpiece that is too thin cannot stand on its side, collapses, and may cause jams—or not bending sufficiently. Staff also described thin paper quality as frequently resulting in machines ripping off cover pages, along with address labels, which rendered mailpieces “no-reads.”

As noted above, mail processing facilities’ staff explained that they manually sort destinating flats to the 5-digit ZIP Code level and not deeper. Facility staff suggested that mailpieces rejected from FSS require no or minimal manual sorting at mail processing facilities, because FSS rejects are already sorted to the 5-digit level when they are fed into the machine for processing.

However, at one site, management commented on the complexity that FSS schemes introduce for flats processing. Management explained that as FSS schemes are revised or new FSS schemes created, 5-digit ZIP Codes from more than one 3-digit ZIP Code area and for more than one DDU can be included in one FSS scheme. The Postal Service’s responses to questions on its method for estimating manual volume also indicate that FSS flats may

need manual separations to both the 3-digit and 5-digit ZIP Code levels at mail processing sites before they can be dispatched to DDUs.<sup>105</sup>

Regardless of whether rejects from flats sorting equipment significantly impacted manual sorting at mail processing facilities, the impact on DDUs was substantial. The rejected volumes and the sorting jobs that generated them dictate the amount of manual sorting that DDU clerks must do to prepare mail for delivery.

For example, “no-read” rejects cannot be re-run on AFSM because AFSM scanners cannot read faulty barcode labels. Dispatching “no-read” mail to DDUs requires clerk workhours to manually sort pieces to carrier routes. On the other hand, where FSS rejects flats due to an irregularity that FSS could not handle but that is acceptable to AFSM, the flats are re-run on AFSM and sorted to carrier route before being dispatched to DDUs. Such carrier-route-sorted flats still require manual casing, although they avoid manual sorting by DDU clerks. As such, the type of mailpiece irregularity determines the amount of sorting that can be performed on automated equipment, at mail processing facilities, and the amount of manual sorting done by clerks at DDUs.

Every mail processing facility that Commission staff visited described receiving daily shipments of machine-incompatible flats that bypassed sortation on automated equipment. Facility staff described expediting such mail to DDUs for manual sortation, completely bypassing automated processing on the basis that most shipments were already presorted for distribution to DDUs. When DDUs received such shipments, clerks had to open each bundle and manually sort pieces to carrier routes.

Manual sorting productivity is calculated from volumes and employee workhours recorded in respective data systems for respective MODS operations. To explain low productivity of manual sorting at one mail processing facility, management commented that productivity values are only as reliable as the data used to calculate them and described challenges with accurate recording of workhours. This site’s management explained that there are two requirements for accurate workhour recording: (1) an individual employee must remember to clock in and out as the employee moves between operations; and (2) for the employee to be able to clock in and out of operations, the employee’s supervisor first needs to change the employee’s base operation in the system. Other facilities confirmed that they focused on clocking in and out only at the beginning and end of employees’ shifts and did not track much employees’ movement between operations during shifts.

If manual workhours recorded in MODS reflect the number of staff clocked into one base operation in a shift, it is not possible to interpret reported productivity values as changes in employees’ actual productivity and to attribute these changes to staff skill level, training, or changes in manual flats volumes.

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<sup>105</sup> Response to CHIR No. 7, question 2; January 13 Response to CHIR No. 5, question 1.g.

Not only are workhours charged to respective manual operations potentially unreliable, the facilities also do not conduct physical surveys of manually processed flats volumes.<sup>106</sup> This makes both values used to calculate manual sorting productivity (volumes and workhours) unreliable.

Starting in FY 2016, the Postal Service replaced physical manual volume surveys with so-called “allowances.” *Id.* The Postal Service states that these allowances represent maximum fractions that can be applied to each facility’s automated flats volumes to estimate manually processed flats. *Id.* The Commission has followed up with the Postal Service to better understand whether application of allowances produced accurate estimates of manually sorted flats at mail processing facilities.<sup>107</sup>

In its response, the Postal Service explains that the determination of facility-specific allowance starts with the same baseline fraction of 7 percent applied to facility’s automated flats flows, but also describes certain additional nuances in the estimation of manually processed flats volumes at the facility level. *Id.* questions 2.b., 2.d.-e. For example, if facility A sends its loose or reject flats to facility B for manual processing, facility A can choose to not report manual volumes, but facility B is unable to report more than the maximum fraction of its own automated flats flows as manually processed. *Id.* In addition, the documentation that the Postal Service cites for calculation of the final facility-specific manual volumes suggests that Postal Service Headquarters reviews and approves the final manual volume percentages and counts for each facility, without any further details on the final review process (*e.g.*, the extent of consultation with facility management).<sup>108</sup>

The Commission is concerned that capping the estimate at 7 or any other percent<sup>109</sup> and not letting facilities report manual volumes might mask potentially increasing volumes that need manual processing. The Commission is also concerned about the specific instance of machine-incompatible volumes, which most facilities reportedly have been receiving for years, with some facilities seeing increases in these volumes. Because the allowances are applied only to automated workloads, they do not capture the machine-incompatible volumes that bypass automated processing.

The Postal Service claims that the allowance method has led to a reduction in the estimated manual flats for “a majority of facilities” compared to previous manual flats estimates, when volumes were counted. *Id.* question 2.g. However, the Postal Service also states that “[a]ll manual flats volume flows were considered and analyzed by the MODS coordinators in July 2015 and accounted for in the calculation for manual flat volumes,” implying that machine-incompatible volumes were accounted for when allowances were determined in

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<sup>106</sup> Docket No. ACR2021, Library Reference USPS-FY21-23, December 29, 2021, PDF file “USPS-FY21-23.Preface.pdf,” at 1 (FY 2021 MODS Productivity Preface).

<sup>107</sup> Response to CHIR No. 7, question 2.

<sup>108</sup> United States Postal Service, Management Operating Data System, Handbook M-32, September 2018, at 12.

<sup>109</sup> Response to CHIR No. 7, question 2.b.

2015. *Id.* question 2.f. This does not address the question of whether allowances based on operations in July 2015 adequately capture increasing manual flats volumes.

In Docket No. ACR2022, the Postal Service states that the significant decreases in manual flat productivities since FY 2016, when compared to prior years, imply that the allowances underestimate flats workloads at mail processing sites.<sup>110</sup> The Postal Service continues to describe manual flat productivities as “sufficiently unreliable” and does not recommend their use. *Id.* at 2.

Without reliable data, reliable analysis of manual processing productivity is not possible. The Commission notes that the lack of actual counts of flats that are manually processed prohibits accurate analysis of the extent of inefficient manual sorting that automation flats receive, or the associated impacts on mail processing cost.<sup>111</sup> Observations from facility visits and the Postal Service’s responses to Chairman’s Information Requests (CHIRs) suggest that the implications of manual processing productivity require further research.

#### d. Productivity and Service Issues in Allied Operations

Sorting activities are referred to as “pure distribution” while activities associated with handling mail between sorting operations are part of allied operations.

The Commission has previously reported on the cost implications and negative impacts on service performance of inefficiencies in allied operations<sup>112</sup>

*Preparation for bundle processing.* Most staff at P&DC sites described assessing bundle integrity by visually inspecting flats drop shipments when mailers’ trucks first arrived at the facility. Staff similarly inspected bundles arriving from upstream mail processing facilities, whether on postal vehicle transportation or on contracted highway contract route (HCR) transportation.

Staff at P&DCs described only occasional issues at arrival, mostly related to bundles being improperly secured during transportation and breaking, or their wrapping/strapping material becoming loose. Staff clarified that this was because most bundles arrived at their facilities either in cardboard containers or secured directly on pallets, which provided good support for bundles.

Staff at NDCs described issues with bundle integrity upon arrival that differed from those at P&DCs. One of the NDCs visited received about 50 percent of bundles in sacks, the other 50

<sup>110</sup> Docket No. ACR2022, Library Reference USPS-FY22-23, December 29, 2022, PDF File “USPS-FY22-23.Preface.pdf,” at 1-2 (FY 2022 MODS Productivity Preface).

<sup>111</sup> The Area In-Plant Support uses the End Of Run data to calculate the volume for each MODS facility which is then submitted to the Postal Service’s headquarters for approval. The percentages used in the calculation for manual flats vary by mail level and site. See Docket No. ACR2022, Library Reference USPS-FY22-NP18, December 29, 2022, folder “USPS-FY22-NP18,” folder “USPS-FY22-NP18 MODS Data,” PDF file “M-32 MODS Handbook.pdf,” at 11-16, 113-39. See also Response to CHIR No. 7, question 2.

<sup>112</sup> See FY 2015 ACD at 173-74; FY 2016 ACD at 167; FY 2017 ACD at 178-79; FY 2018 ACD at 218-19; FY 2019 ACD at 171-72; FY 2020 ACD at 256-57; FY 2021 ACD at 258-59.

percent on pallets. Staff at another NDC said that about 20 percent of its bundles came in sacks. Management at both NDCs explained that bundles transported in sacks were more likely to have bundle integrity issues than bundles transported in containers or on pallets. The Postal Service has proposed eliminating sacks as containers for flats.<sup>113</sup>

Another difficulty staff at NDCs described was that facility staff could not assess bundle integrity before handling or emptying sacks. Any bundles with compromised integrity may have broken during sack handling by NDC employees. Bundle integrity was further compromised during the sack shake out process.

NDCs devoted a substantial number of employees to manual inspection of individual bundles that did not break during unloading and the sack shake out process. Bundles that NDC staff deemed not able to withstand processing on automated bundle sorting equipment and/or subsequent transportation through the network were stabilized. For example, NDC staff added additional strapping when they considered existing strapping insufficient for the bundle size or content, and many bundles (such as those arriving strapped with rubber bands or bundles for which strapping became loose during transportation) were re-strapped.

NDC employees specifically mentioned co-mail bundles as requiring close attention, because they tend to be larger, heavier, and the pieces in the bundles are less uniform.

At one NDC, Commission staff saw what the employees described as “super bundles”—three or four smaller bundles tied into what appeared to be one individual bundle. Facility staff explained that bundling of bundles was not permitted by the DMM and that identifying these bundles was very challenging because “super bundles” appeared no larger than single large bundles. As the NDC staff opened one such “super bundle,” commission staff observed that each of the four bundles included in it destined in a different state. The employees explained that all the bundles would be routed to the address on the first bundle which meant that three out of the four bundles would be misrouted.

Staff at the facilities added that they recognize which mailers ship “super bundles” and co-mail bundles and that facility management assigns additional staff on days shipments from those mailers were expected.

*Preparation for individual piece processing.* Another allied operation is preparing mixed pieces from broken, loose, and reject bundles (loose flats) for individual flats processing on automated equipment.

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<sup>113</sup> Removal of Sacks—USPS Marketing Mail and Periodicals Flats, 87 Fed. Reg. 63,985 (Oct. 21, 2022) (to be codified at 39 C.F.R. pt. 111).

**Picture III-12**  
**A Bin with Mixed Pieces from Broken Bundles**



Facility staff explained that loose flats from bundles that had been pre-sorted to the 3-digit level had to be first manually sorted to the 3-digit level, and then sorted to the 5-digit level on AFMS equipment if possible.<sup>114</sup> However, the operational expert stated that in many cases once a bundle breaks the individual flat will be sorted to its final destination in manual operations rather than automated ones.

*Mail processing network design.* Staff at mail processing facilities and transportation hubs visited by Commission staff performed operations limited to only certain shapes of mail, or mail classes, or sort levels, or some combination of mail attributes. The more narrow the range of facilities' operations, the more critical it was that mail arrived in time to align with planned processing windows.

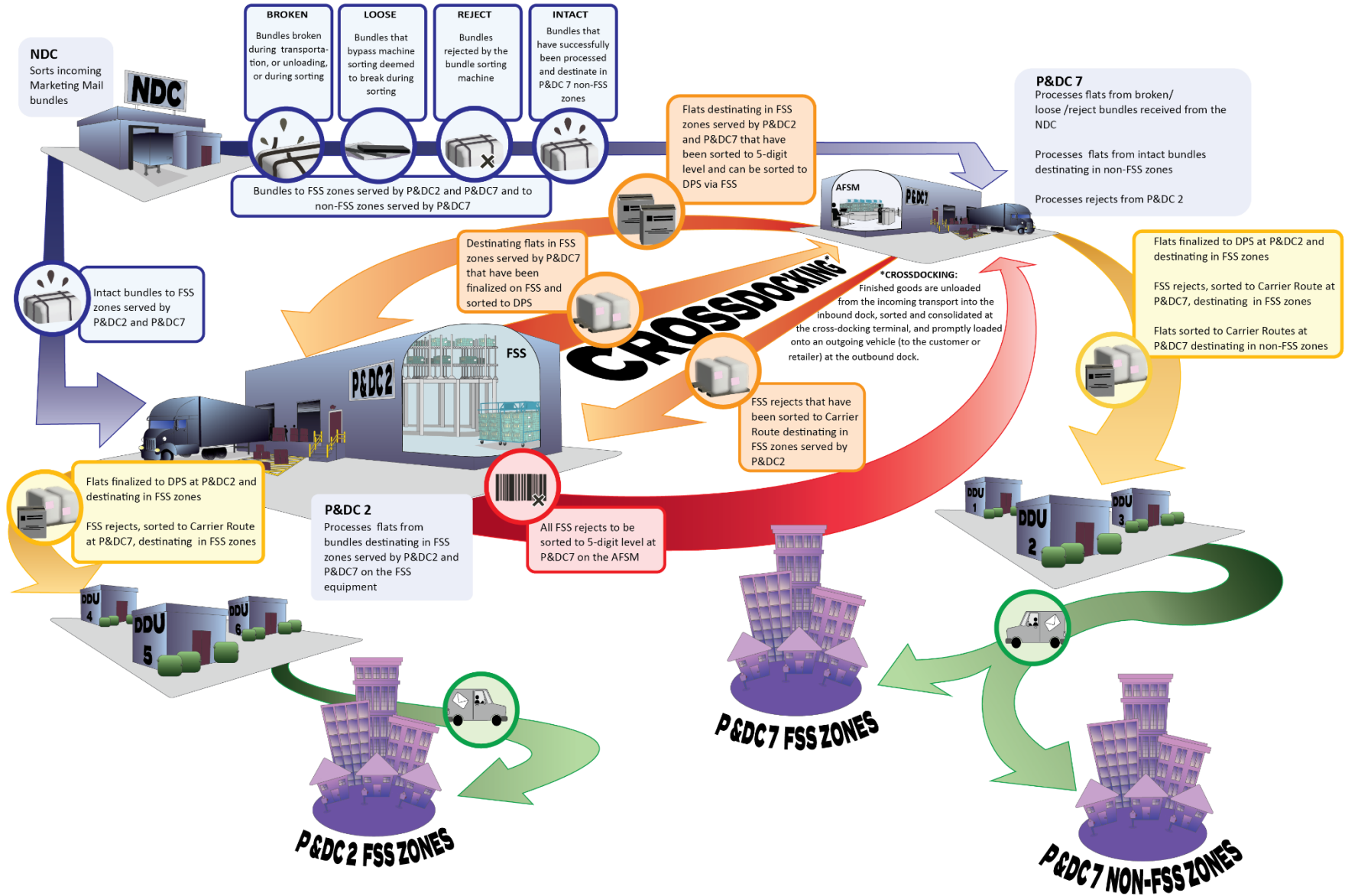
One site (P&DC 7) was in a group of three mail processing facilities (the group included P&DC 2 and an NDC). These three facilities shared processing jobs and moved mail frequently between the different sites. Below, the Commission provides a simplified illustrative example of how destinating USPS Marketing Mail flats flow between the three facilities. *See* Figure III-10. A more detailed description of the flow is included in Appendix A, Section III.B.4.d. Analysis.

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<sup>114</sup> The Postal Service explains that these activities were charged to mail preparation operations associated with the machine and sort type for which they were being manually prepared. January 13 Response to CHIR No. 5, questions 1.a.-d., f. These workhours are not included in the Postal Service's calculated productivity values for machine equipment and represent workhours spent in allied operations. Response to CHIR No. 1, questions 5.c.-d.



Figure III-10



The collaboration and division of processing jobs between the three sites is more complex than depicted in the simplified example above and requires frequent transportation between facilities. Another similar group of facilities referred to “shuttle transportation” running between their interconnected operations.

Facility staff stated that this workload sharing made planning difficult. Management at P&DC 7 noted that bundle breakage rates at the upstream NDC or FSS reject rates at P&DC 2 could not be projected, which made daily workload unpredictable. This impacted timely processing of the flats that did not have any irregularities or cause any inefficiencies.

Another facility processed only outgoing parcels and destinating flats bundles on its APPS equipment. Management stated that the bundle processing window was too long (8 a.m. to 11:30 a.m.) for the low bundle volumes that the facility received. Management described situations in which it ran out of flats bundles by 10 a.m. and switched to parcel processing. For bundles that were dropshipped at the facility between 10 a.m. and 11 a.m. (*i.e.*, within the CET for the described bundle processing window), the staff either delayed processing of the flats bundles, or allow APPS and employees to be idle when there were no bundles to process. In the first instance, service performance scores for the affected flats that arrived within the CET suffered.

*Difficulty accurately projecting workload and impact on timely operations.* Management frequently described a great deal of uncertainty associated with volumes included in scheduled drop shipments. One site gave an example of mailers who indicated they were shipping 120 pallets of bundles at the time of scheduling but actually shipped only 60 pallets. Another example involved mailers who indicated there would be Periodicals bundles in their shipments (which management stated they were obligated to accept any time that the facility was staffed) but only parcels were included on the arriving trucks. Management explained that because of separate sort plans for parcels and bundles, such deviations disrupted planned operations and necessitated decisions that increased time spent in allied operations either for flats bundles or for parcels.

Despite discussions with Postal Service management, it is not clear what causes the discrepancies described above. It is also not clear whether the Postal Service routinely tracks their occurrence, or whether it charges mailers for any costs that it incurs as a result of accepting these drop shipments.<sup>115</sup>

e. Transportation Issues at Mail Processing Facilities and Hubs

As described in Sections III.B.3.a.-b., every mail processing facility and transportation hub visited by Commission staff performed operations that were limited to certain activities.

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<sup>115</sup> See United States Postal Service, Publication 804, Drop Shipment Procedures for Destination Entry, October 2013, available at <https://about.usps.com/publications/pub804.pdf>.

A complex surface transportation network connects operations performed at different facilities. Any deviations from planned operations—whether deviations from projected volumes or delayed arrival of scheduled shipments—result in increased trip frequency between these sites. Management at the visited facilities described prioritizing service performance, *i.e.*, they dispatched mail on scheduled transportation and ordered additional Postal Vehicle Service (PVS) trips for delayed mail. When delayed mail was intended for HCR transportation, facilities either tried to put this mail on outbound HCR trucks departing from nearby plants or scheduled extra transportation.<sup>116</sup>

As noted in Section III.B.1.b. and Section III.B.3.b., the Postal Service’s network included 13 STCs in FY 2021 and FY 2022.<sup>117</sup> The main functions of STCs are to consolidate mail in containers and increase truck space utilization by containers. Fuller containers, transported on fuller trucks, represent more efficient transportation operations and lower unit transportation cost.

At one STC, Commission staff learned that efforts to better fill mail container space on surface trucks were constrained by the fact that only mail of the same mail class and with the same destination could be combined in containers. The Postal Service representative at the STC added that as flats volumes declined, the task became more difficult.

**Picture III-13**  
**Stacked Cardboard Containers (on the left) and**  
**All-Purpose Container (APC) (on the right) Filled with Flats Tubs**



<sup>116</sup> See Docket No. N2021-1, Direct Testimony of Stephen B. Hagenstein on Behalf of the United States Postal Service (USPS-T-3), April 21, 2021, at 8 n.3. for an estimate of cost per mile for regularly scheduled HCR transportation in 2021; see also Docket No. N2021-1, Responses of the United States Postal Service to Questions 1-11, 13-34 of Presiding Officer’s Information Request No. 1, May 17, 2021, question 17.d. for estimates of cost per mile for extra transportation in 2021.

<sup>117</sup> Commission staff learned during STC visits that all 13 STCs are contracted operations, with some Postal Service staff employed on each site full time. Commission staff also learned that the Postal Service employees coordinate between the contractors and the Postal Service Headquarters. For the remainder of the discussions related to STC site visits, the Commission will refer to the Postal Service employees with whom Commission staff discussed STC operations, as Postal Service representatives.

Cardboard containers are widely used on long-distance trucks because they can be stacked and represent better use of truck space. However, because of low flats volumes, cardboard containers are often not filled to capacity with flats tubs. In such cases, it is not possible to stack them because the bottom container would not support the weight of the container placed on top and would collapse. The Postal Service representative at one of the visited STCs explained that for that reason, it frequently used APCs or over-the-road (OTR) containers when cardboard container could not be filled to capacity. However, while using APCs and OTR containers improved container space used when flats volumes were low, they also resulted in less cubic space used on trucks, since APCs and OTR containers cannot be stacked. The operational expert that the Commission worked with noted past efforts to replace cardboard containers with reusable and collapsible plastic containers that are stackable. The expert added that plastic containers would reduce material costs, since plastic is a more durable material than cardboard, and would allow better cubic space utilization on surface trucks because they are always stackable.

As for truck space utilization, staff at the mail processing facilities stated that they generally combined mail shapes and classes on trucks. The complexity and interconnected nature of the processing and transportation networks did not allow for meaningful discussion of the details of what happens when mail shapes and/or mail classes did not share truck space.

During one facility visit, Commission staff learned that STCs can operate as origin or as destination aggregation centers. The Postal Service explains that origin STCs consolidate mail that originates within their local service areas, and dispatch consolidated mail onto long-distance trucks through the surface transportation network.<sup>118</sup> The Postal Service further explains that destination STCs consolidate mail that arrives on inbound long-distance transportation, and dispatch consolidated mail to its local area processing facilities. *Id.*

At a destination STC, the Postal Service representative described frequent transportation to local area mail processing facilities, included in two 3-digit ZIP Code areas, and not more than a 2-hour drive time from the STC. The representative also described operating about 10 long-distance HCR contracts, with daily trips, including coast-to-coast trips. The representative explained that all its HCR trips were round trips.

It is not clear why any STCs would consolidate destinating mail onto short-distance truck trips to local mail processing sites. Transporting miscellaneous letters and flats on expensive, long-distance transportation represents a very costly and inefficient operation. As trip frequency increases, whether to mitigate impacts of processing delays on service performance, insufficient capacity on departing trucks, or due to interconnected operations performed in separate facilities, trucks are at a lower capacity. This increases transportation cost per transported mailpiece, with cost increases substantially higher for ad-hoc transportation.

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<sup>118</sup> Responses of the United States Postal Service to Questions 6-8 of Chairman's Information Request No. 5, January 18, 2023, question 7 (January 18 Response to CHIR No. 5).

f. Last Mile Delivery – Inefficiencies Identified at DDUs

The Commission has reported on delivery costs, and more specifically on costs associated with manually casing of flats, each year since FY 2015.<sup>119</sup> In its FY 2021 ACD, the Commission noted that the 50-percent reduction in flats volumes coincided with an insignificant decline in costs associated with manual casing of flats between FY 2008 and FY 2021. FY 2021 ACD at 260-61. In FY 2008, all flats were manually cased because the Postal Service did not have FSS equipment. FY 2015 ACD at 179. In FY 2021, about 100 FSS machines were operational for sorting flats to DPS, in 47 locations.<sup>120</sup>

Mail processing facilities that processed mail for the three DDUs that the Commission staff visited operated FSS equipment at the time of the visits. Below, the Commission describes how the numerous mail irregularities discovered at mail processing sites impacted operations at the DDUs, including casing of flats.

*Manual sortation of automation flats.* As described above, every mail processing site visited had been receiving regular shipments of machine-incompatible flats, for many years. These shipments were originally intended for FSS processing to DPS. Therefore, DDUs expected to receive them sorted to DPS and thus requiring no manual sorting by clerks or casing by carriers. In other words, letter carriers at these DDUs were expected to merely pick up these trays as they were leaving the office for delivery.

**Picture III-14**  
**Flats That Arrived from an Upstream P&DC Sorted to DPS**



<sup>119</sup> FY 2015 ACD at 177-80; FY 2016 ACD at 168-69; FY 2017 ACD at 180-81; FY 2018 ACD at 221-22; FY 2019 ACD at 173-74; FY 2020 ACD at 259-60; FY 2021 ACD at 260-62.

<sup>120</sup> United States Postal Service, Office of Inspector General, Report No. SM-WP-15-001, Challenges in Controlling Costs with Standard Mail Flats and Periodicals, February 26, 2015, at 8, available at [https://www.oversight.gov/sites/default/files/oig-reports/sm-wp-15-001\\_0.pdf](https://www.oversight.gov/sites/default/files/oig-reports/sm-wp-15-001_0.pdf) (OIG Report No. SM-WP-15-001).

The largest of the three DDUs visited had only FSS zones. However, the manager there described that between 10 and 20 percent of flats come from the upstream P&DC carrier routes, and that the DDU receives about two pallets of Periodicals per week that need manual sorting to carrier routes. On the day of our visit, Commission staff saw four pallets of Periodicals that required manual sorting to carrier routes. The pieces, shown on Picture III-15, were too thick for FSS or AFSM equipment.

**Picture III-15**  
**One of the Pallets with Machine Incompatible Magazines**



The labels on all pallets indicated that the pieces should have been sorted to DPS at the upstream P&DC. The postmaster confirmed that the individual flats pieces were too thick and incompatible with FSS equipment. The pallets included bundles sorted to 5-digit ZIP Codes, and destinating in the DDU's two largest ZIP Codes. The postmaster noted just one of the destinating ZIP Codes included nearly 30 percent of this DDU's carrier routes. The postmaster explained that all bundles needed to be opened, and their pieces manually sorted to the carrier route by clerks. The postmaster added that their delivery would necessarily be delayed because the DDU did not have sufficient clerk staff to manually sort this mail within its service standard window. To explain how common such shipments were, the postmaster described receiving about two pallets of machine-incompatible flats per week, over the course of several years.

Other volumes that needed manual sorting to carrier route and manual casing to DPS included shipments of flats that neither FSS (if applicable) nor AFSM could process. These included "no-read" flats, or flats with sample inserts that neither machine type could handle and were rejected.

The postmasters at two of the three visited DDUs described increasing volumes of flats rejects coming from upstream P&DCs. Additionally, they explained that they have been increasingly receiving First-Class Mail mixed with USPS Marketing Mail in recent years. The postmasters clarified that combining letter- and flat-shaped mail of different mail classes does not present issues for carriers, but added that when packages are included in containers with a mix of mail classes and shapes, they could delay letter carriers for delivery because of the time needed to separate packages from other mail shapes. The postmasters described this issue as more concerning during peak time when package volumes were high. Postmasters explained that for mail carriers to deliver all daily volumes during peak time, carriers made two trips per day for certain carrier routes—one in the early morning to deliver packages only, and a regular trip to deliver the rest of the daily mail. Separating packages from letter and flat mail in such mixed mail shape containers caused delays in carriers' early morning departures from the office, which in turn delayed their departures for regular deliveries.

The visits to mail processing sites and DDUs revealed that flats mail irregularities impacted operations at DDUs significantly because they increased requirements for manual workhours, which DDUs could not plan for or did not have sufficient staffing to perform in a timely manner. The impacts were more profound for high delivery point density DDUs than they were for lower density DDUs.

*Manual casing of flats.* All carrier-routed flats were manually cased at DDUs. For high delivery point density areas, flats not processed to DPS at P&DCs substantially increased the time needed to manually case them.

DDUs are not able to increase staffing to accommodate large increases in daily workload. Of the three DDUs visited, the DDU that was most impacted by the inefficient processing of flats had more than 200 full-time employees. Yet, this DDU described an acute shortage of staff and reported difficulty delivering mail insufficiently processed at the upstream mail processing facilities in a timely manner. The operation expert that the Commission worked with commented that DDUs of this size are few and are not representative of typically sized DDUs.

## 5. Summary of Newly Identified Causes of Inefficiencies

*True prevalence of bundle breakage is unknown.* The Postal Service states that it does not track bundles that do not receive scans on bundle sorters. Response to CHIR No. 4, questions 4.b., 4.d., 5.d., 5.f. That means that the reported bundle breakage reflects only the percentage of bundles that were inducted onto bundle sorters and were not finalized on the equipment because they broke during sortation.

The Postal Service does not track bundles that break during transportation, when unloading from trucks, or while moving bundles from docks to mail processing floor, all situations that occur before they could be inducted to bundle sorting equipment. Neither



does the Postal Service track loose bundles, which bypass machine processing and are treated as broken. Bypassing machine processing may prevent bundle machine stoppages and prevent reporting of breakage, but it does not prevent the inefficient manual processing that these bundles receive.

*Lack of relevant data prevents effective communication and corrective action.* One of the efforts that the Postal Service has made to address bundle breakage was the implementation of the Mailer Irregularity Application (MIA).<sup>121</sup> The MIA was intended to record the specific irregularities associated with bundles that caused inefficient bundle processing.<sup>122</sup> The Postal Service described that it intended to use these data to communicate with mailers about correcting the specific irregularities associated with their shipments prior to entry of any new pieces into the postal network. *Id.* at 19.

However, Commission staff did not observe consistent recording of bundle irregularities during site visits, and some facilities stated that they simply did not record such data. A site that was among those that did not record bundle irregularities processed large volumes of co-mail bundles.<sup>123</sup> Management consistently described co-mail bundles as the worst in terms of bundle preparation quality, leading to inefficient processing.

The Commission followed up with the Postal Service on the recorded data and the actual process the Postal Service has in place to improve mail preparation quality by mailers. The Postal Service notes that since implementation of MIA in FY 2020 and through FY 2022, “7,382 individual mailers incurred irregularities.”<sup>124</sup> The Postal Service states that irregularity data “can be” recorded at all processing stages but that staff in mail processing operations “does not identify every incident.” *Id.* questions 1.a., 3.c. The Postal Service clarifies that “irregularities are categorized into one of five irregularity types: Piece, Bundle, Pallet, Sack, and Tray.” *Id.* question 1.a. The recorded irregularities “are not limited to flat-shaped mail.” *Id.* For example, the MIA might include a record for a mailpiece for which polywrap did not have sufficient strength. However, the record does not indicate the shape of the mailpiece.

Mail irregularities might be identified at various stages between mail induction to the postal network and final piece processing. *Id.* question 1.a. For example, broken bundle strapping could be identified between unloading from mailer’s truck and final bundle sorting operation, but a lotion sample that may have been included in a catalogue might only be identified after an entire catalogue shipment was processed and rejected by both FSS and AFSM machines.

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<sup>121</sup> The Postal Service implemented the MIA in FY 2020. See Docket No. ACR2021, Library Reference USPS-FY21-29, December 29, 2021, PDF file “FY21-29 Service Performance Report.pdf,” at 18 (Docket No. ACR2021, FY 2021 Service Performance Report).

<sup>122</sup> Docket No. ACR2021, FY 2021 Service Performance Report at 18.

<sup>123</sup> The management at this site stated that they considered a certain amount of breakage to be expected and part of the process.

<sup>124</sup> Response to CHIR No. 6, question 3.a.



The MIA replaced a previously used system for recording mail irregularities—Electronic Mail Improvement Reporting (eMIR). *Id.* question 2. Based on the Postal Service’s description, it is reasonable to suggest that eMIR collected data with more relevant details, such as mailpiece description, mail class, processing category, transportation, etc. *Id.* However, eMIR was retired, and its data are no longer accessible. *Id.* It is unclear why the Postal Service replaced eMIR, which recorded irregularities at a more granular level, with the MIA, which does not even identify the shape of the mailpiece for which an irregularity is recorded. *Id.*

During facility visits, private presort mailers emphasized the importance of effective communication between the Postal Service and the industry. On the topic of bundle and flats preparation, mailers expressed willingness to do their part but explained that if any mail preparation irregularities stemmed from their operations, the information that the Postal Service provided on their shipments did not allow them to track shipments to their operations. Without relevant data, they could take no corrective action.

In support of their arguments, mailers attributed the success and efficiency of their operations to effective communication with their own customers, describing customer education on mail preparation as a high-return investment. For the Postal Service, mailers stressed the necessity to understand the sources of inefficiencies in its operations. They expressed frustration about the numerous initiatives, costly investments, and nation-wide network changes, which failed to provide the projected savings and many of which introduced new inefficiencies.

The Postal Service facilities’ staff questioned the value of recording mail irregularities, including their scanning practices. Every mail processing facility visited has received regular shipments of machine-incompatible and low-quality mail for many years. The work that mail processing facilities and DDUs’ clerks, mail handlers, mail carriers perform might be inefficient, but there might also be no efficient way to process irregular mail, whether the mail’s irregularity stems from mailers not complying with mail preparation standards enumerated in the DMM or from DMM standards not accurately reflecting machines’ capabilities. As these employees described recording and reporting on irregularities and specific shipments to the Postal Service Headquarters, without action or support in return, they also expressed feeling unsupported in their difficult jobs. At a few facilities, management pleaded for support, describing staff quitting because of the difficult jobs expected of them. Hiring new, low-skill staff to process inadequately prepared mail further decreases the Postal Service’s overall processing efficiency.

Without recording relevant data, providing the data to the origin mailer, and holding repeat offenders accountable, no improvements in the efficiency of flats processing operations can be achieved.

*Irregular mail possibly receives upgraded service.* Several facilities explained that they combined flats from broken/loose/reject USPS Marketing Mail and Periodicals bundles (loose flats) with MMP flats. They described the MMP as including First-Class Mail Flats and

some other 2- to 3-day service standard volumes. The Commission followed up with the Postal Service to better understand MMP and the implications that merging loose mail with MMP mail might have for flats processing and costs.

In its response, the Postal Service confirms that loose mail is typically processed with MMP mail, and that “with the focus on shape-based processing, MMP flats can include some Periodicals and Marketing Mail as well as First-Class.” Response to CHIR No. 7, questions 3.b., g. Merging low-preparation quality flats with MMP flats potentially results in inadequately prepared mail, particularly outgoing mail, receiving more expedited and more expensive service.

The Postal Service describes the MMP as a distribution system, which includes First-Class Mail, destinating in specific ZIP Codes. *Id.* question 3. The Postal Service also refers to the routing of MMP flats as being “defined in the National Distribution Labeling List [(NDLL)] logistic orders” but does not explain what this means, and how this routing differs from the routing approved for other-than MMP flats. *Id.*

The Commission notes that the NDLL logistics orders likely include information on approved transportation modes between specified origin and destination processing facilities in the country. During visits to STCs, Commission staff learned that First-Class Mail Flats approved for surface transportation mode are routed through STCs. STCs consolidate First-Class Mail from several origin facilities to transport it on fuller trucks, traveling long distances. The unclear reference to logistics orders and NDLL-defined routing might suggest that MMP mail that is not routed through STCs is approved for air transportation.

The impact of treating loose mail as MMP mail is an area that requires further research to understand the implications for flats processing efficiency and cost.

*Processing network (re-)design.* The limited number of operations that facilities performed made their operations interdependent. Any deviations from projected daily volumes or arrival of scheduled drop shipments at one facility had cascading impacts on operations for other facilities, which scheduled their operating windows based on expected mail arrival from interconnected facilities.

The Postal Service describes a shift toward a shaped-based processing network. *Id.* questions 1.b., 4.a., 4.b. The exact implications of the many initiatives, pursued and implemented concurrently in the complex postal network, are difficult to definitively predict.

Flats processing operations span both letter/flat and package processing networks. This is because bundles are sorted on package processing equipment. Commission staff saw sites relying on frequent transportation between operations where bundles were processed on package processing equipment and operations where individual flats were processed.

However, Commission staff saw shifts in processing operations that were not related to mail shapes. Commission staff visited sites for which operations were closely tied to operations in several other sites within a geographic area. Each facility performed very specific operations. This collaboration and division of processing jobs between sites made projecting daily volumes and operations planning very difficult. It also required frequent postal transportation between facilities likely being underutilized. Some facilities referred to shuttle transportation running between their interconnect operations. The complex operations between sites likely resulted in frequent processing delays, at least for some of the mail.

*Revenue deficiency assessments.* The Postal Service states that it does not charge mailers additional postage to recuperate costs associated with inefficient processing of inadequately prepared flats bundles or for manually processing automation flats. January 13 Response to CHIR No. 5, question 4.b.; Response to CHIR No. 6, questions 6.a.-d., 7.a.-d., 8.a.-d.

As discussed earlier, the Postal Service does not record relevant data that would be needed to estimate the costs imposed by the inefficient processing of inadequately prepared mail. Without understanding cost implications, the Postal Service cannot exercise the option of charging mailers supplemental fees, that would reflect the difference between the costs incurred and costs recovered from revenues received for mailers' pieces.

*Estimation of manually processed flats.* The Postal Service and the Commission rely on the reported volumes and workhours in the various operations to analyze trends in productivities and to recommend initiatives for improvements that might seem necessary.

As described in Section III.B.4.c., most facilities do not track employees' time as employees move between activities and only focus on clocking in and out of base operations at the beginning and end of employees' shifts. This might imply that no reported productivity values are reliable and should not be used as a basis for any new initiatives to improve processing productivities of the various operations.

However, the Postal Service also indicates that for machine processing, employees are frequently moving between the assigned base operation and another closely associated operation.<sup>125</sup> For example, an employee's base operation assigned for the shift is to prepare mail for processing on an automated flats sorting equipment (*e.g.*, AFSM AI/ATHS). Such an employee will likely move between preparing mail for induction and operating the equipment once flats are inducted to the machine for sorting.

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<sup>125</sup> See, *e.g.*, Response to CHIR No. 2, question 2.c.; Responses of the United States Postal Service to Questions 1-7 of Chairman's Information Request No. 3, December 21, 2022, question 7 (Response to CHIR No. 3); Docket No. RM2020-13, Petition of the United States Postal Service for the Initiation of a Proceeding to Consider Proposed Changes in Analytical Principles (Proposal Six), September 15, 2020, Proposal Six at 4 (Docket No. RM2020-13, Petition); Docket No. RM2020-13, Petition, PDF file "LCRA\_MP Variability Report.pdf," at 6-9.

For manual sorting operations, however, mail volumes are not recorded by data collection systems, as they are for machine processing. The Postal Service explains that for all facilities that operate automated flats sorting equipment, “the same fraction of 7 percent” is applied to the total volumes that each facility processes on automated equipment to estimate the amount of flats that are manually processed. Response to CHIR No. 7, question 2.b. The Postal Service’s response indicates that there are additional nuances involved and that facility specific percentages are used as well.

This method was implemented in FY 2016 and replaced physical surveys of manually processed flats.<sup>126</sup> The Postal Service explains that the new method led to a reduction in the estimated manual flats volumes for “a majority of facilities.” Response to CHIR No. 7, question 2.g. However, DDUs described increasing volumes requiring manual sorting, related to mailpiece irregularities.

With no data on bundles and individual mailpieces that cause inefficient operations, and no clear method to estimate manually processed flats volumes, the Postal Service is unable or unwilling to develop new tools designed to improve the efficiency of flats processing.

*Staff support and training.* Many facilities described low employee retention rates and staff shortages resulting in high proportions of newly hired, low-skilled employees for some facilities.

To explain the low retention rate, management described that the fewer training opportunities that were available to staff, the harder their jobs were to complete successfully, and the more likely staff were to quit. Management described the workload as too high, and inefficient processing of flats that required manual work contributed to that workload. Management also added that the numerous network changes implemented in recent years were too difficult to follow and adjust to successfully. Management further emphasized the importance of understanding the workload associated with poor mail quality when interpreting employee productivity.

The operational expert commented that the shutdown of FSS will require increased staffing at DDUs and the training of DDUs staff in scheme knowledge. Additionally, the expert noted the delivery routes will have to be restructured and carriers’ office time will increase, resulting in a decrease in available street time.

## 6. Impact of Facility Management Decisions on Efficiency: Case Studies

*Bundle breakage.* Certain management decisions impacted bundle volumes that received inefficient manual processing where automated processing without breakage might have been possible.

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<sup>126</sup> Docket No. ACR2022, Library Reference USPS-FY22-23, December 29, 2022, PDF file “USPS-FY22-23.Preface.pdf,” at 1.

Specifically, management at several facilities stated that staff sometimes but not always re-strap and/or re-wrap loose bundles. Re-strapping or re-wrapping loose bundles would increase the number of bundles processed on automated equipment and reduce bundle volumes by bypassing it and needing inefficient manual handling.

Staff at facilities that operated the APPS and the ADUS had an option to feed bundles into the machine manually, through side feeders. Feeding loose bundles manually meant placing bundles onto a conveyor belt, instead of having them fall 2 or 3 feet from the dumper onto the conveyor belt. Staff at a facility that operated the SPSS described manual feeding of bundles into the machine as the only way to control the high bundle breakage for the SPSS.<sup>127</sup> However, the facility did not consistently use that option.

Discussions with staff at sites that operated more than one type of bundle processing equipment suggested that the decisions about which equipment type facilities should use for packages and flats bundles, including bundles of different pre-sort levels, were made by the Postal Service Headquarters and not facility management. However, facilities' staff and management provided no additional details on the basis for these decisions.

*Recording of bundle and mailpiece irregularities.* Management described recording of bundle and mailpiece irregularities inconsistently, or only when irregular mail disrupted planned processing operations. Management at some sites described no recording at all. At a few facilities, management described recording irregularities consistently, but the Commission staff did not observe any employee doing so during the site visits.

As noted in Section III.B.5., the MIA includes an insignificant number of records on mailpiece and bundle irregularities, suggesting that the inconsistent irregularity recording applies to the entire postal network.<sup>128</sup> The observations from site visits and the MIA data indicate that the Postal Service makes minimal efforts to understand the sources of flats processing inefficiencies or to track volumes that cause inefficient operations, which in turn prevents potential improvements in flats processing.

*Deviations from schedules and impact on all operations.* Commission staff saw differences in how management dealt with late arriving mail. Management at some sites reported they accepted and processed only timely drop shipments, *i.e.*, those that arrived within applicable CETs. At other facilities, management included buffers to their CETs and accepted mail that arrived between half an hour and three hours past CETs. At sites where late drop shipments or delayed mail from upstream postal facilities were accepted, management disrupted current operations to move late mail up the line for processing.

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<sup>127</sup> Of bundle sorting equipment that the Commission staff observed, SPSS was described as one with the longest vertical drop from the dumper to the conveyor belt—3 feet.

<sup>128</sup> See Section III.B.6.; Response to CHIR No. 6, question 3.a., Excel file "MIA Irregularities.xlsx."

At one visited site, parcels and flats bundles were processed on the same equipment. However, sort plans for parcels and bundles were not identical, and the facility staff could not combine them on machine runs. As a result, separate operating windows were scheduled to process packages and to process bundles. Any deviations in scheduled bundle or parcels processing meant the facility management had to make trade-offs between delaying bundles or packages. When faced with such trade-offs, management said it used other factors to decide on the best use of available resources and staff.

*Decisions related to flats volume declines and machine capacity.* In individual flats processing, management reported sometimes combining committed volume (Periodicals) with non-committed volume (USPS Marketing Mail) to increase mail volumes in incoming sort plans, and in turn increase productivity of automated equipment processing. Only one facility's management stated that it never combined pieces from different mail classes in any of its operations, machine processing, or allied operations.

Facilities' management indicated treating flats from broken, loose, or reject bundles (loose flats) as MMP flats. The MMP includes First-Class Mail Flats. Merging loose flats with First-Class Mail Flats in outgoing flows likely meant upgrading inadequately prepared USPS Marketing Mail and Periodicals flats, which caused inefficient operations, to the First-Class Mail network, with expedited service and more expensive transportation options. However, this area is not clearly understood and requires further analysis.

A few facilities' staff described making decisions about whether to sort destinating flats manually or on automated equipment on days when flats volumes were low. By manually sorting automation flats, the facility staff avoided lowering its AFSM equipment's productivity. However, it is not clear how the facility staff determined volumes that would be more efficiently processed if processed manually, and whether sorting them manually was less costly than sorting them on automated equipment.

Management at some facilities explained they varied the start time for certain operations, specifically mentioning outgoing primary operations. With clear information regarding the volume on hand, the machine throughput capability of the AFSM and ultimately the cutoff time<sup>129</sup> required to be on the scheduled outbound transportation, it was possible to delay the start of the operation. This structured delay in the start of the operation resulted in a single continuous flow of the operation and improved productivity compared to a start/stop operation begun at the original scheduled time.

*Transportation scheduling.* Management at many sites explained their commitment to service performance. They focused on having transportation from their facility reach destination facilities in accordance with their CET. In order to achieve this, their primary effort was to ensure outgoing processing operations were completed in accordance with

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<sup>129</sup> Cutoff time is "[t]he latest time that mail can be accepted for processing to meet service standards for the specific mail class or product." See United States Postal Service Publication 32 - Glossary of Postal Terms, available at: [https://about.usps.com/publications/pub32/pub32\\_terms.htm](https://about.usps.com/publications/pub32/pub32_terms.htm).

the cutoff time that resulted in the mail being transported on the dispatch of value.<sup>130</sup> If they had significant delays in processing, they were willing to use unscheduled transportation, while keeping in mind the need to keep additional cost under control. The key was to maximize the volume shipped on the dispatch of value so that the destinating facility could begin its inbound processing operations in a timely manner and then only have to fill in with the volume arriving on the extra transportation.<sup>131</sup>

*Assignment of staff at delivery units.* DDUs were faced with decisions to assign available staff to the various operations when workload exceeded expectations. Management at the visited DDUs described significant increases in daily workload associated with flats received from upstream mail processing sites not sorted to the carrier route level and/or to DPS. For DDUs with an insufficient number of employees, the decision involved preparing some of the daily mail for timely delivery and delaying the delivery of other mail.

## **C. Inefficiencies in Flats Collection and Processing: Data Analysis**

### **1. Bundle Breakage During Mail Preparation, Collection, and Bundle Processing**

#### **a. Introduction**

Bundle processing is often the first step taken by the Postal Service when flats mailpieces are inducted into the Postal Service network. In FY 2021, each bundle of Periodicals flats contained 17.4 mailpieces, on average, and each bundle of USPS Marketing Mail flats contained 26.1 mailpieces on average.<sup>132</sup> Bundles that contain mailpieces that have been presorted to the 3-digit level are sorted on bundle processing equipment. Bundles containing pieces of 5-digit sortation or finer do not require sortation on bundle processing machines. Bundles most frequently break while being processed on bundle processing equipment. If a bundle breaks, a mail processing facility has to process all the individual mailpieces separately as opposed to processing a single bundle. Consequently, bundle breakage increases inefficiencies and mail processing costs. According to interviews with facility management, most bundle breakage occurs as a result of improper handling while being processed on bundle processing equipment. Breakage occurs due to two fundamental reasons: (1) poor quality bundling by the mailer; and (2) the "drops" that occur at the induction into the bundle sorting system and at the output to the sort bins. *See Section III.B.*

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<sup>130</sup> Dispatch of value is "[t]he last dispatch of the day that is loaded on transportation in time to meet the service standard for the mail class or destination." *See id.*

<sup>131</sup> Sites ordered extra transportation for mail that should have been transported on scheduled transportation.

<sup>132</sup> Docket No. ACR2021, Responses of the United States Postal Service to Questions 1-3 of Chairman's Information Request No. 10, February 9, 2022, question 1 (Docket No. ACR2021, Response to CHIR No. 10); Docket No. ACR2021, Response to CHIR No. 10, Excel file "ChIR.10.Q1.Resp.Attach.xlsx."

## b. Data Quality Issues

The Postal Service provides bundle breakage data to the Commission annually as part of the ACR.<sup>133</sup> For the purposes of this report, the Commission aggregated the Postal Service data. This aggregated dataset contains the number of processed bundles and the number of broken bundles by every facility in every fiscal quarter. The Commission has identified numerous concerns with the quality of the data the Postal Service provided. These issues, discussed below, include, but are not limited to, missing data for a notable number of processed bundles and lack of the unique identifiers for the facilities in which the bundle breakage occurred. Data quality issues make it difficult for the Postal Service to identify and correct inefficiencies.

### (1) Missing Bundles

Figure III-11 compares the number of processed Periodicals bundles as provided in the billing determinants dataset and in the Postal Service's bundle breakage dataset for every year from FY 2018 through FY 2021.<sup>134</sup> The billing determinants dataset lists the volume of bundles in every level of workshare by quarter. Mailers submitting USPS Marketing Mail or Periodicals can choose to presort or dropship their mail to earn a discount on postage. *See* FY 2021 ACD at 14-15, 17-25.

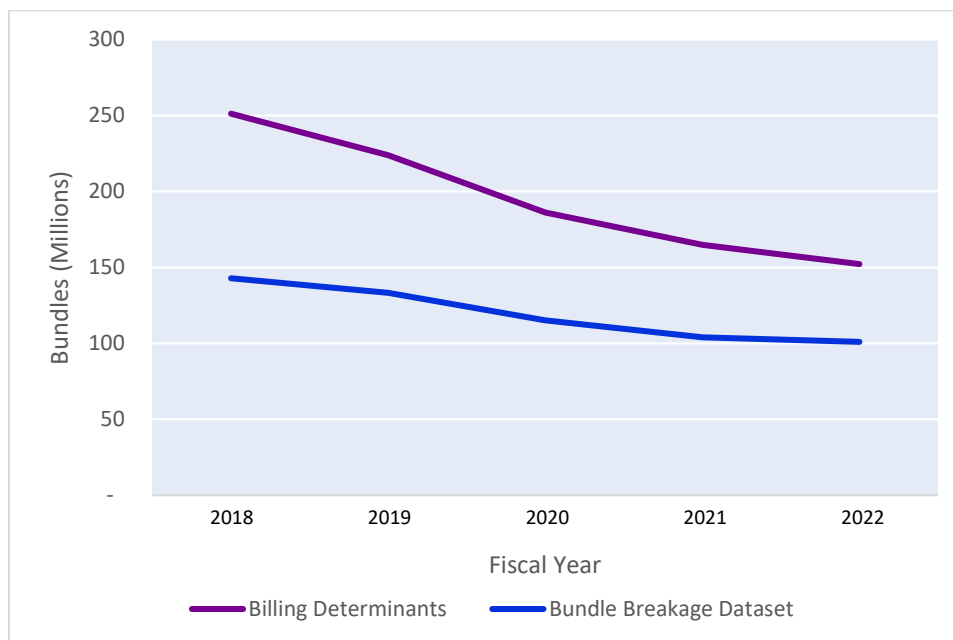
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<sup>133</sup> Docket No. ACR2022, Library Reference USPS-FY22-NP31, December 29, 2022, Excel file "FY18\_FY22.Bundle.Brkg.E1\_NonPublic.xlsx."

<sup>134</sup> The billing determinants dataset is provided in Docket No. ACR2021, Library Reference USPS-FY21-4, December 29, 2021, Excel file "FY21 Periodicals BDs.xlsx" and the bundle breakage dataset is provided in Docket No. ACR2021, Library Reference USPS-FY21-NP31, Excel file "FY17\_FY21.Bundle.Brkg.E1\_NonPublic.xlsx."



**Figure III-11**  
**Annual Quantity of Periodicals Bundles in Billing Determinants**  
**and Bundle Breakage Datasets, FY 2018–FY 2022<sup>135</sup>**



The blue line illustrates the annual sum of Periodicals bundles obtained from the billing determinants dataset, while the orange line illustrates the total number of Periodicals bundles from the bundle breakage dataset. As seen in the figure, there are more bundles recorded in the billing determinants than there are in the bundle breakage dataset for any given year, the bundle breakage dataset only contains 57 to 66 percent of the bundles recorded in the billing determinants dataset. Put differently, at least one-third of all bundles are missing from the bundle breakage dataset annually. In addition, it is important to note that the billing determinants exclude 5-digit bundles as these bundles bypass mail processing on bundle sortation equipment, so the discrepancy is likely larger.

When responding to the questions about the observed difference, the Postal Service states that the bundle breakage dataset only counted bundles with a full-service Intelligent Mail barcode (IMb). Response to CHIR No. 4, question 7.c. The IMb is a barcode sticker that mailers have the option of affixing to their mailings.<sup>136</sup> When a mailer executes the option to affix an IMb sticker to their mailings, it expands their ability to track pieces. *Id.* There are three IMb options: non-automation, basic automation, and full-service. *Id.* IMbs are scanned

<sup>135</sup> Source: Docket No. ACR2022, Library Reference USPS-FY22-4, December 29, 2022, Excel file "FY22 EOY Periodicals BDs Final.xlsx;" Docket No. ACR2021, Library Reference USPS-FY21-4, Excel file "FY21 Periodicals BDs.xlsx;" Docket No. ACR2020, Library Reference USPS-FY20-4, December 29, 2020, Excel file "FY20 Periodicals BDs.xlsx;" Docket No. ACR2019, Library Reference USPS-FY19-4, December 27, 2019, Excel file "FY19 Periodicals BDs.xlsx;" Docket No. ACR2018, Library Reference USPS-FY18-4, December 28, 2018, Excel file "FY18 Periodicals BDsFinal.xlsx." See Docket No. ACR2022, Library Reference USPS-FY22-NP31, Excel file "FY18\_FY22.Bundle.Brkgge.E1\_NonPublic.xlsx."

<sup>136</sup> United States Postal Service, Mailing Services Intelligent Mail Barcode, available at <https://postalpro.usps.com/mailing/intelligent-mail-barcode>.

by mail processing equipment, and thereby added to the bundle breakage dataset, every time a bundle is processed. Any bundles which are missing an IMb or do not have a full-service IMb are excluded from the bundle breakage dataset.

During the facility visits, several facility managers informed Commission staff that clerks sometimes break bundles on purpose. *See* Section III.B.4.a. This is because after visually inspecting a bundle, a clerk may assume that the bundle is likely to break when being processed on bundle processing equipment. *Id.* As a result, the clerk may choose to break the bundle by hand instead of attempting to use bundle processing equipment. Any bundles broken this way are also excluded from the bundle breakage dataset. Response to CHIR No. 4, question 7.

As a result of issues in the data collection process, the Postal Service lacks a significant portion of bundle breakage data. If these data were collected, they could be actionable. Unfortunately, many recurrent patterns of bundle breakage likely persist because inadequate data collection means problems are not identified.

(2) Bundle Breakage Facility is not Properly Distinguished

Another important piece of information missing from the bundle breakage dataset is identification of the network location where each bundle broke. Mailers have the option of dropshipping their bundles at the destination NDC, destination P&DC, or the delivery unit. Depending on where mailers dropship their bundles, each bundle may be processed in one or more downstream facilities before it is intentionally broken and its individual pieces are processed into finer levels of sortation. *Id.* question 3. The Commission is concerned that for bundles that accidentally break, the bundle breakage dataset does not report on where the bundle actually broke. Instead, this dataset only provides information on the first-scan facility. For example, if a mailer dropships bundles at the destination NDC, these bundles might be sorted at an NDC and sorted again at a P&DC. *Id.* Whether these bundles broke accidentally at the NDC or the downstream P&DC, the bundle breakage dataset would only identify the NDC as the first-scan facility. Any bundle that breaks in subsequent machine processing is not distinguished in the bundle breakage dataset. *Id.* question 2.

c. The Postal Service is not Meeting Its Goals to Reduce Bundle Breakage Rates

Reducing bundle breakage rates has long been a goal of Postal Service management. In response to a FY 2019 ACD directive, the Postal Service stated “[it had] focused its efforts on lowering the incidence of bundle breakage at the individual level.”<sup>137</sup> The Postal Service has also acknowledged its goals of improving data collection and communication with mailers. As part of its annual submission of flats data in the FY 2021 ACD, the Postal Service stated “[o]ngoing attention has yielded an increase[d] internal awareness of bundle breakage occurrences and recordation in order to trigger efforts to abate/reduce bundle breakage. Such efforts include reviewing both internal operational processes and customer

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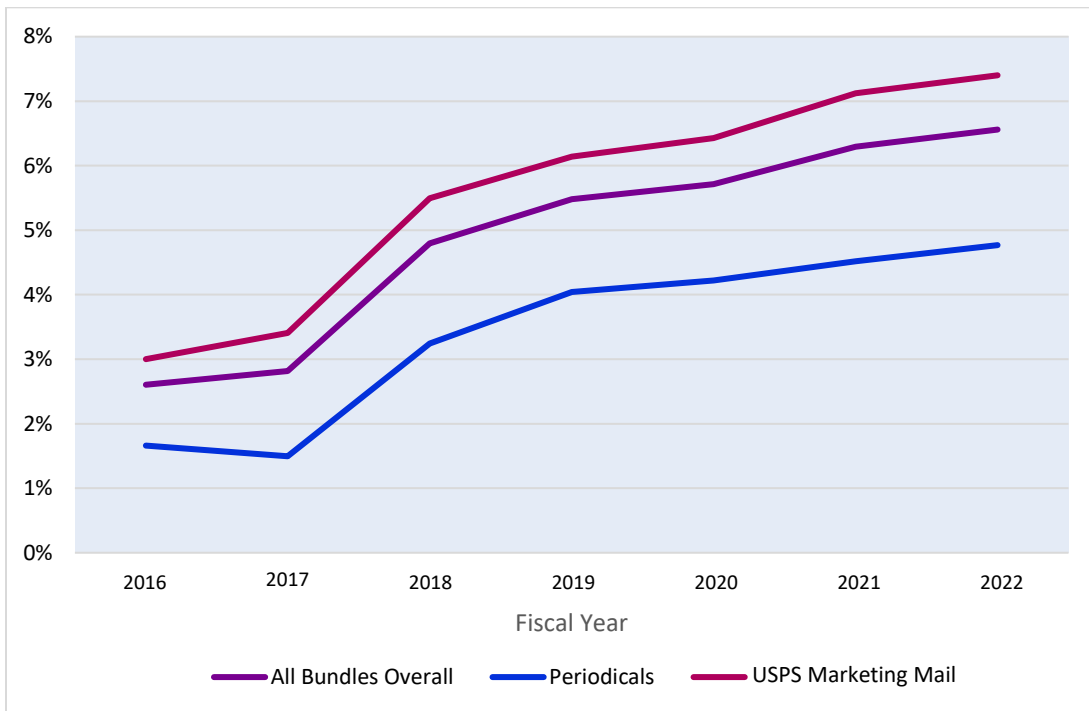
<sup>137</sup> See Docket No. ACR2019, Response of the United States Postal Service to Commission Requests for Status Reports in the FY 2019 Annual Compliance Determination, July 15, 2020, at 4.

communication practices.”<sup>138</sup> Though the data on bundle breakage provided have limitations, they continue to show goals are not being met.

(1) Bundle Breakage Rates Overall

Figure III-12 displays bundle breakage rates for Periodicals, USPS Marketing Mail, and both mail classes combined.

**Figure III-12**  
**Annual Bundle Breakage Rates for Periodicals and USPS Marketing Mail, FY 2016–FY 2022**

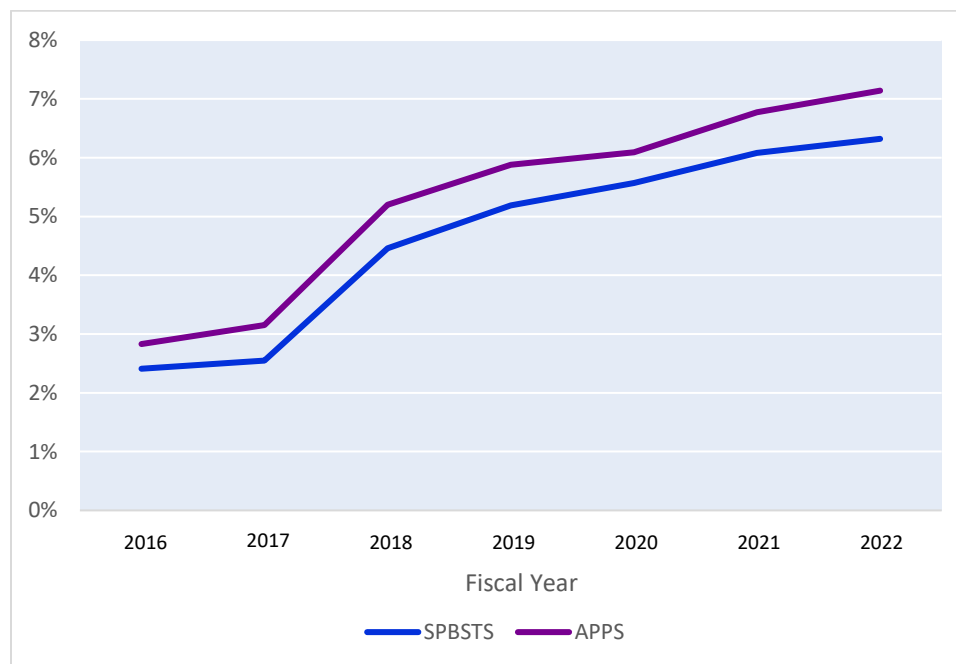


<sup>138</sup> See Docket No. ACR2021, Library Reference USPS-FY21-45, folder “Rule 3050.50 Flats,” folder “Paragraph (e) -- Pinch Point Reports,” folder “e.9 Trend Narrative.PRC.LR.9 Update,” PDF file “FY21 PRC Rule 3050.50(e.9) Narrative.pdf,” at 1 (Docket No. ACR2021, FY 2021 Section e.9 Narrative).

Figure III-12 demonstrates that the rates of bundle breakage on the machines have increased in every fiscal year since FY 2017. Bundle breakage rates for both Periodical bundles and USPS Marketing Mail bundles have steadily increased. When questioned about this increase in the FY 2021 ACD, the Postal Service stated that the COVID-19 pandemic had slowed efforts to improve communications with mailers regarding mail irregularities that result in bundle breakage.<sup>139</sup> However, the Postal Service has had several years since the start of the pandemic to implement its goals, and rates of bundle breakage continue to increase. The Commission's operational expert's opinion was that this explanation was not likely the case. He claims, these trends could result from any of the following changes:

- changes in the Postal Service processing network that have shifted bundles to sortation systems with either higher induction or output heights
- changes in the Postal Service network that cause more handlings on the bundles sorting systems
- continual improvement in reporting system that shows increase due to better reporting, not an actual increase in the problem

**Figure III-13**  
**Annual Bundle Breakage Rates for Bundle Processing Machines, FY 2016–FY 2022<sup>140</sup>**



<sup>139</sup> Docket No. ACR2021, FY 2021 Section e.9 Narrative at 1-2; see FY 2021 ACD at 245.

<sup>140</sup> See Docket No. ACR2022, Library Reference USPS-FY22-NP31, Excel file "FY18\_FY22.Bundle.Brkg.E1\_NonPublic.xlsx;" Docket No. ACR2020, Library Reference USPS-FY20-NP31, December 29, 2020, Excel file "FY16\_FY20.Bundle.Brkg.E1\_NonPublic.xlsx."

The problem of increasing rates of bundle breakage is not isolated to a particular variety of bundle processing equipment. Figure III-13 demonstrates that bundle breakage rates across machines have been increasing since FY 2016.<sup>141</sup> The similarity between the bundle breakage rates for different machines suggests that certain bundle preparation methods increase the likelihood that bundles will break on the machines.

## (2) Communication with Mailers

The Postal Service previously stated that one of its goals was to increase communication with mailers.<sup>142</sup> Such communication is conducive to reducing bundle breakage rates. This is because when mailers are notified that their preparation standards lead to broken bundles, mailers can work to change the way they prepare bundles prior to inducting them into the mail network system. For FY 2022 alone, the Postal Service reported 21 million broken bundles.<sup>143</sup> This value does not include bundles that broke before they could be sorted on automated equipment or bundles that bypassed equipment because they were expected to break.

In FY 2020, the Postal Service implemented the MIA to provide mailers with specific information on mail preparation issues.<sup>144</sup> As evidenced by increasing rates of bundle breakage, the MIA is limited in its ability to produce any measurable effect in improving mail preparation.

The Commission followed up with the Postal Service regarding recorded irregularities in the MIA, which the Postal Service implemented in FY 2020.<sup>145</sup> The irregularity description in the MIA includes more than 80 rows overall, and the irregularities are recorded separately for “five irregularity types” (*i.e.*, bundles, pallets, sacks, trays, and pieces).<sup>146</sup> For bundles, the MIA worksheet provided by the Postal Service includes 25,161 irregularity records. *Id.* Excel file “MIA Irregularities.xlsx.”

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<sup>141</sup> Figure III-13 was created using the bundle breakage data submitted by the Postal Service. This dataset only includes bundles that broke during machine processing.

<sup>142</sup> Docket No. ACR2021, FY 2021 Section e.9 Narrative at 1, 2; see FY 2021 ACD at 242, 245.

<sup>143</sup> Docket No. ACR2022, Library Reference USPS-FY22-45, folder “USPS-FY22-45.zip,” folder “FY22.45.Files.zip,” folder “Rule 3050.50 Flats,” “Paragraph (e) -- Pinch Point Reports,” folder “e.1 Bundle Breakage Visibility,” Excel file “FY18\_FY22Bundle.Brkgge. E1\_Public.xlsx,” tab “E1 - Nation by FY,” cell E62.

<sup>144</sup> Docket No. ACR2021, FY 2021 Section e.9 Narrative at 1; see FY 2021 ACD at 244.

<sup>145</sup> The Postal Service described that the MIA was implemented to “effectively identify mail irregularities,” communicate them to the mailers, and eventually reduce costs associated with handling poorly prepared mail or with mailpieces with quality issues. See Docket No. ACR2021, FY 2021 Service Performance Report at 18-19.

<sup>146</sup> Response to CHIR No. 6, question 3 a.; Excel file “MIA Irregularities.xlsx.” Not all irregularities from the description list are applicable to bundles or other irregularity types. *Id.*

## 2. Analysis of Productivity and Other Issues in Automated Flats Operations

### a. Introduction

Mail processing costs account for a large share of all Postal Service costs. A single flats mailpiece may be processed at several mail processing facilities between its origination point and its destination. At each mail processing facility, flats mail is processed on mail processing machines that sort it to even finer levels until it is sorted finely enough for delivery. The unit mail processing costs of the majority of flats products have increased every year since FY 2019. *See* FY 2021 ACD at 264; *see also* Section IV.D., *supra*. One important factor that affects mail processing cost is labor productivity, which is calculated by dividing workhours spent to process mail by the volume of mailpieces processed. As labor productivity declines, unit attributable cost increases because fewer pieces are being processed per workhour. The inability to match workhours to volume in order to maintain high levels of productivity leads to inefficient operations. Labor productivity has declined in recent years.<sup>147</sup>

### b. AFSM Productivity

In past ACDs, the Commission used the MPV dataset provided by the Postal Service to analyze the relationship between volume and productivity for automated flats processing machines (including the AFSM equipment).<sup>148</sup> However, that dataset excludes a large share of workhours associated with mail processing on automated machines. For the reasons discussed below, in the instant report, the Commission calculates labor productivity using those previously excluded workhours.

AFSM equipment is not homogenous. There are two modifications available for the AFSM: the AI modification assists clerks in feeding mailpieces into the AFSM, and the ATHS modification assists clerks in handling trays once mailpieces have been processed.<sup>149</sup> AFSMs might not have any modifications at all or have any combination of the described modifications. Therefore, there are four types of AFSMs: AFSM, AFSM AI, AFSM ATHS, and AFSM AI ATHS. The four types differ in terms of their volume and labor productivity.

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<sup>147</sup> Shawn Sprague, *What can labor productivity tell us about the U.S. economy?* Beyond the Numbers: Productivity, vol. 3, no. 12 (U.S. Bureau of Labor Statistics, May 2014), available at <https://www.bls.gov/opub/btn/volume-3/what-can-labor-productivity-tell-us-about-the-us-economy.htm>.

<sup>148</sup> *See* Docket No. ACR2021, Library Reference USPS-FY21-NP31, Excel file "NONPUBLIC MP Variance FY17\_21.xlsx."

<sup>149</sup> United States Postal Service, Office of Inspector General, Report No. DA-AR-07-005, Automated Flat Sorting Machine 100 Enhancements, September 10, 2007, at 1-2, available at <https://www.uspsaig.gov/reports/audit-reports/automated-flat-sorting-machine-100-enhancements> (OIG Report No. DA-AR-07-005).

**Figure III-14**  
**Annual Labor Productivity by AFSM Type in FY 2022<sup>150</sup>**

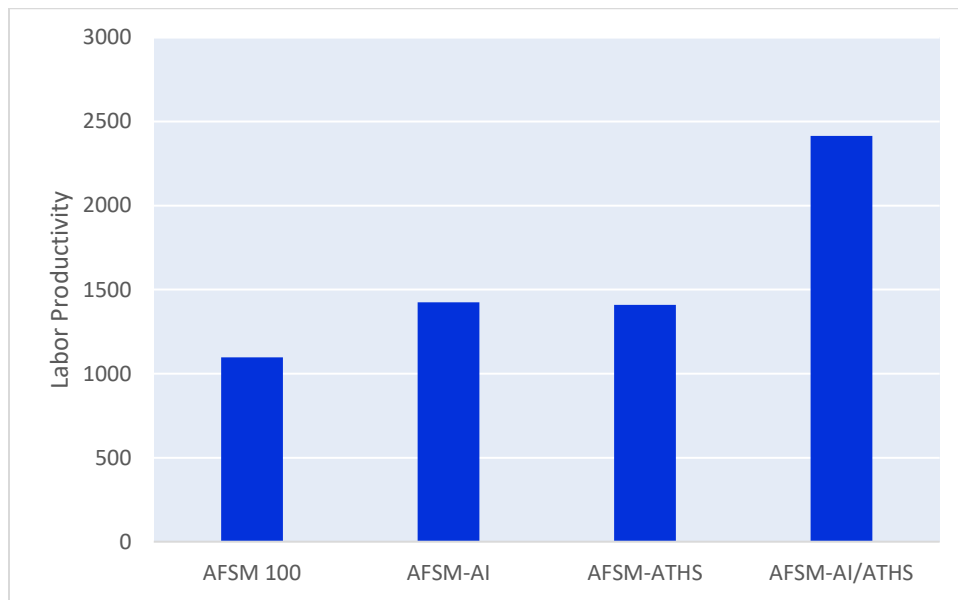


Figure III-14 displays the average labor productivity by AFSM type in FY 2022. Figure III-14 was created by summing the total volume and the total workhours for every AFSM type then dividing the total annual volume by the total annual productivity. Figure III-14 demonstrates that the AFSM with no modifications has the lowest labor productivity. The AFSM-AI and AFSM-ATHS have roughly the same labor productivity, while the AFSM with both modifications has a much higher productivity.

The Commission previously concluded that total pieces fed (TPF) is a reliable metric for measuring the volume of mail processed on a single mail processing machine. TPF, which is generated directly from the mail processing machine, accurately captures the volume processed on an individual machine.<sup>151</sup> There is no ambiguity with regard to which machine processed which volume. However, the same cannot necessarily be said for the workhour data. The Commission previously concluded that while “the quality of data in MODS ha[d] generally improved, the workhours data [might] still be subject to measurement error. Order No. 6096 at 11. Within MODS (that provides data for the MPV), clerks assign labor hours to MODS codes that correspond to specific mail processing activities.<sup>152</sup> The workhours from MODS codes attributable to each AFSM type (as listed in Response to CHIR No. 1) are undoubtedly related to mail processing activities associated with using specific AFSMs. For example, MODs operation 462 describes workhours related

<sup>150</sup> Source: Docket No. ACR2022, Library Reference USPS-FY22-NP18, Excel file “mods2022tour-np.csv.”

<sup>151</sup> See Docket No. RM2020-13, Order on Analytical Principles Used in Periodic Reporting (Proposal Six), January 26, 2022, at 15, 18 (Order No. 6096).

<sup>152</sup> The Postal Service provided a full list of MODS codes attributable to each AFSM type. See Response to CHIR No. 1, question 5.c.; *id.* question 5.d., Excel file “ChIR1\_Q5d.xlsx.”

to the outgoing secondary sortation on the AFSM AI. Similarly, MODS operation 401 describes workhours related to outgoing secondary sortation on the AFSM ATHS. *Id.* Within the MPV, the Postal Service had calculated labor productivity by grouping workhours using these MODS operations in the FY 2019, FY 2020, and FY 2021 ACDs. *Id.*

In previous ACDs, the Commission noted a seemingly spurious correlation between workhours and volume. In the analysis the Commission performed in this study, and by applying the Postal Service's methodology<sup>153</sup> to aggregate workhours from the last three ACDs, the Commission noted a few facilities that exhibited a negative correlation between volume and workhours on a single machine over time. In its Response to CHIR No. 3, the Postal Service explains that the negative correlation may be occurring because some relevant workhours were not included in the analysis and recommended that the Commission include flats preparation workhours.<sup>154</sup> The Commission added time spent on flats mail preparation for AFSMs with the AI modification to the workhours.<sup>155</sup> In previous ACDs, the Commission excluded mail preparation workhours from the analysis of automatic flats mail processing for two reasons. First, the Commission identified certain mail preparation activities as a part of allied operations (*see* Section III.C., *supra*) and discussed it separately in relevant subsections of the ACD. Second, flats mail preparation workhours were omitted from the MPV dataset because they could not be directly attributed to one AFSM type. These workhours could be related to either an AFSM AI or an AFSM AI ATHS. This specification runs contrary to other MODS labor codes which are directly attributable to one type of AFSM.

In this study, the Commission analyzes labor productivity using workhour data encompassing additional activities related to processing volumes on automation equipment.<sup>156</sup> The Commission used the MODS data that groups AFSM types into two AFSM groups to encompass all mail-processing related workhours: productivity for the AFSM AI and the AFSM AI ATHS (AFSM AI group), and for the AFSM and the AFSM ATHS (AFSM non-AI group).

c. Analysis of the Relationship Between the Processed Flats Mail Volume and Mail Preparation Workhours

Figure III-15 shows the share of mail preparation workhours in the total workhours by AFSM group in FY 2022.

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<sup>153</sup> The Postal Service's methodology was to divide workhours by volume for only those MODS operations that were directly attributable to one type of AFSM, excluding mail preparation activities. *See* Response to CHIR No. 1, question 5.

<sup>154</sup> Response to CHIR No. 3, question 7; Library Reference USPS-SS2022-1/NP3, December 21, 2022, PDF file "SS22.1.NP3.CHIR.3.Preface.Response.pdf."

<sup>155</sup> This is MODS operation 140. *Id.*

<sup>156</sup> To accomplish this, the Commission includes MODS operation 140 for flats mail preparation on AFSMs with the AI modification, MODS operation 035 for flats mail preparation on AFSMs without the AI modification, and MODS operation 530 for flats mail preparation on the FSS machine.



**Figure III-15**  
**Total Workhours by AFSM Group in FY 2022<sup>157</sup>**

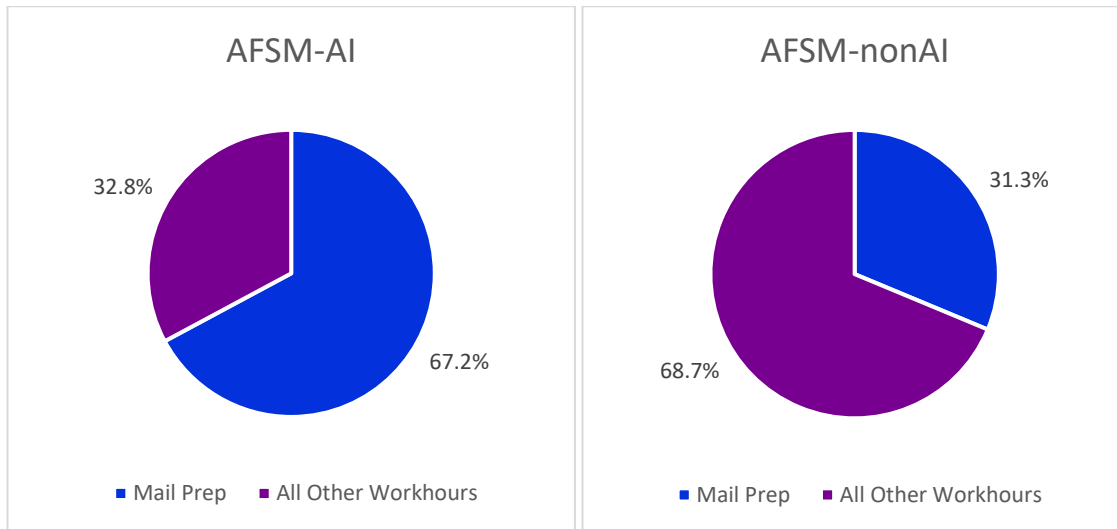
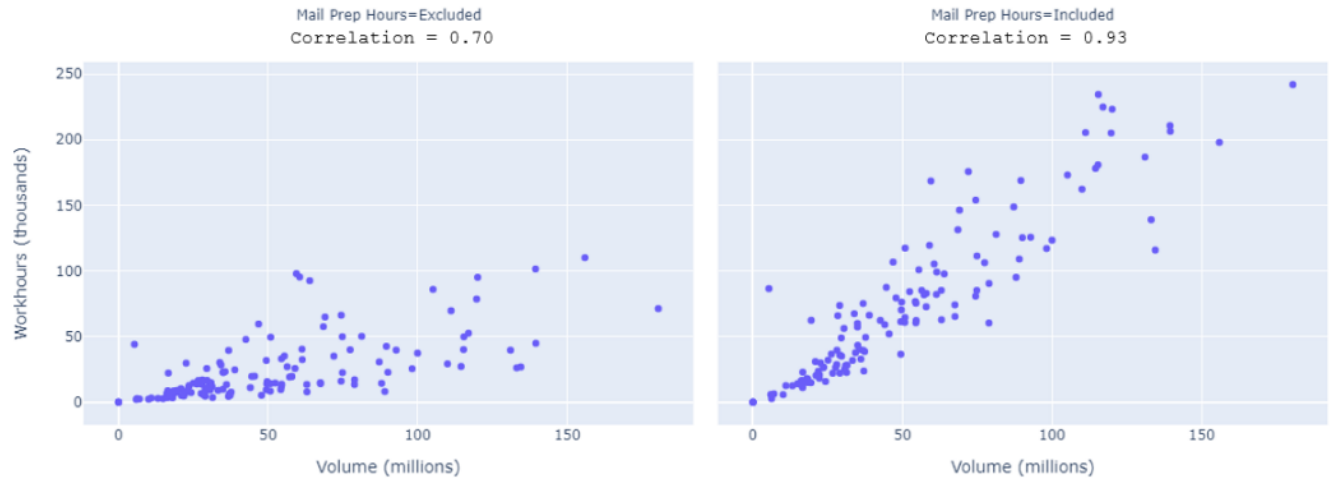


Figure III-15 illustrates that for the AFSM-AI equipment, approximately two-thirds of workhours are related to flats mail preparation, while for the AFSM-nonAI equipment the share of workhours related to mail preparation is less than one-third. Figure III-15 corroborates the assumption that mail preparation labor hours need to be included when analyzing the relationship between flats mail processing volume and labor productivity. Figure III-15 also demonstrates the stark difference in the composition of labor hours for two groups of AFSMs. The findings from Figure III-15 echo the findings from a Postal Service OIG report in 2007. OIG Report No. DA-AR-07-005 at 4. In this report, the Postal Service OIG noted that the Postal Service did not achieve its intended cost savings from AFSM modifications. *Id.*

<sup>157</sup> Docket No. ACR2022, Library Reference USPS-FY22-NP18, Excel file “mods2022tour-np.csv.”

**Figure III-16**  
**Relationship between AFSM-AI Volume and Workhours (with Mail Preparation Hours Excluded and Included) in FY 2022<sup>158</sup>**



The scatter plot on the left illustrates the relationship between workhours and volume when mail preparation hours are excluded, whereas the scatterplot on the right illustrates the similar relationship when mail preparation hours are included. Figure III-16 demonstrates there is a much stronger relationship between volume and workhours when mail preparation workhours are included. The correlation between volume and workhours is about 0.70 when mail preparation hours are excluded, and when mail preparation workhours are included, the correlation increases to 0.93. When repeating this analysis for FSS and AFSM-nonAI machine groups, the correlations also increase when mail preparation hours are included.

d. Errors in Workhour Data

Measures of volume processed are generated directly from the mail processing machine and incorporated into MODS via the Web End-of-Run system. Order No. 6096 at 18. However, as noted above, workhours can be less reliable. As clerks in mail processing facilities switch operations, they are required to record the switch by clocking out of the first operation and into the second one. For example, if a clerk spends 3 hours preparing mail for the AFSM AI, then spends 1 hour working with the FSS machine, they need to record workhours for each operation in MODS. Otherwise, 4 workhours will be attributed to the mail preparation operation on the AFSM-AI and 0 workhours will be attributed to the FSS during that day. The misallocation of workhours to incorrect operations lead to inaccuracies in labor productivity. While it can be difficult to ascertain whether any workhour data are erroneous, some observations in the MODS dataset seem more likely to contain errors.

<sup>158</sup> Docket No. ACR2022, Library Reference USPS-FY22-NP18, Excel file "mods2022tour-np.csv."

**Figure III-17**  
**Mail Preparation and Other AFSM-Related Workhours at P&DC 8, FY 2016–FY 2021<sup>159</sup>**

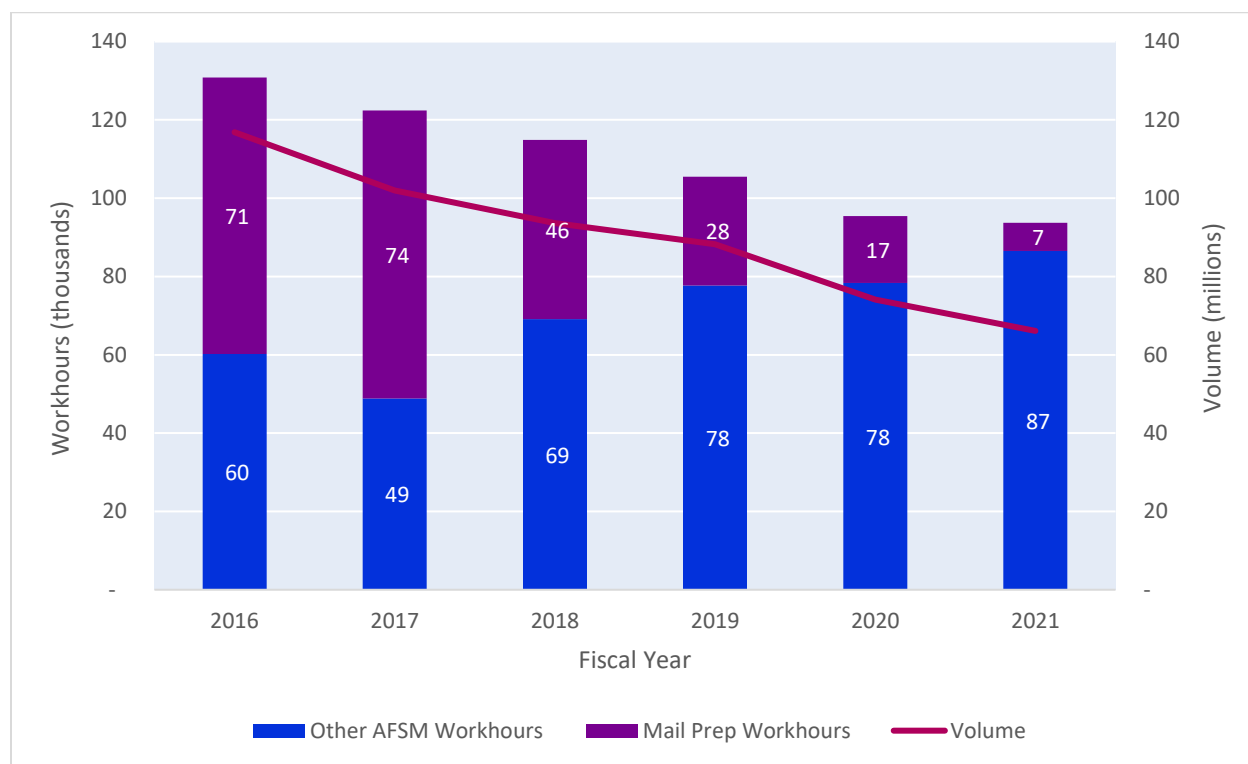


Figure III-17 visualizes the sum of mail preparation labor hours and other AFSM labor hours, and AFSM volumes since FY 2016 at facility 8. Facility 8 provides a good illustration of how non-mail-preparation workhours increased every year since FY 2017 while volume decreased over this time period. The total height of the bars in each figure mimics each other very closely, indicating a high correlation between total workhours and volume. Figure III-17 shows that the share of mail preparation hours as a portion of all AFSM-related workhours has decreased over the last 5 years. In FY 2017, mail preparation labor hours were 60 percent of all AFSM-related labor hours, but in FY 2021 mail preparation labor hours were only 8 percent of all AFSM-related labor hours. *Id.* In summary, mail preparation workhours should be included in the mail processing workhours when analyzing labor productivity.

When questioned about the decreasing share of mail preparation workhours as a portion of all workhours, the Postal Service states that workhours previously clocked to the mail preparation operation were now being recorded to other AFSM-related operations.<sup>160</sup>

<sup>159</sup> Response to CHIR No. 3, question 7; Library Reference USPS-SS2022-1/NP3, Excel file “CHIR3.Q7.AFSM.xlsx.”

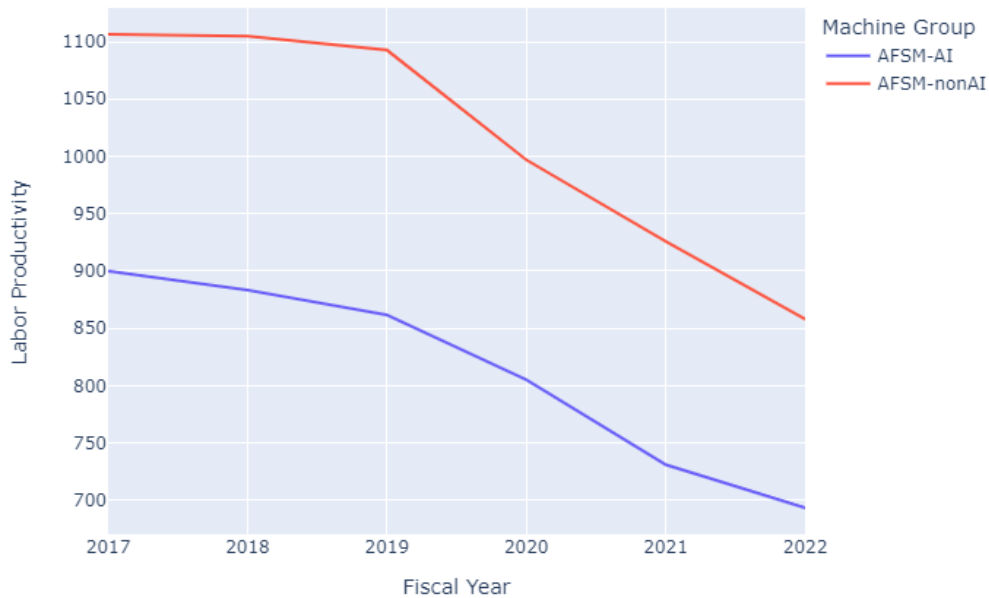
<sup>160</sup> Responses of the United States Postal Service to Questions 1-6 of Chairman’s Information Request No. 8, February 1, 2023, question 6 (Response to CHIR No. 8); Library Reference USPS-SS2022-1 - NP6, February 1, 2023, PDF file “SS22.1.NP6.CHIR.8.Preface.Responses.pdf.”

Errors in workhour data can take many forms. Sometimes employees are clocking too many workhours into the mail prep operation of a single machine. For facilities with both types of AFSMs, sometimes employees can clock hours for the wrong type of AFSM. These different types of errors in workhour data can make it difficult for the Postal Service to correct errors in workhour data once erroneous data have been recorded. The only way to avoid errors in workhour data with absolute certainty is to record workhours correctly.

e. Trends in Labor Productivity

Productivity for both AFSM groups, AFSM-AI and AFSM nonAI, has declined over the last 5 years. Figure III-18 displays annual labor productivity for each AFSM group.

**Figure III-18**  
**Annual Labor Productivity, AFSM, FY 2017–FY 2022<sup>161</sup>**



<sup>161</sup> Docket No. ACR2022, Library Reference USPS-FY22-NP18, Excel file “mods2022tour-np.csv;” Docket No. ACR2021, Library Reference USPS-FY21-NP18, December 29, 2021, Excel file “mods2021tour-np.csv;” Docket No. ACR2020, Library Reference USPS-FY20-NP18, December 29, 2020, Excel file “mods2020tour-np.csv;” Docket No. ACR2019, Library Reference USPS-FY19-NP18, December 27, 2019, Excel file “mods2019tour-np.csv;” Docket No. ACR2018, Library Reference USPS-FY18-NP18, December 28, 2018, Excel file “mods2018tour-np.csv;” Docket No. ACR2017, Library Reference USPS-FY17-NP18, December 29, 2017, Excel file “mods2017tour-np.csv.”

Figure III-19 was generated by summing all labor hours and all volumes from AFSM-related MODS codes at all facilities by year.<sup>162</sup> It is difficult to conclude whether these facilities were not productive or workhours at these facilities were not recorded correctly. Figure III-19 demonstrates a steady decline in labor productivities for both groups of AFSM machines.

**Figure III-19**  
**Annual Workhours and Volume, Total AFSM, FY 2017–FY 2022<sup>163</sup>**

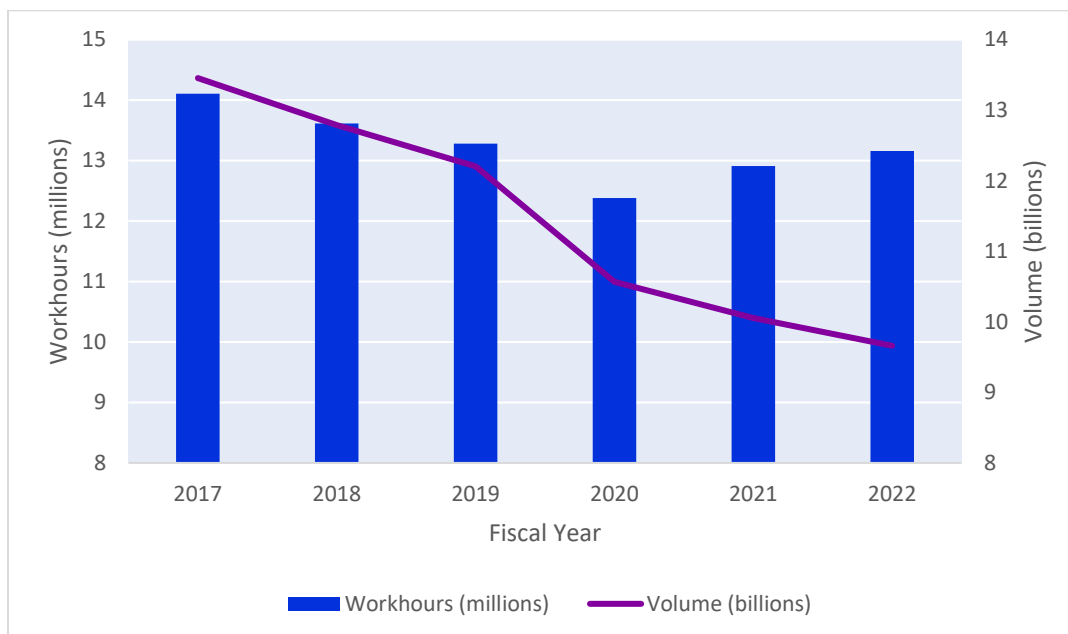


Figure III-19 displays the total annual workhours and volume for all AFSMs. Workhours for the AFSM-AI and AFSM-nonAI machine groups were summed together, because each machine group exhibited a similar pattern. Figure III-19 demonstrates that the main problem with labor productivity is when workhours do not keep pace with declines in volume. For the last 3 fiscal years, workhours have increased even as the total processed volume has decreased.

<sup>162</sup> Annual sums were used instead of taking the average labor productivity by year, because there were a few facilities with extremely high labor productivities.

<sup>163</sup> Docket No. ACR2022, Library Reference USPS-FY22-NP18, Excel file “mods2022tour-np.csv;” Docket No. ACR2021, Library Reference USPS-FY21-NP18, Excel file “mods2021tour-np.csv;” Docket No. ACR2020, Library Reference USPS-FY20-NP18, Excel file “mods2020tour-np.csv;” Docket No. ACR2019, Library Reference USPS-FY19-NP18, Excel file “mods2019tour-np.csv;” Docket No. ACR2018, Library Reference USPS-FY18-NP18, Excel file “mods2018tour-np.csv;” Docket No. ACR2017, Library Reference USPS-FY17-NP18, Excel file “mods2017tour-np.csv.”

## f. Transition from FSS to AFSM

On March 23, 2021, in its “Delivering for America” plan the Postal Service announced that “[d]ue to the dramatic decline of flat mail, [it would] replace flat sorting equipment as appropriate....”<sup>164</sup> On April 20, 2021, the Postal Service announced that it would begin dismantling FSS equipment in several facilities across the country.<sup>165</sup> And in a revision to the DMM effective November 7, 2022, the Postal Service stated it planned, “to remove Flat Sequencing System (FSS) scheme preparation standards.”<sup>166</sup> To explore the progress the Postal Service has made on decommissioning the FSS machine and the impact this could have on flats processing the Commission analyzed the change in the number of AFSMs and FSSs and the labor productivity of these operations.

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<sup>164</sup> United States Postal Service, *Delivering for America: Our Vision and Ten-Year Plan to Achieve Financial Sustainability and Service Excellence*, March 23, 2021, at 28, available at [https://about.usps.com/what/strategic-plans/delivering-for-america/assets/USPS\\_Delivering-For-America.pdf](https://about.usps.com/what/strategic-plans/delivering-for-america/assets/USPS_Delivering-For-America.pdf).

<sup>165</sup> Letter from Debby Szeredy, Executive Vice President, American Postal Workers Union, AFL-CIO, to Lamont Brooks, Director, Clerk Division, American Postal Workers Union, AFL-CIO (Apr. 21, 2021) transmitting Letter from Shannon R. Richardson, A/Manager, Contract Administration (APWU), United States Postal Service, to Mark Dimondstein, President, American Postal Workers Union, AFL-CIO (Apr. 20, 2021), available at <https://www.21cpw.com/wp-content/uploads/2021/05/2021-4-21-Notification-No.-GCCC20210149-USPS-Will-Discontinue-and-Dismantle-FSS-Machines-In-Several-Facilities-Across-the-Country.pdf>.

<sup>166</sup> See United States Postal Service, *Postal Bulletin* No. 22607, Policies, Procedures, and Forms Updates, DMM Revision: FSS Scheme Preparation Discontinued, September 22, 2022, available at <https://about.usps.com/postal-bulletin/2022/pb22607/html/updt.htm>.

**Figure III-20**  
**Annual Workhours and Volume, FSS<sup>167</sup>**

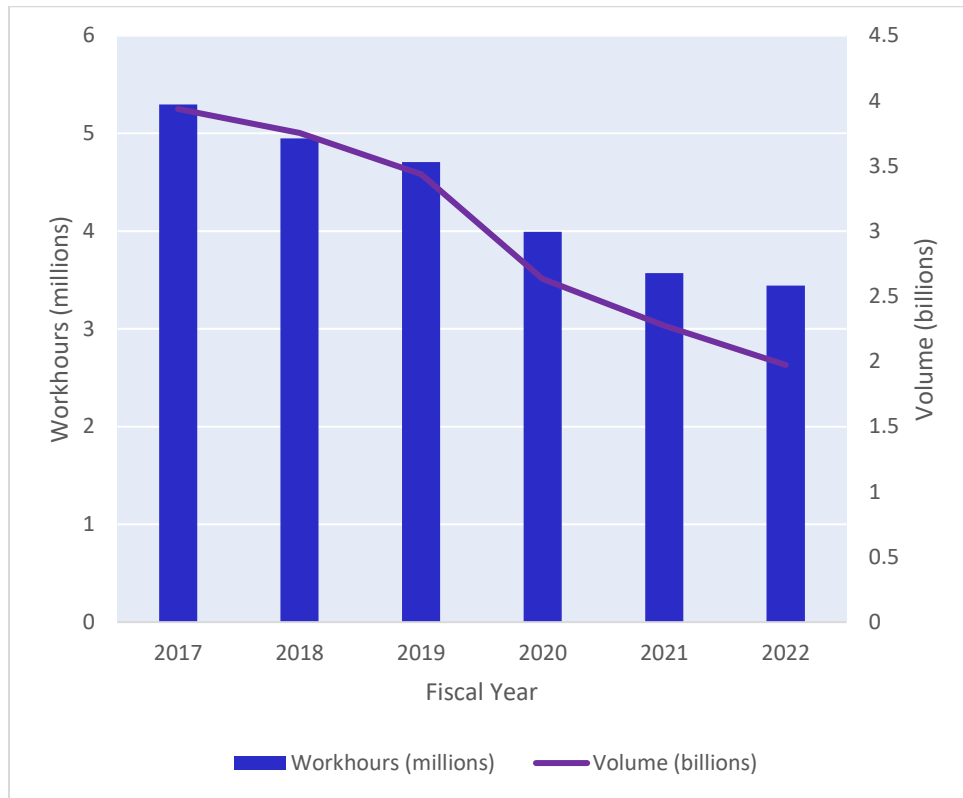


Figure III-20 displays the total annual workhours and volume for all FSS machines. Figure III-20 illustrates a similar pattern on the FSS machine as was observed on the AFSM. Even though total workhours have not been increasing, they have been decreasing at a slower rate than volume from FY 2019 through FY 2022. In FY 2022, volume dropped by 13 percent while workhours dropped by 4 percent. The result of these trends is a decline in FSS labor productivity.

The Postal Service has also been reducing its fleet of AFSMs; however, this rate of reduction has been slower than the rate of volume decrease.

<sup>167</sup> Docket No. ACR2022, Library Reference USPS-FY22-NP18, Excel file "mods2022tour-np.csv;" Docket No. ACR2021, Library Reference USPS-FY21-NP18, Excel file "mods2021tour-np.csv;" Docket No. ACR2020, Library Reference USPS-FY20-NP18, Excel file "mods2020tour-np.csv;" Docket No. ACR2019, Library Reference USPS-FY19-NP18, Excel file "mods2019tour-np.csv;" Docket No. ACR2018, Library Reference USPS-FY18-NP18, Excel file "mods2018tour-np.csv;" Docket No. ACR2017, Library Reference USPS-FY17-NP18, Excel file "mods2017tour-np.csv."

**Figure III-21**  
**AFSM Count and Total Volume Processed, FY 2017–FY 2022<sup>168</sup>**

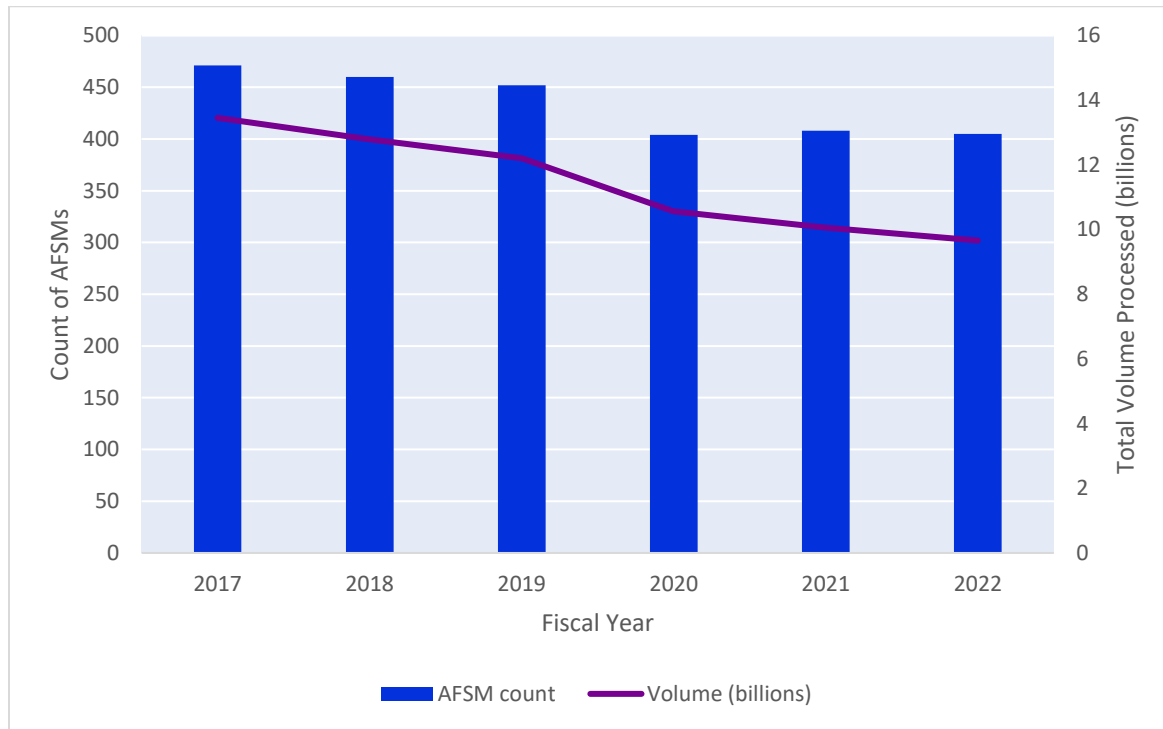


Figure III-21 displays the annual count of all AFSMs and the annual sum of volume processed on AFSMs. All AFSM types are summed because data on the count of machines for every AFSM type was not available. Figure III-21 shows that, while volume processed has declined by 8.6 percent, the count of AFSMs has not changed significantly in FY 2020 through FY 2022.<sup>169</sup> The stable count in AFSMs could be a result of the Postal Service’s decision to instead decommission a significant number of FSS machines during that period or it could precipitate from the Postal Service’s need to leave AFSMs in regions with declining mail volumes to maintain the Universal Service Obligation.

<sup>168</sup> Docket No. ACR2022, Library Reference USPS-FY22-NP18, Excel file “mods2022tour-np.csv;” Docket No. ACR2021, Library Reference USPS-FY21-NP18, Excel file “mods2021tour-np.csv;” Docket No. ACR2020, Library Reference USPS-FY20-NP18, Excel file “mods2020tour-np.csv;” Docket No. ACR2019, Library Reference USPS-FY19-NP18, Excel file “mods2019tour-np.csv;” Docket No. ACR2018, Library Reference USPS-FY18-NP18, Excel file “mods2018tour-np.csv;” Docket No. ACR2017, Library Reference USPS-FY17-NP18, Excel file “mods2017tour-np.csv;” Response to CHIR No. 8, question 3, Excel file “ChiR 8 Q3 2016\_2022.xlsx.”

<sup>169</sup> Commission calculations based on total volume processed in all AFSM operations. See Docket No. ACR2022, Library Reference USPS-FY22-NP18, Excel file “mods2022tour-np.csv;” Docket No. ACR2020, Library Reference USPS-FY20-NP18, Excel file “mods2020tour-np.csv.”



**Figure III-22**  
**Annual Counts of AFSM and FSS Machines, FY 2017–FY 2023<sup>170</sup>**



Figure III-22 shows annual counts of AFSM and FSS machines from FY 2017 to FY 2022. FY 2017 through FY 2019 saw a constant number of FSS machines while AFSM machines slowly declined. Conversely, FY 2020 through FY 2022 saw a relatively stable count of AFSM machines and a dramatic decrease in FSS machines, which is not surprising considering the Postal Service’s plan to eliminate the FSS in 2023. This all suggests the substitution of FSS with AFSM equipment is underway.

g. Trends in Machine Productivity

Another way to measure productivity is to observe machine runtime and TPF. This measurement of productivity (machine productivity) is independent of labor; it measures only the number of mailpieces processed by a machine over a fixed time period.

<sup>170</sup> Response to CHIR No. 8, question 3, Excel file “ChIR 8 Q3 2016\_2022.xlsx.”

**Figure III-23**  
**Trend in AFSM Machine Productivity, FY 2017–FY 2022<sup>171</sup>**

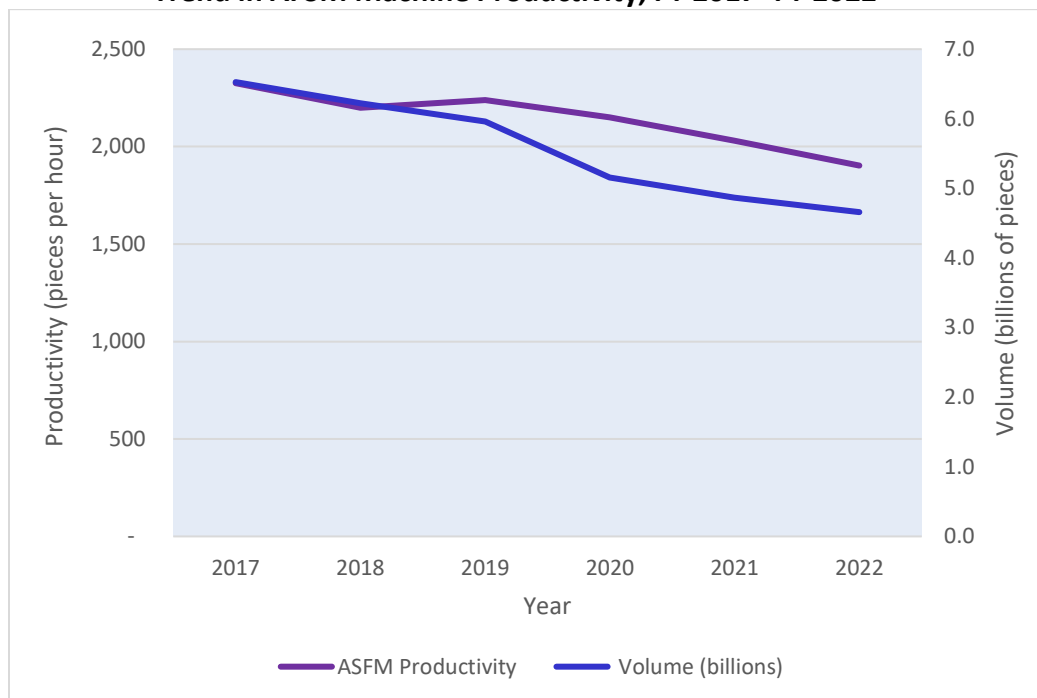


Figure III-23 displays machine productivity as measured by volume of flats mailpieces processed per workhour. The productivity and volume data in Figure III-23 are generated using volumes and productivity measurements from the incoming secondary operation on the AFSMs. This operation accounts for the largest share of all volume processed on the AFSMs. This measure of productivity has also seen declines in recent years; however, it follows volume very closely.

#### h. Conclusion

Labor productivity of automated flats operations should be measured by including mail preparation workhours (even though they are part of allied operations); including these workhours provides a more complete picture of all flats mail processing activities. Labor productivity of automated flats operations has been declining every year, with steeper declines occurring in FY 2019 through FY 2022. Reducing the count of AFSMs may improve productivity; however, in FY 2020 through FY 2022, AFSM count was relatively stable while the count of FSS machines fell precipitously. The full effect of FSS decommissioning on AFSM productivity remains unknown, although facilities with no FSS exhibit higher median AFSM productivity than their counterparts. Machine productivity, as measured in volume per hour, has also been declining at a rate consistent with volume declines.

<sup>171</sup> Docket No. ACR2022, Library Reference USPS-FY22-23, Excel file "YRscrub2022.xlsx;" Docket No. ACR2021, Library Reference USPS-FY21-23, folder "USPS-FY21-23," Excel file "YRscrub2021.xlsx;" Docket No. ACR2020, Library Reference USPS-FY20-23, December 29, 2020, Excel file "YRscrub2020.xlsx;" Docket No. ACR2019, Library Reference USPS-FY19-23, December 27, 2019, Excel file "YRscrub2019.xlsx;" Docket No. ACR2018, Library Reference USPS-FY18-23, December 28, 2018, folder "USPS-FY18-23.Files," Excel file "YRscrub2018.xlsx;" Docket No. ACR2017, Library Reference USPS-FY17-23, December 29, 2017, folder "USPS-FY17-23," Excel file "YRscrub2017.xlsx."

### 3. Analysis of Allied Operations

Allied operations, which occur throughout the mail processing and delivery workflow, represented 27.7 percent and 27.5 percent of flats costs in FY 2021 and FY 2022, respectively.<sup>172</sup> The Postal Service employs Work in Process (WIP) cycles, or cycle time, to gain insight into allied operations. WIP is the amount of time mail spends in mail processing operations.<sup>173</sup> The Postal Service measures processing operations using WIP cycles. Because mail processing operations generally run on planned schedules, service failures may occur due to any additional time spent in one operation before the next operation. *Id.* at 3-4.

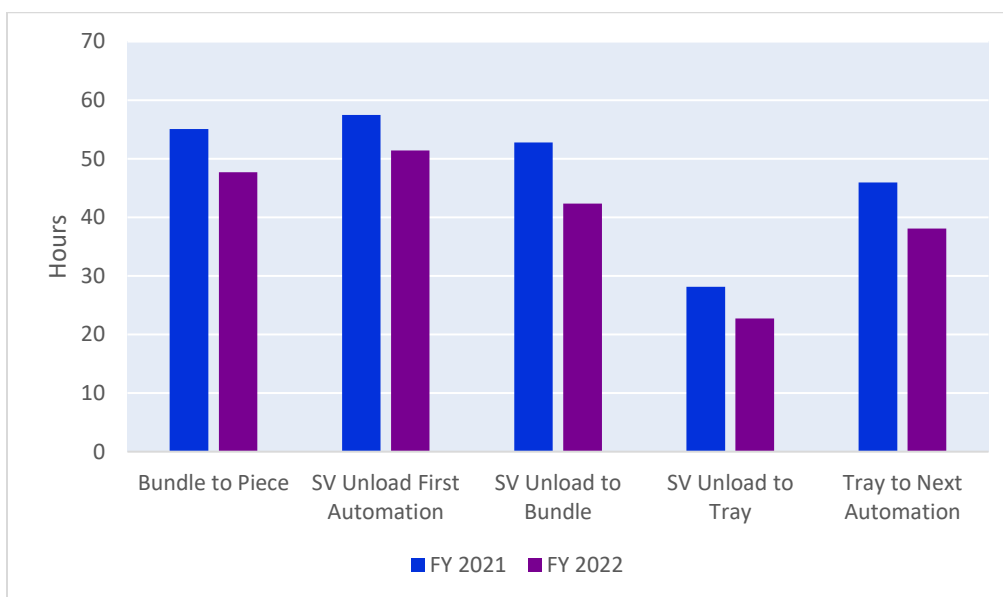
Cycle time performance has been improving since the third quarter of FY 2021 after declining for several years due to COVID-19 related employee non-availability and the gridlock ensuing from the surge in package volume. *Id.* at 4. The Postal Service credits increased network capacity and the hiring of additional employees for the improvement. *Id.* Figure III-24 shows the WIP cycle time for the various flats mail processing operations. There were marked improvements in WIP cycles for all the processing operations in FY 2022.

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<sup>172</sup> Docket No. ACR2021, Library Reference USPS-FY21-45, folder "USPS-FY21-45.zip," folder "FY21.45.Files.zip," folder "Rule 3050.50 Flats," folder "Paragraph (b) -- Financial Report," Excel file "FY21.Rule.3050.50.Para.B.xlsx," tab "Item b11;" Docket No. ACR2022, Library Reference USPS-FY22-45, folder "USPS-FY22-45.zip," folder "FY22.45.Files.zip," folder "Rule 3050.50 Flats," folder "Paragraph (b) -- Financial Report," Excel file "FY22.Rule.3050.50.Para.B.xlsx," tab "Item b11."

<sup>173</sup> Docket No. ACR2022, Library Reference USPS-FY22-45, folder "USPS-FY22-45.zip," folder "FY22.45.Files," folder "Rule 3050.50 Flats," folder "Paragraph (e) -- Pinch Point Reports," folder "e.9 Trend Narrative.PRC.LR.9 Update," PDF file "FY22.Paragraph.e9.Narrative.pdf," at 3 (FY 2022 Section e.9 Narrative).

**Figure III-24**  
**Cycle Time, FY 2021–FY 2022<sup>174</sup>**



The Commission notes the Postal Service’s continuous efforts to enhance the WIP cycle time of allied operations using its visualization timeline tool called GRID for spotting delays in scheduled mail processing processes, and the use of the Cycle Time report in Informed Visibility dashboards for providing real time data visualization of processes to support decision making. See Figure III-24.

## 4. Low Productivity in Manual Sorting Operations

### a. Introduction

Manually sorting is an inefficient operation. In some cases, flats are nonmachinable and must be sorted manually. These flats pay rates that reflect the additional costs incurred from manual sorting. However, there are also a number of flats that pay automation rates but end up being sorted manually. These flats represent a significant inefficiency in Postal Service operations. The reported productivity of manually sorting flats was 282 pieces per hour in FY 2022.<sup>175</sup> As the operational expert told the Commission, this is an exceptionally low productivity, which, most likely, reflects inaccurate data for workhours or volumes. For comparison, the average productivity of an AFSM is 2,000 pieces per hour.<sup>176</sup> The Postal Service would save on mail processing costs by manually sorting as few mailpieces as

<sup>174</sup> Docket No. ACR2022, Library Reference USPS-FY22-NP31, folder “USPS-FY22-NP31.zip,” folder “FY22.NP31.Files,” folder “Rule 3050.50 Flats,” folder “Paragraph (e) – Pinch Point Nonpublic Reports,” folder “e.4 Work in Process,” Excel file “E4\_NonPublic\_New\_WIP\_FY19.FY22.xlsx.”

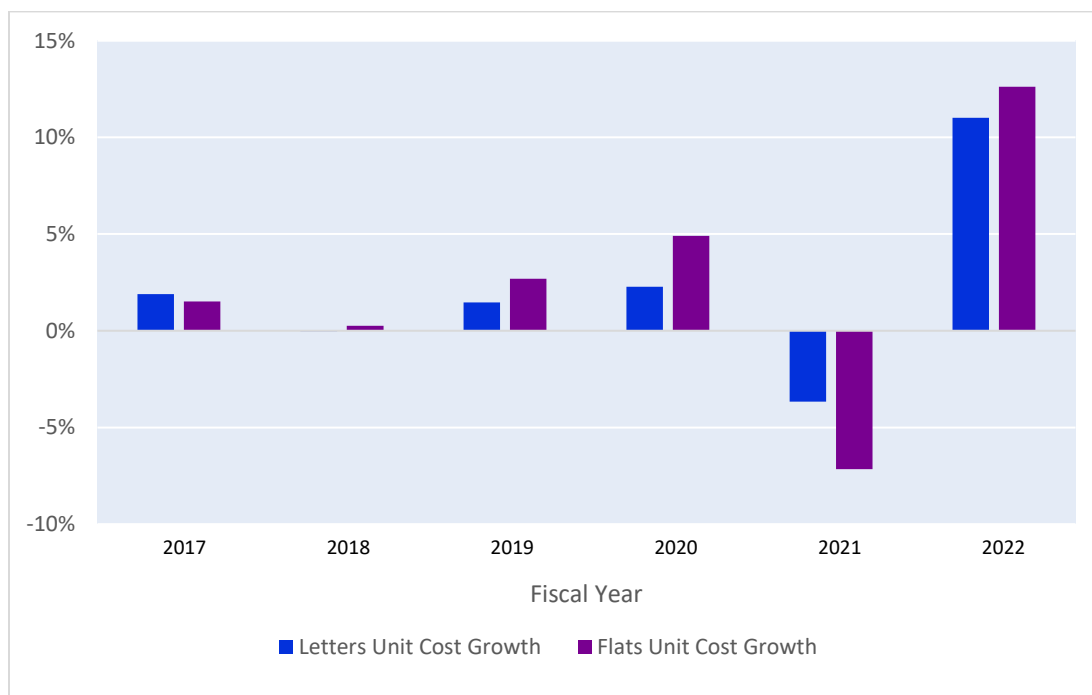
<sup>175</sup> As discussed in the following section, the measure may not be the most accurate, but is the best reported data available on manual productivity. Docket No. ACR2022, Library Reference USPS-FY22-NP18, Excel file “mods2022tour-np.csv.”

<sup>176</sup> Based on Incoming Secondary Sortation on AFSM in FY 2022. See Docket No. ACR2022, Library Reference USPS-FY22-23, Excel file “YRscrub2022.xlsx.”

possible. However, as discussed below, poor data quality presents significant barriers to ameliorating manual sortation.

Figure III-25 shows the change in unit mail processing cost of a manually handled piece of flat-shaped mail and letter-shaped mail.

**Figure III-25**  
**Change in Unit Mail Processing Cost for Manually Processed Letters and Flats,**  
**FY 2017–FY 2022<sup>177</sup>**



In FY 2022, the Postal Service overturned all the progress it made lowering the manual mail processing costs in FY 2021. *See* Figure III-25. While manual mail processing costs of both letters and flats fell in FY 2021, in FY 2022, costs for both shapes increased even higher than in FY 2020. The growth of letters unit cost was 11.0 percent, while the growth of flats cost was 12.6 percent (or 1.6 percentage points higher).

#### b. Data Quality Issues

As discussed in Section III.C.2., labor productivity is calculated by dividing workhours by volume. Upon reviewing materials available from other studies and CHIR responses, the Commission has found both the numerator and the denominator of this ratio to be unreliable. Therefore, the resulting calculated productivity of manual sortation of flats is likewise unreliable.

<sup>177</sup> Source: Docket No. ACR2020, Library Reference USPS-FY20-45, December 29, 2020, Excel file “eFlash.FY16\_FY20.xlsx;” Library Reference USPS-FY22-45, Excel file “eFlash.FY17\_FY22.xlsx.”

Several studies conducted by the Postal Service OIG have indicated errors in workhour data. In 2020, the Postal Service OIG conducted studies on two mail processing facilities with very different reported manual mail processing productivities.<sup>178</sup> In FY 2019, the national average of manual flats productivity was 332 pieces per hour. The Birmingham, AL P&DC reported its manual flats productivity as 100 pieces per hour, while the Tucson, AZ P&DC reported its manual flats productivity as 992 pieces per hour. *Id.* After conducting visits to each facility, the Postal Service OIG concluded that neither facility was recording workhours correctly, and that the difference in reported productivity occurred as a result of erroneous workhour data as opposed to any observable difference in the way flats mailpieces were handled. *Id.* While conducting a facility visit to the Birmingham, AL P&DC, the Postal Service OIG auditors noted that employees that were clocked into the manual flats processing operation were working in other operations. OIG Report No. 20-161-R20 at 2-3. In the Birmingham, AL P&DC, labor hours were overreported, causing manual operations to seem less productive. *Id.* While conducting a facility visit to the Tucson, AZ P&DC, the Postal Service OIG auditors identified 149 occurrences where postal employees processed manual flats volumes without recording any workhours. OIG Report No. 20-163-R20 at 2. In this case, the underreporting of workhours had the consequence of making the facility appear to be more productive than it was in reality. *Id.* at 2-3. In both cases, variation in manual productivity occurred as a result of misrepresentation of workhours.

Another study conducted by the Postal Service OIG took an in-depth look at manual productivity across nine different mail processing facilities. OIG Report No. 21-131-R21 at 9. In this study, the Postal Service OIG found that postal employees did not log their workhours to the correct operation at eight of the nine facilities visited. *Id.* The most salient example of erroneous workhour data was observed during the site visit to the Los Angeles P&DC. At this facility, the Postal Service OIG staff found that 12 employees were clocked into the manual sorting operation but did not observe any employees working in the performing manual sorting. *Id.* The Postal Service OIG went on to state that “management did not monitor on a daily basis the timekeeping practices of employees to ensure they were using the correct operation codes to account for the work performed.” *Id.* Findings from the Postal Service OIG studies are consistent with the findings from the Commission’s facility visits, wherein facility supervisors confirmed manual workhours were not scrutinized.

Volume measurement for automation operations is generated directly from the mail processing machine, but manual volume measurements are not substantiated by any volume counts. As stated in Section III.B.4.c., the Postal Service replaced its manual volume surveys with “allowances” in FY 2016. Response to CHIR No. 7, question 2. The Commission finds that the Postal Service's process of estimating manual volume as a percentage of

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<sup>178</sup> Compare United States Postal Service, Office of Inspector General, Report No. 20-161-R20, Manual Flats Processing Operations at the Birmingham, AL, Processing and Distribution Center, February 12, 2020, at 3, available at <https://www.uspsoig.gov/reports/audit-reports/manual-flats-processing-operations-birmingham-al-processing-and-distribution> (OIG Report No. 20-161-R20), with United States Postal Service, Office of Inspector General, Report No. 20-163-R20, Manual Flats Processing Operations at the Tucson, AZ, Processing and Distribution Center, March 9, 2020, at 2-3, available at <https://www.uspsoig.gov/reports/audit-reports/manual-flats-processing-operations-tucson-az-processing-and-distribution> (OIG Report No. 20-163-R20).

automation volume is more prone to error than using a direct measurement technique, such as surveying.

Given the unreliable measurements of both workhours and volumes in manual flats sorting, the Commission is reluctant to perform rigorous data analysis of labor productivity of manual operations using MODS data. The lack of reliable volume or workhour data represents a tremendous loss of opportunity to track or use this data in any meaningful way. If reliable data were available, the Postal Service could use this data to make more informed decisions about mail processing costs.

Figure III-26 displays manual volumes and manual productivities for flats by fiscal year.

**Figure III-26**  
**Flats Manual Volumes and Manual Productivity, FY 2017–FY 2022<sup>179</sup>**

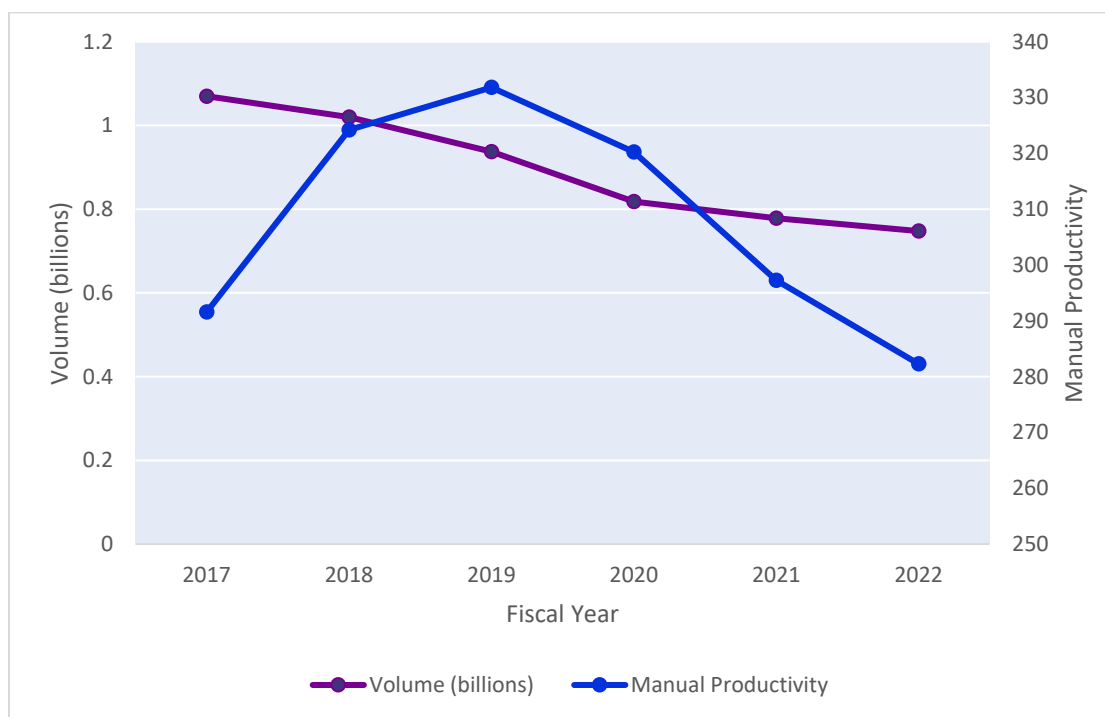


Figure III-26 shows that manual productivity, as calculated by the Commission using MODS data, has been declining since FY 2019. While, as discussed above, this data may be unreliable, the trend in reported productivity is concerning if accurate. In FY 2022 and FY 2021, manual productivities fell at a faster rate than manual volumes. It is possible that the data are so unreliable that there is no basis to draw a conclusion.

<sup>179</sup> Source: Docket No. ACR2022, Library Reference USPS-FY22-NP18, Excel file “mods2022tour-np.csv;” Docket No. ACR2021, Library Reference USPS-FY21-NP18, Excel file “mods2021tour-np.csv;” Docket No. ACR2020, Library Reference USPS-FY20-NP18, Excel file “mods2020tour-np.csv;” Docket No. ACR2019, Library Reference USPS-FY19-NP18, Excel file “mods2019tour-np.csv;” Docket No. ACR2018, Library Reference USPS-FY18-NP18, Excel file “mods2018tour-np.csv;” Docket No. ACR2017, Library Reference USPS-FY17-NP18, Excel file “mods2017tour-np.csv.”

## D. Inefficiencies in Transporting and Delivery of Flats Mail: Data Analysis

### 1. Transportation

The Postal Service provides SV data related to transportation and reports from its SVWeb application that analyzes the SV data.<sup>180</sup> The Postal Service uses the reports from the SVWeb to both track the usage of transportation resources and identify opportunities for mitigating costs. *Id.* at 62. One of the important measures included in the SV is a scan compliance rate, which is the level at which employees use SV to scan barcodes on trailers, handling units, and containers as mail moves through the mailstream.<sup>181</sup> The SV scan compliance in FY 2022 was 94.7 percent, increasing from approximately 92.8 percent in FY 2021. FY 2022 Section e.9 Narrative at 7. As seen in Table III-1 that shows the on-time departure, on-time arrival, and average load for the period from FY 2018 to FY 2022, the percentages of both the on-time departure and arrival declined in FY 2022 when compared to FY 2021, however, the average load continues its upward trend, reaching the highest level in the reporting period.

The Postal Service reports that it ended the strict trips-on-time narrow initiative in FY 2022, which led to the observed reduction in on-time departures and arrivals, and replaced the initiative with a broader focus on overall service performance. FY 2022 Section e.9 Narrative at 7. The Postal Service attributes the increased load percentages to multiple successful initiatives. *Id.*

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<sup>180</sup> See Docket No. ACR2015, Postal Service Third Response at 58-62. SV is “a mobile-scanning application that allows postal personnel to track mail as it is transported across the surface network. Postal personnel use handheld mobile devices to scan barcodes on trailers, handling units, and containers used to transport mail between facilities, as they move across the surface network.” *Id.* at 58. The SVWEB application provides near real-time data, and enables “managers to pull reports presenting Area, District, and facility data, such as the number of trips that have arrived and departed over a given period of time, the percentage of the load on each trip (utilization), and the on-time performance for each trip.” *Id.* at 61-62.

<sup>181</sup> FY 2022 Section e.9 Narrative at 7. The scan compliance expressed as a percentage is calculated by dividing the actual scan by the expected scan. Whereas the Postal Service is “committed to improving manual scan compliance at each facility to as close to 100 percent as possible, the visibility that can be gained from any data system is limited to the extent it relies on human intervention.” See Docket No. ACR2015, Postal Service Third Response at 22, 63-64, 73.



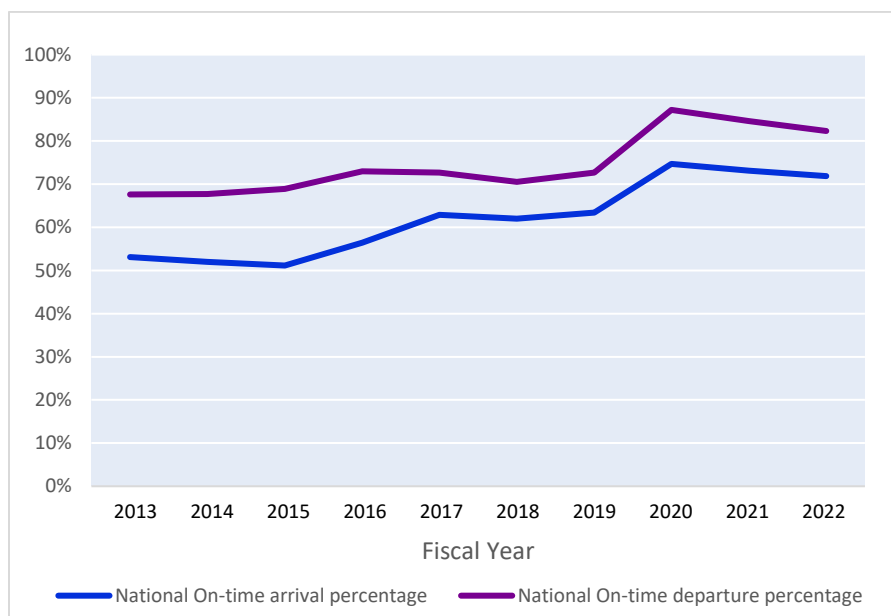
**Table III-1  
On-Time Departure, On-Time Arrival, and Average Load, FY 2018–FY 2022<sup>182</sup>**

Metric	Goal	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
On-time Departure	100%	70.50%	72.60%	87.20%	84.60%	82.33%
On-time Arrival	100%	62.00%	63.40%	74.70%	73.14%	71.88%
Average Load	60%	32.10%	32.10%	38.60%	39.75%	42.89%

The Commission has examined the available data related to on-time performance of surface trips, truck capacity utilization, and the number of misrouted containers, all of which are indicators of the efficiency of transportation operations.

*Trips’ on-time performance.* The Postal Service has reported the following percentages for on-time performance of arriving and departing trips, for FY 2013 through FY 2022.

**Figure III-27  
National On-time Arrival and Departure Percentages, FY 2013–FY 2022<sup>183</sup>**



<sup>182</sup> Source: Docket No. ACR2022, Library Reference USPS-FY22-45, folder “USPS-FY22-45.zip,” folder “FY22.45.Files,” folder “Rule 3050.50 Flats,” folder “Paragraph (e) -- Pinch Point Reports,” folder “e.6 Surface Visibility,” Excel file “Public SV Data\_FY18\_FY22.xlsx,” tab “First Set.”

<sup>183</sup> Source: Docket No. ACR2022, Library Reference USPS-FY22-45, folder “USPS-FY22-45.zip,” folder “FY22.45.Files.zip,” folder “Rule 3050.50 Flats,” folder “Paragraph (e) -- Pinch Point Reports,” folder “e.6 Surface Visibility,” Excel file “Public SV Data\_FY18\_FY22.xlsx;” Docket No. ACR2019, Library Reference USPS-FY19-45, December 27, 2019, folder “Paragraph (e) -- Pinch Point Reports,” folder “e.6 Surface Visibility,” Excel file “Public SV Data\_FY15\_FY19.xlsx;” Docket No. RM2018-1, Response of the United States Postal Service to Commission Information Request No. 1, December 4, 2017, questions PP5-2.d.i.-ii. (Docket No. RM2018-1, Response to CIR No. 1).

As seen in Figure III-27, the on-time departures generally follow the trend of on-time arrivals, although a higher percentage of departing trips are reported as being on-time. This might suggest that PVS and/or contracted transportation does not include sufficient drive times for scheduled routes, since fewer trips (by about 10 percentage points) arrive on time at destination than are dispatched on time from origin. However, assuming that inbound trips carry mail on their return portions (*i.e.*, assuming that every inbound trip is recorded as an outbound trip upon return), the data depicted in Figure III-27 could also indicate that the Postal Service builds in some buffer to accommodate delays in round-trip transportation.

At the mail processing sites and STCs, when discussing on-time arrivals and on-time departures of the scheduled transportation with management, Commission staff learned that in general, for round trips, delayed inbound trips (*i.e.*, delayed arrivals) lead to delayed departures of trucks on the outbound portions of trips. However, management also commented that for some of the delays in truck arrivals, they can “catch-up” on the delays during processing operations and dispatch trucks on time for the return portions of their trips. Staff clarified that the longer the trips, the more likely that the inbound trips would be delayed. Additionally, delays that accumulate over long-haul inbound trips are less likely to be accommodated by receiving facilities, and thus, more likely to lead to delayed outbound trips. Lastly, many staff described delayed mail processing operations at previous sites as the leading cause of delayed arrivals, and they described delayed processing or HCR driver delays as most frequently leading to delayed departures.

The Commission asked the Postal Service additional questions regarding the causes of delayed arriving and departing trips that were related to the Postal Service operations, HCR contractors, or other causes.<sup>184</sup> The Postal Service provided the numbers of late arriving and departing trips, including reasons for delays.

As illustrated in Figure III-28, the data provided showed a similar pattern as the on-time arrival and departure percentages shown in Figure III-27.

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<sup>184</sup> Chairman’s Information Request No. 5, January 6, 2023, question 6.b. (CHIR No. 5).

**Figure III-28**  
**Number of Late Inbound (Arriving) and Outbound (Departing) Trips, FY 2017–FY 2022<sup>185</sup>**

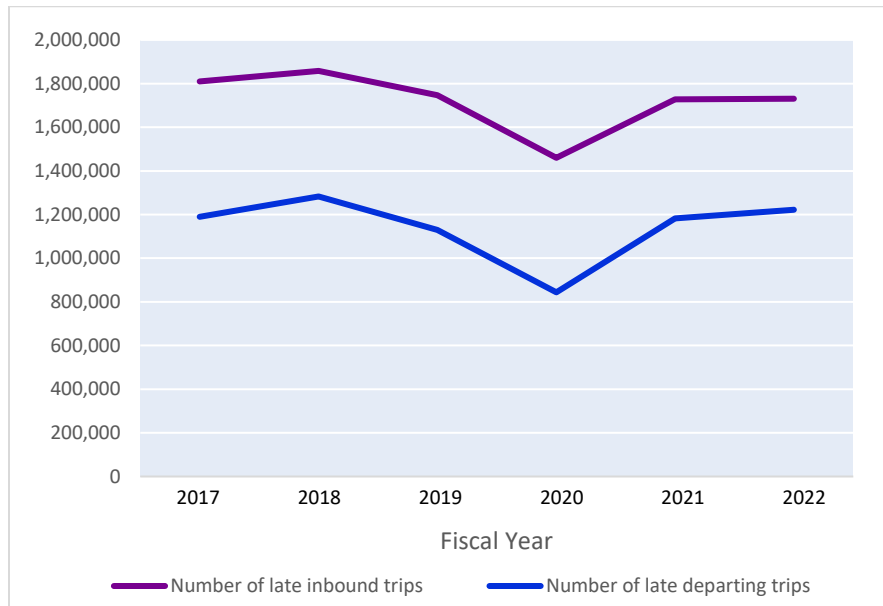


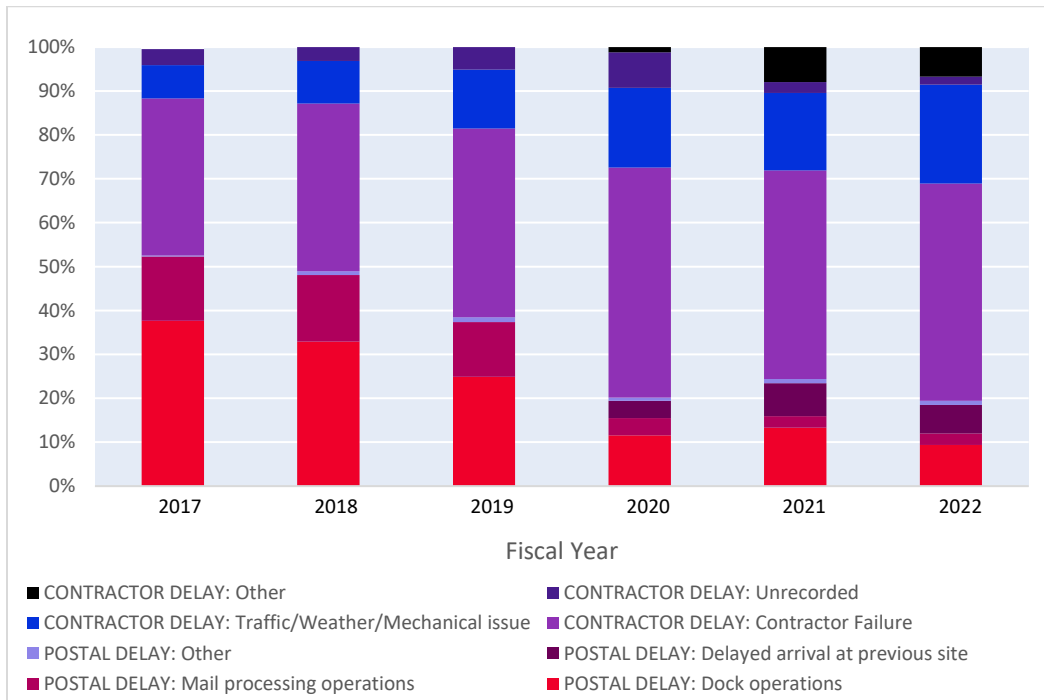
Figure III-29 illustrates that while in FY 2017, more than half of delayed inbound trips were due to delays in postal operations (namely, mail processing and dock operations), by FY 2022, only about one-fifth of delayed inbound trips were caused by postal delays, and over 70 percent were attributed to HCR contractors’ fault. In FY 2022, the Postal Service’s data attribute 50 percent of inbound trips’ delays to “[c]ontractor [f]ailure,” but, the Postal Service does not explain what constitutes “[c]ontractor [f]ailure.”<sup>186</sup>

The Postal Service explains that fault was “determined at point of instance or occurrence” and by personnel, or it was based on discussions between the personnel and the drivers, including “knowledge of local events such as weather, road construction and civil events or unrest.” January 18 Response to CHIR No. 5, question 6.c.iv.

<sup>185</sup> Source: January 18 Response to CHIR No. 5, question 6.b., Excel file “ChIR No. 5\_Q6b\_Response.xlsx.”

<sup>186</sup> January 18 Response to CHIR No. 5, question 6.b., Excel file “ChIR No. 5\_Q6b\_Response.xlsx,” tab “Root Causes,” cell B18.

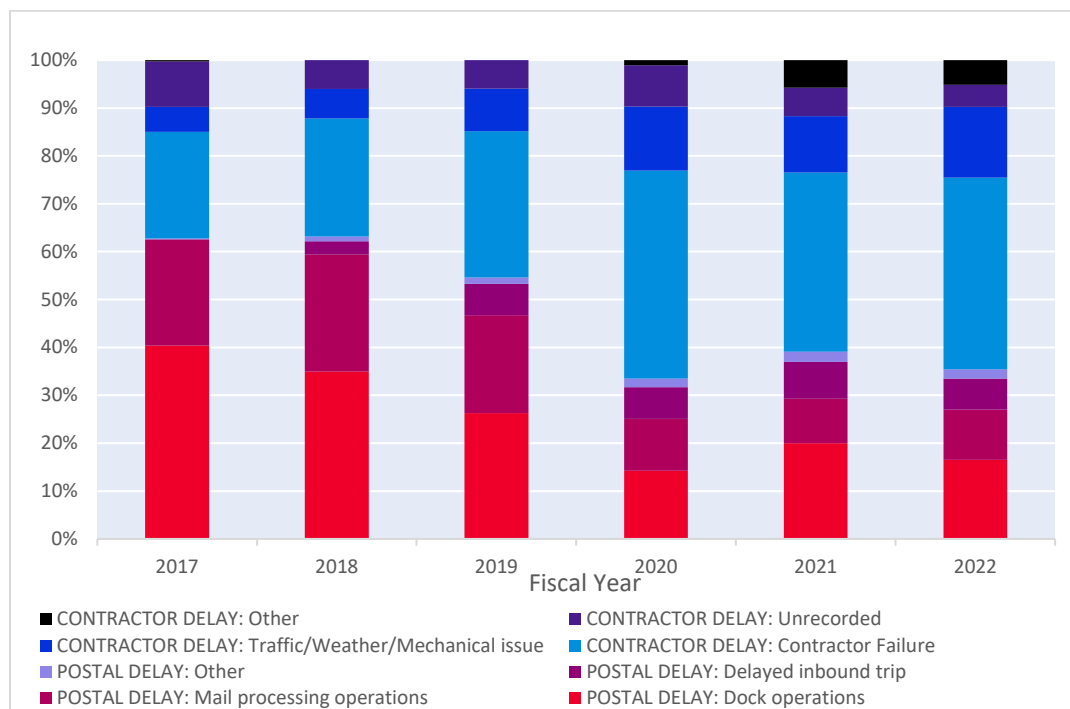
**Figure III-29**  
**Proportions of Delayed Inbound Trips by Reason for Delay, FY 2017–FY 2022<sup>187</sup>**



<sup>187</sup> Source: January 18 Response to CHIR No. 5, question 6.b., Excel file "CHIR No. 5\_Q6b\_Response.xlsx."

The data included in Figure III-30 similarly illustrate proportions of delayed outbound trips attributed to postal- and contractor-driven causes.

**Figure III-30**  
**Proportions of Delayed Outbound Trips by Reason for Delay, FY 2017–FY 2022<sup>188</sup>**



The data shown in Figure III-30 suggest that the Postal Service’s operations were the cause of over 60 percent of delayed outbound trips in FY 2017, with an “improvement” by FY 2022, when postal operations caused delays in about 35 percent of outbound trips. The data also suggest that 6 percent of delayed outbound trips in FY 2022 were due to postal-caused delays for inbound trips, which would leave 29 percent of delayed return trips caused by operations performed at postal facilities dispatching them.

The Commission inquired about the assessment of penalties for HCR contractors, since significant proportions of delayed trips were attributed to contractors’ fault, and since the Postal Service is extending its surface transportation network to reach coast-to-coast, as it attempts to divert mail volumes from the air to the surface transportation network. Response to CHIR No. 7, question 4.a.

The Postal Service’s response indicates that HCR contractors “can submit” a late slip to the Postal Service for payment if it was the Postal Service’s operations that caused delays on the inbound legs of round trips. January 18 Response to CHIR No. 5, question 6.c.i. The Postal Service also states that it is “responsible for paying the HCR contractor” for the

<sup>188</sup> Source: January 18 Response to CHIR No. 5, question 6.b., Excel file “CHIR No. 5\_Q6b\_Response.xlsx.”

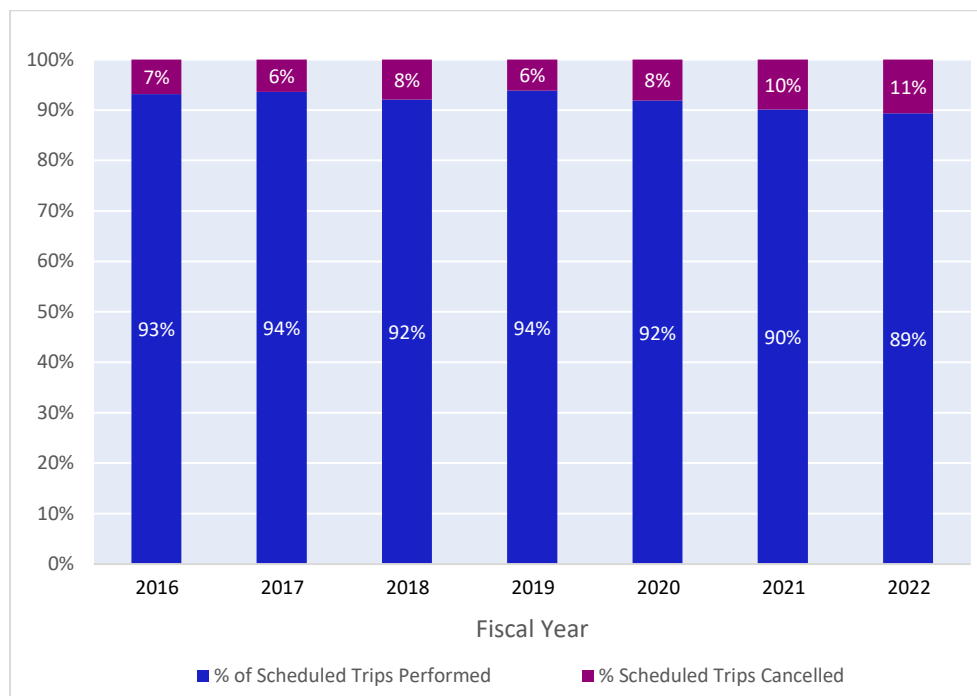
associated delays on the outbound legs of round trips. *Id.* question 6.d. The Postal Service does not clarify to what extent HCR contracts request payments for postal-caused delays.

For delays caused by HCR contractors, the Postal Service states that further action “can be taken” to “eliminate HCR contractors with ongoing failures to operate as contracted” but it does not provide whether it assesses penalties nor does it provide specifics on the extent of failures that would be sufficient to terminate HCR contracts or have HCR contractors operate as previously contracted. *Id.* questions 6.c., d. The lack of clarity with respect to HCR contracts terms and whether or which party enforces them, makes assessing the cost implications of transportation delays impossible.

*Extra transportation.* During facility visits and in response to CHIRs, Commission staff learned about instances when facilities order extra transportation. These include situations such as when HCR drivers do not show up and extra transportation is needed to transport mail ready for dispatch to destination facility. Or they include situations when a facility is informed about a delay for an inbound truck, which is severe enough that it cannot be recovered by speeding up the unloading of mail from the truck upon arrival and the dispatch of mail loaded onto the truck for the outbound portion of the trip, so as to ensure the truck’s arrival at destination by applicable CET. Facility staff explained that in such cases, the scheduled outbound trips are considered cancelled or omitted, and are replaced with extra trips. Extra trips are also ordered when truck space on a scheduled trip is filled, and more mail remains for the route. This can lead to dispatching low volumes of the remaining mail on expensive extra trips, which can significantly increase the transportation cost per transported mailpiece. Such situations were described as relatively frequent by a representative of an STC. The Postal Service states that if less than 15 percent of the truck floor is used, it “may decide against operating the extra trip due to cost” and transport the remaining mail on a later trip. January 18 Response to CHIR No. 5, question 6.e. The Postal Service also describes ordering extra transportation in cases when operations at the processing facility are over capacity and some mail needs to be processed at a different facility. *Id.*

Figure III-31 illustrates proportions of outbound scheduled trips that were performed and those that were cancelled between FY 2016 and FY 2022.

**Figure III-31**  
**Percentage of Outbound Scheduled Trips Performed and Cancelled**  
**Between FY 2016 and FY 2022<sup>189</sup>**



The data depicted in the above figure suggest increases in the proportions of scheduled trips that were cancelled between FY 2016 and FY 2022.

In Figure III-32, the Commission examined all outbound trips that the Postal Service provided data for—those that were performed and those that were not (were cancelled). The performed trips shown in the figure below include additional separations for performed trips—trips that were scheduled and departed on time, trips that were scheduled and departed late, and trips that were not scheduled and ordered as needed (extra trips). This was done to examine whether the provided trip data show associations between changes in proportions of extra trips, cancelled trips, and late departing trips.

<sup>189</sup> The Commission notes that the Postal Service's data reporting is inconsistent and does not allow for comparisons of the number of trips across fiscal years. The underlying trip data depicted in Figure III-31 include outbound trips for 0:00 to 7 a.m. in FY 2019, outbound trips for 24-hour days for FY 2020 through FY 2022, with no detail available on the time(s) of day to which trips reported for FY 2016 through FY 2018 pertain. See Docket No. ACR2022, Library Reference USPS-FY22-45, folder "USPS-FY22-45.zip," folder "FY22.45.Files.zip," folder "Rule 3050.50 Flats," folder "Paragraph (e) -- Pinch Point Reports," folder "e.6 Surface Visibility," Excel file "Public SV Data\_FY18\_FY22.xlsx," tab "Nat'l Trips on Time," cells A28:A29. See also Docket No. ACR2019, Library Reference USPS-FY19-45, folder "Paragraph (e) -- Pinch Point Reports," folder "e.6 Surface Visibility," Excel file "Public SV Data\_FY15\_FY19.xlsx," tab "Nat'l Trips on Time." As such, the Commission shows the percentages of trips with different attributes rather than numbers of trips for the provided data. Source: Docket No. ACR2022, Library Reference USPS-FY22-45, folder "USPS-FY22-45.zip," folder "FY22.45.Files.zip," folder "Rule 3050.50 Flats," folder "Paragraph (e) -- Pinch Point Reports," folder "e.6 Surface Visibility," Excel file "Public SV Data\_FY18\_FY22.xlsx;" Docket No. ACR2019, Library Reference USPS-FY19-45, folder "Paragraph (e) -- Pinch Point Reports," folder "e.6 Surface Visibility," Excel file "Public SV Data\_FY15\_FY19.xlsx."

**Figure III-32**  
**Proportions of Outbound Trips That Were Scheduled and Departed on Time, Scheduled and Departed Late, Scheduled but Cancelled, and Not Scheduled (Extra Trips), FY 2018–FY 2022<sup>190</sup>**

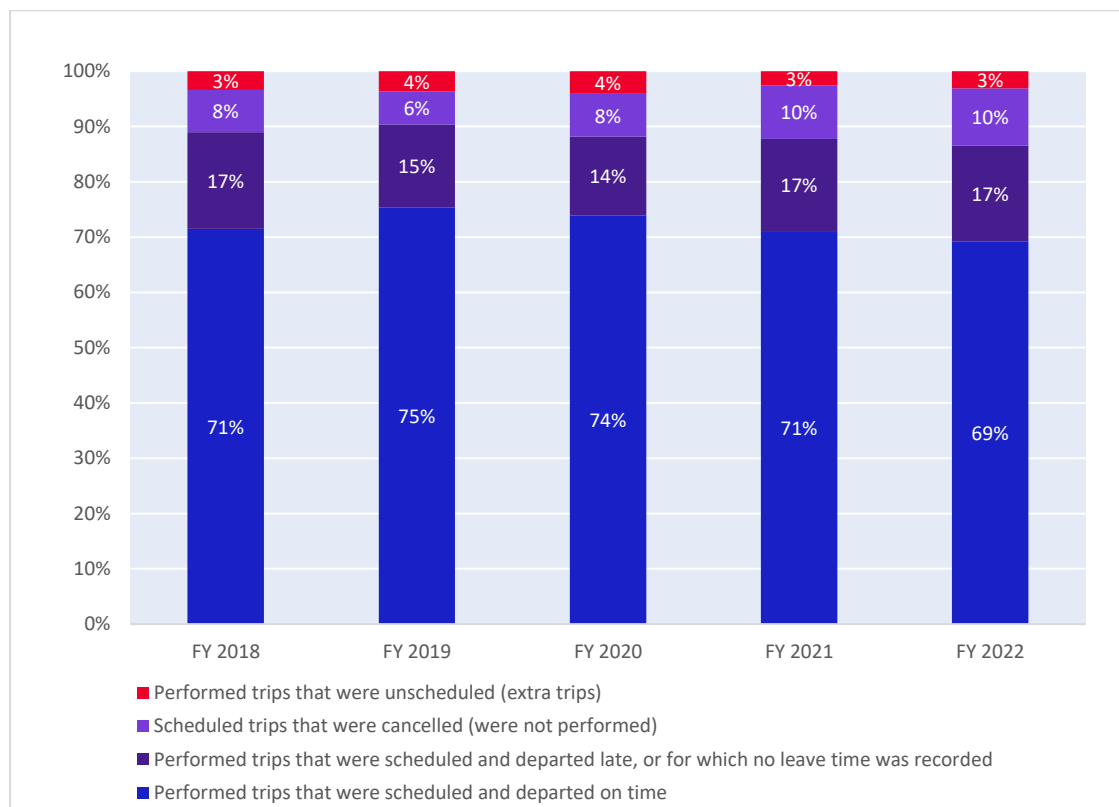


Figure III-32 does not suggest that the increases in trips' cancellations, or in proportions of late departing trips, were associated with increases in the proportions of extra trips.

However, the Commission notes that it is difficult to assess whether the Postal Service excluded relevant trips from the provided trips data because the Commission does not have access to the raw data from which trips shown in the above figures were extracted. For example, the Postal Service explains that the outbound trips, which are depicted in Figures III-31 and III-32, include both HCR and PVS trips, and that they include only trips "departing selected [National Performance Assessment] NPA sites." Response to CHIR No. 1, question 3.a. The Postal Service states that it is "Logistics Operations" that determines the sites to be included, and that some sites, such as "non-Postal sites, select annexes, and [delivery unit] hubs" are excluded. *Id.* question 3.d. The data that the Postal Service provides in the ACR dockets also suggest that the number of sites for which the Postal

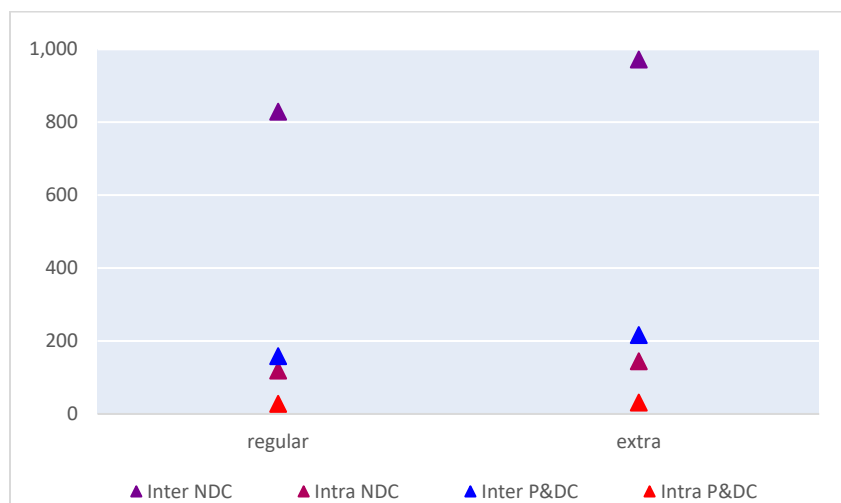
<sup>190</sup> Source: Docket No. ACR2022, Library Reference USPS-FY22-45, folder "USPS-FY22-45.zip," folder "FY22.45.Files," folder "Rule 3050.50 Flats," folder "Paragraph (e) --- Pinch Point Reports," folder "e.6 Surface Visibility," Excel file "Public SV Data\_FY18\_FY22.xlsx."



Service provides trips data changes every year.<sup>191</sup> Moreover, the Postal Service did not include trips for certain routes, or trips it labeled as “Go-Anywhere trips,” or “Air to Surface Diversion” trips, in the outbound trips data shown in Figures III-31 and III-32. *Id.* However, during site visits, Commission staff learned that STCs relied frequently on extra transportation. Since STCs are contracted, and not postal operated sites, STCs might be among the excluded “non-Postal” sites.

The Commission followed up with the Postal Service to request data on mileages driven in the surface transportation network. CHIR No. 5, question 8. The Postal Service explains that mileages were not recorded prior to April 2021. January 18 Response to CHIR No. 5, question 8. The Commission combined FY 2022 data on the number of trips and surface network mileages, to determine whether there is any difference in average trip distance for extra trips and for regularly scheduled trips.

**Figure III-33**  
**Average Trip Distance (Miles) for Regular and Extra Trips in FY 2022, by HCR Contract Category<sup>192</sup>**



The provided data for FY 2022, shown in Figure III-33, indicate that extra trips are between 11 and 37 percent longer, on average, than regularly scheduled trips. As such, the potential cost impact of inefficient transportation operations stems not only from higher cost per mile for extra trips compared to cost per mile for scheduled trips, but also from extra trips being potentially routed differently and being longer than the scheduled trips they replace. *See id.* question 6.e.

<sup>191</sup> See Docket No. ACR2022, Library Reference USPS-FY22-NP31, folder “USPS-FY22-NP31.zip,” folder “FY22.NP31.Files.zip,” folder “Rule 3050.50 Flats,” folder “Paragraph (e) -- Pinch Point Nonpublic Reports,” folder “e.6 Surface Visibility,” Excel file “NonPublic NPA\_Trips on Time Data\_FY18\_FY22.xlsx,” tabs “FY18 SV NPA Data,” “FY19 SV NPA Data,” “FY20 SV NPA Data,” “FY21 SV NPA Data,” and “FY22 SV NPA Data.”

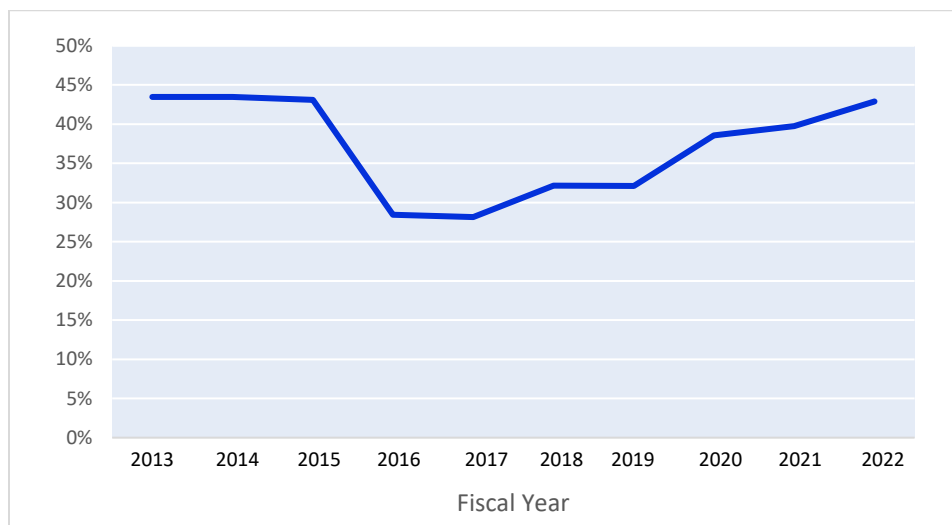
<sup>192</sup> Source: January 18 Response to CHIR No. 5, question 8.

*Truck space utilization.* The Postal Service provides data on “load percentage,” which is calculated as follows:<sup>193</sup>

$$\frac{\text{sum of the base area of containers scanned as loaded onto departing trucks (ft}^2\text{)}}{\text{sum of the floor area of departing trucks (ft}^2\text{)}}$$

The Postal Service’s data on load percentage for FY 2013 through FY 2022 are shown in Figure III-34.

**Figure III-34**  
**National Average Load Percentage, FY 2013–FY 2022<sup>194</sup>**



The Commission notes that the Postal Service’s load percentages might represent overestimates, based on the example calculation that the Postal Service provided, which is replicated in Table III-2.

<sup>193</sup> Response to CHIR No. 1, questions 2.b.i., c.

<sup>194</sup> Source: Docket No. ACR2022, Library Reference USPS-FY22-45, folder “USPS-FY22-45.zip,” folder “FY22.45.Files.zip,” folder “Rule 3050.50 Flats,” folder “Paragraph (e) -- Pinch Point Reports,” folder “e.6 Surface Visibility,” Excel file “Public SV Data\_FY18\_FY22.xlsx;” Docket No. ACR2019, Library Reference USPS-FY19-45, folder “Paragraph (e) -- Pinch Point Reports,” folder “e.6 Surface Visibility,” Excel file “Public SV Data\_FY15\_FY19.xlsx;” Docket No. RM2018-1, Response to CIR No. 1, question PP5-2.d.iv.

**Table III-2**  
**Example of How Load Percentages are Calculated<sup>195</sup>**

Container Type	Container Base Area, ft <sup>2</sup>	Container Count	53 ft Trailer Floor Area, ft <sup>2</sup>	Load Percentage
Hamper	7.23	2	450.5	$(7.23 \text{ ft} * 2) / 450.5 \text{ ft} = 3.2\%$
OTR <sup>196</sup>	22.53	3	450.5	$(22.53 \text{ ft} * 3) / 450.5 \text{ ft} = 15.0\%$
FSS CASTR <sup>197</sup>	7.56	5	450.5	$(7.56 \text{ ft} * 5) / 450.5 \text{ ft} = 8.4\%$
Gaylord 4FT	17.33	6	450.5	$(17.33 \text{ ft} * 6) / 450.5 \text{ ft} = 23.1\%$
Pallet	17.33	9	450.5	$(17.33 \text{ ft} * 9) / 450.5 \text{ ft} = 34.6\%$

Specifically, discussions with staff at visited sites suggested that Gaylord containers must be transported on pallets. In that case, of the nine pallets that are included in the calculated load percentage, six pallets are used to support the Gaylord containers, and including them represents double counting their combined square foot areas in the calculated load percentage. Another situation when such calculated load percentages might lead to overestimates of load percentages would be when mail containers are stacked, which the Postal Service staff described as attempting to do, to better utilize cubic space on trucks.

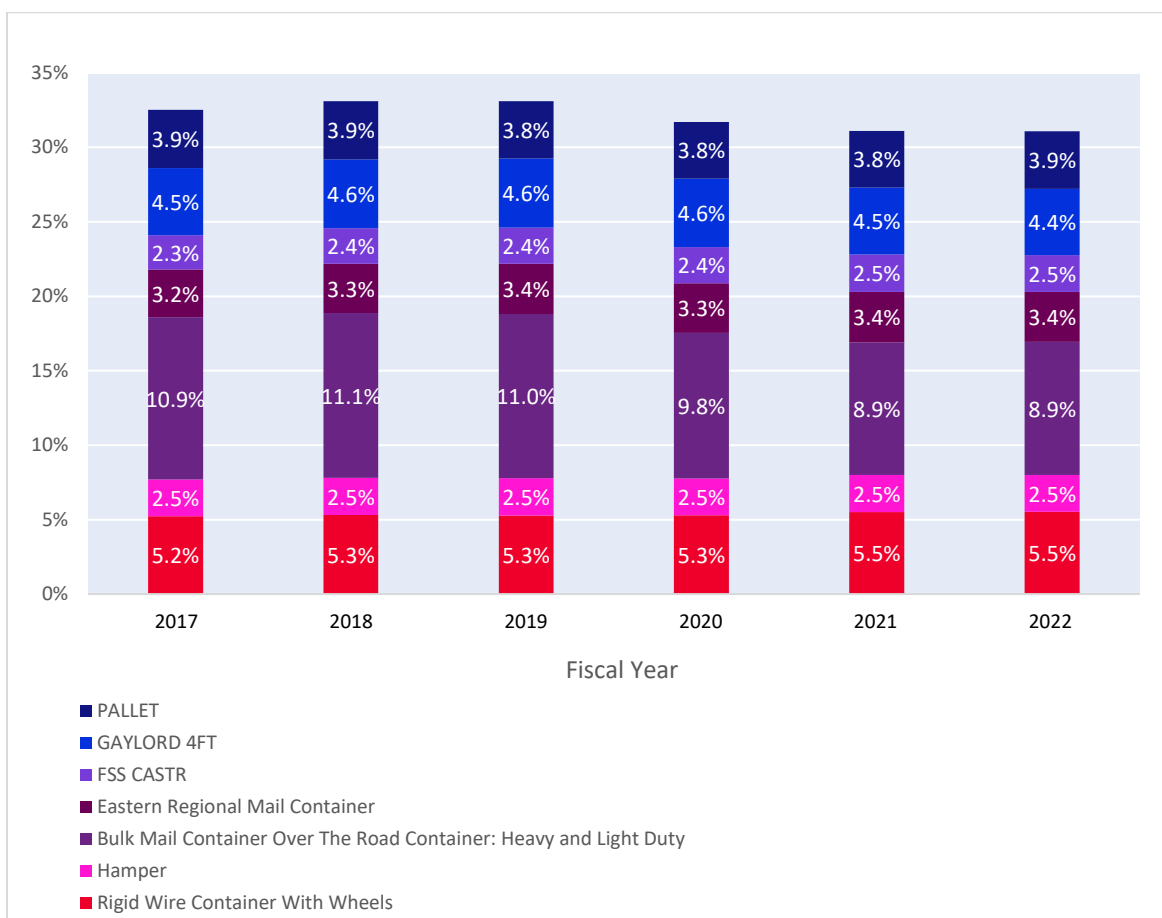
Figure III-35 includes data that the Postal Service provided on the percentage of truck space utilization by container type.

<sup>195</sup> Source: Response to CHIR No. 1, question 2.d.

<sup>196</sup> Over-the-Road container.

<sup>197</sup> Flats Sequencing System Carrier Automated Street Tray Rack.

**Figure III-35  
Truck Space Utilization by Container Type, FY 2017–FY 2022<sup>198</sup>**



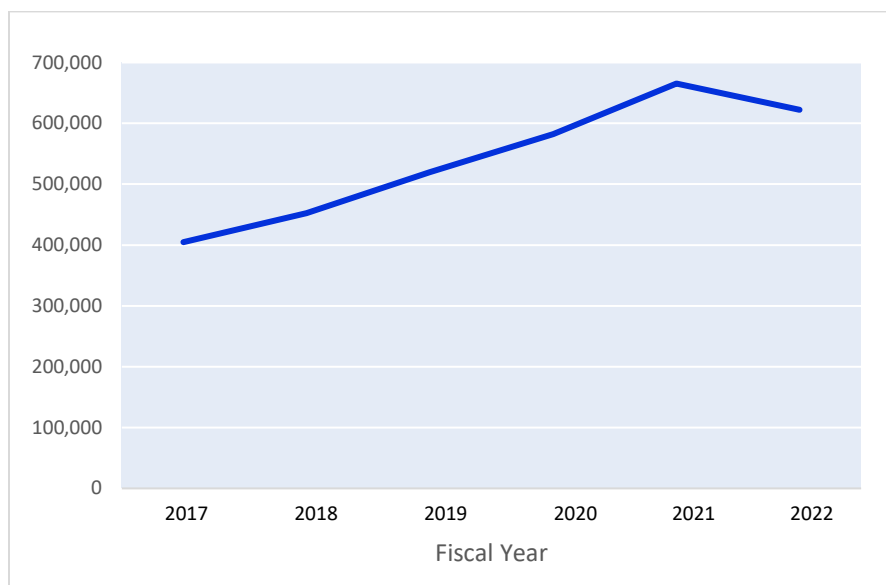
The Commission notes that of the container types included in Figure III-35, only Gaylord containers (and pallets on which they are transported) are stackable and allow better use of trucks’ cubic spaces.<sup>199</sup> However, the data suggest that most of the space on trucks is used for containers that cannot be stacked. *Id.* The operational expert clarified that Gaylord containers can be made of cardboard or plastic, and that while stacking of cardboard containers might be dependent on conditions described above, plastic Gaylord containers can always be stacked.

<sup>198</sup> Source: Docket No. ACR2022, Library Reference USPS-FY22-45, folder “USPS-FY22-45.zip,” folder “FY22.45.Files.zip,” folder “Rule 3050.50 Flats,” folder “Paragraph (e) -- Pinch Point Reports,” folder “e.6 Surface Visibility,” Excel file “Public SV Data\_FY18\_FY22.xlsx;” Docket No. ACR2019, Library Reference USPS-FY19-45, folder “Paragraph (e) -- Pinch Point Reports,” folder “e.6 Surface Visibility,” Excel file “Public SV Data\_FY15\_FY19.xlsx.”

<sup>199</sup> See generally United States Postal Service, Mail Transport Equipment, Handbook PO-502, June 2017, available at [https://apwu.org/sites/default/files/po502\\_0.pdf](https://apwu.org/sites/default/files/po502_0.pdf).

*Misrouted containers.* The Postal Service provides data on the numbers of misrouted containers, which are containers unloaded from trucks at “unexcepted” sites.<sup>200</sup> These data do not represent total annual misrouted container counts, but rather, container counts during “comparable” 4-week periods in each fiscal year from FY 2017 through FY 2022.<sup>201</sup> The provided counts for the last 6 fiscal years are presented in Figure III-36.

**Figure III-36**  
**Number of Misrouted Containers During Comparable 4-Week Periods**  
**in FY 2017 Through FY 2022<sup>202</sup>**



During site visits, the facilities’ staff explained that they generally directed misrouted containers to their intended facilities. This might lead to added trips and mileages in the network, for which the Postal Service incurs associated transportation costs, especially for containers with mail that is subject to tighter service standard windows, although according to the Commission’s operational expert, this may not occur frequently. In addition, misrouting mail containers has implications on service performance, as it delays mail arrival at intended processing facilities by CETs.

The Commission examined facility level data to see whether the numbers of misrouted containers that the facilities receive are more-or-less evenly distributed. The data depicted in Figure III-37 illustrate that most sites for which the Postal Service provided data

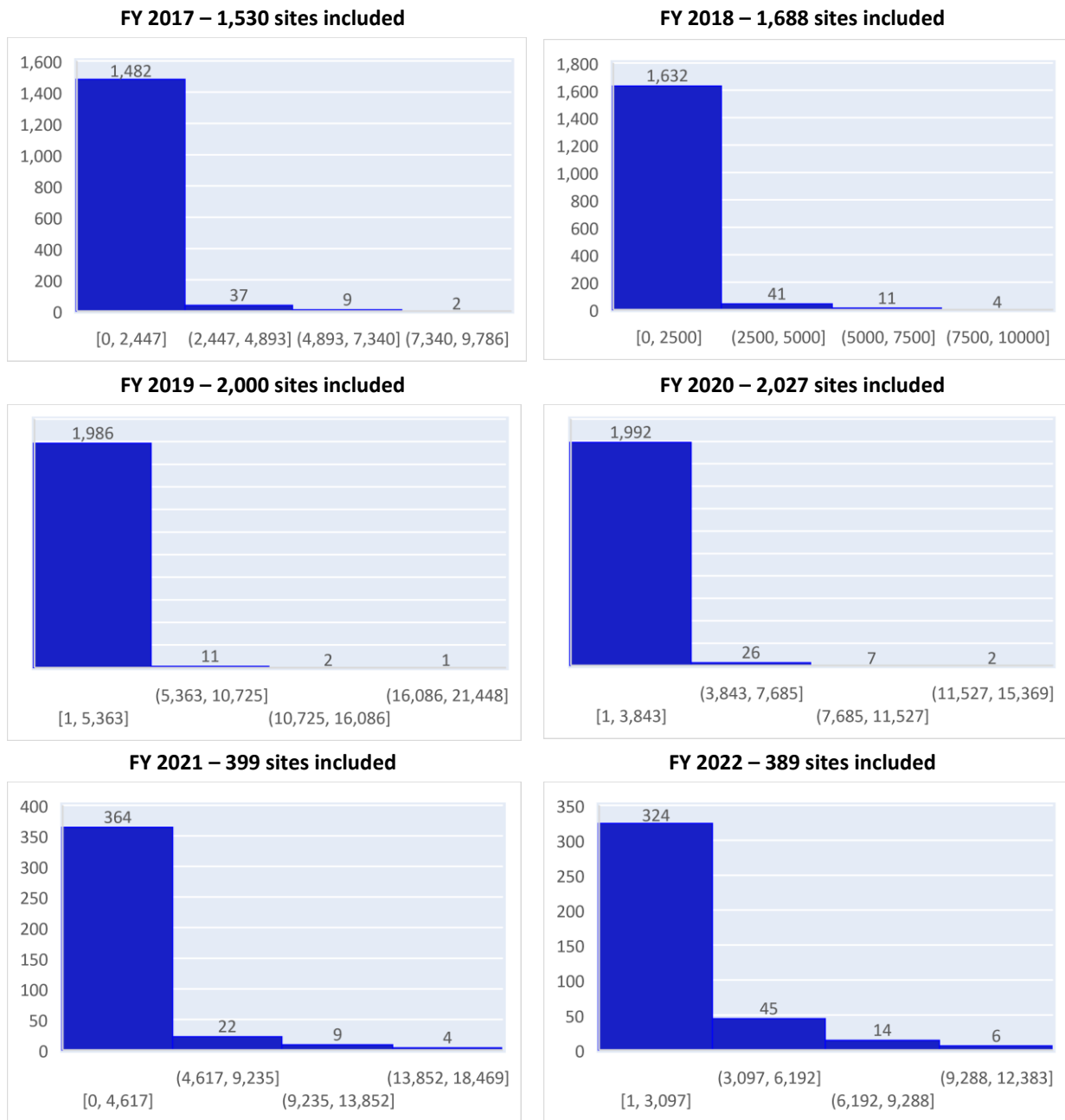
<sup>200</sup> See, e.g., Docket No. ACR2022, Library Reference USPS-FY22-45, folder “USPS-FY22-45.zip,” folder “FY22.45.Files.zip,” folder “Rule 3050.50 Flats,” folder “Paragraph (e) -- Pinch Point Reports,” folder “e.6 Surface Visibility,” Excel file “Public SV Data\_FY18\_FY22.xlsx,” tab “First Set,” cell B17.

<sup>201</sup> *Id.* tab “Request,” cells B34:B36. See also Docket No. ACR2019, Library Reference USPS-FY19-45, folder “Paragraph (e) -- Pinch Point Reports,” folder “e.6 Surface Visibility,” Excel file “Public SV Data\_FY15\_FY19.xlsx,” tab “Request,” cells B34:B35.

<sup>202</sup> Source: Docket No. ACR2022, Library Reference USPS-FY22-45, folder “USPS-FY22-45.zip,” folder “FY22.45.Files.zip,” folder “Rule 3050.50 Flats,” folder “Paragraph (e) -- Pinch Point Reports,” folder “e.6 Surface Visibility,” Excel file “Public SV Data\_FY18\_FY22.xlsx.”

received up to 1,000 misrouted containers during the 4-week periods, and that many fewer sites received more than 1,000 misrouted containers.

**Figure III-37**  
**Number of Facilities by the Number of Misrouted Containers,**  
**Shown in 1,000 Container Increments, in FY 2017 Through FY 2022<sup>203</sup>**



<sup>203</sup> Source: Docket No. ACR2022, Library Reference USPS-FY22-NP31, Excel file “NonPublic SV Data\_FY18\_FY22.xlsx;” Docket No. ACR2019, Library Reference USPS-FY19-NP31, December 27, 2019, Excel file “NonPublic SV Data\_FY15\_FY19.xlsx.”

The data depicted in the above figures suggest that the number of sites for which the Postal Service provided misrouted container data has decreased from over 1,500 in FY 2017, and more than 2,000 in FY 2020, to only 389 sites in FY 2022. Moreover, the data suggest that the number of misrouted containers did not decrease as the number of sites included in the reported data decreased. On the contrary, the 404,710 containers in FY 2017 pertained to 1,530 sites while the 622,132 containers in FY 2022 were unloaded at just 389 sites. That suggests an increase from an average of 265 misrouted containers per site in FY 2017 to an average of 1,599 misrouted containers per site in FY 2022. The impact of routing these containers to their intended facilities on transportation costs is potentially large, considering possibly separate trip for each misrouted container that a facility unexpectedly receives and sends to its intended site.

The Commission notes that the analysis presented in this section is meant to explain the efficiency of the Postal Service's overall transportation operations. This is because the Postal Service generally combines mail products with similar service standards, and with the same origin and destination points, on shared transportation.<sup>204</sup> This is also because the trip and container data provided by the Postal Service and analyzed in this section do not include information on mail products transported on trips and in containers.

The Postal Service uses the Transportation Cost System (TRACS) to develop distribution keys, which are then used to allocate costs incurred on purchased and postal vehicle transportation to mail products.<sup>205</sup> The distribution keys are estimated by sampling trucks and truck stops, as well as mail included on sampled trucks, for several categories of trips. *Id.* As such, inefficiencies in transportation operations, such as trips which operate solely to transport flats products sorted on an FSS equipment from an NDC directly to respective destination DDUs, would appear in a representative sample, their transported volumes would be reflected in estimated distribution keys, and in turn, in transportation costs distributed to flats products. *Id.*

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<sup>204</sup> See, e.g., Docket No. N2021-2, United States Postal Service Request for an Advisory Opinion on Changes in the Nature of Postal Services, June 17, 2021, at 7-8.

<sup>205</sup> See generally Docket No. ACR2022, Library Reference USPS-FY22-36, December 29, 2022, PDF file "USPS\_FY22\_36\_TRACS-Preface.pdf."

## 2. Last Mile Delivery

The Last Mile occurs during the time a mailpiece is in transit from its final mail processing plant sortation or delivery unit bundle handling to its delivery by postal personnel.

The Postal Service uses last mile impact (LMI) quarterly scores to monitor the service impact of last-mile delivery. The Postal Service defines LMI as “an estimate of the percentage of mail which moved from on-time after the last processing scan to late after delivery.”<sup>206</sup> The LMI report includes the overall on-time score, on-time score at last processing, and the LMI for all flat-shaped products at each service standard.<sup>207</sup> As seen in Table III-3, compared to FY 2021, the LMI quarterly scores in FY 2022 showed varying levels of performance with regard to the products. The annual LMI scores for various flats categories (but those in the USPS Marketing Mail High-Density Saturation and Bound Printed Matter categories), generally improved from FY 2021 to FY 2022. The Postal Service’s national target for LMI is 1.0 percent.<sup>208</sup>

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<sup>206</sup> See Docket No. RM2018-1, Response to CIR No. 1, question PP6-4.d. The Postal Service states that some of the measurement systems under the Transit Time Measurement System (TTMS) provides the calculations of the LMI for flats. *Id.* question PP6-4.b.

<sup>207</sup> The Commission had proposed the rules for the data reporting requirements as part of 39 C.F.R. § 3050.50. See Order No. 5004 at 11, 20.

<sup>208</sup> See Docket No. ACR2019, Responses of the United States Postal Service to Questions 1-41 of Chairman’s Information Request No. 4, January 24, 2020, question 15.k.



**Table III-3**  
**Last Mile Impact: Change Year Over Year, FY 2022–FY 2021<sup>209</sup>**

Product	Service Standard	Change Year Over Year (FY 22-FY 21)			
		Q1	Q2	Q3	Q4
Presort First-Class™ Flats	Overnight	1.1	0.8	0.8	0.2
	Two-Day	0.3	0.9	0.7	0.4
	3-5 Day	1.0	1.1	1.9	1.8
Single Piece First-Class™ Flats	Overnight	N/A			
	Two-Day	0.1	0.3	0.1	0.2
	3-5 Day	-0.2	-0.2	0.3	0.3
USPS Marketing Mail Flats	Destination Entry	1.5	1.5	1.5	1.2
	End-to-End	0.1	-0.4	0.0	0.2
USPS Marketing Mail Carrier Route	Destination Entry	1.4	1.8	1.5	1.1
	End-to-End	0.3	0.4	0.3	1.6
USPS Marketing Mail EDDM-Retail	Destination Entry	N/A			
USPS Marketing Mail HD and Sat Flats	Destination Entry	-0.4	0.1	0.0	-0.4
	End-to-End	-0.2	-0.4	-0.8	0.3
Periodicals-Within County		0.1	0.4	0.8	0.7
Periodicals-Outside County	Destination Entry	0.2	0.4	1.1	0.6
	End-to-End	0.0	-0.5	0.1	0.1
Bound Printed Matter Flats	Destination Entry	0.3	-0.5	-0.5	0.3
	End-to-End	-0.1	-0.9	0.3	0.3

<sup>209</sup> Source: Docket No. ACR2022, Library Reference USPS-FY22-45, folder "USPS-FY22-45.zip," folder "FY22.45.Files.zip," folder "Rule 3050.50 Flats," folder "Paragraph (e) -- Pinch Point Reports," folder "e.9 Trend Narrative.PRC.LR.9 Update," Excel file "CH 6 Data and Tables 2022.PRC.LR.9 Update.xlsx," tab "LMI Indicators." The colors in the cells of the table indicate LMI quarterly scores at varying levels of performance with regards to the products in FY 2022, in comparison to FY 2021. Considering that the Postal Service's national target for LMI is 1.0 percent, the green color shows a performance that is close to or higher than the national target (darker/brighter shades of green indicate a better performance). The yellow color shows a medium level performance, and the red/orange color shows a poor level performance (where red colors characterize the poorest performance).

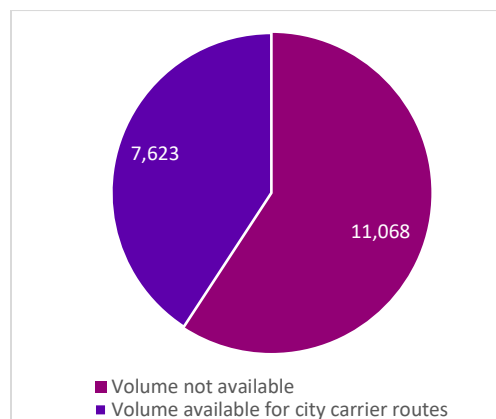
As discussed in Section III.B.4.f., during mail processing site visits, the Commission learned that DDUs received regular shipments of flats, which were not sorted at the upstream mail processing facilities according to the price categories they qualified for, and required manual sorting to carrier route level and/or manual casing, by DDUs' staff. The Commission followed up with the Postal Service to request mail class-specific data on destinating flats volumes received by DDUs for delivery, the amount of sorting they received at the upstream mail processing facilities, as well as the volumes and workhours recorded in manual flats distributions. CHIR No. 5, question 9.

The Postal Service explains that no mail class information for flats received by DDUs for final delivery was available. January 13 Response to CHIR No. 5, questions 9.a.-b. The Postal Service also explains that no data for total destinating flats volumes were available, and only data for flats destinating on city carrier routes were available. *Id.*

For flats' sort levels, the Postal Service could only provide flats volumes that DDUs received in DPS, following FSS processing at upstream mail processing sites and could not provide data for flats sorted to other levels. *Id.* question 9.d.

The data provided by the Postal Service indicate that of the 18,691 DDUs, as identified by unique finance numbers, no data on destinating flats volumes were available for 11,068 units. *See* Figure III-38.

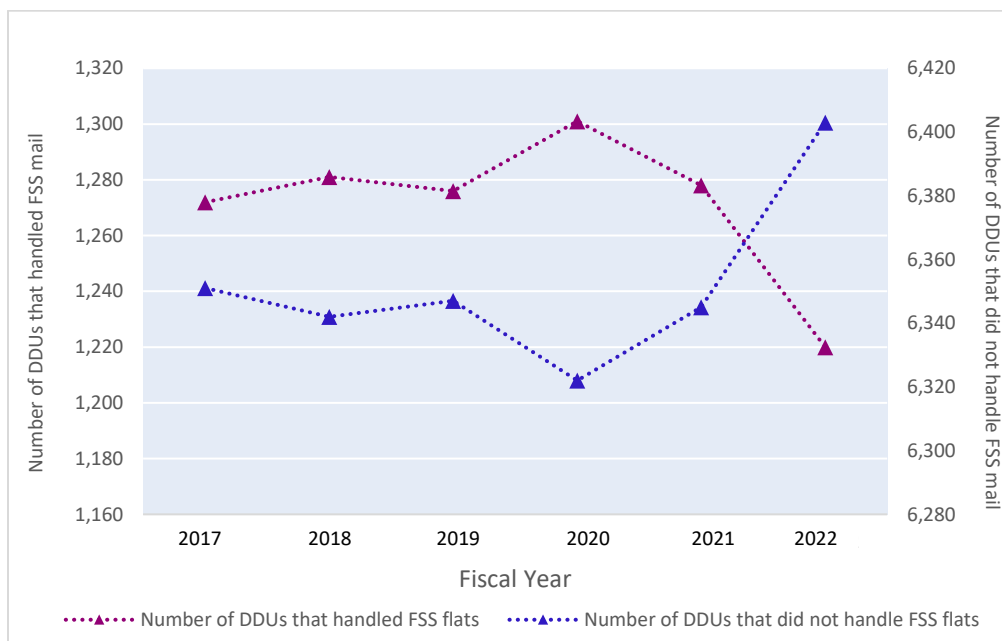
**Figure III-38**  
**Number of DDUs<sup>210</sup>**



<sup>210</sup> Source: January 13 Response to CHIR No. 5, question 9; Library Reference USPS-SS2022-1/NP4, January 13, 2023, Excel file "ChIR\_5\_Q9\_a.b.d\_DOIS.xlsx."

Of the 7,623 DDUs for which volumes destinating on city carrier routes are available, the number of DDUs that handled FSS mail fluctuated between FY 2017 and FY 2021, declining more sharply in FY 2022, as illustrated in Figure III-39. This likely is related to a large extent to the decommissioning of FSS operations at mail processing facilities, which the Postal Service started in FY 2021.<sup>211</sup> See Section III.B.4.b.

**Figure III-39**  
**Number of DDUs for Which the Postal Service Provided Data on Flats Volumes Destinating on City Carrier Routes, FY 2017–FY 2022<sup>212</sup>**

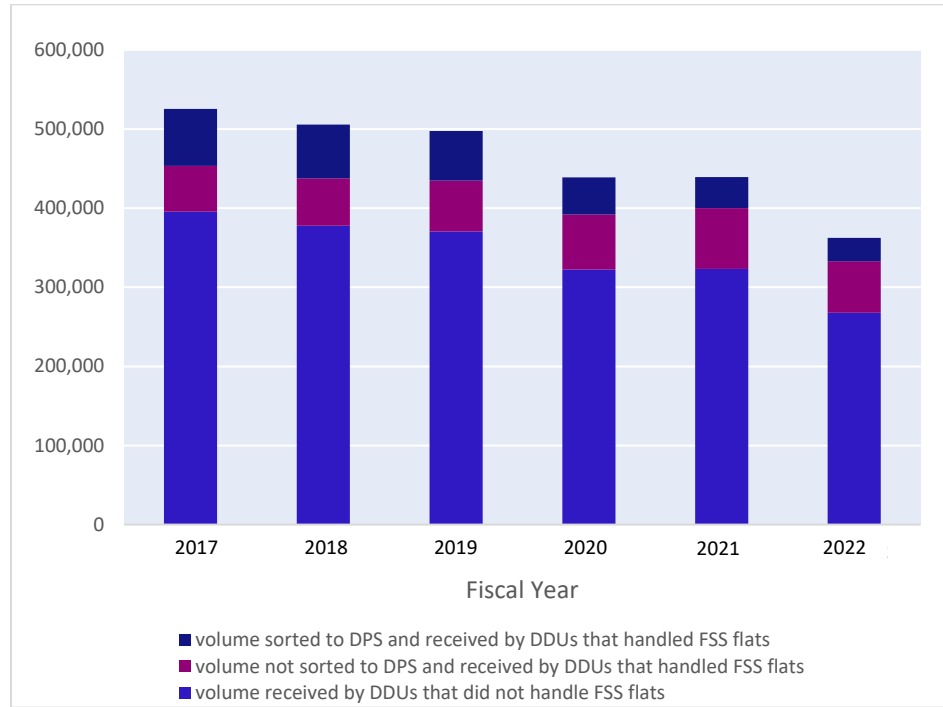


In Figure III-40, the Commission illustrates that most (about 75 percent) of the provided destinating flats volumes were received by DDUs that did not handle FSS mail in the respective fiscal years. The figure provides additional separation for volumes received by DDUs that handled FSS mail, by whether the received volumes were sorted to DPS at the upstream mail processing facility or not.

<sup>211</sup> Docket No. ACR2021, Library Reference USPS-FY21-45, folder “USPS-FY21-45.zip,” folder “FY21.45.Files.zip,” folder “Rule 3050.50 Flats,” folder “Paragraph (f) -- Operational Changes Report,” PDF file “FY21 Paragraph (f) Report.pdf,” at 4-5; Docket No. ACR2022, Library Reference USPS-FY22-45, folder “USPS-FY22-45.zip,” folder “FY22.45.Files.zip,” folder “Rule 3050.50 Flats,” folder “Paragraph (f) -- Operational Changes Report,” PDF file “FY22 Paragraph (f) Flats Operational Initiatives Report.pdf,” at 4-5.

<sup>212</sup> Source: January 13 Response to CHIR No. 5, questions 9.a.-b., d.; Library Reference USPS-SS2022-1/NP4, Excel file “ChIR\_5\_Q9\_a.b.d\_DOIS.xlsx.”

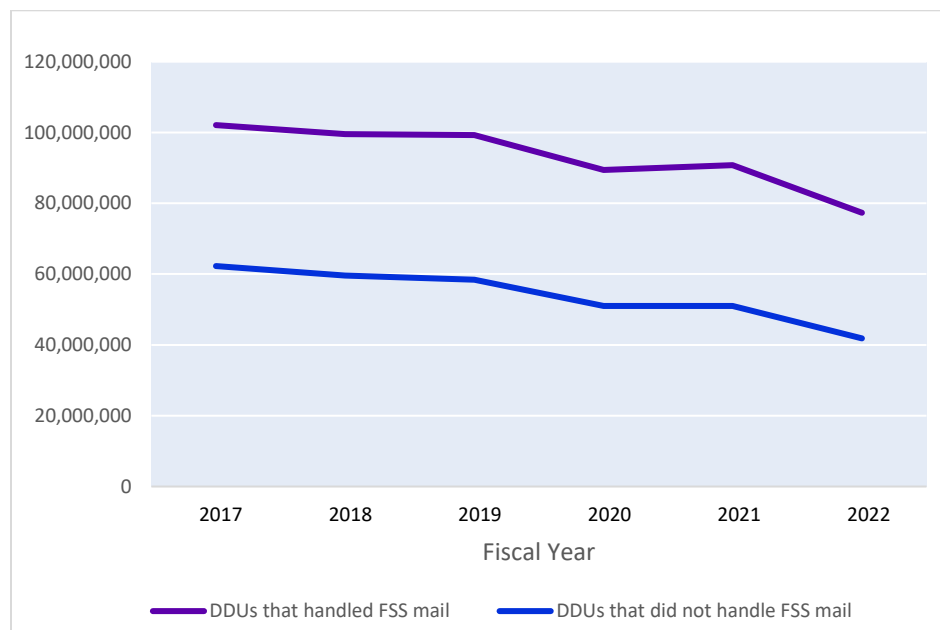
**Figure III-40**  
**Flats Volumes (Millions) Provided by the Postal Service as Destinating on City Carrier Routes,**  
**FY 2017–FY 2022<sup>213</sup>**



Of the volumes included in Figure III-40, about 25 percent were received by DDUs that handled FSS flats. However, the DDUs that handled FSS flats represented only about 17 percent of DDUs for which destinating flats volumes were provided by the Postal Service. This suggests that DDUs that handled FSS flats also handled higher overall flats volumes per year than the DDUs that did not handle FSS flats. This is depicted in Figure III-41.

<sup>213</sup> Source: January 13 Response to CHIR No. 5, question 9; Library Reference USPS-SS2022-1/NP4, Excel file “ChIR\_5\_Q9\_a.b.d\_DOIS.xlsx.”

**Figure III-41**  
**Flats Volumes Received for Delivery on City Carrier Routes Per Fiscal Year Per DDU,**  
**FY 2017–FY 2022<sup>214</sup>**



In FY 2017, DDUs that handled FSS flats received about 64 percent more flats for final delivery on city carrier routes, on average. By FY 2022, the DDUs that handled FSS flats received about 85 percent more flats for delivery than DDUs that did not handle FSS flats.

This analysis confirms that the Postal Service deployed FSS equipment at mail processing facilities that served high delivery volume DDUs, with likely high delivery point densities. The analysis also suggests that flats volume declines have not been evenly distributed in the postal network. Specifically, data included in the above figure suggest that flats which destined in higher-density areas, included in FSS zones, have not declined as sharply as have volumes that destined in non-FSS zones. This not only confirms that the impact of FSS removal on the workload associated with the need to manually case all flats will be more severe for DDUs serving high-density urban areas, but also suggests that high delivery-point density DDUs might not experience as much relief in casing workload due to volume declines as will DDUs serving lower density areas. In fact, lower delivery point density DDUs that the Commission staff visited already described decrease in workloads related to casing of flats which was related to flats volume declines.

The Commission does not have data that would allow examining flats volumes that should have been processed on FSS and those that were processed on FSS, at the delivery unit level. As noted in Section III.B.5., the Postal Service does not track data on flats that bypass automated processing at mail processing sites due to mailpiece irregularities. As such, the

<sup>214</sup> Source: January 13 Response to CHIR No. 5, question 9; Library Reference USPS-SS2022-1/NP4, Excel file "ChIR\_5\_Q9\_a.b.d\_DOIS.xlsx."

Commission requested data on volumes and workhours recorded in manual flats operations at DDUs. CHIR No. 5, questions 9.e-f. The data provided by the Postal Service in response to this request are depicted in Figures III-42 and III-43.

**Figure III-42**  
**Distribution of Flats Volumes Recorded in Manual Flats Distributions Between DDUs That Handled FSS Mail and Those That Did Not, FY 2017–FY 2022<sup>215</sup>**

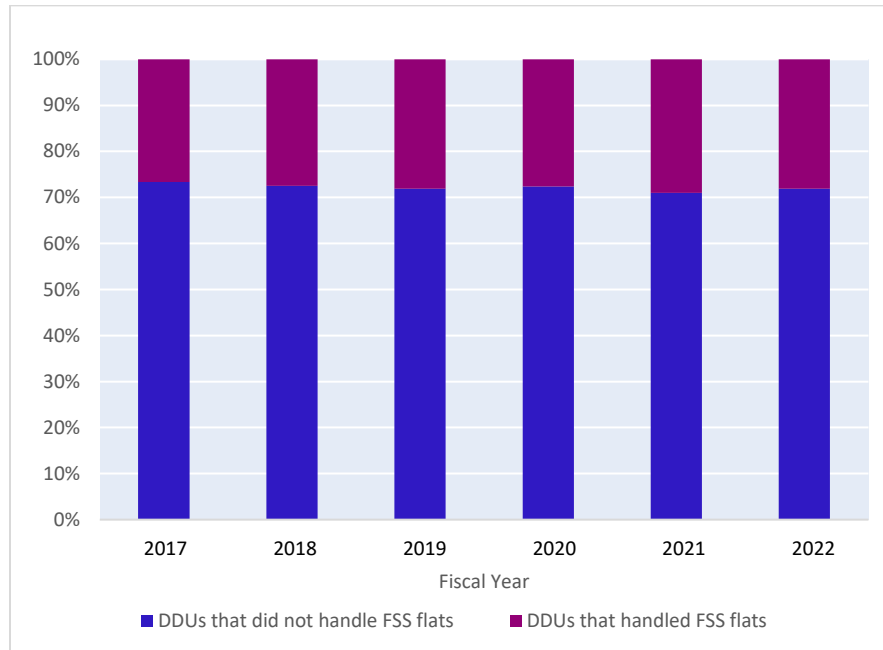
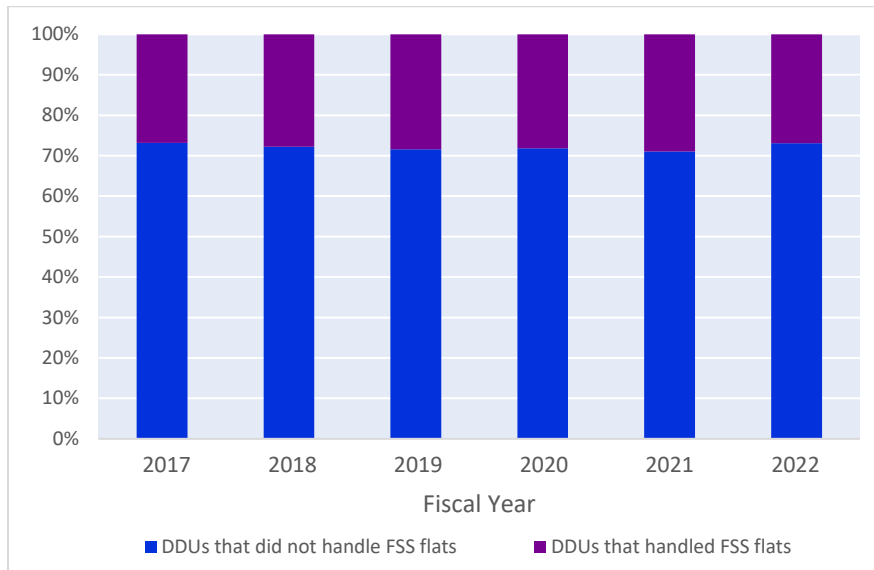


Figure III-42 suggests that about 30 percent of flats recorded in manual distributions pertained to DDUs that handled FSS mail, while these DDUs received 25 percent of flats volumes for which the Postal Service provided data (see Figure III-40).

Figure III-43 shows similar proportions of workhours recorded in manual flats distributions between DDUs that handled FSS flats and those that did not.

<sup>215</sup> Source: January 13 Response to CHIR No. 5, question 9; Library Reference USPS-SS2022-1/NP4, Excel files “ChIR\_5\_Q9\_a.b.d\_DOIS.xlsx” and “ChIR 1\_Q9 Manual Flt Vol\_hrs FY 17\_FY22.xlsx.”

**Figure III-43**  
**Workhours Recorded in Manual Flats Distributions<sup>216</sup>**

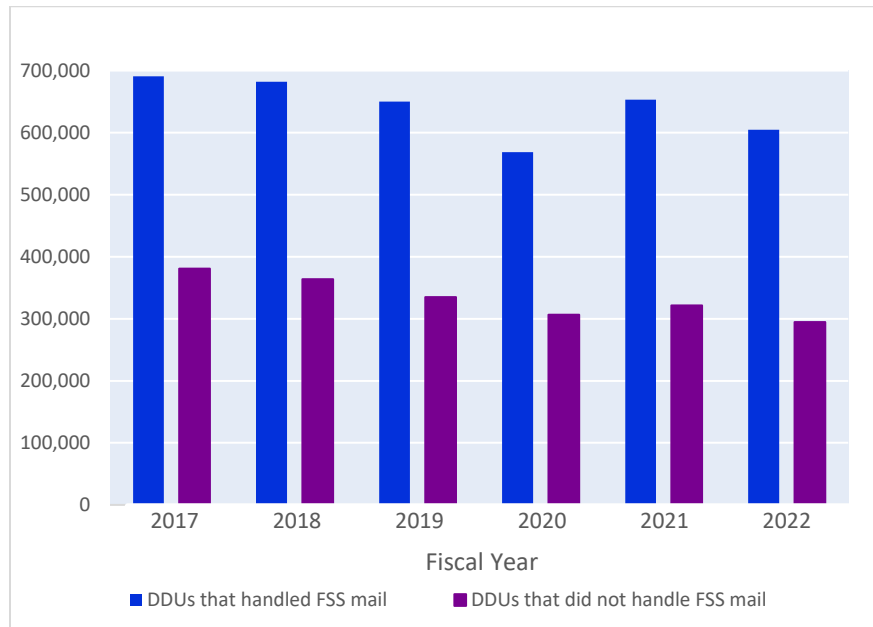


As noted above and depicted earlier in this section in Figure III-41, DDUs that handled FSS flats handled between 64 and 85 percent more destinating flats per delivery unit, on average, than DDUs that did not handle FSS mail.

Analysis of flats volumes handled in manual distributions on a per delivery unit basis reveals that DDUs that handled FSS flats processed between 81 and 105 percent more flats in manual distributions than DDUs that did not handle FSS flats. This is illustrated in Figure III-44.

<sup>216</sup> Source: Library Reference SS2022-1-NP4, January 13, 2023, Excel files “ChIR\_5\_Q9\_a.b.d\_DOIS.xlsx” and “ChIR\_1\_Q9 Manual Flt Vol\_hrs FY 17\_FY22.xlsx.”

**Figure III-44**  
**Flats Recorded in Manual Distributions per DDU and Fiscal Year<sup>217</sup>**



The data analyzed in this section confirm what the Commission staff observed during DDU site visits and what was discussed in Section III.B.4.f. Specifically, Commission staff observed that the DDUs that served FSS zones reported more severe increases in workload related to inadequately processed flats received from the upstream mail processing facilities than the DDU that did not serve any FSS zones.

The Commission and the operational expert both note the need to understand the implications that sub-optimal FSS operations have had in the past, as illustrated in the above data analysis, as well as the need to continue monitoring the implications of FSS removal on DDUs’ operations, costs, and service performance related to last mile impact.

<sup>217</sup> Source: Library Reference SS2022-1-NP4, January 13, 2023, Excel files “ChIR\_5\_Q9\_a.b.d\_DOIS.xlsx” and “ChIR\_1\_Q9 Manual Flt Vol\_hrs FY 17\_FY22.xlsx.”



# CHAPTER IV. IMPACTS OF DIFFERENT FACTORS ON FLATS COST

## A. Impact of Volume Trends on Flats Cost

### 1. Analysis of Volume Trends and Unit Attributable Costs at the Product Level for Non-Compensatory Flats Products<sup>218</sup>

Figure IV-1 compares the volume and unit attributable cost trends of a group of non-compensatory and compensatory flats products.<sup>219</sup> Unit attributable costs are adjusted for inflation using FY 2021 as the base year,<sup>220</sup> which are represented by the solid lines in the figure. The dotted lines represent nominal unit attributable costs. The decrease in the volume of the group of non-compensatory flats is due to decreases in all three flats products in the group: USPS Marketing Mail Flats, In-County Periodicals, and Outside County Periodicals. The volume of the group of compensatory flats is stable until the last 3 years, which sees a decline in volume due to a decrease in volume of USPS High Density and Saturation Flats and Parcels. Unit attributable costs of the group of compensatory products remain relatively stable over the years, while non-compensatory flats products have experienced a large increase in real unit attributable costs between FY 2016 and FY 2021.

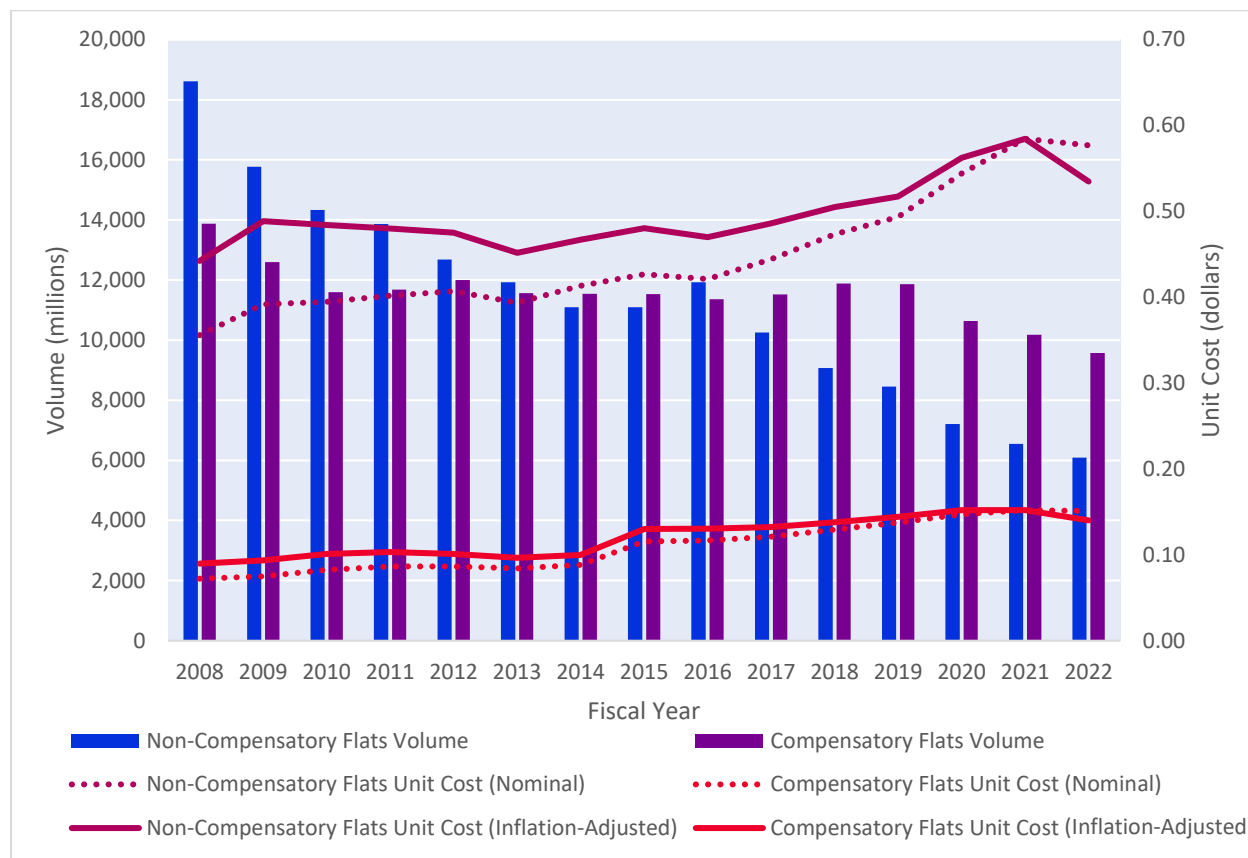
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<sup>218</sup> As in Chapter II, non-compensatory flats products considered in this Chapter are flats products for which their revenue did not cover their attributable cost in FY 2021.

<sup>219</sup> This figure shows the volume and unit attributable cost for flats that have been non-compensatory or compensatory for the entire period shown in the graph. First-Class Mail Flats and Carrier Route Flats are excluded because First-Class Mail Flats was non-compensatory in FY 2021 only and Carrier Route Flats became non-compensatory in FY 2019. EDDM-R is excluded because it was not added to a product list until FY 2013.

<sup>220</sup> This adjustment uses FY consumer price index for all urban consumers (CPI-U). See United States Bureau of Labor Statistics, available at [www.bls.gov](http://www.bls.gov).

**Figure IV-1**  
**Volume and Unit Attributable Cost<sup>221</sup> Trends of a Group of Non-Compensatory and Compensatory Flats,<sup>222</sup> FY 2008–FY 2022<sup>223</sup>**



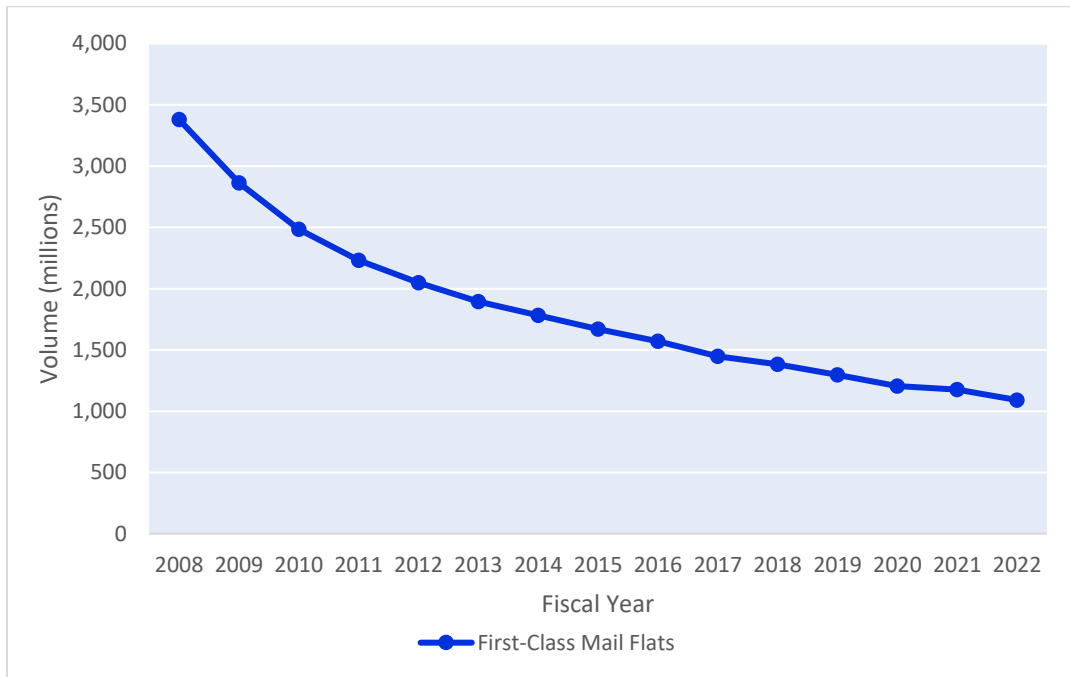
Figures IV-2 through IV-4 show that for each flats products that were non-compensatory in FY 2021, the volume decrease has been persistent and steady; volume was decreasing almost every year since FY 2008. In FY 2016, there was a migration of Carrier Route Flats to the USPS Marketing Mail Flats product due to the implementation of FSS-specific prices. FY 2016 ACD at 48 n.59. See Figure IV-3. In FY 2017, the Postal Service proposed, and the Commission approved, the elimination of these FSS prices. *Id.* Therefore, the volume and, consequently, unit attributable cost data for FY 2016 reflect a different mail mix than volume and unit attributable cost data for other years. *Id.*

<sup>221</sup> Unit attributable costs have been adjusted for inflation using FY 2021 as the base year. The dotted line represents the un-adjusted, nominal unit attributable costs.

<sup>222</sup> The group of non-compensatory flats includes USPS Marketing Mail Flats, In-County Periodicals, and Outside County Periodicals. The group of compensatory flats includes USPS High Density and Saturation Flats and Parcels and Bound Printed Matter Flats. See n.219 for explanation.

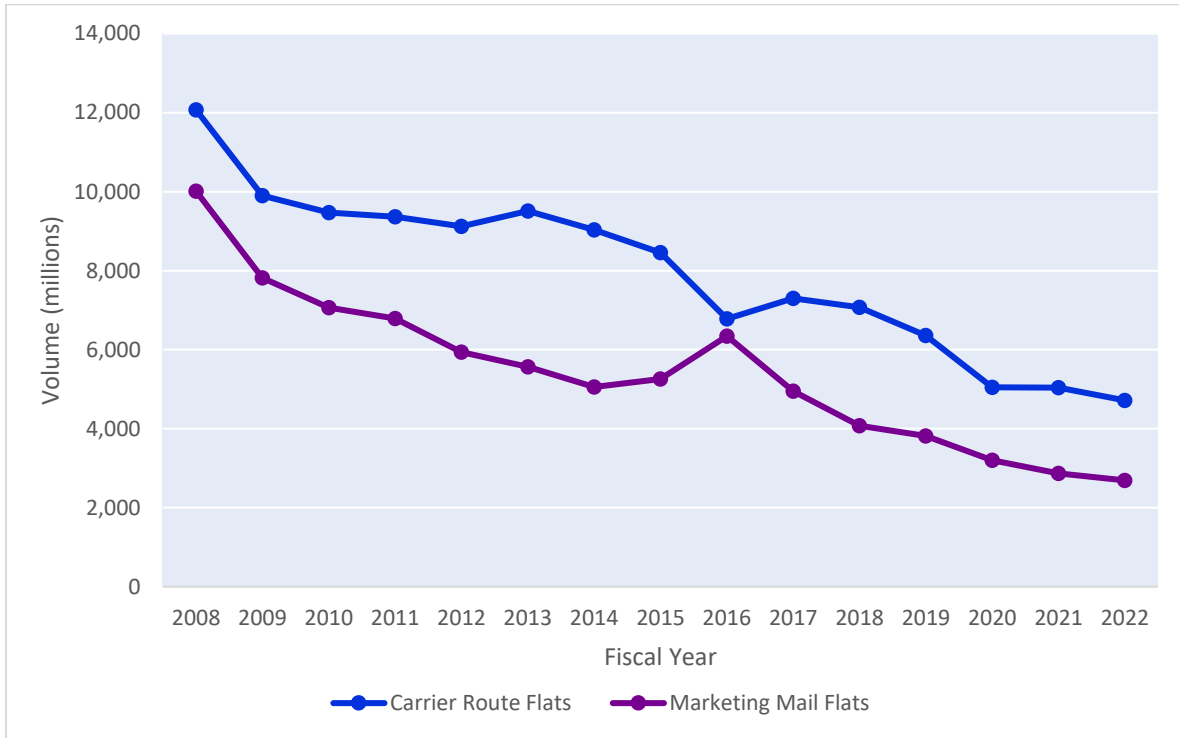
<sup>223</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report.

**Figure IV-2**  
**Volume of First-Class Mail Flats, FY 2008–FY 2022<sup>224</sup>**



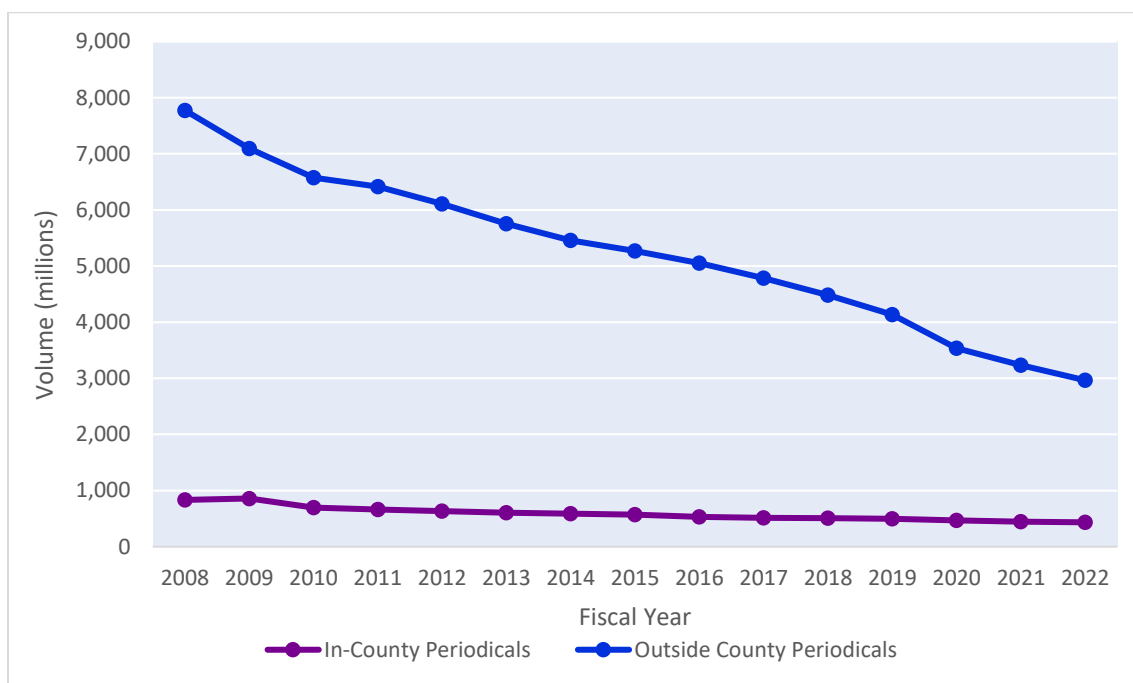
<sup>224</sup> Source: FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report.

**Figure IV-3**  
**Volume of USPS Marketing Mail Flats and USPS Carrier Route Flats,**  
**FY 2008–FY 2022<sup>225</sup>**



<sup>225</sup> Source: FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report.

**Figure IV-4**  
**Volume of Periodicals Products, FY 2008–FY 2022<sup>226</sup>**



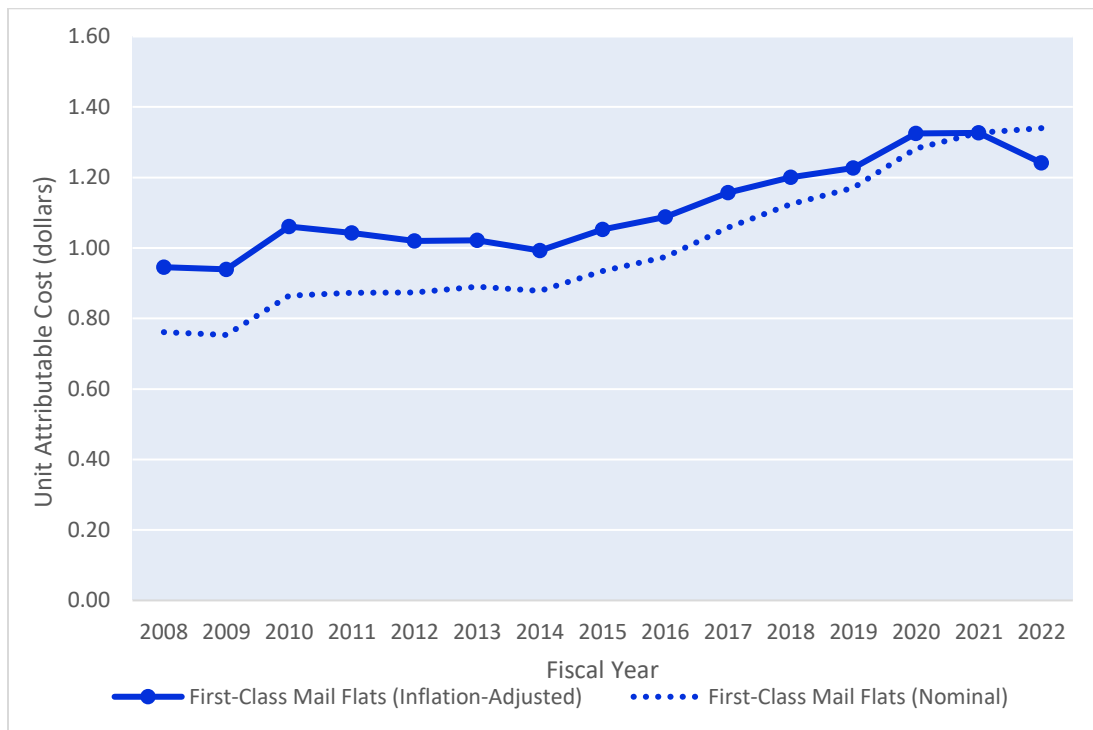
Figures IV-5 through IV-7 show the unit attributable costs (inflation-adjusted and nominal) of flats products that were non-compensatory in FY 2021. The unadjusted unit attributable costs are represented by the dotted lines. First-Class Mail Flats has a significantly higher unit attributable cost than any other non-compensatory flats products. In the FY 2021 ACR, the Postal Service stated that the increase in the unit attributable cost of First-Class Mail Flats between FY 2020 and FY 2021 was driven by increases in mail processing and surface transportation unit costs.<sup>227</sup> The unit attributable cost of First-Class Mail Flats has been increasing since FY 2014, and its real unit attributable cost has increased by 33 cents from FY 2014 to FY 2021. USPS Marketing Mail Flats and Outside County Periodicals have the next highest unit attributable costs. Until FY 2022, the unit attributable cost of USPS Marketing Mail Flats had been increasing since FY 2016, while Outside County Periodicals unit attributable cost remained relatively stable until it increased sharply in FY 2020 and

<sup>226</sup> Source: FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report.

<sup>227</sup> FY 2021 ACR at 9. First-Class Mail Flats’ mail processing unit costs increased on average by 6.4 percent annually between FY 2017 and FY 2021. *Id.* The Postal Service explains that as flat-shaped products’ volumes decreased, the productivities for various mail processing operations also declined, resulting in higher mail processing costs. *Id.* In regard to higher transportation costs, the Postal Service attributes this to the higher variabilities approved in Docket No. RM2021-1 as well as the possibility that declining volumes resulted in fewer average pieces per container and thus higher transportation unit attributable costs. *Id.*

FY 2021.<sup>228</sup> Carrier Route Flats and In-County Periodicals have lower unit attributable costs but have also experienced large proportional increases in unit attributable costs.<sup>229</sup>

**Figure IV-5**  
**Unit Attributable Costs of First-Class Mail Flats: Inflation-Adjusted and Nominal, FY 2008–FY 2022<sup>230</sup>**

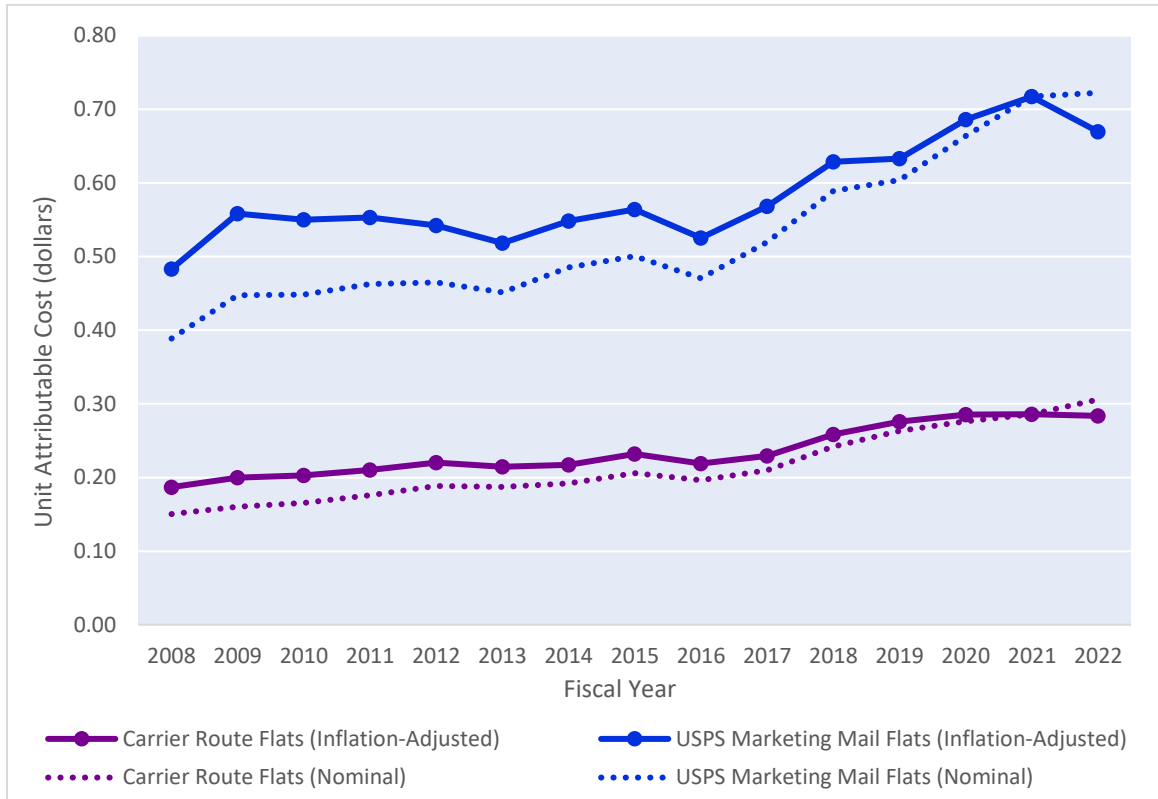


<sup>228</sup> The Postal Service ascribes the increase in the unit attributable cost of USPS Marketing Mail Flats to higher unit mail processing costs due to decreases in USPS Marketing Mail Flats volume. It states that “[b]ecause setup and breakdown activities are largely invariant to processed volume, the continued volume declines necessarily lead to higher unit mail processing costs.” FY 2021 ACR at 20.

<sup>229</sup> The Postal Service notes that the increase in unit attributable cost of Carrier Route Flats between FY 2019 and FY 2020 is driven by higher delivery unit costs. FY 2020 ACR at 13. This increase is due in part to a costing methodology change. *Id.* It states that in addition, the declining volume caused a loss of economies of density, as there were fewer pieces to distribute to a steadily increasing number of delivery points. *Id.* at 14.

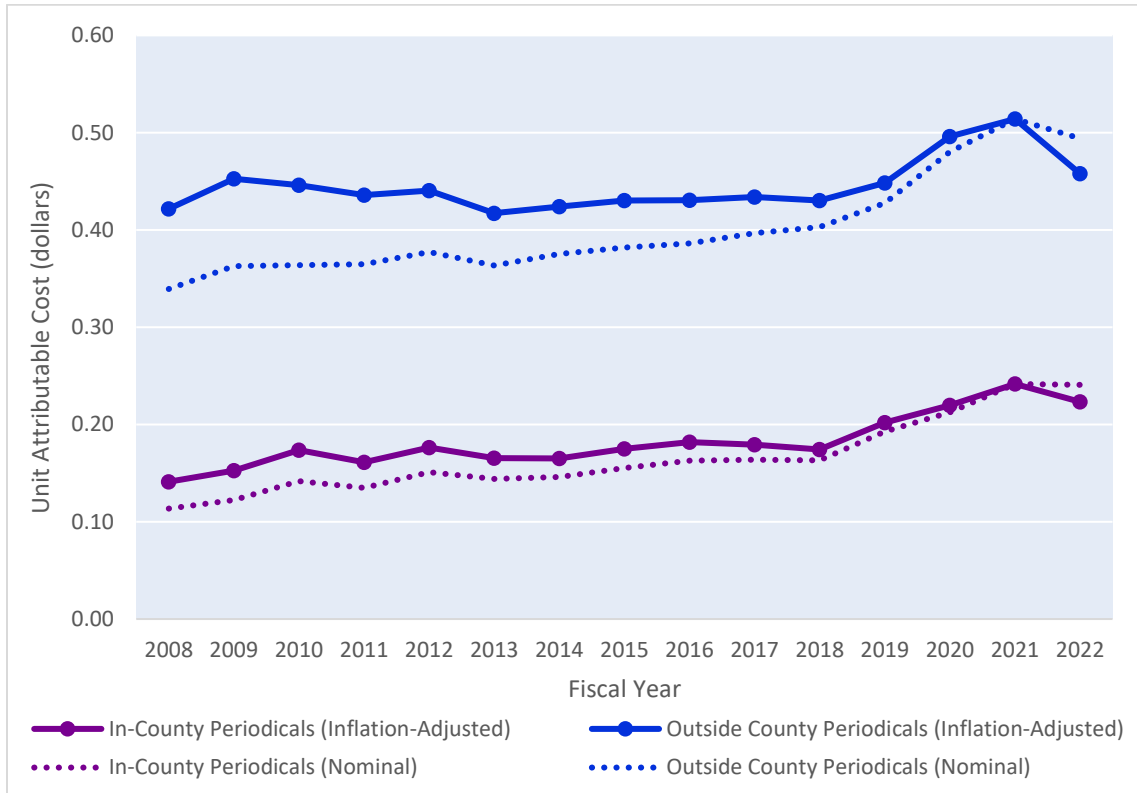
<sup>230</sup> Source: FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report.

**Figure IV-6**  
**Unit Attributable Costs of USPS Marketing Mail Flats and Carrier Route Flats: Inflation-Adjusted and Nominal, FY 2008–FY 2022<sup>231</sup>**



<sup>231</sup> Source: FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report.

**Figure IV-7**  
**Unit Attributable Costs of Periodicals: Inflation-Adjusted and Nominal,**  
**FY 2008–FY 2022<sup>232</sup>**



<sup>232</sup> Source: FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report.



## 2. Econometric Analysis of the Impact of the Decreasing Flats Volumes on Unit Cost

Another way to investigate efficiency is to view the Postal Service as a natural monopoly and measure the potential loss of scale economies implied by the volume decline, in particular for flat-shaped mail.<sup>233</sup> Economies of scale are the cost advantages that may be reaped from producing more so that costs are spread over more pieces. In this section, the degree of scale economies (DSE) is measured at an organization-wide level and at product levels and then compared. This section also includes a prediction of the future flat-shaped mail marginal costs based on the extrapolation of current volume trends. Finally, this section discusses the challenges posed by the analysis, as well as potential solutions to those challenges.

### a. Marginal Unit Cost Analyzed in this Section

In the context of a single-product firm, the measurement of the unit cost poses little to no conceptual problems. In a multiproduct firm such as the Postal Service, however, the definition of the unit cost is not straightforward.<sup>234</sup> In this section, the Commission analyzes and econometrically predicts the marginal cost, “the cost of producing another unit of output,”<sup>235</sup> of each of 4 flat-shaped mail products. In its annual Cost and Revenue Analysis (CRA) reports, the Postal Service provides data on unit volume variable cost (the ratio of volume variable cost to mail volume),<sup>236</sup> which “is in fact equal to [the product’s] marginal cost.”<sup>237</sup>

The econometric analysis is performed after a firm-level investigation of the degree of scale economies (DSE). An investigation into scale economies involves both the marginal costs and the ratio of total operating (accrued) cost to total mail volume.

### b. Data

Four flats mail products are considered in this analysis along with 10 other Market Dominant products or product categories, as well as one competitive mail category consisting of aggregated competitive products. There are 15 mail products or product categories in total.

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<sup>233</sup> Although the question regarding whether the Postal Service exhibits characteristics of a natural monopoly has been extensively debated, this debate has not reached clear and unequivocal conclusions.

<sup>234</sup> See Docket No. RM2016-2, Order Concerning United Parcel Service, Inc.’s Proposed Changes to Postal Service Costing Methodologies (UPS Proposals One, Two, and Three), September 9, 2016, at 54, Appendix A (Order No. 3506); United States Postal Service, Office of Inspector General, Report No. RARC-WP-17-005, Examining Changes in Postal Product Costs, March 13, 2017, Appendix at 11, available at [https://www.uspsoig.gov/sites/default/files/reports/2023-01/RARC-WP-17-005\\_0.pdf](https://www.uspsoig.gov/sites/default/files/reports/2023-01/RARC-WP-17-005_0.pdf).

<sup>235</sup> Summary Description of USPS Development of Costs by Segments and Components, Fiscal Year 2021; Narrative Explanation of Econometric Demand Equations for Market Dominant Products Filed with Postal Regulatory Commission on January 20, 2022; Narrative E, July 1, 2022, folder “Summary Description FY2021,” file “APPH-21.docx,” at H-1-H-2 (FY 2022 Summary Descriptions).

<sup>236</sup> See, e.g., Docket No. ACR2022, Library Reference USPS-FY22-1.

<sup>237</sup> FY 2022 Summary Descriptions, Appendix H at H-1.

The flat-shaped mail products are:

- Flats (First-Class Mail)
- Flats (USPS Marketing Mail)
- In-County (Periodicals)
- Outside County (Periodicals)

The other mail products or categories are:

- Single-Piece Letters (First-Class Mail)
- Single-Piece Postcards (First-Class Mail)
- Presort Cards (First-Class Mail)
- Presort Letters (First-Class Mail)
- Enhanced Carrier Route<sup>238</sup> (USPS Marketing Mail)
- Letters (USPS Marketing Mail)
- Parcels (USPS Marketing Mail)
- BPM Flats and Parcels (Package Services)
- Media and Library Mail (Package Services)
- Free Mail for the Blind and Otherwise Handicapped Persons & to service members
- Competitive Mail

To each of the 15 products or product categories corresponds a time series of volume, volume variable cost, and attributable cost data. The product-level time series data are annual observations over the 22 fiscal years, from 2000 to 2021. At the aggregate level, the time series of the overall accrued (or total operating) cost, total class-level volume, total mail volume, and total number of delivery points also range from FY 2000 to FY 2021.

### c. The Econometric Analysis

#### (1) Introduction

The econometric analysis starts from the premise that flat-shaped mail cannot be isolated from mail of other shapes in the postal network, and therefore, it is important to place the analysis of the impact of volume declines on unit costs for flats mail in the general context of the loss of scale economies generated at the firm level by overall mail volume decline. Consequently, the connection between firm-level loss of scale economies and flats mail volumes should be clarified.

However, there are difficulties in defining the connection between flats mail volume and firm-wide loss of scale economies. The first difficulty is that there is no meaningful way to disaggregate the Postal Service cost function (the relationship between the cost and the output generating it) into a set of product-level or group-of-products-level cost functions. Consequently, the disaggregation of the degree of scale economies into single-product returns uses the relevant cost concept of incremental cost (now equivalent to attributable cost), whereas at the firm level, total operating cost is a more relevant cost concept. This

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<sup>238</sup> This product category combines three products: High Density and Saturation Letters, High Density and Saturation Flats and Parcels, and Carrier Route.

makes the two measures difficult to compare unless total attributable cost is used to replace total operating cost at firm level.

The second difficulty comes from the challenge of controlling for relevant factors (*e.g.*, inflation, mail mix, delivery points) that influence the relationship between the unit cost and the volumes in firm-level analysis. This difficulty is what motivates a more detailed analysis within an econometric framework. However, even the econometric approach is not without challenges, as explained below.

When the regression analysis employs the time series, the longer the time period covered by the analysis, the more robust the model is, and the more precise estimates will be. In the model used to estimate the relationship between the unit marginal costs and the volumes, a relative shortness of the time series (22 years) may represent an obstacle for econometric analysis. An additional question is whether the regression should be run separately for each flats mail product or jointly for all the considered flats.

The most important difficulty in this econometric analysis is the interpretation of the estimated relationship between the unit costs and volumes, as causal. The unit volume variable cost data, for example, are the outputs of upstream econometric estimations performed by the Postal Service and reported annually. The latter estimations seek to causally link cost variables to their drivers, while controlling for many relevant factors. Additionally, the estimation does not disentangle flats volume decline and flat mail processing workhour and overtime workhours. Consequently, re-estimating the temporal relation between the reported marginal costs and volumes, delivery points, and measures of volume mix, and interpreting the estimated marginal effects as causal is, to say the least, problematic. The emphasis here is placed on the joint predictive power of these variables, the objective being the forecasting of the marginal costs.

Based on the above observations, the analysis is organized in the following two parts.

*Placing the flat-shaped mail in the general context of the scale diseconomies caused by mail decline.* In the first part of the analysis, a firm-level metric for the DSE is defined based on the relevant economic literature and calculated using the available data. The DSE is also calculated for each of the flats mail products. The objective of this part is to clarify and measure the linkage between the rate of mail volume decline and the rate of cost decline. The general conclusion here is that although, over the considered period, flats mail volume has declined at a greater rate than Market Dominant mail volume, the magnitude of product-level DSE requires caution in concluding that flats mail volume decline has contributed more than other Market Dominant mail volume decline to the firm's loss of scale economies.

*Analyzing flats marginal costs from a predictive perspective.* The second part of the analysis examines the linkage between flats unit volume variable costs (or marginal costs) and volumes while controlling for volume mix, delivery points, and inflation. An econometric model is built and estimated. The specific goal of this exercise is not to causally link unit

cost to mail volumes, but to predict the marginal costs of flats for FY 2022 through FY 2026, after estimating the temporal correlational relationship between the marginal cost and the volume data over the time period of FY 2000 through FY 2021. So, the declines in volumes are taken as warning signs that may help determine the likely future trends in the flats products' marginal costs.

(2) Part 1. Firm-Level and Product-Level Metrics for the Degree of Scale Economies and its Relation to Flats Mail

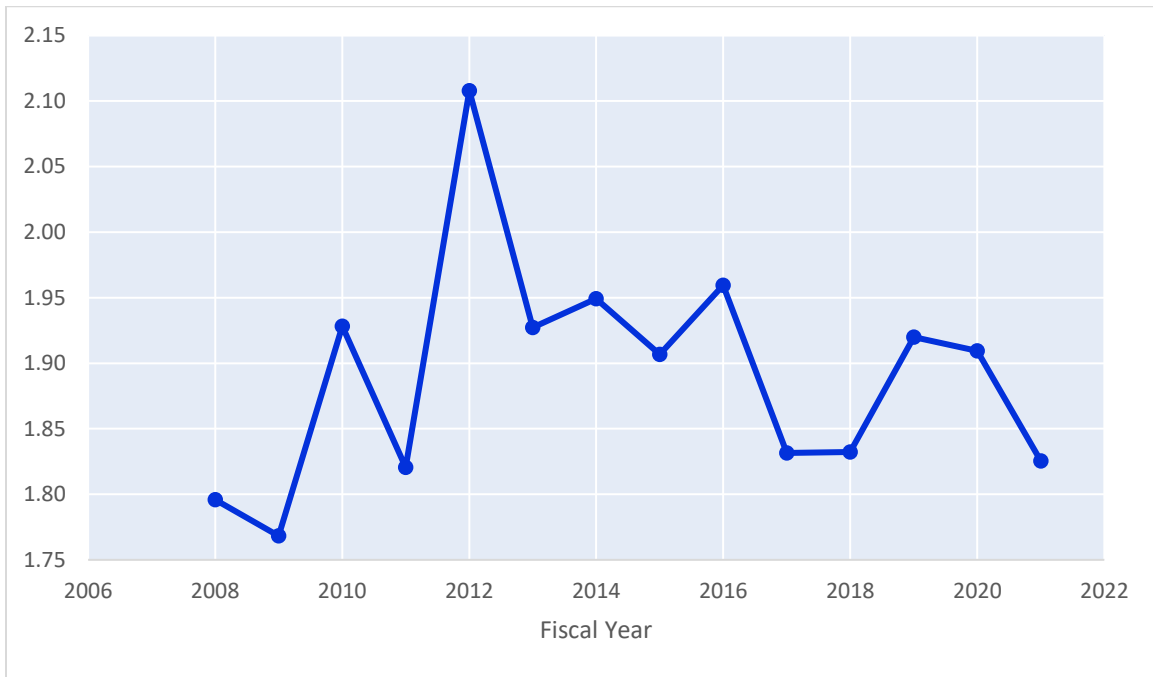
The notion of scale economies conveys the idea of a cost advantage induced by spreading the total operating cost over larger quantities of goods. The presence of economies of scale means that a proportionate increase in the output induces less than the proportionate increase in the cost with the effect that the cost per unit decreases.<sup>239</sup> The relevant metric is the DSE. The DSE can be interpreted as the elasticity of the composite output with respect to the cost needed to produce it. Returns to scale are increasing when the DSE is greater than one, constant when the DSE is equal to one, or decreasing when the DSE is less than one. BPW at 50. The DSE can be calculated in the context of the Postal Service as the ratio of total operating cost to total volume variable cost or, equivalently, the ratio of total operating (accrued) cost to total mail volume (this ratio is a proxy to average cost), divided by the average marginal cost (total volume variable cost divided by total mail volume). Because total operating cost is larger than volume variable cost, the magnitude of the metric is larger than one, *i.e.*, returns to scale are increasing. The details of this calculation and the presentation of the metric are in Appendix A, Section IV.A.2. Analysis.

Figure IV-8 shows the curve of the firm-level degree of scale economies, the magnitude of which has fluctuated over the years while remaining well above one. In the presence of scale economies, the decline in volumes results in a comparatively slower decline in total costs. The specific contributions of flats mails to this loss of scale economies can be suggested by the relative volume decline for flats compared to other Market Dominant mail.

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<sup>239</sup> The concept and its measurement are discussed in William J. Baumol, John C. Panzar, & Robert D. Willig, *Contestable Markets and the Theory of Industry Structure*, Harcourt Brace Jovanovich, Inc. (1988 ed.) (hereinafter "BPW").

**Figure IV-8**  
**Annual Degrees of Scale Economies (DSE)**



**Table IV-1**  
**Average Annual Growth Rate of Mail Volume, FY 2008–FY 2021**

Mail Product	Average Annual Growth Rate of Volume
First-Class Mail Flats	-7.80%
USPS Marketing Mail Flats	-9.16%
In-County Periodicals	-4.65%
Outside County Periodicals	-6.53%
Market Dominant Mail Total	-3.81%
Competitive Mail Total	12.38%

Table IV-1 shows that the average rates of decline in volume have been higher for the four highlighted flats products than for Market Dominant mail on average. While this may suggest that the declines of flat-shaped mail volumes have notably contributed to the overall loss of scale economies, such a conclusion is implicitly assuming that firm-level DSE is the same as product-level DSE, which is not the case.

Product-specific returns to scale can be calculated as the ratio of the average incremental cost of the mail product to its marginal cost. BPW at 68. In the Postal Service's costing methodology, product incremental cost is defined as the sum of its volume variable costs, its product specific costs, and those inframarginal costs calculated as part of a product's incremental costs. 39 C.F.R. § 3035.107(b).

Over the time period of FY 2017 through FY 2021, the DSEs for the four individual flats products have lied in the following ranges: First-Class Mail Flats [1.003-1.004], USPS Marketing Flats [1.003 -1.004], In-County Periodicals [1.000 -1.001], Outside County Periodicals [1.002-1.003]. The details are in the Appendix A, Section IV.A.2. Analysis. These magnitudes suggest that contrary to the conclusion suggested by the firm-level DSE, flats cost may have fallen almost as fast as volumes decline.

There are at least two limitations to the analysis conducted so far. The first is that the analysis does not isolate the impact of relevant factors, such as mail mix and delivery points (as a proxy for network factors). A second limitation is that the costs have not been adjusted for inflation. These two limitations are addressed in the second part of the analysis.

Part 2 of this analysis provides a more in-depth examination of the relationship between volume decline and flats mail unit cost, measured by marginal cost, within a predictive econometric setting.

### (3) Part 2. Econometric Modeling and Estimation

As mentioned above, an econometric estimation of the observed temporal relationship between flats unit costs and their volumes, based on time-series data on unit cost and volumes cannot be properly interpreted as causal, because the cost variables are already obtained from the econometric estimations that are performed upstream by the Postal Service.

As noted above, this section is written from a predictive perspective. Its objective is to first estimate the temporal correlation between marginal costs and mail volumes, controlling for the effects of delivery points and mail mix, and accounting for the effect of inflation. Then, based on the estimation results, it seeks to predict the unit costs (taken here to be the marginal costs) of the four flats mail products based on extrapolating the observed trends in volumes, volume mix, and delivery points over the period FY 2000 through FY 2021. Both the model and the estimation method are presented in the Appendix A, Section IV.A.2. Analysis. The focus here is on out-of-sample prediction.

Volumes and delivery points are forecasted to serve as the inputs to the out-of-sample predictions of the inflation-adjusted marginal cost. To forecast the volume for each product, the annual growth rate of the volume is calculated for the period FY 2008 through FY 2021. Using the average annual growth rate or the compound annual growth makes negligible differences in the results. The calculated compound annual growth rate is successively applied to the annual volumes, beginning with the FY 2021 volume, and forecasting the volumes for the period running from FY 2022 through FY 2026. The same is done for mail class volumes and total volume. The volume shares are then calculated. For the delivery points, the extrapolation is also based on the data from FY 2008 to FY 2021. The resulting forecasts for the four flats mail products are shown in Table IV-2. Total volume and delivery points only depend on the fiscal year and, therefore, do not vary from one mail product to another.

**Table IV-2  
Forecasted Volumes and Delivery Points**

Flat Mail Product	FY	Volume	Mail Class Total Volume	Delivery Points	Total Volume
First-Class Mail Flats	2022	1,084.56	48,635.00	164.22	124,463.00
	2023	999.99	46,466.10	165.35	120,183.00
	2024	922.01	44,394.00	166.49	116,051.00
	2025	850.12	42,414.20	167.63	112,060.00
	2026	783.82	40,522.70	168.79	108,207.00
USPS Marketing Mail Flats	2022	2,606.30	64,215.90	164.22	124,463.00
	2023	2,367.44	62,257.00	165.35	120,183.00
	2024	2,150.46	60,357.90	166.49	116,051.00
	2025	1,953.38	58,516.60	167.63	112,060.00
	2026	1,774.35	56,731.60	168.79	108,207.00
In-County Periodicals	2022	426.36	3,446.24	164.22	124,463.00
	2023	406.52	3,228.19	165.35	120,183.00
	2024	387.60	3,023.93	166.49	116,051.00
	2025	369.56	2,832.60	167.63	112,060.00
	2026	352.36	2,653.37	168.79	108,207.00
Outside County Periodicals	2022	3,020.84	3,446.24	164.22	124,463.00
	2023	2,823.60	3,228.19	165.35	120,183.00
	2024	2,639.24	3,023.93	166.49	116,051.00
	2025	2,466.92	2,832.60	167.63	112,060.00
	2026	2,305.85	2,653.37	168.79	108,207.00

The out-of-sample predictions based on the extrapolation of the trends in the included observable explanatory variables are shown in Table IV-3, along with their standard errors (SE). Figure IV-9 displays the corresponding trends, historical and forecasted. The observed (non-predicted) numbers for FY 2022 are shown in the first (uncolored) row of Table IV-3 to allow their comparison with the forecasted figures for FY 2022. In Table IV-3, all the marginal costs (predicted and non-predicted) are in FY 2021 dollars.

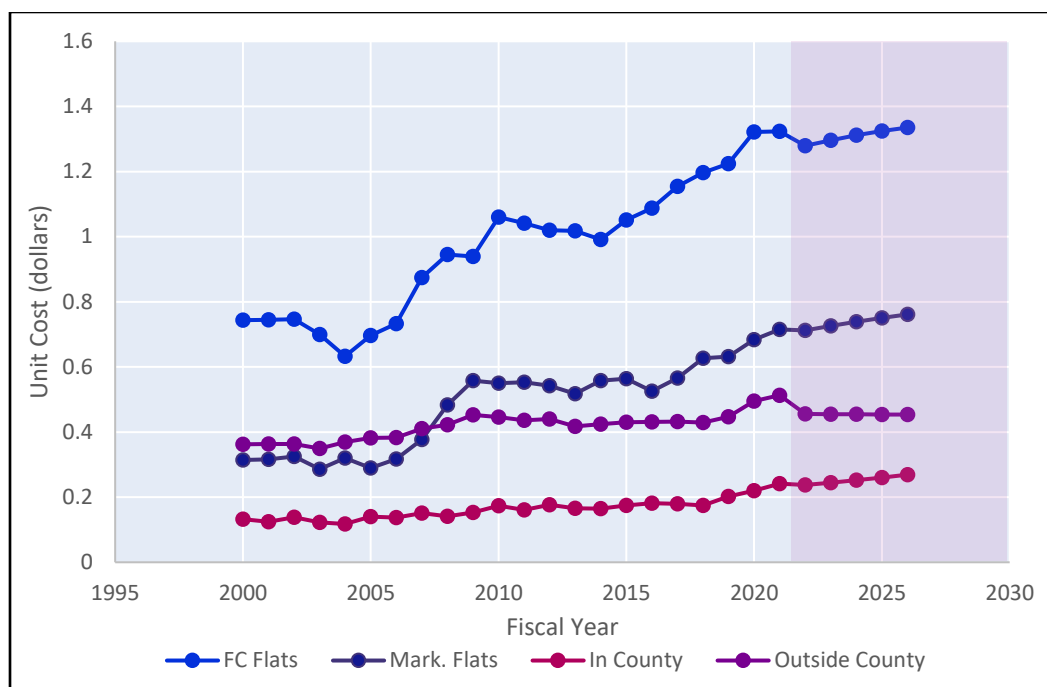


The forecasts suggest that the continuous decline in mail volume will likely be accompanied by a continuous increase in the *real* unit cost, where the latter is measured by the marginal cost. Inflation would only worsen the upward trends if the marginal costs were expressed in nominal terms.

**Table IV-3**  
**Forecasted Marginal Costs Over FY 2022–FY 2026, in FY 2021 Dollars**

FY/ Standard Error (SE)	First-Class Mail Flats	USPS Marketing Mail Flats	In-County Periodicals	Outside County Periodicals
Observed FY 2022 Marginal Cost in FY 2021 Dollars	1.239	0.668	0.223	0.457
2022	1.279	0.713	0.237	0.456
SE	0.111899	0.112827	0.112337	0.112753
2023	1.296	0.726	0.245	0.455
SE	0.120742	0.121758	0.121163	0.121579
2024	1.311	0.738	0.252	0.454
SE	0.129795	0.13088	0.130197	0.130596
2025	1.324	0.750	0.260	0.454
SE	0.138847	0.139977	0.139229	0.139597
2026	1.335	0.761	0.269	0.454
SE	0.147919	0.149072	0.148287	0.148609

**Figure IV-9**  
**Historical and Forecasted Marginal Costs in FY 2021 Dollars**



A shortcoming of the estimation, among other possible shortcomings, is the short (for purposes of econometric analysis) length of the time series, which probably has affected the precision of the estimations and, hence, the econometric forecasts. The prediction has also not attempted to disentangle flats volume decline and flat mail processing workhour and overtime workhour increases. These limitations are expected to be progressively mitigated as longer series become available in other uses of the model in the future.

#### (4) Conclusion

This econometric analysis has covered two related aspects of the linkage between the trends in flat-shaped mail volumes and marginal costs. The first aspect, which is discussed in Section IV.A.2.c.2., concerns the fact that flat-shaped mail cannot be operationally isolated from the other mail products and, therefore, share with all the other mail products, the burden of the loss of scale economies generated at the firm level by mail volume decline. The comparison of volume decline for individual flat-shaped mail products and general Market Dominant mail suggests that the declines in flats volumes have likely contributed to a greater extent than the declines in other Market Dominant mail volumes to the firm's overall loss of scale economies, hence the increase in its unit costs. However, product-level DSEs, which are more relevant to this matter, suggest instead that this conclusion is too categorical and that the speed of cost decline may have matched that of volume decline for flat-shaped mails.

To provide more insight about these suggestions, the effect of volume decline on unit costs is assessed after controlling for other possibly relevant factors, and this represents the second aspect of the above linkage. This second aspect, which is covered in Section IV.A.2.c.3., concerns the temporal relationship between flats mail volumes and their inflation-adjusted marginal costs. An econometric model has been proposed and estimated using data covering the period FY 2000 through FY 2021. The model controls for delivery points and mail mix. The estimation results were then used to forecast the unit costs of the four flat-shaped mail products under consideration, for the years FY 2022 through FY 2026, based on the extrapolation of volume and delivery points trends. The forecasts are within reasonable margins of errors.

The key general lessons that emerge from all the analysis are the following:

- The continuous decline in mail volume, heavily impacted by the shift of hard copy communications to electronic media as the result of the development of the Internet, tends to continuously drive unit costs up, even when controlling for the effect of inflation. Mail products that experience faster declines in their volumes contribute more to the induced loss of scale economies at a firm level. Even though flats are among those mail products, caution should be exercised in concluding that their volume declines have contributed more than other Market Dominant products' volume declines to the overall loss of scale economies. In this regard, it is worth noting that flat-shaped mail accounts for only a small percentage of total mail volume.
- Over time, flats real (inflation-adjusted) marginal costs continue to increase, while flats volumes decline. This suggests that the burden of the increase in unit costs will likely continue as the mail volumes continue to decline over the future years. Cost reduction programs must be established that at least match the rate of decline in order to stabilize marginal costs.

## **B. Analysis of Flats Unit Costs for Major Functional Categories by Dependent Component**

For each product that consists of more than 80 percent flat-shaped mail, 39 C.F.R. § 3050.50(b)(2) requires the Postal Service to provide the unit attributable costs disaggregated into the following functional cost categories: mail processing, delivery, vehicle service driver, purchased transportation, window service, and other. 39 C.F.R. § 3050.50(b)(2). These functional cost categories are identified as relevant to providing context to the "pinch points" discussed in Section III.B.4. Each of these functional cost categories contains costs from different dependent components. Specifically, dependent components costs are calculated for the major functional categories by adding the costs associated with supervisors and administration, service-wide benefits, and facility-related and equipment-related costs. Some dependent components contribute only to one

functional cost category while others are relevant to several categories. For example, “Evaluated Route”<sup>240</sup> is a dependent component, whose cost is entirely contained within the delivery functional cost category, while “Retiree Health Benefits” is a dependent component of all functional cost categories.<sup>241</sup> Dependent component costs are used to calculate non-operational piggyback factors.<sup>242</sup> Figure IV-10 lists the major dependent components for the three main functional cost categories.<sup>243</sup> Major dependent components have at least 5 percent share of the costs of a functional category for a flats product. The costs of all other components are consolidated as other costs.<sup>244</sup> Section IV.B.1. discusses the unit attributable cost associated with the functional cost categories for all flats products combined. Section IV.B.2. provides a detailed analysis of dependent components for each individual flats product separately.

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<sup>240</sup> Evaluated route is a dependent component associated with rural carriers. The dependent component contains the labor costs associated with evaluated routes. On an evaluated route, a rural carrier is paid based on the evaluated time of the route. The evaluated time is developed based on compensation categories for various carrier activities such as route length, and boxes served, as well as the volume by type delivered and collected. See Summary Description of USPS Development of Costs by Segments and Components, Fiscal Year 2021, July 1, 2022, folder “Summary Description FY2021,” file “CS10-21.docx.”

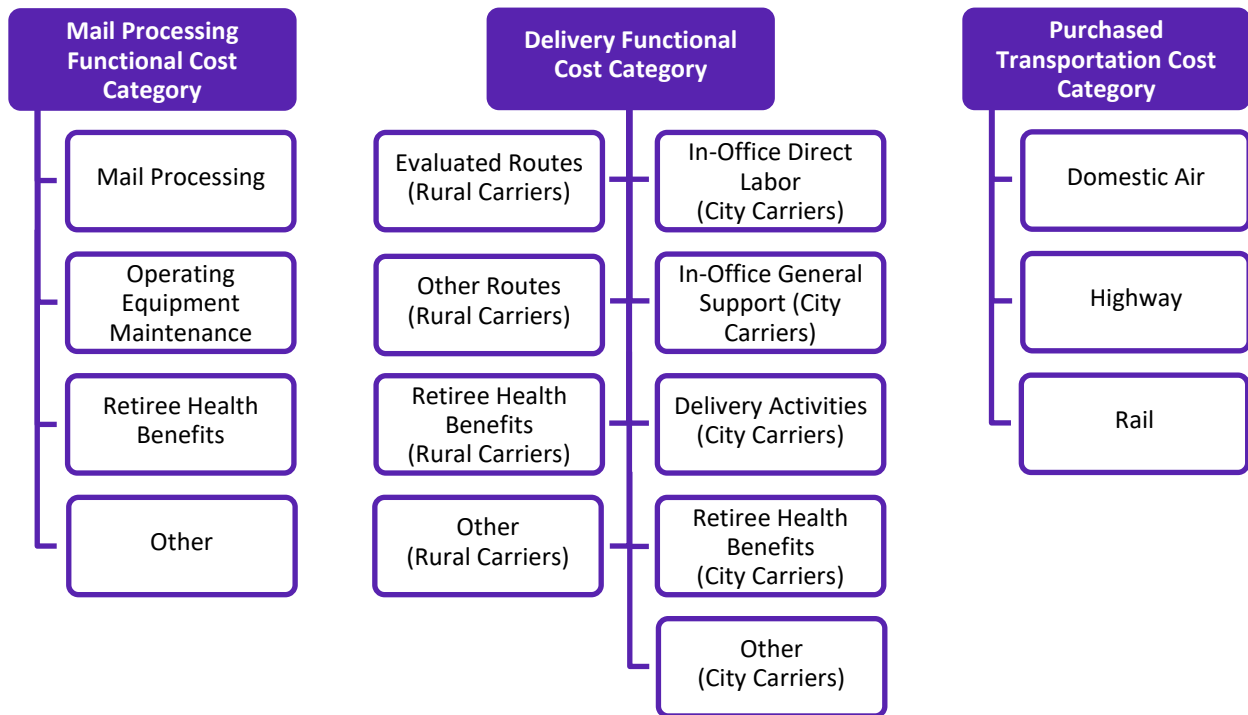
<sup>241</sup> With the exception of Purchased Transportation.

<sup>242</sup> See FY 2021 ACD at 262. Non-operational piggyback factors are employed in cost studies to augment labor cost estimates for the major functions by adding the costs associated with supervisors and administration, service-wide benefits, along with facility-related and equipment-related costs. See Docket No. ACR2021, Library Reference USPS-FY21-24, December 29, 2021, folder “USPS-FY21-24,” PDF file “USPS-FY21-24.Preface.pdf.”

<sup>243</sup> The vehicle service driver and window service functional cost categories are moved into the “other” category because they do not individually account for a large percentage of the total unit attributable cost. Purchased transportation cost category only has three dependent components, so they are all listed in Figure IV-10.

<sup>244</sup> The mail processing functional category has more than 30 dependent components. Between FY 2008 and FY 2022, a number of dependent components have been added and removed but none which are of significance. See Docket No. ACR2022, Library Reference USPS-FY22-24, folder “USPS-FY22-24,” PDF file “USPS-FY22-24.Preface.pdf;” Excel file “FY22Public.PB.xlsx” (FY 2022 Piggybacks), tab “MailProc.” Delivery has more than 80 dependent components. Similar to mail processing, a number of dependent components have been added and removed between FY 2008 and FY 2022, but none contribute significantly to the functional category. See FY 2022 Piggybacks, tab “CityCarriers” for City Carriers, tab “Rural” for Rural Carriers. Examples of dependent components consolidated into the “other” category includes quality control, joint supervision clerks & carriers, higher level supervisors, custodial personnel, plant & building equipment maintenance, holiday leave, rents, fuel, utilities, equipment depreciation, and more.

**Figure IV-10**  
**Dependent Components in Each Major Functional Cost Category**



# 1. Overall Flats Unit Attributable Costs by Functional Category (Mail Processing, Delivery, Purchased Transportation, and Other)

## a. Cost Distribution Trend Across Major Functional Categories

Figure IV-11 shows how the unit attributable cost of all eight flats products is distributed across the three main functional cost categories between FY 2008 and FY 2022. Compared to the mail processing and delivery functional categories, the shares of purchased transportation and “other” costs remain relatively stable over the years.<sup>245</sup> The functional category with the highest share in total flats attributable cost was the mail processing functional category prior to FY 2015 but changed to the delivery functional category in FY 2015. *See* Figure IV-11. The delivery functional category’s share in total flats cost has been increasing since. As discussed in Section II.A., since FY 2014, the overall flats volume has declined and unit attributable costs have increased.<sup>246</sup> Because Figure IV-11 provides the cost distribution trends for all flats products collectively, this cost distribution is affected by changes in the volume mix of flats products and the cost distributions of individual flats products. For example, USPS Marketing Mail High Density and Saturation Flats and Parcels has the highest volume of all flats products and experienced the lowest volume decline of all flats products.<sup>247</sup> The Commission concludes that a part of this shift from mail processing to delivery costs can be attributed to the shift of the flats volume mix towards USPS High Density and Saturation Flats and Parcels (the flats product with a high share of delivery costs in its attributable cost *e.g.*, 82.9 percent in FY 2022).<sup>248</sup> Section IV.B.2., which discusses the functional costs for each flats product individually, shows that part of this shift is also due to increasing delivery costs for almost all flats products.

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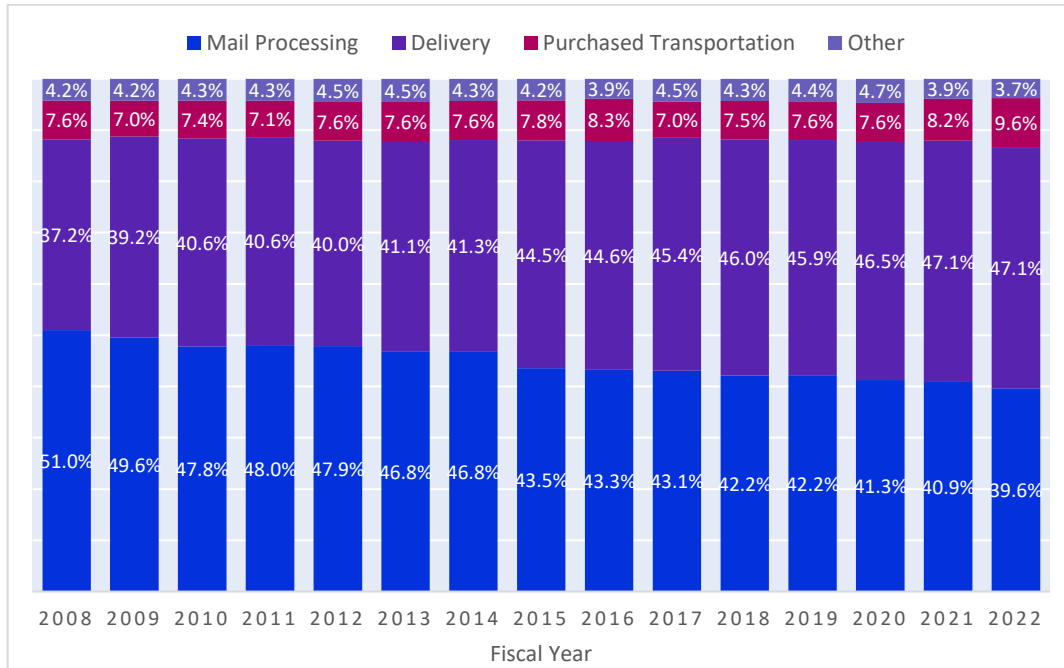
<sup>245</sup> In FY 2021 and FY 2022, the proportion attributed to purchased transportation increased by a few percentage points.

<sup>246</sup> As was illustrated by Figure II-5, total flats volume has been decreasing every year and unit attributable cost has been increasing.

<sup>247</sup> *See* Section II.A., Table II-3.

<sup>248</sup> *See* Section IV.B.2.a., Table IV-4.

**Figure IV-11**  
**Distribution of Attributable Cost across Functional Cost Categories,**  
**FY 2008–FY 2022<sup>249</sup>**



<sup>249</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; Docket No. ACR2021, Library Reference USPS-FY21-24, folder “USPS-FY21-24,” Excel file “FY21Public.PB.xlsx” (FY 2021 Piggybacks); Docket No. ACR2020, Library Reference USPS-FY20-24, folder “USPS-FY20-24,” Excel file “FY20Public.PB.xlsx” (FY 2020 Piggybacks); Docket No. ACR2019, Library Reference USPS-FY19-24, folder “USPS-FY19-24,” Excel file “FY19Public.PB.xlsx” (FY 2019 Piggybacks); Docket No. ACR2018, Library Reference USPS-FY18-24, folder “USPS-FY18-24,” Excel file “FY18Public.PB.xlsx” (FY 2018 Piggybacks); Docket No. ACR2017, Library Reference USPS-FY17-24, folder “USPS-FY17-24,” Excel file “FY17Public.PB.xlsx” (FY 2017 Piggybacks); Docket No. ACR2016, Library Reference USPS-FY16-24, folder “USPS-FY16-24,” Excel file “FY16Public.PB.xlsx” (FY 2016 Piggybacks); Docket No. ACR2015, Library Reference USPS-FY15-24, folder “USPS-FY15-24,” Excel file “FY15Public.PB.xlsx” (FY 2015 Piggybacks); Docket No. ACR2014, Library Reference USPS-FY14-24, folder “USPS-FY14-24,” Excel file “FY14Public.PB.xlsx” (FY 2014 Piggybacks); Docket No. ACR2013, Library Reference USPS-FY13-24, folder “USPS-FY13-24,” Excel file “FY13Public.PB.xlsx” (FY 2013 Piggybacks); Docket No. ACR2012, Library Reference USPS-FY12-24, folder “USPS-FY12-24,” Excel file “FY12Public.PB.xlsx” (FY 2012 Piggybacks); Docket No. ACR2011, Library Reference USPS-FY11-24, folder “USPS-FY11-24,” Excel file “FY11Public.PB.xlsx” (FY 2011 Piggybacks); Docket No. ACR2010, Library Reference USPS-FY10-24, folder “USPS-FY10-24,” Excel file “FY10Public.PB.xlsx” (FY 2010 Piggybacks); Docket No. ACR2009, Library Reference USPS-FY09-24, folder “USPS-FY09-24,” Excel file “FY09Public.PB.xlsx” (FY 2009 Piggybacks); Docket No. ACR2008, Library Reference USPS-FY08-24, folder “USPS-FY08-24,” Excel file “FY08Public.PB.xlsx” (FY 2008 Piggybacks); Docket No. ACR2022, Library Reference USPS-FY22-2, December 29, 2022, Excel file “FY22Public Cost Segs and Comps.xlsx,” tab “CS14” (FY 2022 CS14); Docket No. ACR2021, Library Reference USPS-FY21-2, Excel file “FY21Public Cost Segs and Comps.xlsx,” tab “CS14” (FY 2021 CS14); Docket No. ACR2020, Library Reference USPS-FY20-2, Excel file “FY20Public Cost Segs and Comps.xlsx,” tab “CS14” (FY 2020 CS14); Docket No. ACR2019, Library Reference USPS-FY19-2, Excel file “FY19Public Cost Segs and Comps.xlsx,” tab “CS14” (FY 2019 CS14); Docket No. ACR2018, Library Reference USPS-FY18-2, Excel file “FY18Public Cost Segs and Comps.xlsx,” tab “CS14” (FY 2018 CS14); Docket No. ACR2017, Library Reference USPS-FY17-2, Excel file “FY17Public Cost Segs and Comps.xlsx,” tab “CS14” (FY 2017 CS14); Docket No. ACR2016, Library Reference USPS-FY16-2, Excel file “FY16Public Cost Segs and Comps.xlsx,” tab “CS14” (FY 2016 CS14); Docket No. ACR2015, Library Reference USPS-FY15-2, Excel file “FY15Public Cost Segs and Comps.xlsx,” tab “CS14” (FY 2015 CS14); Docket No. ACR2014, Library Reference USPS-FY14-2, Excel file “FY14.2.Public Cost Segs and Comp.xlsx,” tab “CS14” (FY 2014 CS14); Docket No. ACR2013, Library Reference USPS-FY13-2, Excel file “FY13 Public.CS&CRpt.xlsx,” tab “CS14” (FY 2013 CS14); Docket No. ACR2012, Library Reference USPS-FY12-2, Excel file “FY12.Public CS&CRpt.xlsx,” tab “CS14” (FY 2012 CS14); Docket No. ACR2011, Library Reference USPS-FY11-2, Excel file “FY11Public CS&CRpt.xlsx,” tab “CS14” (FY 2011 CS14); Docket No. ACR2010, Library Reference USPS-FY10-2, Excel file “FY10 Public CS&C Rpt.xlsx,” tab “CS14” (FY 2010 CS14); Docket No. ACR2009, Library Reference USPS-FY09-2, Excel file “FY09 Public CS&C Rpt.xlsx,” tab “CS14” (FY 2009 CS14); Docket No. ACR2008, Library Reference USPS-FY08-2, Excel file “FY08.PubSeg&CompRpt.xlsx,” tab “CS14” (FY 2008 CS14).

b. Flats Unit Attributable Cost Trends by Functional Cost Categories

For all flats products collectively, mail processing unit cost<sup>250</sup> has not changed dramatically from FY 2008 to FY 2022. *See* Figure IV-12. While this cost has been increasing slightly since FY 2013, with larger increases between FY 2019 and FY 2021, it is more stable than delivery unit cost. Delivery unit cost of all flats products combined surpassed mail processing unit cost in FY 2015 and the gap between the unit costs of these two functional categories has been growing since then. *See* Figure IV-12. Additionally, purchased transportation cost of the flats products combined have increased since FY 2019.

There is a sudden jump in delivery unit cost from FY 2014 to FY 2015 which is due, in large part, to a methodological change approved in Docket No. RM2015-7. *See* Section IV.E. for details.<sup>251</sup> However, in the years following, delivery unit cost continues to increase in a persistent manner which is unlikely to be a result of methodological changes.

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<sup>250</sup> Mail processing unit cost for all flats products collectively is the sum of mail processing costs for all flats products divided by total volume of flats products. In other words, this is equivalent to taking a weighted average of individual flats products' mail processing unit costs, weighted by the proportion of the individual flats product's volume in relation to total flats volume. Thus, flats products with high unit attributable costs and/or volumes will contribute more to the total flats mail processing unit cost.

<sup>251</sup> This methodological change affected the unit attributable costs of USPS Marketing Mail High Density and Saturation Flats and Parcels and USPS EDDM-R the most. *See* Section IV.E.2., Table IV-9.



**Figure IV-12**  
**Total Flats Products Unit Attributable Cost by Functional Cost Category<sup>252</sup>**

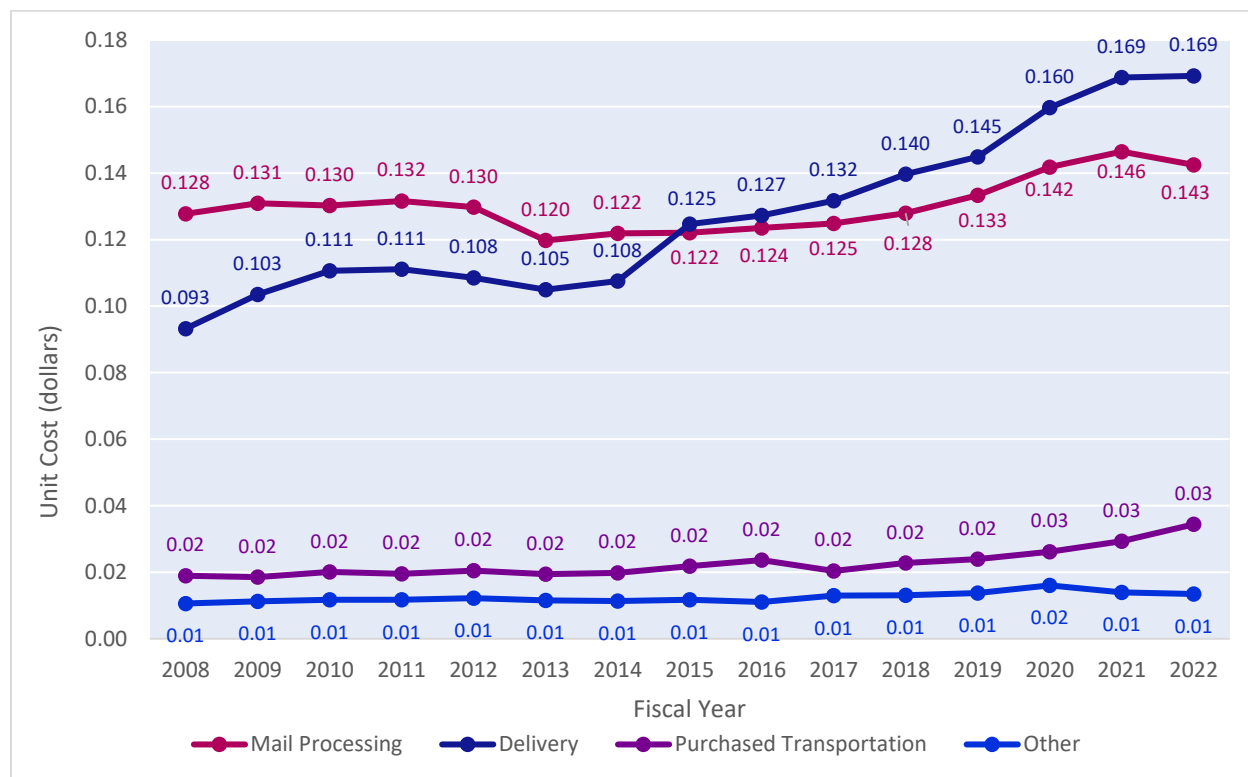


Figure IV-13 illustrates how each flats product contributes to the mail processing functional cost category. The distribution of mail processing cost across flats products has not changed significantly even as total mail processing unit cost increases and flats products volume mix changes.<sup>253</sup>

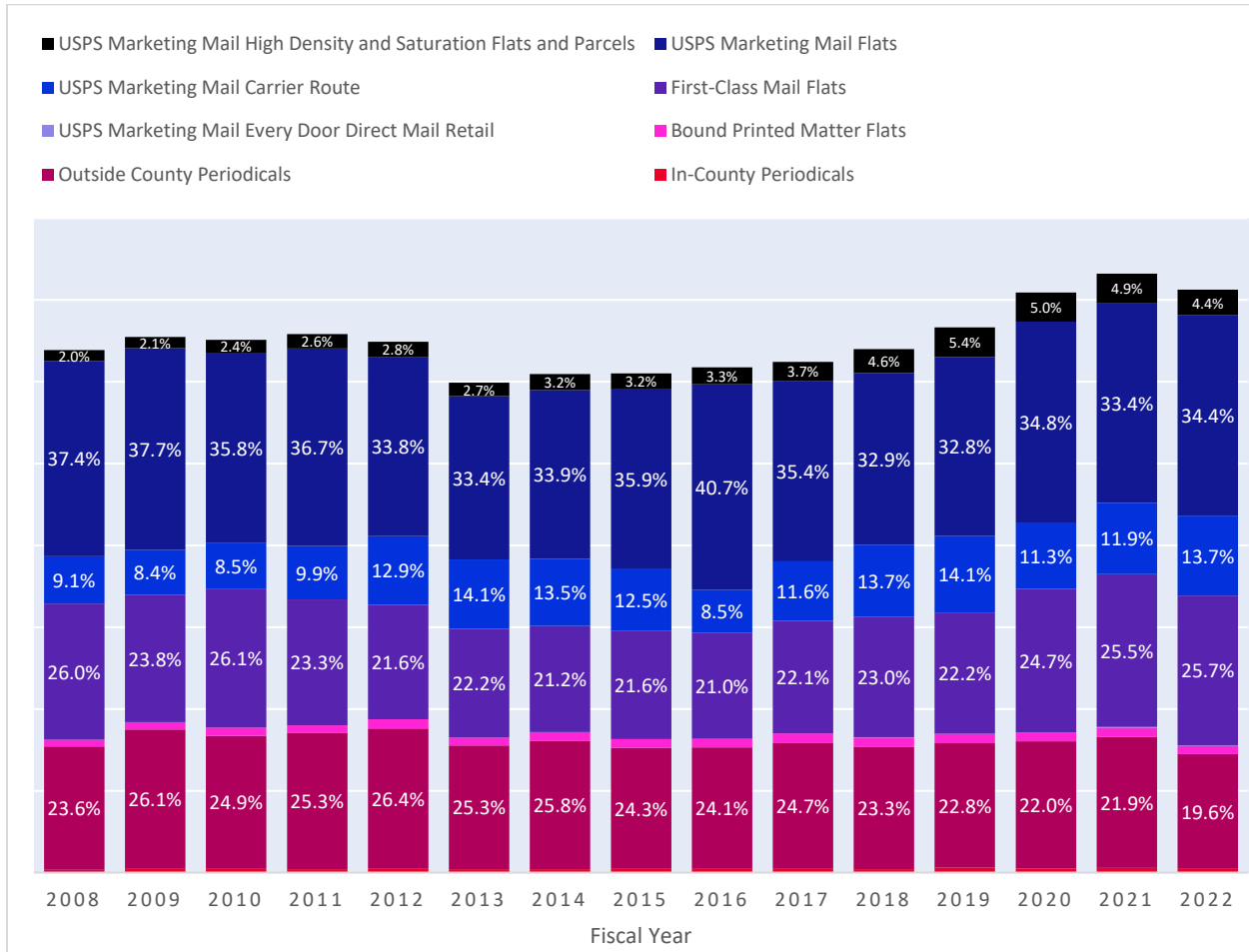
USPS Marketing Mail Flats accounts for the largest share of flats mail processing cost (34.4 percent in FY 2022). In the last 4 years, the share of the First-Class Mail Flats mail processing cost in the total flats mail processing cost has increased slightly: from 23.0 percent in FY 2018 to 25.7 percent in FY 2022. The share of the Outside County Periodicals mail processing cost in the total flats mail processing cost has decreased slightly: from 23.3 percent in FY 2018 to 19.6 percent in FY 2022. The proportion of mail processing cost

<sup>252</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks; FY 2022 CS14; FY 2021 CS14; FY 2020 CS14; FY 2019 CS14; FY 2018 CS14; FY 2017 CS14; FY 2016 CS14; FY 2015 CS14; FY 2014 CS14; FY 2013 CS14; FY 2012 CS14; FY 2011 CS14; FY 2010 CS14; FY 2009 CS14; FY 2008 CS14.

<sup>253</sup> With the exception of FY 2016, when some mail processing unit cost weight is shifted from USPS Marketing Mail Carrier Route to USPS Marketing Mail Flats. This is related to the shift of Carrier Route Flats to USPS Marketing Mail Flats in FY 2016 as discussed in Section IV.A.1.

associated with USPS Carrier Route Flats and USPS Marketing Mail High Density and Saturation Flats and Parcels has remained steady (at approximately 11 to 14 percent and 4.4 to 5.4 percent respectively) between FY 2018 and FY 2022. USPS Marketing Mail EDDM-R, In-County Periodicals, and BPM Flats have very small shares (less than 2 percent) in the total flats mail processing cost.<sup>254</sup>

**Figure IV-13**  
**Distribution of Mail Processing Unit Cost Across Flats Products, FY 2008–FY 2022<sup>255</sup>**



Note: The share of the In-County Periodicals is less than 1 percent each year and the share of BPM Flats is between 1 and 2 percent. USPS Marketing Mail EDDM-R has zero mail processing costs.

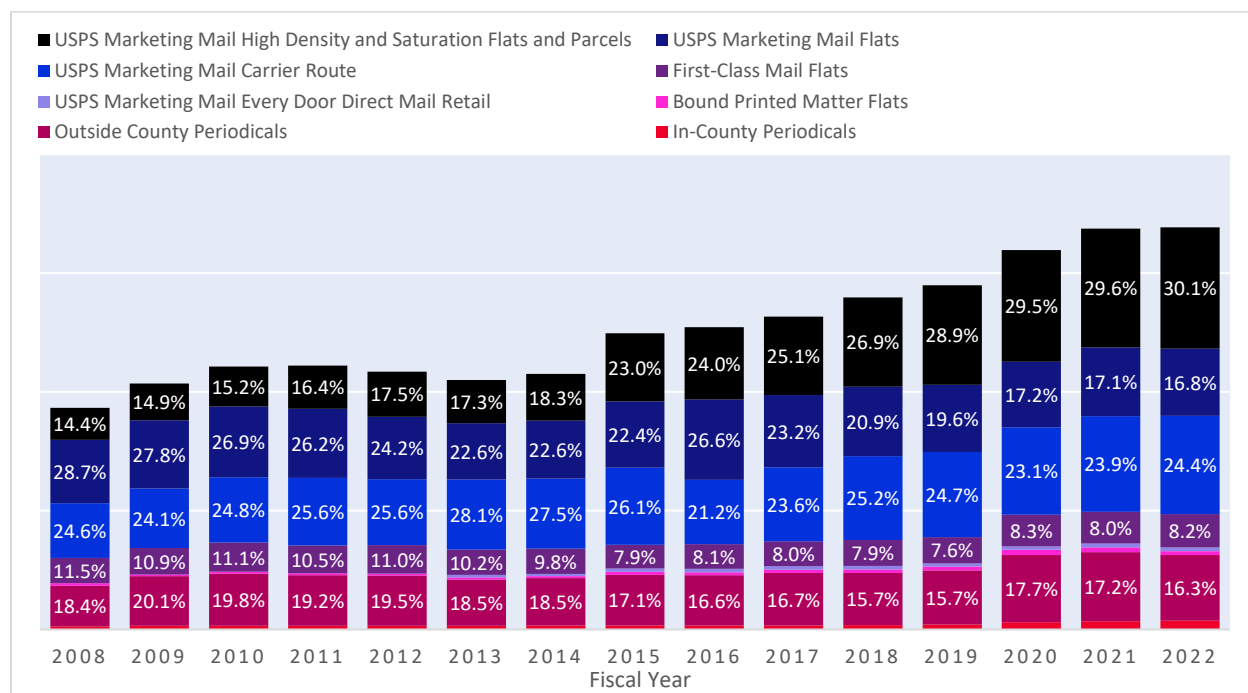
<sup>254</sup> USPS Marketing Mail EDDM-R has zero mail processing costs. See Figure IV-13; FY 2022 Piggybacks.

<sup>255</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks.

The distribution of delivery cost, on the other hand, varies more. See Figure IV-14. As the flats delivery cost increase, USPS Marketing Mail High Density and Saturation Flats and Parcels contribute more to the cost, and USPS Marketing Mail Flats contributes less.<sup>256</sup>

Since FY 2018, the combined share of the USPS Marketing Mail High Density and Saturation Flats and Parcels and USPS Marketing Mail Carrier Route products is more than half of the total flats delivery cost. In FY 2022, USPS Marketing Mail Flats and Outside County Periodicals each accounted for approximately 16 to 17 percent of the delivery cost. First-Class Mail Flats only accounted for 8.2 percent of delivery cost in FY 2022, compared to 25.7 percent of mail processing cost. USPS Marketing Mail EDDM-R, In-County Periodicals, and BPM Flats each accounted for less than 2 percent of delivery cost. These products have low volumes and, therefore, do not have large shares in total flats mail processing and delivery costs.<sup>257</sup>

**Figure IV-14**  
**Distribution of Delivery Unit Cost Across Flats Products, FY 2008–FY 2022<sup>258</sup>**



Note: The share of In-County Periodicals is between 1 and 2 percent each year. The shares of BPM Flats and USPS Marketing Mail EDDM-R are approximately 1 percent each.

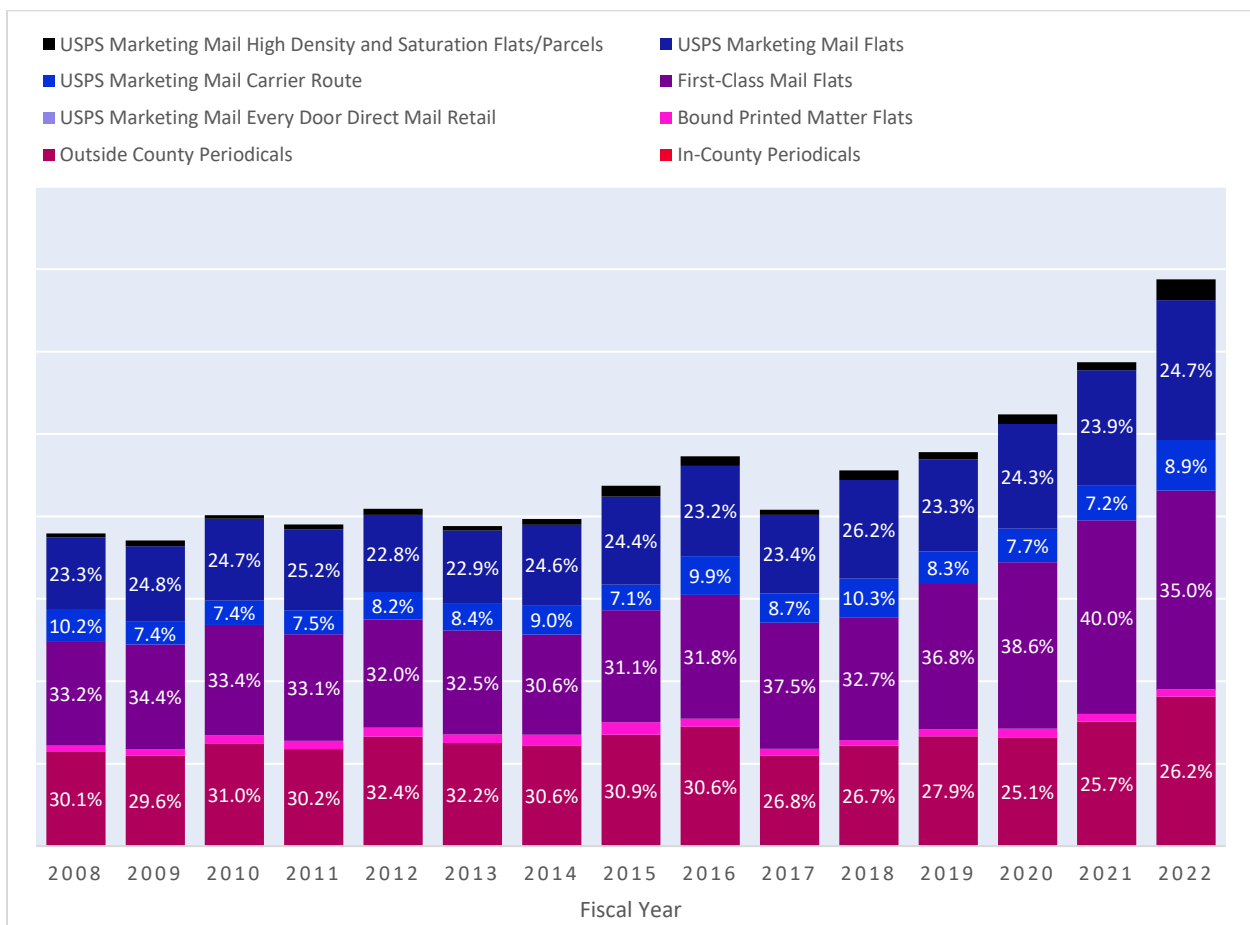
<sup>256</sup> Again, this is with the exception of FY 2016, when the effect of the shift of volume from USPS Marketing Mail Carrier Route to USPS Marketing Mail Flats is seen in the shift of delivery unit cost weight from USPS Marketing Mail Carrier Route to USPS Marketing Mail Flats.

<sup>257</sup> See Sections II.A.2. and IV.A.1. for volumes of these products.

<sup>258</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks.

Figure IV-15 illustrates that purchased transportation unit cost has increased since FY 2017 while distribution of purchased transportation cost across flats products has remained largely the same. Shares of purchased transportation costs vary by approximately 2 or 3 percentage points for all flats products except First-Class Mail Flats and Outside County Periodicals. The share of the First-Class Mail Flats purchased transportation unit cost in the total purchased transportation unit cost has increased by approximately 4 percent since FY 2015 while the share of Outside County Periodicals purchased transportation unit cost decreased by approximately 4 percent.

**Figure IV-15**  
**Distribution of Purchased Transportation Unit Cost Across Flats Products, FY 2008–FY 2022<sup>259</sup>**



Note: The shares of USPS Marketing Mail High Density and Saturation Flats/Parcels and BPM Flats are each between 1 and 4 percent. In-County Periodicals and USPS Marketing Mail EDDM-R have no purchased transportation costs.

<sup>259</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks; FY 2022 CS14; FY 2021 CS14; FY 2020 CS14; FY 2019 CS14; FY 2018 CS14; FY 2017 CS14; FY 2016 CS14; FY 2015 CS14; FY 2014 CS14; FY 2013 CS14; FY 2012 CS14; FY 2011 CS14; FY 2010 CS14; FY 2009 CS14; FY 2008 CS14.

## 2. Analysis of the Trends in Unit Attributable Costs by Major Functional Cost Category for Non-Compensatory Flats Products<sup>260</sup>

### a. Introduction

For all flats products, the mail processing dependent component makes up the highest cost in the mail processing functional category. This dependent component covers labor costs of clerks and mailhandlers performing mail processing activities.<sup>261</sup> The delivery functional cost category consists of dependent components split by City Carriers and Rural Carriers.<sup>262</sup> See Figure IV-16 for short descriptions of each major delivery dependent component.<sup>263</sup> Unlike the other functional cost categories, purchased transportation cost does not include the piggyback factors and consists of only three dependent components: Domestic Air, Highway, and Rail. See FY 2021 ACD at 272.

**Figure IV-16**  
**Delivery Functional Category Major Dependent Components<sup>264</sup>**

#### City Carrier Major Dependent Components

- **In-Office Direct Labor:** Mail preparation (sequencing residual mail for delivery)
- **In-Office General Support:** Moving empty equipment, personal time, training
- **Delivery Activities:** Delivery and Collection of Mail
- **Retiree Health Benefit:** Normal cost of the retirement health benefits of active employees

#### Rural Carrier Major Dependent Components

- **Evaluated Routes:** Delivery and collection of mail on evaluated routes
- **Other Routes:** Relief routes for overburdened routes or other routes that cannot be handled by adding segments to existing routes
- **Retiree Health Benefits:** Normal cost of the retirement health benefits of active employees

<sup>260</sup> This subsection includes the discussion of flats products that were non-compensatory in FY 2021.

<sup>261</sup> See Appendix A, Section IV.B. Analysis for more details.

<sup>262</sup> City carriers corresponds to cost segments 6 and 7. Rural carriers corresponds to cost segment 10. See Appendix A, Section IV.B. Analysis for a short description of city and rural unit cost calculations.

<sup>263</sup> See Cost Segment 6 Summary Description FY 2021; see Summary Description of USPS Development of Costs by Segments and Components, Fiscal Year 2021, July 1, 2022, folder "Summary Description FY2021," file "CS07-21.docx" (Cost Segment 7 Summary Description FY 2021); Summary Description of USPS Development of Costs by Segments and Components, Fiscal Year 2021, July 1, 2022, folder "Summary Description FY 2021," file "CS10-21.docx" (Cost Segment 10 Summary Description FY 2021).

<sup>264</sup> Major dependent components are any dependent components with more than 5 percent share of the costs of a functional category for a flats product.

**Table IV-4**  
**Distribution of Unit Attributable Cost Across Functional Category of Each Product, FY 2022<sup>265</sup>**

	Mail Processing	Delivery	Purchased Transportation	Other
<b>First-Class Mail Flats</b>	55.1%	20.9%	18.1%	5.9%
<b>USPS Marketing Mail High Density and Saturation Flats and Parcels</b>	10.1%	82.9%	2.1%	4.9%
<b>USPS Marketing Mail Carrier Route</b>	29.7%	63.0%	4.7%	2.6%
<b>USPS Marketing Mail Flats</b>	55.4%	32.1%	9.6%	2.9%
<b>Every Door Direct Mail Retail</b>	3.6%	91.9%	0.4%	4.1%
<b>In-County Periodicals</b>	19.6%	78.3%	1.1%	1.0%
<b>Outside County Periodicals</b>	42.0%	41.4%	13.5%	3.0%
<b>Bound Printed Matter Flats</b>	48.2%	38.3%	10.2%	3.4%

While delivery cost outweighs mail processing cost for flats products overall, the distribution of unit attributable costs across functional categories differs depending on the product. Table IV-4 shows the FY 2022 distribution of each flats product's unit attributable cost across the major functional categories, with the highest cost category highlighted in red. For half of the flats products, mail processing accounts for the highest share of unit attributable cost while for the other half, delivery accounts for the highest share. *See* Table IV-4.

Among flats products, where delivery is the highest cost category, delivery cost outweighs the next highest cost category (mail processing) by more than double.<sup>266</sup> Delivery makes up between 63.0 percent and 91.9 percent of unit attributable costs for these products. For flats products that have the highest share of costs from mail processing, the range of the share is lower, between 42.0 percent and 55.4 percent. These products also have a higher share of attributable costs associated with purchased transportation costs than products for which the delivery category is the costliest: ranging from 9.6 percent to 18.1 percent compared to 0.4 percent to 4.7 percent.

<sup>265</sup> Source: Commission calculations using data from Docket No. ACR2022, USPS-FY21-45, folder "FY22.45.Files," folder "Rule 3050.50 Flats," folder "Paragraph (B) – Financial Report," Excel file "FY22.Rule.3050.50.Para.B.xlsx," tab "Item b2;" FY 2022 Public CRA Report; FY 2022 Piggybacks; Docket No. ACR2022, USPS-FY22-2, CS14.

<sup>266</sup> Compare mail processing and delivery costs for USPS Marketing Mail High Density and Saturation Flats and Parcels, USPS Marketing Mail Carrier Route, USPS Every Door Direct Mail Retail, and In-County Periodicals in Table IV-4.

The next sections analyze each non-compensatory flats product separately in the order of flats products with the lowest cost coverage to the highest. The analysis provides details on how the unit costs of each major functional category and their dependent components have changed for each non-compensatory flats product between FY 2008 and FY 2022.<sup>267</sup> For simplicity, only dependent components that comprise more than 5 percent of the functional category are singled out, with the rest consolidated as “other” costs, except for the purchased transportation functional category, which only has three dependent components.<sup>268</sup>

b. In-County Periodicals

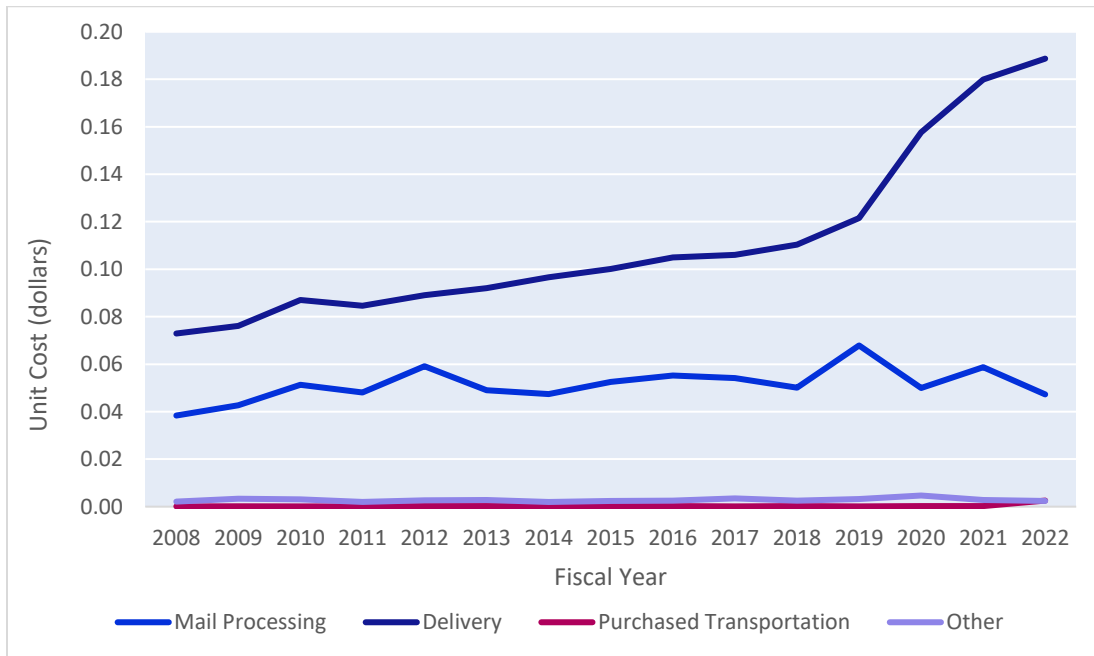
The unit attributable cost of In-County Periodicals comes mostly from the delivery functional category, though it is only since FY 2019 that delivery costs have significantly diverged from mail processing costs. *See* Figure IV-17. Mail processing unit costs have small year-to-year deviations but the general trend appears to be relatively constant at approximately 5 cents per unit.

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<sup>267</sup> For brevity, this section will mainly focus on the dependent components of each product’s highest costing functional category and only look at the other functional categories when there are unusual trends.

<sup>268</sup> The mail processing functional category has more than 30 dependent components. Between FY 2008 and FY 2022, a number of dependent components have been added and removed but none which are of significance. *See* FY 2022 Piggybacks tab “MailProc.” Delivery has more than 80 dependent components. Similar to mail processing, a number of dependent components have been added and removed between FY 2008 and FY 2022, but none contribute significantly to the functional category. *See* FY 2022 Piggybacks, tab “CityCarriers” for City Carriers, tab “Rural” for Rural Carriers.

**Figure IV-17  
In-County Periodicals Functional Unit Costs<sup>269</sup>**

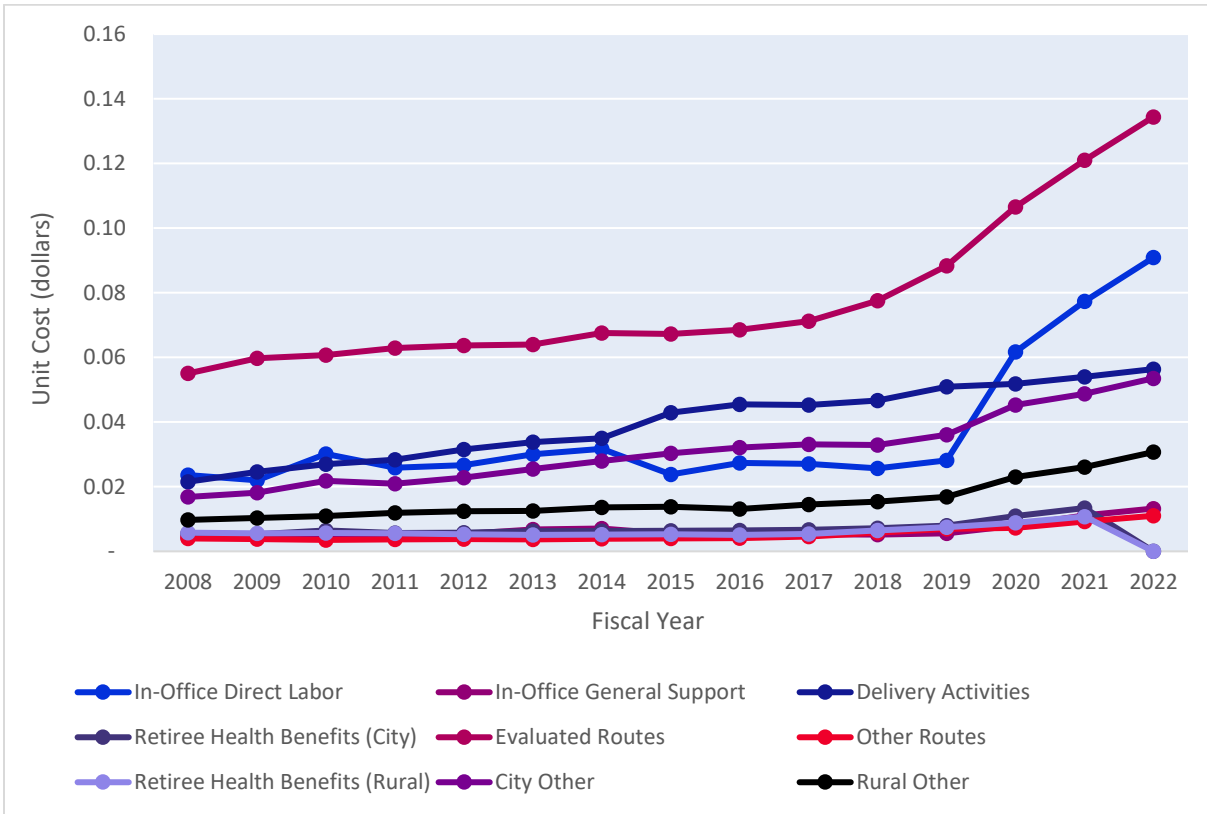


*Delivery.* There are two dependent components responsible for the significant increase in costs since FY 2019: evaluated routes and In-Office Direct Labor. See Figure IV-18. Evaluated routes is the costliest dependent component. In-Office Direct Labor, after having been even with or below Delivery Activities and Other City Costs, has surpassed the two since FY 2020 to become the second most costly dependent component for In-County Periodicals. The Postal Service attributed increases in City Carrier In-Office unit costs in FY 2020, in part, to a change in costing methodology regarding sampling of city carriers in the office which led to higher delivery costs. FY 2020 ACD at 47. While the overall unit attributable cost for In-County Periodicals has decreased from FY 2021 to FY 2022 as seen in Section II.A.1. and Section IV.A.1., it is concerning that In-Office Direct Labor and evaluated routes delivery unit costs continue to increase.

<sup>269</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks; FY 2022 CS14; FY 2021 CS14; FY 2020 CS14; FY 2019 CS14; FY 2018 CS14; FY 2017 CS14; FY 2016 CS14; FY 2015 CS14; FY 2014 CS14; FY 2013 CS14; FY 2012 CS14; FY 2011 CS14; FY 2010 CS14; FY 2009 CS14; FY 2008 CS14.



**Figure IV-18**  
**In-County Periodicals Delivery Functional Category Dependent Components,**  
**FY 2008–FY 2022<sup>270</sup>**



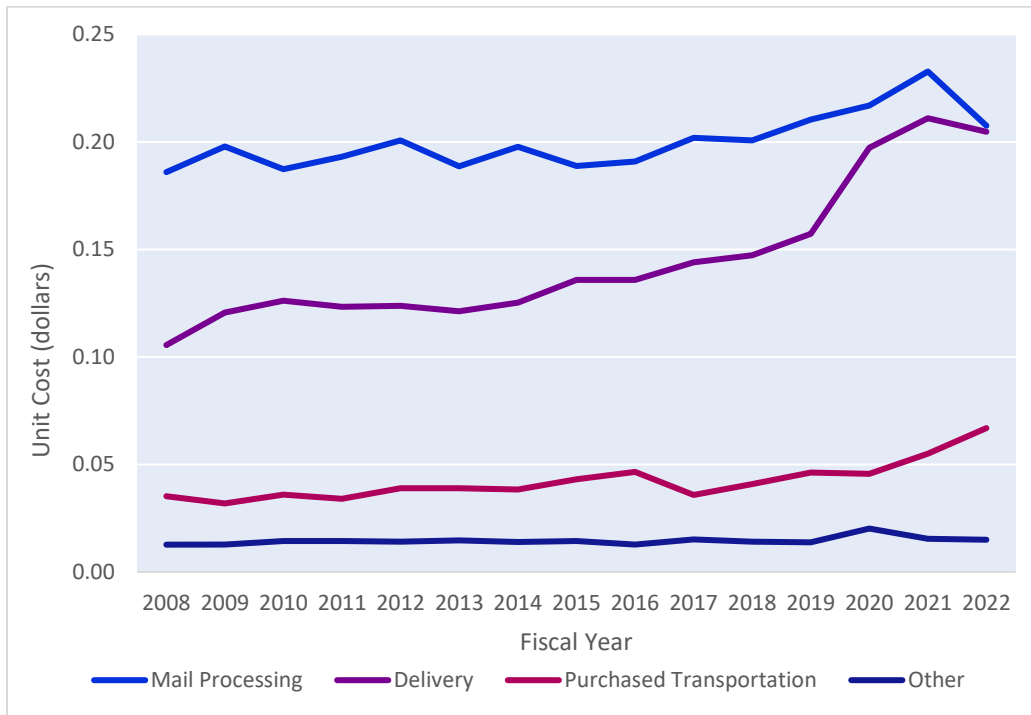
c. Outside County Periodicals

In FY 2022, mail processing and delivery make up almost an equal proportion of the unit cost of Outside County Periodicals (42.0 percent and 41.4 percent, respectively).<sup>271</sup> Figure IV-19 illustrates that this was not always the case, and that delivery unit cost has increased steadily since FY 2015, with a dramatic jump in FY 2020. Delivery unit cost only recently caught up with mail processing unit cost.

<sup>270</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks; FY 2022 CS14; FY 2021 CS14; FY 2020 CS14; FY 2019 CS14; FY 2018 CS14; FY 2017 CS14; FY 2016 CS14; FY 2015 CS14; FY 2014 CS14; FY 2013 CS14; FY 2012 CS14; FY 2011 CS14; FY 2010 CS14; FY 2009 CS14; FY 2008 CS14; Response to CHIR No. 8, Excel file "SS2022.1Resp.CHIR8.Q2.xlsx."

<sup>271</sup> See Table IV-4.

**Figure IV-19**  
**Outside County Periodicals Functional Unit Costs<sup>272</sup>**

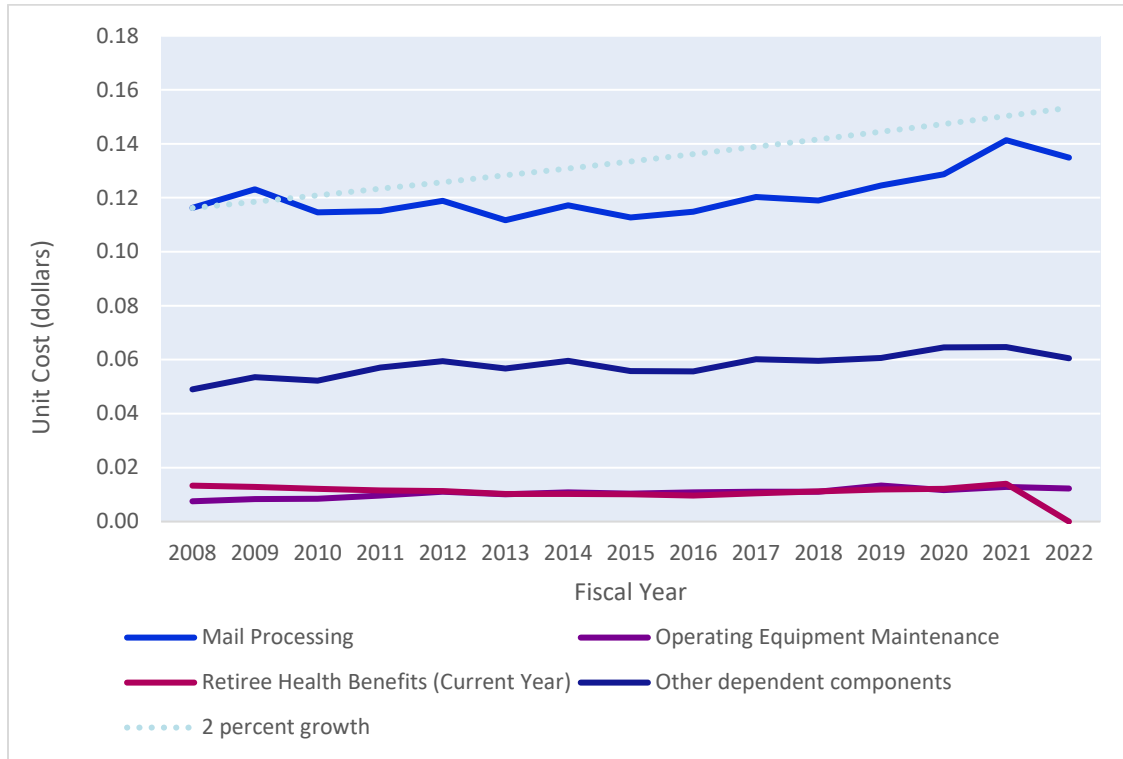


(1) Mail Processing

The unit cost of all dependent components of the mail processing functional category has decreased in FY 2022. *See* Figure IV-20. The dotted line in Figure IV-20 represents a 2-percent growth rate in mail processing unit cost since FY 2008 and the figure illustrates that while the unit costs for mail processing dependent component trend slightly upwards, it remains below a 2 percent growth rate, even with inflation in recent years well above that.

<sup>272</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks; FY 2022 CS14; FY 2021 CS14; FY 2020 CS14; FY 2019 CS14; FY 2018 CS14; FY 2017 CS14; FY 2016 CS14; FY 2015 CS14; FY 2014 CS14; FY 2013 CS14; FY 2012 CS14; FY 2011 CS14; FY 2010 CS14; FY 2009 CS14; FY 2008 CS14.

**Figure IV-20**  
**Outside County Periodicals Mail Processing Functional Category Dependent Components,**  
**FY 2008–FY 2022<sup>273</sup>**

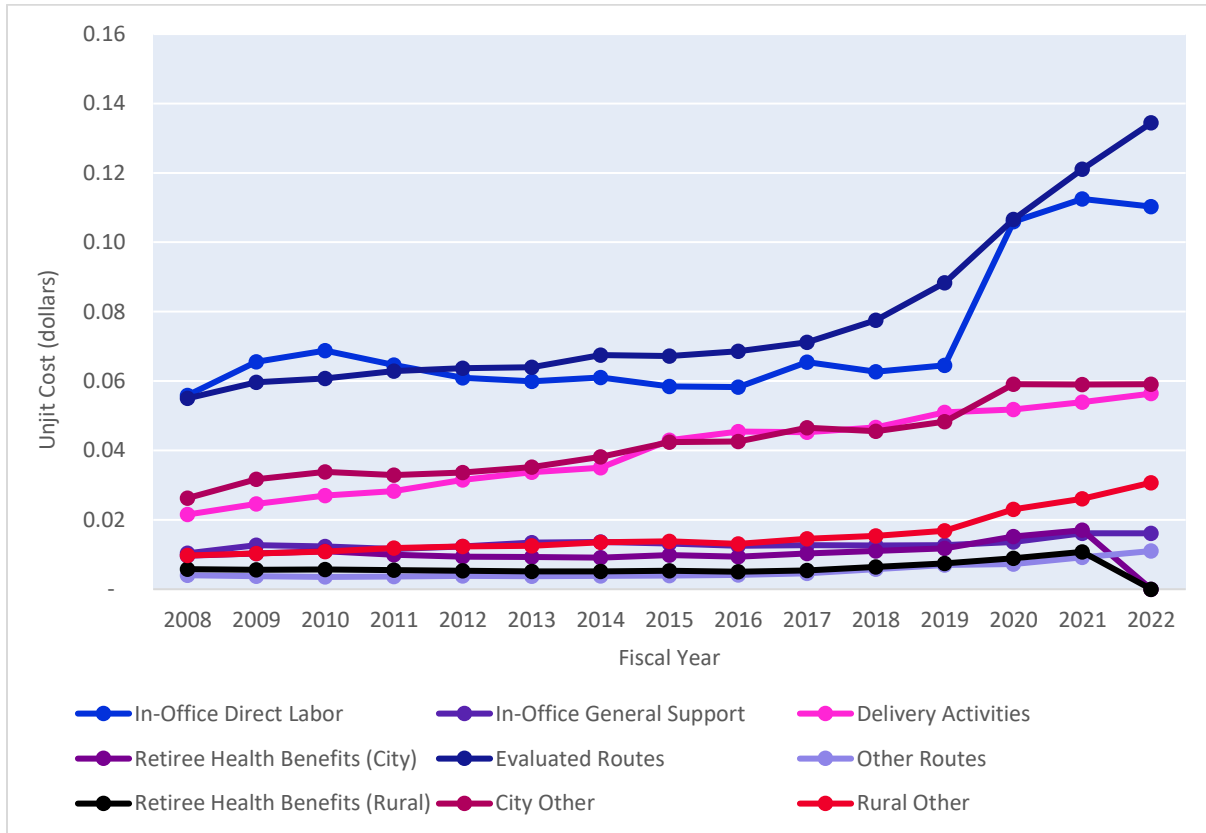


(2) Delivery

While the unit cost of the mail processing functional category is higher than the delivery functional category, the trends of the delivery unit costs is much more concerning. Figure IV-21 shows that the dramatic increase in delivery unit costs in FY 2020 was due to a jump in the unit cost of In-Office Direct Labor dependent component. This is primarily the result of a change in costing methodology for City Carriers In-Office. FY 2020 ACR at 28. Since then, there have not been any more significant increases in unit cost of In-Office Direct Labor. Unit cost of evaluated routes, however, has been increasing persistently and significantly since FY 2018 and it does not appear to be slowing.

<sup>273</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks; FY 2022 CS14; FY 2021 CS14; FY 2020 CS14; FY 2019 CS14; FY 2018 CS14; FY 2017 CS14; FY 2016 CS14; FY 2015 CS14; FY 2014 CS14; FY 2013 CS14; FY 2012 CS14; FY 2011 CS14; FY 2010 CS14; FY 2009 CS14; FY 2008 CS14.

**Figure IV-21  
Outside County Periodicals Delivery Functional Category Dependent Components,  
FY 2008–FY 2022<sup>274</sup>**



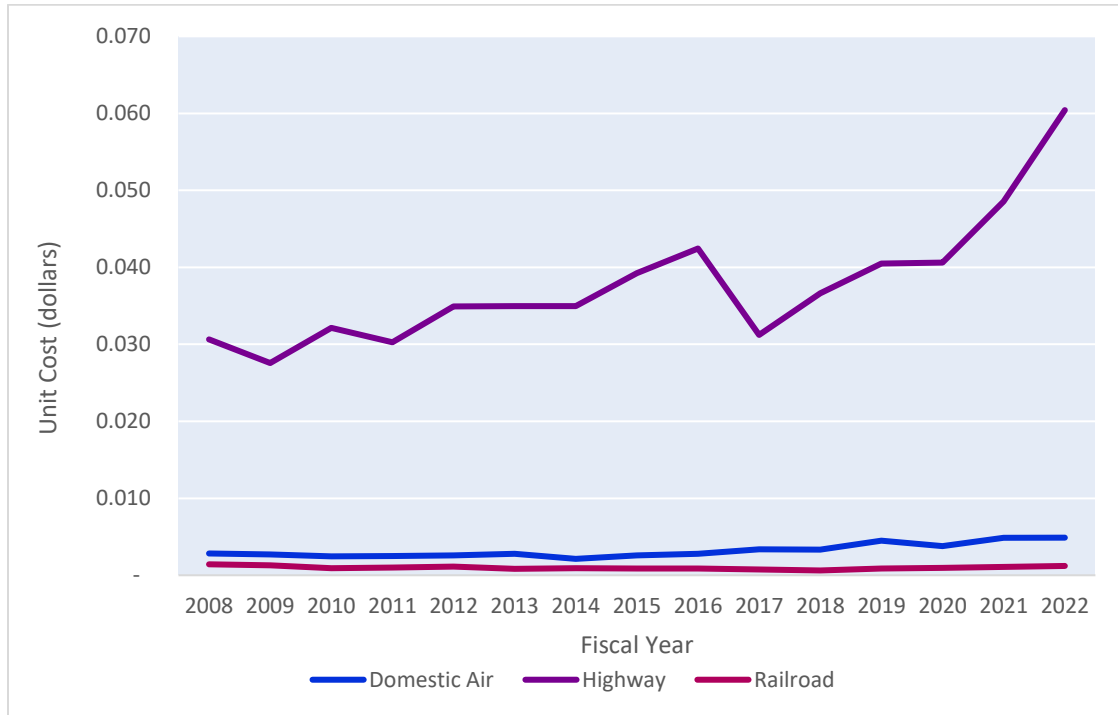
**(3) Purchased Transportation**

Purchased transportation makes up 13.5 percent of the unit cost for Outside County Periodicals, the second highest share associated with purchased transportation among all flats products. Highway transportation contract unit cost is the main driver of the purchased transportation functional category for Outside County Periodicals. The unit cost of the highway transportation dependent component had almost doubled from FY 2017 to FY 2022.<sup>275</sup> See Figure IV-22.

<sup>274</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks; Response to CHIR No. 8, Excel file "SS2022.1Resp.CHIR8.Q2.xlsx."

<sup>275</sup> See Section IV.D.2. for further discussion.

**Figure IV-22**  
**Outside County Periodicals Purchased Transportation Functional Category Dependent Components, FY 2008–FY 2022<sup>276</sup>**



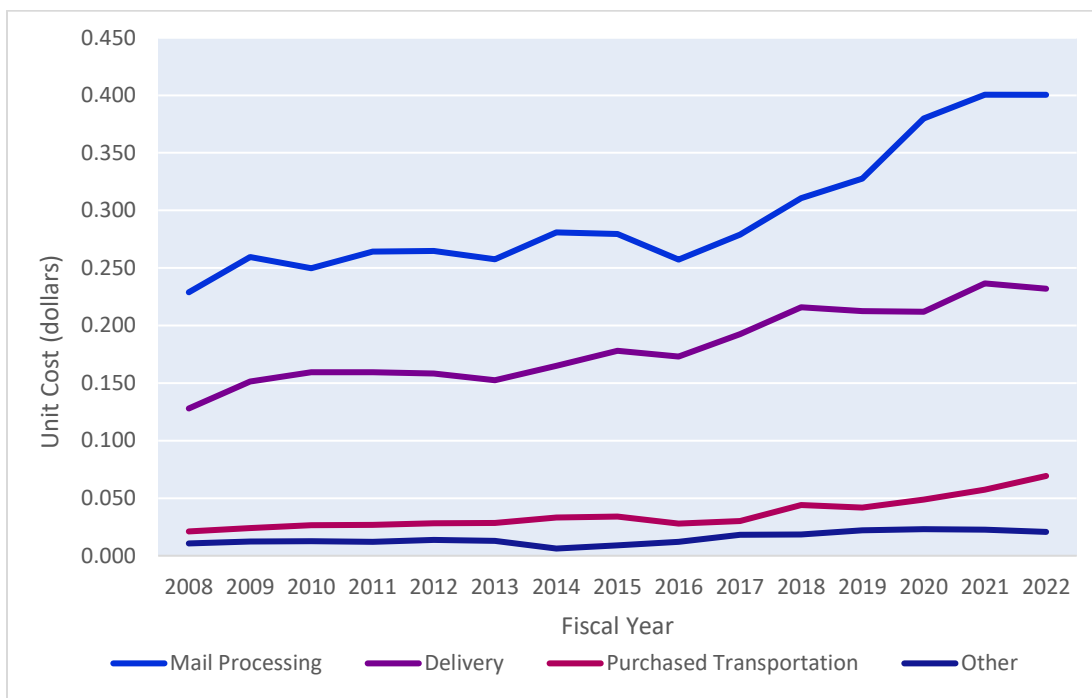
d. USPS Marketing Mail Flats

Mail processing, delivery, and purchased transportation unit costs have all increased for USPS Marketing Mail Flats since FY 2016. *See* Figure IV-23. Mail processing costs have increased more than delivery costs, which is especially noticeable from FY 2018 to FY 2021. While from FY 2021 to FY 2022 the unit costs of the other major functional categories have either decreased (delivery) or stayed the same (mail processing, other), purchased transportation unit cost increased by 20.9 percent.<sup>277</sup>

<sup>276</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 CS14; FY 2021 CS14; FY 2020 CS14; FY 2019 CS14; FY 2018 CS14; FY 2017 CS14; FY 2016 CS14; FY 2015 CS14; FY 2014 CS14; FY 2013 CS14; FY 2012 CS14; FY 2011 CS14; FY 2010 CS14; FY 2009 CS14; FY 2008 CS14.

<sup>277</sup> *See* Docket No. ACR2021, Library Reference USPS-FY21-45, folder “Rule 3050.50 Flats,” folder “Paragraph (b) – Financial Report,” Excel file “FY21.Rule.3050.50.Para.B.xlsx,” tab “Item b2;” Docket No. ACR2022, Library Reference USPS-FY22-45, folder “Rule 3050.50 Flats,” folder “Paragraph (b) – Financial Report,” Excel file “FY22.Rule.3050.50.Para.B.xlsx,” tab “Item b2.”

**Figure IV-23**  
**USPS Marketing Mail Flats Functional Categories, FY 2008–FY 2022<sup>278</sup>**



(1) Mail Processing

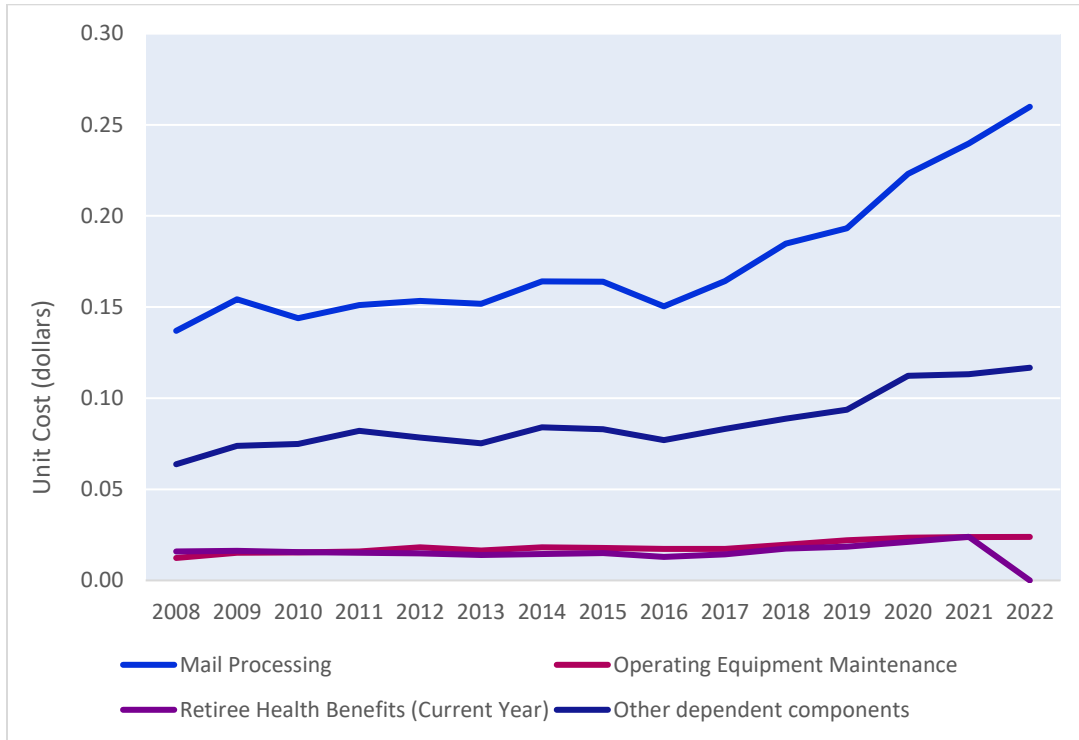
Figure IV-24 shows the trends of all the dependent components that comprise 5 percent or more of the mail processing functional category. While the other dependent components have increased slightly since FY 2016, the bulk of the increase comes from the mail processing dependent component.

The unit cost of the mail processing functional category appeared constant from FY 2021 to FY 2022 as Figure IV-23 shows. The dependent components in Figure IV-24 illustrate that this is due to the elimination of the Retiree Health Benefits dependent component rather than a decrease in mail processing dependent component costs. In fact, the mail processing dependent component has been on a steep, linear incline since FY 2016.<sup>279</sup>

<sup>278</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks; FY 2022 CS14; FY 2021 CS14; FY 2020 CS14; FY 2019 CS14; FY 2018 CS14; FY 2017 CS14; FY 2016 CS14; FY 2015 CS14; FY 2014 CS14; FY 2013 CS14; FY 2012 CS14; FY 2011 CS14; FY 2010 CS14; FY 2009 CS14; FY 2008 CS14.

<sup>279</sup> See Appendix A, Section IV.B. Analysis for an analysis of the driving factors for this incline.

**Figure IV-24**  
**USPS Marketing Mail Flats Mail Processing Functional Category Dependent Components, FY 2008–FY 2022<sup>280</sup>**

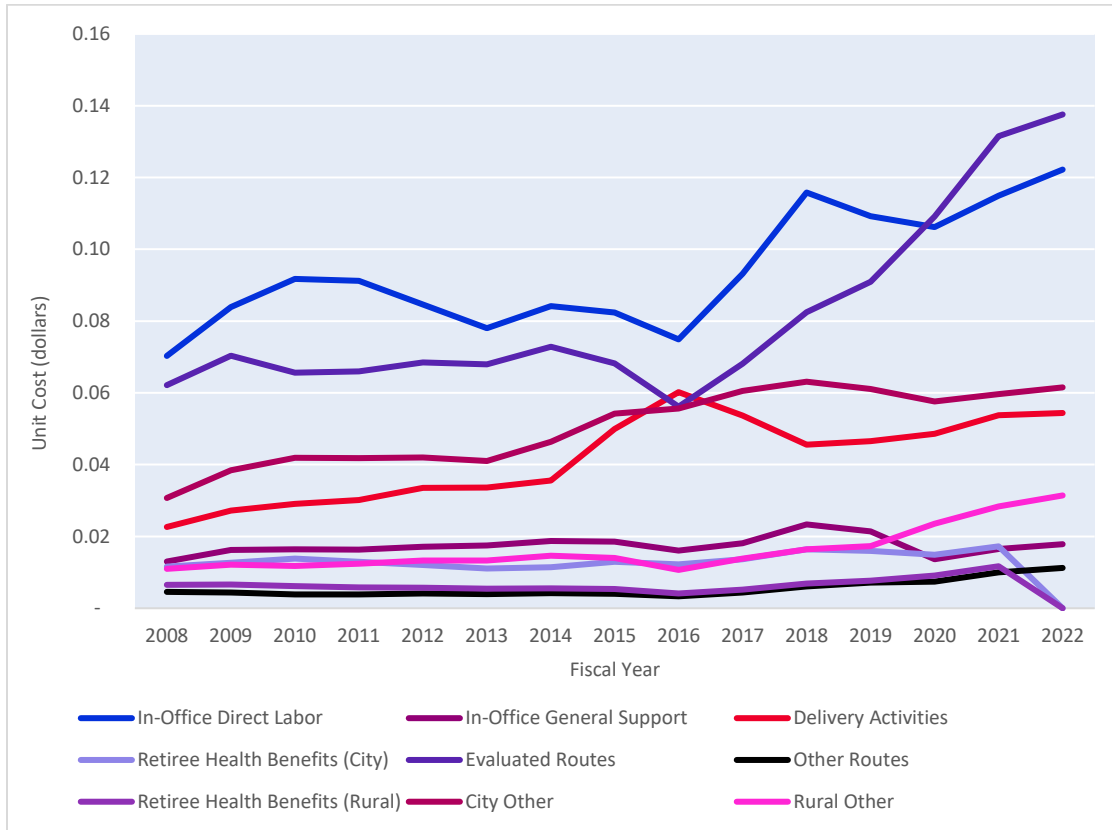


(2) Delivery

Figure IV-23 shows that while the unit costs of the delivery functional category appear relatively stable, a closer look at the dependent components reveals that there has been a large increase in costs associated with the evaluated routes dependent component. See Figure IV-25. The shift in cost from evaluated routes to delivery activities in FY 2016 is due to the migration of Carrier Route Flats to the USPS Marketing Mail Flats products as a result of the implementation of FSS-specific prices, which was eliminated the next year. FY 2016 ACD at 48 n.59.

<sup>280</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks.

**Figure IV-25**  
**USPS Marketing Mail Flats Delivery Functional Category Dependent Components,**  
**FY 2008–FY 2022<sup>281</sup>**



(3) Purchased Transportation

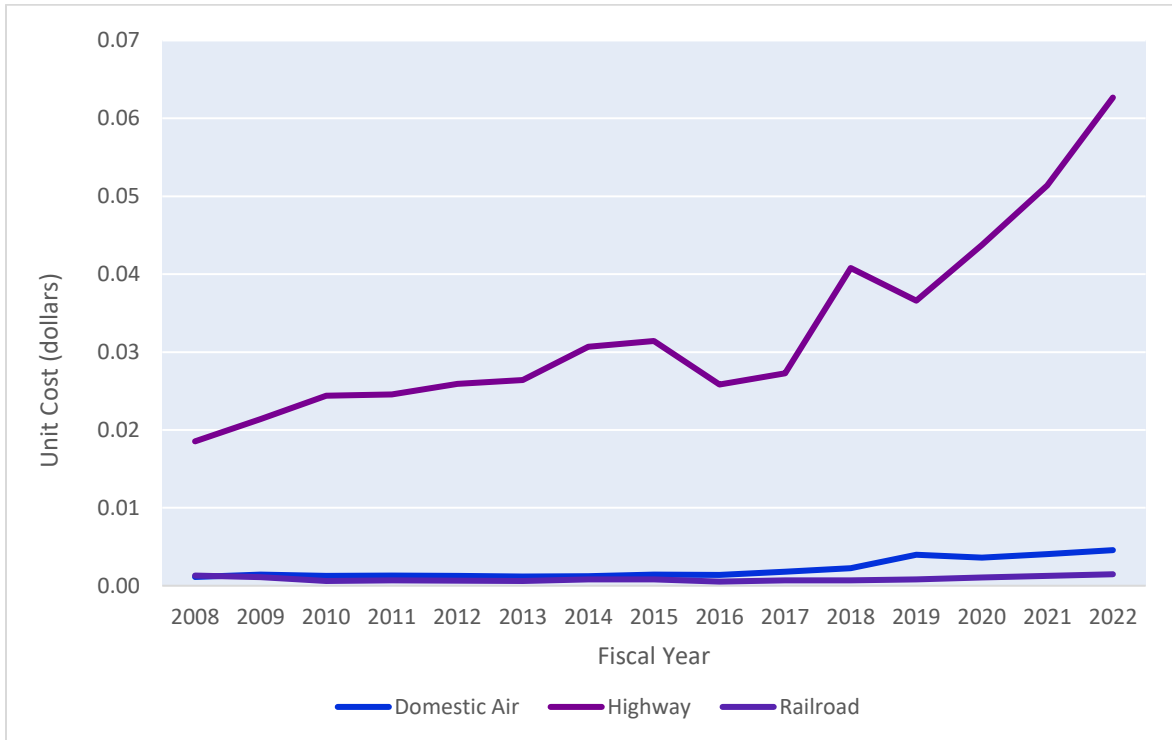
Purchased transportation costs associated with highway transportation contracts is the driving component for the increase in purchased transportation costs.<sup>282</sup> See Figure IV-26.

<sup>281</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks; Response to CHIR No. 8, Excel file “SS2022.1Resp.CHIR8.Q2.xlsx.”

<sup>282</sup> See Section IV.D.2. for further discussion.



**Figure IV-26**  
**USPS Marketing Mail Purchased Transportation Dependent Components,**  
**FY 2008–FY 2022<sup>283</sup>**

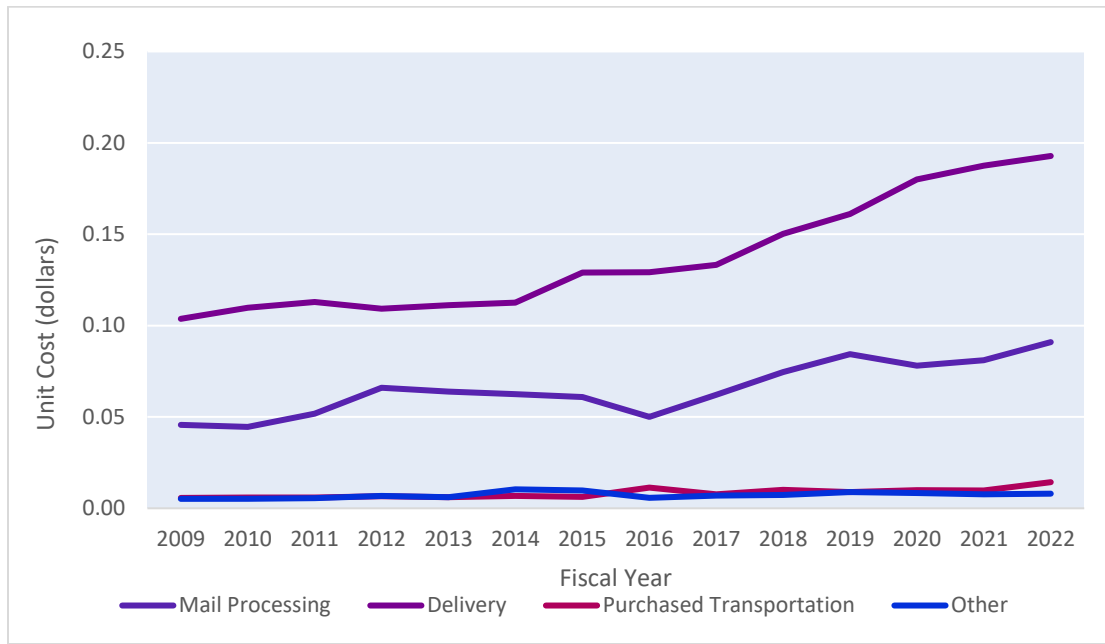


e. USPS Marketing Mail Carrier Route

Increases in Carrier Route Flats unit attributable cost is driven by higher delivery unit costs. See Figure IV-27.

<sup>283</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 CS14; FY 2021 CS14; FY 2020 CS14; FY 2019 CS14; FY 2018 CS14; FY 2017 CS14; FY 2016 CS14; FY 2015 CS14; FY 2014 CS14; FY 2013 CS14; FY 2012 CS14; FY 2011 CS14; FY 2010 CS14; FY 2009 CS14; FY 2008 CS14.

**Figure IV-27**  
**USPS Marketing Mail Carrier Route Functional Unit Costs<sup>284</sup>**

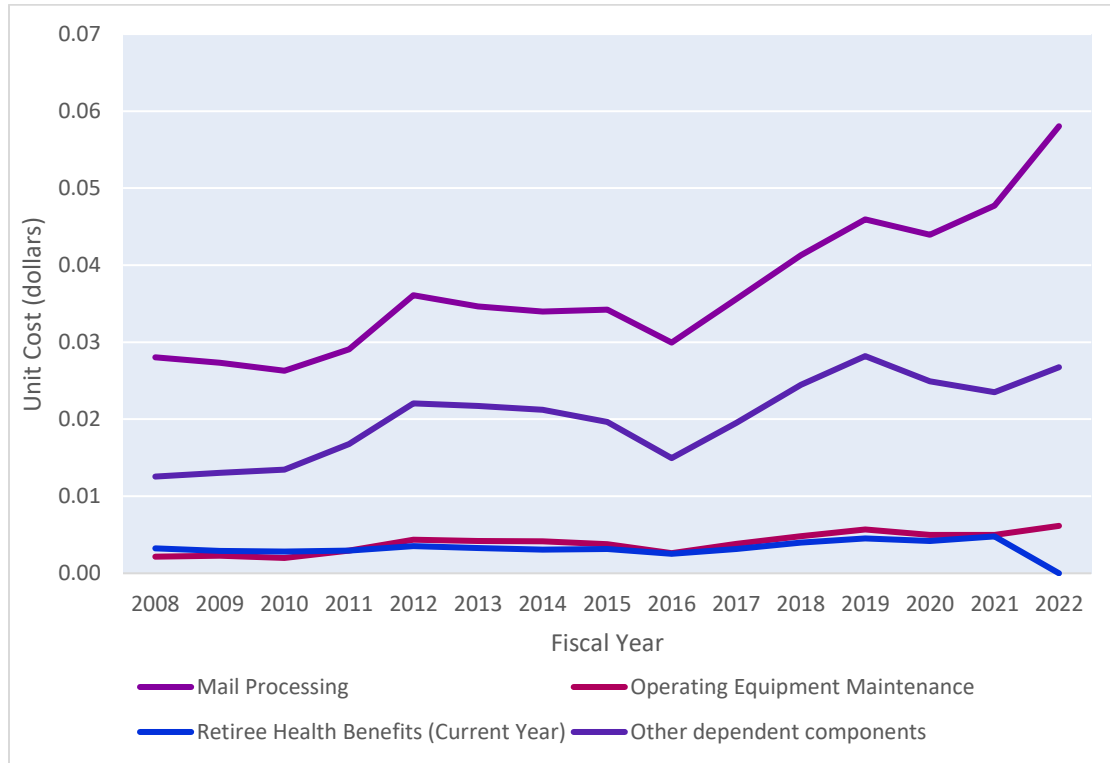


(1) Mail Processing

The mail processing unit cost of carrier route flats, while low compared to delivery costs, has almost doubled since FY 2016. While the increase appears to level out between FY 2019 and FY 2022 in Figure IV-27, separating the dependent components in Figure IV-28 shows that the mail processing dependent component has continued to increase dramatically in FY 2021 and FY 2022 and that the stability of the mail processing functional category from FY 2021 to FY 2022 was only because of the elimination of Retiree Health Benefits.

<sup>284</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks; FY 2022 CS14; FY 2021 CS14; FY 2020 CS14; FY 2019 CS14; FY 2018 CS14; FY 2017 CS14; FY 2016 CS14; FY 2015 CS14; FY 2014 CS14; FY 2013 CS14; FY 2012 CS14; FY 2011 CS14; FY 2010 CS14; FY 2009 CS14; FY 2008 CS14.

**Figure IV-28**  
**USPS Marketing Mail Carrier Route Mail Processing Functional Category Dependent**  
**Components, FY 2008–FY 2022<sup>285</sup>**

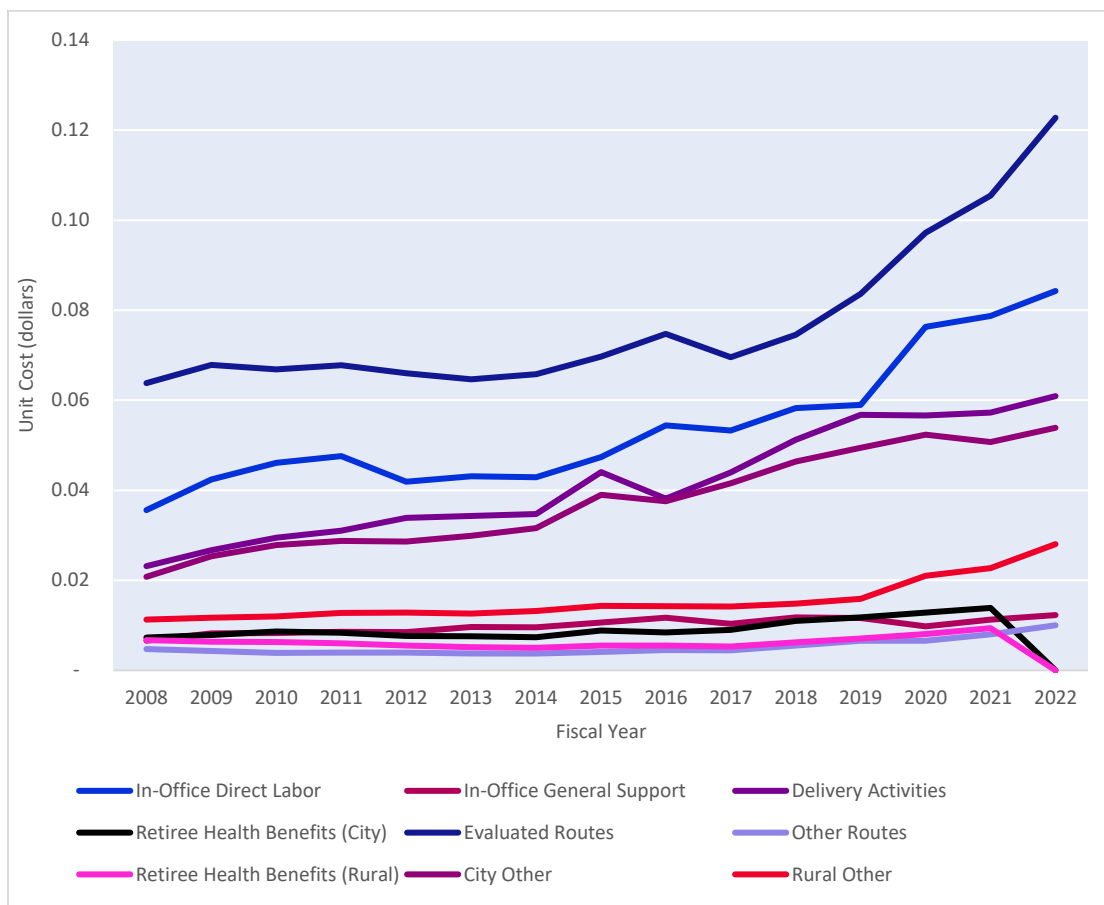


(2) Delivery

Similar to other flats products, there is a jump in the unit cost of the In-Office Direct Labor dependent component in FY 2020 which is due to a methodology change. The unit costs of all the major dependent components of the delivery functional category are trending upwards. See Figure IV-29. Rural Carrier evaluated routes has the highest unit costs for Carrier Route Flats and, similar to other flats products, is increasing at a faster rate than the other dependent components.

<sup>285</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks.

**Figure IV-29**  
**USPS Marketing Mail Carrier Route Delivery Functional Category Dependent Components,**  
**FY 2008–FY 2022<sup>286</sup>**



f. First-Class Mail Flats<sup>287</sup>

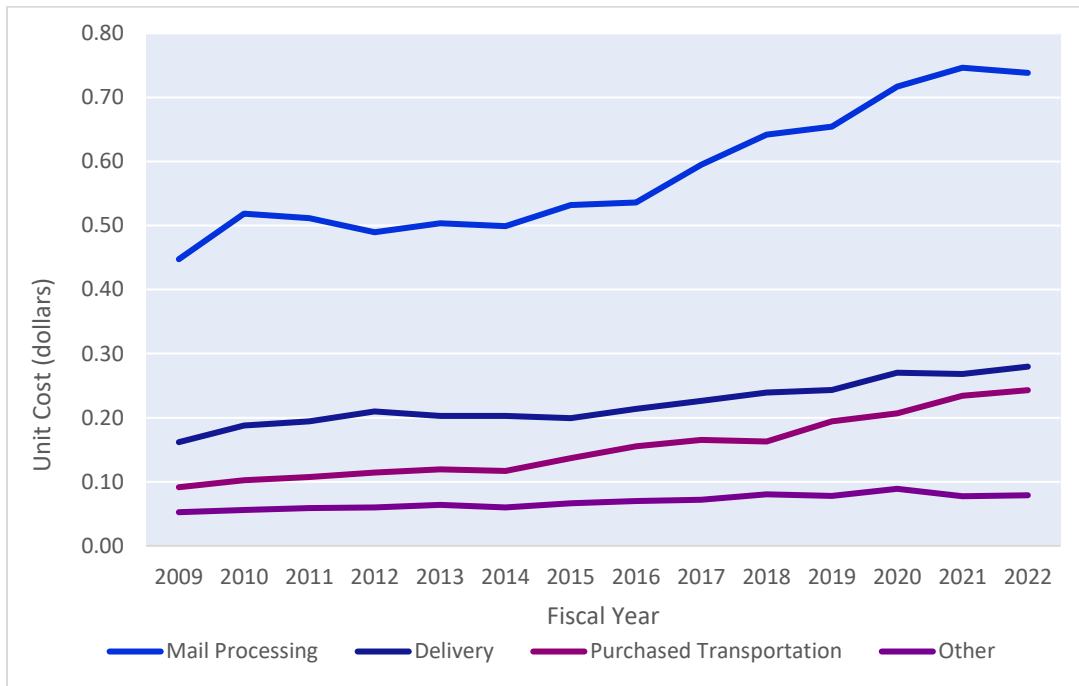
In FY 2022, First-Class Mail Flats had the largest gap between its mail processing unit cost and the unit cost of other functional categories. Only 20.9 percent of First-Class Mail Flats attributable cost is associated with delivery activities. This is the lowest share of delivery costs among all flats products. See Section IV.B.2.a., Table IV-4. It is also the flats product that has the highest share of cost associated with purchased transportation, 18.1 percent.<sup>288</sup> Unit costs in all functional categories are trending upwards. See Figure IV-30.

<sup>286</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks; Response to CHIR No. 8, Excel file “SS2022.1Resp.CHIR8.Q2.xlsx.”

<sup>287</sup> The product was non-compensatory in FY 2021 only.

<sup>288</sup> See Section IV.2.B.a.

**Figure IV-30**  
**First-Class Mail Flats Functional Unit Costs<sup>289</sup>**

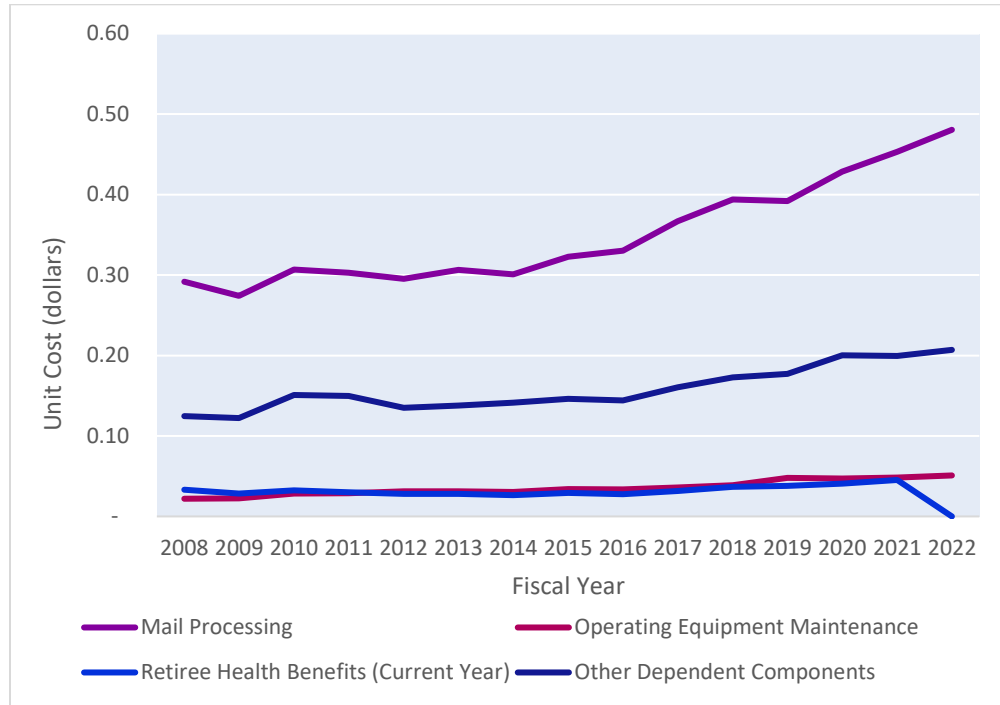


(1) Mail Processing

Similar to USPS Marketing Mail Flats, while the unit cost of the mail processing functional category decreased in FY 2022, as Figure IV-30 illustrates, this is only due to the elimination of costs in the Retiree Health Benefits dependent component. The unit cost associated with the mail processing dependent component is still increasing. See Figure IV-31.

<sup>289</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks; FY 2022 CS14; FY 2021 CS14; FY 2020 CS14; FY 2019 CS14; FY 2018 CS14; FY 2017 CS14; FY 2016 CS14; FY 2015 CS14; FY 2014 CS14; FY 2013 CS14; FY 2012 CS14; FY 2011 CS14; FY 2010 CS14; FY 2009 CS14; FY 2008 CS14.

**Figure IV-31  
First-Class Mail Flats Mail Processing Functional Category Dependent Components,  
FY 2008–FY 2022<sup>290</sup>**



(2) Delivery

Unlike most other flats products,<sup>291</sup> which only had a substantial increase in unit costs for In-Office Direct Labor in FY 2020 due to the methodology change,<sup>292</sup> the unit cost for In-Office Direct Labor of First-Class Mail Flats has had a number of increases since FY 2017, and they do not appear to be associated with any methodology changes.<sup>293</sup> The unit cost of evaluated routes has been increasing at a steady rate every year since FY 2008 except for FY 2018. See Figure IV-32.

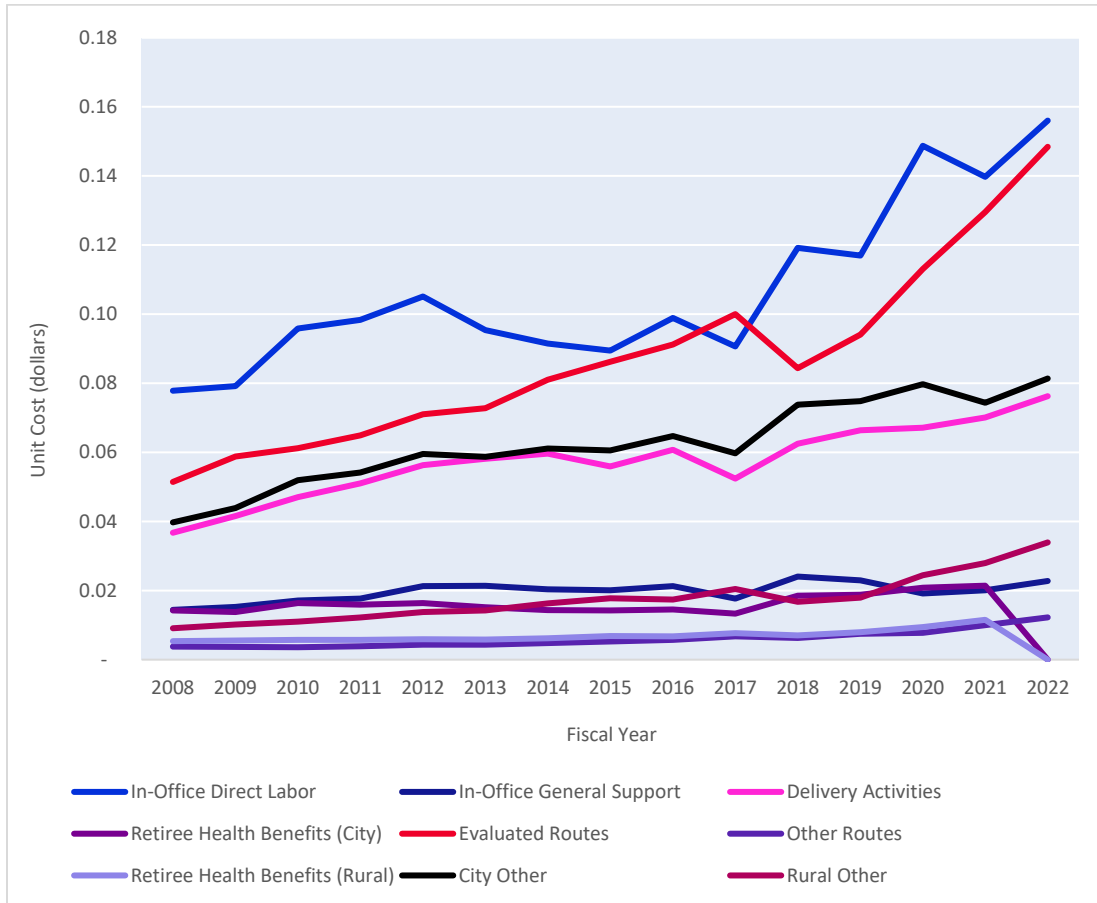
<sup>290</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks.

<sup>291</sup> The unit costs for In-Office Direct Labor of In-County Periodicals continued to increase after FY 2020, but for other non-compensatory flats products, In-Office Direct Labor costs leveled off after FY 2020. See Figures IV-18, IV-21, IV-25, and IV-29.

<sup>292</sup> FY 2020 ACR at 28 (citing Docket No. RM2020-10).

<sup>293</sup> See Table IV-8 in Section IV.E. for a list of methodology changes.

**Figure IV-32**  
**First-Class Mail Flats Delivery Functional Category Dependent Components,**  
**FY 2008–FY 2022<sup>294</sup>**

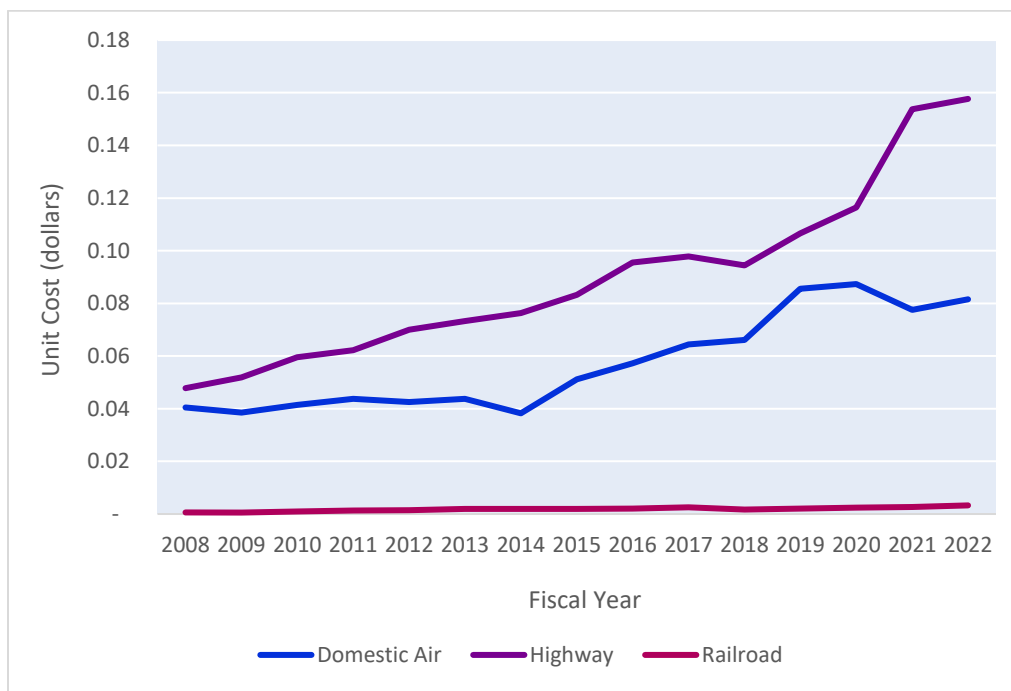


**(3) Purchased Transportation**

First-Class Mail Flats has the highest purchased transportation unit costs of all the flats products. It’s also the only flats product with a significant proportion of costs associated with the domestic air contracts. While the unit cost relating to highway contracts of other flats products was relatively flat until FY 2017, it has been increasing for First-Class Mail Flats since FY 2008, with a large jump in FY 2021. See Figure IV-33. Unit costs of domestic air contracts have been increasing steadily since FY 2014.

<sup>294</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 Piggybacks; FY 2021 Piggybacks; FY 2020 Piggybacks; FY 2019 Piggybacks; FY 2018 Piggybacks; FY 2017 Piggybacks; FY 2016 Piggybacks; FY 2015 Piggybacks; FY 2014 Piggybacks; FY 2013 Piggybacks; FY 2012 Piggybacks; FY 2011 Piggybacks; FY 2010 Piggybacks; FY 2009 Piggybacks; FY 2008 Piggybacks; Response to CHIR No. 8, Excel file “SS2022.1Resp.CHIR8.Q2.xlsx.”

**Figure IV-33**  
**First-Class Mail Flats Purchased Transportation Functional Category Dependent Components,**  
**FY 2008–FY 2022<sup>295</sup>**



g. Conclusion

First-Class Mail Flats, USPS Marketing Mail Flats, and Carrier Route Flats are all experiencing increases in mail processing unit costs, though delivery costs outweigh mail processing costs for Carrier Route Flats. The driving factors for these higher mail processing unit costs are increases in clerk and mailhandler costs associated with ASFM 100 operations<sup>296</sup> and increases in unit costs for mail processing activities at post offices and other small facilities.<sup>297</sup>

Delivery unit costs are increasing for all flats products. This is primarily due to increases in unit costs to deliver and collect mail by rural carriers (evaluated routes). Increases in delivery unit costs are also magnified by increases in unit costs associated with mail preparation and sequencing by city carriers (In-Office Direct Labor), including an increase

<sup>295</sup> Source: Commission calculations using data from FY 2022 Public CRA Report; FY 2021 Public CRA Report; FY 2020 Public CRA Report; FY 2019 Public CRA Report; FY 2018 Public CRA Report; FY 2017 Public CRA Report; FY 2016 Public CRA Report; FY 2015 Public CRA Report; FY 2014 Public CRA Report; FY 2013 Public CRA Report; FY 2012 Public CRA Report; FY 2011 Public CRA Report; FY 2010 Public CRA Report; FY 2009 Public CRA Report; FY 2008 Public CRA Report; FY 2022 CS14; FY 2021 CS14; FY 2020 CS14; FY 2019 CS14; FY 2018 CS14; FY 2017 CS14; FY 2016 CS14; FY 2015 CS14; FY 2014 CS14; FY 2013 CS14; FY 2012 CS14; FY 2011 CS14; FY 2010 CS14; FY 2009 CS14; FY 2008 CS14.

<sup>296</sup> See Appendix A, Section IV.B. Analysis for driving factors in increases in mail processing dependent component unit costs.

<sup>297</sup> Some increases in mail processing unit costs in FY 2018 at post offices and other small facilities is due to a methodology change (Docket No. RM2018-10, Order on Analytical Principles Used in Periodic Reporting (Proposal Seven), October 12, 2018 (Order No. 4855), but this does not explain the continued increases. See Cost Segment 3 Summary Description FY 2021.



in FY 2020 in the unit costs of In-County Periodicals, Outside County Periodicals, Carrier Route Flats, and BPM Flats due to a costing methodology change.<sup>298</sup>

Purchased transportation unit costs are also increasing for Outside County Periodicals, USPS Marketing Mail Flats, and First-Class Mail Flats. These increases are driven by increases in unit costs associated with highway contracts. Of all flats products, First-Class Mail Flats is the product with the highest share of purchased transportation cost (that share was more than 18 percent in FY 2022). It is also the only flats product that has a large and increasing unit cost associated with domestic air contracts.

## C. Impact of Excess Capacity and Idle Time on Flats Sorting Operations

### 1. “Excess Capacity” in Postal Service Operations

As required by section 206(a)(1)(B) of the PSRA, within the Flats Study, the Commission must quantify the effect of excess capacity on flats operations and costs. In this section, the Commission analyzes excess capacity in mail processing and discusses excess capacity in transportation and delivery. In the mail processing operations, at the facility level, the Commission econometrically evaluates how excess capacity affects workhours used to process flats on automated equipment (AFSM and FSS).

For this purpose, the Commission first econometrically evaluates how flats volume and machine downtime affect excess capacity. Then, the Commission analyses the impact of flats volume and the number of machines at each facility on excess capacity. Finally, the Commission examines how flats volume and excess capacity affect workhours (and costs) at the mail processing facilities. The methodology and results of the econometric analysis are discussed in Sections IV.C.1. and IV.C.2., and some additional details are provided in Appendix A, Section IV.C. Analysis.

The Federal Reserve Board refers to capacity as “*sustainable maximum output*—the greatest level of output a plant can maintain within the framework of a realistic work schedule after factoring in normal downtime and assuming sufficient availability of inputs to operate the capital in place.”<sup>299</sup> The Postal Service defines “downtime [as a measure of the amount] of time that machines [are] not operational during a run, as distinct from the

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<sup>298</sup> FY 2020 ACR at 28 (citing Docket No. RM2020-10).

<sup>299</sup> Board of Governors of the Federal Reserve System, *Capacity Utilization Explanatory Notes*, available at <https://www.federalreserve.gov/releases/g17/capnotes.htm#:~:text=The%20Federal%20Reserve%20Board%20constructs,divided%20by%20a%20capacity%20index.>

amount of time machines are not used outside of processing runs,”<sup>300</sup> which is idle time.<sup>301</sup> In Response to CHIR No. 3, the Postal Service discussed the factors that determine excess capacity in flats mail processing, transportation, and delivery operations. Response to CHIR No. 3, question 5.

a. Mail Processing

The Postal Service stated that the main reason for excess capacity in flats mail processing is the steady decline in flats mail volume. Over the past few years, as volume declined, “the Postal Service has made minimal reductions to the flat processing fleet,” *i.e.*, FSS and AFSM. Therefore, “the decline in volume without a commensurate decline in number of machines has led to an increase in excess capacity.” *Id.* question 5.a.

During facility visits, Commission staff learned that on low-volume days facility staff made determinations not to use FSS equipment, and sort flats on the AFSM equipment instead. This led to FSS equipment being unused. At one facility the Commission staff visited, FSS was usually run on weekends and sometimes on Fridays. Only running the FSS machines two-three times a week significantly increased idle time. At another facility that only operated AFSMs, management discussed their efforts to decrease the idle time. They ran AFSM machines each day and used the Run Plan Generator to optimize machine usage. Besides a certain 4-hour maintenance window, management had flexibility to choose times for different sort plans based on mail volumes. As a result, the AFSMs at that facility had very low idle time.

The Postal Service defines daily machine capacity as the number of pieces that theoretically “could be processed in 16 hours of run time per day with a target throughput of 7,500 pieces per hour for AFSM” machines and “19,000 pieces per hour for FSS” machines. *Id.* The Postal Service also defines percent utilization as the “actual number of pieces processed divided by capacity.” Accordingly, AFSM daily capacity is 120,000 (= 7500 x 16) pieces and its annual capacity is 43,800,000 (=120,000\*365). Similarly, the FSS daily capacity is 304,000 (=19,000\*16) pieces, and its annual capacity is 110,960,000 (=304,000\*365). Thus, the percent excess capacity is calculated as 1 minus utilization. *Id.* Subsequently, the Postal Service concluded that in FY 2022, excess capacity for AFSM was 42 percent, and for FSS was 51 percent. *Id.*

The Commission analyzed the relationship between volumes and excess capacity at the facility level. Using MODS data for FY 2017 through FY 2022 by mail processing facility for two machine types (AFSM and FSS), the Commission developed a panel dataset with the data on volume, workhours, number of machines, machine downtime, and capacity by the finance number for each machine type at the corresponding facility. See Appendix A,

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<sup>300</sup> Response to CHIR No. 3, question 5.a.; Library Reference USPS-SS2022-1/NP3, December 21, 2022, folder “SS22.1\_NP3\_ResponseFiles,” folder “Q.5,” Excel file “Flats MP Excess Capacity FY 2022.xlsx,” tab “Main.”

<sup>301</sup> During machine idle time, they “are not run but are available to do so.” See, *e.g.*, Docket No. N2012-1, Responses of United States Postal Service Witness Emily Rozenberg to Public Representative Interrogatories PR/USPS-T3-17, February 16, 2012. Generally speaking, idle time is a period of time when employees or equipment are in a waiting period. See <https://www.getflowpath.com/blog/how-to-calculate-idle-time-and-why-its-important>.

Section IV.C. Analysis for details. Excess capacity for each machine at the facility was estimated using the formula provided by the Postal Service. Response to CHIR No. 3, question 5.

The Commission's econometric analysis confirms that there is a significant reverse relationship between the excess capacity and flats volume processed by each machine type (FSS or AFSM). *See* Table IV-5. In this econometric model, excess capacity is a dependent variable, and volume and machine downtime are the explanatory variables. This model explains how a unit change in volume or downtime may impact excess capacity.<sup>302</sup> The sign of a coefficient indicates if a relationship is positive or negative. In addition, the P-Value of coefficient indicates whether this relationship is statistically significant.<sup>303</sup> The magnitude of impact is related to the size of the coefficient. *Id.* at 133-35. The data used in this analysis were provided by the Postal Service and cover the period from FY 2017 to FY 2022. See Appendix A, Section IV.C. Analysis for details.

As presented in Table IV-5, negative volume coefficients for ASFM and FSS machines mean that a decrease in flats volumes processed on these machines corresponds with an increase in the excess capacity at the Postal Service's facilities (when machine downtime does not change). Furthermore, the P-Values for these two coefficients indicate that the reverse relationship between excess capacity and volume is significant. A decline in volume results in an increase in excess capacity.

The downtime coefficient is more predictable. As Table IV-5 displays, a significant positive relationship exists between machines' downtime and excess capacity at the facility level. An increase in machine downtime corresponds with a slight increase in excess capacity, assuming the processed volume does not change.

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<sup>302</sup> A logarithm (ln) transform in variables volume and downtime ensures the relationships are linearized. It also allows an easier interpretation of the result in percentage. *See* Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach* 41 (5th ed. 2013). Since excess capacity is already a percentage ratio, it does not need to be transformed into logarithm form.

<sup>303</sup> When the P-Value is less than 0.05 and close to zero, it means that with 95 percent confidence, we can accept the coefficient. In other words, the coefficient is statistically significant. *See* Wooldridge, *supra*, at 41.

**Table IV-5  
Regression Results**

Relationship Between Excess Capacity, Volume, and Downtime FY 2017-FY 2022						
AFSM						
Excess Capacity	Coefficient	Std. err.	T	P>t	[95% conf. interval]	
InVolume	-0.206765	0.00937	-22.07	0.000	-0.225146	-0.188383
InDowntime	0.058068	0.00814	7.13	0.000	0.042091	0.074046
_cons	3.724427	0.12611	29.53	0.000	3.476996	3.971858
R-squared:	Obs per group:					
Within =	0.4807	min =	195			
Between =	0.6788	avg =	197.8			
Overall =	0.4817	max =	199			
				F(2,1179) =	545.77	
corr(u <sub>i</sub> , X <sub>b</sub> ) =	0.0581			Prob > F =	0.000	
FSS						
Excess Capacity	Coefficient	Std. err.	T	P>t	[95% conf. interval]	
InVolume	-0.115823	0.0122991	-9.42	0.000	-0.140052	-0.091594
InDowntime	0.091436	0.0127809	7.15	0.001	0.066257	0.116614
_cons	2.143740	0.1505374	14.24	0.000	1.847184	2.440296
R-squared:	Obs per group:					
Within =	0.6733	min =	33			
Between =	0.8725	avg =	41			
Overall =	0.6733	max =	43			
				F(2,238) =	46.18	
corr(u <sub>i</sub> , X <sub>b</sub> ) =	0.3961			Prob > F =	0.000	

Moreover, as shown in Table IV-6, in both AFSM and FSS flats processing operations, additional machines at mail processing facilities increase excess capacity if volumes are stable. In a declining volume environment, excess capacity increases if the number of machines is unchanged. In other words, excess capacity may increase when volume declines at a facility without the number of machines being adjusted appropriately. Response to CHIR No. 3, question 5.a.

**Table IV-6  
Regression Results**

Relationship Between Excess Capacity, Volume, and Number of Machines FY 2017-FY 2022						
AFSM						
Excess Capacity	Coefficient	Std. err.	T	P>t	[95% conf.	interval]
InVolume	-0.297196	0.006524	-45.55	0.000	-0.3099963	-0.2843953
InMachinesNo	0.287799	0.010448	27.55	0.000	0.2673009	0.3082967
_cons	5.469688	0.109418	49.99	0.000	5.255012	5.684365
R-squared:	Obs per group:					
Within =	0.6705		min =	195		
Between =	0.9571		avg =	197.8		
Overall =	0.6709		max =	199		
			F(2,1179) =	1199.32		
corr(u_i, Xb) =	0.0862		Prob > F =	0.000		
FSS						
Excess Capacity	Coefficient	Std. err.	T	P>t	[95% conf.	interval]
InVolume	-0.1850294	0.0069807	-26.51	0.000	-0.1987812	-0.1712777
InMachines	0.1856448	0.0076024	24.42	0.000	0.1706682	0.2006214
_cons	3.902918	0.1210274	32.25	0.000	3.664497	4.14134
R-squared:	Obs per group:					
Within =	0.7503		min =	33		
Between =	0.9810		avg =	41		
Overall =	0.7984		max =	43		
			F(2,238) =	357.54		
corr(u_i, Xb) =	0.4333		Prob > F =	0.000		

b. Transportation

The Postal Service specified that there is “potential excess capacity in flat transportation due to FSS processing.” *Id.* The Commission acknowledges that the Postal Service will discontinue FSS processing from all facilities in FY 2023. *Id.* However, it is unclear how much transportation utilization will improve after decommissioning all FSS at the mail processing facilities. The Postal Service stated that it “will reevaluate plant-to-delivery unit transportation at former FSS sites as FSS processing is discontinued in FY 2023.” *Id.*

When discussing excess capacity in current transportation operations related to flats, the Postal Service states that it determines surface transportation by reviewing trip utilization and calculates it as the average floor utilization of the truck or trailer by leg for each trip. *Id.* However, this calculation is not for flats transportation only because the truck or trailer floor is not used only for flats transportation. *Id.*

An example of transportation operations that the Commission staff observed and likely led to excess transportation capacity, was the fact that only mail of the same shape, same mail class, and for the same destination could be combined in containers as they were being consolidated for long-haul transportation in the surface transportation network. As a representative at a STC explained, filling containers in this manner with declining First-Class Mail letters and flats volumes prevented better maximum use of container space. In the case of stackable containers, such as Gaylord four-foot containers, it also prevented stacking them on trucks (*see* Section III.D.1.).

Commission staff also observed that to meet service standards, facility management often makes decisions, to dispatch delayed mail or misrouted containers on direct underutilized trips, which contributes to excess capacity in transportation.

Although the usual standard in industries is to consider excess capacity when the utilization is less than 80 or 85,<sup>304</sup> the Postal Service considers excess capacity in transportation when the utilization is less than 65 percent. Response to CHIR No. 3, question 5.a. Besides “processing operating plans” and “service standards” constraints and “arrive by the Critical Entry Times (CETs),” which sometimes make the transportation run under-utilized, there are other factors that impact transportation utilization. *Id.*

These factors are “container fill rates, the number of trips operating in lanes, and the amount of time between the available dispatch time and required arrival at destination as it compares to the service standards of the product on the trips.” *Id.* Consequently, the Postal Service concluded that in FY 2022, the utilization rate for HCR was 42.46 percent, and for PVS was 32.54 percent. In total (as an annual average), the transportation utilization for FY 2022 was 39 percent. *Id.*

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<sup>304</sup> The Effect of Imports of Steel on the National Security, U.S. Department of Commerce, Bureau of Industry and Security, Office of Technology Evaluation, January 11, 2018, at 4; CRI: How Manufacturers Should Account for Excess Capacity, available at <https://cricpa.com/insight/manufacturers-excess-capacity/>.

This utilization rate is for more than flats and includes all other types of mail. As discussed in Section III.D.1., the Postal Service generally combines mail products with similar service standards, and with the same origin and destination points, on shared transportation. Therefore, the data are not available that would allow isolating the excess capacity in transportation of flats mail from transportation of all mail shapes.

c. Delivery

The Postal Service stated that it is unaware of any meaningful excess capacity related to delivery because “carriers generally handle all shapes simultaneously on the street, variations in flats volume would not automatically create situations” that allied with excess capacity. *Id.* Moreover, through a route adjustment process, variations in the volumes of all shapes would be handled over time to eliminate any mismatch between workload and hours. Subsequently, the Postal Service states that the concept of excess capacity relating to flats is irrelevant in the current delivery operating environment. *Id.* The operational expert the Commission consulted noted this might not be easily done during a short time (*e.g.*, 2-3 years), especially if volume continues to decline and the FSS is taken out of the mail processing operations.

While the Postal Service stated that it would be adjusting routes to eliminate any mismatch between workload and hours over time, the Commission’s operational expert noticed that removing FSS from all facilities may increase carrier office hours and the number of required routes. He also suggested that the Postal Service should continue the ongoing City-Route Inspections to ensure halting any workhours, vehicle, and equipment mismatches due to volume reduction.

## 2. Analysis of the Relationship Between Excess Capacity and Workhours in Flats Sorting Operations

The Postal Service specified that sharp and constant volume declines and invariant setup and breakdown activities to processed volume are reasons for the continued increase in flats mail processing cost. FY 2021 ACR at 20; FY 2021 ACD at 53.

When quantifying the effects of the volume trends and excess capacity on the Postal Service’s costs at the facility level, the Commission looked at the impact of these two factors on workhours spent during AFSSM and FSS operations. These workhours represent time spent by labor while operating the machines, and it is reported in MODS as direct labor workhours on the specific machine. See Appendix A, Section IV.C. Analysis for details. In the Postal Service costing system, workhours recorded at the mail processing facilities and directly associated with FSS and AFSSM operations are used to estimate the costs of these operations.<sup>305</sup>

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<sup>305</sup> See, *e.g.*, Summary Description of USPS Development of Costs by Segments and Components, Fiscal Year 2021; Narrative Explanation of Econometric Demand Equations for Market Dominant Products Filed with Postal Regulatory Commission on January 20, 2022; Narrative, July 1, 2022, folder “Summary Descriptions FY 2021,” folder “Summary Descriptions of FY 2021,” Word file “CS-03-21.docx,” at 3-3-3-4.

The results of the econometric analysis presented in Table IV-7, suggest that there is a strong positive relationship between workhours, on one side, and volume and excess capacity, on another side. For both AFSM and FSS, regression results indicate that 1 percent (1 unit) increase in volume corresponds with almost a proportional impact on workhours (*i.e.*, they increase by approximately 1 percent as well). This is consistent with previous Commission findings.<sup>306</sup> Similarly, a positive relationship exists between excess capacity and workhours, and this relationship is statistically significant. *See* Table IV-7. An increase in excess capacity results in increased workhours for AFSM and FSS flats operations. For instance, in the case of FSS, a 1 percent increase in excess capacity results in approximately 1.2 percent increase in workhours. For AFSM, the impact of excess capacity on workhours is smaller: a 1 percent increase in excess capacity corresponds with a 0.36 percent increase in workhours.<sup>307</sup>

The Commission concludes that a combined effect of declined volume and increased excess capacity corresponds with the increased costs of flats operations.

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<sup>306</sup> Docket No. RM2022-13, Order on Analytical Principles Used in Periodic Reporting (Proposal Six), November 3, 2022, at 11-12 (Order No. 6322).

<sup>307</sup> For interpretation of coefficients in regression models in different functional forms *see e.g.*, Woodbridge Jeffrey M., *Introductory Econometrics. A Modern Approach* (5<sup>th</sup> Edition), 2013 at 44, available at <https://jaimedv.com/eco/4c1-ecomet/jeffrey-m-wooldridge--econometrics--book.pdf>.



**Table IV-7  
Regression Results**

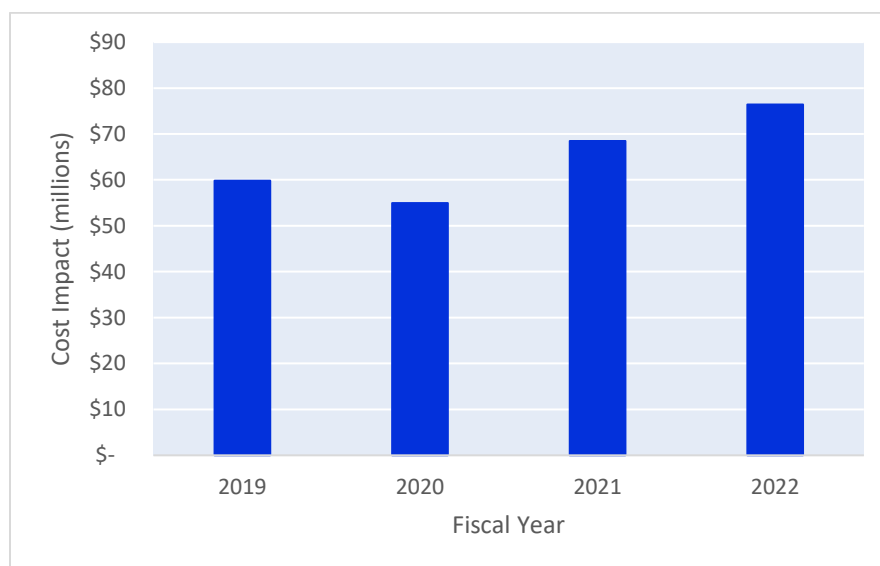
Relationship Between Workhours, Volume, and Excess Capacity FY 2017-FY 2022						
AFSM						
InWorkhours	Coefficient	Std. err.	t	P>t	[95% conf. interval]	
InVolume	0.9927277	0.0258873	38.35	0.000	0.9419372	1.043518
Excess Capacity	0.3627038	0.1146985	3.16	0.001	0.1376677	0.5877399
example_cons	-7.759188	0.4897082	-15.84	0.000	-8.719986	-6.798391
R-squared:	Obs per group:					
Within =	0.678		min =	194		
Between =	0.5008		avg =	197.7		
Overall =	0.6758		max =	199		
			F(2,1178) =	1240.07		
corr(u_i, Xb) =	-0.0741		Prob > F =	0.000		
FSS						
InWorkhours	Coefficient	Std. err.	t	P>t	[95% conf. interval]	
InVolume	1.07153	0.0371403	28.85	0.000	0.998364	1.144695
ExcessCap	1.208881	0.3284074	3.68	0.000	0.5619247	1.855838
_cons	-9.80325	0.7786812	-12.59	0.000	-11.33724	-8.269263
R-squared:	Obs per group:					
Within =	0.7873		min =	33		
Between =	0.8362		avg =	41		
Overall =	0.7835		max =	43		
			F(2,238) =	440.35		
corr(u_i, Xb) =	-0.2028		Prob > F =	0.000		

## D. Effects of Different Operational Factors and Certain Investment Decisions on Flats Cost

### 1. Cost Impacts of Bundle Breakage

Figure IV-34 displays the total cost impact of broken bundles for each fiscal year. Total bundle breakage costs have increased during the last three consecutive fiscal years even though the total number of bundles has declined throughout this period. In FY 2022, bundle breakage costs accounted for 34 percent of all bundle processing costs. From FY 2019 through FY 2022, bundle breakage cost the Postal Service \$260 million cumulatively, which emphasizes the urgent need to reduce bundle breakage rates and, consequently, costs.

**Figure IV-34**  
**Annual Cost of Broken Bundles<sup>308</sup>**



As discussed in Section III.C., bundle breakage is a significant cost to the Postal Service, which has been increasing every year since FY 2020. The Postal Service collects data on bundle breakage, but the dataset has several shortfalls. First, bundles without a Full-Service IMb are missing from the count of bundles processed. Second, bundles that are purposefully broken because they were viewed as on the verge of breaking as they are entering the bundle sorting system and bundles that broke before they were processed are

<sup>308</sup> Docket No. ACR2021, Library Reference USPS-FY21-45, folder "FY21.45.Files," folder "e.9 Trend Narrative.PRC.LR.9 Update," Excel file "CH 6 Data and Tables FY 21. PRC.LR.9 Update.xlsx," tab "Table VI-10 – Bundle Cost Impact."

missing from the count of broken bundles. Third, the dataset does not identify where bundle breakage occurs. The Postal Service lacks ways to fully document breakage. In turn it lacks the ability to associate this data with specific mailers and provide this information to the mailers. Ultimately, it also lacks the ability to hold mailers financially accountable for ongoing poor bundle creation in order to offset the additional processing costs that result. With adequate data collection, the Postal Service could identify patterns of bundle breakage and work to mitigate it. Expanded use of MIA would notify mailers of mail preparation issues.

## 2. Impacts on Flats Transportation Costs

Between FY 2015 and FY 2022, the flats unit transportation costs increased by 57.1 percent and the associated volume transported to a DDU for delivery or to another mail processing unit for further sortation decreased by 34.4 percent.<sup>309</sup> As shown in Figure IV-35, the upward trajectory of unit costs began in FY 2017.<sup>310</sup> The Postal Service has attributed the increases in unit transportation costs to include more USPS Marketing Mail Flats being entered farther from their destinations.<sup>311</sup> The Postal Services also credited the increases to overall surface transportation inflationary pressures together with sampling variation,<sup>312</sup> and an increase in purchased surface transportation for First-Class Mail Flats due in part to a decrease in the capacity utilization of flats tubs.<sup>313</sup> Additionally, the Postal Service ascribed the increases to transit failures exacerbated by the COVID-19 pandemic taking a toll on employee availability,<sup>314</sup> and transportation capacity for all mails being greatly affected by the increases in e-commerce. *Id.* Among other policy measures the Postal Service undertook to respond to transportation unit cost increases were hiring new employees and converting non-career employees into career employees to address employee shortages. *Id.*

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<sup>309</sup> See Docket No. ACR2022, Library Reference USPS-FY22-45, folder "USPS-FY22-45," folder "FY22.45.Files," folder "Rule 3050.50 Flats," folder "Paragraph (e) – Pinch Point Reports," folder "e.9 Trend Narrative.PRC.LR.9 Update," Excel file "CH 6 Data and Tables 2022.PRC.LR.9 Update.xlsx," tab "Figure VI-10 Transportation." First-Class Mail Flats, USPS Marketing Mail Carrier Route, USPS Marketing Mail Flats, USPS Marketing Mail High Density/Saturation Flats, Periodicals, and BPM Flats for each fiscal year are summed to calculate the costs and volumes.

<sup>310</sup> Docket No. ACR2022, Library Reference USPS-FY22-45, folder "USPS-FY22-45," folder "FY22.45.Files," folder "Rule 3050.50 Flats," folder "Paragraph (e) – Pinch Point Reports," folder "e.9 Trend Narrative.PRC.LR.9 Update," Excel file "CH 6 Data and Tables 2022.PRC.LR.9 Update.xlsx," tab "Figure VI-10 Transportation."

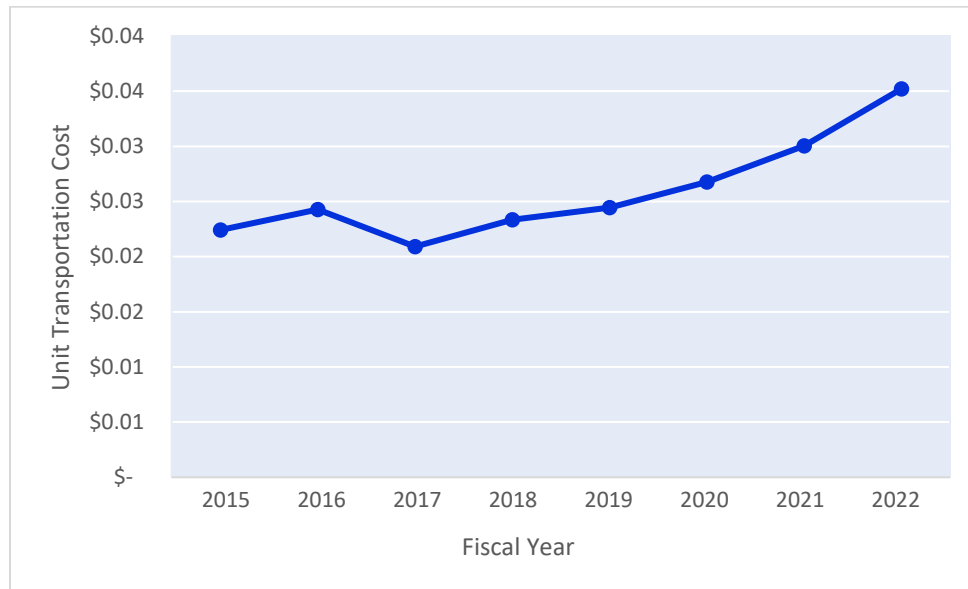
<sup>311</sup> See Docket No. ACR2018, Responses of the United States Postal Service to Questions 1-5 of Chairman's Information Request No. 22, question 5, March 13, 2019 (Docket No. ACR2018, Response to CHIR No. 22). See also Docket No. ACR2019, Library Reference PRC-LR-ACR2019-9, March 25, 2020. The percent of USPS Marketing Mail Flats and Carrier Route entered at a DSCF decreased from 77.0 percent to 75.5 percent in FY 2019, and the percent of mail entered at origin increased from 12.0 percent to 12.7 percent from FY 2015 to FY 2019. Response to CHIR No. 22, question 5; Docket No. Library Reference PRC-LR-ACR2019-9.

<sup>312</sup> Docket No. ACR2019, Library Reference USPS-FY19-45, December 27, 2019, folder "FY19.45.3050.50 Public Content," folder "Paragraph (e) -- Pinch Point Reports," folder "e.9 Trend Narrative.Chpt 6 Update," PDF file "FY19.ACD.CHAPTER 6 UPDATE.pdf," at 3.

<sup>313</sup> Docket No. ACR2020, Responses of the United States Postal Service to Questions 1-30 of Chairman's Information Request No. 5, question 1.a., February 2, 2021.

<sup>314</sup> FY 2022 Narrative at 6.

**Figure IV-35**  
**Flats Transportation Unit Costs FY 2015–FY 2022**



### 3. Impact on Last Mile/Delivery Costs

In-office and street time are the two components of the city career delivery operations.<sup>315</sup> The unit costs for city carrier in-office processing (casing) increased by 47.1 percent from FY 2008 to FY 2022. Comparatively, the same unit costs increased by 35.1 percent from FY 2015 to FY 2022 as shown in Figure IV-36.<sup>316</sup> The Postal Service spent a total of \$3.7 billion on delivery costs for flats in FY 2022, equivalent to 16.9 cents per piece.<sup>317</sup> The Postal Service spent a total of \$1.1 billion on city carrier in-office costs in FY 2022, including the casing costs for flats. *See* FY22 Delivery. When the additional mail processing costs

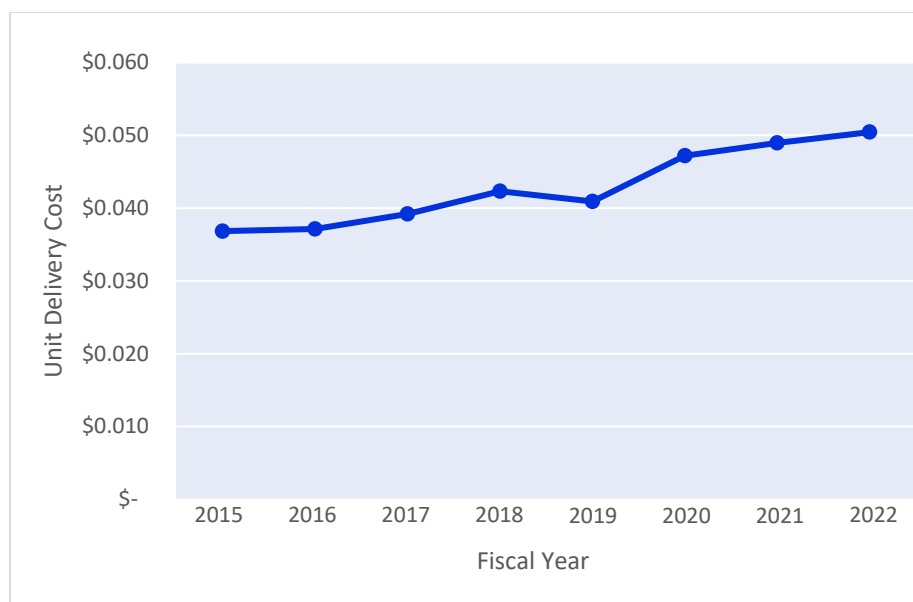
<sup>315</sup> Docket No. RM2015-7, Order Approving Analytical Principles Used in Periodic Reporting (Proposal Thirteen), October 29, 2015 (Order No. 2792). *See also* FY 2015 ACD at 177. The in-office time reflects the costs the city carriers incur while casing, and the street time reflects the costs the city carriers incur while delivering the mail. *Id.* at 6 n.9. City carriers delivered 67.7 percent of all flats and accounted for about 66.4 percent of delivery costs in FY 2022, and rural carriers delivered 32.3 percent and accounted for about 33.6 percent of the delivery costs in the fiscal year. The total flats delivered in the fiscal year were 20,892,071, and the rural carriers delivered about 6,737,731 of the totals. The total costs of flats delivery in the fiscal year amounted to \$3,002,622, and the costs for rural flats delivery amounted to \$1,009,115. *See* Docket No. ACR2022, Library Reference USPS-FY22-19, FY 2022 Delivery Costs by Shape, December 29, 2022, folder “USPS-FY22-19,” folder “Delivery Model Files,” Excel file “UDCInputs.xlsx,” tabs “RuralVols” and “RPWShape,” column “Flats.” *See also* Docket No. ACR2022, Library Reference USPS-FY22-2, Excel file “FY22Public Cost Segs and Comps.xlsx,” tabs “CS06,” “CS07,” and “CS10.”

<sup>316</sup> *See* Docket No. ACR2022, Library Reference USPS-FY22-45, December 29, 2022, zip folder “USPS-FY21-45.zip,” zip folder “FY21.45.Files.zip,” folder “Rule 3050.50 Flats,” folder “Paragraph (e) – Pinch Point Reports,” folder “e.9 Trend Narrative.PRC.LR.9 Update,” Excel file “CH 6 Data and Tables 2022.PRC.LR.9 Update.xlsx,” tab “Figure VI-11 Delivery” (FY22 Delivery).

<sup>317</sup> *See* Docket No. ACR2022, Library Reference USPS-FY22-45, December 29, 2022, zip folder “USPS-FY21-45.zip,” zip folder “FY21.45.Files.zip,” folder “Rule 3050.50 Flats,” folder “Paragraph (b) – Financial Report,” Excel file “FY22.Rule.3050.50.Para.B.xlsx,” tab “Item b2” (FY22 Financial Report B2). *See also* Docket No. ACR2022, Library Reference USPS-FY22-24, December 29, 2022, folder “USPS-FY22-24,” Excel file “FY22Public.PB,” tabs “CityCarriers” and “Rural;” Docket No. ACR2022, Library Reference USPS-FY22-1, FY 2022 Public Cost and Revenue Analysis (PCRA) Report, December 29, 2022, file “Public\_FY22CRAReport.xlsx,” tab “Volume1.”

associated with the FSS are added to the city carrier in-office costs,<sup>318</sup> the Postal Service spent over \$1.24 billion processing flats to DPS in FY 2022. This is a 4.3 percent decrease in costs from FY 2021 when the Postal Service spent \$1.30 billion on processing flats to DPS.<sup>319</sup> Nevertheless, this is only slightly less than the amount spent casing flats in FY 2008 when volume was more than double the FY 2022 volume.<sup>320</sup> The Postal Service had to case all flats manually in FY 2008 because there were no FSS machines. Despite the addition of several FSS machines and volume declining by 54.1 percent between FY 2008 and FY 2023,<sup>321</sup> the Postal Service has only been able to reduce the cost of final sortation operation for flats by 24.4 percent.<sup>322</sup>

**Figure IV-36**  
**City Delivery Carriers – Office Activity**  
**Unit Costs, FY 2015–FY 2022**



<sup>318</sup> *Id.* The cost segment 6 In-Office cost for flats in FY 2022 was \$1.109 billion. *Id.* The mail processing cost for the FSS was \$130 million. See Docket No. ACR2022, Library Reference USPS-FY22-45, folder “USPS-FY2245,” folder “FY22.45.Files,” folder “Rule 3050.50 Flats,” folder “Paragraph (b) – Financial Report,” Excel file “FY22.Rule.3050.50.Para.B.xlsx,” tab “Item b6.”

<sup>319</sup> *Id.* The unit cost of processing flats to DPS in FY 2022 was 6.7 cents per piece, and 6.4 cents per piece in FY 2021. See Docket No. ACR2022, Library Reference USPS-FY22-45, folder “USPS-FY21-45,” folder “FY21.45.Files,” folder “Rule 3050.50 Flats,” folder “Paragraph (e) – Pinch Point Reports,” folder “e.9 Trend Narrative.PRC.LR.9 Update,” Excel file “CH 6 Data and Tables 2022.PRC.LR.9 Update.xlsx,” tab “Figure VI-12 FSS.”

<sup>320</sup> See FY22 Delivery. The cost segment 6 In-Office cost for flats in FY 2008 was \$1.641 billion, \$401 million more than the combined FSS mail processing and in-office cost of \$1.240 billion in FY 2022. The flats volume was 47.94 billion pieces in FY 2008 and declined to 21.99 billion pieces in FY 2022, representing a 54.1 percent decline. *Id.*

<sup>321</sup> *Id.*

<sup>322</sup> The cost segment 6 In-Office cost for flats in FY 2008 was \$1.641 and the cost of processing flats to DPS in FY 2022 was \$1.240. *Id.*

#### 4. History of FSS Operations and Potential Impact of FSS Decommissioning on Flats Costs

In October 2006, the Postal Service invested \$1.49 billion to develop, purchase, and deploy 100 flats sequence sorting machines at 33 sites. OIG Report No. SM-WP-15-001 at 8. The FSS was a strategic initiative implemented to increase the percentage of flat-shaped mail in delivery point sequence.<sup>323</sup> This initiative focused on reducing carrier sortation and associated costs through automated processing of flats into delivery point sequence. The goal of the FSS was to replicate for flats the benefits achieved by letter sequencing, which would have improved service and financial performance of flats. *Id.* at 51.

Due to the reduction in flats volume and the FSS failing to meet key performance requirements, the deployment of the FSS was more limited than originally envisioned. OIG Report No. SM-WP-15-001 at 8. Furthermore, FSS operations did not have the intended effect on improving cost or service.

In the FY 2021 ACD, the Commission noted continuous and persistent increases in flats costs. FY 2021 ACD at 228. The Commission also highlighted the trend of declining performance for the FSS. *Id.* at 250-51. In FY 2015, only 82 percent of flats which destined in FSS zones were sorted to DPS. FY 2015 ACD at 170. By FY 2021, only 66 percent of flats were sorted to DPS. FY 2021 ACD at 250.

The Postal Service implemented several initiatives aimed at improving FSS performance, including monitoring it through the FSS Scorecard, creating self-audit checklists for facilities, and deploying certain software enhancements to address sort logic and improve handling of barcoded items. FY 2019 ACD at 167. In FY 2021, the initiatives designed to improve FSS processing included removing excess FSS machines. FY 2021 ACD at 251.

Finding it no longer cost-effective to continue FSS processing due to declines in flats volume and changes in “mailer make-up,” the Postal Service stated that FSS processing would be discontinued in FY 2023.<sup>324</sup>

Since FSS decommissioning will impact mail processing at both mail processing facilities and DDUs, as well transportation schedules, and delivery operations, it will impact costs the Postal Service incurs on these operations. Given the plan to complete the decommissioning of FSS in FY 2023, it is likely that costs for certain operations will increase immediately following the decommissioning. The Postal Service will need to restructure operations at the destination mail processing centers by shifting volumes from the eliminated FSS to AFSMs. The flats that cannot be sorted to carrier route on the AFSM and go through the manual sortation, will likely shift to DDUs. DDUs might need to expand

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<sup>323</sup> Docket No. ACR2010, Library Reference USPS-FY10-17, 2010 Comprehensive Statement on Postal Operations, December 29, 2010, at 53.

<sup>324</sup> Docket No. ACR2022, Library Reference USPS-FY22-45, folder “FY22.45.Files,” folder “Rule 3050.50 Flats,” “Paragraph (f) -- Operational Changes Report,” PDF file “FY22 Paragraph (f) Flats Operational Initiatives Report.pdf,” at 4-5.

their operations to include additional sortation and bundle distribution operations. The additional office time that carriers will spend manually casing flats previously sorted to DPS will force a reduction in street time to keep routes within an 8-hour timeframe. This will result in a change to route structure.

*Mail processing costs.* The removal of FSS equipment will eliminate costs associated with the scheduled and unscheduled maintenance of this equipment. Management at the Postal Service facilities visited by Commission staff explained that FSS equipment received 4 hours of preventive maintenance daily. The Postal Service stated it saved \$2.8 million in FSS maintenance in just two months (October through November 2022), and it planned to save \$23.4 million in maintenance “by the end of FY 2022.” Response to CHIR No. 7, question 4.b. The Postal Service added it had removed 93 of the 100 FSS machines originally installed, as of January 26, 2023, the date of the filing of its Response to CHIR No. 7. *Id.*

The discussions with staff at mail processing facilities suggested the Postal Service made facility-specific projections for increases in flats volumes that would be processed on the AFSM equipment and which were previously sorted on the FSS equipment. Staff also commented that these projections were based on an assumed shift in mailers’ presorting of flats to carrier route bundles, which would not need sorting at mail processing facilities and would be cross docked to DDUs. The Postal Service confirmed this expectation and clarified that to require no handling at mail processing facilities, carrier route bundles would need to be entered on carrier route or 5-Digit pallets.<sup>325</sup> The Commission is not able to project changes in flats presort levels by mailers, and the associated impact on mail processing workload and costs at impacted facilities.

The discussion that follows reflects the operational expert’s high-level views of the impact that the decommissioning of the FSS will have on flats operations and costs following FSS shutdown.

According to the operational expert the Commission consulted, there will be a direct impact on DDUs associated with the distribution of both Carrier Route and Enhanced Sequence bundles to their specific routes. Flats from these bundles were previously processed on FSS and then sent in containers to DDUs, where they were directly handled by carriers. As such, the Postal Service incurred minimal in-office delivery costs for these flats when they were sorted on FSS, and the costs associated with these pieces will likely increase when the FSS is decommissioned.

*Transportation costs.* The Commission anticipates reduction in costs associated with transportation of FSS flats. This would include elimination of certain transportation dedicated to moving flats sorted on FSS equipment, such as transportation from mail processing facilities to DDUs and transportation of flats between facilities operating FSS equipment to facilities operating AFSM equipment. *See* Section III.B.4.d.

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<sup>325</sup> Response to CHIR No. 2, question 3.d.; Response to CHIR No. 3, question 5.e.; Response to CHIR No. 7, question 1.b.

However, while the Postal Service expressed hope FSS decommissioning would reduce trips from plants to delivery units,<sup>326</sup> it also suggested it would “reevaluate transportation from plants to delivery units at former FSS sites in FY 2023.” Response to CHIR No. 3, question 5.e. Therefore, there is an uncertainty regarding the cost impact of FSS decommissioning on transportation operations.

*Delivery costs.* When FSS processing is discontinued, delivery costs associated with manual casing of flats that were previously sorted to DPS and required no casing, will increase. The operational expert the Commission consulted explained that due to the increased casing workload, the routes will need to be inspected and restructured. The expert clarified the process for accomplishing this is somewhat different for city and rural carrier routes, due to different methods in the bargaining agreements with the two unions that represent city and rural carrier employees. The operational expert concluded that while there are some differences in route evaluation processes between city and rural carrier routes, the impacts of FSS decommissioning on delivery costs associated with city and rural carrier routes will be similar.

The first challenge for the Postal Service might be on management/supervisor staffing required to conduct these inspections/evaluations. The operational expert provided additional details on what the route evaluation process would entail. Specifically, the expert commented that, as was the case when FSS was first implemented, dedicated teams of managers and supervisors would need to be created. The process would require well-trained staff and be time consuming. This process could not be absorbed by the existing staff of managers and supervisors, nor could these activities be absorbed during the current workday. The teams formed would have to come from top quality managers and supervisors from DDUs. In turn, it would be necessary to backfill these positions with temporary management and supervisory staff. To the maximum extent possible, the Postal Service will need to draw this staff from non-FSS DDUs. However, non-FSS DDUs’ staff may not have the appropriate level of experience. The result might be an added strain on staffing at the Postal Service facilities and an increase in associated costs.

Another challenge the elimination of FSS will impose on the Postal Service operations will be a shift of workload from mail processing operations performed at mail processing facilities to DDUs. This shift in workload will increase the time carriers will spend on in-office activities and reduce the time available for street delivery. Because carriers must keep routes within an 8-hour schedule, this change will require a creation of new, shorter routes with reduced street time, to offset the increase in office time. The basic issue is to keep routes within an 8-hour schedule.

The restructuring of routes will clearly impact the Postal Service’s delivery and mail processing operations. It will also impact mailers, who will need to adjust the bundle preparation to reflect the restructured carrier routes. Mailers are generally provided an allowance period to make the transition to the new route structures. During that period of

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<sup>326</sup> Response to CHIR No. 7, question 1.b.



time, and for each delivery zone undergoing a change, the Postal Service will receive pre-sorted bundles from mailers that will require manual sortation by clerks. However, mailers will still receive the discounts that would apply if their pre-sorted bundles were sorted on automated equipment, and the Postal Service will not receive the full savings benefit of proper presort.

## 5. Potential Changes in Flats Operations and Costs Due to Sorting and Delivery Centers

### a. Background

The Postal Service is in the early stages of rolling out a plan to move and aggregate certain delivery units, which currently mostly operate out of post offices, into larger facilities called Sorting and Delivery Centers (S&DCs).<sup>327</sup> S&DCs will mostly be using existing space in P&DCs and other existing facilities, including Processing and Distribution Facilities and main offices.<sup>328</sup> The Postal Service also plans to build new facilities in metro areas to house the S&DCs, some of which will also house Regional Distribution Centers (RDCs). *Id.*

The purpose of the S&DCs is to “reduce transportation and mail handling costs”<sup>329</sup> by aggregating delivery units into “larger Sort and Delivery Centers with adequate space, docks and material handling equipment to operate more efficiently.”<sup>330</sup> According to an issue of *The Eagle*, a Postal Service magazine targeted to its employees, the daily operating function of the S&DC will be essentially the same as a Destination Delivery Unit (DDU), “except on a larger scale and with much greater efficiency, operational reliability and staffing flexibility.”<sup>331</sup> Where a metropolitan area might today be served by 80 small delivery units, these carrier operations will be served by four or five larger facilities. *Id.* at 10. *See* Figure IV-37 for an illustrative example. Moving delivery units from post offices to S&DCs means that instead of delivery routes starting and ending at post offices after being transported there from P&DCs, delivery routes will start directly from large S&DCs.

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<sup>327</sup> The Athens location was opened mid-November 2022 after some delay. The updated schedule in a USPS letter to the National Association of Postal Supervisors sets out to convert another 17 “spoke offices” (post offices and other facilities that currently house delivery units) to five additional S&DCs by in February 2023. *See* Letter to Ivan D. Butts, President, National Association of Postal Supervisors from James Lloyd, Director, Labor Relations Policies and Programs, December 5, 2022, available at [https://naps.org/files/galleries/Updated\\_Schedule\\_for\\_Implementation\\_of\\_S\\_DC\\_Sites\\_and\\_Spoke\\_Offices\\_Lloyd\\_12\\_2\\_2022.pdf](https://naps.org/files/galleries/Updated_Schedule_for_Implementation_of_S_DC_Sites_and_Spoke_Offices_Lloyd_12_2_2022.pdf). In total, the Postal Service plans to consolidate delivery operations at more than 200 post offices and other facilities. *See* United States Postal Service, Office of Inspector General, Upcoming Audit Work, available at <https://www.uspsaig.gov/reports/upcoming-audit-work?page=1>.

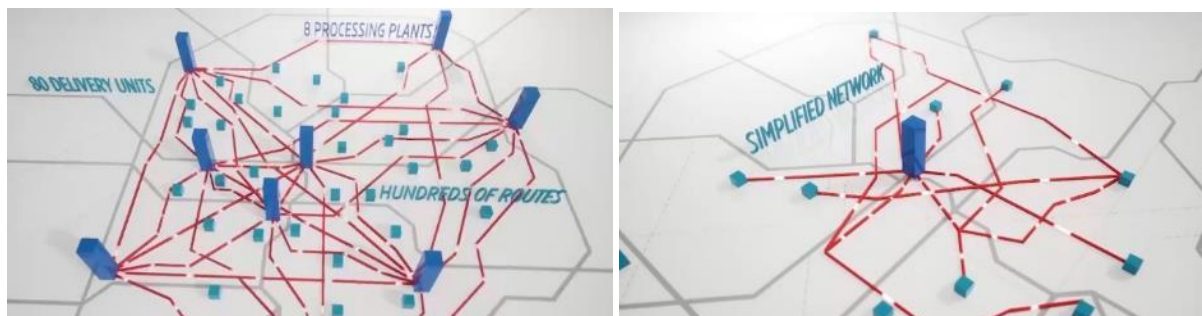
<sup>328</sup> Sorting & Delivery Center presentation by USPS, July 29, 2022, [https://www.unitedpma.org/docs/default-source/default-document-library/resources/sdc---dpmg-management-association-update\\_07.29.2022.pdf](https://www.unitedpma.org/docs/default-source/default-document-library/resources/sdc---dpmg-management-association-update_07.29.2022.pdf).

<sup>329</sup> *See* Letter to Edmund A. Carley, National President, United Postmasters and Managers of America from James Lloyd, Director, Labor Relations Policies and Programs, July 29, 2022, available at [https://www.unitedpma.org/docs/default-source/default-document-library/resources/notification-0729202246b67af2-353b-48a5-9ca8-87cf43e95d81.pdf?sfvrsn=6055688d\\_3](https://www.unitedpma.org/docs/default-source/default-document-library/resources/notification-0729202246b67af2-353b-48a5-9ca8-87cf43e95d81.pdf?sfvrsn=6055688d_3).

<sup>330</sup> *See* *The Eagle Magazine*, Volume 1, Issue 4, July 2022, at 11, available at <https://about.usps.com/resources/eaglemag/em20220802.pdf>.

<sup>331</sup> *See* *The Eagle Magazine*, Volume 2, Issue 2, February 2023, at 11, available at <https://about.usps.com/resources/eaglemag/em20230131.pdf>.

**Figure IV-37<sup>332</sup>**  
**Illustrative Example of Planned Network Change**



b. Potential Changes to Flats Operations and Costs

While there is not much detailed information yet on how these new S&DCs will reduce transportation and mail handling costs, the Commission anticipates it will affect the major functional cost categories of flats products in the following ways.

*Mail processing.* The effect on the Flats operations will heavily depend on which delivery units are being aggregated. For example, if the carriers at the selected delivery units are currently preparing large volumes of flats products, these costs would then be shifted and aggregated to an S&DC, which could potentially be more efficient because of economies of scale.<sup>333</sup> However, given the elimination of FSS, it is unlikely many additional processing windows will be available. As a result, cost savings due to economies of scale may not be significant.<sup>334</sup>

*Delivery.* One presentation from the Postal Service estimated a 5 to 10 percent increase in the number of routes required.<sup>335</sup> This appears to be due to longer distances traveled between the S&DC and the start and end points of a delivery route, which will increase the time needed to complete a route. These routes will need to be shortened to accommodate any delivery time restrictions, so more routes will need to be added. Based on current information, the Commission anticipates costs related to delivery activities to increase. In-Office costs, which currently includes mail preparation at delivery units, may see improvements if mail processing becomes more efficient at the S&DCs. However, as discussed above, much of the improvements in mail processing will already be realized due to the elimination of FSS.

<sup>332</sup> Louis DeJoy, Postmaster General, United States Postal Service, Keynote Address at 2022 National Postal Forum, May 16, 2022, at 24:30, 25:05, available at <https://about.usps.com/video/NPF2022Keynote.mp4>.

<sup>333</sup> Currently, mail preparation by city carriers is considered "In-Office Direct Labor." See Section IV.B.2. for more details about this cost component.

<sup>334</sup> With the elimination of FSS, the only operation of benefit that can be performed will be Carrier Route on an AFSSM. Given the elimination of FSS, a significant amount of Carrier Route volumes will already have to be shifted to AFSSM.

<sup>335</sup> United States Postal Service, Sorting & Delivery Center (S&DC), July 29, 2022, available at [http://www.savethepostoffice.com/wp-content/uploads/2022/08/SDC-DPMG-Management-Association-Update\\_07.29.2022.pdf](http://www.savethepostoffice.com/wp-content/uploads/2022/08/SDC-DPMG-Management-Association-Update_07.29.2022.pdf).

*Purchased transportation.* Since delivery routes will start and end at S&DCs, this eliminates the need for transportation from P&DCs to individual delivery units at post offices and other facilities. In addition, many of these S&DCs will be co-located with P&DCs or RDCs, so transportation costs to S&DCs may be significantly less than to DDUs.

## **E. Impact of Methodological Changes on Unit Attributable Cost**

### **1. Introduction**

The Postal Service calculates unit attributable costs for its products in each year. However, comparing unit attributable costs over time presents additional challenges. This is especially true in cases where the Postal Service has modified the methodology it employs to estimate costs, as it risks conflating changes due to cost measurement changes with those due to other factors, such as improvements in operations. This makes the construction of a useful time series problematic.

This section identifies changes to cost measurement methodologies that render comparisons of the unit attributable costs of certain products over time difficult and suggests methods that will partly overcome the difficulties and produce a useful time series. In particular, this section identifies the impact methodological changes exercise on the unit attributable costs of flats products.

To analyze flats unit attributable costs as a time series, it would be ideal to remove the impact of cost methodology changes on each product's cost in each fiscal year. Fortunately, there is information available on the impacts of costing methodology changes, so that it is possible to produce such a time series, one that does not vary dramatically from the unit attributable costs filed in the relevant CRA. The resulting time series can be used to cast some light on the recent history of flats costs, but great care should be taken in using the series, as it embodies significant assumptions, as described in the Appendix A, Section IV.E. Analysis.

These time series of costs will differ from the CRA unit attributable costs not only because they account for changes in cost methodology, but also because they address the impact of the overall price level over the period. For that reason, the time series of costs for flats products include an adjustment for inflation, with annual costs expressed in terms of FY 2022 prices. Section IV.E.2. presents the flats-shaped unit attributable cost time series from 2008 to FY 2022, adjusted for both methodological changes and inflation.<sup>336</sup> Issues and concerns over the use of such a time series of flats unit attributable costs are included in the Appendix A, Section IV.E. Analysis.

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<sup>336</sup> This inflation adjustment uses fiscal-year CPI-U. See United States Bureau of Labor Statistics, [www.bls.gov](http://www.bls.gov).

## 2. Costing Methodology Impacts on Flats Unit Attributable Cost

The Postal Service has proposed numerous changes to analytical principles (methodology changes) over the past decade and a half, most of which have been affirmed by the Commission because these changes have improved the quality and accuracy of the data or analysis. The Postal Service petitions the Commission to open a rulemaking docket for specific changes. Interested parties may comment and reply to each other's comments; but ultimately the Commission rules on the proposal. The subset of rulemaking dockets with an impact on unit flats costs is shown in Table IV-8, along with a brief description of each methodology change.

**Table IV-8  
Methodology Changes with Impacts on Flats Products Costs**

<b>Rulemaking Docket No.</b>	<b>Description</b>	<b>Date Affirmed</b>
<b>RM2022-13</b>	Peak Season Transportation Costs	11/3/2022
<b>RM2021-1</b>	Change in Estimation of Highway Costs	10/6/2021
<b>RM2021-7</b>	Replace Manual data collection for SPR with PTR and TACS	9/30/2021
<b>RM2020-10</b>	IOCS Cluster Sampling Using TACS	9/25/2020
<b>RM2020-1</b>	Update method for estimating facility-related costs	8/17/2020
<b>RM2020-7</b>	New Methodology for City Carrier Delivery Time	6/9/2020
<b>RM2019-6</b>	Update and Improve Methodology for Calculating SPR Cost Estimation	1/14/2020
<b>RM2018-5</b>	IOCS Street and Office Time Definitions	1/8/2019
<b>RM2018-10</b>	Reorganize C/S 3 and Change some Mail Processing Cost Pools	10/12/2018
<b>RM2018-4</b>	Methodology changes in RCCS data collection procedures - digital images	7/13/2018
<b>RM2016-12</b>	New Method for Highway Variabilities Estimation	6/22/2017
<b>RM2016-3</b>	Attribution of the Cost of Vehicles used on City Carrier Routes.	12/22/2015
<b>RM2015-19</b>	Merge C/S 3 and 4 - CAG K and L Post Offices w/CAG A-J Post offices	11/24/2015
<b>RM2015-5</b>	Methodology for Customer Care Center costs	11/19/2015
<b>RM2015-7</b>	Update City Carrier Street Time Model- for C/S 7	10/29/2015
<b>RM2012-5</b>	New method for VSD cost measurement based on TRACS-VSD C/S 8	9/10/2012
<b>RM2010-1</b>	Updated Density Factors for C/S 14 and C/S 8	1/14/2010
<b>RM2009-10</b>	New Items for Inclusion Rural Evaluation Factors	11/13/2009
<b>RM2009-10</b>	Distribution of MVS costs - correction erroneous distribution key	11/13/2009
<b>RM2009-10</b>	Distribution of SPR Costs C/S 7	11/13/2009
<b>RM2009-10</b>	Accrued Costs of Loading/Unloading Vehicle	11/13/2009

Table IV-9 shows the predicted cost impact of each methodology change on the unit attributable cost of flats products in the fiscal year the methodology changes was implemented.<sup>337</sup> The unit attributable cost changes are those that result from the change in costing methodology in a given fiscal year.<sup>338</sup>

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<sup>337</sup> This report refers to the impact of the methodology change in the year it was implemented as “local” to distinguish them from the “global” impact of methodology changes on unit costs (*i.e.*, when local impacts are applied to all relevant years).

<sup>338</sup> The analysis makes use of the unit attributable cost changes shown in the petition. Otherwise, the cost change is divided by Revenue, Pieces, and Weight to obtain unit attributable cost changes.

**Table IV-9**  
**Local Impacts (in Dollars) on Flats Products Costs from Methodology Changes**

	First-Class Mail Flats	High Density and Saturation Flats and Parcels	Carrier Route Flats	USPS Marketing Mail Flats	Every Door Direct Mail--Retail	Periodicals	Bound Printed Matter Flats
RM2022-13	-0.0365	-0.0003	-0.0028	-0.0162	0.0000	-0.0072	-0.0132
RM2021-1	0.0132	0.0001	0.0008	0.0025	0.0000	0.0023	0.0030
RM2021-7	-0.0003	0.0000	0.0000	-0.0001	0.0000	-0.0002	-0.0016
RM2020-10	-0.0037	0.0050	0.0174	-0.0207	0.0054	0.0284	0.0577
RM2020-1	0.0011	0.0004	-0.0004	0.0010	0.0003	0.0003	-0.0030
RM2020-7	-0.0110	-0.0120	-0.0070	-0.0050	-0.0090	-0.0050	-0.0030
RM2019-6	0.0050	-0.0002	-0.0010	-0.0021	-0.0002	-0.0009	-0.0004
RM2018-5	0.0023	0.0063	0.0115	-0.0217	0.0064	0.0183	0.0684
RM2018-10	0.0091	0.0000	0.0005	-0.0001	-0.0002	0.0050	0.0022
RM2018-4	0.0000	0.0000	-0.0001	0.0000	0.0000	0.0000	0.0000
RM2016-12	-0.0156	-0.0004	-0.0012	-0.0058	0.0000	-0.0065	-0.0172
RM2016-3	0.0015	0.0021	0.0018	0.0019	0.0018	0.0016	0.0015
RM2015-19	-0.0001	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001
RM2015-5	0.0006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0011
RM2015-7	-0.0113	0.0212	0.0088	0.0077	0.0182	0.0060	-0.0016
RM2012-5	0.0050	0.0000	0.0010	0.0010	0.0000	0.0010	-0.0060
RM2010-1	-0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0190
RM2009-10	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0015
RM2009-10	0.0023	0.0004	0.0010	0.0018	0.0000	0.0013	0.0012
RM2009-10	-0.0001	-0.0001	-0.0001	-0.0001	0.0000	-0.0004	-0.0492
RM2009-10	-0.0013	-0.0017	-0.0022	-0.0020	0.0000	-0.0021	-0.0024

An example of a methodology change that had an impact on the unit attributable cost of flat-shaped products is the changes the Postal Service made to the In-Office Cost System (IOCS) sampling method in FY 2020. In September 2020, the Commission affirmed the Postal Service's Proposal Three (Docket No. RM2020-10) to modify the sampling method for IOCS.<sup>339</sup> The new sampling method would utilize census data from the Time and Attendance Collection System to take on-site readings while the carriers are still in the office. This enables the collection of more on-site readings, considered more accurate than telephone readings taken after the carrier leaves for the street.<sup>340</sup>

The impact of this proposal on flats unit attributable costs is significant. The Postal Service estimated the FY 2020 unit cost of First-Class Mail Flats would fall by 0.37 cents and the unit cost of USPS Marketing Mail Flats would fall by 2.07 cents, while other flats products unit cost would rise: for High Density and Saturation Flats and Parcels by 0.5 cents, for EDDM-R by 0.54 cents, for Carrier Route by 1.74 cents, for Periodicals by 2.84 cents, and for BPM by 5.77 cents (*see* Table IV-9, row 4).

As a second example of a cost methodology change with impacts on flats products, Proposal Two in Docket No. RM2020-7 updated city carrier delivery variabilities.<sup>341</sup> The Commission affirmed the Postal Service's proposed methodology changes in this docket on July 9, 2020.<sup>342</sup> In its proposal, the Postal Service introduced a new method for estimating delivery unit costs, which would be updated each year. Prior to this methodological change, the variability was calculated from the study data set. However, by utilizing the total average letter and flat delivered volume for this task, it became possible to update the delivery variabilities each year. This change had the effect of lowering the unit attributable costs of the flats products, as illustrated by the impact of the change on the Marketing Mail High Density and Saturation Flats and Parcels product (*see* Table IV-9, row 6).

Adjusting unit attributable costs by accounting for methodology changes is heavily reliant on the Postal Service's prediction of the impact of the methodology change on a single year.<sup>343</sup> See Appendix A, Section IV.E. Analysis for more discussion on assumptions used in the Commission's analysis.

Another important consideration with regard to a time series of unit attributable costs stems from the fact that each methodology change in the unit attributable costs for the current fiscal year implies a change in all of the unit attributable cost estimates preceding

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<sup>339</sup> Docket No. RM2020-10, Order on Analytical Principles Used in Periodic Reporting (Proposal Three), September 25, 2020 (Order No. 5697).

<sup>340</sup> Since it may be that telephone readings tend to raise the cost of First-Class Single-Piece Letters, the impact of the change to the IOCS sampling method would be expected to lower the cost of Single-Piece Letters and raise costs for presorted products. Indeed, the Postal Service's estimate of the impact reflects this effect.

<sup>341</sup> Docket No. RM2020-7, Petition of the United States Postal Service for the Initiation of a Proceeding to Consider Proposed Changes in Analytical Principles (Proposal Two), April 7, 2020 (Docket No. RM2020-7, Petition).

<sup>342</sup> Docket No. RM2020-7, Order on Analytical Principles Used in Periodic Reporting (Proposal Two), July 9, 2020 (Order No. 5583).

<sup>343</sup> In addition to changes to cost methodology, the Postal Service makes changes to the products it delivers. Two such changes are discussed in the Appendix A, Section IV.E. Analysis and assumed to have no impact on the costs of flats products.



the current year, stretching back to the beginning of the period over which the desired time series extends. This is because costing methodology changes are generally proposed to improve the accuracy of the cost measurement. As seen in Appendix A, Section IV.E. Analysis, the accuracy of the analysis depends on the validity of the assumptions, and therefore there is no verifiably accurate method of making the overall adjustments.<sup>344</sup>

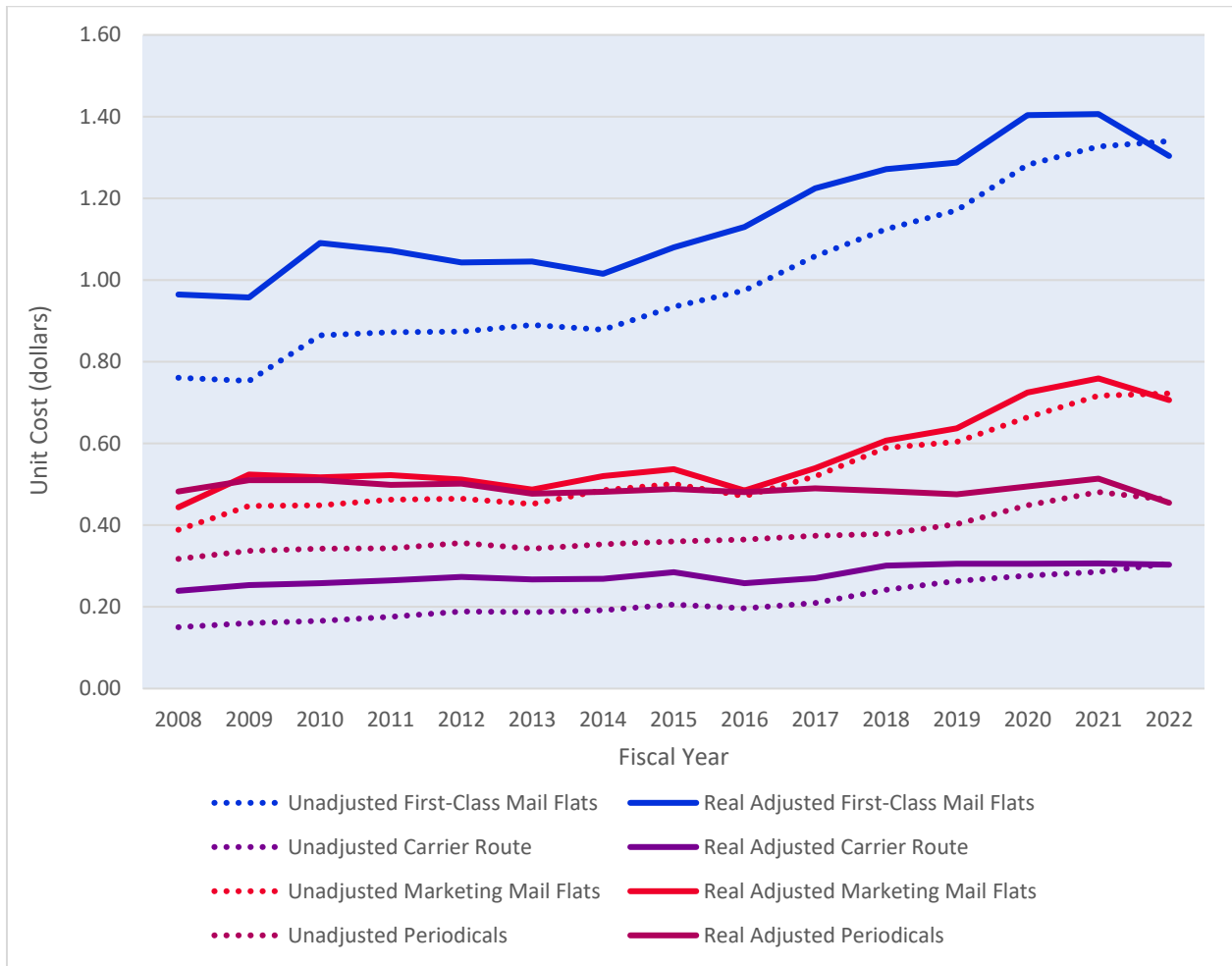
To produce a time series that has comparable unit attributable costs across years, the impacts of the methodology changes in Table IV-9 are applied to the unit attributable costs of flats products in all fiscal years prior to the fiscal year of its affirmation.<sup>345</sup> An additional adjustment is then made for inflation. Figure IV-38 and Figure IV-39 present the unadjusted and adjusted time series from FY 2008 to FY 2022 for flats products that were non-compensatory and compensatory in FY 2021.

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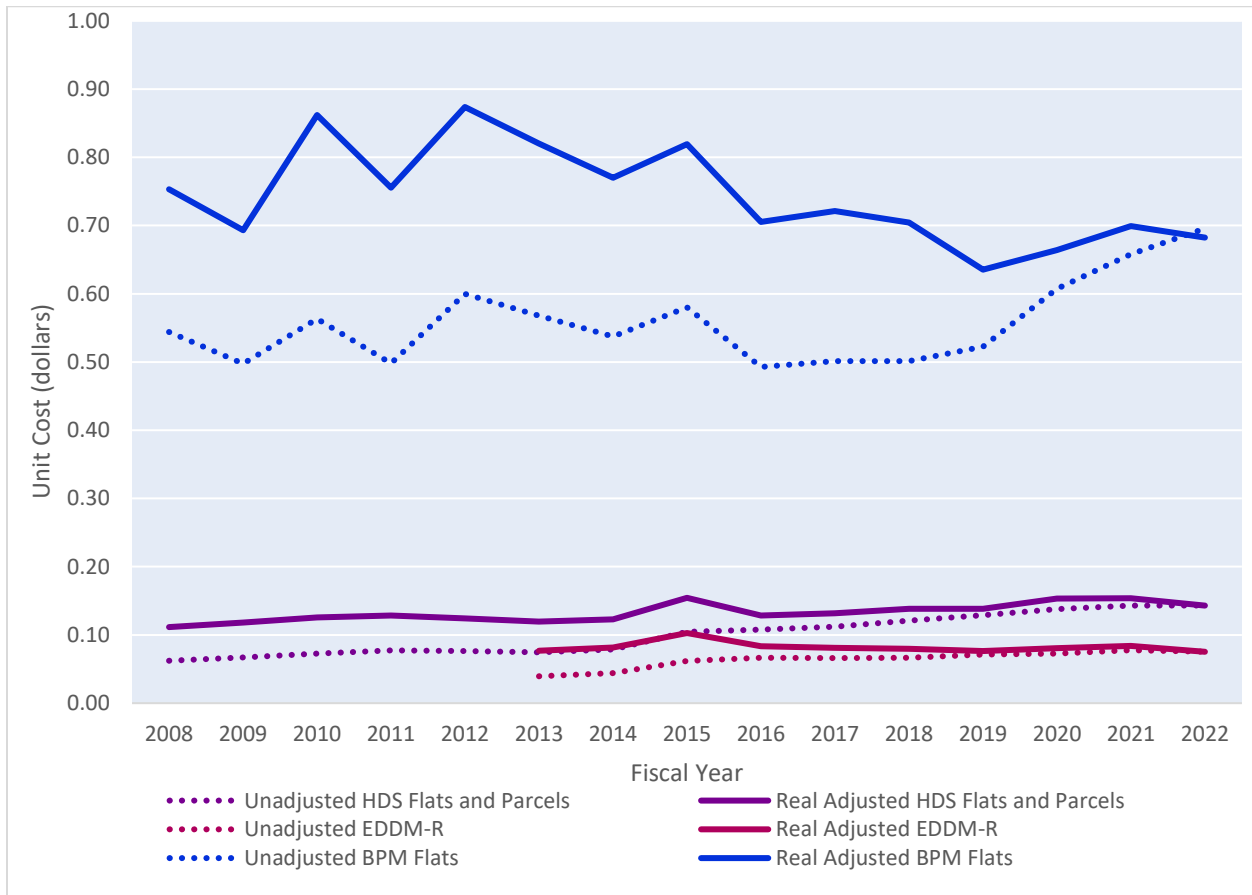
<sup>344</sup> As new or improved data become available, a new methodology may become a possibility. However, and for reasons discussed above, a cost impact predicted for the current year, possibly because of the availability of new data, will require adjustments in all previous years. Hence a time series of unit attributable costs in this year will be different from the time series conducted in future years, after more changes to costing methodologies have taken place. A possible exception would be those changes in cost that are reflective of operational changes in the current year. In that case, the unit attributable cost of the previous years may arguably not need any adjustment based on cost changes in the current year. In that case, a part of the work of constructing a time series would be to disentangle impacts tied to operational changes and those proposed as corrections to erroneous past costing methodologies. That will be a difficult task, as proposed changes brought forward in the Commission rulemaking dockets are typically discussed by the USPS as stemming from both sources: a desire to improve a costing methodology *and* a desire to keep the cost measurement in line with changes in operations. See Appendix A, Section IV.E. Analysis for further discussion.

<sup>345</sup> More discussion is provided in the Appendix A, Section IV.E. regarding the procedure and assumptions required to do this.

**Figure IV-38**  
**Unadjusted and Adjusted Unit Attributable Costs of Non-Compensatory Flats Products**



**Figure IV-39**  
**Unadjusted and Adjusted Unit Attributable Costs for Compensatory Flats Products**



# CHAPTER V. SUMMARY OF CONCLUSIONS

This study identifies the causes of inefficiencies in the collection, sorting, transportation, and delivery of flats. In addition, the study quantifies the effects of the volume trends, investment decisions, excess capacity, and operational inefficiencies of the Postal Service on costs that are attributable to flats.

The principal findings of this study are as follows:

- In FY 2022, the cost coverage (revenue divided by attributable cost) for all flats products increased. However, unit attributable costs also increased for the majority of flats products.
- Since FY 2010, the total volume of all flats products has decreased by 43.4 percent or an average of 4.6 percent annually.
- Six pinch points continue to contribute to cost and service issues for flats: (1) bundle processing; (2) automated processing; (3) manual sorting; (4) allied operations; (5) transportation; and (6) last mile/delivery.
- Reported bundle breakage rates likely underestimate true bundle breakage because only bundles that break on bundle sorters are reported. However, bundles break, or are treated as if they will break, during other processing stages.
- Bundle breakage often results in inefficient manual processing of individual flats.
- How bundles are prepared and presented to the Postal Service significantly impacts bundle breakage rates. Better coordination between the Postal Service and mailers is necessary to improve bundle integrity.
- Due to the lack of machine counts and clocking errors, measurement of both workhours and volumes in manual flats sorting are unreliable. The lack of reliable volume or workhour data represents a tremendous loss of opportunity to track or use this data in any meaningful way.
- Lack of relevant data prevents effective communication between mailers, facility staff, and Postal Service Headquarters, inhibiting corrective action.
- Insufficient data, coupled with data quality issues, makes it difficult to assess the Postal Service's ability to improve flats processing efficiency.
- The Postal Service does not always understand the sources of flats processing inefficiencies or track volumes that cause inefficient operations.
- Recent operational plans, such as decommissioning FSS machines and the creation of S&DCs, will likely impact flats costs.

The PSRA requires the Postal Service, within 6 months, either to develop and implement a plan to remedy each inefficiency identified in the study or else to provide an explanation as to why remedying such inefficiency is impracticable. Based on the findings of the study, the Commission provides the following suggestions to the Postal Service for consideration as it develops its plan. Specifically, the Postal Service should consider:

- Continuing the combination of increasing revenue and reducing costs until unit revenue exceeds unit attributable cost for each non-compensatory flats product.
- Continuing to study the causes, impacts, and ways to reduce bundle breakage; enhancing the reporting and tracking of bundle irregularities; and working with mailers to ensure corrective actions are implemented when irregularities are shared.
- Further assessing the quality of its data, particularly as it relates to volume, workhours, and productivity, and exploring cost effective ways to improve that quality.
- Implementing initiatives to reduce mail processing costs.
- Identifying mail processing facilities with extreme (unusually high or low) productivity values and those with quarterly productivity values based on a large number of missing workhours or volume; targeting those sites to improve their reporting or explaining why the provided productivity is accurate for a given facility.
- Developing an accurate method to track flat-shaped mail that is manually processed. Once there is an accurate measurement of such flat-shaped mail, the Postal Service should consider developing a specific plan to: (1) continue to decrease the quantity of flat-shaped mailpieces processed manually, and (2) achieve a proportional reduction in unit mail processing costs for manual operations.
- Including in its plan specific, achievable goals to reduce costs associated with allied operations, transportation, and delivery of flats.
- Quantifying the impact of any initiatives on costs to ensure its efforts are effective.

The Commission will continue to work with the Postal Service and the postal community to address these challenges.

# Appendix A: Flats Study Report Analysis

## Sections III.B.1. and III.B.2. Analysis

### Methodology Applied in Commission Analysis

1. Methodology for Developing Datasets Used for Commission Analysis on Bundle Breakage and Productivity Issues

Productivity data related to both manual and automated processing are available via the Mail Processing Variance (MPV) dataset, which is developed by aggregating Management Operating Data System (MODS) data.<sup>1</sup> The MPV dataset includes the volume of mailpieces processed on each flats mail processing machine and the number of associated workhours. The MPV dataset contains one observation per facility in every fiscal quarter and defines productivity as volume divided by workhours. *See id.*

Bundle processing data are available via a bundle breakage dataset that provides data on the number of bundles processed and the number of bundles broken at each facility.<sup>2</sup>

Transportation data are available in the Surface Visibility (SV) dataset and includes metrics such as the number of late trips per facility and container utilization, which is the percentage of space that containers utilize in a truck.<sup>3</sup>

When developing the datasets for analysis in Sections III.B.1. through III.B.2., Sections III.C.1. through III.C.2., and Section III.C.4., the Commission cleaned the Postal Service data using Python programming language. The cleaning process involved removing rows with zero volumes or abnormal observations (outliers). Specifically, some facilities were recorded as having zero mail volumes for a particular mail processing machine if that machine did not actually exist in that particular facility. These zero observations were removed as they did not provide any relevant information on mail processing. Also, each dataset was adjusted to account for synonyms that indicated the same value. For example, if multiple names were used for the same facility, they had to be standardized. The Commission then merged the datasets to gain more information about all the facilities and identify those that were substantially above or below average based on certain criterion (*e.g.*, level of productivity of flats mailpieces on automated machines or bundle breakage

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<sup>1</sup> Responses of the United States Postal Service to Questions 1-8 of Chairman's Information Request No. 1, August 16, 2022, question 5 (Response to CHIR No. 1); Docket No. ACR2021, Library Reference USPS-FY21-NP31, December 29, 2021, Excel file "NONPUBLIC MP Variance FY17\_21.xlsx."

<sup>2</sup> Docket No. ACR2021, Library Reference USPS-FY21-NP31, Excel file "FY17\_FY21.Bundle.Brkg.E1\_NonPublic.xlsx."

<sup>3</sup> Docket No. ACR2021, Library Reference USPS-FY21-NP31, Excel file "NonPublic SV Data\_FY17\_FY21.xlsx."

rate). *See* Section III.B.2. The Commission also performed data analysis indicating geographic regions where mail processing facilities are located and facility types, such as network distribution centers (NDCs) and processing and distribution centers (P&DCs). Ultimately, the final dataset the Commission developed included bundle breakage and automation processing data at the facility level and with information for each machine at each facility. Data were of a quarterly frequency spanning FY 2016 through FY 2021.

2. Commission Data Analysis Underlying the Selection of Mail Processing Sites for Visits Based on Automated Flats Sorting Machine (AFSM) and Flats Sequencing System (FSS) Volumes and Productivities

As explained in Section III.B.2.a., when selecting mail processing sites, the Commission sought to visit:

- both P&DCs and NDCs
- sites in different regions of the United States
- sites with high and medium flats volumes
- sites with relatively high and relatively low
  - productivity of AFSMs
  - productivity of FSS machines
  - rates of broken bundles
- sites that have good network ties with each other

When considering volume processed at facilities as provided in the Postal Service's datasets, the Commission observed that some facilities processed too little flats volume to merit consideration for a visit in the time we had available. *See* Figure A-1.

**Figure A-1**  
**Volume and Productivity of AFSMs at the Mail Processing Facilities:**  
**Facilities with Low Volume vs. Other Facilities<sup>4</sup>**

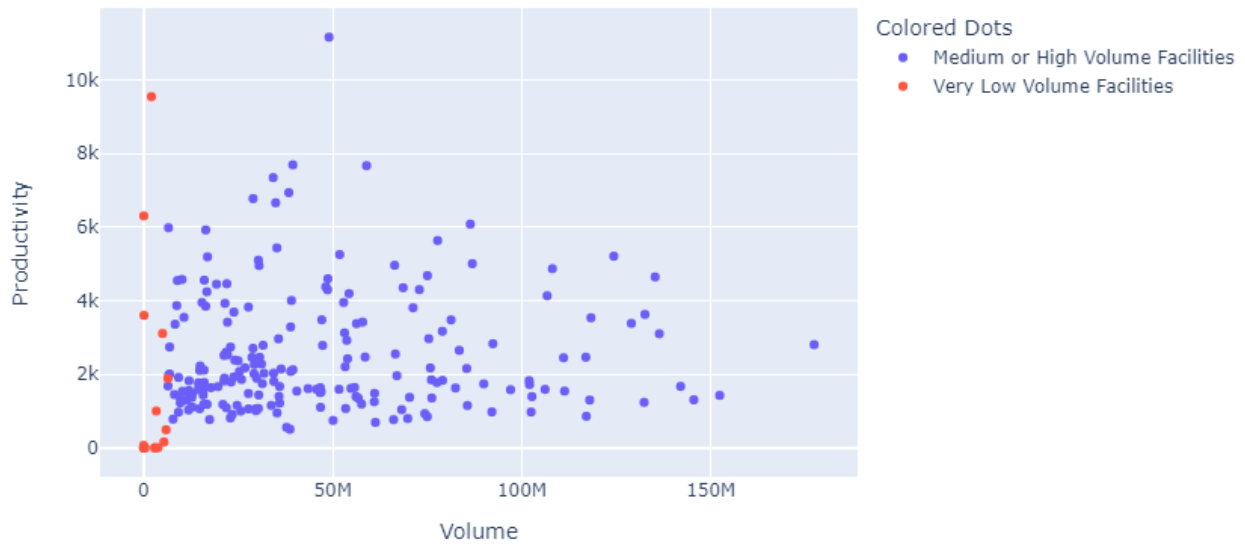


Figure A-1 provides volume and productivity for all types of facilities with AFSMs. Each dot represents a single type of AFSM at a facility in FY 2021.<sup>5</sup> For example, a facility may have five machines of two types: three AFSM-AI and two AFSM-ATHS. This facility will have two dots on the chart (one dot for each AFSM type). Orange dots represent the AFSM equipment with volume in the lowest decile of all AFSM machines. They cover a wide range of productivities but process such a low volume of flats mailpieces that the Commission excluded them from consideration for this study.

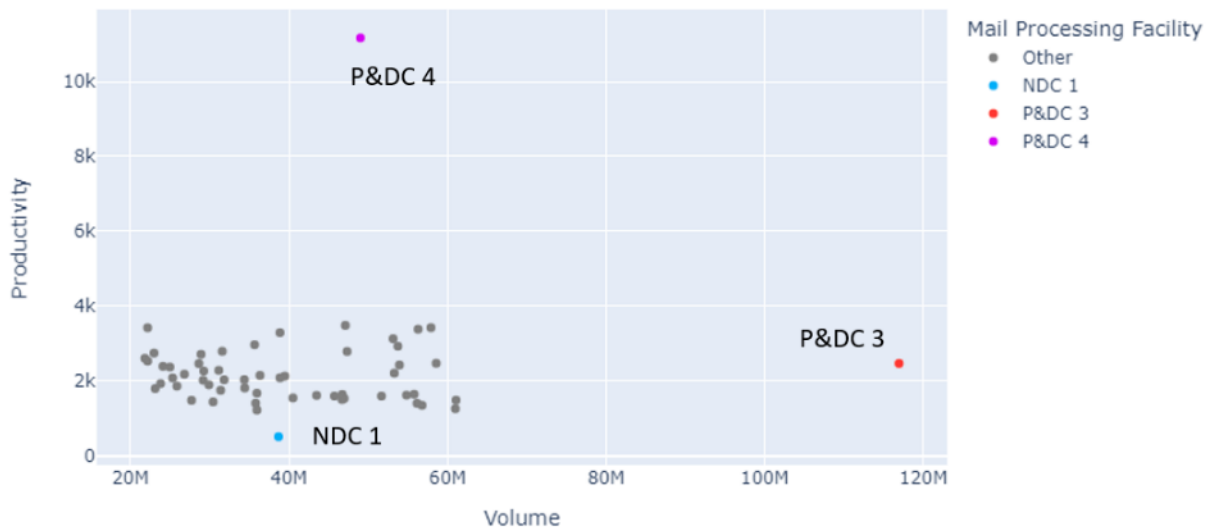
As Figure A-2 shows, the Commission visited both types of mail processing facilities—P&DCs and NDCs—that process flats on AFSMs. Figure A-2 provides the FY 2021 volume and productivity for some of the AFSMs at the facilities selected by the Commission for visits (visualized by dots of different color) and some other facilities with average volume, productivity, or both (visualized by dark grey dots).

<sup>4</sup> See Docket No. ACR2021, Library Reference USPS-FY21-NP31, Excel file “NONPUBLIC MP Variance FY17\_21.xlsx.”

<sup>5</sup> Not all AFSMs are homogenous. For a more detailed description of each AFSM type, please refer to Section III.C.



**Figure A-2**  
**Volume and Productivity of AFSMs at Mail Processing Facilities in FY 2021<sup>6</sup>**

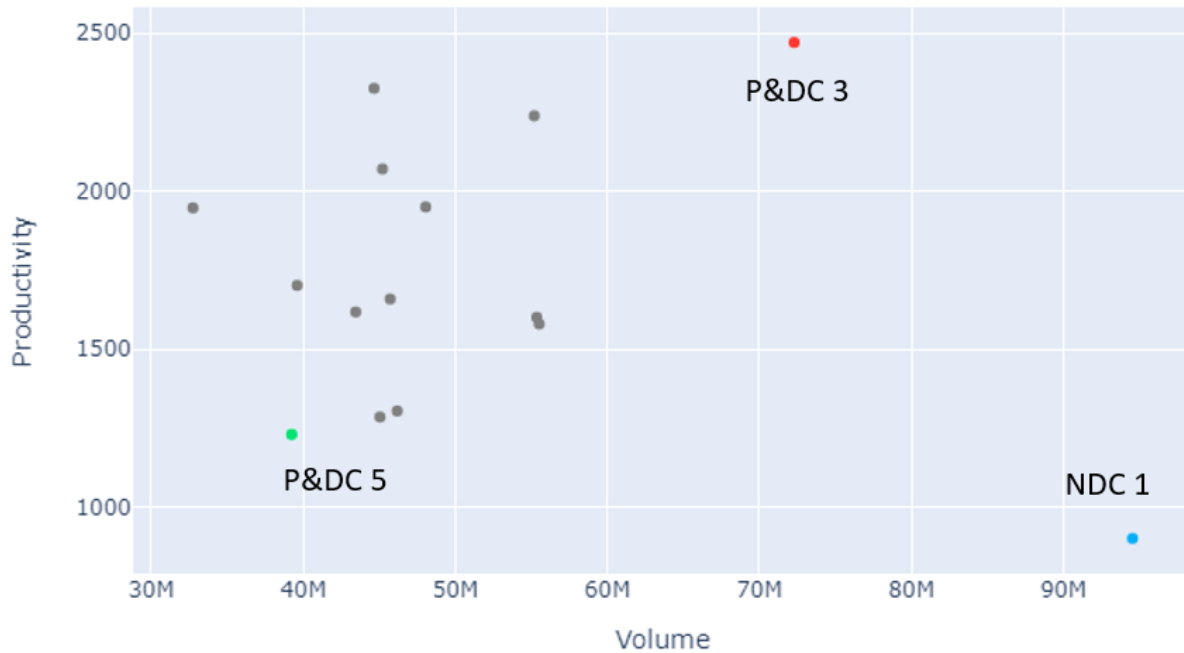


For facilities that the Commission did not visit (they are represented by grey dots), both the flats volumes and AFSM productivities fall within 50 percent of the mean (average) volume and the mean productivity. Thus, for AFSMs, the grey dots represent machines that process between approximately 20 million and 60 million flats mailpieces. Other facilities that are further from the average volume or average productivity have been filtered. NDC 1 processes above-average volume on its AFSM equipment, yet its productivity was among the lowest of all facilities with AFSMs. P&DC 4 has one of the highest AFSM productivities but processes volume close to average. The volume processed by the AFSM located at P&DC 3 is far above the average level, yet its productivity is close to the average.

Similarly, Figure A-3 displays the FY 2021 volume and productivity of a sample of the FSS facilities visited by the Commission (visualized by colored dots) and some other facilities (visualized by dark grey dots).

<sup>6</sup> See Docket No. ACR2021, Library Reference USPS-FY21-NP31, Excel file "NONPUBLIC MP Variance FY17\_21.xlsb."

**Figure A-3**  
**Volume and Productivity of FSS at Mail Processing Facilities in FY 2021<sup>7</sup>**



For the visualized facilities that the Commission did not visit, both the flats volumes and FSS productivities are within 30 percent of the average volume and the average productivity. Other facilities that are further from the mean volume or mean productivity have been filtered. P&DC 3 shows high FSS volume and productivity—far above average. NDC 1 processes volume well above average but its FSS productivity is much lower than of FSS machines at other facilities processing a similar amount of volume. P&DC 5 processes flats on its FSS machine at a similar level of productivity as NDC 1, yet it processes roughly half of the volume.

When selecting facilities to visit based on the rate of broken bundles, the Commission used the bundle breakage dataset provided by the Postal Service as part of flats cost and service performance analysis in the *Annual Compliance Report (ACR)*.<sup>8</sup> This dataset, however, presents unique problems because there are six different machines that can process bundles. See Table A-1.

<sup>7</sup> See Docket No. ACR2021, Library Reference USPS-FY21-NP31, Excel file “NONPUBLIC MP Variance FY17\_21.xlsx.”

<sup>8</sup> See Docket No. ACR2021, Library Reference USPS-FY21-NP31, Excel file “FY17\_FY21.Bundle.Brkge.E1\_NonPublic.xlsx.”

**Table A-1**  
**All Bundle Processing Machines**

Acronym	Full Name
ADUS	Automated Delivery Unit Sorter
APPS	Automated Package Processing System
EPPS	Enhanced Package Processing System
HTPS	High Throughput Package Sorter
SPBSTS	Small Parcel and Bundle Sorter Tracking System
SPSS	Small Package Sorting System

After analyzing bundle breakage data, the Commission chose to focus primarily on the APPS and SPBSTS bundle processing machines because they typically process a large volume of bundles.

Figure A-4 was created by filtering the bundle breakage dataset to include only the APPS and SPBSTS machines and USPS Marketing Mail Flats. The dataset was further filtered to include machines that were within 50 percent of the average volume of bundles processed and 50 percent of the average percentage of broken bundles. The facilities selected for visits from this filtered dataset had a different rate of broken bundles than a typical mail processing facility. Figure A-4 displays a sample of the facilities that the Commission visited and where it observed bundle processing, as well all other facilities that process bundles.

**Figure A-4**  
**Bundle Breakage Rate and Bundles Processed – All Facilities<sup>9</sup>**

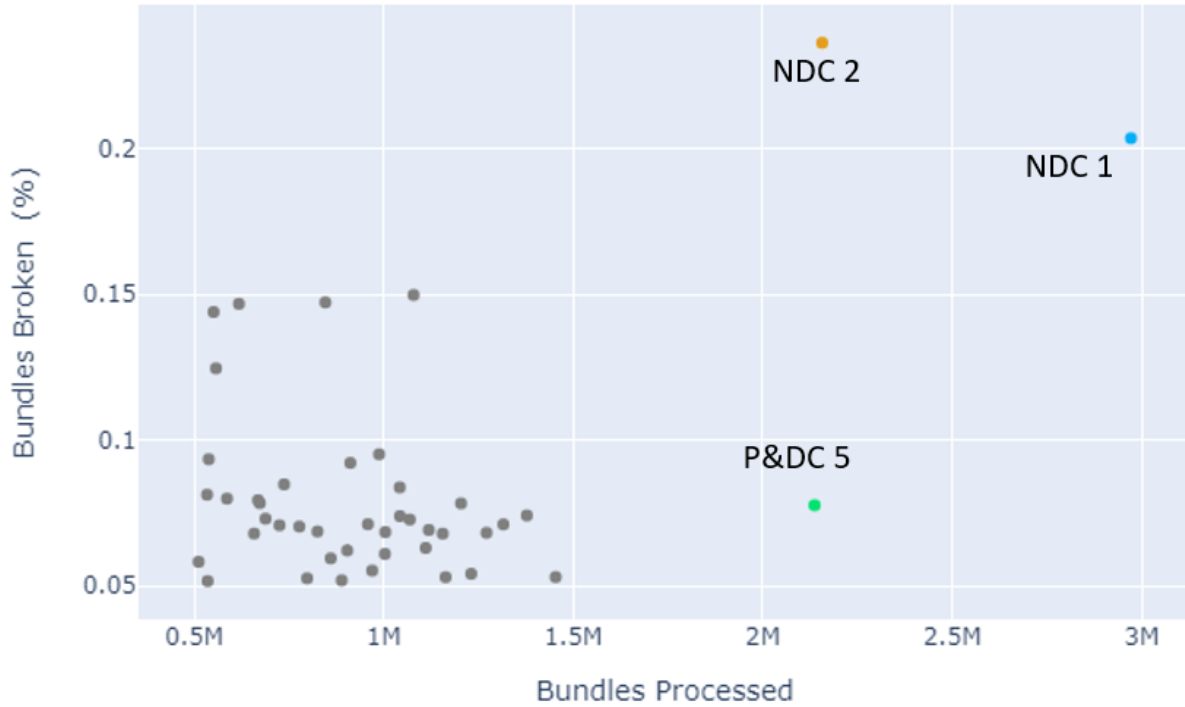


Figure A-4 demonstrates that both NDC 1 and NDC 2 have very high volume and high rates of bundle breakage. P&DC 5 processes a similar number of bundles to NDC 2, yet its bundle breakage rate is less than half of the NDC 2 rate.

<sup>9</sup> See Docket No. ACR2021, Library Reference USPS-FY21-NP31, Excel file "FY17\_FY21.Bundle.Brkgge.E1\_NonPublic.xlsx."

### 3. Commission Data Analysis Underlying the Selection of Surface Transfer Centers (STCs)

When selecting facilities to visit based on transportation metrics, the Commission used the SV dataset provided by the Postal Service as part of the ACR.<sup>10</sup> The Commission selected STCs with low on-time arrivals and on-time departures.

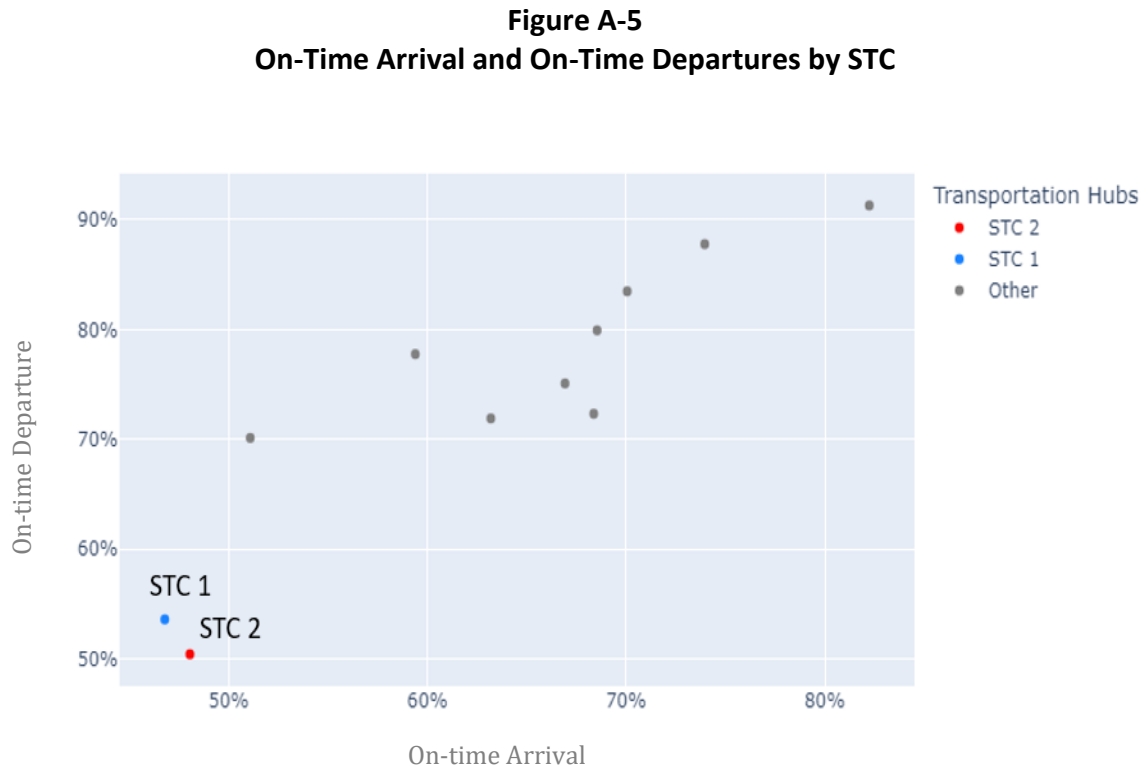


Figure A-5 shows that STC 1 and STC 2 are clear outliers in terms of both low on-time arrival and on-time departure when compared to most other facilities.<sup>11</sup>

<sup>10</sup> See Docket No. ACR2021, Library Reference USPS-FY21-NP31, Excel file "NonPublic SV Data\_FY17\_FY21.xlsx."

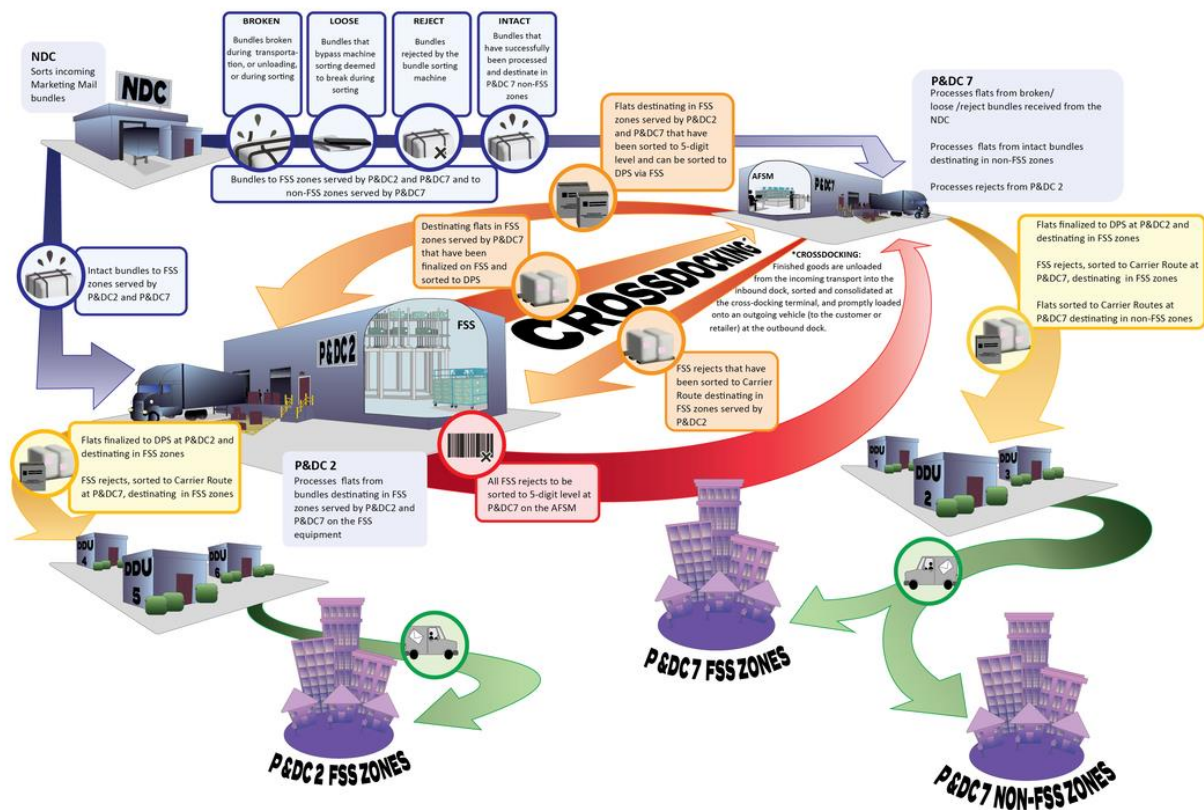
<sup>11</sup> On-time arrival and on-time departure percentage are highly correlated.

## Section III.B.4.d. Analysis

### Impact of Mail Processing Network Design on Allied Operations

In Section III.B.4.d., the Commission discusses the impact of network design on the time flats spend in allied operations as they move between facilities for different mail processing jobs. Frequent movement of mail between facilities also increases trip frequency and mileages driven in the surface transportation network and, in turn, increases transportation costs for flats products.

In Section III.B.4.d., the Commission includes an illustrative example of the collaboration and the associated flows of USPS Marketing Mail flats volumes between three mail processing sites (see Figure III-10.). The flows depicted in Figure III-10 are described in more detail below.



The NDC receives USPS Marketing Mail flats pre-sorted in bundles.

All bundles that break before they can be sorted at the NDC, bundles that are loose and bypass bundle/small package processing, and bundles that are rejected during bundle processing at the NDC are sent to P&DC 7 for processing. These include bundles that destinate in P&DC 2 and in P&DC 7 service areas.

All intact bundles are sorted on the NDC's bundle/small package sorting equipment, for subsequent distribution to mail processing facilities that the NDC serves, including P&DC 2 and P&DC 7. Bundles that are processed successfully are dispatched to respective P&DCs based on whether they destinate in FSS zones. This is explained below.

P&DC 7 service area includes FSS and non-FSS zones; P&DC 2 service area includes only FSS zones. However, of the two P&DCs, only P&DC 2 has FSS equipment. As such, USPS Marketing Mail bundles that are successfully processed at the NDC and destinate in P&DC 7 service area are dispatched from the NDC in two separate flows—bundles that destinate in P&DC 7 non-FSS zones are sent to P&DC 7 for next processing while bundles that destinate in FSS zones served by P&DC 7 are sent to P&DC 2, for sorting of individual flats pieces to DPS (on its FSS equipment). Since P&DC 2 service area includes FSS zones only, and since this P&DC operates FSS equipment, all successfully processed flats bundles that destinate in P&DC 2 service area are dispatched from the NDC to P&DC 2 for subsequent processing, in one flow.

P&DC 2 sorts flats that destinate in FSS zones included in its own service area and flats that destinate in FSS zones served by P&DC 7, on its FSS equipment.

All successfully sorted flats that destinate in P&DC 7 FSS zones are dispatched to P&DC 7 where they are cross docked and subsequently dispatched to respective DDUs, served by P&DC 7. All successfully sorted flats that destinate in P&DC 2 service area are dispatched to respective DDUs that this P&DC serves.

FSS rejects, whether they destinate in the P&DC 2 or P&DC 7 service areas, are sent to P&DC 7 to be re-run on the AFSMs and sorted to carrier route. Flats that are sorted on the AFSM equipment at P&DC 7, and which destinate in its own service area, are dispatched to respective DDUs for final delivery. Carrier routed flats sorted on the AFSM equipment at P&DC 7 that destinate in P&DC 2 service area are dispatched to P&DC 2, for eventual transportation to respective DDUs, served by P&DC 2.

As for broken/loose/reject flats bundles that P&DC 7 receives from the NDC for processing, some destinate in FSS zones (within P&DC 2 and P&DC 7 service areas), while others destinate in non-FSS zones (within P&DC 7 service area). After being manually prepared and then sorted on the AFSM equipment to 5-digit ZIP Code level, flats that destinate in FSS zones (whether within the P&DC 2 or P&DC 7 service areas) are dispatched to P&DC 2, for sorting to DPS on the facility's FSS equipment. Flats from broken/loose/reject bundles that destinate in non-FSS zones (within the P&DC 7 own service area) remain at P&DC 7 and are sorted on the AFSM equipment to carrier route, for final delivery.

## Section IV.A.2. Analysis

This section covers two parts pertaining to the analysis performed in Section IV.A.2. The first part (A1) presents a more detailed discussion of the degree of scale economies. The second part (A2) describes the model and the corresponding estimation techniques, as well as the tables and figures pertaining to the estimation results.

### A1. The Degree of Scale Economies

#### Definition and Properties

To formalize the idea behind scale economies, it is insightful to begin with the case of a single-product firm and then generalize the definition to the multiproduct case, which is more relevant to the Postal Service. First, a few notations are introduced.

Let  $C(v)$  denote the cost function of a single-product firm, with the argument  $v$  denoting the output level.

#### Definition A1.<sup>12</sup>

*The degree of scale economies at  $v$  is*

$$S(v) = \frac{C(v)}{vC'(v)} \quad (A1)$$

*Returns to scale are increasing, constant, or decreasing as  $S(v)$  is greater than, equal to, or less than unity.*

In the expression on the right-hand side of (A1),  $C'(v)$  denotes the derivative of  $C(v)$  with respect to the output  $v$ , *i.e.*, the marginal cost at the level of output  $v$ .

The metric  $S(v)$  is, as one can observe, the inverse of the elasticity of the cost function with respect to the output. Hence, it is interpretable as “the elasticity of the output with respect to the cost needed to produce it.” Baumol et al., *supra*, at 51. The generalization of Definition A1 to the multiproduct case is obtained by first viewing the output as a vector  $v = (v_1, \dots, v_J)$ , where it is assumed that there are  $J$  outputs in total. In the case of the Postal Service,  $v$  includes Competitive products grouped as a single mail product, among its components.

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<sup>12</sup> William J. Baumol et al., *Contestable Markets and the Theory of Industry Structure* 21 (Definition 2A6) (1988).



Let  $C(v)$  denote the cost function of a multiproduct firm, with the argument  $v$  denoting the relevant composite output,  $v = (v_1, \dots, v_j)$ .

**Definition A2.**<sup>13</sup>

The degree of scale economies defined over the entire product set  $N = \{1, \dots, J\}$ , at  $v$ , is given by

$$S_N(v) = \frac{C(v)}{\sum_j v_j C'_j(v)}, \quad (\text{A2})$$

where  $C'_j(v)$  denotes the partial derivative of the cost function with respect to the  $j$ th output, i.e., the marginal cost of product  $j$ ,  $C'_j(v) = \frac{\partial C(v)}{\partial v_j}$ . (A3)

$S_N(v)$  can be interpreted as the elasticity of the output bundle  $v$  with respect to the cost needed to produce it, and returns to scale are increasing (constant, or decreasing) as  $S_N(v)$  is greater than unity (equal to, or less than unity, respectively). Baumol et al., *supra*, at 50, 51.

Worthy of note is the fact that the metric  $S_N(v)$  is dimension-free. In particular, it is not affected by inflation since the latter's effects on the numerator and the denominator cancel out.

**Remark A1.**

The elasticity of a single-argument function can, in general, be defined for a given value of the argument as the ratio of the marginal value of the function to its average value. Hence, for a cost function of a single-product firm, the elasticity is the ratio of the marginal cost to the average cost. The right-hand side of relation (A1) can, therefore, equivalently be expressed as the ratio of the average cost (cost per output unit) to the marginal cost (cost of the last unit).

$$S(v) = \frac{C(v)}{vC'(v)} = \frac{\left(\frac{C(v)}{v}\right)}{C'(v)} \quad (\text{A4})$$

In the multi-product case, the metric  $S_N(v)$  can be given a similar representation, i.e., the ratio of average to marginal cost. However, because the average cost, as stressed by Bradley (2017)<sup>14</sup>, is an ill-defined concept, a conventional metric can be defined by

<sup>13</sup> Baumol et al., *supra*, at 50 (Definition 3B1).

<sup>14</sup> United States Postal Service, Office of Inspector General, Report No. RARC-WP-17-005, Examining Changes in Postal Product Costs, March 13, 2017, at 11, available at [https://www.uspsaig.gov/sites/default/files/reports/2023-01/RARC-WP-17-005\\_0.pdf](https://www.uspsaig.gov/sites/default/files/reports/2023-01/RARC-WP-17-005_0.pdf).

referring to the concept of *ray average cost (RAC)*. Baumol et al., *supra*, at 48-50. The *RAC* is defined by first fixing a bundle, say  $v^0$ , and then calculating the average cost of  $t$  units of this reference bundle, *i.e.*, of  $tv^0$ ,  $t > 0$ , where  $t$  becomes the (one-dimensional) count unit.

$$RAC(t; v^0) = \frac{c(tv^0)}{t} \quad (A5)$$

However, because the choice of the reference bundle  $v^0$  is completely arbitrary, it can be (conventionally) taken to be the product mix in which the quantity of each product is expressed as a fraction of the total number of mailpieces.

$$v^0 = \left( \frac{v_1}{\sum_j v_j}, \dots, \frac{v_J}{\sum_j v_j} \right) \quad (A6)$$

The quantity  $t$  is chosen in this case to be the total number of mailpieces:  $t = \sum_j v_j$ . With these choices, the *RAC* takes the form

$$RAC(\sum_j v_j; v^0) = \frac{c((\sum_j v_j)v^0)}{\sum_j v_j} = \frac{c(v)}{\sum_j v_j} \quad (A7)$$

Noteworthy is the fact that the right-hand side of the second equality in (A7) is a popular alternative way in which the cost per mailpiece is defined in the postal literature, *i.e.*, as total operating cost divided by total mailpieces. Taking this as a conventional measure for the average cost, one has (by dividing both the numerator and the denominator by total mail pieces)

$$S_N(v) = \frac{c(v)}{\sum_j v_j c'_j(v)} = \frac{\left( \frac{c(v)}{\sum_j v_j} \right)}{\left( \frac{\sum_j v_j c'_j(v)}{\sum_j v_j} \right)} = \frac{RAC}{AMC}. \quad (A8)$$

The denominator of the right-most ratio in (A8) is the volume-weighted average of the product-level marginal cost or, equivalently, the ratio of the total volume-variable cost to total number of mailpieces, which will be referred to as the *aggregate marginal cost (AMC)*. Hence *AMC* is an overall measure of marginal cost and relation (A8) expresses the degrees of scale economies as the ratio of the average cost, measured by the *RAC*, to the aggregate marginal cost, measured by *AMC*.

## Application

In the context of this analysis, the cost  $C(v)$  is taken to be the Postal Service's total operating cost in a given fiscal year. The argument  $v$  is the volume bundle corresponding to the set  $N$ , the set of all products in the relevant fiscal year. In the parlance of the postal costing, the product between the marginal cost of the mail product  $j$  and its volume, *i.e.*,  $v_j C'_j(v)$ , represents product  $j$ 'th's volume-variable cost. Hence, the sum  $\sum_j v_j C'_j(v)$  represents the total volume-variable cost. The degree of scale economies is measured, therefore, by the ratio of total operating cost to total volume-variable cost, *i.e.*,

$$S_N(v) = \frac{\text{Total Operating Cost}}{\text{Total Volume Variable cost}} \quad (3.2)$$

Because total operating cost is larger than volume-variable cost,  $S_N(v)$  is larger than 1, *i.e.*, returns to scale are increasing in the context of the Postal Service. This means that overall decline in volume will likely result in a comparatively slower decline in overall operating cost. In the case of a single-product firm, this would mean an increase in unit costs, all other things held constant.

*Remark.* Although it is tempting to conclude that given a level of overall operating cost, larger total volume-variable cost induces a lower degree of scale economies, which, in the context of decreasing mail volumes, may suggest that more cost should be attributed regardless of statutory costing principles, one must resist that temptation. Indeed, the reason for calculating total variable cost is the existence of common costs that cannot be causally linked to specific products or sub-groups of products. Hence, the size of the total volume-variable cost is not a deliberate choice left to the discretion of the Postal Service.

Product-specific returns to scale can be calculated as the ratio of the average incremental cost of the mail product to its marginal cost. Baumol et al., *supra*, at 68. In the Postal Service's costing methodology, product incremental cost is defined as the sum of its volume-variable costs, its product-specific costs, and those inframarginal costs calculated as part of a product's incremental cost. See 39 C.F.R. § 3035.107(b). Although it may seem more convenient to have an independent product-level cost function, as already mentioned, there is no meaningful way to disaggregate the Postal Service cost function into a set of product-level cost functions.

Regarding the magnitudes of the loss of scale economies, in FY 2021 calculated using total operating cost, for example, the degree of scale economies was equal to 1.83 (*see* Section IV.A.2., Figure IV-8). Hence, each percent decrease in volumes has induced only  $\frac{1}{1.83}$  or 0.55 percent decrease in costs.

Table A-2 displays marginal costs of the four flat-shaped mails (columns 2-5), along with the aggregate firm-level marginal costs (the volume-weighted average of the products' marginal costs, which is also equal to the total volume-variable cost over all mailpieces, which are provided in column 6).

**Table A-2**  
**Marginal Costs**

FY	FC Flats	Marketing Mail Flats	In County Periodicals	Outside County Periodicals	Firm-Level Aggregate Marginal Cost
2008	0.76	0.39	0.11	0.34	0.21
2009	0.75	0.45	0.12	0.36	0.23
2010	0.86	0.45	0.14	0.36	0.23
2011	0.87	0.46	0.13	0.36	0.23
2012	0.87	0.46	0.15	0.38	0.24
2013	0.89	0.45	0.14	0.36	0.24
2014	0.88	0.49	0.15	0.38	0.24
2015	0.93	0.50	0.16	0.38	0.25
2016	0.97	0.47	0.16	0.39	0.26
2017	1.06	0.52	0.16	0.40	0.26
2018	1.12	0.59	0.16	0.40	0.28
2019	1.17	0.60	0.19	0.43	0.29
2020	1.28	0.66	0.21	0.48	0.33
2021	1.32	0.72	0.24	0.51	0.35

It is useful to match the marginal costs amounts in Table A-2 with the corresponding rates of decline in volumes that were provided in Table IV-1 in Section IV.A.2. of this Report. The flats products with the top two highest marginal costs series (First-Class Mail Flats and USPS Marketing Mail Flats) also have the respective rates of -7.80 percent and -9.16 percent, which are higher in absolute value than the average rate of mail decline for Market Dominant mail (-3.81 percent). Outside County Periodicals also has higher marginal cost than the firm-level aggregate marginal cost and its rate of mail volume decline is larger than the average rate for Market Dominant mail. The lowest of the marginal costs pertains to In County Periodicals, which nevertheless has a larger volume decline rate than the average rate for Market Dominant mail.

The return to scale for product  $i$  can be calculated as the ratio of its unit attributable cost to its marginal cost. This ratio will be denoted by  $S_i$ .

Table A-3 shows the returns to scale for four flat-shaped mail along with the firm-level number where the latter, for the sake of comparison, is calculated as the ratio of attributable cost to volume-variable cost, for the period from FY 2017 to FY 2021.

**Table A-3**  
**Attributable-Cost-Based Firm-Level and Mail-Product-Specific Returns to Scale**

FY	Firm-Level	FC Flats	Marketing Flats	In County Periodicals	Outside County Periodicals
2017	1.051	1.004	1.004	1.001	1.003
2018	1.077	1.003	1.003	1.001	1.003
2019	1.075	1.003	1.003	1.000	1.003
2010	1.074	1.004	1.004	1.000	1.002
2021	1.075	1.003	1.003	1.000	1.002

In all cases, the degree-of-scale-economies is larger than 1, indicating the existence of scale economies over all the considered period, albeit the magnitudes are much smaller than the firm-level counterparts. Although Table A-3 has the advantage of offering a way to compare the product-level to the firm-level returns to scale, this advantage is tempered by the fact that the mail-product-level metric is based on a less comprehensive cost concept. For this reason, the product-level degree of scale economies is not given further consideration in this section of this Appendix.

## A2. Model and Estimation Method

### (a) The Model

The econometric model is written as

$$c_{it} = \varphi(v_{it}, d_t, s_{it}, c_{it}, v_i) + u_{it} \quad (\text{A2.1})$$

In (A2.1), the indexes  $i$  and  $t$  denote the mail product and the fiscal year, respectively. The dependent variable is the marginal cost, *i.e.*, the unit volume-variable cost, denoted by  $c_{it}$ . The set of explanatory variables includes the product volume,  $v_{it}$ , the share of a product's volume in the mail-class volume,  $s_{it}$ , the share of mail class volume in the total (firm-level) volume,  $c_{it}$ , the number of delivery points,  $d_t$ , and a product-specific dummy,  $v_i$ . The data underlying the estimation are the result of a piling up the time series of all mail products. The term  $u_{it}$  denotes the idiosyncratic error term. To control for the effect of inflation, the marginal costs are inflation-adjusted prior to the estimation, using the consumer price index for all urban consumers, and choosing FY 2021 as the base year.<sup>15</sup>

<sup>15</sup> See U.S. Bureau of Labor Statistics, available at [www.bls.gov](http://www.bls.gov).

This estimation, which includes product dummies, does not assume linearity of the function. In fact, the estimation is agnostic about  $\varphi$ , which is simply assumed to belong to a (large) defined set of base functions of various degrees of complexity. The main justification for including product dummies in the model is in the fact that the number of mail products can roughly be considered as fixed, *i.e.*, it does not increase with the sample size and, therefore, the estimation is not subject to the well-known incidental-parameter problem.<sup>16</sup> As part of the estimation process, the choice of the regression function is made through an index that, in a Ridge-like estimation,<sup>17</sup> penalizes function complexity. The penalization of complexity is referred to in the relevant literature (the machine-learning literature) as a regularization. The specific version of the regularization-based estimation technique used in this analysis is known as the kernel regularized least squares, which is described below.<sup>18</sup>

### (b) Data and Estimation Results

The estimation of (A2.1) uses the data on volumes and delivery points over the FY 2000 through FY 2021 time period. The summary statistics of the observed variables entering the model are provided in Table A-4 where the product share of the mail class volume is the ratio of the product's volume to the volume of the corresponding mail class. Likewise, the share of mail class volume in the total volume is the ratio of the mail class volume to the firm-level total mail volume. Prior to the estimation, numerical identification numbers are assigned to the mail products. Table A-5 indicates the correspondences, where flats are bolded.

**Table A-4**  
**Summary Statistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
Marginal Cost (2021 Dollars)	330	1.0	1.4	0.0	6.2
Volume (Millions)	330	11549.9	16299.7	20.0	57086.0
Delivery Points (Millions)	330	150.1	7.9	134.5	163.1
Product's Share of Mail Class Volume	330	0.4	0.4	0.0	1.0
Mail Class's Share of Total Volume	350	0.3	0.2	0.0	0.5

<sup>16</sup> See generally Tony Lancaster, *The Incidental Parameter Problem Since 1948*, 95 J. Econometrics 391 (2000); Manuel Arellano & Jinyong Hahn, *Understanding Bias in Nonlinear Panel Models: Some Recent Developments* (Centro de Estudios Monetarios y Financieros (CEMFI) [Center of Monetary and Financial Studies], Working Paper No. 0507, 2005), available at [https://ideas.repec.org/p/cmfwpaper/wp2005\\_0507.html](https://ideas.repec.org/p/cmfwpaper/wp2005_0507.html).

<sup>17</sup> See Arthur E. Hoerl & Robert W. Kennard, *Ridge Regression: Biased Estimation for Nonorthogonal Problems*, 12 Technometrics 55 (1970).

<sup>18</sup> Detailed technical information can be found in Jens Hainmueller & Chad Hazlett, *Kernel Regularized Least Squares: Reducing Misspecification Bias with a Flexible and Interpretable Machine Learning Approach*, 22 Pol. Analysis 143 (2014) and Peter Bühlmann & Sara van de Geer, *Statistics for High-Dimensional Data. Methods, Theory and Applications* (2011).

The estimation results are shown in Table A-6, along with Figure A-6, which provides the histograms of the pointwise derivatives of the deflated marginal cost with respect to each of the explanatory variables, except for the dummies.<sup>19</sup>

**Table A-5**  
**Mail Product Identification Numbers**

Mail Product/Category	Product/Category identification Number
Enhanced Carrier Route	1
Free Mail - blind, handicapped & servicemen	2
Bound Printed Matter Flats and Parcels	3
<b>FC Mail Flats</b>	<b>4</b>
<b>In County Periodicals</b>	<b>5</b>
<b>USPS Marketing Mail Flats</b>	<b>6</b>
USPS Marketing Mail Letters	7
USPS Marketing Mail Parcels	8
Media Mail and Library Mail	9
<b>Outside County Periodicals</b>	<b>10</b>
Presort Cards	11
Presort Letters	12
Single-Piece Letters	13
Single-Piece Postcards	14
Competitive Mail	15

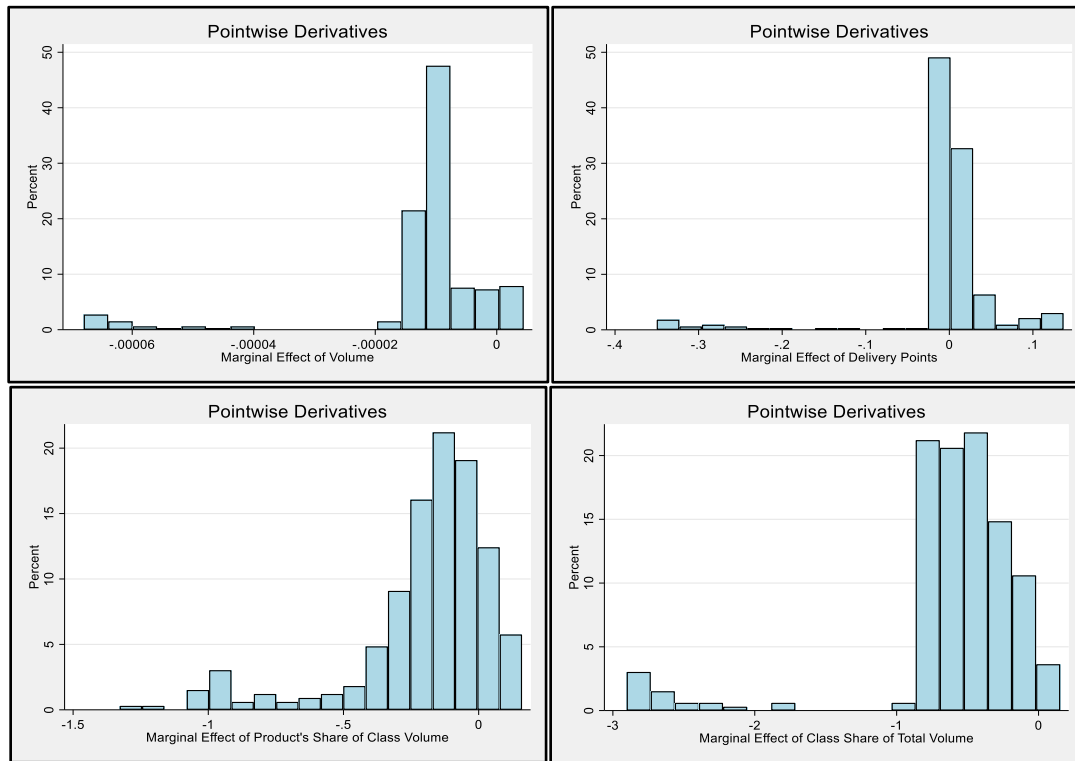
<sup>19</sup> The marginal effects of the dummies also vary along the predicted curve. Their histograms have not been included.

**Table A-6**  
**Estimation Results**

Number of Obs		Reference mail product for dummies: Enhanced Carrier Route					
Lambda							
Tolerance							
Sigma							
Eff. df							
R2							
Looloss							
Marginal Cost in 2021 Dollars	Avg.	SE	t	P>t	P25	P50	P75
Volume	-1.2E-05	1.50E-06	-8.251	0.000	-1.2E-05	-1E-05	-8.00E-06
Delivery Points	-0.004	0.002	-2.461	0.014	-0.004	0.000	0.012
Product_Share_of_Class_Volume	-0.196	0.051	-3.844	0.000	-0.257	-0.136	-0.037
Class_Share_of_Total_Volume	-0.611	0.107	-5.730	0.000	-0.710	-0.517	-0.308
Free Mail	-0.071	0.035	-2.036	0.043	-0.233	0.291	0.420
Bound Printed Matter Flats	-0.022	0.050	-0.432	0.666	-0.147	0.346	0.474
FC Mail Flats	0.029	0.045	0.644	0.520	-0.017	0.342	0.478
In County Periodicals	-0.427	0.043	-10.032	0.000	-0.526	-0.134	0.096
USPS Marketing Mail Flats	-0.144	0.048	-3.026	0.003	-0.163	0.153	0.341
USPS Marketing Mail Letters	-0.134	0.082	-1.620	0.106	-0.163	0.157	0.286
USPS Marketing Mail Parcels	0.260	0.046	5.585	0.000	0.222	0.546	0.674
Media and Library Mail	1.061	0.044	24.208	0.000	0.719	1.051	1.448
Outside County	-0.260	0.039	-6.753	0.000	-0.410	0.085	0.267
Presort Cards	-0.344	0.044	-7.842	0.000	-0.455	-0.131	0.140
Presort Letters	-0.143	0.065	-2.196	0.029	-0.174	0.148	0.276
Single-Piece Letters	-0.150	0.048	-3.161	0.002	-0.203	0.143	0.319
Single-Piece Postcards	-0.256	0.044	-5.831	0.000	-0.352	-0.024	0.241
Competitive Mail	0.757	0.039	19.427	0.000	0.280	0.750	1.203



**Figure A-6**  
**Histograms of the Pointwise Derivatives**

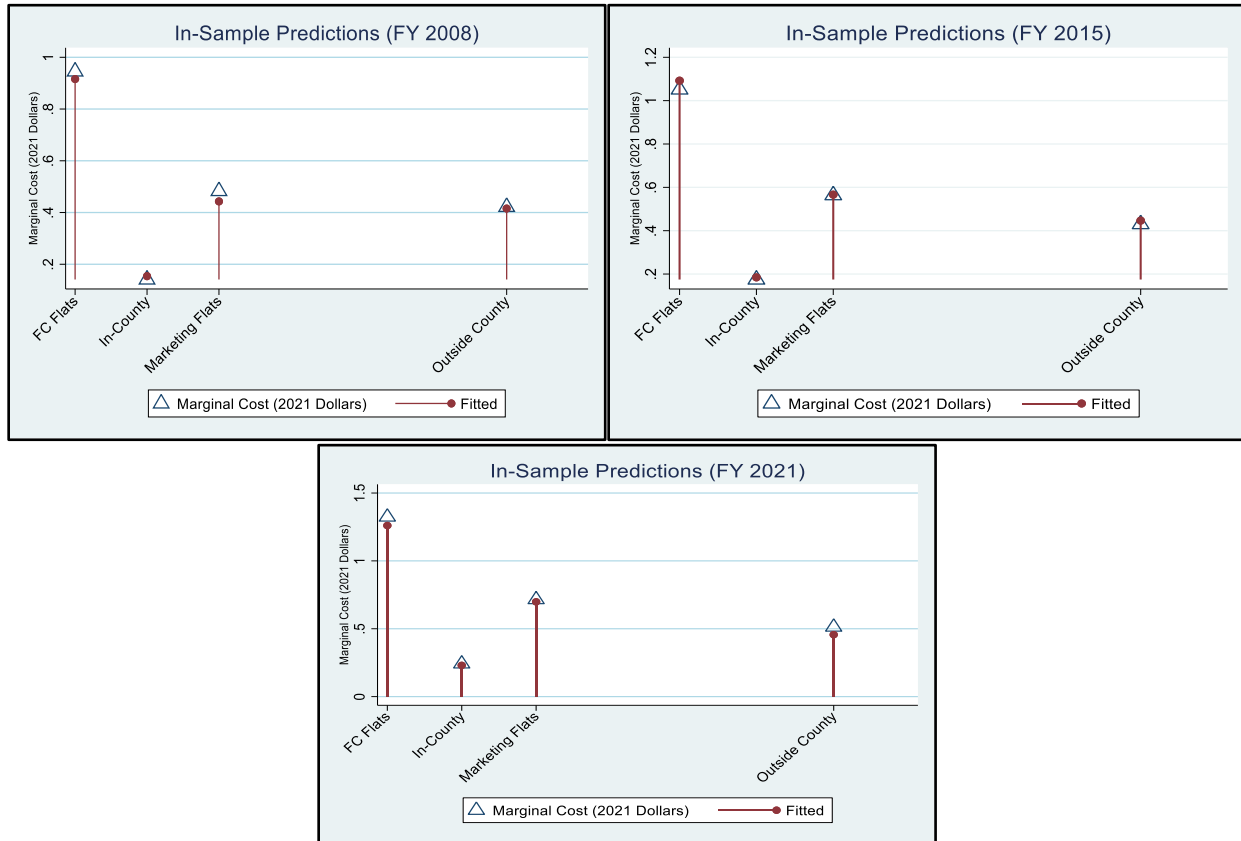


In Table A-6, “Avg.” denotes the (sample) average pointwise marginal effects. Unlike in linear regression, the marginal effect varies along the predicted curve. These average marginal effects are given along with their standard deviation and the corresponding p-values. The last three columns, P25, P50, and P75, respectively, display the 1st quartile, the median, and 3rd quartile of the pointwise marginal effects. The estimation is performed with the STATA package and, more precisely, with the command “krls” and its associated postestimation commands.

(c) In-Sample and Out-of-Sample Forecasts

Figure A-7 shows the in-sample predictions. Only the predictions for 3 fiscal years (FY 2008, FY 2015, and FY 2021) are presented, for illustrative purposes. The centers of the triangles are the actual values of the deflated marginal cost. The (brown-color) discs at the top end of the vertical segments represent the predicted values. The locations of mail products on the x-axis are determined by the numerical identification numbers assigned to them (see Table A-5).

**Figure A-7**  
**In-Sample Prediction**



## (d) The Kernel Regulated Least Squares Estimation

The estimation procedure for  $\varphi$  will consist of: (i) defining, *on the basis of the available data sample*, the set of candidate functions that will fit the data and (ii) choosing the best function from the set of candidate functions, based on a loss function (which is defined so as to penalize those functions that have too many parameters, and hence are too complex).

A clarification concerning the word “kernel” is needed to avoid any confusion between the regularized least squares method used here and the traditional weighted local estimation called the kernel regression. While both approaches (KRLS and kernel regression) use mathematical kernels, the KRLS method uses a kernel to define (from the sample observations on the explanatory variables) the set of candidate functions that can be used to fit the data.<sup>20</sup> This amounts to defining the candidate right-hand side variables in a linear ridge regression equation. In that sense, regularized least squares methods are generalized ridge-regression methods in which the estimate function is chosen from some suitable space of functions defined on the basis of the available sample. The objective is to minimize some given loss function over the defined space of functions. A penalization term (the “regularizer”) is added to the loss function to control the complexity of the optimally chosen function. A trade-off between the model fit and function complexity is realized through a positive multiplicative coefficient, say  $\lambda$ , to the regularizer.<sup>21</sup> A larger value of the coefficient  $\lambda$  is synonymous to a heavier penalty imposed to more complex functions. *Id.* In the specific method considered, the suitable class of candidate functions are all kernel-expansion functions  $\varphi$  of the form

$$\varphi(.) = \sum_l c_l k(., x_l) \quad (A2.2)$$

where  $l$  denotes the observation index,  $x_l$  is the vector of the values of the explanatory variables appearing in observation  $l$ , and  $c_1, \dots, c_N$  are coefficients to be estimated along with  $\lambda$ . The function  $k(., .)$  is some suitable kernel function chosen by the modeler, *e.g.*, the Gaussian kernel function

$$(x_i, x_j; \delta) = e^{-\left(\frac{\|x_i - x_j\|^2}{\delta}\right)},$$

where  $\delta$  is the dimension of  $x_i$  and  $\|.\|$  is the Euclidean norm.

---

<sup>20</sup> Mathematically, a given kernel gives rise to a class of kernel-expansion types of functions that can be organized into a reproducing kernel Hilbert space (RKHS). The “representer theorem” is a set of results according to which a large class of optimization problems with RKHS regularizers have solutions that can be expressed as kernel expansions in terms of the sample. *See, e.g.*, Bernhard Scholkopf et al., *A Generalized Representer Theorem* 416 (David Helmbold & Bob Williamson eds., 2001), available at <https://alex.smola.org/papers/2001/SchHerSmo01.pdf>.

<sup>21</sup> *See generally* Hainmueller & Hazlett, *supra*; Bühlmann & van de Geer, *supra*.

Formally, the problem to be resolved is a version of the so-called Tikhonov Regularization Problem:

$$\text{Argmin}_{\varphi \in \Phi} \sum_l (y_l - \varphi(x_l))^2 + \lambda \|\varphi\|^2 \quad (\text{A2.3})$$

where  $\|\cdot\|$  is the norm corresponding to the Reproducing Kernel Hilbert Spaces defined by the chosen kernel,<sup>22</sup> and  $y_l$  is the value of the dependent variable in the  $l$ -th observation.

The estimation consists in optimally choosing the coefficients  $c_1, \dots, c_N, \lambda$ , and the variance  $\sigma^2$  of the error term  $u$  in the regression equation  $y = \sum_l c_l k(\cdot, x_l) + u$ , where  $y$  is the dependent variable. Homoskedasticity is implicitly assumed (but is not necessary) in the presentation.

Hainmueller and Hazlett (2014) summarize some of the properties of the KRLS estimator as follows.

First, it is worth noting that for a given  $\lambda > 0$ , problem (16) has the unique solution

$$c^* = (K + \lambda I)^{-1}y,^{23}$$

$$\text{where } K = \begin{bmatrix} k(Q_1, Q_1) & \cdots & k(Q_1, Q_N) \\ \vdots & \ddots & \vdots \\ k(Q_N, Q_1) & \cdots & k(Q_N, Q_N) \end{bmatrix}. \quad (\text{A2.4})$$

Under the assumptions that the unknown function is of the form (A.2.1), but  $y$  is observed with an error  $u$  of zero conditional expectation,  $E(u|Q) = 0$ , the estimator,  $\hat{c}$ , of the vector  $c = (c_1, \dots, c_N)$  (which is simply of the same form as (A2.4), with the particularity that the observed  $y$  is noisy), is unbiased in the sense:  $E(\hat{c}|Q, \lambda) = c$ , where  $\lambda$  is included in the condition to emphasize the dependence of the optimal solution on it. Likewise, the predicted marginal cost function,  $\hat{\varphi}(x)$ , is pointwise unbiased, conditional on volume, *i.e.*,

$$E(\hat{\varphi}(x)|Q, \lambda) = \varphi(x) \quad \forall x \quad (\text{A2.5})^{24}$$

Regarding the small-sample properties of the KRLS, Hainmueller and Hazlett (2014) provide evidence, from simulations, of the not-so-bad small-sample performance of the kernel regularized least squares method.<sup>25</sup>

<sup>22</sup> See Hainmueller & Hazlett, *supra*, at 149.

<sup>23</sup> See *id.*

<sup>24</sup> Recall that ridge estimator is biased but has lower variance than the OLS estimator. So, the untestable assumption that the unknown function is in the choice set is crucial for the unbiasedness.

<sup>25</sup> See W. Holmes Finch & Maria E. Hernández Finch, *Multivariate Regression with Small Samples: A Comparison of Estimation Methods*. 43 Gen. Linear Model J. 16 (2017).

## Section IV.B. Analysis

### Expanded Discussion of Dependent Components

#### *Note on delivery dependent component unit cost calculations*

When calculating a product's unit costs for delivery dependent components, the volume of the product is split into city volume and rural volume.<sup>26</sup> City Carrier dependent component costs are divided by city volume, Rural Carrier dependent component costs are divided by rural volume.

#### Mail processing dependent component driving factors

The mail processing dependent component encompasses three major categories of activities: (1) automated and manual distribution of mail; (2) "allied labor" operations<sup>27</sup>; and (3) miscellaneous work including other mail processing support activities.<sup>28</sup> This component is partitioned into three types of facilities in which the costs accrue: MODS facilities, NDCs,<sup>29</sup> and "non-MODS" offices. MODS facilities include P&DCs, processing and distribution facilities (P&DFs), and International Service Centers (ISCs).*Id.* The non-MODS group consist primarily of Post Offices, stations, and branches not included in the previous two groups. *Id.* at 37. They are generally Post Offices and other small facilities that engage primarily in manual mail processing activities. *Id.*

The following analyzes the partitioned mail processing dependent component costs of the two products with the highest mail processing costs, USPS Marketing Mail Flats and First-Class Mail Flats.

#### *USPS Marketing Mail Flats Mail Processing Dependent Component Driving Factors*

To understand the driving factors for increase in the mail processing costs of USPS Marketing Mail Flats, the next three figures illustrate the cost changes in the three types of facilities that partition the mail processing dependent component.

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<sup>26</sup> The city/rural volume split for each product is calculated each year using percentages derived from the city and rural volumes provided in Chairman's Information Request No. 8 and Notice of Filing Under Seal, January 25, 2023, question 2.

<sup>27</sup> This includes platform operations, collection and cancellation operations, main preparation, manual bundle/tray/sack/sorting, and dispatching.

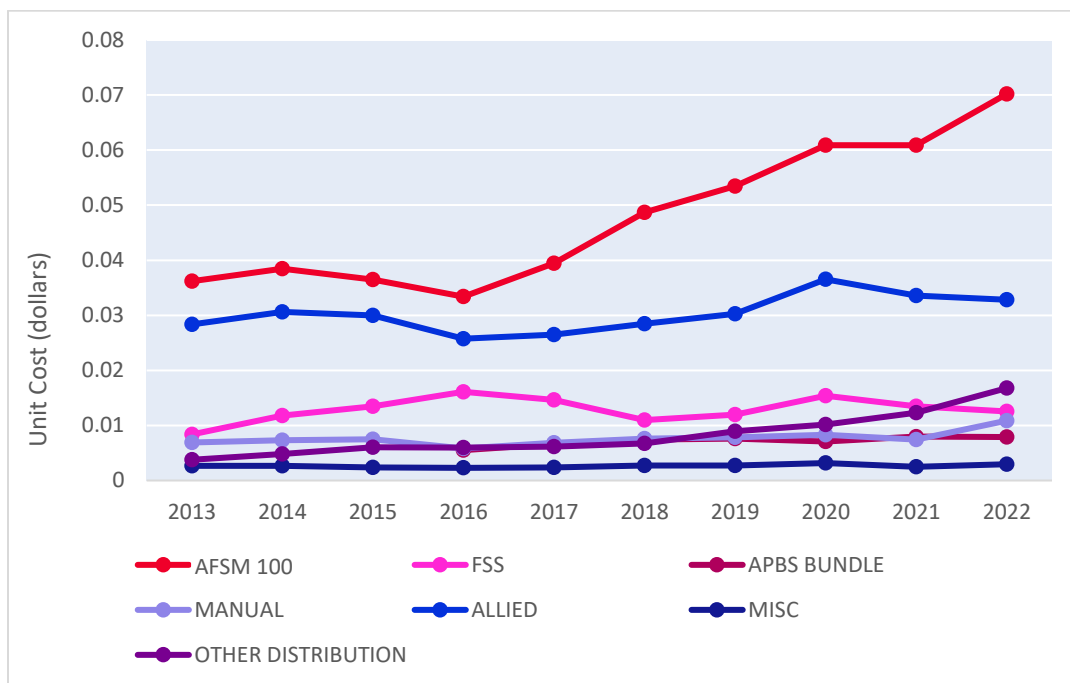
<sup>28</sup> See Summary Description of USPS Development of Costs by Segments and Components, Fiscal Year 2021, July 1, 2022, folder "Summary Description FY2021.zip," file "CS03-21.docx" (FY 2021 Cost Segment 3 Summary Description).

<sup>29</sup> NDCs use MODS for operational data reporting but are treated as a separate facility group. *Id.* at 3-3.

MODS facilities

MODS costs are separated into cost pools forming three primary groups: distribution operations, allied operations, and miscellaneous and support operations.<sup>30</sup> Figure A-8 separates the MODS cost in this way, with specific distribution operations separated out (AFSM 100, FSS, APBS Bundle) because these are of particular interest for flats products. Clerk and mailhandler costs associated with AFSM 100 operations, which has been increasing since FY 2016, appears to be a driving factor in the increase in mail processing unit costs since FY 2016. The other operations remain relatively stable.

**Figure A-8**  
**USPS Marketing Mail Flats MODS Facilities Unit Costs by Operation, FY 2013–FY 2022<sup>31</sup>**



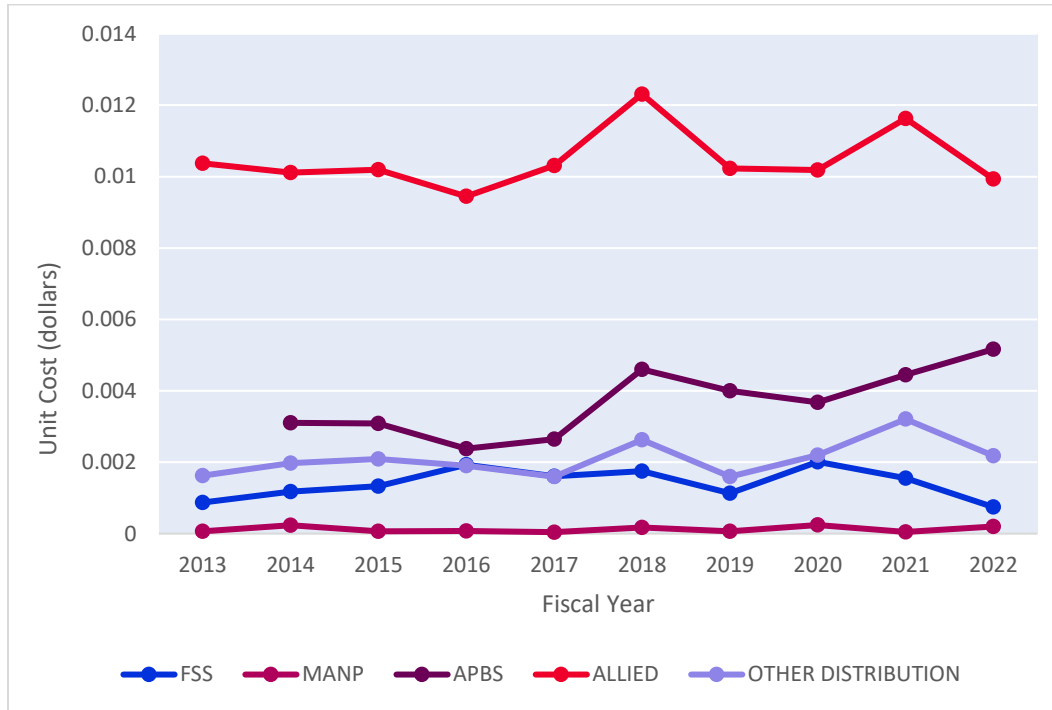
NDCs

Clerk and mailhandler labor costs at NDCs are relatively low compared to other facilities and remain relatively stable compared to the other facilities. See Figure A-9.

<sup>30</sup> See *id.* at 3-4-3-6.

<sup>31</sup> As seen in Figure A-8, the mail processing dependent component unit cost had been quite stable prior to FY 2013. For simplicity, the figures showing the partitioned mail processing dependent component unit costs will only focus on 10 fiscal years.

**Figure A-9**  
**USPS Marketing Mail Flats NDCs Unit Costs by Operation, FY 2013–FY 2022**



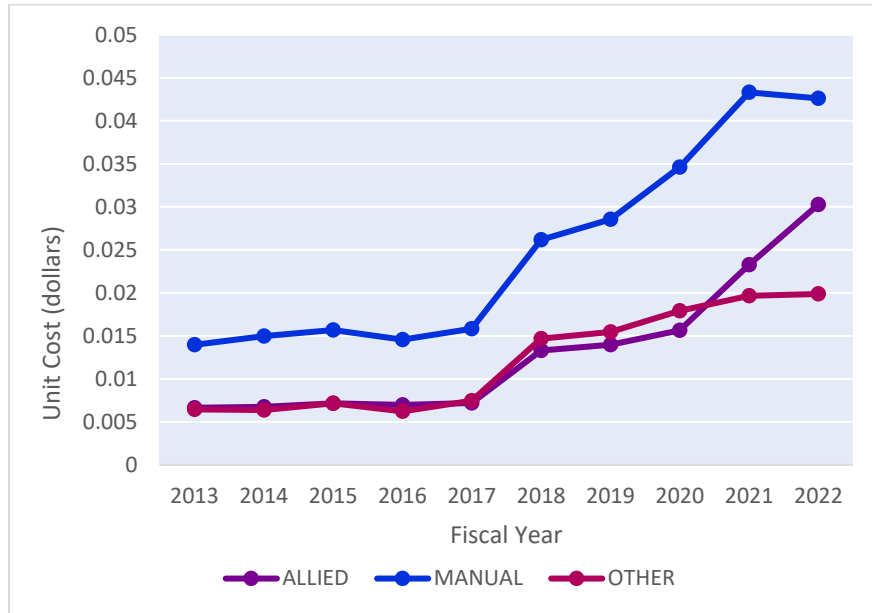
Non-MODS Facilities

Non-MODS offices are generally Post Offices and other small facilities that engage primarily in manual mail processing activities.<sup>32</sup> As seen in Figure A-10, non-MODS clerk and mailhandler costs were very stable until FY 2017. In FY 2018, there was a sudden jump in the costs of all activities (allied, manual, and other), and increases have continued for manual activities since while allied operations were stable a couple years before large increases in FY 2021 and FY 2022. These increases contribute to the increase in mail processing unit costs seen in Figure IV-24 in Section IV.B.2.d. The sudden jumps in costs in FY 2018 are due to methodology changes implemented that year.<sup>33</sup>

<sup>32</sup> See *id.* at 3-7.

<sup>33</sup> Beginning in FY 2018, costs recorded at MODS facilities in LDCs 41-44, 48-49, and 79 are included in the costs for non-MODS offices. *Id.* at 3-3 n.2; see Docket No. RM2018-10, Order on Analytical Principles Used in Periodic Reporting (Proposal Seven), October 12, 2018 (Order No. 4855).

**Figure A-10**  
**USPS Marketing Mail Flats Non-MODS Facilities Unit Costs by Operation, FY 2013–FY 2022**



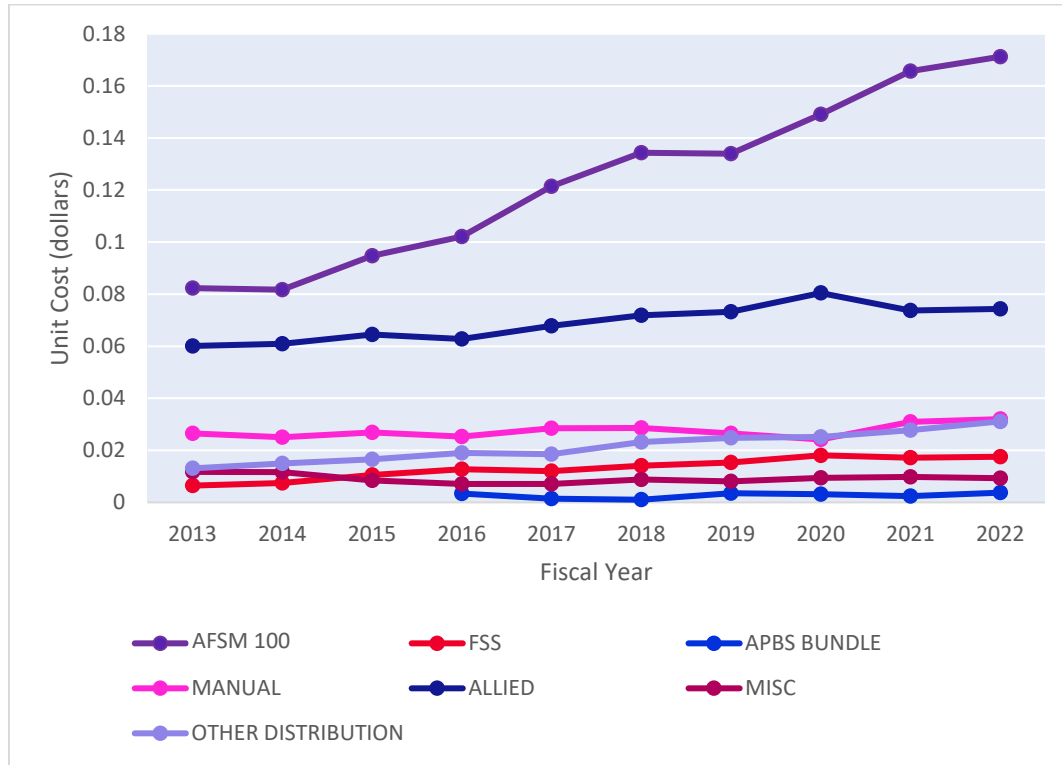
*First-Class Mail Flats Mail Processing Dependent Components Driving Factors*

MODS Facilities

Similar to USPS Marketing Mail Flats, clerk and mailhandler costs associated with AFSM 100 appear to be the driving factor for the increase in mail processing unit costs for First-Class Mail Flats since FY 2014. The other operations remain relatively stable. See Figure A-11.



**Figure A-11**  
**First-Class Mail Flats MODS Facilities Unit Costs by Operation, FY 2013–FY 2022<sup>34</sup>**



**Non-MODS Facilities<sup>35</sup>**

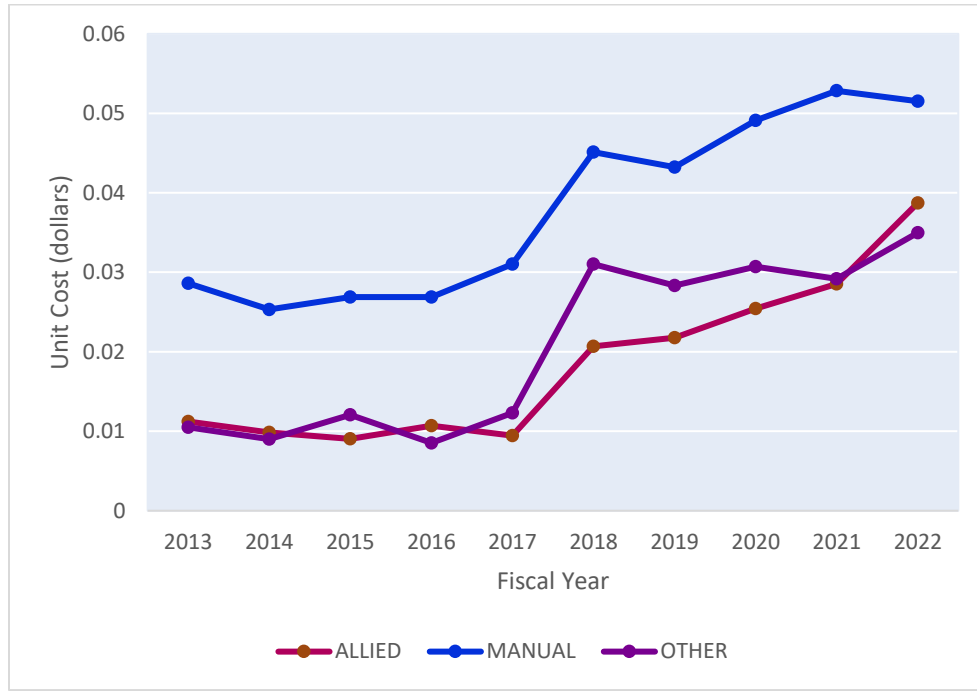
Although there is a sharp increase in the unit costs of all non-MODS operations<sup>36</sup>, non-MODS unit costs are low compared to costs associated with AFSM 100 operations. See Figure A-12. Therefore, these sudden jumps are not noticeable in the unit cost of the mail processing dependent component seen in Figure IV-31 in Section IV.B.2.f.

<sup>34</sup> As seen in Figure IV-12 in Section IV.B.1., the mail processing dependent component unit cost had been quite stable prior to FY 2013. For simplicity, the figures showing the partitioned mail processing dependent component unit costs will only focus on 10 fiscal years.

<sup>35</sup> Mail processing unit cost at NDCs for First-Class Flats is excluded from the analysis because it is very low and contribute a negligible amount to the mail processing dependent component.

<sup>36</sup> Similar to USPS Marketing Mail Flats, this jump corresponds with a methodology change in how costs are recorded. See generally Order No. 4855; FY 2021 Cost Segment 3 Summary Description.

**Figure A-12**  
**First-Class Mail Flats Non-MODS Facilities Unit Costs by Operation, FY 2013–FY 2022**



## Section IV.C. Analysis

### 1. Methodology for Developing Datasets for Econometric Analysis

The Postal Service provides annually to the Commission the daily Management Operating Data System (MODS) data<sup>37</sup> by facility, tour,<sup>38</sup> and operation and the monthly MODS data<sup>39</sup> by facility and operation. To support the MODS data, the Postal Service also annually provides the map of MODS operations to operation groups.<sup>40</sup> To calculate excess capacity at the mail processing facilities for FY 2017 to FY 2022, the Postal Service provided the key<sup>41</sup> to the finance number and name of each facility, as well as the machine counts<sup>42</sup> at each facility for FY 2017 to FY 2022. The Postal Service also made available the list of relevant MODS operations codes,<sup>43</sup> including the operations codes used to calculate the excess

<sup>37</sup> Docket No. ACR2017, Library Reference USPS-FY17-NP18, December 29, 2017, folder “documents,” folder “USPS-FY17-NP18,” folder “USPS-FY17-NP18 MODS Data,” folder “mods2017tour-np,” file “mods2017tour-np.csv;” Docket No. ACR2018, Library Reference USPS-FY18-NP18, December 28, 2018, folder “USPS-FY18-NP18.files,” folder “USPS-FY18-NP18 MODS Data,” folder “mods2018tour-np,” file “mods2018tour-np.csv;” Docket No. ACR2019, Library Reference USPS-FY19-NP18, December 27, 2019, folder “USPS-FY19-NP18,” folder “USPS-FY19-NP18 MODS Data,” folder “modstour2019-np,” file “modstour2019-np.csv;” Docket No. ACR2020, Library Reference USPS-FY20-NP18, December 29, 2020, folder “USPS-FY20-NP18,” folder “USPS-FY20-NP18 MODS Data,” folder “modstour2020-np,” file “modstour2020-np.csv;” Docket No. ACR2021, Library Reference USPS-FY21-NP42, February 22, 2022, folder “OneDrive\_2022\_02-22,” folder “Docket No. ACR.2021,” folder “USPS-FY21-NP42,” folder “USPS-FY21-NP42.files,” file “modstour2021r-np.csv;” Docket No. ACR2022, Library Reference USPS-FY22-NP18, December 29, 2022, folder “USPS-FY22-NP18,” folder “USPS-FY22-NP18 MODS Data,” folder “mods2022tour-np,” file “mods20222022-np.csv.”

<sup>38</sup> MODS is a Postal Service national program that is a systematic approach to gathering, storing, and reporting workload, workhours, and machine utilization. The MODS day consists of three tours of 8 hours each; Tour II begins at the start of the MODS day, followed by Tour III, and ends with Tour I. For example, if the MODS day begins at 07:00, tour times would be Tour II from 07:00 to 14:59, Tour III from 15:00 to 22:59, and Tour I from 23:00 to 06:59. See Docket No. ACR2022, Library Reference USPS-FY22-NP18, folder “USPS-FY22-NP18,” folder “USPS-FY22-NP18 MODS Data,” file “M-32 MODS Handbook.pdf,” at n. 9 (MODS Handbook).

<sup>39</sup> Docket No. ACR2017, Library Reference USPS-FY17-NP18, folder “documents,” folder “USPS-FY17-NP18,” folder “USPS-FY17-NP18 MODS Data,” file “mods\_month\_fy17.csv;” Docket No. ACR2018, Library Reference USPS-FY18-NP18, folder “USPS-FY17-NP18.files,” folder “USPS-FY18-NP18 MODS Data,” file “mods\_month\_fy18.csv;” Docket No. ACR2019, Library Reference USPS-FY19-NP18, folder “USPS-FY19-NP18,” folder “USPS-FY19-NP18 MODS Data,” file “mods\_month\_fy19.csv;” Docket No. ACR2020, Library Reference USPS-FY20-NP18, folder “USPS-FY20-NP18,” folder “USPS-FY20-NP18 MODS Data,” file “mods\_month\_fy20.csv;” Docket No. ACR2021, Library Reference USPS-FY21-NP18, December 29, 2021, folder “USPS-FY21-NP18,” folder “USPS-FY21-NP18 MODS Data,” file “mods\_month\_fy21.csv;” Docket No. ACR2022, Library Reference USPS-FY22-NP18, folder “USPS-FY22-NP18,” folder “USPS-FY22-NP18 MODS Data,” file “mods\_month\_fy22.csv.”

<sup>40</sup> Docket No. ACR2017, Library Reference USPS-FY17-23, December 29, 2017, folder “USPS-FY17-23,” folder “Programs,” file “opmap17.xlsx;” Docket No. ACR2018, Library Reference USPS-FY18-23, December 28, 2018, folder “USPS-FY18-23,” folder “Programs,” file “opmap18.xlsx;” Docket No. ACR2019, Library Reference USPS-FY19-23, December 27, 2019, folder “USPS-FY19-23,” folder “Programs,” file “opmap19.xlsx;” Docket No. ACR2020, Library Reference USPS-FY20-23, December 29, 2020, folder “USPS-FY20-23,” folder “Programs,” file “opmap20.xlsx;” Docket No. ACR2021, Library Reference USPS-FY21-23, December 29, 2021, folder “USPS-FY21-23,” folder “Programs,” file “opmap21.xlsx;” Docket No. ACR2022, Library Reference USPS-FY22-23, December 29, 2022, folder “USPS-FY22-23,” folder “Programs,” file “opmap22.xlsx.”

<sup>41</sup> Docket No. ACR2021, Library Reference USPS-FY21-NP42, folder “OneDrive\_2022\_02-22,” folder “Docket No. ACR.2021,” folder “USPS-FY21-NP42,” folder “USPS-FY21-NP42.files,” file “ChIR17.Q4b.finlist\_fy21\_MODS.nonpublic.xlsx.”

<sup>42</sup> Library Reference USPS-SS2022-1 - NP6, February 1, 2023, folder “USPS-SS2022-1\_NP6,” folder “SS.NP6.ChIR.8.NP.Files,” folder “Q.5,” file “ChIR8.Q5.Rev.AttB.Nonpublic.xlsx,” tab “Machine Counts;” Responses of the United States Postal Service to Questions 1-6 of Chairman’s Information Request No. 8, February 1, 2023, Excel file “ChIR 8 Q3 2016\_2022.xlsx.”

<sup>43</sup> See Responses of the United States Postal Service to Questions 1-8 of Chairman’s Information Request No. 1, August 16, 2022, question 5.c.

capacity at the mail processing facilities. The operations codes employed in determining the excess capacity are part of the labor distribution code (LDC) 12.<sup>44</sup>

The Commission created a subset of the daily MODS data aggregated to the monthly level by LDC 12 and a subset of the monthly MODS data by LDC 12 and merged the two subsets, comprising the relevant operations relating to AFSM and FSS mail processing machines. The merger enabled the Commission to get the total volume (the number of pieces-fed)<sup>45</sup> and the labor workhours on machines from daily MODS data and the machine downtime<sup>46</sup> hours from the monthly MODS data. The merged MODS data were combined with the operations map data, the facility identifier data, and the machine count data to create comprehensive data to calculate excess capacity. This merger allowed the Commission to ascertain each facility's machine type, machine count, capacity, reported volume, workhours, and downtime.

## 2. Testing Explanatory Variables for Multicollinearity

To ensure that there is no multicollinearity in the econometric models developed and presented within the instant study, the Commission ran some tests. A high (although not perfect) correlation between two or more independent (explanatory) variables is called multicollinearity.<sup>47</sup> High multicollinearity threatens the stability and precision of the estimated coefficients in the regression models over time.<sup>48</sup> To measure the degree to which each explanatory (predictor) variable is affected by multicollinearity, statisticians apply the variance inflation factor (VIF) test. The higher the VIF, the more serious the effect of multicollinearity is on the explanatory variables.<sup>49</sup> An accepted cutoff value for the VIF is 10.<sup>50</sup> Multicollinearity exists when  $VIF > 10$ . Table A-7 presents VIFs for all three econometric models discussed in Sections IV.C.1. and IV.C.3. It is easy to see that there is no multicollinearity in any of these models.

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<sup>44</sup> The LDC is a matrix of the Postal Service's National Workhour Reporting System (NWRS), the labor expense functional reporting system consisting of the National Workhour Report and the Labor Utilization Report. LDC 12 records all nonsupervisory hours of employees involved in the mechanized distribution of letters and flats relating to mail processing operations. See Docket No. R2006-1, Library Reference USPS-LR-L-55, May 3, 2006, folder "LR-55," folder "LR-L-55 electronic version (.doc & excel)," folder "lr-l-55 part1," PDF file "\_Labor Distribution Codes.pdf." See also United States Postal Service, Publication 32 – Glossary of Postal Terms, July 2013, available at [https://about.usps.com/publications/pub32/pub32\\_terms.htm#ep1011832](https://about.usps.com/publications/pub32/pub32_terms.htm#ep1011832).

<sup>45</sup> Total pieces fed (TPF) is the number of pieces inducted at the front of mechanization or automation equipment. This count includes rejects, reworks, re-feed, etc. While preparing the data, the TPF was set equal to the total piece handling (TPH), wherever TPF is less than TPH in the data. TPH is the number of handlings necessary to distribute each piece of mail from the time of receipt to dispatch. See MODS Handbook at 17-18. See also Docket No. ACR2022, Library Reference USPS-FY22-23, December 29, 2022, folder "USPS-FY22-23," folder "Programs," TXT file "MODSprod22\_log.txt."

<sup>46</sup> The Postal Service did not include records of downtime hours in the daily MODS data for FY 2017 to FY 2021.

<sup>47</sup> See Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach* 95 (5th ed. 2013).

<sup>48</sup> For the discussion of the potential impact of multicollinearity on the estimated variabilities in the Postal Service costing models, see, e.g., Docket No. RM2019-6, Order on Analytical Principles Used in Periodic Reporting (Proposal One), January 14, 2020, at 18, Appendix (Order No. 5405).

<sup>49</sup> For more details, see, e.g., John Fox, *Applied Regression Analysis and Generalized Linear Models* 320-21 (2nd ed. 2008).

<sup>50</sup> See, e.g., Wooldridge, *supra*, at 98; Dawn Iacobucci et al., *Mean Centering Helps Alleviate "Micro" But Not "Macro" Multicollinearity*, 48 Behav. Rsch. Methods 1308, 1315 (2016).

**Table A-7**  
**The Variance Inflation Factor (VIF) – Multicollinearity Test**

VIF Test			
	Dependent Variable	Explanatory Variables	VIF
AFSM	Excess Capacity	InDowntime, InVolume	4.03
	Excess Capacity	InMachineNo, InVolume	3.17
	InWorkhours	ExcessCapacity, InVolume	1.90
FSS	Excess Capacity	InDowntime, InVolume	3.57
	Excess Capacity	InMachineNo, InVolume	3.14
	InWorkhours	ExcessCapacity, InVolume	1.27

3. Summary Statistics

Table A-8 provides some basic information about all variables in econometric models for AFSM and FSS machines. See Sections IV.C.1., IV.C.3. There were 1,187 observations for AFSM and 246 observations for FSS models.

**Table A-8**  
**Summary Statistics**

	Variable	Units	Obs	Mean	Std. dev.	Min	Max
AFSM	ExcessCapacity	Percent	1,187	0.426475	0.2032069	-0.4849408	0.947901
	InVolume	Million	1,187	17.55494	0.9175507	9.964818	19.70422
	InDowntime	Hours	1,187	5.713749	1.062127	-2.995732	8.11068
	InWorkhours	Hours	1,186	9.829	1.011889	5.022103	12.44823
	InMachinesNo	Numbers	1,187	0.604731	0.5718543	0	2.079442
FSS	ExcessCapacity	Percent	246	0.705253	0.076907	0.3522206	0.8712559
	InVolume	Million	246	17.92949	0.5915817	16.20959	19.34828
	InDowntime	Hours	246	6.979262	0.5420426	5.499706	8.339649
	InWorkhours	Hours	246	10.2613	0.6587158	8.645352	12.07607
	InMachinesNo	Numbers	246	0.6454212	0.5141506	0	1.791759

## Section IV.E. Analysis

### Expanded Discussion of Costing Methodology Changes

This analysis bears upon the issue of producing reliable SPLY comparisons and more generally on the possibility of constructing a series of unit flats costs going back in time. Clearly, a comparison of costs in one fiscal year to another would need to rely on the adjusted unit costs, but the question is how to make that comparison, and the answer to that question will influence the comparison. If a simple comparison from year to year may be misleading, one possible remedy would be to compare adjusted attributable unit costs, where the adjustment would be derived from the projected impacts.

Consider a comparison of the FY 2021 Carrier Route Flats costs to the FY 2020 costs. A simple comparison of unit attributable costs would show an increase in Carrier Route Flats costs of 3.5 percent.<sup>51</sup> However, if the costs are first transformed by making the relevant adjustments, the comparison shows a 3.0 percent decline in unit costs.<sup>52</sup>

Such an exercise would rely upon an assumption that the impacts estimated for one year are appropriate to use to adjust attributable unit costs in prior years, an assumption Section IV.E. of this Report makes in proposing a time series.<sup>53</sup> This assumption requires that events and changes each year are independent, which is a strong assumption to make. Suppose, for example, that some event had occurred in FY 2019, which made the FY 2020 changes in In-Office Cost System (IOCS) impossible to apply to FY 2019. Then the application of these cost adjustments to all prior years would produce inaccurate attributable unit costs. By explicitly assuming the independence of the adjustments, this analysis calls for attention to the care that should be taken in use of the time series data.

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<sup>51</sup> Commission calculations using data from FY 2021 and FY 2020 Public CRA. See Docket No. ACR2021, Library Reference USPS-FY21-1, December 29, 2021, PDF file "USPS-FY21-1 Preface.CRA.Report.pdf"(FY 2021 Public CRA Report); Docket No. ACR2020, Library Reference USPS-FY20-1, December 29, 2020, PDF file "USPS-FY20-1 Preface.CRA.Report.pdf" (FY 2020 Public CRA Report).

<sup>52</sup> Commission calculations using data from FY 2021 Public CRA Report and FY 2020 Public CRA Report. These relevant adjustments include inflation and methodology changes as described below.

<sup>53</sup> There is a materiality issue here, of course. Consider Docket No. RM2015-19, which merges C/S 3 and C/S 4. A small impact is felt on FCM flats (-0.01 cents) and by increases of similar magnitude in some other flats products.

The issue becomes more problematic when comparing unit costs over a greater span of time because of the frequency of methodological changes. Consider again, as an example, the impact of methodology changes on the Carrier Route Flats product. The appropriate local impact due to methodology changes in FY 2020 alone would include:

- IOCS Cluster Sampling using Time and Attendance Collection System (Docket No. RM2020-10)
  - 1.74 cents
- New Methodology for City Carrier Delivery Time (Docket No. RM2020-7)
  - -0.70 cents
- Update and Improve Methodology for Calculating SPR Cost Estimates (Docket No. RM2019-6)
  - -0.10 cents
- Update Method for Estimating Facility-Related Costs (Docket No. RM2020-1)
  - -0.04 cents

The local impact for Carrier Route Flats due to methodology changes in FY 2020 would be 0.90 cents (1.74 -0.70 -0.10 -0.04). Application of the provided local impact to prior years' unit costs would require the assumption that this adjustment derived for Carrier Route Flats in FY 2020 is applicable to prior years. A decision also needs to be made as to whether the adjustments are best represented by level quantities or proportions, or in some other way.

The adjustments applied in Section IV.E. of this Report are due to methodological changes. Cost impacts due to methodological changes are more likely to be applicable to previous years, unlike changes in products' volume mix or operational changes. The presumption made here is that the Postal Service will adopt the most accurate estimate of the cost impact, subject to cost considerations, that evolving technology will support. Part of the motive for introducing changes to a costing methodology may at times be keeping up with operational practices, but for the purposes of this Report it is assumed to be secondary to choosing the most accurate technique for cost measurement.

Using the Carrier Route Flats example, this assumption suggests that the 0.90 cents local adjustment in FY 2020 should apply to all prior years in order to make a valid comparison of attributable unit cost across years. Therefore, in constructing the time series seen in Section IV.E., the unit attributable costs of FY 2008 through FY 2019 are all adjusted by 0.90 cents due to the methodology changes in FY 2020.

## **Caveats and Cautions for the Applied Adjustments**

The report discusses the possible construction of a time series of the unit cost of flats products going back to FY 2008. Since the Postal Service provides an estimate of the impact of each of its proposed methodology changes, it is possible to produce a time series, by applying the calculated impact to the unit costs of flats products, going back in time. Whether such a series would be meaningful depends on the use to which it put and whether it would be subject to significant restrictive assumptions.

One such assumption is that the adjustments applied to the previous years' unit costs are the appropriate ones, bearing in mind there is no unique procedure for choosing the adjustments. The restriction is that the adjustments derived from analysis of the current year are equally applicable to the prior years. This is problematic because the Postal Service produces the impact estimate in order to compare costs with and without the proposed methodological change in the current year, and not necessarily as long-term impacts.

The procedure for deriving an adjusted time series is straightforward: apply the adjustments to the unit costs and include impacts of all subsequent years' local impacts, then adjust for inflation. There are three steps in constructing the time series:

- Construct a matrix of local impacts. In some cases, there are multiple impacts in a given year. In that case impacts are summed to present a unique effect for the fiscal year.
- Construct a matrix of global impacts, based on the local impacts described above. Each year's total unit cost global impact would include the local impacts of all subsequent years.
- Such numbers, when also adjusted for inflation, constitute the desired time series of adjusted unit attributable costs that account for inflation and methodology changes. These time series of unit attributable costs are for each flats product, and they are referred to as real adjusted attributable unit costs.

The difference between the reported Cost and Revenue Analysis (CRA) unit cost and the real adjusted attributable unit cost is relatively small, usually is not higher than a few cents (assuming that the inflation level is low).



## Changes to Products

Among the assumptions to which the time series would be subject are whatever modifications are made to produce some consistency in the list of products. Among such modifications are the date when a new product is offered, the fraction of the new product's volume in the total mail volume, and the fraction of the product's volume that is a result of a reduction in volume from pre-existing products.

The FY 2008 CRA introduces a line item under Standard Mail (currently USPS Marketing Mail) referred to as Not Flat-Machinables and Parcels.<sup>54</sup> This category, which consists of parcel-shaped pieces that do not meet the eligibility standards for letters or flats, was present in the CRA through FY 2012.<sup>55</sup> The construction of a time series would require an assumption on the source of such volumes, *i.e.*, which of the other Standard Mail items would see a reduction because of the added category, and how this would impact the effect of the change on specific product costs. This Report assumes that the inclusion of Not Flat-Machinables and Parcels had no impact on the volumes or costs of other categories of Standard Mail, and in particular that the local impact of cost methodologies on the flat-shaped products would not change as a result of the additional category.

Similarly, USPS Marketing Mail Every Door Direct Mail—Retail (EDDM-R) is introduced as a product in FY 2013. Although targeted to new volume, it is not certain whether the source of EDDM-R volumes and costs comes from a reduction in other Standard Mail categories. The unit costs in a time series would be sensitive to the assumptions made regarding such inclusions or exclusions of cost categories featured in the CRA. Again, for simplicity, this Report assumes that the inclusion of EDDM-R does not change the impact of costing methodology changes on unit costs of other products.

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<sup>54</sup> Docket No. ACR2008, Library Reference USPS-FY08-1, December 29, 2008, file "USPS-FY08-1.doc"(FY 2008 Public CRA Report).

<sup>55</sup> Docket No. ACR2008, United States Postal Service *Annual Compliance Report*, December 29, 2008.

# Appendix B: Acronyms and Abbreviations

Acronym/Abbreviation	Meaning
ACD	<i>Annual Compliance Determination</i>
ACR	<i>Annual Compliance Report</i>
ADC	area distribution center
ADUS	Automated Delivery Unit Sorter
AFSM	Automated Flats Sorting Machine
AFSM - AI	Automated Flats Sorting Machine with Automatic Induction Modification
AFSM - ATHS	Automated Flats Sorting Machine with Automatic Tray Handler and Sorting Modification
AFSM - AI ATHS	Automated Flats Sorting Machine with both AI and ATHS
APBS	Automated Parcel and Bundle Sorter
APC	All Purpose Container
APPS	Automated Package Processing System
CETs	Critical Entry Times
DDU	destination delivery unit
DMM	Domestic Mail Manual
DSE	Degree of Scale Economies
DU	delivery unit
eMIR	Electronic Mail Improvement Reporting
EPPS	Enhanced Package Processing System
FCM	First-Class Mail
FSS	Flats Sequencing System
FY	Fiscal Year
HCR	Highway Contract Route
IMb	Intelligent Mail barcode
IOCS	In-Office Cost System
LDC	labor distribution code
LMI	Last Mile Impact
MIA	Mailer Irregularity Application
MMP	Managed Mail Program
MODS	Management Operating Data System
MPV	Mail Processing Variance
NDC	network distribution center

Acronym/Abbreviation	Meaning
NDLL	National Distribution Labeling List
NPA	National Performance Assessment
OTR	over-the-road container
P&DC	processing and distribution center
PAEA	Postal Accountability and Enhancement Act
PVS	Postal Vehicle Service
RDC	Regional Distribution Center
S&DC	Sorting and Delivery Center
SPBSTS	Small Package and Bundle Sorter Tracking System
SPPS	Small Package Sorting System
STC	Surface Transfer Center
SV	Surface Visibility
TACS	Time and Attendance Collection System
TRACS	Transportation Cost System
USPS OIG	United States Postal Service Office of Inspector General
WIP	Work in Process

# Appendix C: Glossary

## A

**Allied operations** are mail processing activities that involve preparing the mail for pallet, bundle, or piece processing and include platform operations, such as unloading trucks and moving pallets to mail processing equipment.

**Attributable costs** include the sum of the volume-variable costs, product-specific costs, and those inframarginal costs calculated as part of the product's incremental costs.

## B

**Bundle** is a plastic-wrapped or banded group of presorted mailpieces.

**Bundle breakage** occurs when the material holding the flats bundle breaks.

## C

**Capacity** is the sustainable maximum output—the greatest level of output a plant can maintain within the framework of a realistic work schedule after factoring in normal downtime and assuming sufficient availability of inputs to operate the capital in place.

**Carrier route** is a delivery route along which mail carrier delivers mail to individual addresses.

**Casing** involves placing mailpieces into separations that follow the sequence in which carriers deliver mail along carrier routes.

**City route** is a route of geographic locations within the boundaries of a delivery unit.

**Compensatory product** is a product whose revenues are greater than its attributable cost.

**Contribution** of a product or group of products is the product or group of products' revenue minus its attributable cost.

**Cost coverage** of a product or group of products is the product or group of products revenue divided by the product or group of products attributable cost.

## D

**Degree of Scale Economies** measures the degree to which the proportionate increase in the output induces less than the proportionate increase in the cost, with the effect that the cost per unit decreases.

**Delivery point sequence** is an order of delivery units that mail carrier follows as he/she delivers mail along a carrier route.

**Distribution operations** are mail processing activities that involve sorting mail into separate groups based on a common destination.

**Downtime** is the time machines are not operational during a run.

## E

**Excess capacity** is calculated as one minus utilization and expressed as a percentage.

**Extra transportation** is short-term highway transportation, scheduled on an as-needed basis, to transport mail volumes that failed to be loaded on scheduled transportation.

## I

**Idle time** is the time machines are not used outside of processing runs.

**Incoming mail** is mail received by a mail processing facility for distribution within its service area.

**Incremental cost** of a product is the total cost caused by adding that product to the Postal Service's output mix.

**Inframarginal costs** of a product represent the difference between the incremental cost of the product and the sum of the volume-variable and product-specific costs of the product.

## L

**Labor productivity** in a specific mail processing operation is the volume (number of mailpieces) processed during a workhour.

**Last Mile** includes all activities related to last mile operations that involve office time (when carriers are in a delivery unit preparing and manually sorting mail prior to delivery) and street time (when carriers are on the street actually delivering mail).

## M

**Managed mail program** is a distribution system, which includes First-Class Mail, destinating in specific ZIP Codes.

**Manual sorting** is the sorting of mailpieces performed by hand.

**Marginal cost** of a mail product is the cost of the last unit produced (of that product) when the volumes of all other products are assumed constant. In the context of the Postal Service, the marginal cost of a mail product is calculated as the per-mailpiece volume-variable cost of that product.

## N

**Non-compensatory product** is a product whose revenue is less than its attributable cost.

## O

**On-Time Arrival** is a percentage of mailpieces arriving at the facility on time.

**On-Time Departure** is a percentage of mailpieces departing a facility on time.

**Outgoing mail** is mail received by a mail processing facility for sorting and dispatch to mail processing facility(ies) where mail destines. Outgoing mail is also referred to as originating mail.

## P

**Pinch point(s)** are functions where the Postal Service is not operating at maximum efficiency from a cost or service perspective. The Commission previously identified six pinch points related to flats processing and delivery: bundle processing, automated processing, manual sorting, allied operations, transportation, and last mile/delivery.

**Product-specific costs** represent costs that are not volume variable but, for certain products, are directly or indirectly caused by that product.

**Productivity** is the volume of mailpieces processed divided by hours in a specific mail processing operation. See also **Labor productivity**.

## R

**Rural route** is a route serving delivery points outside the boundaries of a delivery unit.

## S

**Sort plan** is a systematic plan for the distribution of mail to its destination according to ZIP Codes and delivery point codes. Schemes are classified by the types of separations made and/or the source of the mail worked.

**Surface Visibility** is a concept using barcode technology that allows the tracing of barcoded mail as it passes through automated and manual processes that scan the barcodes and capture the handling in real time by the piece, container, and trailer.

## U

**Unit attributable cost** is attributable cost divided by volume.

**Utilization** is the actual number of pieces processed divided by the capacity in percentage.

## V

**Volume** is the count of mailpieces.

**Volume-variable costs** are calculated by multiplying the total volume of the class or product by the unit costs (the change in total costs resulting from a one-unit change in its volume alone when the volumes of other products remain constant).

## W

**Workhour** is one hour of work performed by a postal employee.