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Docket No. RM2024-2

Calculating the Rural Carrier Product Costs Arising Under the New Evaluation System*

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I. INTRODUCTION

The two largest parts of the Postal Service delivery network are its city carrier routes and its rural carrier routes. Although there are similarities in the activities that city and rural carriers perform, their methods of compensation are very different. City carriers are compensated on an hourly basis, for the time it takes them to complete their assigned tasks. Rural carriers, in contrast, are compensated through an evaluated time system which sets the base hours for a route, which, in turn, set the carrier’s pay. A rural carrier’s compensation does not depend upon the actual time spent completing all the required activities on a route. The Postal Service’s cost for a rural route, as a consequence, does not depend upon the actual hours worked, but rather upon the route’s evaluated time. That evaluation depends upon the standard times for the activities performed on the route, the route’s physical characteristics, and the volumes handled on the route.

In order to update and improve the accuracy of route evaluations, the Postal Service and the National Rural Letter Carriers’ Association were directed to create a new evaluation system called the Rural Route Evaluated Compensation System (RRECS). In May of 2023, RRECS was instituted and is currently in place to determine rural route evaluations and to thus serve as the essential foundation for rural carrier compensation. Due to the establishment of an updated and refined evaluation system, the Postal Service initiated research into the implications of RRECS for attributing rural carrier costs to products. The results of that research are presented in this report.

II. THE ESTABLISHED METHOD OF CALCULATING RURAL CARRIER VOLUME VARIABLE COSTS

The established rural carrier methodology appropriately reflects the mechanism through which rural carriers are compensated while accounting for the causal linkage between volume and costs. Prior to the implementation of RRECS, rural carrier compensation was determined by the amount of evaluated time for different activities like casing mail, loading the vehicle, or driving the route. The amount of evaluated time for each activity depended upon two factors, the negotiated time associated with the activity and the amount of the activity taking place on the route. For example, casing letters had a negotiated evaluation factor of 0.0698 minutes per piece.[1] If a route averaged 1,250 cased letters per week, then it would be credited with 87.25 evaluated minutes for that activity.

Some activities, like casing letters or flats, are volume related. Others, like driving the same fixed route each day, are not. Changes in volume affect a route's evaluated time by causing changes in the evaluated minutes compiled in volume-related activities. But volume changes do not affect the evaluated minutes in non-volume related activities. In other words, evaluated time in volume-related activities is volume variable, while evaluated time in non-volume-related activities is not. The established methodology captures this causality by calculating the overall rural carrier variability as the ratio of evaluated time in volume-related activities to total evaluated time. It multiplies that variability by accrued rural cost and then distributes the volume variable cost to products.

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[1] Formally, the negotiated standard for casing letters was 0.0550 minutes per piece plus an additional 0.01428 minutes for strapping out.

A. The Established Methodology was Developed Over Time Through the Combined Efforts of the Postal Service and the Commission

The established method for attributing rural carrier costs had its genesis in Docket No. R80-1. In that case, the Postal Service submitted testimony proposing to base the variability of rural carrier costs on the evaluation system that determines rural carriers' compensation. To calculate the variability, the Postal Service made a determination of which rural carrier evaluation times were, or were not, volume related:[2]

> Appendix 5 shows how the evaluated time for a week is computed from time standards and allowances. Based on the nature of each time standard and allowance, it is classified in this appendix as volume-related, not volume-related, and partly volume-related.
>
> Volume-related elements are those whose evaluated time varies directly in proportion to the volume of mail and special services. On the average, 32.2 percent of total evaluated time for the route is for these elements. Elements not volume-related are those whose evaluated time does not vary with volume. On the average, 65.4 percent of the total evaluated time for the route is for these elements.

The volume-related elements were associated with handling different types of volume, primarily in the office, and in collecting mail and money orders. The non-volume-related elements were primarily associated with street activities like driving the route or servicing mailboxes and other once-a-day activities.

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[2] *See*, Direct Testimony of Howard S. Alenier on Behalf of The United States Postal Service, Docket No. R80-1, USPS-T-7, Exhibit USPS-7D, Estimating The Variability With Volume Of Rural Carrier Payroll Costs at 9.

Two elements were classified as being partly volume related. Vehicle loading time was deemed to be 50 percent variable, apparently based upon a regression analysis:[3]

> It was estimated that half the time on this element varies in proportion to volume. This estimate was consistent with a regression analysis of the average loading time for each of the six route types as a function of the average volume of mail per route.

The other partly variable time element was for handling two forms, one of which was thought to be volume-variable and the other was not. The following list presents the volume-related, partly volume-related, and not volume-related activities from that case:[4]

Volume-Related Elements

<u>1. Mail received for delivery:</u>

a. Letter-size mail, except boxholder mail
b. Other mail cased, except boxholder mail
c. Boxholder mail
d. Parcels and other mail not caseable
e. Mail strapped out, including boxholder mail cased
f. Registered, certified, special delivery and numbered-insured articles and express mail
g. C.O. D.'s and customs-due articles
h. Postage due articles
i. Undeliverable mail marked up

<u>2. Mail and money order applications received on the route</u>

a. Letter and Flats
b. Parcels
c. Registered and certified articles
d. Money order applications

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[3] *Id*.

[4] *See*, Direct Testimony of Howard S. Alenier on Behalf of The United States Postal Service, Docket No. R80-1, USPS-T-7, Appendix 5, Page 1 of 2.

Elements Not Volume-Related

1. Mileage of route
2. Boxes on route
3. Withdrawing mail from distribution case
4. Change of address orders processed
5. Locked pouch deliveries
6. Purchasing and checking stamp stock
7. Office work not covered and personal needs
8. Other suitable allowances (in-office and on route)

Elements Partly Volume-Related

1. Loading vehicle including time to and from work area but not for arranging parcels in delivery sequence
2. Forms 3579 and 3868 completed

A sample of rural routes was drawn and the Postal Service used the data from those routes, and the standard times for volume-related activities, to calculate the volume-related time. That calculation was based, in part, on an assumption of a ten percent increase in volume on all rural routes:[5]

> The total current evaluated times and workload counts were used to determine volume-related evaluated times, by computing evaluated times for elements not volume-related and subtracting the totals of such non-volume-related time from the total evaluated times. Then 10 percent of the volume-related time was added to the current evaluated time to reflect the effect of increasing the volume of mail and special services by 10 percent.

[5] *See*, Direct Testimony of Howard S. Alenier on Behalf of The United States Postal Service, Docket No. R80-1, USPS-T-7, Exhibit USPS-7D, Estimating The Variability With Volume Of Rural Carrier Payroll Costs at 10.

The Commission did not accept the Postal Service's proposed approach. Its rejection was partly based the fact that the Commission did not find the Postal Service's approach to be a "longer-run" variability analysis:[6]

> The Service has made no attempt to show that its analysis of the method of paying rural carriers accurately measures the actual changes in work time that would flow from a change in mail volume. It is the change in actual work time that we would expect to drive costs in the longer run.

The Commission also disagreed with the Postal Service's identification of street time activities as not being volume related:[7]

> Thus, the Service's pay mechanism approach takes into account certain rural carrier in-office activities associated with volume received for delivery. But it does not appear to adequately reflect changes in out-of-office delivery related activities. In particular, changes in the number of accesses and in load time would not be reflected by the Service's approach.

The Commission's concern at that time appeared to be, in part, because the Postal Service's proposed terms-of-incurrence approach did not measure actual time spent on the rural route and thus did not take into account the impact of coverage on rural carrier street time:[8]

> Setting aside changes in the time required to load individual receptacles as a result of a volume change, coverage -- the ratio of actual deliveries to total possible deliveries -- would almost certainly be affected if coverage is less than total. And this would affect the number of accesses and the total

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[6] *See*, Opinion and Recommended Decision, Docket No. R80-1 Volume 2 of 2, Appendix J, Cost Segment X at 154.

[7] *Id.* at 158.

[8] *Id.* at 159.

> load time (for the system). In this proceeding, the Service acknowledges that average coverage on rural routes is less than 100 percent.

In Docket No. R84-1, the Postal Service again proposed the use of a terms-of-incurrence approach (which is also sometimes referred to as the method-of-payment approach): [9]

> The methods by which rural carrier salaries are determined in turn dictate the costs of rural carriers and the manner in which those costs actually reflect and respond to variations in mail volume. In the case of evaluated routes, changes in volume cause proportional changes in elements of evaluated time. As a result, evaluated route carrier pay is directly influenced by changes in mail volume.

The Postal Service also addressed the Commission's concern that a terms-of-incurrence analysis did not capture the "longer-run" response of carrier time to volume changes. It did so by estimating a regression equation with the recorded carrier time on each route as the dependent variable and the route's quantities of various workload variables as the explanatory variables. The estimated equation produced a variability very similar to the terms-of-incurrence variability.[10]

The Commission accepted the Postal Service's proposed approach:[11]

> We accept, with some reservations, the Service's development of variability premised on terms of payment

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[9] *See*, Direct Testimony of Grady B. Foster on Behalf of The United States Postal Service, Docket No. R84-1, USPS-T-9 at 8.

[10] *Id*. at 13.

[11] *See*, Opinion and Recommended Decision, Docket No. R84-1, Volume 1 of 2, page 249, September 7, 1984.

> because these variability calculations appear to be consistent with variability levels determined by functional analysis.

In Docket No. R87-1, the Postal Service did not present a new rural carrier analysis, so the Commission continued to employ the terms-of-incurrence approach proposed by the Postal Service in the previous two cases:[12]

> [003] In Docket No. R84-1, the Commission accepted with reservation the Postal Service's reliance upon terms-of-incurrence analysis to calculate rural carrier variability. For this proceeding, the Postal Service does not perform any additional variability analysis. Instead, the Service mechanically applies the Docket No. R84-1 variability percentage to calculate the amount of variable costs in the FY 1986 base year.

The Postal Service did, however, change its distribution key:[13]

> [005] The Commission's Docket No. R84-1 opinion suggested that the Service reconsider its approach of distributing all rural carrier costs including street time activities on the basis of one distribution key, in-office costs. Using in-office costs to distribute rural carrier costs did not given [sic] recognition to cost causation by class relating to street time activities. In this proceeding, the Service changed its distribution key for evaluated routes. Specifically, from Forms 2858R and 2848, the Service collected data on delivered and collected volumes of mail by rural carriers. These volumes by class were then used to distribute costs associated with the time allowance developed by using the corresponding work measure.

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[12] *See*, Opinion and Recommended Decision, Docket No. R87-1 Volume 2 of 2, Appendix J, CS X, at 1.

[13] *Id*. at 3.

In Docket No. R90-1, the Postal Service sponsored an updated analysis of rural carriers using the terms-of-incurrence approach. The Postal Service addressed the Commission's concern that the approach was not sufficiently long run:[14]

> In prior rate cases, the Commission expressed concern about the reliability of the Terms-of-Incurrence analysis for estimating long-run variability. Further analysis of this methodology indicates that it should be accurate in the long run. Over the last decade, the most significant changes in the attribution of Rural Carrier costs have been related to the reclassification of routes and the increase in mail volume. The Terms-of-Incurrence analysis is based on a simulation based on current route characteristics and reflects changing route classifications and dividing routes which become "overburdened" as volume increases. In addition, econometric tests, discussed below, show that the Rural Carrier Time Standards are reasonably accurate measures for all volumes of mail. The analysis thus reflects the behavior of costs in the long run.

The terms-of-incurrence analysis was based upon a sample of routes drawn from the 1989 Rural Mail Count. The rural evaluation factors were classified as either being volume variable or fixed, with the classification being similar, but not identical, to the classification used in previous cases. Two new fixed evaluation factors, NDCBU collection compartments and Parcel Post lockers were added and two evaluation factors were adjusted. The completion of certain forms and the purchasing stamp allowance were split into fixed and volume variable components.[15]

As before, a simulation analysis was performed, assuming a theoretical volume increase, in which necessary routes were reclassified, relevant wages were applied,

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[14] *See*, Direct Testimony of Dana W. Barker on Behalf of The United States Postal Service, Docket No. R90-1, USPS-T-13 at F2.

[15] *Id*. at F-11

and costs were recalculated. The variability was measured as the resulting percentage change in costs for the given percentage change in volume.[16] The distribution key was based on the 2858R surveys and an adjustment was made for the fact the definition of flats in the survey was different from the definition of flats in the National Mail Count.[17]

The Commission accepted witness Barker's analysis and variability calculation, but rejected the use of a carrier time regression, proposed by an intervenor in the case, to compute the variability:[18]

> [155] We have determined to retain the terms-of incurrence approach followed in prior cases and followed by the Postal Service in this proceeding. As long as rural carriers are being paid by converting workload measurement to evaluated time and then salaries, the terms-of-incurrence analysis is a more accurate measurement of the effect of changes in volume on actual costs than regression analysis of time. On a theoretical level, standing in isolation, there may be some merit in MOAA's position that time is the equivalent to true economic costs; however, this is not the case with rural carrier costs. For rural carriers, the impact of volume changes on actual costs is an inaccurate measure of cost causation if it does not account for route reclassification, overtime and other factors causing salary levels to change as volume changes. Andrew's multiple regression analysis does not account for these factors, and thus is inferior for the purpose of calculating volume variability.

The current established methodology was set by the Commission in Docket No. R97-1. The Postal Service proposed abandoning the simulation approach to

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[16] *Id*. at F-17

[17] *Id*. at F-26

[18] *See*, Opinion and Recommended Decision, Docket No. R90-1 Volume 1 of 2, Appendix J, at 26.

calculating the rural carrier variability and instead solely used the ratio of volume variable evaluated time to total evaluated time.[19]

> This testimony proposes a modest change in this traditional volume variability calculation. It proposes to no longer account for route reclassifications that occur in response to large discrete volume and workload changes.

Two brief reasons were given for the change in method. First, the simulation approach required a selection of a specific percentage change in volume, and second, the simulation approach was inconsistent with the calculation of marginal cost.[20]

The Commission accepted this modification:[21]

> The first is the undisputed proposal to change slightly the method for determining volume variability. This simplification appears to be justified. The previously applied arbitrary assumptions about future changes in volume should be removed from consideration, and thus the proposed variabilities of 0.4904 for Evaluated Routes and 0.4987 for Other Routes are accepted.

The Commission also addressed two distribution key issues. The first was how to make the shape adjustment between the National Mail Count data and Rural Carrier Cost System data and the second was how to create separate DPS and Sector Segment distribution keys.[22] The established methodology has been followed since

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[19] *See*, Direct Testimony of Donald M. Baron on Behalf of The United States Postal Service, Docket No. R97-1, USPS-T-17 at 72.

[20] *Id*. at 73.

[21] *See*, Opinion and Recommended Decision, Docket No. R97-1, Volume.1, at 201

[22] *Id*.

Docket No. R97-1, although there have been subsequent updates made to the rural carrier distribution key.

B. The Analytical Structure of the Established Methodology

While the conceptual approach to calculating the variability of rural carrier costs is straightforward, the actual calculation of volume variable costs, by product, is more complex. The complexity arises from the fact that different postal products are handled in different rural carrier actions, and that accurate product costing should embody this heterogeneity. For example, the product mix handled in the casing letters activity is different from the product mix handled in the casing flats activity. It is more accurate to separately attribute the casing letters cost to its products and the casing flats cost to its products than it is to attribute their combined cost to all products.

The importance of this disaggregation can be demonstrated with a simple example. Suppose there are two operations, casing letters, and casing flats. Further, suppose that the constant volume variable cost per piece of casing a letter is $0.05 and of casing a flat is $0.10. Lastly suppose there are four postal products, Blue, Green, Yellow, and Red. Blue and Green mail includes both letters and flats while Yellow mail is letter only and Red mail is flat only. Table 1 presents the volumes for the different products, by shape, along with the cost of casing them in each operation.

Table 1
Volumes and Costs For the Example

Casing Letters

Product	**Volume**	**Cost**
Blue	200	$10.00
Green	200	$10.00
Yellow	100	$5.00
Subtotal	500	$25.00

Casing Flats

Product	**Volume**	**Cost**
Blue	100	$10.00
Green	200	$20.00
Red	700	$70.00
Subtotal	1000	$100.00
Total	**1500**	**$125.00**

If costs are attributed in a single cost pool, the volume variable cost of $125 is distributed to products based upon their proportions of the 1,500 pieces cased. For example, Blue mail has 200 letters and 100 flats for a total of 300 pieces. That is 20 percent of the total 1,500 pieces, so Blue mail would receive 20 percent of the volume variable cost, or $25. By similar calculations, Green mail would receive $33.33, Yellow mail would receive $8.33 and Red mail would receive $58.33. But a check of Table 1 shows that these attributed costs do not match the costs incurred. For example, cased Red flats incur a cost of $70, but receive only $58.33 in this aggregate approach.[23]

The inaccuracy is resolved by distributing the costs within each cost pool and then calculating overall product costs. Blue mail's 200 letters represent 40 percent of the total letters, so Blue mail gets 40 percent of the $25 letter cost or $10.00. Blue

[23] In this simple example, all costs are volume variable, so the true volume variable costs by product match the incurred costs.

mail's 100 flats represent 10 percent of the total flats, so Blue mail also gets $10 of flat cost. Similarly, Red Flats are 70 percent of total flats, so Red mail gets 70 percent of the $100 flat cost or $70. Using the individual cost pools, the attributed costs match the actual costs incurred for each product.

This disaggregated approach is followed in the established rural carrier methodology. The process of calculating the variability starts with the identification of which of the various evaluation factors are volume variable, $EF_V(i)$ and which are not volume variable, $EF_{NV}(j)$. Next, the time, or evaluation allowance, for each factor is calculated as the product of the factor and its count $\mathrm{N(i)}$:

$$EA_V(i) = EF_V(i) * \mathrm{N(i)}$$

$$EA_{NV}(j) = EF_{NV}(j) * \mathrm{N(j)}$$

The overall variability is then calculated as the ratio of the sum of the volume variable evaluation allowances to the sum of all allowances:

$$\varepsilon = \frac{\sum_{i=1}^{n} EA_V(i)}{\sum_{i=1}^{n} EA_V(i) + \sum_{j=1}^{m} EA_{NV}(j)}$$

This variability is then used each year to calculate that year's volume variable cost, by multiplying it by the current year accrued cost, C_t:

$$VVC_t = \varepsilon * C_t = \left[\frac{\sum_{i=1}^{n} EA_V(i)}{\sum_{i=1}^{n} EA_V(i) + \sum_{j=1}^{m} EA_{NV}(j)}\right] * C_{t.}$$

However, the amount of evaluated time for the different volume variable activities can change from year to year if the associated counts change.[24] To allow for this

[24] In the established methodology, the relative volume changes are captured only when a Rural Mail Count was performed. The most recent mail count was done in 2018, so the proportions of volume variable time have not changed since then.

possibility, each evaluation allowance's volume variable cost is calculated as the product of current year's total volume variable cost and the evaluation allowance's proportion of total volume variable allowance time, θ(i):

$$\theta(i)_t = \frac{EA_V(i)_t}{\sum_{i=1}^{n} EA_V(i)_t}$$

$$VVC_{EA_V(i)_t} = VVC_t * \theta(i)_t = C_t * \varepsilon * \theta(i)_t.$$

The volume variable costs for each activity are then distributed to the products that are handled in that activity. Although the overall variability is a useful indicator for assessing the nature of rural carrier activity, it is not actually needed to calculate volume variable costs.[25] To see this, note that the above expression for volume variable cost for each individual evaluation factor includes the overall variability (ε) and substitution of the formula for that variability yields:

$$VVC_{EA_V(i)_t} = C_t * \frac{\sum_{i=1}^{n} EA_V(i)_t}{\sum_{i=1}^{n} EA_V(i)_t + \sum_{j=1}^{m} EA_{NV}(j)_t} * \frac{VVC_{EA_V(i)_t}}{\sum_{i=1}^{n} EA_V(i)_t}.$$

Cancellation of terms yields:

$$VVC_{EA_V(i)_t} = C_t * \frac{VVC_{EA_V(i)_t}}{\sum_{i=1}^{n} EA_V(i)_t + \sum_{j=1}^{m} EA_{NV}(j)_t}.$$

This equation demonstrates that each activity's volume variable cost can be calculated as the product of the current accrued cost and the activity's proportion of all activity time, both volume variable and non-volume variable.

[25] Note that in the established methodology, the overall variability by route type (evaluated and other) will change only when a Rural Mail Count is performed. In other words, both the overall variability and the relative proportions of time in each volume variable activity change when a Rural Mail count is done.

C. Because of the Introduction of RRECS, it is Appropriate to Update and Refine Rural Carrier Costing

The replacement of the previous method of route evaluation with RRECS is a sufficiently large change in cost incurrence to stimulate investigation into whether a revision of the rural carrier costing methodology is needed. In its general approach, RRECS is similar to the previous evaluation method in that it sets time standards for the different rural carrier activities, collects data on the factors that drive those activities, and combines these two types of information to determine the evaluated time for each rural route. However, RRECS is materially different from the previous system in some important ways.

First, it presents a far more detailed classification of daily carrier activities. For example, the previous evaluation system had an evaluation item for "Parcels Delivered." RRECS, in contrast, has separate activities for parcels delivered to the door, parcels delivered to a mailbox, and parcels delivered to a parcel locker. In addition, it has a detailed breakout of the activities associated with parcel delivery such as gathering parcels for transport to the case, organizing large parcels, organizing small and medium parcels, and reloading parcels for delivery. This different, and more detailed, activity structure could lead to changed cost attributions to the various products, and provides motivation for refining the cost attribution system so that it aligns properly with the current route evaluation system.

Second, RRECS has developed refined, and different, time standards for individual rural carrier activities. Instead of using negotiated standards, RRECS uses engineering and statistical methods to establish those standards. To the degree that

RRECS produces different standards than the previous system, for the same activities, it will imply different volume variable costs.

Third, RRECS uses recent data to determine the various counts that are applied to the time standards to determine evaluated time. This means that RRECS reflects the current mix of volumes and route characteristics. In contrast, the established methodology relies upon a special study, the Rural Mail Count, to capture those counts. The last Rural Mail Count was done in 2018, so the established methodology reflects the mix of mail at that time. Given that relative mail volumes have changed since then, adjusting that established methodology to align with RRECS would move it from embodying historical volumes to embodying current volumes. This would improve the accuracy of the resulting attributable costs.

III. THE RURAL ROUTE EVALUATED COMPENSATION SYSTEM

As explained above, the Postal Service and the National Rural Letter Carriers' Association were directed to create RRECS, which is the new rural route evaluation system. RRECS is an automated system that uses scientifically derived time standards and ongoing data capture processes to calculate the daily standard time for each rural carrier route. The daily standard time for a route is the sum of the individual time sequences for each of the mutually exclusive work activities that describe a rural carrier's day. It is designed to measure the time required by an experienced and motivated rural carrier, working at a normal pace, to accomplish all the route's daily tasks, while accounting for route-specific characteristics and allowing for personal needs and unavoidable delays.

Each time sequence is a measure of the time spent in a specific activity like casing letters, delivering parcels to the door, or refueling the vehicle. For nearly all the time sequences, the calculated time is the product of the time standard for the activity and the number of units for the activity.[26] For example, the time sequence for delivering parcels to the door is the product of the time standard of [redacted] minutes per parcel, and the value for the associated unit, which is the number of parcels delivered to the door on that day. If the route has [redacted] door parcels to be delivered, its evaluated time for delivering parcels to the door would be [redacted] minutes.

The activity time standards are based upon time and motion studies for the various carrier activities. Establishing the RRECS time standards included carefully defining the work activity being measured, including setting its beginning and ending points. The next step involved developing the standard method of performing each activity, which was then applied when the time and motion study methods were used to measure the activity's standard time. Nearly all of the time standards were set by the engineering approach. However, the standards associated with driving time were based upon a statistical analysis because the time and motion methods were not applicable to that activity.

The units for the different carrier activities are primarily derived from various Postal Service operational databases. The ongoing RRECS data capture system replaces the periodic rural mail counts that took place in the previous system, and it

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[26] There are three activities that are sufficiently heterogenous across routes so that effective time standards could not be established. For these three activities, loading the vehicle, deviations for Priority Mail Express deliveries, and end of shift activities, the actual time the carrier spends in the activity is recorded on the carrier's Mobile Delivery Device (MDD).

captures daily data from systems like Product Tracking and Reporting (PTR), End of Run (EOR) reports, and Informed Visibility (IV). RRECS also created the Rural Street Database (RSD) to digitally map rural routes and to compile and maintain data on individual route characteristics such as delivery locations. Units range over a variety of cost drivers, from a count of pieces of mail, to a count of trays handled, to the feet walked or driven, to the number of boxes visited, to the number of days of service. Each unit reflects the nature of the relevant activity performed by the carrier. For example, the unit for organizing large parcels is “Piece,” reflecting the carrier handles individual parcels in that activity, but “Tray” is the unit for gathering DPS letters because carriers handle trays in that activity. The unit for activities that are performed once a day, like setting up the scanner, is “Day.”

A. The Role of RRECS in Determining Rural Carrier Compensation

RRECS plays an essential role in determining compensation for rural carriers. Rural carrier compensation is based upon the evaluated time for their routes and RRECS is the foundation for determining each route’s evaluated time. The first step in that foundation is the calculation of a route’s Daily Standard Time (DST). Daily Standard Time is the total time, according to the established time standards, required to accomplish all the daily tasks on a carrier’s route. Some of the time is caused by the volumes being delivered and some of the time is caused by the physical characteristics of the route, like the number of boxes being served. To ensure it captures the full seasonal cycle of mail volume, RRECS determines the volume-related Daily Standard Time using volumes collected over a full-year, twelve-month period. This approach eliminates the concern that the previous Rural Mail Count, which was based upon a specific two-week period, did not accurately capture the true volume profile for a route. In RRECS, the calculation of times for sequences that are volume related are based upon the average value, over the twelve-month period, for the relevant volumes. For those time sequences that are not volume related, the calculation of Daily Standard Time uses the most recent values for the units.

The next step in calculating a route's compensation is the translation of Daily Standard Time into evaluated hours, which are whole-hour equivalents of ranges of standard hours. This translation is part of the rural carrier bargaining agreement and takes place outside of RRECS. Figure 1 demonstrates how the different parts of RRECs come together to provide the basis for rural carrier compensation.

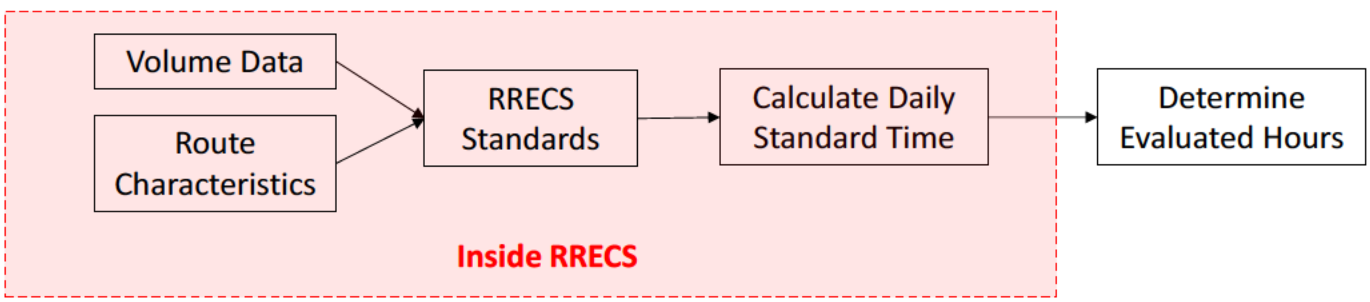

Figure 1: The Role RRECS Plays in Determining Each Route's Compensation

B. The RRECS Data Set

Because RRECS is the measurement system that links actual volumes to actual rural carrier compensation, it is appropriate to use data from RRECS to measure the variability of rural carrier costs and to distribute attributable costs to products. To that end, as soon as RRECS was implemented in May 2023, the Postal Service produced a RRECS data set containing the information that was used to determine the evaluated time on each rural route, which is the same information that is required to attribute rural carrier costs to the products that cause them to arise. The RRECS data set covers all active rural routes and thus contains 81,163 observations, one for each route. It also contains 321 variables which are of four types: identifying variables, unit variables, sequence variables, and subsequence variables.

Identifying variables include descriptors about the routes such as a route's ZIP Code, its route identification number, or the dates over which volume data were collected. Unit, or count, variables provide measurements of the cost drivers that cause rural carriers to incur time. Examples include a route's volume of DPS letters or its basic route miles. Lastly, (time) sequences and subsequences measure the times associated with individual carrier actions, both in the office and on the route. Examples of sequences include the daily time for driving the carrier's basic route or the time for organizing large parcels. Each sequence typically combines a time standard and the unit of measure for the underlying activity. Sequences can be simple or complicated.

An example of a simple sequence is given by Sequence 004, Casing Random Letters. The formula for this sequence is straightforward. For each route, the RRECS time standard for casing letters (S004) is multiplied by the average daily volume of random letters, which is measured by the associated unit variable, called T06:

*Sequence 004: Case Random Letters = Standard S004 * T06.*

An example of a more complicated sequence is given by Sequence 017A, Pull Down Handle Trays. The cost driver for this activity is the number of trays, but RRECS does not measure that variable directly. Instead, it calculates the number of trays by first calculating the route's average daily amount of cased mail and dividing the total cased mail volume by the number of pieces per tray. The calculated number of trays is then multiplied by the standard time per tray. To calculate the volume of cased mail, RRECS sums the volumes of random letters and flats, Carrier Route flats, WSS letters and flats, boxholder letters and flats, and the fraction of mailbox parcels that are considered “small.” For a parcel to be considered small, it must be cased.

The sequence also includes two conditional calculations. If a route receives less than 400 DPS letters, then its DPS volume is included in the calculation of cased mail. This change occurs because routes receiving less than 400 pieces of DPS mail case it. Finally, if the carrier is using a private vehicle, or is using a left-hand-drive Postal Service vehicle, then DPS flats (FSS) are also included in cased mail.

The formula for the Pull Down Handle Trays sequence is:

*Sequence 017A: Pull Down Handle Trays = Roundup (Cased mail ÷ S220) * S017A, where cased mail = (T6+T7+T8+T11+T12+T13+T14+T57+(S219 * (T16+T16A))) + if (T9<400), then T9, else 0 + if (T3=0 or T58=1) then T10, else 0,*

where:

Standard S017A is the pull down-handle trays standard of [redacted] minutes per tray.
Standard S219 is fraction of small parcels [redacted] in the small/med total
Standard S220 is the number of pieces per tray [redacted]
T06 is Random letters
T07 is Random flats
T08 is Carrier Route flats
T11 is WSS flats
T12 is WSS letters
T13 is Boxholder flats
T14 is Boxholder letters
T10 is DPS flats
T58 is LHD government vehicle (y/n)
T03 is USPS vehicle – 1 = Yes; 0 = No
T57 is Second-run DPSL
T16 is Parcels delivered to the mailbox
T16a is Unscannable parcels – mailbox
T09 is DPS letters

Subsequences are used to build up sequences that have multiple parts or conditions. There are three sets of subsequences. The first set of subsequences captures each route's times associated with the different parts of the Drive Speed Matrix. The Drive Speed Matrix (DSM) is a table of distances and associated standard speeds which RRECS uses to determine driving times on rural routes. Each distance interval on a rural route is measured, and RRECS identifies which entry in the Drive Speed Matrix corresponds to that distance. It then multiplies the interval's distance times its standard speed to calculate the interval's driving time. Each DSM subsequence captures the route's amount of driving time for the intervals that fall in the specified range. The sum of the DSM subsequences is the route's basic driving time, Sequence 034.

The next set of subsequences are used to build up each route's box service time. Box service times vary in two dimensions. First, the time varies by the number of bundles on the route. For example, one-bundle routes (that have neither a DPS bundle nor an FSS bundle) have different standard box service times than two-bundle routes (which have DPS bundles). Servicing a curbline box on a one-bundle route has a standard time of [redacted] minutes, while servicing a curbline box on a two-bundle route has a standard time of [redacted] minutes. Second, the box service times vary by the type of receptacles on the route. As mentioned before, a curbline box on a two-bundle route has a standard service time of [redacted] minutes, but the service time for a CBU box on a two-bundle route is [redacted] minutes. In addition, some types of receptacles require additional actions and have additional subsequences associated with them. Sidewalk boxes have an additional dismount and prep time subsequence.[27] Because they also require a dismount, CBU and central receptacles also have a dismount and prep subsequence associated with them. Since these two types of receptacles have multiple boxes associated with them, they both have subsequences for what is called "unit time," which is the time required for the carrier to unlock, open, close, and lock the main door of the receptacle. CBUs and central boxes also have collection compartments, so

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[27] A sidewalk box occurs when the carrier must dismount and walk across a sidewalk to deliver to a regular box.

carriers get a time credit for sweeping the collection compartments. Finally, it is possible for each route, regardless of the number of bundles, to incur creep time and there is a subsequence that includes that time. Creep time arises when the distance between boxes is less than 5 feet. When there is such a small space between boxes, the route is credited with [redacted] minutes per space.[28]

The last set of subsequences determine the time associated with stopping and waiting at traffic control points. These subsequences include the times associated with various types of control points like stop signs or yield signs. The sum of the times associated with each type of traffic control point forms the time for Sequence 072, Traffic Control Point Duration.

The unit or count variables measure the various cost drivers on the carrier's route and can be classified into three groups: volumes, activities, and route characteristics. The volume unit variables include counts of the different types of mail and parcels handled by rural carriers. For example, T06 counts random letters, T08 counts carrier route flats, and T17 counts parcels delivered to a parcel locker. The activity unit variables capture the time for actions that carriers record on their MDD. There are three primary such variables, T26 is for loading the vehicle, T36 is for deviations for Express Mail, and T43 is for end-of-shift office activities. The route characteristic unit variables measure characteristics of the route that affect daily carrier time, such as T27, which is basic route miles, T28r, which is a count of the number of residential addresses on the

[28] A complete list of the subsequences for each type of route are presented in Tables 9, 10 and 11, in Section IV, below.

route, and T50 is which is the average distance from Direct Door Delivery stops to the associated door deliveries.

C. Evaluating the RRECS Data Set

When considering the usefulness of an operational data set for attributing costs to products, there are several criteria which can help make that determination. First, because operational data are not collected expressly for calculating attributable costs, one should assess whether the operational purpose of collecting the data is consistent with the requirements of the costing exercise. For example, does the operational data set contain the variables needed for calculating product costs? Next, one should assess if the operational data set sufficiently covers the activities that are generating the costs being studied. It is important that the data collection effort is sufficiently broad so as to represent the underlying cost-generating process. Third, one should assess if the data set is reasonably complete. Operational data are collected for a variety of reasons and are designed to be consistent with standards of reporting associated with the operational purpose. No operational data set is going to be perfect, but the collected data should be reviewed to assess if the amount of missing information could affect the costing analysis. Fourth, one should assess whether the data are relatively timely. To the degree possible, it is useful to have the data set reflect current operations and volumes. Finally, one should assess if the data set produces basic statistics which are consistent with known operational parameters. For a delivery data set, one could check on average daily volumes, hours, or delivery points to assess the reasonableness of the data. Each of these criteria are addressed in the following subsections.

1. Are the RRECS data consistent with a rural carrier attributable costing exercise?

The RRECS data are produced for the purpose of determining rural carrier compensation as a function of volume-related, and non-volume-related, activities. The data are used to determine the evaluated time on each route, which links directly to the compensation paid for that route.

In other words, the RRECS data are used to determine rural carriers' compensation and constitute the mechanism that links the volumes delivered on rural routes to the rural carrier cost that arises from delivering that volume. As such, the RRECS data embody the cost-generating process for Cost Segment 10 costs and are not just consistent with, but are fundamental to, attributing rural carrier costs. This volume-cost linkage also means that the RRECS data contain the variables necessary for calculating volume variable costs, namely, the evaluated times associated with both volume-variable and non-volume-variable activities and counts of the various volumes handled across the network of rural routes.

2. Do the RRECS data sufficiently cover the costs being studied?

The costs being analyzed in the attributable costing exercise are for Cost Segment 10 and arise from the compensation of rural carriers. That compensation is based upon the evaluated hours required to handle volumes collected and delivered by rural carriers and is affected by the characteristics of the routes over which delivery takes place. It is fair to say that the costs being analyzed are the costs of providing service over the rural route network. Because the RRECS data include information on the relevant hours, volumes, and characteristics on the 80,000 plus rural routes, they represent a census of those routes and completely cover the costs being studied.

3. Are the RRECS data reasonably complete?

The RRECS data set has 81,163 observations (one for each route) and 321 variables. It has, consequently, 26,053,323 data cells. Of those cells, just 9,312 have what might be missing data, representing just four one-hundredths of a percent. Said otherwise, 99.96 percent of the data cells are populated. This is a very high level of completion for an operational data set. Moreover, review of the cells with missing data elements reveals that only 11 of 9,312 cells are for time sequence variables, which are the variables used to calculate volume-variable costs. The missing 11 time-sequence cells are all for one variable, Sequence DE10, which is time incurred for dismounts for extra deliveries. This means that there are 11 routes with a missing value for that specific sequence.[29]

A review of the data for those 11 routes reveals that they also have missing values for a number of volume variables such as DPS, WSS letters and flats, boxholder letters and flats, parcels delivered to the door and mailbox, and accountables. The fact that this subset of routes has missing values for a number of volume variables raises a question about using their data for calculating volume variable costs. Although the data support accurate route compensation, the routes are sufficiently unusual, and of very a small number, so it is prudent to drop them from the analysis data set used to calculate volume variable costs. Such an approach removes any question about possible data errors in the variability analysis and represents a minuscule reduction in the data set.

[29] The fact that a route has missing data for this sequence does not mean that the route's compensation is miscalculated. The missing data could be from routes that do not have dismounts to record.

The RRECS analysis data set would still cover 81,152 routes and include 26,049,792 data cells.

Following the deletion of the 11 routes, there are 8,899 (0.0003) remaining missing data cells. Yet, a review of those individual cells reveals that even this small number of missing cells do not have a negative impact on the cost attribution exercise. First, 88.3 percent of the missing data cells are for missing Drive Speed Matrix entries. The Drive Speed Matrix is the table of distances and associated standard speeds which RRECS uses to determine driving times on rural routes. A rural route interval is the distance between a mailstop, traffic control point, or segment endpoint (e.g., a right or left turn) and the next mailstop, traffic control point, or segment endpoint. RRECS determines each route's set of intervals and assigns each one a standard speed based upon the corresponding entry in the Drive Speed Matrix. The driving time for an interval is just the product of the interval's distance and that standard speed. If a route has a missing value for an entry in the Drive Speed Matrix, it just means that the interval was handled as an exception and the missing value does not affect the calculation of the route's driving time.[30] In fact, all 81,152 routes have a calculated driving time, so these missing data cells have no impact on the calculation of volume variable costs.

[30] An exception arises when a route has not been mapped through the standard process but has instead had the interval value input as a non-mapped measure. An exception does not have negative effects for the calculation of the route's drive time. All of the missing values occur on the 167 routes that have non-mapped exceptions.

Table 2
Distribution of Missing Data Cells in Analysis Data Set

Variable	**Number of Missing Cells**	**Proportion of Missing Cells**
Drive Speed Matrix	7,849	88.2%
DPS Letter & Flat Volumes (433 Routes)	866	9.7%
Distance To and From the Gas Pump	167	1.9%
End-of-shift Office Activities Units	10	0.1%
Load Vehicle Units	6	0.1%
# of PARS Label Forms	1	0.0%
Total	**8,899**	**100.0%**

Source: Investigate Missing Data Elements.sas

The next set of missing data cells is for the 433 routes that have missing values for DPS letter volumes and DPS flat (FSS) volumes. To investigate the reason for these missing data cells, one can compare the values for the volume variables for the 433 routes with missing DPS letter volumes with the values for the same variables for the 80,286 routes that report DPS letter volumes. The first thing to note is that the 433 routes have high volumes of random (cased) letters. In addition, they are all one-bundle routes. In RRECS, routes are classified as one, two, or three bundle routes. If a route receives a daily volume of at least 400 DPS letters and a positive amount of DPS flats (FSS) then it is a three-bundle route. For three-bundle routes, DPS letters and DPS flats are both brought to the street as separate bundles, while the remaining volumes (all non-DPS) are cased. The non-DPS mail that is cased represents the third bundle. If a route receives a daily volume of at least 400 DPS letters and no DPS flats (FSS) then it is a two-bundle route. For these routes, all mail except the DPS letters is cased. The DPS letter mail is the second bundle, which goes directly to the street without casing.

Finally, if a route receives less than 400 DPS letters and no DPS flats, it is a one-bundle route. For these routes, the DPS letter mail is cased or collated. Thus, none of the 433 routes with missing DPS values actually receive DPS flats. In addition, if any of them receive DPS letters, then those letters are cased and are likely counted in the random letters category. This explains the relatively high random letter volumes for the routes with missing DPS volumes. Given these conditions, the volumes for DPS letters and flats are appropriately set equal to zero on these routes, preserving their place in the data set.

Table 3

Means for Volume Variables for Routes Not Reporting and Reporting DPS Volume

Variable	**DPS Missing**	**DPS Entered**
Random Letters	[redacted]	[redacted]
Random Flats	[redacted]	[redacted]
Carrier Route Flats	[redacted]	[redacted]
DPS Letters	[redacted]	[redacted]
FSS	[redacted]	[redacted]
WSS Flats	[redacted]	[redacted]
WSS Letters	[redacted]	[redacted]
Boxholder Flats	[redacted]	[redacted]
Boxholder Letters	[redacted]	[redacted]
Door Parcels	[redacted]	[redacted]
Mailbox Parcels	[redacted]	[redacted]
Locker Parcels	[redacted]	[redacted]
Accountables	[redacted]	[redacted]
# of Bundles	[redacted]	[redacted]

Source: Investigate Missing Data Elements.sas

The next variables with missing data cells are: (1) the distance to and from the gas pump, (2) end-of-shift activities units, (3) load vehicle units, and (4) the number of

PARS labels. None of these variables are used in the variability analysis so the missing cells have no impact on any of the variability calculations.

In sum, the RRECS data set contains a complete set of variables and observations on the set of routes that make up the Postal Service's rural carrier network. There are no missing observations (routes) and nearly no missing data cells. This completeness reflects the fact that the RRECS data are used to determine the compensation on each rural route, so completeness is important in its primary use.

4. Are the RRECS data timely?

The data set used in this analysis includes the information that was used to determine route evaluations in May of 2023. It is the basis for current evaluations and rural compensation and thus very timely. Following the RRECS protocols, the volume data were averaged over the one-year period from March 11, 2022 through March 10, 2023. The two-week period over which specific route characteristics were calculated ran from February 25, 2023, through March 10, 2023.

5. Does the data set produce statistics consistent with operational parameters?

An important way to assess an operational data set is to examine if it provides descriptive statistics that are consistent with known operational practice and parameters. Do average daily volumes reflect known national trends? Are the number of addresses per route consistent with route structure? Is the total evaluated time for the route consistent with an eight-hour day? To address these questions, Table 4, below, provides average values for key operational variables.

Table 4

RRECS Average Daily Values Per Route

Variable	**Mean**
Cased Letters	[redacted]
DPS Letters	[redacted]
Cased Flats	[redacted]
Boxholders	[redacted]
Door Parcels	[redacted]
Mailbox Parcels	[redacted]
Locker Parcels	[redacted]
Accountables	[redacted]
Number of Addresses	[redacted]
Basic Route Miles	[redacted]
Number of Door Deliveries	[redacted]
Daily Time	[redacted]

Source: Investigate Missing Data Elements.sas

A review of the average volumes presented in Table 4 shows that the RRECS volumes are consistent with national trends. Non-parcel volume is dominated by DPS letters, which is by far the largest volume category, leaving a relatively small value for cased letters. In addition, cased flats are only a fraction of the size of DPS letters and capture nearly all flats, as FSS flats have nearly disappeared. Rural routes average only [redacted] FSS pieces per day, as 72,466 rural routes (89.3 percent) did not receive any FSS pieces. In the meantime, the growth in parcel volume in recent years is reflected by the fact that, on average, rural routes deliver more than [redacted] parcels per day.

The route characteristics also reflect current operational practice. RRECS routes average just over 600 delivery points, have 45 basic route miles, and have an average daily time of almost exactly 8 hours.

Evaluation of the different criteria associated with using an operational data set to perform an attributable costing exercise demonstrates that the RRECS data are appropriate for measuring rural carrier product costs. The RRECS data include the variables required for accurately measuring volume variable rural carrier costs, are up to date, and can be updated on an ongoing basis going forward. The data cover all rural routes reflecting the fact they are used to determine rural carriers' compensation on each route in the network.

D. Describing a Rural Carrier's Day

There are 75 different RRECS sequences that cover all the activities performed by rural carriers.[31] When they are combined, they determine the Daily Standard Time for each rural route. Examination of the average daily times for the different sequences can provide a profile of the "typical" rural carrier's day under RRECS. While there is great diversity in individual activities across the rural carrier network, examining how the average rural carrier spends the day provides insight into how RRECS defines and measures carrier activities. Some of the sequences represent a substantial portion of the carrier's day while other sequences have very small amounts of time associated with them. The average Daily Standard Time across the eighty-thousand plus rural routes is 481.6 minutes or 8.03 hours.

Two sequences dominate the rural carrier's day. Driving the route and delivering mail to the various receptacles along the route take up nearly half the day. Those two

[31] Only 74 of the sequences have time associated with them. As part of the RRECS implementation process, the Postal Service recorded the time for Sequence 084, Safety Service talks under Miscellaneous Time. If this approach changes in future evaluations, then Sequence 084 will have positive values for time and will be included in the calculations.

sequences are the only ones that average more than [redacted] percent of the carrier's day. Rural carriers spend, on average, [redacted] hours per day driving the line of travel (Sequence 034) on their route. They also average [redacted] hours a day delivering mail to the various receptacles (Sequence 036) on the route. In addition to that delivery service time, carriers spend, on average, nearly [redacted] minutes verifying the addresses of the mail that they deliver (Sequence 086). Carriers are required to examine and verify the address on mail they deliver and receive a standard time (which differs for letters and flats) for each verified piece.

Table 5: Sequences with the Highest Average Daily Time

Sequence	Description	Average Daily Minutes	Proportion of Daily Time
SEQ034	Basic Route Driving	[redacted]	[redacted]
SEQ036	Box Service Time	[redacted]	[redacted]
SEQ086	Verify addresses	[redacted]	[redacted]
SEQ051	Perform prelim & concluding activities at vehicle for trip to the door	[redacted]	[redacted]
SEQ032	Load vehicle	[redacted]	[redacted]

Source: Daily Profiles xlsx

Another time-consuming activity on rural carrier routes is performing the various actions at the vehicle associated with making a delivery trip to a recipient's door (Sequence 051). These required actions include parking the vehicle upon arrival, retrieving the scanner, retrieving the parcel or accountable to be delivered and departing for the customer's door. When carriers return to their vehicles, they need to load any collected volume, enter the vehicle, and return the scanner to its storage location. The time standard for this set of activities taking place before and after a door delivery is [redacted] seconds per stop.

In contrast, there are some sequences that have very little time associated with them. These sequences are typically associated with delivering or handling accountables and average just small fractions of a minute per route, per day. For example, Sequence 044, Delivering COD, averages just [redacted] minutes per route. This low average time is not due to a low standard time for delivering a COD, which is [redacted] minutes per piece, but rather because so few CODs are delivered on rural routes.

As mentioned above, a profile of the average rural carrier's day can be created from the RRECS time sequences. Those time sequences cover the carrier's daily time for each route, and the average sequence values can be used to calculate the proportion of the average day required for each sequence. If the sequences are grouped by the major tasks rural carriers perform, they can provide insight into how daily rural carrier time is currently spent. Moreover, if the same exercise is performed for the various rural carrier times used in the established methodology, based upon the PS Form 4241M (hereafter Form 4241) evaluation factors and the 2018 Rural Mail Count measures, a profile of the carrier's day under that system can also be produced. Comparison of the two profiles will illuminate how rural activities have shifted and provide some initial insight into where attributable cost changes may occur. A daily profile is not sufficiently detailed to calculate volume variable costs and distribute them to products, but it does identify major areas of carrier time, and thus cost.

Table 6 presents the daily profile associated with the established methodology based on the old evaluation factors and 2018 volume counts. It shows that driving time and box time were the two major tasks for rural carriers, with box time accounting for about one-third of the carrier's day. Casing time, overall, represented about 13 percent of the carrier's day. Parcel handing represented about 8 percent of the day, although the time for scanning parcels was included in the Other Street activity, so the actual parcel time proportion was a bit larger. Under the old evaluation system, rural carriers received a separate street time credit for DPS mail, leading to the 37 minutes per day of DPS time.

Table 6
Form 4241/2018 Rural Mail Count Daily Profile

Activity	Included Evaluation Factors	Average Daily Minutes	Proportion of Daily Time
Case Letters	1	14.1	2.8%
Case Flats	1	47.7	9.5%
Parcels	3	39.5	7.9%
Case Boxholders	1	4.0	0.8%
Accountables	6	13.4	2.7%
DPS	1	37.0	7.4%
FSS	1	0.9	0.2%
Load Vehicle	2	12.5	2.5%
Other Office	7	24.3	4.8%
Driving	1	96.1	19.1%
Box	5	172.3	34.3%
Other Street	10	41.2	8.2%
Total	**39**	**503.0**	**100%**

Source: Daily Profiles.xlsx

Table 7 presents similar information for the currently used rural carrier evaluation system, based upon RRECS' different time sequences and current data. In general, it is possible to align the two different systems around major carrier tasks, but RRECS separately measures time for door deliveries of parcels and accountables which require the carrier to leave the vehicle. The previous evaluation system had no such evaluation factor, so it has no corresponding time proportion. As mentioned above, driving time is the most time-consuming task in the current environment, followed by box service time and handling parcels, which now consume over [redacted] a day. Door delivery is the fourth most time-consuming activity and is primarily caused by the delivery of parcels adding to the amount of time that will ultimately be attributed to parcels. Casing time represents just [redacted] percent of the carrier's day.

Table 7
RRECS Daily Profile

Activity	**Included Sequences**	**Average Daily Minutes**	**Proportion of Daily Time**
Case Letters	2	[redacted]	[redacted]
Case Flats	3	[redacted]	[redacted]
Parcels	8	[redacted]	[redacted]
Case Boxholders	2	[redacted]	[redacted]
Accountables	10	[redacted]	[redacted]
DPS	4	[redacted]	[redacted]
FSS	3	[redacted]	[redacted]
Load Vehicle	1	[redacted]	[redacted]
Other Office	17	[redacted]	[redacted]
Driving	2	[redacted]	[redacted]
Box	1	[redacted]	[redacted]
Door Delivery	5	[redacted]	[redacted]
Other Street	17	[redacted]	[redacted]
Total	**75**	**481.6**	**100.0%**

Source: Daily Profiles.xlsx

A side-by-side comparison of the two sets of time proportions is provided in Table 8, which makes it easy to inspect how the proportions have changed. The first noticeable change is the reduction in box time across the two systems. This comes about primarily because RRECS provides credit for only those boxes that receive mail, whereas the old evaluation system provided the route with credit for every single box on the route.[32] Next, there is a material increase in driving time. This reflects the granular and precise method RRECS uses to calculate driving time. RRECS maps each route to find the set of distance intervals that comprise the route and then applies a carefully measured standard speed to each interval. The sum of the driving times for all of the intervals on the route is the total driving time on the route.

Parcel time is materially higher under RRECS, reflecting both the increase in parcel volumes and RRECS' detailed analysis of the different activities required to handle parcels. There are eight different time sequences in RRECS directly associated with handling parcels, and five more in the door delivery activity, which is overwhelmingly associated with parcels. In contrast, there is a decline in flats casing time, reflecting the decline in the volume of flats since 2018. Finally, because RRECS does not provide a separate time credit for handling DPS letters on the street, the calculated DPS time is the limited amount of office time for DPS mail, along with DPS letters' contribution to general street activities such as box service and vehicle loading.

[32] In rural carrier parlance the term "box" refers not only to curb boxes but all receptacles including sidewalk boxes, CBU boxes and central delivery boxes.

Table 8

Rural Carrier Daily Activity Proportions

Activity	4241& RMC	RRECS	Difference
Case Letters	2.8%	[redacted]	[redacted]
Case Flats	9.5%	[redacted]	[redacted]
Parcels	7.9%	[redacted]	[redacted]
Case Boxholders	0.8%	[redacted]	[redacted]
Accountables	2.7%	[redacted]	[redacted]
DPS	7.4%	[redacted]	[redacted]
FSS	0.2%	[redacted]	[redacted]
Load Vehicle	2.5%	[redacted]	[redacted]
Other Office	4.8%	[redacted]	[redacted]
Driving	19.1%	[redacted]	[redacted]
Box	34.3%	[redacted]	[redacted]
Door Delivery		[redacted]	[redacted]
Other Street	8.2%	[redacted]	[redacted]

Source: Daily Profiles xlsx

IV. FINDING VOLUME VARIABLE RURAL CARRIER COSTS

To accurately measure volume variable costs, it is important to have an analytical structure that embodies the causality between volume changes and cost responses. This requires understanding and then capturing the process by which costs are actually incurred. Generally, this involves studying the activity being performed, identifying the cost driver(s) for the activity, and then measuring two things, the relationship between cost and the cost driver(s) and the relationship between the cost driver(s) and volume. In the case of rural carriers, the incurrence of cost is explicit. Carriers are compensated on the basis of the evaluated time for their routes, not the actual time spent serving the route. In other words, the cost of a rural carrier to the Postal Service depends upon the evaluated route time, not the actual time spent on the route. As a result, the correct approach to measuring rural carrier volume variable costs is to investigate the relationship between volume and the evaluated time for rural routes. When volume changes, holding everything else constant, the evaluated time on rural routes will change in a specific way; the time associated with the relevant volume variable activities changes.

From a theoretical approach, the established methodology captures the relationship between volume and rural carrier cost. It identifies which rural carrier evaluated activities are volume variable, and then uses them to determine the amount of volume variable cost. It next identifies which products are used in each volume variable activity and distributes the volume variable costs to those products. Because it embodies the way the rural carriers are actually compensated, the established methodology captures the causality between volume and rural carrier cost.

Although the established methodology has a solid causal basis, its actual implementation is dated. The Form 4241 negotiated evaluation factors, historically applied to determine rural carrier evaluated time, are no longer used, so that set of rural carrier volume variable cost calculations does not embody the way rural carrier costs are incurred. Because the previous evaluation system has been replaced by RRECS, the established methodology must be updated to ensure it replicates the current relationships between volume and rural carrier cost.

The current implementation of the established methodology is also dated because it relies upon volumes from the 2018 Rural Mail Count. There have been material volume shifts since that count took place, and it is appropriate to update the costing methodology to account for those volume shifts. Updating the established methodology to reflect the current evaluation system also provides certain advantages for the calculation of attributable costs. First, RRECS captures volume from ongoing Postal Service operational data systems, so there is no longer a need to perform a Rural Mail Count.[33] As a result, the calculation of volume variable rural mail costs no longer depends upon a special volume study, but is based upon ongoing operational data. The volume counts will automatically be updated each year, so the attributable cost calculation will always be adjusted to reflect any current changes in volume.

Second, RRECS provides a more detailed description of carrier activities and reflects the way rural carrier operations are currently being performed. It covers all rural routes and the RRECS data set incorporates the calculation of Daily Standard Time for each one of those routes. It thus provides a more accurate basis for calculating attributable rural carrier costs.

One of the essential characteristics of the established methodology is the identification of volume variable evaluation time. As explained in Section II above, this identification is based upon a classification of whether a particular carrier activity is volume related. Application of the established methodology to RRECS thus requires undertaking a similar classification exercise. As explained in detail in the following section, the RRECS classification exercise will follow a specific algorithm that traces the causality from rural route volumes to the associated cost driver(s), to the resulting evaluated time. The subsequent subsections describe the application of that algorithm to the individual RRECS time sequences.

[33] RRECS does include a periodic Mini Mail Survey (MMS) to cover a small number of items not covered by automated systems. The items include random letters and flats, walking distances, PARS labels and Miscellaneous Activities.

A. Linking Sequences to Units

Integrating the RRECS data and structure into the established methodology requires identifying the RRECS sequences that are volume variable. That identification requires examining, for each of the 75 different sequences that make up the carrier's day,[34] the relationship between volume and evaluated time. The algorithm, illustrated in Figure 2, proceeds in two steps. It first requires examining, for each sequence, the relationship between the cost driver or drivers and the evaluated time. This involves examining and understanding how the sequence's unit(s) and standard(s) come together to define the evaluated time. Second, it involves examining the relationship between the relevant volume and the sequence's unit(s). Sometimes this relationship is straightforward because the sequence's unit is a measure of volume, so the linkage is direct. In other cases, the linkage is indirect and requires additional analysis of how changes in volume do, or do not, affect the unit.

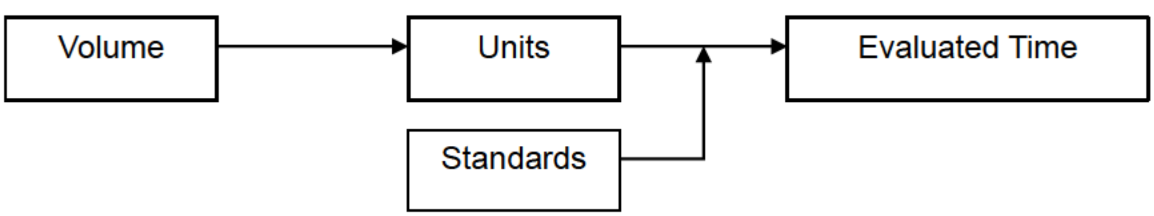

Figure 2: The Relationship Between Volume and Time in RRECS

[34] In the RRECS data there are 77 daily sequences but only 75 different ones. The extra sequences arise because of the way RRECS calculates box time. The time standards for box time depend upon the number of bundles handled on the route and each route's box time will depend upon how many bundles the route has. RRECS calculates the box time for each route for each of the three numbers of bundles, even though only the one relevant box time is used to calculate a route's Daily Standard Time. The two duplicative, and unused, box time sequences are the two extra sequences.

As explained above, RRECS sequences are determined by their associated time standards and the units to which those standards apply. RRECS sequences have a mathematical formula that describes how the standards and units are combined to produce each route's evaluated time for that sequence. Most of the RRECS sequences have a single standard and unit associated with them. For these sequences, it is relatively straightforward to link the sequence to its unit. The most common unit is "Piece," because the number of pieces handled is the cost driver for many different actions, such as casing the various types of mail, gathering, organizing, and delivering parcels, or delivering small volume items (accountables, COD, Postage Due). For the sequences that involve just one type of mail, the process to identify how changes in units affect carrier time is clear. Changes in the number of pieces of the relevant type of mail have a direct impact on the time required to handle that mail.

Another common unit is "Day," which is associated with activities that take place once a day, regardless of volume, like setting up the scanner or moving trays to storage. Identifying the relationship between the unit and sequence time is also straightforward for these sequences because they occur once a day, regardless of volume.

The remaining sequences are more complex. They may be based upon multiple standards (and units), they may be constructed from multiple subsequences which could have differing units, or their time could be directly recorded on the carrier's scanner. Determining the relationship between sequence time and units for these sequences takes further investigation.

An example of a sequence that has multiple standards is given by Sequence 018, Gather Parcels for Transport to the Case. It has two standards associated with it, S018A, which is the standard time per cart for gathering parcels from the first cart, and S018B which is the standard time per cart for gathering parcels from additional carts. Both of these standards have "Cart" as their unit, so Sequence 018 also has "Cart" as its unit.

Sequence 034, Basic Route Driving is an example of a sequence that is comprised of multiple subsequences. Its standard time depends upon the Drive Speed Matrix, which contains average driving speed for various distance ranges from the short (0 feet to 15 feet) to the long (4,745 feet to 4,965 feet). The standard drive time for each interval is then applied to each route's various distance intervals to calculate the route's drive time. For all cells in the Drive Speed Matrix, the unit is "Foot." The unit for Sequence 034 is therefore "Foot."

Sequences 032 (Load vehicle), 053 (Deviation for Express Mail Delivery), and 063 (End-of-Shift Office Activities) do not have standards associated with them. Their times are recorded on the carriers' Mobile Delivery Devices (MDD). Consequently, they do not have any units associated with them and will have to be analyzed individually for their relationship with volume. To identify that this subsequent analysis is necessary, their units will be designated as "MDD." Sequence DE10, Authorized Dismounts, also makes use of the MDD, but in a different way. This sequence captures the time associated with extra dismounts the carrier has to make in the course of delivery. The carrier uses the MDD to record each time such a dismount takes place, but does not record the amount of time for the dismount. Instead, the carrier gets a standard time (based upon the type of receptacle) for the dismount activity.[35] Each of these standards has "Trip" as its unit, so the unit for Sequence DE10 is also "Trip."

Sequence 035, Basic Route Walking, depends upon the distance walked and the standard walking speed. The unit for this sequence is therefore "Foot." Sequence 037, Drive from a Mail Stop to Direct Door Delivery (DDD) Stop, depends upon the distance driven on a route between the two types of stops and the driving speed from the Drive Speed Matrix for the interval distance between the two types of stops. Its unit is thus also "Foot."

Sequence 058, Reload Mail for Delivery, depends upon a lookup table that sets the standards for different numbers of trays for the three different (by number of bundles) types of routes. All entries in the lookup table are based upon the number of trays handled, so the unit for this sequence is "Tray." Sequence 059, Reload Medium Parcels for Delivery, is similar to Sequence 058. Medium parcels are too large to fit into the carrier's case, but are small enough that they do not require a separate access for delivery. The number of medium parcels is converted into the corresponding number of trays and, based upon that figure, a separate lookup table is used to determine the credited time per tray. The unit for this sequence is also "Tray."

Sequence 086, Verifying Addresses, has two standards, S144 and S145, associated with it. The former is for verifying letter addresses and the latter is for verifying flat addresses. Both of the standards have "Piece" as their unit, so Sequence 086 will also have "Piece" as its unit.

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[35] The four receptacle-specific standards are S103A: Additional Trip SDWK, S107A: Additional Trip OTHER, S111A: Additional Trip CBU, and S117A: Additional Trip CENT. In addition, for each dismount, the carrier receives a walking-distance time credit.

Sequence 072, TCP Duration, is the total time on the route for stopping at the various traffic control points that occur along the route. It is comprised of the times spent at the different types of traffic control points like a yield sign, a traffic light, or a school cross walk. Sequence 072 thus includes a number of different standards, each for a different type of traffic control point. All of the standards have a traffic control point (TCP) as their unit, so the Sequence 072 unit is also "TCP."

Sequence 082, Carrier Pickup Items and Manifest Scans, is the combination of two other sequences, 082A and 082B. Each of those sequences have "Scan" as their unit so the unit for sequence 082 is also "Scan."

Sequence 052, Gather Accountable Mail/Large Parcel at Vehicle, depends upon two standards, S048F which is "Gather Accountable Mail/Large Parcel Fixed," and S048V which is "Gather Accountable Mail/Large Parcel Variable." The unit for S048F is "Trip" and the unit for S048V is "Piece." Sequence 052, as a result, has two units, "Trip" and "Piece." Sequence 083, Miscellaneous Activities, does not have a standard associated with it. Its unit will be designated as "NONE."

Sequence 036A, Sequence 036B, and Sequence 036C, Route Service Times, all relate to the service time associated with delivering letters, flats and small and medium parcels to the various types of mail receptacles on the route. They are each comprised of the different sub-sequences which cover the times associated with the different activities required for delivering mail along the route. The difference among the three sequences is that they cover different types of routes, as defined by the number of bundles carried on the route. Sequence 036A is for one bundle routes, Sequence 036B is for two bundle routes, and Sequence 036C is for three bundle routes. Some of the subsequences are the same across the three types of routes and some of them are bundle-specific. Moreover, the various subsequences have different units associated with them, so the investigation of volume variability for the time associated with route service time must be performed at the level of the subsequences. The subsequences for each route type are listed in Tables 9 through 11 below.

Table 9: Route Service Subsequences for a One Bundle Route

Subsequence	Standard	Description	Unit
Seq036_s100	S100	Box time CURB (one-bundle)	Box
Seq036_s103	S103	Dismount and prep SDWK	Stop
Seq036_s104	S104	Box time SDWK (one-bundle)	Box
Seq036_s107	S107	Dismount and prep OTHER	Stop
Seq036_s108	S108	Box time OTHER (one-bundle)	Box
Seq036_s111	S111	Dismount and prep CBU	Stop
Seq036_s112	S112	Unit time CBU	Unit
Seq036_s113	S113	Box time CBU (one-bundle)	Box
Seq036_s116	S116	Collection box CBU	Coll Box
Seq036_s117	S117	Dismount and prep CENT	Stop
Seq036_s118	S118	Unit time CENT	Unit
Seq036_s119	S119	Box time CENT (one-bundle)	Box
Seq036_s122	S122	Collection box CENT	Coll Box
Seq036_s143	S143	Creep Time	Space

Table 10: Route Service Subsequences for a Two Bundle Route

Subsequence	Standard	Description	Unit
Seq036_s101	S101	Box time CURB (two-bundle)	Box
Seq036_s103	S103	Dismount and prep SDWK	Stop
Seq036_s105	S105	Box time SDWK (two-bundle)	Box
Seq036_s107	S107	Dismount and prep OTHER	Stop
Seq036_s109	S109	Box time OTHER (two-bundle)	Box
Seq036_s111	S111	Dismount and prep CBU	Stop
Seq036_s112	S112	Unit time CBU	Unit
Seq036_s114	S114	Box time CBU (two-bundle)	Box
Seq036_s116	S116	Collection box CBU	Coll Box
Seq036_s117	S117	Dismount and prep CENT	Stop
Seq036_s118	S118	Unit time CENT	Unit
Seq036_s120	S120	Box time CENT (two-bundle)	Box
Seq036_s122	S122	Collection box CENT	Coll Box
Seq036_s143	S143	Creep Time	Space

Table 11: Route Service Subsequences for a Three Bundle Route

Subsequence	Standard	Description	Unit
Seq036_s102	S102	Box time CURB (three-bundle)	Box
Seq036_s103	S103	Dismount and prep SDWK	Stop
Seq036_s106	S106	Box time SDWK (three-bundle)	Box
Seq036_s107	S107	Dismount and prep OTHER	Stop
Seq036_s110	S110	Box time OTHER (three-bundle)	Box
Seq036_s111	S111	Dismount and prep CBU	Stop
Seq036_s112	S112	Unit time CBU	Unit
Seq036_s115	S115	Box time CBU (three-bundle)	Box
Seq036_s116	S116	Collection box CBU	Coll Box
Seq036_s117	S117	Dismount and prep CENT	Stop
Seq036_s118	S118	Unit time CENT	Unit
Seq036_s121	S121	Box time CENT (three-bundle)	Box
Seq036_s122	S122	Collection box CENT	Coll Box
Seq036_s143	S143	Creep Time	Space

B. Identifying the Volume Variable Sequences under RRECS

Based upon the forgoing analysis, all of the sequences and subsequences that cover the carrier's day have units associated with them. The next step is to identify which of the sequences are volume variable. The identification process is based upon identifying the relationship between units and volume. If the unit is volume-related, then the associated sequence is volume variable. A sequence is volume variable because both the linkage between volume and unit and the linkage between unit and sequence time are in force. A change in volume causes a change in the number of units, which in turn causes a change in the sequence's evaluated time. If the unit is not volume dependent, but is driven by a non-volume factor, then the associated sequence is not volume variable.

Changes between units and sequence times are generally one-for-one due to the linear structure of sequences, and that relationship justifies a one hundred percent time-to-unit variability assumption. An overall one hundred percent sequence variability assignment also requires assuming a one hundred percent variability between volume and units. Making this assumption now is reasonable for calculating attributable costs, but does not foreclose the possibility of further analysis of the assumption if subsequent consideration suggests that it is warranted.

There are 98 sequences and subsequences to analyze. There are 77 sequences, but three of them, Sequence 036A, Sequence 036B and Sequence 036C, are replaced by their subsequences because the individual subsequences have different units. There are 24 different subsequences. When they are added to the remaining 74 sequences, a total of 98 sequences and subsequence need investigation. The results of that investigation are presented and discussed in the following sub sections.

Table 12: Frequencies and Proportions of Units
for the Sequences and Subsequences

Unit	Frequency	Proportion
Box	16	16.3%
Bundle	1	1.0%
Cart	1	1.0%
Coll Box	2	2.0%
Contact	1	1.0%
Day	8	8.2%
Event	2	2.0%
Foot	7	7.1%
Form	1	1.0%
Handful	1	1.0%
MDD	3	3.1%
NONE	1	1.0%
Piece	29	29.6%
Reach	1	1.0%
Refuel	1	1.0%
Rubber Band	1	1.0%
Sale	1	1.0%
Scan	3	3.1%
Space	1	1.0%
Stop	4	4.1%
TCP	1	1.0%
Tray	5	5.1%
Trip	2	2.0%
Trip/Piece	1	1.0%
Unit	4	4.1%
Total	**98**	**100.0%**

Source: SSU.xlxs

1. Sequences Whose Units Vary with Volume

Across these 98 sequences and subsequences that make up the carrier's day, there are 25 different units. The most common unit is "Piece" which is associated with 29 different time sequences. In some ways, the sequences that have "Piece" as their unit are the easiest to analyze. The cost drivers for these sequences are the number of pieces of various types of volume. When those volumes change, the associated pieces also change, spurring a change in the amount of evaluated time. Moreover, the evaluated time is based upon the average volume over the year, so only sustained changes in volume will cause sustained changes in evaluated time.

An examination of the various sequences that have "Piece" as their unit reveals that they are carrier activities that require handling of individual pieces, whether it is casing mail, gathering and organizing parcels, or delivering accountables.[36] This reinforces the fact that these sequences are completely volume variable.

Table 13: The Types of Sequences that Have "Piece" as their Unit

Number of Sequences	**Type of Carrier Activity**
9	Casing various shapes of mail
6	Gathering, organizing or delivering parcels
8	Processing or delivering small volume items (accountables, COD, postage due)
5	Collecting items like certified mail and carrier pickup
1	Verifying addresses

Another nine sequences are also closely related to piece volume.[37] Although their units are not "Piece," they are units that depend upon piece counts. These units,

[36] A complete list of the sequences that have "Piece" as their unit is provided in SSU.xlsx in USPS-RM2024-2-NP1, Link Sequences and Units Directory.

[37] The eight sequences with units closely related to piece volume are SEQ 058 Reload Mail for Delivery, SEQ 059 Reload Medium Parcels for Delivery, SEQ 017B1 Pull Down

"Tray," "Handful," Bundle," "Cart," and "Rubber Band" are all calculated by dividing a piece volume by a constant. For example, there are [redacted] pieces per handful, so the "Handful" unit is found by dividing the volume of cased mail by [redacted]. When volumes change and measured pieces change, these calculated units also change, causing a change in evaluated time. These sequences are also completely volume variable.

The "Event" unit is associated with two different time sequences. The first, Sequence 049, is for a Carrier Pickup or Prepaid Event, and the second, Sequence 051, Performing Preliminary and Concluding Activities at the Vehicle, is associated with a trip to the door for a door delivery.

As Sequence 049 measures time associated with Carrier Pickups, its standard (S045) covers the actions the carrier does before and after making the pickup. It includes actions like checking for a manifest, slowing the vehicle for the stop, retrieving the scanner, counting the number of parcels, verifying the pickup notice, leaving PS Form 5630 with the customer, and stowing any parcels that were collected. The standard allows [redacted] minutes for each pickup event, regardless of the number of parcels picked up.

In determining whether this time sequence is volume variable, it is worth noting that there is a different time sequence (Sequence 050) that accounts for the number of pieces picked up at the stop, which has "Piece" as its cost driver. In Sequence 050, the carrier receives a standard time for each item picked up. Sequence 049 relates to

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Handful, SEQ 017C Position and Remove Rubber Bands, SEQ 017A Pull Down Handle Trays, SEQ 027, Process Markups, SEQ 007 Gather DPS Letters, SEQ 018 Gather Parcels for Transport to Case, and SEQ 014 Gather DPS flats.

activities that take place before and after the pickup and provide the carrier the same time credit regardless of the number of parcels collected. This suggests that Sequence 049 is not fully volume variable unless each carrier pickup involves only one collected parcel. Otherwise, economies of density would indicate that this time would rise less rapidly than volume, as there will be instances in which collecting an additional parcel would not create an additional pickup event. In fact, the Sequence 049 evaluated time is the same whether one, two, or ten parcels are picked up. But this does not justify classifying the sequence time as not at all volume variable. It is the presence of the parcel volume to be collected that creates the pickup event, so changes in volume have the potential to affect the number of pickups. Until additional research can determine the actual variability of pickups with respect to volume, Sequence 049 time will be assumed to be completely volume variable.

The second "Event" time sequence (Sequence 051) relates to preliminary and concluding activities at the vehicle associated with a door delivery, such as parking the vehicle, retrieving the scanner, and re-entering the vehicle after the delivery. It is associated with the door delivery of parcels, accountables, CODs, or customs due. The standard time for each event is the same regardless of the number of pieces delivered, but at least one piece of the relevant volume is required to initiate a deviation delivery. The variability of this time sequence also depends upon the density of delivered parcels per delivery and is likely to be below one hundred percent. However, the median pieces per door delivery is just [redacted], suggesting the variability might be relatively high. As with Carrier Pickups, until additional research can determine the actual variability with respect to volume, Sequence 051 will be assumed to be completely volume variable.

There is another RRECS time sequence associated with carrier pickups that has a different unit. Sequence 026, Process Carrier Pick-up Event Forms provides the carrier with time for processing the forms for carrier pickups and its unit is “Form.” The evaluated time is the product of the standard time to handle and verify the required form (Standard S026 at [redacted] seconds) and the number of carrier pickups on the route. The verification time would not appear to depend upon the amount of volume collected, but each pickup requires additional volume for it to occur. Thus, like Sequence 049, Sequence 026 will be assumed to be one hundred percent volume variable.

Two sequences have “Trip” as their unit and both are volume variable. The first one is Sequence 087, Miscellaneous To Door Deliveries, which measures the time carriers incur making miscellaneous trips to the door. The evaluated time is based on the number of miscellaneous deliveries on the route. While it is not known exactly what caused the small number of undefined deliveries, which average just [redacted] per day, it is likely that they were caused by volume, and, consequently, Sequence 087 will be considered to be volume variable. The other sequence is for Authorized Dismounts, Sequence DE10. This time arises when a carrier has to make an additional delivery that requires a dismount because of additional volume. Additional volume is the reason for the additional dismount, so this sequence is volume variable.

Sequence 052, Gather Accountable Mail/Large Parcels at the Vehicle, has two units, “Trip” and “Piece,” reflecting the dual nature of the covered activities. The formula for the sequence is somewhat complicated and includes two different standards and cost drivers. The first standard, S048F (Gather Accountables/Large Parcels - Fixed) is applied to each stop, for delivery to the door, and is [redacted] seconds for the first parcel retrieved from the vehicle for delivery. As this activity occurs for each trip to a door delivery the associated unit is the number of trips. RRECS classifies this activity as "fixed" because its value does not increase when the number of parcels delivered to the door increases beyond one. However, a change in volume can cause a change in the number of trips for door deliveries, so it is at least partially volume variable. Without a measure of the volume density of door deliveries, the degree of variability is unknown and like the other "Trip" and "Event" sequences this part of Sequence 052 will be assumed to be one hundred percent volume variable. The second standard, S048V, is the time credit for any additional door parcel or accountable and its unit is "Piece." This part of the sequence is fully volume variable as it varies one-for-one with changes in volume. With both parts of Sequence 052 being fully volume variable, the sequence is also volume variable.

2. Sequences Whose Units Do Not Vary With Volume

There are some activities that carriers do every day in the same way, regardless of the amount of volume handled on the route. The eight individual time sequences associated with these types of activities all have "Day" as their unit. The activities include setting up the scanner (Sequence 001), inspecting the vehicle (Sequence 033), locating and accessing trays of DPS mail (Sequences 008 and 015), performing fixed accountable cage activities (Sequence 025), completing a trip report (Sequence 030), gathering random mail (Sequence 003) and moving trays to storage (Sequence 031). The carrier gets the same standard credit each day, so the amount of time credited for these activities does not change when volume changes. Because this time is not affected by volume, these time sequences are not volume variable.

Another sequence that is not volume variable is Sequence 072, Traffic Control Point Duration. This sequence captures the time for driving delays and is based upon the number of traffic control points like stop signs or traffic signals on the route. The amount of time credited depends upon the number and type of different traffic control points and is unrelated to volume. Another route driving-related subsequence is Subsequence 036_S143, which is part of box service time. This subsequence provides a standard time for vehicle movements when the route's boxes are too close together to accurately measure a distance interval. This occurs when one curbline box is within five feet of the next curbline box and, when it happens, the route earns a standard creep time. This time depends upon route configuration and is not affected by volume and is not volume variable.

Sequence 064, Contact Rural Reach Customers, provides a standard time for rural carriers to contact customers about potentially providing additional business to the Postal Service:[38]

> Rural Reach is a lead-generation program for rural carriers and follows the same concept as Customer Connect — rural carriers identify potential businesses on their routes that can benefit from learning more about postal products and services. As part of Rural Reach, rural carriers submit leads and share product information with key customers.

The amount of rural reach time generated on a route depends upon the number of potential customers contacted, not the volume of mail, and is thus not volume variable.

[38] *See*, https://about.usps.com/strategic-planning/cs09/CSPO_09_070.htm

After a carrier cases the mail, he or she must transfer the mail from the case to trays by pulling the mail down and strapping it out. After putting an empty tray on the shelf, the carrier will take the mail from the compartments in the case, rubber band it, and then put it into the tray. RRECS has four different time sequences associated with the strapping out activity, one for handling the trays (Sequence 017A), one for gathering the mail into a handful for pulling down (Sequence 017B1), one for reaching and pulling down each compartment in the case (Sequence 017B2) and one for banding the mail (Sequence 017C).

Sequence 017A is based upon the number of trays handled (its unit is "Tray"), which is a function of the amount of cased mail, and as explained above, is volume variable. Sequence 017B1 is based upon the number of handfuls of mail the carrier has (its unit is "Handful"), which, also as explained above, is calculated as the amount of cased mail divided by [redacted] pieces per handful. Sequence 017B1 is volume variable. Sequence 017B2 is determined by the number of compartments the carrier has to clear (its unit is "Reach"). The evaluated time for Sequence 017B2 is calculated by multiplying a standard pull down time (which depends upon the number of bundles on the route) by the number of addresses on the route. Unlike the previous two sequences, the time for Sequence 017B2 does not depend upon volume. The evaluated time is the same every day, regardless of the volume handled, and is not volume variable. Sequence 017C is based upon how many handfuls have to be banded (its unit is "Rubber Band"), which in turn is based upon the amount of cased mail and, as explained above, is volume variable.

There are two subsequences associated with collecting mail at delivery points. One is for CBUs (Subsequence 036_S116) and one is for Central deliveries (Subsequence 036_S122). The unit for these two sequences is "Collection Box." The time standard is the same for both sequences. The carrier receives [redacted] minutes for each compartment, regardless if any mail is actually collected. Because the carrier gets the same amount of time each day for sweeping the compartments, regardless of volume, these subsequences are not volume variable.

Carriers also get credit for sweeping collection mail from collection points (like blue boxes) on their routes. Sequence 054, Service (Blue Box) Collection Points captures the evaluated time for this activity. Carrier get a standard amount of time per collection point ([redacted] minutes) regardless of the amount collected and even if no mail is collected. Sequence 054 evaluated time is the product of the standard time and the number of collection points on the route and is not a function of volume. The time for this sequence is not volume variable.

There are four subsequences with the "Stop" unit and they are all a part of delivery service time. They are all associated with dismounting the vehicle to make a delivery and are defined by the type of mail receptacle and are not volume variable. Subsequence 036_S103 is for a stop at a Sidewalk box, Subsequence 036_S107 is for a stop at an Other delivery, Subsequence 036_S111 is for a stop at a CBU, and Subsequence 036_S117 is for a stop at a Central delivery.[39] Each of these subsequences has an associated time standard that is applied to each relevant delivery

[39] An "Other" delivery occurs when the carrier dismounts the vehicle and then walks to deliver the mail, usually inside a building or business.

point. For example, Standard S107 provides [redacted] minutes for each Other delivery point, while Standard S117 provides [redacted] minutes for each Central delivery point. The fact that the standard dismount time is the same each day regardless of volume and the subsequences are calculated with respect to the number of delivery points, not volume, indicates that these subsequences are not volume variable.

The unit for Sequence 057 is "Refuel," because the sequence measures the time required for the carrier to refuel the vehicle. The sequence is based upon the route's basic route miles and a standard for how many miles the vehicle can be driven before it needs refueling. This sequence is not volume variable.

There are two sequences and two subsequences for which the unit is, in somewhat confusing terminology, "Unit." The two sequences, Sequences 055 and 056, refer to the daily delivery of mail pouches between Postal Service facilities. Here the term "Unit" arises because the activity involves delivering the pouch to another Postal Service facility or unit. An inter-unit stop occurs when a carrier stops at a satellite Post Office to drop off a mail pouch. Sequence 055 measures time for servicing inter-unit mail for "Low Volume" stops, meaning the carrier does not need a cart to transport the pouch from the vehicle to the facility. Sequence 056 is for "High Volume" stops, meaning the carrier uses a cart. The time credited for these sequences depends only on the number of stops, by type, and not the amount of mail delivered at the stops. This type of delivery is a network function and the associated time is not volume variable. The units, and thus the number of stops, are determined by the placement of mail facilities, not volume.

The two subsequences that have a unit which is titled “Unit,” relate to the delivery of mail at multi-address receptacles. They are subsequences of route service time performed at those receptacles. Here the term “Unit” arises because of the nature of the delivery receptacles. Subsequence 036_S112, Unit Time CBU, measures the time it takes the carrier to open the back of the CBU and prepare the mail for delivery. Subsequence 036_S118, Unit Time Central, measures the time for the same function at Central delivery points. Each day, routes with multi-address receptacles receive the standard time for this activity, by receptacle type, for each unit on the route. The standard “Unit” time for a CBU, S112, is [redacted] minutes. The time for Subsequence 036_S112 is thus [redacted] minutes times the number of CBU units on the route; if a route has 10 CBUs, it would earn [redacted] minutes for Subsequence 036_S112. A similar calculation produces the evaluated time for Subsequence 036_S118. The times for these subsequences are determined by the configuration of the route and not by the amount of volume going to the delivery point and are not volume variable.

On occasion, rural carriers will sell stamps on their routes. RRECS provides a time credit for this activity through Sequence 065, Sell Stamp Stock. The evaluated time for this sequence is based upon the frequency of stamp sales and is not related to volume on the route, so Sequence 065 time is not volume variable.

RRECS also has a catchall time sequence that covers miscellaneous activities, Sequence 083. Because the activities included in this sequence are open ended, there is no unit associated with it. The sequence time is thus considered to be not volume variable.

3. <u>Sequences Whose Units' Variation with Volume Depends on the Context</u>

There are three types of units whose link to volume depends upon the context in which the need for the unit arises. Sequences with these units may or may not be volume variable, depending upon the context. In each case, the unit is associated with more than one time sequence, so each sequence must be individually investigated.

The first of the three units to be investigated is "Foot," and there are six sequences that have this unit.[40] They all involve distance travelled and three of them are for walking and three are for driving.

Sequence 002, Office Walking, accounts for office walking time and the evaluated time is calculated through combining a standard (S002) time of [redacted] minutes per foot and the distance the carrier walks in the office. The distance walked is measured in linear feet, and it is different for routes that include withdrawing mail because the carrier's activities are somewhat different when that occurs. Office walking includes time for actions like when the carrier walks from the case to the scanner location to retrieve the scanner, when the carrier walks from the case to the vehicle for inspection, and when the carrier walks from the case to the accountables distribution point. These activities are based upon the office layout, and office walking time does not vary throughout the year as volume changes, so Sequence 002 is not volume variable.

[40] Technically, there are seven sequences that have "Foot" as their unit, but the seventh has no time associated with it and thus does not need to be investigated. When RRECS was constructed, it included Sequence 084, Safety Service Talks, which included not only time for the safety talk but also time for the carriers to walk to and from the safety talk. This latter component had "Foot" as its unit. As part of the RRECS implementation process, there is no recorded the time for Sequence 084, Safety Service talks. Instead, that time is included in under Miscellaneous Time.

For routes that receive DPS mail, there is an additional office walking sequence, Sequence 085, Office Walking – DPSL. This accounts for the time it takes the carrier to walk from the case to DPS storage area and is based upon distance and the standard walking speed. It is not a function of how much DPS mail the carrier receives and is not volume variable.

Although rural carriers primarily drive during street delivery, they do a small amount of basic route walking. On average, they spend about [redacted] minutes a day walking to service non-curb boxes on their routes. This time is captured by Sequence 035, Walk – Basic Route. The basic route walking time is computed by multiplying each basic walking distance by the walking speed standard. Basic route walking time is defined by the geography of the route and the carrier is credited with the same amount each day, regardless of volume. This sequence is not volume variable.

Rural carriers spend a large amount of the street time in basic route driving. This is the time it takes for the carrier to cover the line of travel on the route and is similar to fixed route time for city carriers. Sequence 034, Drive – Basic Route, includes the time the carrier spends each day driving the core distance of the route. In RRECS, each route is mapped to identify the various distance intervals that make up the route's structure. Each distance interval is then multiplied by its associated standard speed from the Drive Speed Matrix entry to get the standard driving time for the interval. The sum of the standard driving times from all intervals is the route's evaluated time for Sequence 034. This time is dependent upon the geography of the route, and average driving speeds, but does not depend upon volume. It captures each rural route's portion of network coverage, is the same every day, and is not volume variable.

In addition to basic route driving and walking, rural carriers also drive and walk to make door deliveries of large parcels and accountables. Sequence 037, Drive – Mail Stop to Direct Door Delivery, measures the additional driving time rural carriers incur to make door deliveries, which is the time spent driving from a regular park point to a Direct Door Delivery (DDD) stop. For each route, this time depends upon the driving speed for the route's average distance from a regular park point to DDD stop times the sum of the DDD driving distances.[41] Although volume is not included in the formula for Sequence 037, the volume of parcels does affect the number of Direct Door Deliveries on the route. As the volume of parcels and accountables changes, so does the number of Direct Door Deliveries. Because of economies of density, it is unlikely that the number of Direct Door Deliveries are exactly proportional to volume, but without an empirical measure of that relationship, Sequence 037 time will be assumed to completely volume variable.

Carriers walk from the DDD park point to the door to deliver the associated large parcels and/or accountables. Sequence 038, Walking – Direct Door Delivery Stop to Door, measures the time for this walking. The sequence time is calculated through multiplying the walking speed standard times the sum of the walking distances for all Direct Door Deliveries.[42] As with DDD driving time, DDD walking time depends upon the creation of door deliveries for large parcels and accountables and is subject to the same

[41] Sequence 037 excludes the driving time for Direct Door Deliveries of Priority Express Mail. That time is captured in Sequence 053.

[42] Sequence 038 also excludes the walking time for Direct Door Deliveries of Priority Express Mail.

set of arguments. Consequently, Sequence 038 time will also be assumed to be completely volume variable.

The next unit whose link to volume depends upon the context is “Scan,” and it is associated with three different sequences. Two of them, Sequences 061 (Perform Simple One-Step Scans) and 062 (Perform Prompted Two-Step Scans) measure the time carriers spend taking RRECS activity scans. As the titles suggest, Sequence 061 is for simple scans and Sequence 062 is for more complex, two-step, scans. RRECS activity scans cover a variety of circumstances including recording when a carrier clocks in or when the carrier goes to and returns from lunch. Carriers also scan to indicate they received a boxholder or walk-sequenced set or they are starting to load their vehicles. The scans are also used to record trips to the door, authorized dismounts, or sales of stamps. Many of the scans are not at all related to volume and the remaining scans have only an attenuated link to volume. The time for taking these scans is not volume variable.

The third sequence to have “Scan” as its unit is Sequence 082, Carrier Pickup Item and Manifest Scans. The time for this unit is volume variable because part of the scanning time is directly related to the number of items picked up by the carrier and the other part is associated with scanning the manifests at each pickup. Because nearly all of the time in Sequence 082 is related to scanning the individual items collected, the sequence will be identified as volume variable.

The last unit to be examined for the nature of its link to volume is actually a placeholder. As explained above, the evaluated time for three RRECS sequences are not calculated in the usual way of multiplying a time standard against the relevant units.

Because of the nature of the activities, the experts who constructed RRECS decided that these three activities could be more accurately measured by having the carriers use their scanners to record the actual amount of time incurred. As a result, these three sequences, Sequence 053 - Deviation for Express Delivery, Sequence 063 - End-of-Shift Office Activities, and Sequence 032 - Load Vehicle all have “MDD” as their unit. By their nature, these sequences have no standard or physical unit that can be used to determine their variability and the underlying activity must be carefully analyzed to determine if the sequences are volume variable.

Sequence 053 measures the time carriers spend performing a deviation delivery of Priority Mail Express. It includes the time from when the deviation begins to the time when it ends. This type of deviation delivery is potentially subject to economies of density as delivering two pieces of Priority Mail Express to one address does not take twice as long as delivering a single piece. But Priority Mail Express is a low volume, low density product, so such economies are likely to be limited. In addition, because only one product is involved in this activity, all of the time for the activity would be included in the attributable cost for that product, Priority Mail Express. Consequently Sequence 053 is designated as completely volume variable.

Sequence 063, End-of-Shift Office Activities, time starts when the carrier returns to the delivery unit and ends when the carrier starts casing or clocks out. This time covers a variety of end-of-shift activities, some of which may take place daily, like returning empty mail trays or moving the vehicle to its regular parking location, and some may take place on an as needed basis, like reporting vehicle problems or processing a change of address form. The carrier also disposes of any mail collected on the route that day, replenishes the stamp stock and rural reach cards, and maintains the case. While a subset of the end-of-shift activities may be tangentially related to collected volume, the recorded time is generally for routine daily activities, so the sequence time is not considered to be volume variable.

The third sequence that has "MDD" as its unit is Sequence 032, which captures time for carriers loading their vehicles. This is similar to the Vehicle Loading evaluation factor in the established methodology, which has a variability of 50 percent. This established variability was determined by Postal Service witness Alenier in Docket No. R80-1, apparently based upon a regression analysis:[43]

> Loading Vehicles. It was estimated that half the time on this element varies in proportion to volume. This estimate was consistent with a regression analysis of the average loading time for each of the six route types as a function of the average volume of mail per route. (Emphasis in original.)

In the established methodology, vehicle loading time is treated differently than the other evaluation factors as it has a partial variability. This difference suggests that further investigation of the variability of vehicle loading time is important. Consequently, an investigation was made of whether it is possible to use current RRECS data to update the vehicle loading variability. The analysis, and its results will be presented and discussed in the next section.

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[43] *See*, Direct Testimony Of Howard S. Alenier On Behalf Of the United States Postal Service, Exhibit USPS-7D, Estimating the Variability with Volume of Rural Carrier Payroll Costs, Docket No. R80-1, April 21, 1980. at 9.

4. <u>Sequences that are Partially Variable with Volume.</u>

While nearly all of the RRECS sequences are either fully volume variable or not volume variable, there are two sequences that, based upon previous research, are likely to be partially volume variable. The first of those sequences is Sequence 032, which measures the time for loading the vehicle. As explained above, the Form 4241 counterpart to Sequence 032 has a variability of 50 percent in the established methodology, based upon a regression analysis of average vehicle loading time and average volume of mail per route. For most RRECS sequences, it is not possible (and not necessary) to empirically estimate the relationship between the sequence time and the associated cost driver. This is because sequence time is calculated deterministically, as the product of a fixed standard time, which applies equally to all routes, and the relevant cost driver which is often a piece measure of volume. Any attempt to estimate a regression equation on such data would simply return the fixed time standard as the estimated coefficient. Fortunately, Sequence 032 time is not calculated in this way, but is actually recorded by each carrier on each day and measures the actual time spent loading the vehicle. It is possible, therefore, to estimate a vehicle loading time econometric equation in which a route's actual loading time is a function of the route's volume. The RRECS data set contains a cross-section of over 80,000 routes that includes each route's average daily vehicle loading time along with the average daily volumes which are loaded and then delivered.

A first check on the current assumption of a 50 percent variability for vehicle loading time can be performed by estimating a quadratic equation through regressing average daily loading time on average daily total volume. A quadratic equation is an appropriate starting point for this estimation because it has been used successfully in a variety of city carrier functions and allows for the possibility of economies or diseconomies of scale in loading the vehicle. Estimating the model for a single aggregate volume permits direct comparison to the original variability model from Docket No. R80-1.

Table 14 presents the results of estimating such a model. The model produces a variability of 46.0 percent which is close to, but does not match, the current assumed value of 50 percent. The result does support an inference that vehicle loading is neither fully volume variable nor not volume variable at all, and presents a credible estimate of the actual variability. Both the first-order and second-order terms in the equation are statistically significant and have the expected signs. A positive first order term indicates that vehicle loading time increases as the amount of volume to be loaded increases and a negative second order time indicates that there are economies associated with the loading activity.[44]

[44] As a check on the quadratic specification, a translog model in a single aggregate variable was also estimated. It produced a similar variability of 49.8 percent, corroborating the variability from the quadratic model. Full results for the translog model can be found in in USPS-RM2024-2-NP1, Calculate Volume Variability and Cost Pool Times Directory.

Table 14: Results of a Quadratic Vehicle Loading Time Model in One Volume Variable

Variable	Coefficient (in Seconds)	t-Statistic
Intercept	252.9036	41.32
Volume	0.6648	103.65
Volume Squared	-0.0001	-62.83
[redacted]	[redacted]	[redacted]
Elasticity	46.0%	
# of Observations	81,146	
R^2	0.2654	

Source: Estimate LV Models.sas

While the single-variable model provides an estimate of the overall variability of vehicle loading time, it does include an implicit assumption that all types of mail have the same impact on loading time. That is, it implicitly assumes that a 10 percent increase in DPS letters has the same impact on vehicle loading time as a 10 percent increase in large parcels. Given the relative sizes of the two different types of mail, this is unlikely. A disaggregated model would, theoretically, provide an opportunity to empirically test this implicit assumption.

In practice, however, estimation of a fully disaggregated model is unlikely to be successful because of the high degree of correlation among the various volumes delivered on rural routes. Table 15 presents the correlations, across routes, for the major volume categories and it reveals that those different types of volume are highly correlated. All of the correlations are statistically significant and many of them are large in absolute value. This means that a route that delivers a lot of (few) DPS letters will also delivery a lot of (few) mailbox parcels and carrier route flats. This correlation precludes accurately estimating the individual vehicle loading elasticities for the different volumes.

Table 15: Correlations Among Rural Volumes by Shape

	Carrier Route Flats	DPS Letters	Door Parcels	Mailbox Parcels
Carrier Route Flats	1	0.60392	0.24659	0.49959
		<.0001	<.0001	<.0001
DPS Letters	0.60392	1	0.30185	0.65595
	<.0001		<.0001	<.0001
Door Parcels	0.24659	0.30185	1	0.5954
	<.0001	<.0001		<.0001
Mailbox Parcels	0.49959	0.65595	0.5954	1
	<.0001	<.0001	<.0001	

A fully disaggregated model thus suffers from an extreme degree of multicollinearity and will produce inaccurate results, such as negative elasticities. For example, estimation of a quadratic model in five volume variables, cased letters and flats, DPS letters, FSS, parcels, and accountables suffers from severe multicollinearity with a condition index of 71.7, multiple variables with Variance Inflation Factors over 20 and a negative marginal time and variability for DPS mail.[45] An effective way of dealing

[45] The full results for the five-variable model are presented in in USPS-RM2024-2-NP1, Calculate Volume Variability and Cost Pool Times Directory. A condition index in the range of 5 to 10 indicates minor multicollinearity, a condition index in the range of 30 is an indication of moderate collinearity and as the condition index approaches 100, it is considered a sign of serious multicollinearity. *See*, Belsley, David A., Kuh, Edwin, and Welsch, Roy E., Regression Diagnostics: Identifying Influential Data and Sources of Collinearity, John Wiley & Sons, Hoboken, New Jersey, 2004 at 105.

with multicollinearity is to reduce the number of coefficients that need to be estimated in the regression by combining variables that likely have a similar impact on the dependent variable. In the case of vehicle loading time, the main difference in the activity is between loading letters, flats, and small and medium parcels which are containerized, and then loaded into the vehicle in their containers, and large parcels which are transported to the vehicle in hampers, but then loaded individually as pieces. The marginal time for an individual letter or flat is likely to be quite small, given how they are loaded, but the marginal time for a large parcel is likely to be substantially higher.

To capture this important difference, without creating a disqualifying amount of multicollinearity, a two-variable model is specified. The first variable combines letters, flats, small and medium parcels, and accountables. The second variable includes large parcels.[46] This approach materially reduces the degree of multicollinearity as the condition index falls to 32.0, indicating that much of the multicollinearity was coming from having several volume variables moving together across routes. All of the estimated coefficients have the appropriate signs, with both volume variables having

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[46] RRECS does not specifically identify parcels as being small, medium and large. Instead, it identifies parcels by where they are delivered. Parcels delivered to a mailbox or parcel locker are considered small and medium, with small parcels (which are determined by a historical average) being cased with flats and medium parcels being delivered as part of regular delivery. Parcels that require a separate trip to the delivery point (door parcels) are consider to be large parcels. The formulas for the three sizes of parcels are:

Small Parcels = [redacted] * (Mailbox Parcels+ Locker Parcels)
Medium Parcels = [redacted] * (Mailbox Parcels + Locker Parcels)
Large Parcels = Door Parcels

Mailbox parcels account for [redacted] percent of small and medium parcels.

positive first order terms and negative second order terms, indicating that additional volume causes additional loading time, but there are economies of density in play. As one would expect, the marginal loading time for a containerized letter or flat is just a fraction of a second (0.15 seconds) but the marginal loading time for a large parcel is substantially higher at 11.2 seconds.

Table 16 presents the results of estimating the two-volume quadratic model.[47] It provides an elasticity for letter/flats/small and medium parcels of 24 percent and an elasticity for large parcels of 32.2 percent. The variable for the combined volume of letters/flats/small and medium parcels has a small marginal time but a large value (1,828 pieces) for average daily volume. The large volume means that a 10 percent increase in the variable implies an additional 182 pieces to be loaded, which contributes to the 24 percent variability. An additional 182 pieces would generate an additional 26.74 seconds of loading time, which averages [redacted] seconds, and thus causes a [redacted] percent increase of the amount of loading time.

[47] The full results for the two-variable quadratic model are presented in in USPS-RM2024-2-NP1, Calculate Volume Variability and Cost Pool Times Directory.
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Table 16: Results of a Quadratic Vehicle Loading Time Model in Two Volume Variables

	Coefficient (in Seconds)	**t-Statistic**
Intercept	208.2282	37.70
L/F/SP	0.2892	49.68
L/F/SP Squared	-0.00001	-3.13
Large Parcels	20.6052	104.68
Large Parcels Squared	-0.0358	-59.69
L/F/SP * Large Parcels	-0.0039	-42.43
[redacted]	[redacted]	[redacted]
L/F/SP Elasticity	24.0%	
Large Parcel Elasticity	32.2%	
# of Observations	81,146	
R^2	0.4763	

Source: Estimate LV Models.sas

In contrast, large parcels have a relatively small daily volume ([redacted] pieces) but a relatively high marginal time. A 10 percent increase in large parcels would be just [redacted] additional pieces, but because of the higher marginal time for loading a large parcel, this volume increase would create an additional [redacted] seconds of loading time which is 3.2 percent of the amount of loading time that takes place at mean volume levels.

The two-variable model has a combined variability of 56.2 percent which is higher than the variability from the single volume variable model. It also fits the data better, as its R^2 statistic is 0.476 as compared to 0.265 for the single-variable model, suggesting that the heterogeneity in loading time is important.

The other sequence that is partly variable with volume is box time. This type of time is currently not considered to be volume variable in the established methodology because in the previous Form 4241-based rural carrier evaluation system, carriers got credit for every box on the route, whether or not the box received mail. Under RRECS, carriers get credit only for those boxes that receive mail, which is determined by the calculation of the route's coverage.[48] Coverage is defined as the proportion of boxes that receive mail.

Figure 3 presents the components of route service time, which captures the time associated with carriers delivering mail to the various types of boxes on the route. In RRECS, box time is the only part of route service time that has a coverage factor applied to it.

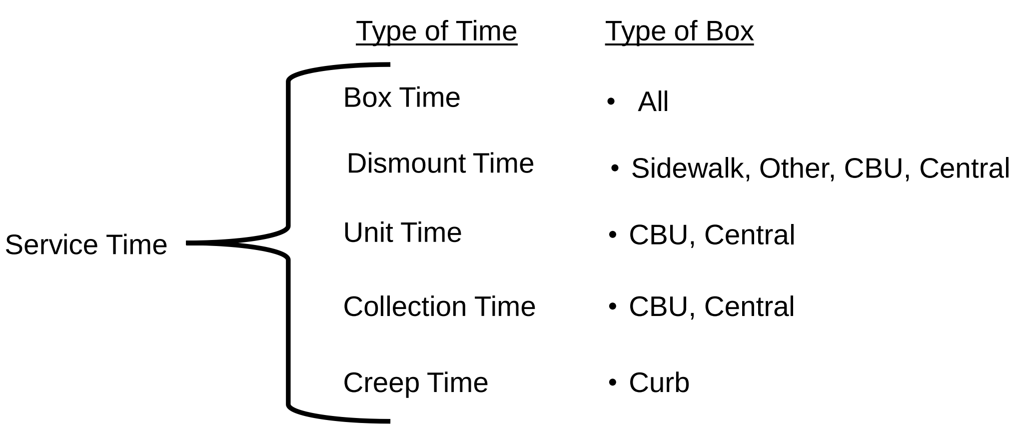

Figure 3: Components of Service Time

[48] In RRECS, the term "box" refers not just to curb boxes but also to sidewalk boxes, other boxes, CBU boxes and other boxes. Calculation of coverage for a route includes all types of boxes.

Maximum possible box time for a route is calculated by multiplying, by type of box, a standard time factor by the number of boxes. Actual box time for a route is calculated by multiplying its maximum possible box time by the route's coverage factor. In RRECS, coverage is calculated for each route in a multi-step process that uses both the GPS Tracking Data and the Informed Visibility data. In the first step, coverage is calculated for single-post curb boxes using the GPS Tracking Data. This requires matching recorded GPS stops to expected curb boxes and including any DDD stops as covered addresses. It also includes removing any "low frequency" stops, where a low frequency stop has a low (< 30 percent) coverage based upon the GPS Tracking Data and high (≥ 30 percent) volume coverage.

In the second step, Informed Visibility volume coverage is calculated for curb, CBU, and central boxes. Informed Visibility coverage is calculated on a box-by-box basis, with separate coverage values being calculated by box type. A saturation scan for a route sets coverage at one hundred percent for that day. In the third step, the combined daily coverage is calculated. For curb boxes, RRECS determines which coverage measure is to be used according to the following algorithm. If single-post curb boxes are at least 20 percent of the addresses on the route, or if the route has at least 100 single-post curb boxes, the coverage based upon the GPS Tracking Data will be used. Otherwise, the Informed Visibility coverage will be used. For CBU and central boxes, the Informed Visibility coverage is used. The route's daily coverage is the box-weighted average of the curb, CBU, and central coverages.

The fourth step involves calculating the final daily coverage. Each route's final daily coverage is the median daily coverage from the most recent 13 weeks. The median is used to avoid undue influence from poor data or erroneous days. The last step calculates the route's final coverage which is the average of the daily median coverages. The route's final coverage is calculated during the bi-year volume updates.

The key question for finding attributable costs is the degree to which coverage varies with volume. There is a natural, positive, relationship between coverage and volume. If a route has no volume delivered, coverage is necessarily zero. At the other extreme, if a route has sufficient volume so that every address gets at least one piece of mail, then coverage would be one hundred percent. The issue for measuring the volume variability of coverage is the degree to which coverage varies with volume changes in between the two extremes. Fortunately, there has been previous research investigating the relationship between volume and coverage for both rural and city carriers.

In Docket No. R84-1, Postal Service witness Foster estimated a coverage model for rural carriers using an exponential regression model.[49] The exponential model was borrowed from the established city carrier analysis, where it was used to estimate the variability of access time. The exponential coverage model was used by the Commission and the Postal Service to analyze city carrier access time until Docket No. R2005-1, when a more aggregate approach to city carrier costs was proposed and accepted.[50] The exponential model specifies that coverage (COV_i) is a function of the

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[49] *See*, Direct Testimony of Grady B. Foster on Behalf of The United States Postal Service, Docket No. R84-1, USPS-T-9 at 22.

[50] *See*, Opinion and Recommended Decision, Docket No. R90-1, Volume.1 of 2 at III-98. *and* Opinion and Recommended Decision, Docket No. R94-1, at III-48.

volume per address ($\frac{V_i}{Add_i}$):

$$COV_i = 1 - e^{-\beta \frac{V_i}{Add_i}}.$$

This functional form has several characteristics that make it appropriate for measuring the relationship between volume and coverage. First, it is bounded by zero and one, just as is actual coverage. Second, as volume per address approaches zero, so does coverage and as volume per address gets very large, coverage approaches one. Finally, the rate of increase in coverage falls as volume per address increases. Figure 4 presents an example of an exponential coverage function with a beta coefficient equal to 0.4.

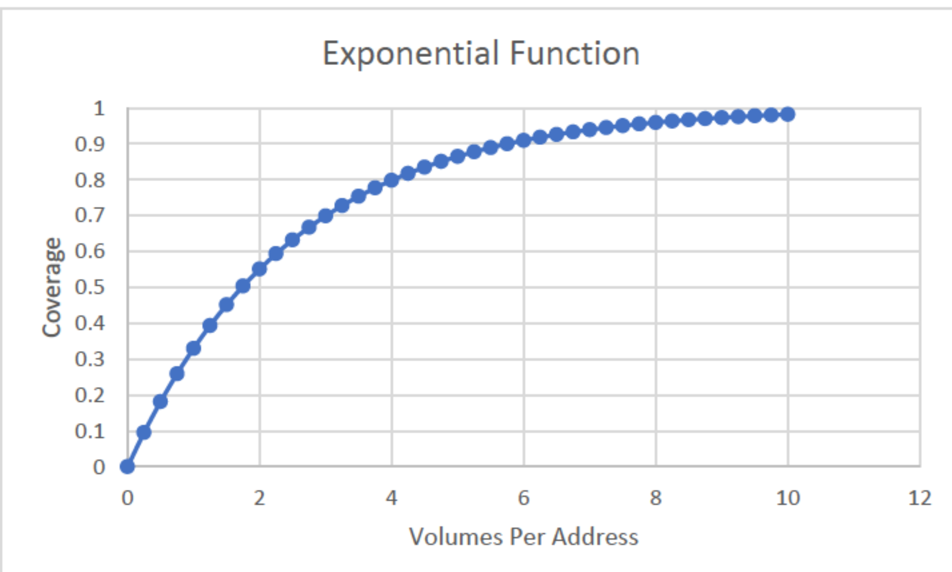

Figure 4: Example of an Exponential Coverage Function

The coverage model can be estimated on the 81,152 rural carrier routes included in RRECS, using the exponential functional form. The average coverage level for rural routes is [redacted] percent, with an average of 605.9 addresses per route. The average volume per address is [redacted] pieces. There is only one coefficient to be estimated, β, and it is precisely estimated. The exponential model requires nonlinear estimation, so traditional measures of fit are not available. However, the approximate standard error indicates a high degree of precision, as shown in Table 17.[51]

Table 17: Estimated Coefficient and Confidence Interval for the Exponential Coverage Model

Estimate	Approx. Std. Error	Approx. t-statistic	Approx. 95% Confidence Interval	
0.5344	0.000383	1395.3	0.5336	0.5351

Source: Estimate Coverage Models.sas

Even though the exponential model is nonlinear, the variability is still calculated in the usual way. First, one calculates the derivative of the exponential function with respect to volume:

$$\frac{\partial Cov}{\partial Vol} = \frac{\partial\left(1 - e^{-\beta\frac{Vol}{Add}}\right)}{\partial Vol} = -\frac{\beta}{Add}\left(-e^{-\beta\frac{Vol}{Add}}\right) = \frac{\beta}{Add}e^{-\beta\frac{Vol}{Add}},$$

Then, one multiplies the derivative by the ratio of mean volume to the coverage level that occurs at mean volume ($\widehat{Cov}$):

$$\varepsilon_{Cov,\,Vol} = \frac{\partial Cov}{\partial Vol} * \frac{Vol}{Cov} = \frac{\frac{\beta\, Vol}{Add}e^{-\beta\frac{Vol}{Add}}}{1 - e^{-\beta\frac{Vol}{Add}}} = \frac{\beta\, Vol}{Add}\left(\frac{1 - \widehat{Cov}}{\widehat{Cov}}\right).$$

[51] The full results for the single-variable coverage equation are given in in USPS-RM2024-2-NP1, Calculate Volume Variability and Cost Pool Times Directory.

Inserting the values from the estimated exponential function and the means from the RRECS data set yields a variability of 39.5 percent:[52]

$$\varepsilon_{Cov,Vol} = \frac{0.5344 * \text{[redacted]}}{605.85}\left(\frac{1 - \text{[redacted]}}{\text{[redacted]}}\right) = 0.395.$$

While this formula provides the estimate of the coverage variability, what is needed to calculate attributable rural carrier costs is the variability of box time with respect to volume. To calculate that variability, one must determine how the impact of volume on coverage translates to an impact on box time. In RRECS, a route's box time is found in three steps:

Step 1: Identify if a route has one, two, or three bundles.

Step 2: Multiply each box, by type, by its associated standard and sum the time across all boxes on the route to get the maximum possible box time.

Step 3. Multiply the maximum possible box time by the route's coverage.

This calculation can be expressed mathematically as:

$$BT_i^k = \left(\sum_{j=1}^{5} \sigma_j^k BOX_{ij}\right)\lambda_i \quad k=1,\ 2,\ 3,\ \ j=1(Curb), 2(Sidewalk), 3(Other), 4(CBU),\ 5(Central)$$

In this equation, BT_i^k is the route's box time, the σ_j^k are the bundle specific, box-type specific standard times, BOX_{ij} represents the number of boxes of each type on the

52 The coverage calculated at the average volume and average number of delivery points is [redacted], which is slightly above the average coverage of [redacted] due to the curvature of the exponential coverage function.

route and λ_i is the route's coverage. To find the variability of box time with respect to volume, one starts with the derivative of box time with respect to volume:

$$\frac{\partial BT_i^k}{\partial V_i} = \left(\sum_{j=1}^{5} \sigma_j^k BOX_{ij}\right)\frac{\partial \lambda_i}{\partial V_i}, \quad as\ \frac{\partial \sigma_j^k}{\partial V_i} = \frac{\partial BOX_{ij}}{\partial V_i} = 0$$

Then, to calculate the variability, one multiplies the derivative by the route's volume and divides by the route's box time:

$$\varepsilon_{Box,V_i} = \left(\sum_{j=1}^{5} \sigma_j^k BOX_{ij}\right)\frac{\partial \lambda_i}{\partial V_i}\left[\frac{V_i}{\left(\sum_{j=1}^{5} \sigma_j^k BOX_{ij}\right)\lambda_i}\right] = \frac{\partial \lambda_i}{\partial V_i}\frac{V_i}{\lambda_i} = \varepsilon_{Cov,Vol}$$

This equation shows that the elasticity of box time with respect to volume is just the elasticity of coverage with respect to volume. To see why this is true, consider a simple example in which coverage elasticity is 30 percent, meaning that a 10 percent increase in volume would cause coverage to increase by 3 percent. Suppose that, as shown in Figure 5, a route has an average of 100 pieces of mail, 100 addresses and a coverage of 80 percent. With a standard time of 5 seconds per box, the route would have 400 seconds of box time, resulting from having an average of 80 covered boxes at 5 seconds each.

Now suppose that volume increases by 10 percent, meaning it increases to 110 pieces. With a 30 percent coverage variability, the 10 percent increase in volume would cause a 3 percent increase in coverage to 82.4 percent. Multiplying the higher coverage value by the 100 addresses, yields an average of 82.4 covered boxes. At five seconds each, this yields 412 seconds of box time. The percentage increase in box time is (412 - 400)/400 or three percent. A ten percent increase in volume has caused a

3 percent increase in box time, so the variability of box time with respect to volume is 30 percent, which equals the coverage elasticity.

	Volume	Box Standard	Addresses	Coverage	Box Time
Pre Volume Change	100	5	100	0.800	400
Post Volume Change	110	5	100	0.824	412
Percentage Change	10%	0%	0%	3%	3%

Figure 5: Numerical Example of Impact of Coverage Variability

The single-variable coverage model implicitly assumes that all products have the same coverage elasticity, meaning they have an equal likelihood of changing coverage and it implies that there is a single cost pool shared by all volumes. Consequently, products with large (small) volumes will receive a relatively large (small) proportion of volume variable cost. But if different types of products have different proclivities for covering addresses, a single-cost pool approach could lead to under or over costing certain types of products. To investigate this possibility, one can calculate the marginal changes in coverage from changes in different types of volume. In the single volume model, this marginal effect is calculated as:

$$\frac{\partial Cov}{\partial Vol} = \frac{\beta}{Add} e^{-\beta \frac{Vol}{Add}}.$$

Because coverage is a percentage, and not a time or cost value, it can be challenging to interpret the marginal effect. For example, the marginal effect in the single-variable model is 0.00017. One useful way of interpreting the marginal effect is to calculate its discrete analog, by using the marginal effect to calculate the change in the coverage ratio from a given change in volume. Suppose the "average" route has a coverage of 80 percent, but then received an additional 30 pieces of mail. Based on the marginal effect, coverage would increase by almost half a percentage point: 0.000171 *30 = 0.0051. In other words, coverage would increase from 80 percent to 80.51 percent.

In the single-volume model, the marginal impact on coverage, and the variability, is the same regardless of the type of mail. To test this assumption, one can estimate a multivariable coverage model. One factor that could determine the impact of a type of mail volume on coverage is the characteristic of that type of mail for clustering, or being delivered in groups of multiple pieces. It only takes one piece of mail to convert an uncovered address to a covered address, so mail that is clustered (i.e., tends to be delivered in groups) would tend to have a smaller impact on coverage than a type of mail, of similar volume, that tends to be delivered as a single piece to each address. Another factor that could influence the coverage effect of a type of mail would be whether it tends to be delivered by itself, or along with other pieces of mail.

Multicollinearity precludes putting all of the individual different types of mail in a coverage equation, but three different groupings of mail could capture the different coverage effects. One group that merits investigation is parcels and accountables. Although parcel volume has grown over the last several years, parcels and accountables have relatively low volumes, averaging just [redacted] pieces per address. This suggests that parcels and accountables are likely to have relatively low levels of clustering and thus have a potentially higher coverage impact than other types of mail.

Another important group of mail is DPS letters. This is a high-volume category, averaging [redacted] pieces per address and representing the majority of pieces delivered on rural routes. Its high volume may cause it to have a high coverage elasticity. The third group includes non-DPS letters and all flats and falls in the middle of the volume distribution, averaging about [redacted] per stop. However, it does include walk-sequence letters and flats, and boxholder letters and flats, which can cover most or all of the addresses on a route on the days they occur. A three-variable model would permit testing if the coverage response to different types of volume is the same. The three-variable exponential model specifies coverage as a function of non-DPS letters and flats per address, ($\frac{V_i^{NDLF}}{Add_i}$), DPS letters per address, ($\frac{V_i^{DPS}}{Add_i}$), and parcels and accountables per address, ($\frac{V_i^{PA}}{Add_i}$):

$$COV_i = 1 - e^{-\beta_1 \frac{V_i^{NDLF}}{Add_i} - \beta_2 \frac{V_i^{DPS}}{Add_i} - \beta_3 \frac{V_i^{PA}}{Add_i}}$$

Table 18 presents the marginal times, elasticities, and volume effects for the three mail types.[53] It shows that, in fact, the different types of mail do have different impacts on coverage. The type of mail with the largest marginal effect is parcels and accountables (a category which is nearly all parcels). An additional 30 parcels on a route cause coverage to increase by almost seven-tenths of a percent. This is 59 percent higher than the effect of non-DPS letters and flats. The fact that parcels have a

[53] The full results for the three-variable exponential coverage model are given in in USPS-RM2024-2-NP1, Calculate Volume Variability and Cost Pool Times Directory.

relatively low elasticity should not be interpreted as an indication that changes in parcel volume do not lead to changes in coverage. The relatively low elasticity is a reflection of parcels' relatively low volume. A ten percent increase in parcels is, on average, only an increase of [redacted] pieces, whereas a ten percent increase in DPS letters is an increase, on average, of [redacted] pieces.

Table 18: Results from a Three-Variable Exponential Coverage Model

	Non DPS Letters / Flats	**DPS**	**Parcels / Accountables**
Elasticity	9.93%	26.65%	3.02%
Marginal Effect	0.00014	0.00018	0.00023
Additional Coverage from 30 Additional Pieces	0.43%	0.54%	0.69%

Source: Estimate Coverage Models.sas

DPS letters, in contrast, have a high elasticity (26.7 percent) because of their high volume. Its marginal coverage effect is smaller than that for parcels, but larger than for non-DPS letters and flats, so that is also a contributor. But DPS letters are by far the largest source of rural route volumes. Non-DPS letters and flats have the smallest marginal effect, but have substantial volume, leading to the middle variability of nearly 10 percent.

The sum of the three individual elasticities is 39.6 percent which essentially matches the overall variability, so the disaggregated model is identifying the separate sources of the overall variability. This raises the following question: If the overall variability from the disaggregated model is very similar to the variability from the single-variable model, what is the advantage of estimating the disaggregated model? The advantage is that the disaggregated model forms group-specific cost pools reflecting the different coverage-causing effects of the different types of volume. As a result, each volume group's coverage-causing characteristics are reflected in the group's volume variable box time. By not accounting for these differences, the single-volume coverage model will overstate volume variable costs for products with lower-than-average coverage cost-causing characteristics and understate volume variable costs for the products with higher-than-average coverage cost-causing characteristics.

This outcome can be illustrated by a simple simulation of the volume variable costs for the groups of products calculated from the two models. The simulation starts with total FY 2022 rural carrier accrued cost of $9.223 billion. To get to a simulated box time, one can apply the RRECS box time proportion of [redacted] percent of total rural time and the RRECS coverage value of [redacted] percent. Multiplying those two percentages by total accrued rural cost produces a simulated accrued cost of $1.530 billion for box time. The simulation then uses the mean values for the various volumes to calculate the volume variable costs for DPS letters, non-DPS letters and flats, and parcels and accountables under the application of the one-variable and three-variable coverage models. The results of the simulations are presented in Table 19.

Table 19: Results of Simulating Volume Variable Box Time Costs Under Two Coverage Models

Volume Type	One Volume Model	Three Volume Model	Difference	% Difference
DPS	$388.48	$407.71	$19.23	5.0%
Non-DPS Letters & Flats	$180.71	$151.92	-$28.79	-15.9%
Parcels/Accountables	$34.51	$46.25	$11.73	34.0%
Total	$603.70	$605.88	$2.18	0.4%

Source: Simulation of Coverage Models xlsx

As expected, using the disaggregated model shifts volume variable cost toward those volume types that have higher coverage-causing characteristics, parcels and DPS letters. It also shifts volume variable cost away from the volume type that has the below average coverage-causing characteristics, non-DPS letters and flats. The biggest effect is for parcels and accountables, which experience a 34 percent increase in volume variable cost. This shift occurs because parcels have relatively small volume, so they receive a relatively small proportion of the volume variable cost in the one-variable model, and a relatively high impact on coverage, which the three-variable model captures. In sum, the three-variable model does a better job in attributing costs to products and is preferred over the one-variable model.

C. Calculating the Overall Rural Carrier Labor Variability

Once the variability for each time sequence and subsequence is determined, calculating the overall variability for labor time is straightforward. First, one identifies the sequences and subsequences that make up the carrier's day and confirms that the sum of their daily times equal total daily carrier time.[54] The next step is to calculate the total time, for each sequence, across all carrier routes.[55] The total times for each sequence are multiplied by the sequences' variabilities to calculate each sequences' volume variable time. When a sequence's variability is equal to one, the sequence's volume variable time will equal its accrued time. When a sequence's variability is zero, its volume variable time is also zero.

More formally, in the RRECS structure, the overall variability is the ratio of the total volume variable time (T^{VV}) to total time, which is the sum of volume variable time and non-volume variable time (T^{NVV}). Total volume variable and non-volume variable times are just the sums of the volume variable and non-volume variable times from the individual sequences, so the overall rural carrier volume variability (VV) is given by:

$$VV = \frac{\sum_{i=1}^{n} T_i^{VV}}{\sum_{i=1}^{n} T_i^{VV} + \sum_{j=1}^{m} T_j^{NVV}}$$

There are 98 sequences and subsequences that make up the rural carrier's day. Sixty-five percent (64) of those sequences and subsequences are volume variable, with 48 of the sequences and subsequences having a variability of one hundred percent and the other 16 being partly variable. The remaining 34 sequences and subsequences are not volume variable. Table 20 presents the breakout of RRECS total hours by those that

[54] This confirmation is done in the SAS program entitled, Confirm Sequences of Carrier's Day.sas which is contained in in USPS-RM2024-2-NP1, Calculate Volume Variability and Cost Pool Times Directory.

[55] The total times are calculated in the SAS program entitled, Create Total Times Dataset.sas which is contained in in USPS-RM2024-2-NP1, Calculate Volume Variability and Cost Pool Times Directory.

are volume variable and those that are not volume variable. It also presents the resulting overall labor variability.

Table 20: Calculating the RRECS Rural Carrier Labor Time Variability

Category	Hours
Volume Variable Time	307,527
Not Volume Variable Time	343,794
Total Time	651,321
[redacted]	
Volume Variability	47.2%

Source: Identify and Calculate VV Cost.sas

The RRECS labor time variability of 47.2 percent is substantially above the labor time variability from the established methodology of 39.0 percent.[56] [57]The increase in variability occurs for a number of reasons. First, under RRECS, box time is volume variable, whereas under the established methodology it is not. This is important because total box time, across numbers of bundles and types of receptacles is a large

[56] The overall labor variability in the established methodology is the cost-weighted average of the variability for evaluated routes (38.98 percent) and other routes (34 percent). RRECS does not distinguish between evaluated and other routes and the resulting variability applies to all routes.

[57] Rural carriers who use their own vehicles receive an Equipment Maintenance Allowance (EMA), which is not volume variable in either the established methodology or under RRECS. In FY 2022, the EMA was just over $644 million. The existence of the EMA reduces the overall rural carrier variability in the established methodology to 36 percent and the overall variability under RRECS to 44.2 percent.

time sequence in RRECS and applying the coverage variability to it makes it the largest volume variable sequence.[58]

Second, under RRECS rural carriers get explicit credit for verifying the addresses of mail as it is delivered. Because this activity occurs at every box that receives mail on the route, carriers get this time credit for all mail delivered directly to boxes. Verifying addresses is the second largest volume variable sequence, yet in the established methodology, this time is implicit in the non-volume variable box time.

Third, RRECS includes extensive detail on the handling and delivery of parcels. Carriers get time credit not only for the delivery of parcels to the door or mailbox, but also for preliminary parcel-related work like organizing their parcels in the office and preparing parcels at the vehicle for deliveries to the door. With the growth in parcel volumes, these additional parcel-related activities represent the third through fifth largest volume variable time sequences.

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[58] There are 15 subsequences that make up box time. They cover the 3 different bundle counts and the 5 different receptacle types. An individual route will have only 5 of the sequences as it has only one bundle type. The 15 box time subsequences make up 37.1 percent of volume variable time. The largest subsequence is Sequence 036_s101 which covers box time for curbline boxes on two-bundle routes, which accounts for 12 percent of volume variable time.

Table 21: Volume Variable Sequences with the Largest Volume Variable Times

Sequence	Description	Hours	% of VV Time
036_s101	Box time CURB (two-bundle)	[redacted]	[redacted]
086	Verify addresses	[redacted]	[redacted]
051	Prelim & concluding at vehicle for trip to door	[redacted]	[redacted]
020	Organize small and medium parcels	[redacted]	[redacted]
019	Organize large parcels	[redacted]	[redacted]

Source: Identify and Calculate Variability VV Cost.sas

V. DISTRIBUTING VOLUME VARIABLE COSTS TO PRODUCTS

Once volume variable costs have been calculated, the next step in the costing process is to distribute those costs to the products that caused them. In the established methodology for rural carriers, the distribution of volume variable costs to products is based upon an accurate, and approved, data system called the Rural Carrier Cost System (RCCS):[59]

> The RCCS manual sampling (RCCS-Manual) is a continuous, ongoing cross-sectional statistical study, or probability sample of rural carrier route-days. Approximately 6400 RCCS samples are scheduled each Fiscal Year. For each selected route-day, a sample of mail is selected, and for each selected mailpiece, the class, product, compensation category, and shape of mail is recorded directly into a portable microcomputer using the Computerized On-Site Data Entry Systems (CODES) software.

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[59] *See*, USPS-FY22-35_RCCS_Preface, Rural Carrier Cost System Documentation, Docket No. ACR 2022, December 29, 2022 at 2.

The role of RCCS is to distribute the costs in the various cost pools defined by the volume variable evaluation factors to individual Postal Service products:[60]

> Data from the RCCS-Manual are used to distribute volume variable costs across classes, products – including Extra Services, and price categories. The delivery portion of the RCCS (data collected via the CODES data collection system) provides the mail category data for the distribution of volume variable mail delivery costs.

The distribution keys in RCCS are primarily shape-based, including keys like DPS letters, other (cased) letters, cased flats, boxholders, parcels and accountables.

As explained in the previous section, in the established methodology, the volume variable costs for each evaluation factor cost pool are calculated by multiplying the factor's proportion of evaluated time ($\theta(i)$) times the current year's overall rural carrier volume variable cost:

$$VVC_{EA_V(i)} = VVC * \theta(i) = C_t * \varepsilon * \theta(i).$$

The amount of each evaluation factor's volume variable cost that is distributed to an individual product depends upon the product's proportion of the distribution key associated with that factor. For example, the volume variable cost attributed to product "j" in evaluation factor "i" is given by:

$$VVC^j_{EA_V(i)} = C_t * \varepsilon * \theta(i) * \ \delta(i)^j.$$

where $\delta(i)^j$ is the proportion of the ith distribution key associated with the jth product. In the established methodology, the volume variable costs for each evaluation factor cost pool are the amounts to which the distribution keys are applied. For example, in FY 2022, the Letters Delivered evaluation factor had $249.7 million in volume variable costs

[60] *Id*. at 3.

that were distributed to the various postal products like First-Class Single Piece Letters or Marketing Mail Letters, based upon the RCCS "Other Letters" distribution key. In the established methodology, the distribution step is relatively straightforward for two reasons. First, there is a correspondence between the historical Form 4241-based evaluation factors and the RCCS data structure. This correspondence facilitates linking distribution keys to cost pools. Second, there are relatively few evaluation factors, which limits the number of required distribution exercises.

Things are more complex under RRECS. First, there are many more time sequences and subsequences than under the current methodology. Second, those sequences and subsequences provide a much more detailed breakout of the carrier's activities, some of which will not have a direct correspondence to a single RCCS shape category. Consequently, the first step in distributing RRECS based volume variable costs to products is constructing cost pools that can effectively make use of the RCCS distribution keys.

The required RRECS cost pools can be developed by carefully examining the units associated with each volume variable sequence to identify what type of mail causes the cost in that sequence. The RRECS volume measure driving the sequence can be then aligned to an RCCS distribution key. However, there is much more detail in RRECS than there was in the historical Form 4241 evaluation system regarding the different activities required to handle and deliver parcels. RRECS identifies the specific time sequences associated with parcel delivery, depending upon whether the parcel is delivered to a mailbox, to a parcel locker, or to the door. Although RCCS contains information that permits constructing different distribution keys by mailbox, locker and door parcels, under the established costing methodology there is no benefit from doing so because the methodology contains only a single parcel cost pool.

With the application of RRECS, this is no longer true. A RRECS-based costing system can develop separate cost pools for mailbox, locker, and door parcels, making it useful to subdivide the RCCS parcel distribution key into three separate distribution keys, one for mailbox parcels, one for locker parcels, and one for door parcels.[61] The use of the three disaggregated parcel distribution keys increases the accuracy of parcel cost attribution because the parcel-type-specific cost pools are distributed on the parcel-type-specific distribution keys. This approach ensures that the products that cause the different types of parcel activities receive the volume variable costs they generate.[62]

Table 22 presents a concordance between the various RRECCS mail volume measures and the associated RCCS distribution keys.

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[61] For a description of how the FY2022 RCCS data were modified to construct the disaggregated parcel distribution keys, *see* the Appendix to the Proposal.

[62] The advantage of the disaggregated approach is demonstrated in the example provided in Section II.B., above.

Table 22: Concordance Between RRECS Volume Measures and RCCS Distribution Keys

RRECS Volume Measures			RCCS Distribution Keys
T06	T12		LETTERS DEL
T07	T08	T11	FLATS DEL
T15	T15a		DOOR PARCELS DEL
T16	T16a		MAILBOX PARCEL DEL
T17	T17a		LOCKER PARCEL DEL
T13	T14		BOXHLDRS DEL
T18			ACCTBLS DEL
T09			DPS DEL
T10			FSS (DPS FLATS)
T21			POSTAGE DUE
T22	T23		CARRIER PICKUP

Sources: RRECS_Solver_to_RMSS_EvaluationOutput_ICD_V1.3_20230130.docx and CS10-Public-FY22.xlsx

In many cases, the unit for the time sequence is “Piece,” and the associated RRECS volume measure, such as T06 or T11, can be used to determine the type of mail causing the cost. For example, Sequence 004, Casing Random Letters has “Piece” as its unit and the type of volume handled is T06, random (cased) letters. The distribution key that would apply to Sequence 004 is thus the RCCS Letters Delivered key. In other cases, the unit is indirect (e.g., bundles or trays), so additional investigation is required to identify the mail that goes into the bundle or tray.

When there is a direct correspondence between the RRECS volume type and the RCCS volume type, the RCCS distribution key can be directly applied. An example of this type of correspondence is given by Sequences 012 and 013, Casing Boxholder Flats and Letters. The associated RRECS volume measures are boxholder mail (T13 and T14), by shape, and, in combination, they link directly to the RCCS Boxholder distribution key. This pair of sequences also illustrates another aspect of cost pool formation under RRECS. There are cases when more than one sequence shares the same distribution key. As long as these time sequences also have the same variability, they can be combined into a single cost pool for distribution.

In some other cases, a time sequence includes more than one type of volume. In these cases, to have an accurate distribution of costs, the cost pool should be subdivided into shape-specific sub-pools. This can be done on the basis of (1) differing time standards and units by shape, (2) an estimated variability equation, or (3) relative RRECS volumes for the included shapes of mail.

There are also a few sequences (e.g., COD, or Money Orders) that refer to a specific product which matches only a subset of an RCCS distribution key. Because the time in these sequences is devoted to a single product, no distribution key is necessary as these costs can be directly distributed to that one product. Finally, there is a very small set of time sequences, with minimal times, that do not have a cost driver and cannot be associated with an RCCS distribution key. This tiny amount of cost must be distributed on RPW volumes. Distribution keys for the different types of sequences and subsequences are presented and discussed in the following subsections.

A. Analyzing Sequences that Match a Single RCCS Distribution Key

The development of separate RCCS parcel distribution keys based upon the location where the parcel is delivered creates two distribution keys that link directly to an associated RRECS cost pool.[63] The first one is for mailbox parcels. Sequence 040

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[63] Formally speaking, the RRECS sequences form *time* pools that will not be converted to *cost* pools until they are multiplied by current year accrued rural carrier costs. However, it is standard parlance in the established methodology to refer to these groupings of time as cost pools, and that will be continued here.

captures the time for delivering parcels in the mailbox. The RCCS distribution key for mailbox parcels captures the product volume breakout for those parcels which are delivered to the mailbox. There is thus a direct correspondence between the RRECS cost pool and the distribution key.

Delivering Mailbox Parcels Cost Pool

Sequence	Description	Distribution Key
SEQ040	Deliver parcels to mailbox	MAILBOX PARCEL DEL

The same condition arises for parcels that are delivered to a parcel locker. Sequence 041 captures the time for the delivery of these parcels and the RCCS locker parcel distribution key contains the product breakout for those parcels.

Delivering Locker Parcels Cost Pool

Sequence	Description	Distribution Key
SEQ041	Deliver parcels to parcel locker	LOCKER PARCEL DEL

B. Analyzing Sequences That Can Be Combined to Form a Single Cost Pool that Matches an RCCS Distribution Key

The first cost pool that can be formed by combining two or more sequences is the Casing Non-DPS Letters Cost Pool. This cost pool combines the casing time for random and WSS letters, both of which would be included in the RCSS Letters Delivered key.

Casing Non-DPS Letters Cost Pool

Sequence	Description	Distribution Key
SEQ004	Case random letters	LETTERS DEL
SEQ011	Case WSS letters	

A similarly structured cost pool is the DPS Cost Pool, whose associated sequences involve handling DPS letters. One sequence is for gathering DPS letters and the other is for casing them.[64] The unit for Sequence 007, Gathering DPS Letters, is "Tray" but the number of trays is determined by dividing the volume of DPS mail by a fixed number ([redacted]) of pieces per tray. The sequence thus links back to DPS pieces.

Casing DPS Cost Pool

Sequence	Description	Distribution Key
SEQ007	Gather DPS letters	DPS DEL
SEQ009	Case DPS letters	

The Casing Flats Cost Pool includes three sequences but all of them refer to flats that are cased and included in the RCCS Flats Delivered distribution key. That distribution key is therefore applicable to all three sequences.

[64] The existence of this cost pool does not mean that rural carriers routinely case their DPS mail. DPS letters will be cased only in the relatively few instances in which a route gets less than 400 pieces of DPS.

Casing Flats Cost Pool

Sequence	Description	Distribution Key
SEQ005	Case random flats	FLATS DEL
SEQ006	Case Carrier Route flats	
SEQ010	Case WSS flats	

The Casing Boxholders Cost Pool combines boxholder letter and flat casing, but because RCCS has a combined boxholder distribution key, the two time sequences will share the same distribution key and can be appropriately combined.

Casing Boxholders Cost Pool

Sequence	Description	Distribution Key
SEQ012	Case Boxholder flats	BOXHLDRS DEL
SEQ013	Case Boxholder letters	

One of the sequences in the FSS Cost Pool (Sequence 014) is for gathering the FSS mail (called DPS flats in RRECS) and that involves handling trays. But the number of trays is determined by dividing the volume of FSS mail by a fixed number ([redacted]) of pieces per tray, so Sequence 014 also has FSS volume as its cost driver. The RCCS FSS distribution key can be applied to both sequences in the cost pool.

FSS Cost Pool

Sequence	Description	Distribution Key
SEQ014	Gather DPS flats	FSS (DPS Flats)
SEQ016	Case DPS flats	

The Postage Due cost pool includes both the collection of Postage Due and its processing. But the two sequences both have Postage Due as their RRECS cost driver and can be combined to associate with the RCCS Postage Due distribution key.

Postage Due Cost Pool

Sequence	**Description**	**Distribution Key**
SEQ024	Process postage due	POSTAGE DUE
SEQ045	Collect postage due	

Unlike the delivery of mailbox and locker parcels, which have a single dedicated cost pool associated with them, door parcel delivery has three dedicated cost pools. All three of the cost pools have "Piece" as their unit and all three record time exclusively for handling and delivering door parcels. The three can thus be combined into a single cost pool. The first sequence captures the time for organizing door parcels in the office.[65] The second one, Sequence 060 captures the time associated with carriers reloading door parcels onto their vehicle for delivery. The third one, Sequence 039 measures the time for delivering parcels to the door.

[65] Although the title of this sequence (019) is Organize Large Parcels, it could be named Organize Door Parcels because in RRECS large parcels and door parcels are the same thing.

Deliver Door Parcels Cost Pool

Sequence	Description	Distribution Key
SEQ019	Organize large parcels	
SEQ039	Deliver parcels to door	DOOR PARCELS DEL
SEQ060	Reload large parcels for delivery	

There are four different time sequences that go into the Carrier Pickup Cost Pool. Only one of them has “Piece” as its unit, but the other three activities, with “Event,” “Scan,” and “Form” units all are solely related to Carrier Pickups. As there is only one type of volume handled in these cost sequences, the Carrier Pickup distribution key can be applied to them all.

Carrier Pickup Cost Pool

Sequence	Description	Distribution Key
SEQ026	Process carrier pick-up event forms	CARRIER PICKUP
SEQ049	Carrier pickup & prepaid event	
SEQ050	Carrier pickup & prepaid items	
SEQ082	Carrier pickup items and manifest scans	

C. Analyzing Sequences that Link to More than One RCCS Distribution Key and Should Be Split into Smaller Cost Pools.

Sequence 086, Verify Addresses, is large, in terms of daily time, and provides carriers with time credit for verifying the addresses on mail before it is deposited in the mail receptacle. Carriers get credit for each piece that is delivered, so the volumes verified run across several RCCS distribution keys, including letters delivered, DPS delivered, flats delivered, FSS delivered, and mailbox parcels delivered. One might consider constructing a single Verify Addresses cost pool and distribute its volume variable costs on the relative volumes in a combined distribution key, but that would not be accurate because letters and flats (including parcels cased with flats) have different verification time standards. Carriers get [redacted] minutes for letters and [redacted] minutes for flats and small parcels that are cased with flats. In RRECS, small parcels are calculated as [redacted] percent of the parcels delivered to the mailbox.

These different time standards mean that the different types of mail receive different time credits, and accurate attribution requires creating cost pools that are subsets of Sequence 086 time and that reflect these different standards. Specifically, four separate cost pools are appropriate, one for each of the volume shapes verified.

Verify Addresses Cost Pools

Cost Pool	Formula	Distribution Key
VERIFY_L	[redacted]*(Random Letters + WSS Letters)	LETTERS DEL
VERIFY_L	[redacted]*(DPS Letters)	DPS DEL
VERIFY_F	[redacted]*(Random Flats + CRRT Flats + FSS + WSS Flats)	FLATS DEL
VERIFY_MP	[redacted]*[redacted]* Parcels Delivered to Mailbox)	MAILBOX PARCELS DEL

There are three volume variable sequences associated with pulling down mail. The first, Sequence 017A, Pull Down Handle Trays, captures the time carriers need for handling trays of cased mail, both preparing empty trays to be filled and the loading of full trays into a cart for transfer to the vehicle. The unit for this sequence is “Tray,” where the number of trays is calculated as a function of the amount of cased mail. The number of trays is found by dividing the route’s cased mail by [redacted] pieces per tray.

The second sequence, Sequence, 017B1, Pull Down Handful, captures the time carriers spend preparing and positioning the mail into handfuls for pulling down. The unit for this sequence is “Handful,” and the number of “Handful” units is found by dividing the volume of cased mail by [redacted]. The third sequence, Sequence 017C, Position and Remove Rubber Bands, captures the time carriers spend putting rubber bands around the mail that is pulled down and the time they spend removing the rubber bands prior to address verification. The unit for Sequence 017C is “Rubber Band,” and the number of “Rubber Band” units is also found by dividing the volume of cased mail by [redacted]. All three of these time sequences are driven by cased mail. They have the same variability (one hundred percent) and the same distribution key. They can be combined into a single cost pool, called Pulldown Cost Pool.

Cased mail includes random letters and flats, carrier route flats, WSS letters and flats, boxholder letters and flats, and cased parcels. Under certain conditions, cased mail can also include DPS and FSS mail.

Cased mail includes DPS only when the route receives less than 400 pieces of DPS. This happens on just [redacted] percent of routes, and those routes include just [redacted] percent of DPS volume. Cased mail includes FSS only when the carrier does not have a USPS vehicle or the USPS vehicle is left-hand drive. This happens on [redacted] percent of routes, but includes just [redacted] percent of FSS volume. Finally, cased mail includes only the small parcel proportion of mailbox parcels. Given these values, it does not seem appropriate to include DPS, FSS, and parcels with equal weight as regularly cased letters and flats when subdividing the Pulldown cost pool by type of mail. Doing so would overstate their role in causing cased mail costs.

Instead, the RRECS formula for cased mail can be applied to form the separate subset cost pools that each align with an individual RCCS distribution key. The cased mail (CM) formula is given by:

CM = *(T06+T07+T08+T11+T12+T13+T14*

+ ([redacted] ** (T16+T16A)))*

+ *if (T09<400), then T09, else 0*

+ *if (T3=0 or T58=1) then T10, else 0*

This formula can be operationalized by identifying the different types of volume and inserting the actual probabilities of the two conditional statements:

CM = *T06+T12 (Letters)*

+T07+T08+T11 (Flats)

+T13+T14 (Boxholder)

+[redacted]* *(T16+T16A) (Parcels)*

+ [redacted]**T9 (DPS)*

+ [redacted]**T10 (FSS)*

The cased mail proportions implied by this formula can be applied against total Pull Down time to produce six subsets, creating individual Pull Down cost pools, each with its own distribution key:[66]

Pull Down Pools

Cost Pool	**Description**	**Distribution Key**
PULLDOWN_L	[(T06+T12)/CM]*PULL DOWN Time	LETTERS DEL
PULLDOWN_F	[(T07+T08+T11)/CM]*PULL DOWN Time	FLATS DEL
PULLDOWN_B	[(T13+T14)/CM]*PULL DOWN Time	BOXHLDRS DEL
PULLDOWN_MP	[redacted]*(T16+T16A)/CM]*PULL DOWN Time	MAILBOX PARCELS DEL
PULLDOWN_D	[redacted]*(T09)/CM]*PULL DOWN Time	DPS DEL
PULLDOWN_S	[redacted]*(T10)/CM]*PULL DOWN Time	FSS

[66] Only mailbox parcels are cased so the corresponding distribution key for the markup of cased parcels is the RCCS mailbox parcel key.

There is another time sequence that has "Tray" as its unit, but it depends upon a different set of mail types. Sequence 058, Reload Mail for Delivery credits the route with time for reloading mail, depending upon the number of trays handled which, in turn, depends upon the amounts of random mail, boxholder mail, DPS mail, FSS mail, and their associated standards for pieces per tray.

There are four types of trays handled in the reload activity:

$$Trays = Random\ Mail\ Trays + Boxholder\ Trays + DPS\ Trays + FSS\ Trays$$

The number of each type of tray handled is calculated by dividing the volumes of the relevant mail categories by the associated standards for pieces per tray:

$$Trays = \overbrace{((T06+T12+T14) \div S202) + ((T07+T08+T11+T13) \div S203) + ((T16+T17) \div S204)}^{\text{Random Mail Trays}}$$

$$+ \underbrace{((T13+T14) \div S205)}_{\text{Boxholder Trays}} + \underbrace{(T09 \div S200)}_{\text{DPS Trays}} + \underbrace{(T10 \div S201)}_{\text{FSS Trays}}$$

or:

Trays = (Cased Letters ÷ [redacted]) + (Cased Flats ÷ [redacted]) + (Small/Medium Parcels ÷ [redacted])

+ (Boxholders ÷ [redacted]) + (DPS ÷ [redacted]) + (FSS ÷ [redacted]).

The proportions of trays, by type, can then be used to form the seven subset Reload Mail cost pools:[67]

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[67] In RRECS, the sum of small and medium parcels equals the sum of mailbox and locker parcels, so the time associated with reloading the trays of small and medium parcels can be appropriately divided into the times for mailbox and locker parcels.

Reload Mail For Delivery Cost Pools

Sequence	Description	Distribution Key
RELOAD_L	[((T06+T12+T14) ÷ [redacted])/TRAYS]*RELOAD Time	LETTERS DEL
RELOAD_F	[((T07+T08+T11+T13) ÷ [redacted])/TRAYS] *RELOAD Time	FLATS DEL
RELOAD_B	[((T13+T14) ÷ [redacted])/TRAYS]*RELOAD Time	BOXHLDRS DEL
RELOAD_MP	[((T16) ÷ [redacted])/TRAYS]*RELOAD Time	MAILBOX PARCELS DEL
RELOAD_LP	[((T17) ÷ [redacted])/TRAYS]*RELOAD Time	LOCKER PARCELS DEL
RELOAD_D	[(T09 ÷ [redacted])/TRAYS]*RELOAD Time	DPS DEL
RELOAD_S	[(T10 ÷ [redacted]/TRAYS]*SEQ058 Time	FSS

The structure of Sequence 027, Process Markup Bundles, is similar to the reload sequences, in the sense that the evaluated time depends upon many different types of volumes, but rather than “Tray” being the unit, it is “Bundle.” Carriers get credit for each bundle of mail marked up, and the number of bundles marked up is calculated from each route’s relevant volume of letters, flats, DPS, FSS, and small parcels multiplied by the markups per bundle standard of [redacted]. The marked-up bundles formula is given by:

*Marked Up Bundles = (T6+T7+T8+T9+T10+T11+T12+([redacted]*T16))* [redacted]

Using the standard time per marked up bundle, one can also calculate the proportions of time associated with the different mail shapes: cased letters (T06+T12), cased flats (T07+ T08+T11), cased parcels ([redacted]*T16), DPS (T09), and FSS (T10). These time proportions support the construction of shape-specific cost pools:[68]

Process Markup Bundles Cost Pools

Cost Pool	Description	Distribution Key
MARKUP_L	[(T06+T12) * [redacted]/BUNDLES] *Markup Time	LETTERS DEL
MARKUP_F	[(T07+T08+T11) * [redacted]/BUNDLES] * Markup Time	FLATS DEL
MARKUP_MP	[redacted]* (T16) * [redacted]/BUNDLES] * Markup Time	MAILBOX PARCELS DEL
MARKUP_D	[(T09) * [redacted]/BUNDLES] *Markup Time	DPS DEL
MARKUP_S	[(T10) * [redacted]/BUNDLES] *Markup Time	FSS

Forming cost pools for Direct Door Delivery (DDD) requires two steps. In the first step, the four different sequences that comprise DDD are combined into one aggregate cost pool.

[68] Only mailbox parcels are marked up, so the corresponding distribution key for the markup of cased parcels is the RCCS mailbox parcel key.

Direct Door Delivery Sequences

Sequence	Description	Distribution Key
SEQ051	Prelim & concluding at vehicle for trip to door	DOOR PARCELS DEL & ACCOUNTABLES DEL
SEQ052	Gather accountable mail/large parcel at vehicle	
SEQ037	Drive (mail stop to DDD stop)	
SEQ038	Walking speed (DDD stop to door)	

Of the four sequences, only Sequence 052 has pieces associated with it (the Sequence 051 unit is "Trip" and the unit for Sequences 037 and 038 units is "Foot.") But the volumes counted in Sequence 051 are the door parcel and accountable volumes that are gathered for delivery to the door. It is reasonable that these are also the volumes that caused the additional DDD stops and thus caused the DDD drive time, the DDD walking time, and the DDD time at vehicle. Consequently, the volumes that drive Sequence 052 also are applicable to the other three sequences.

The second step addresses the fact that the DDD distribution key is "mixed," meaning it is made up of more than one RCCS distribution key. The DDD distribution key includes both door parcels and accountables. To account for this mixture, one could just apply the relative volume proportions from RCCS for the individual door parcel and accountable products to distribute the volume variable costs, but that would ignore the fact that the calculation of DDD time in RRECS depends upon the RRECS door parcel and accountable volumes, not RCCS volumes. It is appropriate, therefore, to first subdivide the DDD cost pool into a door parcel sub pool and an accountable sub pool, and then distribute the costs to parcel and accountable products within each sub pool. The RRECS DDD volume (DDDV) is given by the following formula:

		Door Parcels		Accountable Mail		Customs Due		COD		Postage Due
DDDV	=	T15 + T15A	+	T18	+	T19	+	T20	+	T21

The relative proportions of the RRECS DDD volume can then be used to define the individual DDD sub pools that align with RCCS distribution keys.

Direct Door Delivery Cost Pools

Cost Pool	**Description**	**Distribution Key**
DDD_DP	((T15 + T15A)/DDDV) * DDD Time	DOOR PARCELS DEL
DDD_A	(T18)/DDDV) * DDD Time	ACCOUNTABLES DEL
DDD_CUS	(T19)/DDDV) * DDD Time	CUSTOMS DUE
DDD_COD	(T20)/DDDV) * DDD Time	COD
DDD_PD	(T21)/DDDV) * DDD Time	POSTAGE DUE

Sequence 032, Load Vehicle Time, is the actual elapsed time, measured by carriers using their scanners. As a result, there is no unit associated with this sequence with which to identify sub pools. This is an issue for Sequence 032 because many different types of volume are loaded into vehicles, meaning that a single Load Vehicle

Time cost pool would have a mixed distribution key. However, the variability for Load Vehicle Time is determined by an econometric equation, and the variabilities from that equation can be used to construct cost pools by multiplying them by total vehicle load time. The econometric model has two volume vectors which together determine volume variable loading time, each with its own variability. Applying the two variabilities to accrued vehicle loading costs automatically produces the two separate cost pools required for distribution.

The volumes in each of the two vectors can be used to identify the relevant RCCS cost pools. The first volume vector has many different types of volume, so it can be decomposed into separate cost pools to line up with separate RCCS distribution keys. The second vector contains only door parcels and can be associated with the RCCS door parcel distribution key. Mailbox and locker parcels are included in the first volume vector and the volume variable times for loading these types of parcels is distributed to products based upon their associated distribution keys.

The letter, flat, boxholder, DPS, FSS, mailbox parcel, locker parcel, and accountable cost pools are formed as for previous cost pools with mixed distribution key, using their proportions of the relevant volume (CNT) within the first vector:

$$CNT = T06 + T07 + T08 + T09 + T10 + T11 + T12 + T13 + T14 + T16 + T16A + T17 + T17A + T18 + T19 + T20 + T21$$

Load Vehicle Time Cost Pools

Cost Pool	Description	Distribution Key
LV_L	[(T06+T12)/CNT] * 0.2396 * LOAD VEHICLE Time	LETTERS DEL
LV_F	[(T07+T08+T11)/CNT] * 0.2396 * LOAD VEHICLE Time	FLATS DEL
LV_B	[(T13+T14)/CNT] * 0.2396 * LOAD VEHICLE Time	BOXHLDRS DEL
LV_MP	[[(T16+T16A)/CNT] * 0.2396] * LOAD VEHICLE Time	MAILBOX PARCELS DEL
LV_LP	[[(T17+T17A)/CNT] * 0.2396] * LOAD VEHICLE Time	LOCKER PARCELS DEL
LV_DP	[0.3219] * LOAD VEHICLE Time	DOOR PARCELS DEL
LV_D	[(T09)/CNT] * 0.2396 * LOAD VEHICLE Time	DPS DEL
LV_S	[(T10)/CNT] * 0.2396 * LOAD VEHICLE Time	FSS DEL
LV_A	[(T18+T19+T20+T21)/CNT] * 0.2396 * LOAD VEHICLE Time	ACCTBLS DEL

The other set of sequences that depend upon the results of an econometric equation to determine cost pools are those that comprise box time. As explained above, there are fifteen different time sequences defined by three different levels of bundles and five different types of delivery receptacles that combine to determine total box time. The unit for all of these sequences is "Box," which does not have a link to volume, so there is no direct link to distribution keys. The variability for this cost pool arises indirectly, through the variability of coverage with respect to volume. Box time, consequently, gets its variability from the estimated coverage equation.

The variability equation has three volume vectors: non-DPS letter and flats, DPS, and parcels and accountables, each with its own variability. These variabilities can be used to form three box time sub pools. The DPS letters sub pool aligns directly with the DPS distribution key from RCCS, but the non-DPS letter and flat sub pool and the parcel and accountable sub pool have mixed distribution keys, and like the Direct Door Delivery cost pool, the proportions of RRECS volumes must be applied to construct shape-specific sub pools that align with RCCS distribution keys.

The volume for the non-DPS letter and flat sub pool is given by:

LFB = T06+T12+T07+T08+T10+T11+T13+T14.

The volume for the parcel and accountable cost pool is given by:

PAB = T16+T16A+T17+T17A+T18.

With these definitions, the Box Time Cost pools can be formed:

Box Time Cost Pools

Cost Pool	Description	Distribution Key
BOX_L	0.0993 * ((T06+T12)/LFB) * BOX Time	LETTERS DEL
BOX_F	0.0993 * ((T07+T08+T11)/LFB) * BOX Time	FLATS DEL
BOX_B	0.0993 * ((T13+T14)/LFB) * BOX Time	BOXHLDRS DEL
BOX_S	0.0993*((T10)/LFB) * BOX Time	FSS DEL
BOX_DPS	0.2665 * BOX Time	DPS DEL
BOX_MP	0.0302 * ((T16+T16A)/PAB) * BOX Time	MAILBOX PARCELS DEL
BOX_LP	0.0302 * ((T17+T17A)/PAB) * BOX Time	LOCKER PARCELS DEL
BOX_A	0.0302*(T18/PAB) * BOX Time	ACCTBLS DEL

There are two sequences that handle both locker and mailbox parcels. Both of the sequences can be divided into parcel-type-specific cost pools that match directly to an RCCS distribution key.

The first sequence to be divided is Sequence 020, Organize Small and Medium Parcels. This sequence measures the time to organize the small and medium parcels that will be delivered to mailboxes and parcel lockers. The unit for this sequence is

"Piece," so the separate times for organizing mailbox and locker parcels can be constructed by applying the relative amounts of volume, of each type, to the sequence time.

Organize Small/Medium Parcels Cost Pools

Cost Pool	Description	Distribution Key
ORG_MP	[(T16+T16a)/(T16+T16a+T17+T17a)]*ORG S/M PARCELS Time	MAILBOX PARCELS DEL
ORG_LP	[(T17+T17a)/(T16+T16a+T17+T17a)]*ORG S/M PARCELS Time	LOCKER PARCELS DEL

The other sequence handling mailbox and locker parcels is Sequence 059, Reload Medium Parcels for Delivery. In RRECS, medium parcels on a route are defined a fixed percentage ([redacted]) of the sum of mailbox and locker parcels. Consequently the proportions of mailbox and locker parcels in the medium parcel category equals the proportions of mailbox and locker parcels in their overall sum.[69] Although the unit for this sequence is "Tray," there is a single standard for the number of medium parcel pieces per tray regardless of where they are delivered, so the relative volumes of mailbox and locker parcels can be used to construct the separate cost pools for mailbox and locker parcels.

[69] Let MED represent medium parcels, MP represent mailbox parcels, and LP represent locker parcels. Then MED = [redacted] * (MP+LP). The number of mailbox parcels that are medium (MED_MP) = [redacted] * MP. The proportion of medium parcels that are delivered to the mailbox is equal to MED_MP / MED. This is equal to [redacted] * MP / [redacted] (MP+LP) = MP / (MP+LP).

Reload Medium Parcels Cost Pools

Cost Pool	Description	Distribution Key
ORG_MP	[(T16)/(T16+T17)] * RELOAD MEDIUM PARCELS Time	MAILBOX PARCELS DEL
ORG_LP	[(T17)/(T16+T17)] * RELOAD MEDIUM PARCELS Time	LOCKER PARCELS DEL

D. Analyzing Sequences that Match to a Subset of an RCCS Distribution Key.

The RRECS COD cost pool has two sequences, one for processing CODs (Sequence 023) and one for delivering CODs (Sequence 044). Both of them handle just one product - CODs. The distribution key for the COD cost pool is the COD volume within the RCCS Special Services key.

COD Cost Pool

Sequence	Description	Distribution Key
SEQ023	Process COD	COD
SEQ044	Deliver COD	

There is also a separate Money Order volume measure within the RCCS Special Services key. In addition, the Money Order cost pool has just one sequence, Sequence 047, Collect Money Order Applications, and only money orders are handled in that sequence. The distribution key for this cost pool is Money Orders from RCCS.

Money Order Cost Pool

Sequence	Description	Distribution Key
SEQ047	Collect money order applications	MONEY ORDERS

The unit of the Express Mail Deviations Cost Pool is "MDD," meaning there is not a direct link between the time incurred and a measure of volume. But, because there is only one product handled in this sequence, Sequence 053, the distribution key is simply Priority Mail Express, as all of the cost from this cost pool goes to that product.

Express Mail Deviations Cost Pool

Sequence	**Description**	**Distribution Key**
SEQ053	Deviation for express delivery	PME

The last sequence that aligns with a subset of an RCCS distribution key is also a combined sequence. Sequence 046, Collect Registered/Certified Mail captures any time that the carrier spends collecting Registered or Certified Mail from customers' mailboxes. The time standard is the same for both types of mail and there is no count of Registered and Certified Mail, but the estimated volume is based upon a historical, network-wide, average number of Registered and Certified pieces per address, per day, of [redacted].[70] For each route, that average is multiplied by the number of addresses on the route to estimate the Registered and Certified mail collected. For a typical route with 600 addresses, the estimated volume would be [redacted] per day.

Under these circumstances the distribution key would just be the relative amounts of RCCS Registered and Certified collected volumes from RCCS.

[70] When constructing RRECS, a determination was made that there was an insufficient volume of Certified and Registered Mail collected from customers to justify attempting to count the pieces.

Collect Registered/Certified Mail

Sequence	Description	Distribution Key
SEQ046	Collect registered/certified mail	ACCOUNTABLES COLLECTED

E. Analyzing Sequences that Do Not Have a Known Distribution Key

There are five very small cost pools that do not have an identifiable product or set of products associated with them. These cost pools are general activities that are volume related, in a broad sense, but there is insufficient information to determine which product volumes are handled. Table 23 provides each of the five cost pools' proportions of carrier time. Given their small size and the lack of a known distribution key, their costs will be distributed on the basis of RPW volumes.

Table 23: Time Proportions for Small Cost Pools without Distribution Keys

Cost Pool	Proportion of Carrier Time
PARS Cost Pool	0.00038
Accept Certain Parcels Cost Pool	0.00001
Miscellaneous Delivery Cost Pool	0.00001
Extra Dismount Cost Pool	0.00139
Customs Due Cost Pool	0.00006

Source: Form Cost Pool Proportions.sas

VI. CALCULATING PRODUCT VOLUME VARIABLE COSTS

In the previous section of this report, a set of RRECS cost pools were constructed so as to embody all of the volume variable time sequences while being consistent with the existing RCCS distribution keys. In a number of cases, this involved splitting an RRECS time sequence, like Pull Down Handle Trays, or a group of common time sequences, like the ones that comprise Direct Door Delivery, into smaller, shape-based cost pools. This construction relied upon a number of approaches such as applying different shape-based RRECS time standards (Verify Addresses), applying the different shape-based physical characteristics, like pieces per tray (Reload Mail for Delivery), or applying the variabilities estimated in an econometric equation (Load Vehicle).

This breakout analysis resulted in 71 different cost pools and sub pools, nearly all of which are consistent with the RCCS distribution keys.[71] A review of the 71 different cost pools and sub pools shows that they can be combined in a manner that preserves the consistency with RCCS distribution keys. For example, there are seven individual cost pools that all link to the Letters Delivered RCCS distribution key. These seven individual cost pools contain only volume variable cost, and all share the same distribution key, so they can legitimately be combined into a single Letters Delivered cost pool. This combination of individual cost pools is illustrated in Figure 6.

[71] The only cost pools that were not linked to the RCCS distribution keys were the 5 cost pools that did not have either a direct or an indirect link to specific types of volume, due to their extremely small size and nature. These cost pools use the default of RPW product volumes for their distribution keys.

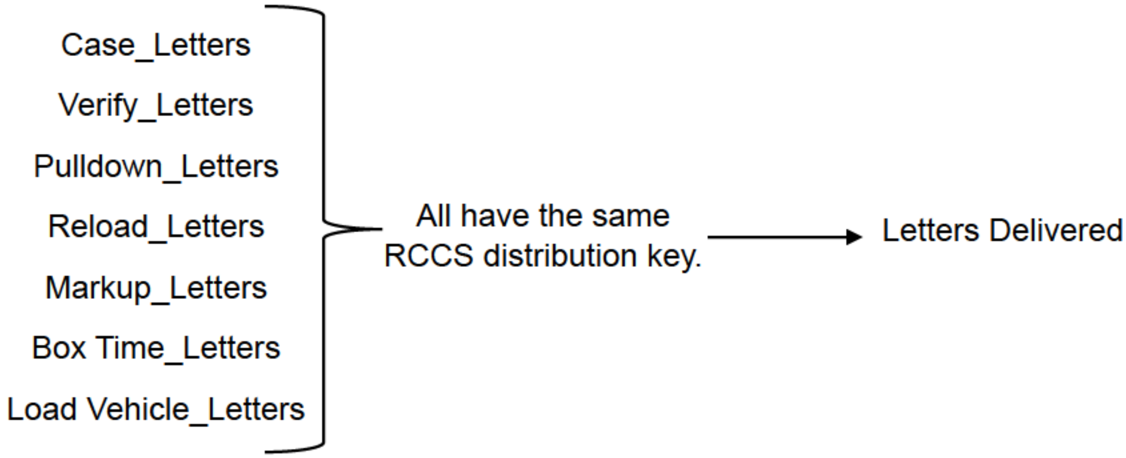

Figure 6: Cost Pools Sharing the Letter Distribution Key

Similar combinations can be made for other sets of individual cost pools which share the same distribution key, including, for example, cased flats, DPS letters, door parcels, mailbox parcels, locker parcels, and boxholders. Some of the individual cost pools do not have a common distribution key and will remain as individual cost pools in the final list. Table 24 presents the list of final cost pools along with an enumeration of how many individual cost pools are included in each.[72]

[72] The formulas for each of the combined cost pools are presented in Form Cost Pool Proportions.sas which is included in in USPS-RM2024-2-NP1, Calculate Volume Variability and Cost Pool Times Directory.

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Table 24: Structure of Final Cost Pools

Final Cost Pool	# of Individual Cost Pools
Cased Letters	7
Cased Flats	7
Door Parcels	4
Mailbox Parcels	10
Locker Parcels	7
Boxholders	5
Accountables	4
DPS	6
FSS	6
Postage Due	2
Carrier Pickup	1
COD	2
Money Order	1
Priority Mail Express	1
Registered/Certified	1
PARS	1
Extra Dismount	1
Customs	2
ACP	1
Miscellaneous	1

Source: Form Cost Pool Proportions.sas

A. Calculating the Current Year Volume Variable Cost for Each Cost Pool

In the established rural carrier cost model, the volume variable costs for each cost pool are calculated as follows. First, the accrued costs for rural carriers are accumulated separately, for the first two postal quarters, and then for the second two postal quarters of the fiscal year (This is done in CS10-Public-FY22.xlsx at Tab 10.0.1). Next, an exogenously determined overall rural carrier variability is applied to the accrued costs to compute overall volume variable costs. (This is also done in CS10-Public-FY22.xlsx at Tab 10.0.1). Lastly, by half-year, the overall volume variable costs are allocated to cost pools based upon the Form 4241 evaluation factors and the 2018 RMC volumes. (This is done in CS10-Public-FY22.xlsx at Tabs 10.1.1 PQ1-2 and 10.1.1 PQ3-4).

In contrast, in the RRECS structure, the overall variability is endogenous. Rather than being calculated exogenously, it is determined in each half year by the distribution of rural carrier times across the completely volume variable, the partially volume variable and the non-volume variable time sequences. The overall variability is just the ratio of the resulting volume variable time to all time. This is an advantage of the RRECS structure, as the overall variability can be updated semi-annually without having to re-estimate any variability models by simply using the most recent RRECS data. The recalculated variability thus reflects any changes in rural carrier volumes or operations.[73] It also means that RRECS requires a somewhat different approach to

[73] Because RRECS is just beginning, in Proposal Eight there is only one set of variabilities calculated for both sets of semi-annual accrued costs. However, if the proposal is accepted, ongoing RRECS data could be used to update the variability twice a year.

calculating volume variable costs, by cost pool, that does not rely upon an exogenous overall variability.

In the RRECS structure, the overall variability is the ratio of the total volume variable time (T^{VV}) to total time (T^{VV}+T^{NVV}):

$$VV = \frac{\sum_{i=1}^{n} T_i^{VV}}{\sum_{i=1}^{n} T_i^{VV} + \sum_{j=1}^{m} T_j^{NVV}}.$$

By separating the individual volume variable cost pools that make up the numerator of the formula, one can demonstrate that for an individual volume variable cost pool, the proportion of volume variable time is given by the ratio of that cost pool's time to total time:

$$VVTP(p) = \frac{T_p^{VV}}{\sum_{i=1}^{n} T_i^{VV} + \sum_{j=1}^{m} T_j^{NVV}}.$$

A similar formula holds for a cost pool that is a combination of RRECS time sequences.

$$VVTP(\tilde{p}) = \frac{T_p^{VV} + T_q^{VV} + T_r^{VV}}{\sum_{i=1}^{n} T_i^{VV} + \sum_{j=1}^{m} T_j^{NVV}}.$$

These RRECS proportions can be used to calculate the current year volume variable cost for each related cost pool. In a given year, that volume variable cost, ($VVC_t(p)$), for a given cost pool, is found by multiplying the RRECS proportion by the accrued rural carrier cost for that year:

$$VVC_t(p) = C_t\left(\frac{T_{p,t}^{VV}}{\sum_{i=1}^{n} T_{i,t}^{VV} + \sum_{j=1}^{m} T_{j,t}^{NVV}}\right).$$

Table 25 presents the RRECS proportions for the volume variable cost pools along with the application of the proportions to the first two quarters of FY 2022 costs.

Table 25: FY 2022 Quarters 1 & 2 Rural Carrier Volume Variable Costs By Cost Pool

VOLUME VARIABLE COST POOL	PROPORTION OF ACCRUED COST	DISTRIBUTION OF VVC (Thousands)
LETTERS	3.72%	$171,140
FLATS	7.71%	$354,275
DOOR PARCELS	15.78%	$725,221
MAILBOX PARCELS	7.02%	$322,508
LOCKER PARCELS	0.60%	$27,359
BOXHLDRS	1.07%	$49,233
COD	0.00%	$32
ACCTBLS	1.55%	$71,391
DPS	8.93%	$410,532
FSS	0.20%	$9,034
POSTDUE	0.01%	$469
PICKUPS	0.36%	$16,743
MONORDER	0.00%	$113
EXPRESS	0.07%	$3,178
REGCERT	0.00%	$109
PARS	0.04%	$1,767
EXTRA_DM	0.14%	$6,409
CUSTOMS	0.01%	$288
ACP	0.00%	$56
MISC	0.00%	$54
TOTAL VOLUME VARIABLE COST		$2,169,911
ACCRUED COST		$4,595,717
VARIABILITY		47.2%

Source: CS10-NP FY22.RRECS.xlsx

The largest aggregate cost pool is for the door parcel handling and delivery time, representing 15.8 percent of accrued costs. Cased flats and DPS are the next largest aggregate cost pools at 7.7 percent and 8.9 percent of accrued cost, respectively. The sum of the allocated volume variable costs divided by accrued cost produces the overall variability of 47.2 percent. This matches the sum of the proportions of accrued cost made up by the volume variable cost pools.

B. Distributing the Volume Variable Costs to Products

The distribution of cost pool costs to products follows the established methodology with the exception that it relies upon calculating a single distribution of costs, as opposed to separate distributions for evaluated routes and other routes, because RRECS combines the two types of routes in its sequence time calculations. Each cost pool has been structured to have a single distribution key associated with it, so the distribution of volume variable costs is relatively straightforward. Each product receives a proportion of the cost pool's volume variable cost that equals its proportion of the volume in the distribution key. This proportion is called the product's distribution factor

For example, below is the formula for the distribution factor for First Class Single Piece in the Letter cost pool:

$$DF_{FCSP}^{L} = \frac{V_{FCSP}^{L}}{\sum_{k=1}^{w} V_{k}^{L}}$$

Table 26 presents the results of applying this distribution methodology to the major cost pools and product groups.[74]

[74] The detailed distribution of volume variable costs to all products, in all cost pools, is presented in in USPS-RM2024-2-NP1, Calculate Product Volume Variable Costs and Impact Analysis Directory.

Table 26: Distribution of Volume Variable Costs for Major Cost Pools

PRODUCT	Letters	Flats	Mailbox Parcels	Door Parcels	Locker Parcels	Box-holders	Account-ables	DPS	FSS
Total First-Class Mail	132,878	35,323	0	0	0	107	0	381,945	599
Total USPS Marketing Mail	206,273	531,265	1,909	1,727	40	95,262	0	439,431	15,155
Total Periodicals	1,965	138,771	0	0	0	2,084	0	161	2,322
Total Package Services	32	4,953	24,326	56,460	10,089	0	0	0	45
Total Domestic Market Dominant Mail	342,995	710,686	27,608	64,799	11,779	98,804	0	823,555	18,127
Total Domestic Market Dominant Mail and Services	342,995	710,686	27,608	64,799	11,779	98,804	124,398	823,555	18,127
First-Class Package Service	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Priority Mail	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Parcel Select	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total Domestic Competitive Mail and Services	0	0	613,654	1,382,810	42,727	0	1,780	0	0
Total International Mail And Services	460	297	5,968	7,815	400	0	17,094	328	3

Source: CS10-NP FY22.RRECS.xlsx

Table 26 shows that First Class Mail's volume variable cost comes primarily from letter shaped mail, both cased letters and DPS letters. Marketing Mail is more mixed with large proportions of volume variable cost coming from both letters and flats, with a material contribution from boxholders. The volume variable cost for Periodicals comes nearly all from flats and the volume variable costs for competitive products comes almost exclusively from parcels.

C. Summing the Volume Variable Costs Across Cost Pools

The final step in calculating product volume variable costs is also straightforward. One just adds the volume variable costs, by product, across the cost pools to find each product's volume variable cost. Table 27 presents those product volume variable costs for FY 2022 produced under RRECS along with their counterparts produced under the established methodology.[75]

[75] The complete volume variable costs for individual Market Dominant and Competitive products are presented in USPS-RM2024-2-NP1, Calculate Product Volume Variable Costs and Impact Analysis Directory.

Table 27: Assessing the Impact of RRECS on FY 2022 Volume Variable Costs by Product Groups (Thousands of Dollars)

Product	Existing VV Cost	RRECS VV Cost	Difference	% Change
Total First-Class Mail	540,481	557,808	17,327	3.2%
Total USPS Marketing Mail	1,319,505	1,300,303	-19,202	-1.5%
Total Periodicals	183,189	145,762	-37,427	-20.4%
Total Package Services	56,896	96,490	39,594	69.6%
Total Domestic Market Dominant Mail	2,109,345	2,114,648	5,303	0.3%
Total Domestic Market Dominant Services	211,099	124,964	-86,135	-40.8%
First-Class Package Service	[redacted]	[redacted]	[redacted]	[redacted]
Priority Mail	[redacted]	[redacted]	[redacted]	[redacted]
Parcel Select	[redacted]	[redacted]	[redacted]	[redacted]
Total Domestic Competitive Mail and Services	1,194,671	2,081,115	886,444	74.2%
Total International Mail And Services	38,035	35,601	-2,434	-6.4%
Total Vol Var & Prod Spec	3,553,150	4,354,724	801,574	22.6%

Source: RRECS Non-Public Cost Impact.xlsx

Application of the RRECS methodology to the same FY 2022 accrued costs produces substantially higher volume variable costs than the established methodology. The higher volume variable costs arise for several reasons. First, under RRECS, a material portion of box time is volume variable, due to the fact that under RRECS, rural carriers only get box credit for addresses that receive mail, not all addresses, as before. When combined with the fact that coverage is volume variable, this difference creates a new, large, volume variable cost pool. Second, RRECS takes a much more detailed examination of the activities rural carriers perform in the office and on the street, which leads it to identifying higher time standards for handling mail. This change results in more rural carrier time being associated with products. Third, RRECS is based upon current volumes, not 2018 volumes, and thus includes the cost effects of the increase in parcel volume.

Most notable in Table 27 is the large increase in volume variable costs for both Package Services and Competitive products. These increases reflect both the higher parcel-shaped volumes recorded in RRECS, as compared to the 2018 Rural Mail Count, and the fact that RRECS identifies a higher carrier time per parcel than was negotiated under the previous Form 4241-based system.

The impact of the parcel volume increase can be assessed through comparing the daily parcels volumes produced by the 2018 Rural Mail Count and the 2023 RRECS data. The Inputs tab of in CS10-Public-FY22.xlsx presents the weekly parcel volume count from the 2018 Rural Mail count, which can be converted to a daily figure by dividing by 6. That produces a daily volume count of 72.2 parcels. RRECS records the number of mailbox, locker and door parcels for each route and the average daily volume of parcels per route is [redacted]. This is a [redacted] percent increase in parcel volume over the 2018 RMC value.

The other contributor to higher volume variable costs for parcel-shaped mail is the higher evaluated time per parcel in RRECS as compared to the old Form 4241-based system. In RRECS there are multiple time sequences associated with handling parcels. Some of them are associated with all types of parcels and some are associated with only door, mailbox, or locker parcels. Table 28 presents a list of sequences that are fully or partially related to handling parcels, and the type of parcels handled in each one.

Table 28: Distribution of Types of Parcels Across RRECS Sequences

RRECS Sequences	Mailbox	Locker	Door
Gather Parcels for Transport to Case	x	x	x
Organize Large Parcels			x
Organize Small And Medium Parcels	x	x	
Deliver Parcels to Door			x
Deliver Parcels to Mailbox	x		
Deliver Parcels to Parcel Locker		x	
Reload Medium Parcels for Delivery	x	x	
Reload Large Parcels for Delivery			x
Verify Addresses	x		
Box Time	x	x	
Pulldown	x		
Reload Mail for Delivery	x	x	
Markup	x		
Direct Door Delivery Activities			x
Load Vehicle	x	x	x

Source: Form Cost Pools.sas

The RRECS unit time for each of the three types of parcels can be calculated by first finding the unit time for each of the individual sequences, and then by adding together the relevant unit times for each type of parcel.[76] Table 29 presents the different components that add up to the total unit times for the three types of parcels. The Delivery Parcel activity includes three RRECS sequences because they each are solely dedicated to handling door parcels. They are the Organize Large Parcel, Deliver

[76] The complete parcel unit time calculations can be found in Calculate Total Unit Parcel Times.sas which is included in USPS-RM2024-2-NP1, Calculate Product Volume Variable Costs and Impact Analysis Directory.

Parcels to the Door, and Reload Large Parcels for Delivery sequences. The mailbox and locker parcel Delivery Parcel activity include just the Deliver Parcels to Mailbox and Delivery Parcels to Parcel Locker Sequences. The supporting sequences for mailbox and locker parcels, like organizing or reloading, are listed separately because they involve handling both types of parcels.

There are two similar sounding activities for mailbox and locker parcels, Reload Medium Parcels for Delivery and Reload Mail for delivery. The former is time associated with reloading medium parcel trays, which are made up of a mix of door and locker parcels, and thus generate evaluated time for those shapes. The latter is time associated with loading mail trays that contain a variety of different types of mail including, in part, mailbox and locker parcels. These two types of parcels also earn evaluated time through their participation in this related, but different, activity.

Table 29: Components of Parcel Unit Times (Minutes Per Piece)

Activity	Door	Mailbox	Locker
Deliver Parcel	[redacted]	[redacted]	[redacted]
Gather Parcels For Transport to Case	[redacted]	[redacted]	[redacted]
Organize Small and Medium Parcels		[redacted]	[redacted]
Reload Medium Parcels for Delivery		[redacted]	[redacted]
Box Service		[redacted]	[redacted]
Pull Down		[redacted]	
Markup		[redacted]	
Verify Addresses		[redacted]	
Direct Door Delivery Activities	[redacted]		
Reload Mail For Delivery		[redacted]	[redacted]
Load Vehicle	[redacted]	[redacted]	[redacted]
Total	[redacted]	[redacted]	[redacted]

Source: Calculate Total Unit Parcel Times.sas

Table 30, below, presents the minutes per piece for each of the three parcel types as well as the overall volume-weighted average unit time. As one would expect, the parcels delivered to the door have the highest unit time, as this type of delivery requires not only walking to the door but also driving to an additional parking point, leaving the vehicle and obtaining the parcel from the back of the vehicle.

Table 30: RRECS Unit Parcel Times and Average Daily Volumes

Type	Minutes Per Piece	Average Pieces Per Day
Door	[redacted]	[redacted]
Mailbox	[redacted]	[redacted]
Locker	[redacted]	[redacted]
All	[redacted]	[redacted]

Source: Calculate Total Unit Parcel Times.sas

Calculating the unit parcel time in the Form 4241-based system is much more straightforward. There are only three evaluation factors: Parcel (office and street) which is 0.528 minutes per piece (including vehicle load and markup time), Non-signature Scan which is 0.30 minutes per piece and Parcels Accepted which is 4 minutes per piece. However, from the 2018 RMC, for evaluated routes, there were only 0.53 parcels accepted per week, for every 457.15 parcels delivered. This is a ratio of 0.0012. Applying this ratio to the four-minute evaluation factor yields a time per delivered parcel of 0.0047 minutes.

Table 31 presents the unit time for parcels under the old Form 4241-based evaluation system. The total parcel unit time is less than one minute, and comparing the current RRECS unit time with the historical Form 4241 unit time reveals that the unit time for parcels is [redacted] percent higher under RRECS. This higher unit time also contributes to a higher volume variable cost for parcel shaped pieces.

Table 31: Form 4241 Parcel Unit Time

Evaluation Factor	Minutes Per Piece
Parcel	0.5000
Non-signature Scan	0.3000
Parcels Accepted	0.0047
Total	0.8047

Source: CS10-Public-FY22.xlsx, Tab Inputs

Periodicals volume variable time decreased because of the decline in flats volume. The 2018 Rural Mail count produced an average of 413 cased flats per day while the 2023 RRECS data produced a substantially lower average of [redacted] case flats per day. In addition, FSS volumes fell from an average of 34.7 pieces per day to a much smaller average of just [redacted] pieces per day.

VII. IMPACT ANALYSIS

When the Postal Service switched to RRECS for compensating rural carriers, it changed the way it incurs cost on rural routes. Those changes, along with changes in volume since 2018, caused the changes in volume variable rural carrier costs presented above in Table 27. Moreover, the percentage changes presented in that table are also the percentage changes in unit rural carrier costs (with piggybacks), because the denominator is the same (RPW volumes) for both the Form 4241-based and the RRECS based unit rural carrier costs.

It is informative, however, to examine the changes in overall unit volume variable cost for various products as a result of the RRECS implementation and data update. The unit cost changes, including piggybacks, are presented in Table 32 below.[77] There is relatively little change in any First-Class Mail products, as the reduction in the volume of letters is offset by a higher unit time for letters. Except for parcels, Marketing Mail products also have relatively small changes in their unit costs, although flat shaped products do experience a decline in cost because of the decline in rural carrier flats volume. Periodicals unit costs also declined because of the decline in rural route flats volume. Because RRECS shows a material lower volume of flats on rural routes, the unit cost per RPW piece falls, when compared to the unit cost from the established methodology that relies upon flat volumes from 2018.

Package Services unit costs rise due to higher parcel volumes and higher evaluated times per parcel in RRECS. The same is true for competitive products. Finally, the unit costs for special services fall because of both lower volumes and lower unit times in RRECS. In sum, the impact analysis demonstrates that the proposed costing methodology produces volume variable and unit costs consistent with the changes in volume since 2018 and the change in the route evaluation structure brought on by RRECS.

[77] The full set of unit cost changes, including detail on Competitive products, is presented in USPS-RM2024-2-NP1, Calculate Product Volume Variable Costs and Impact Analysis Directory.

Table 32: Changes in Unit Costs Due to Switch to RRECS

PRODUCT	Established Unit Cost	RRECS Unit Cost	Unit Cost Change	% Change in Unit Cost
Single-Piece Letters	$0.36	$0.36	$0.00	-0.81%
Single-Piece Cards	$0.35	$0.35	$0.00	-0.41%
Presort Letters	$0.14	$0.14	$0.00	1.47%
Presort Cards	$0.10	$0.10	$0.00	2.08%
Flats	$1.34	$1.32	-$0.01	-1.02%
Total First-Class Mail	$0.22	$0.22	$0.00	0.19%
High Density and Saturation Letters	$0.09	$0.10	$0.00	2.08%
High Density and Saturation Flats/Parcels	$0.14	$0.14	-$0.01	-3.86%
Every Door Direct Mail-Retail	$0.08	$0.08	$0.00	3.29%
Carrier Route	$0.30	$0.29	-$0.01	-3.89%
Letters	$0.12	$0.12	$0.00	1.99%
Flats	$0.72	$0.71	-$0.01	-1.73%
Parcels	$2.04	$2.08	$0.04	2.15%
Total USPS Marketing Mail	$0.16	$0.16	$0.00	-0.22%
In County	$0.24	$0.23	-$0.01	-5.54%
Outside County	$0.49	$0.48	-$0.01	-2.70%
Total Periodicals	$0.46	$0.45	-$0.01	-2.89%
Package Services				
Bound Printed Matter Flats	$0.70	$0.68	-$0.01	-1.97%
Bound Printed Matter Parcels	$1.14	$1.34	$0.20	17.56%
Media/Library Mail	$4.63	$4.70	$0.06	1.34%
Total Package Services	$1.77	$1.87	$0.10	5.72%
Ancillary Services				
Certified Mail	$2.78	$2.32	-$0.46	-16.48%
COD	$14.74	$11.44	-$3.30	-22.39%
Insurance	$1.85	$1.74	-$0.11	-6.03%
Registered Mail	$14.47	$14.11	-$0.35	-2.45%
Money Orders	$2.58	$2.58	$0.00	-0.09%
First-Class Package Service	[redacted]	[redacted]	[redacted]	[redacted]
Priority Mail	[redacted]	[redacted]	[redacted]	[redacted]
Parcel Select	[redacted]	[redacted]	[redacted]	[redacted]
Total Domestic Competitive Products	$2.79	$2.95	$0.16	5.71%

Source: RRECS Non-Public Cost Impact