

BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, D.C. 20268-0001

Modification of Analytical Principles
Approved For Periodic Reporting
(Proposal Two)

Docket No. RM2010-10

RESPONSES OF THE UNITED STATES POSTAL SERVICE TO
QUESTION 1-7 OF CHAIRMAN'S INFORMATION REQUEST NO. 2
(August 26, 2010)

The Postal Service hereby files its responses to questions 1-7 of Chairman's Information Request No. 2, issued on August 13, 2010. Responses were requested no later than August 26, 2010. Each question is stated verbatim, and followed by the response.

Respectfully submitted,
UNITED STATES POSTAL SERVICE

By its attorneys:

Daniel J. Foucheaux, Jr.
Chief Counsel, Pricing & Product Support

Eric P. Koetting

475 L'Enfant Plaza West, S.W.
Washington, D.C. 20260-1137
(202) 268-2992, FAX: -5402
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1. The material accompanying the Petition, filed June 25, 2010, that supports Proposal Two-A, at page 4, discusses the impact of a 20 percent reduction in the number of ODIS-RPW sample tests on the accuracy of the 3-digit ZIP Code ODIS/RPW volumes used in the Postal Service's model of the value of the postal monopoly and the cost of universal service as follows:

The estimates are compared, by shape, with alternative estimates derived with the Postal Service's delivery data systems (DOIS, RMCS) to ensure consistency. For an overwhelming majority of ZIP Codes both systems provide comparable data. In [a] few instances the two estimates cannot be reconciled; if this occurs the ZIP Codes are omitted from the model.

Petition, Proposal Two-A, at 4.

- a. Please describe by what measure volume estimates from these alternative systems were determined to be "comparable" or "not comparable."
- b. Please describe how many ZIP Codes are eliminated as a result of this comparison under the current ODIS-RPW sample size, and how many would be eliminated if the proposed 20 percent reduction in sample tests were implemented.

Response:

- a. The Postal Service's USO study model made use of data set constructed for the purpose of network analytics. This data set was based upon a number of sources, including ODIS and RPW, and featured a matrix of volume flows, by class and subclass, among the nation's three-digit ZIP Codes. The Postal Service's USO model solely analyzed destination volumes, not origin volumes, so only the destination data were used. The destination volumes for each three digit ZIP Code were compared in a hierarchical system with a "local" measure of delivered volume for those same ZIP Codes, in which the "local" measure was

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the sum of the ZIP Code's DOIS (city carrier) and RMCS (rural carrier) delivered volume.

Because it was believed that the accuracy of the network analytics data set improved with aggregation, a hierarchical approach to data evaluation was followed. In the first step, the network analytics data set volume for all ZIP Codes within an ADC service area was compared with the "local" delivered volume for the same ZIP code. If the two volume measures were within a given percentage difference (supplied by the model user), the ZIP Codes were included in the analysis. However because of possible variations among the ZIP Codes in the network analytics data set, the sum of the volume for all ZIP Codes in the ADC were distributed to the individual ZIP Codes on the basis of their proportional "local" volumes.

The data for ZIP Codes within those ADC areas that did not match the pre-specified criterion were further analyzed, because there might be good data for some of the SCF areas within an ADC area even if some the data for other SCF areas might be inaccurate. Therefore, for those ADC areas not included in the analysis, the network analytics data set volume for all ZIP Codes within an SCF service area was compared with the "local" delivered volume for the same SCF. If the two volume measures were within a given percentage difference (supplied by the model user), the ZIP Codes were included in the analysis. Finally, the data for ZIP Codes within those SCF areas that did not match the

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pre-specified criterion were further analyzed, because there might be good data for some of the ZIP Codes within an SCF service area even if some the data for other ZIP Codes areas might be inaccurate. For those SCF service areas not included in the analysis, the network analytics data set volume for each ZIP Code in an SCF service area was compared with the "local" delivered volume for the same ZIP Code. If the two volume measures were within a given percentage difference (supplied by the model user), the ZIP Code was included in the analysis.

- b. The number of ZIP Codes eliminated depends upon the criterion supplied by the model user. For example, using the data set employed in the USO study, when a 25 percent criterion was used, 81 of the 910 ZIP Codes were eliminated by this process. When a 20 percent criterion was used, 170 ZIP Codes were eliminated.

 The hierarchical nature of the volume comparison system, described above, implies that calculating how many additional ZIP Codes would be eliminated due to a 20 percent reduction in sample tests in the ODIS/RPW data system is not simply a matter of "plugging in a higher variance" and recalculating the number of ZIP Codes included. Such a calculation, if feasible, would be highly complex, and would likely require constructing pseudo databases to

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attempt to quantify the changes in the network analytics database that would have occurred had ODIS and RPW been selected under different sampling rules.

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2. The material supporting Proposal Two-A, at page 4, states that the reduction in the reliability of 3-digit volume estimates “could be mitigated by making more extensive use of other data systems such as the Carrier Cost System [CCS].” Please describe specifically how CCS data could be used to mitigate the loss of precision in ODIS/RPW volumes at the 3-digit ZIP Code level.

Response:

As described in the response to question 1, part a of this Information Request, the Postal Service's USO model relies upon destination volumes by three digit ZIP Codes. “Local” measures of delivered volume, such as DOIS and RMCS, exist, but do not include information on volumes by individual product. CCS data does provide information by class of mail, but only for a sample of routes within each ZIP Code. Therefore, it may be possible to use CCS data, perhaps at an SCF or ADC level, to distribute the shape-based DOIS or RMCS data to individual product. If so, this would reduce or even preclude the need for ODIS/RPW volumes at the 3-digit ZIP Code level.

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3. The material supporting Proposal Two-A, at page 5, states that a 20 percent reduction in ODIS-RPW sample tests “would not have an impact” on network planning tools “since the key inputs are now based on national systems such as End of Run, Surface Visibility and TIMES.”
- a. Does this mean that ODIS-RPW data are no longer inputs into the Postal Service’s network planning, optimization, or simulation models, or that they remain inputs but are not considered as important as other inputs?
 - b. Do data from End of Run, Surface Visibility, and TIMES allow volumes of single-piece mail to be accurately estimated at the District or 3-digit ZIP Code level? If so, please describe how they are being used to do this. For example:
 - i. Assuming that barcodes are generally applied to single-piece mail by the Postal Service rather than the mailer, does the Postal Service archive the tracking data in such barcodes in a way that allows it to form the basis of quarterly or annual volume estimates?
 - ii. Does the Postal Service record and archive nesting data when barcoded single-piece mail is aggregated into containers and routed through the delivery network?
 - c. What specific data from delivery confirmation, POS terminals, and the Intelligent Mail barcode are currently used to capture single-piece volumes (in particular Single-Piece First-Class Mail) below the national level, and what additional data from those sources will be used to capture single-piece volumes in the future?
 - d. If ODIS-RPW data that are accurate at the District or 3-digit ZIP Code level are not available in FY 2011, would End of Run, Surface Visibility, TIMES, delivery confirmation, POS terminals, and Intelligent Mail barcode, taken together, enable the Postal Service to develop volume estimates at those levels that fully reflect volumes of single-piece mail?
 - e. If the answer to “d.” is no, what role will single-piece mail volumes play in the Postal Service’s network planning, optimization, or simulation models in FY 2011?

Response:

- a. ODIS-RPW data are no longer input into the Postal Service’s network planning, optimization and simulation models.

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- b. No. End of Run, TIMES and Surface Visibility provide the Postal Service with more accurate information related to workload and network flow, which is what the Postal Service uses for network planning.
 - i. Not applicable.
 - ii. These data are maintained as part of full-service IMB.

- c. As part of our current network planning tools, Delivery Confirmation and POS data do not capture single-piece volume for Single-Piece First-Class Mail. These sources of information are utilized to estimate Priority Mail and Package Service flow from the portion of these services purchased at retail which will flow through the network. In the future, it is expected the Intelligent Mail barcode will capture a majority of mailer single-piece volume.

- d. No.

- e. None. The Postal Service utilizes workload and workload flows to plan its networks.

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4. At page 5 of the material supporting Proposal Two-A, the Postal Service states that the Operation's Logistics group will consider alternatives to replace ODIS as the sole source for base volume estimates in its Transportation Optimization Planning and Scheduling (TOPS) models. The alternatives mentioned are Surface Visibility and TIMES. What specific information collected from either of these data systems could be used to capture single-piece mail volumes at the 3-digit ZIP Code pair level?

Response:

The ODIS data, volume extrapolations in particular, presented one way to obtain estimates of aggregated volume moving between origin and destination processing centers. The Surface Visibility and TIMES systems do not provide single-piece volumes at the 3-digit ZIP Code pair level, but they do provide truck utilization data that are specific to origin and destination transportation centers and that align with the national network planning role of TOPS.

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5. Regarding service performance measurement, the Postal Service acknowledges at page 5 of the material supporting Proposal Two-A that it is necessary to aggregate three years of ODIS-RPW data to obtain usable volume data at a sub-national level. It also mentions that wider use of the Full Service Intelligent Mail Barcode should eventually improve the accuracy of these volumes. Please explain how mail entered as single piece will acquire an Intelligent Mail barcode and whether the information in that barcode will be archived and available for supplementing the ODIS-RPW estimates at sub-national levels.

Response:

We do not see a direct reference to the aggregation of three years of ODIS-RPW data on page 5 of Proposal Two-A. While use of Full Service Intelligent Mail will improve the accuracy of 3-digit volume information simply because one replaces a sampling estimate with 'census' information there is no reference to its use for single piece volumes. The Intelligent Mail Barcodes are currently being implemented for bulk mail entered mail volume.

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6. The material supporting Proposal Two-B describes the Postal Service's plan to make individual carrier routes sample frame units for ODIS-RPW data collection. The Postal Service's response, filed August 3, 2010, to CHIR No. 1 question 1.f., asserts that the proliferation of sample frame units under the proposed alternative sample frame should not result in larger CVs for those estimates. It states that its analysis of City Carrier Cost System (CCCS) and Rural Carrier Cost System (RCCS) data indicates that the CVs under the alternative sample frame would be smaller than under the current sample frame because "[c]arriers tend to deliver about the same amount of mail by carrier route type."
- a. Is the small variation in delivered volume at the route level a reference to variation across routes of a given type, across delivery days, or both?
 - b. Please provide the statistical analysis that led to this conclusion.
 - c. Is the conclusion that variation in volumes delivered on individual routes are small consistent with the evidence provided in Docket No. N2010-1 that volumes routinely vary by 25 percent depending on the day of the week?
 - d. In Docket No. N2010-1, the Postal Service concludes that if Saturday street delivery were discontinued, Tuesday street volumes may routinely be 40 percent greater than the average daily volume of the remaining days of the week. Is this consistent with an assumption that variation in route-level volumes would be small under such an operating plan?

Response:

- a. The small variation in delivered volume at the route level is a reference to variation across routes within a same stratum, but is not a reference to variation across delivery days.
- b. Analysis is based on FY 2009 CCCS, RCCS, and ODIS-RPW data. CCCS and RCCS data are stratified by 3-digit zip code and carrier type (high- and low-volume residential routes, high-and low-commercial routes, and high- and low-volume rural routes). Let i be 3-digit zip code, j be carrier type, and k be a test. Let N denote the number of 3-digit zip and N_{ij} denote the number of route-days in area i and carrier type j . n_{ij} represents the number of route-days sampled for area i and

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carrier type j in FY2009. y_{ijk} represents the k -th route day-volume in area i and carrier type j . The estimate of across routes variance was computed for each (i, j) combination by the formula,

$$s_{ij}^2 = \frac{1}{n_{ij} - 1} \sum_{k=1}^{n_{ij}} (y_{ijk} - \bar{y}_{ij})^2.$$

Let \hat{T} be the national-level volume estimate where

$$\hat{T} = \sum_{i=1}^N \sum_{j=1}^{N_{ij}} \frac{N_{ij}}{n_{ij}} \sum_{k=1}^{n_{ij}} y_{ijk}.$$

Variance of \hat{T} is

$$V(\hat{T}) = \sum_{i=1}^N \sum_{j=1}^{N_{ij}} N_{ij}^2 \frac{\sigma_{ij}^2}{n_{ij}},$$

and its estimator is

$$\hat{V}(\hat{T}) = \sum_{i=1}^N \sum_{j=1}^{N_{ij}} N_{ij}^2 \frac{s_{ij}^2}{n_{ij}}.$$

We compared the precision of \hat{T} with the current MEP-based estimator \hat{T}_{MEP} where

$$\hat{T}_{MEP} = \sum_{i=1}^N \sum_{s=1}^{M_{is}} \frac{M_{is}}{m_{is}} \sum_{t=1}^{m_{is}} x_{ist}.$$

Here M_{is} denotes the number of MEP-day in area i and MEP type s . m_{is} represents the number of MEP-days sampled for area i and MEP type s in FY2009. Therefore, x_{ist} represents the t -th day volume in area i and MEP type s . The variance estimate of

\hat{T}_{MEP} is

$$\hat{V}(\hat{T}_{MEP}) = \sum_{i=1}^N \sum_{s=1}^{M_{is}} M_{is}^2 \frac{s_{is}^2}{m_{is}}$$

where,

$$s_{is}^2 = \frac{1}{m_{is} - 1} \sum_{t=1}^{m_{is}} (x_{ist} - \bar{x}_{is})^2$$

is the MEP-to-MEP variation.

We computed and compared the coefficient of variation of these two estimators.

It is estimated that CVs of National-level volume estimates under the current (\hat{T}_{MEP}) and proposed (\hat{T}) designs are 0.21 percent and 0.16 percent, respectively. National-level

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variance under a design is the sum of respective variances over areas, therefore, we concluded that the gained efficiency under the proposed design is due to the route-to-route variations being smaller than MEP-to-MEP variations on average.

- c. The twenty-five percent volume variation referenced in Docket No. N2010-1 and the assertion made in response to CHIR No. 1 question 1.f. refers to two distinct variations that are not necessarily related. The first refers to day-to-day volume variation, while the second refers to route-to-route variation. On a given day of the week, route-to-route volume variation is small because carriers in the same carrier type "tend to deliver about the same amount" regardless of volume being high or low on that day.

- d. Please refer to responses a.-c. The response to CHIR NO.1 question 1.f refers to route-to-route variation, and not day-to-day variation described in Docket No. N2010-1.

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7. In its response to CHIR No. 1, the Postal Service describes the alternative ODIS-RPW sample frame that it proposes to test as essentially skip sampling of mail at the carrier case, where characteristics of the sampled mailpiece, such as shape, rate category, method of postage payment, etc., are recorded. This seems to closely parallel the data collection process that is currently used in the CCCS and the RCCS.
- a. Could the Postal Service combine the ODIS-RPW, CCCS and RCCS data collection systems and reduce the aggregate number of ODIS-RPW, CCCS, and RCCS sample tests well below the number that is currently required to administer these data collection systems?
 - b. By combining these data collection systems, could the Postal Service maintain or improve the current level of statistical precision of both systems and still save as much money as it seeks to save by cutting the size of the ODIS-RPW sample?

Response:

- a. No. ODIS-RPW is used primarily to supply official RPW estimates of revenue, volume and weight, particularly focused on single-piece mail. The RCCS and CCCS gather data on all mail products for use as distribution keys for Cost Segments 7 and 10 of the CRA, and for delivery cost models in the ACR. Although similar, there are procedures and data elements in the carrier cost systems that are significantly different from ODIS-RPW. Collecting required CCCS/RCCS data elements on all mail products, particularly those that are not single-piece, would reduce the sampling efficiency gains from integrating the three systems. Compromises would be required among the data elements collected, procedures followed, and the time required to perform the test. Before such integration could take place, these compromises would need to be carefully evaluated to reduce the risk of harm to data quality to each of the three data collection systems. Furthermore, in the event of a methodology change for city carrier delivery cost, new data elements or procedures that could be easily incorporated by the relatively small CCCS might be compromised if they would need to be included into a much larger ODIS/CCCS/RCCS system. Finally,

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simply collecting CCCS/RCCS data elements within ODIS-RPW cannot provide the distribution keys for Special Purpose Routes. These keys are currently provided by the CCCS-SPR and use a different design and sampling frame.

- b. No. The Postal Service seeks a 20 percent reduction in workload. Eliminating the RCCS and CCCS would result in a reduction equivalent to only 9 percent of the current ODIS-RPW workload. The reduction would be even less given the time required to collect the additional data elements required by the CCCS and RCCS in ODIS-RPW. The current precision of ODIS-RPW estimates could not be maintained without a design change. CCCS, RCCS and ODIS-RPW estimates may be impacted otherwise as discussed in response to Q7.a above.

CERTIFICATE OF SERVICE

I hereby certify that I have this date served the foregoing document in accordance with Section 12 of the Rules of Practice and Procedure.

Eric P. Koetting

475 L'Enfant Plaza West, S.W.
Washington, D.C. 20260-1137
(202) 268-2992, FAX: -5402
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