FY 2012 Special Cost Studies Workpapers -

Flats Cost Models (First-Class Mail and Standard Mail) & Periodicals Cost Model

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I. Preface

A. Purpose and Content

USPS-FY12-11 documents the development of the FY 2012 mail processing unit cost estimates for First-Class Mail Presort flats, Periodicals Outside-County flats, and Standard Mail flats.

B. Predecessor Documents

First-Class Mail model: Rev_FCM.Psrt.Flats.with.NDC.xls (Order No. 1383 in Docket No. RM2012-2);

Periodicals model: Rev_PER.OC.Flats.with.NDC.Alt.xls (Order No. 1383 in Docket No. RM2012-2) and;

Standard Mail model: Rev_Std.Flats.MP.with.NDC.xls (Order No. 1383 in Docket No. RM2012-2)

Ordinarily the PRC's ACD versions would be used; however, models in Proposal 18 (Docket No. RM2012-2) contained significant modifications which necessitated using the models listed above as the starting point.

In addition to the PRC-approved methodological changes from Docket No. RM2012-2 the Postal service proposed methodological changes in Docket No. RM2012-8, Proposal 9. USPS-FY12-11 updates the model versions from Docket No. RM 2012-2 with toggle switches to allow switching between the Docket No. RM2012-2 and Docket No. RM2012-8 versions of the model. The Docket No. RM2012-8 models that have been updated and used here are:

First-Class Mail model: FCM.Prsrt.Flats.1023.xls (Docket No. RM2012-8 as revised 10/23/2012);

Periodicals model: PER.OC.Flats.0915.xls (Docket No. RM2012-8) and;

Standard Mail model: Std.Flats.MP.0915.xls (Docket No. RM2012-8).

C. Methodology

USPS-FY12-11 uses the PRC's Order No. 1383, Proposal 18 (Docket No. RM2012-2) cost methodology, except for the methodological changes described in the next section.

D. Changes to Models and Methodology

On Sept 28, 2012, the Postal service filed Proposal 9 (Docket No. RM2012-8) with methodological changes to be included in the ACR documents and spreadsheets. The proposal contained 8 modifications. Of these, all 8 apply to the Outside-County Periodicals model and only modifications 1, 3, 5 and 6 apply to the Standard Flats and First-Class Mail Flats model. Reversion to the PRC's Docket No. RM2012-2 cost model is possible by changing toggle switches to "OFF" for any of the proposed modifications with the exception of Modifications 1 and 2. Modifications are as follows:

Modification 1 – Remove "Switches" from Proposal 19 (Docket No. RM2012-2) Model

All models filed in Docket No. RM2012-2 contained a number of switches intended to allow analysts to isolate the influence of any one of the proposed changes to the model. As Proposal 19 changes have been accepted by the PRC these switches are no longer necessary. As part of this change the "Switches" tab is renamed "FSS

Parameters" as the tab now contains calculations of FSS parameters. This modification applies to all three models.

Modification 2 – Correction of Summary Statistics

In the Periodicals model, due to inconsistencies in the structures of the tables with bundle volume and cost the summary statistics of bundle costs and calculation of total bundle sorting costs on the "Bundle Cost CRA" tab were in error because of cell referencing errors. These errors occurred in the cells in columns Z – AE of the "Summary" tab and F7 – H14 of the "Bundle Cost CRA" tab. This modification corrects these errors. This modification applies to Periodicals model only.

Modification 3 – Enhanced reject flows

Prior versions of the flats models only explicitly modeled one of the several phenomena that cause piece processing failures on the AFSM 100 – pieces sent to the remote coding that could not be finalized. Processing failures can occur for a number of reasons and the inclusion of only REC rejects understated the number of pieces needing additional handlings as measured by the ratio of MODS TPH to TPF. Modification 3 enhances the modeled flow of AFSM 100 rejects to improve the consistency with measured MODS statistics. This modification applies to all three models.

Modification 4 – Improved Piece Allied Flows

The predecessor to the current Periodicals flats model, LR-I-332 (Docket No. R2000-1), was developed when flats incurred a much simpler flow. In 2000, the AFSM 100 had not been deployed and most Incoming Secondary (IS) processing was done at the delivery unit manually. Each facility typically processed the mail once and there was very little intra-facility flow of mail from scheme to scheme. The modeled flows mirrored this and allied flows simple with intra-facility flows largely ignored. The introduction of the AFSM 100 and FSS has changed this. Today most IS processing is conducted on mechanized equipment meaning that mail flowing from Incoming Primary (IP) operations will typically incur some intra-facility allied activity. Modification 4 makes changes to the modeled allied flows to reflect operational realities. This modification applies to Periodicals model only.

Modification 5 - Class-specific FSS Coverage factors

The initial version of the flats models with FSS operations assumed that the distribution of mail across mail class being processed on the FSS was similar to the national distribution of mail across class. This assumption is not supported by operational practice or cost systems. Unit cost estimates from the CRA indicate that First-Class Mail incurs lower FSS cost than either Standard or Periodicals. This difference is driven primarily by service considerations. Some facilities cannot efficiently structure FSS processing windows to be able to meet service standards for First-Class Mail. First-Class Mail at these facilities will be processed on the AFSM 100 or manually rather than be sequenced on the FSS.

Modification 5 generates class-specific coverage factors by first using cost estimates to distribute MODS TPF to class then generates a class specific coverage factor as the ratio of distributed MODS FSS TPF to eligible RPW volume. This modification applies to all three models.

Modification 6 – Moving PO Box distribution to non-modeled

Flats models do not explicitly model the mail processing activity of distributing pieces to PO boxes. The cost of PO Box distribution is unlikely correlated with preparation characteristics, and if it was, it is not possible to measure PO Box incidence across piece-presort level. Prior to Docket No. RM2011-12, PO Box distribution at stations and branches was identified in LDC 44 but distribution at NONMODS offices was not separately identified. With the adoption of the Docket No. RM2011-12 methodology it is now possible to isolate PO Box distribution costs. As these costs are not preparation-dependant nor are they modeled, these costs are moved to “non-modeled”. This modification applies to all three models.

Modification 7 – Updating Container Cross-docking estimates

Transportation route information is used in conjunction with Periodicals Mail.dat information to develop updated estimates of the number of facilities a container passes through before it reaches the destination facility where it will be opened and the contents distributed. This modification applies to Periodicals model only.

Modification 8 – Simplification of Modeled Container Handling Costs

Modification 8 simplifies the calculation of container handling costs by recognizing that the prior methodology which generated contrived flows through facility types was unnecessary and overly complex. Modification 8 simplifies the calculation of container costs by recognizing that, in the context of such models, the facility type is not a relevant factor as it is not practical to develop separate productivities for each facility type. This eliminates the need to develop complicated schemas to impute the flow through each facility type. This modification applies to Periodicals model only.

E. Evolution of current cost methodology

In Docket No. R2006-1, the PRC drew upon the work of witness Stralberg (TW-T-2 and TW-LR-2) to develop separate estimates for the unit costs of handling pieces, bundles, and containers of Periodicals. In Docket No. ACR2007, the Postal Service made several improvements to the PRC's model, in order to resolve internal inconsistencies while adhering to the PRC's methodology. In preparing for the 2008 ACR, the Postal Service filed modifications to all three cost models in Proposal 12 (Docket No. RM2009-1), some of which proposed new methodologies while others merely updated existing data. The PRC issued Order No. 170 (January 12, 2009), ruling on each modification.

On March 30, 2009, the PRC filed its version of the Periodicals cost model (PRC-ACR2008-LR5), in which the PRC included the In-Plant IS Coverage factor change, but rejected the calculation of the 'Auto/Mech' factor, instead reverting to part of the

undocumented assumption from TW-LR-L-2 (Docket No. R2006-1). Although the USPS-FY08-11 Periodicals model allowed the 'Auto/Mech' factor to change as a result of the new In-Plant IS Coverage factor, PRC-ACR2008-LR5 did not allow the 'Auto/Mech' factor to change, causing a discrepancy for the processing of 40,000 pieces in model worksheet '5D'.

The Postal Service filed Proposal Twelve (Docket No. RM2009-10, July 28, 2009) to clarify the implicit calculation of the 'Auto/Mech' factor from the In-Plant Incoming Secondary (IS) coverage factors in the 'Coverage Factors' sheet of the Periodicals cost models. The PRC analyzed the proposal and issued its recommendation in Order No. 339 (November 13, 2009).

On October 23, 2009, the Postal Service filed three modifications in Proposal Twenty-five (Docket No. RM2010-4). Modification One was a methodological change in the calculation of Flats Coverage Factors described in detail in the preface to USPS-FY09-14. Modification Two proposed to use UFSM1000 downflow piece density data from USPS-FY08-14 as a proxy for manual operations piece density data. Modification Three corrected an error in the calculation of the cost of handling OSCF-entered MADC sacks. The PRC issued Order No. 399 (January 27, 2010) ruling on each modification. On December 11, 2009, the Postal Service filed Proposal Twenty-nine (Docket No. RM2010-6) implementing some of the suggestions made by the PRC in Order No. 339 (Docket No. RM2009-10, November 13, 2009). The adjustment was necessary to avoid an implausible "Auto/Mech factor" input which concerned the PRC in its 2008 ACD

(page 55-56). Proposal Twenty-nine uses the existing bundle breakage estimate and the estimated number of carrier route pieces on BMC, ADC, SCF, and 3-Digit containers to control for mechanized incoming secondary sorts of carrier route pieces. Then the proportion of IOCS costs by shape (USPS-FY11-NP18) is used to estimate the proportion of letter and parcel pieces that are worked in the flats cost pools - AFSM100 and FSM/1000. The changes can be observed in worksheet 'COVERAGE FACTORS', cells D71 through D74. The calculations for Proposal Twenty-nine, yield a lower and operationally more realistic 'Auto/Mech' factor. The PRC accepted Proposal Twenty-nine in Order No. 400 (January 28, 2010).

The Postal Service filed Proposal 18 (Docket No. RM2012-2) on Nov 30, 2011, with four modifications. The PRC-approved and the Proposed versions of all models were filed in last ACR. PRC ruled on Proposal 18 in Order No. 1383 (Jun 26, 2012).

F. FSS Deployment Adjustments for All Models.

The Flats Sequencing System (FSS) machine sorts flat mail into Delivery Point Sequence (DPS) for carrier delivery. This program seeks to eliminate the last significant manual sortation currently performed by carriers before leaving the office. Phase I of FSS deployment began in May 2008 for the deployment of the first 100 machines and ended in mid 2011. Cost estimation of the FSS processing necessitated several changes to all three models. The Periodicals model required additional changes due to the modeling of handling of FSS-scheme and FSS-facility pallets. The adjustments include but are not limited to: inclusion of an FSS cost pool, addition of FSS in Incoming Secondary nodes on the model sheets and cost calculations on the

cost sheets, and FSS coverage factors, accept/finalization rates, productivities, piggyback factors, and other factors. The following sections details the modifications necessary to model FSS activities and their logic.

FSS MODIFICATIONS

FSS Deployment – In FY 2011 the Postal Service had significant deployments of the Flats Sequencing System (FSS). In an effort to take full advantage of the FSS equipment the Postal Service introduced optional preparation rules that introduced two container levels - FSS Scheme and FSS facility containers, and a new bundle level - FSS bundle.

FSS Facility Containers - FSS facility containers are similar to SCF containers. Both container types contain co-mingled mail for multiple Incoming Secondary (IS) sort plans and Carrier Route (CR) mail that require sortation and separation on bundle sorting equipment. The significant difference between the SCF container and the FSS Facility container is that all mail on the container is required to destinate in a zone that is processed on the FSS. The FSS Facility container was introduced so that FSS mail could be identified expeditiously and processed on bundle sorting equipment to accommodate the FSS processing window ahead of mail with a later processing window. Operationally, SCF and FSS Facility containers are handled in similar manners. Both containers remain intact until they arrive at the facility in-charge of the Incoming Primary (IP) bundle sort where they will be taken to the bundle sorting operation and the contents dumped and sorted.

Because the two containers are similar they have identical logic in the model. Because downflow density data is not yet available for FSS Facility containers the downflow density data for SCF containers is used as a proxy. Since the downflow density parameters are the only potential source of difference between the two containers, the use of proxy SCF information yields identical cost estimates of the two containers.

FSS Scheme Containers - FSS Scheme containers are defined as a container that contains mail for a single FSS scheme. The container can only contain 5-Digit, 5-Digit Scheme, Carrier Route, or FSS bundles. For mail destinating in an FSS zone, the 5-Digit and Carrier Route separations are of no value as all the mail is to be worked on the same scheme. Operationally it is preferred that all mail be bundled in uniform sized FSS bundles. The 5-Digit and Carrier route bundles are permitted while mailers adjust to FSS preparation.

FSS Scheme containers flow through the postal network intact until they arrive at the destinating FSS facility where they are taken directly to the FSS operation. The advantage of FSS Scheme containers is that the mail on these containers can bypass bundle sortation and be sent directly to the prep operation to be inducted into the FSS.

FSS scheme pallets are modeled like SCF pallets with the exception that FSS Scheme pallets do not incur pallet dumping costs as the pallets can be loaded directly into the FSS prep operation. While not yet authorized, the model included structure for FSS

Scheme sacks so as to be prepared if it is determined to be advantageous to allow FSS Facility sacks the future. FSS Facility sacks are modeled exactly like SCF sacks.

FSS Bundles – FSS bundles are simply a collection of pieces that destinate in a FSS scheme. The FSS bundle is intended to eventually replace 5-Digit and Carrier Route bundles for mail destinating in FSS zones. The 5-Digit and Carrier Route presort is of no operational value for mail destinating in FSS zones as all mail will be sequenced on the FSS and the presort does not enable mail to skip any processing steps. The advantage of preparing this mail in FSS bundles rather than 5-Digit or Carrier Route bundles is that FSS bundle preparation enables customers to enter fewer bundles that are more homogeneous in size.

FSS bundles may be placed on ADC, SCF, 3-Digit, FSS Facility or FSS scheme containers. Once removed from entry containers these bundles flow through the processing network until they have been sorted to the destination FSS Scheme where the bundles are opened and prepped for FSS induction. With the exception of FSS bundles on FSS scheme pallets the bundle processing logic in the model is similar for FSS and 5-Digit bundles. FSS bundles and 5-Digit bundles differ in that FSS bundles will be opened and distributed at the DSCF while a portion of 5-Digit bundles will flow to the delivery unit for piece distribution and will therefore incur additional cost while bundled. FSS bundles on FSS Scheme pallets incur no bundle handling costs. The downflow densities for FSS bundles are not yet available and are proxied with the densities of Carrier Route bundles.

Piece Distribution in FSS

IS Coverage factor adjustments – The introduction of the FSS bundle requires that the Incoming Secondary coverage factors be adjusted in order to accurately estimate the processing costs of mail entered in 5-Digit bundles. Coverage factors are used to measure the probability that a piece destinates at a facility with a given equipment configuration.[1] The coverage factors are developed using ODIS destinating volumes. By using ODIS destinating volumes an implicit assumption is made that the coverage factors are invariant to bundle presort level. With the introduction of FSS bundles this assumption cannot be valid for 5-Digit bundles so the coverage factors must be recalculated for these bundles.

All facilities with FSS are also equipped with AFSM100 machines. Thus any mail migrating from 5-Digit bundles to FSS bundles will have necessarily destinated in a facility equipped with an AFSM 1000. Mail that remains in 5-Digit bundles post-FSS will have higher incidence of destinating at facilities that either have no mechanization or only have UFSM 1000. As it is impractical to enumerate destinating volume by bundle level the derivation of the coverage factor adjustment is deduced mathematically.

The adjustment begins by calculating the proportion of mail destinating in FSS zones that has migrated to FSS bundles (FSSMIG) by multiplying the proportion of flats

[1] This is not the same as the probability that a piece will be worked on a given piece of equipment. The incidence of being worked on a piece of equipment depends on additional flow parameters. While it is necessary for a piece to destinate at a facility with a piece of equipment in order to be worked on that equipment it is not sufficient.

volume worked on the FSS by the proportion FSS destinating volume that arrives in FSS bundles. The Postal Service initially proposes to use machine counts MODS FSS operations to calculate the proportion if flats volume worked on FSS machines and Mail.dat files to calculate the proportion of volume destinating in FSS zones that are prepared in FSS bundles. The current model uses assumptions since mailers could not supply documentation of FSS preparation until the beginning of Quarter 4 of FY2011 meaning there has not been sufficient time to derive estimates from the Mail.dat data.

FSS Coverage Factors:

The coverage factors for 5-Digit and CR bundles are calculated from the initial coverage factors using the following formulas:

FSS = (National FSS proportion – FSSMIG) / (1-FSSMIG)

Manual = (Initial manual) / (1-FSSMIG)

UFSM 1000 = (Initial UFSM 1000) / (1-FSSMIG)

The AFSM 100 coverage factors are calculated residually by proportionally sharing the residual proportions. Here an assumption is made that the volume migrating to FSS bundles is independent of whether or not an AFSM 100 destination facility also has an UFSM 1000.

Non-IS coverage factors – Coverage factors used for 3-Digit, ADC and MADC bundles are only adjusted to reflect FSS processing. The coverage factors for Manual, and FSM

1000 are unchanged from the initial factors. The FSS coverage factor is taken to be the national proportion worked on FSS equipment. The AFSM 100 coverage factors are calculated residually by proportionally sharing the residual proportions. Here the assumption is made that the volume migrating to FSS bundles is independent of whether or not an AFSM 100 destination facility also has a UFSM 1000.

Additional Adjustments – While estimating Mechanized IS percentage as the ratio of MODS IS flats volume (adjusted for letters being worked on flats mechanization) to the sum of RPW volume of Single Piece, MADC, ADC, 3-Digit, 5-Digit, and CR volume in broken bundles, the FSS volume should be considered as well. The FSS volume is removed from the denominator because this volume is getting the IS sort on the FSS. To do this, RPW volume for non-HD and non-Saturation RPW volume (assuming that HD and Saturation will not be processed on FSS) and the MODS FSS volume (MODS FSS volume is reduced to account for letters worked on FSS equipment assuming that the proportion of letters worked as flats on FSS is the same as on other flats equipment) are subtracted. This gives an estimate of the proportion of "FSS eligible" flats (SP, MADC, ADC, 3D, 5D and basic CR) volume to "worked" FSS volume.

Model Changes: FSS and CR Piece Flow Sheets – Two additional sheets have been added to the Periodicals model to account for piece handling costs associated with FSS and CR bundles. The CR sheet is included to capture the piece handling costs associated with CR bundles that destinate in FSS zones. The CR sheet uses the national FSS proportion less the proportion of FSS zone volume migrated to FSS

bundles as a measure to the proportion of CR bundles that flow to FSS zones. The model used in this proposal used AFSM 100 acceptance rates to proxy for FSS acceptance rates. The Postal Service intends to analyze FSS operational data to calculate FSS specific acceptance parameters.

Adjustments to CR Bundle Flows – Prior to the introduction of FSS, carrier route bundles would flow to the delivery unit in containers that contained commingled carrier route bundles destinating at the delivery unit. At the delivery unit a clerk would sort these bundles to individual carriers. With the introduction of the FSS, carrier route bundles that destinate in FSS zones will not incur this sort at the delivery unit. These bundles will be taken directly from the incoming primary bundle sorting operation to the FSS operation and will not incur incoming secondary sortation as a bundle.

II. Guide to USPS-FY12-11 Spreadsheets

A. Organization

The USPS-FY12-11 workpapers consist of six separate Microsoft Office Excel workbooks, two each for the First-Class Mail Presort, Standard Mail, and Periodicals Outside-County model cost estimates. There are no non-public documents associated with USPS-FY12-11.

All three class-models have been setup with toggle switches in the worksheet ‘Switches’ to allow the user to turn “off” or “on” the proposed modification from Proposal Nine (Docket No. RM2012-8). Pending approval by the PRC, Proposal Nine modifications have been turned “off” to adhere to the PRC-approved methodology. An

alternate version has been filed with all modifications turned “on” to yield the alternate methodology filed in Docket No. RM2012-8.

B. Input/Output

The cost models rely on FY 2012 data inputs from several sources. Volume Variability factors are from Part 1 of USPS-FY12-7 (Cost Segment 3 Cost Pools & Other Information). Overhead and Premium Pay Factors are from Part 7 of USPS-FY12-7. The disaggregated wage rates are from Part 8 of USPS-FY12-7. MODS productivity figures are from USPS-FY12-23 (MODS Productivity Data). Operation Specific Piggyback factors are from USPS-FY12-25 (FY 2012 Mail Processing Piggyback Factors). Mail processing unit cost estimates by shape are from USPS-FY12-26 (FY 2012 Mail Processing Unit Costs by Shape). Flats Automation/Mechanization Piece Density Study data and several field study data results are from USPS-FY08-14 (Mail Characteristics Study). Flat bundle density downflow study data, Mail Characteristics study data for First-Class Mail presort flats, Periodicals Outside-County flats, and Standard Mail flats are from USPS-FY12-14 (Mail Characteristics Study).

First-Class Mail Presort, Standard Mail, and Periodicals Outside-County flats model cost estimates are used by USPS-FY12-3 (FY 2012 Discounts and Passthroughs of Workshare items). First-Class Mail and Standard Mail unit cost estimates are provided to USPS-FY12-30 (FY12 NSA Market Dominant Materials).

Unless otherwise specified, any data inputs that were not explicitly replaced by FY 2012 actual data have remained the same as in Docket No. ACR2011, including the PRC’s workpapers in that docket.

III. Flats Total Mail Processing Unit Cost Estimates

This section describes the flats mail processing unit cost estimates for First-Class Mail, Standard Mail and Periodicals flats.

Most changes that have been made to the cost models involve simple updates of cost model inputs (e.g., productivity figures), except as noted.

A. Flats Mail Processing Technologies

The flats cost models estimate mail processing unit costs. In FY 2012, the Postal Service relied on FSS in addition to the equipment described in the preface to USPS-FY11-11 (Docket No. ACR2011), section III.A; for the effect of the technologies on the cost models. Flats bundle sorting activities are performed using the Automated Package Processing System (APPS), the Automated Parcel and Bundle Sorter (APBS), the Small Parcel and Bundle Sorter (SPBS), the Linear Integrated Parcel Sorter (LIPS), or manual bundle-sorting operations. Flats piece distribution activities are performed using the Flats Sequencing System (FSS), the Automated Flat Sorting Machine Model 100 (AFSM100), the Upgraded Flat Sorting Machine Model 1000 (UFSM1000), or manual piece-sorting operations. Some AFSM100 machines have been retrofitted with Automatic Tray Handling System (ATHS), Automated Induction (AI), or both. FSS phase I deployment is complete and has been described in Section I.E above.

B. Cost Methodology

1. CRA Mail Processing Unit Costs

The cost analyses rely upon shape-specific CRA mail processing unit costs, which are reported separately for First-Class Mail, Periodicals Outside-County Non-

letters, and Standard Mail by cost pool in the In-Office Cost System (IOCS).[2] These CRA mail processing unit costs are subdivided into multiple cost pools. Each cost pool represents a specific mail processing task performed at Network Distribution Centers (NDCs) formerly BMCs, MODS plants, or non-MODS plants. The costs are "mapped" to each cost pool using the methodologies in USPS-FY12-7.

2. Model-Based Mail Processing Unit Costs

The flats cost models consist of two sections used to estimate piece costs: a mail flow spreadsheet and a cost spreadsheet. In the Periodicals model, additional spreadsheets are used to calculate bundle and container costs. For First-Class Mail Presort and Standard Mail separately, a weighted model cost for all the rate categories that were de-averaged is then computed using FY 2012 mail volumes. This cost is tied back to the FY 2012 CRA shape specific mail processing costs using CRA adjustment factors. The approach for the Periodicals CRA adjustment factor is different as described in section III. B. 2. C below.

a. Mail Flow Spreadsheet

Each spreadsheet "flows" flat-shaped mail pieces through the mail processing network. This network is represented by a series of boxes (operations) and arrows on each spreadsheet that "flow" mail to other operations. Each box is separated into two parts. The right-hand section represents the number of physical pieces processed in a given operation. The left-hand section is equal or higher in value, and reflects the fact that some pieces are processed through a given operation more than once. The latter

[2] USPS-FY12-11 spreadsheets; see worksheet "CRA PRESORT FLATS' in the First-Class Mail model and worksheet 'CRA FLATS' in the Periodicals and Standard Mail models.

values are ultimately used by the cost sheet to calculate model costs. The mail pieces are “flowed” from one operation to the next using the input data described below.

i. FY Mail Volumes

Mail Characteristics Study data are used as the starting point in developing mail flow spreadsheets. The data contained in USPS-FY12-14 reflect the FY 2012 Revenue, Pieces, and Weights (RPW) mail volumes for flat-shaped mail. The Periodicals volume data is presented in piece, bundle, and container counts by mail preparation characteristics.

ii. Bundle Sort

The recent bundle breakage study (USPS-FY08-14) estimates breakage rates for bundles on pallets, in sacks, and in subsequent operations. These data are used to estimate the number of bundles finalized and broken in each bundle sorting operation. In the Periodicals model, those calculations are made in worksheet ‘BUNDLE PROBABILITIES’.

iii. Entry Profile

For the First-Class Mail and Standard Mail cost models, the operations during which bundles are broken and finalized are used to develop an "ENTRY PROFILE" spreadsheet. This spreadsheet translates the number of bundles back into pieces.

The mail flow spreadsheet pulls these data into the corresponding cell in the "PIECE ENTRY POINTS" section based on whether they are machinable and/or barcoded. The "PCS IN" box at the top of each mail flow spreadsheet sums the data in

the "PIECES ENTRY POINTS" cells to ensure that all mail pieces are entered into the model.

iv. Coverage Factors

Coverage factors are estimates of the percentage of mail volume in a given period of time that encounters various equipment and technologies. The Postal Service's MAILDIRECTIONv2 file is used to identify the physical location where mail for each 3-Digit zone is processed. MODS data are used to identify the sortation technologies used at each "covered" facility.[3] Proposal Twenty-five, approved in Order No. 399, (January 27, 2010) described in section I.D above supersedes Modification 10 in Proposal Twelve (Docket No. RM2009-1). To some extent, however, the adjustment contemplated by Proposal Twenty-nine, approved by the PRC in Order No. 339 (November 13, 2009) supersedes modification 8 from Proposal Twelve. Updated Coverage factors have been incorporated in all three models of the 'Coverage Factors' worksheet. FSS Coverage Factors methodology was introduced in Proposal 18 and is incorporated in all three models. Detailed description of the methodology and formulas used in computation of Coverage factors is provided in section I.E above. In Proposal 9 (Docket No. RM2012-8)

modification 5, the Postal Service has proposed a class-specific enhancement to Coverage Factors.

v. Accept Rates

The "accept rates" used in the mail flow spreadsheets reflect the fact that, for a variety of reasons, some mail is not accepted by the different types of automated flats

[3] The "covered" facilities were those facilities scheduled to have the specific equipment or technology in FY 2011.

mail processing equipment, and is therefore diverted to manual operations for processing. These “accept rates” are taken from several sources, including engineering studies.

The "BCR accept" rate reflects the percentage of barcoded mail that was accepted on the AFSM100 during engineering tests. The "OCR accept" rate reflects the percentage of non-barcoded mail pieces that were finalized by the AFSM100 in these same tests. No routinely maintained updates are available by Postal Service’s Operations or Engineering offices. The FSM "keying accept" rate is the sort rate in “key” mode of the machine; it is not related to Remote Encoding Center (REC) keying activities. The cost models use the most recently available “accept rate” data, unless otherwise indicated.[4] The rejects from the automated UFSM1000 operation are assumed to be keyed only once, except for manual incoming secondary operations.[5] Rejects that occur during keying operations are diverted to manual operations. The "refed/misfaced REC timeout" accept rate reflects the percentage of total mail volume that must be re-fed through the machine because the REC keyers did not finalize the mail piece before it "timed out". The models assume that this mail is refed only once. The "REC image finalization rate" represents the percentage of mail for which Data Conversion Operators (DCO) at the REC were able to achieve a finest-depth-of-sort result. Finally, the "total accept rate" represents the total percentage of the mail that is finalized.

[4] Data were provided by Operations based on FY 2011.

[5] It is assumed that UFSM1000 automation incoming secondary rejects would not be keyed on that machine, due to the relatively small volumes that would be rejected for a given ZIP Code or group of ZIP Codes.

vi. Mail Flow Piece Densities

A “sort plan” is a software program that associates each output bin on mail processing equipment with address information on the mail piece. The term “density” refers to the percentage of mail that is sorted to a given bin on a machine using a given sort plan. In the mail flow spreadsheets, automation / mechanization piece density percentages are used to “flow” mail to succeeding operations. Updated automation/mechanization piece density data have been taken from USPS-FY08-14 and used in all three models. As mentioned in section I.D above, the PRC approved the use of UFSM1000 piece density data from USPS-FY08-14 (Docket No. ACR2008), replacing UFSM1000 density data from USPS-LR-J-63 (Docket No. R2001-1), as a proxy for manual operations piece density data in modification 2 in Proposal Twenty-five (Order No. 399, January 27, 2010). Proposal 18 included a modification for the exclusion of single-piece density data in MADC piece density data.

The data inputs described above are used in the mail flow spreadsheets to flow mail pieces through a modeled representation of the postal mail processing network. After mail pieces are finalized in an automation or manual incoming secondary operation, the finalized mail volumes are totaled for each of those operations and the sum is entered in the “PCS OUT” box at the top of the page. This calculation is performed to ensure that all pieces that are entered into the model are also processed through the model and finalized.

b. Cost Spreadsheet

Each cost spreadsheet accesses the mail volumes from each operation in the corresponding mail flow spreadsheet. This volume information, in conjunction with the

other data inputs described above, is used to calculate a mail processing cost estimate for the mail volumes flowing through each operation. Each operation cost is then divided by the "PCS OUT" mail volume in order to determine the weighted operation cost. The sum of these weighted operation costs is the model cost. In the Periodicals model, the cost spreadsheet have been incorporated since ACR 2007 in the ‘MADC’, ‘ADC’, ‘3D’, ‘5D’, ‘FSS’, and ‘CR’ worksheets, along with the piece flow diagrams.

c. CRA Adjustments

Separately for First-Class Mail and Standard Mail, the model costs are weighted together using FY 2012 mail volumes. The sum of the costs in the CRA workshare-related proportional cost pools is then divided by this weighted model cost in order to calculate the CRA proportional adjustment factor. The costs for the remaining fixed cost pool classification are used as fixed adjustments. The total mail processing unit costs are calculated as follows:

((Mail Processing Model Cost) * (Proportional Factor)) + (Fixed Factor)

=Total mail processing unit costs.

The PRC approved Modification 9 in Order No. 170 (January 12, 2009) approving a single CRA adjustment factor for Periodicals.

C. Presort-Adjusted Mail Processing Unit Cost Methodology

An examination of the mail characteristics for the non-automation presort category within First-Class Mail presort and Standard Mail reveals that a great deal of this mail is presorted to either 3-digit or 5-digit ZIP Codes. As such, the actual total mail processing unit costs for First-Class Mail nonautomation presort flats are lower than

those for First-Class Mail automation mixed ADC presort flats. In order to make a more useful comparison, the costs for automation mixed ADC presort flats should be compared to the costs for nonautomation presort flats that have been presorted to the same level (in this instance, mixed ADC). Consequently, adjusted costs were developed for First-Class Mail presort flats and Standard Mail flats.

For First-Class Mail presort flats, adjusted costs were developed for nonautomation presort flats at each presort level (mixed ADC, ADC, 3-digit, and 5-digit). The costs for the automation presort flats rate categories remained the same. The adjusted cost models were developed using the identical entry profile from the corresponding automation mail flow model. For example, in this analysis, the nonautomation mixed ADC mail flow model uses the same entry profile as the automation mixed ADC mail flow model. The only difference is that the mail volumes for barcoded machinable and nonmachinable mail in the automation model were entered as non-barcoded machinable and nonmachinable mail in the nonautomation model. The model costs from these models were adjusted using the actual CRA adjustment factors described above.

For Standard Mail flats, a similar analysis was performed, but the adjustments were made to the automation model costs instead of the nonautomation model costs. Therefore, the nonautomation model costs remained the same. The adjusted cost models were developed using the identical entry profile from the corresponding nonautomation mail flow model. The only difference is that the mail volumes for non-barcoded machinable and nonmachinable mail in the nonautomation model were entered as barcoded machinable and nonmachinable mail in the automation model.

The model costs from these models were adjusted using the actual CRA adjustment factors as described above.

Cost Summary Tables – First-Class Mail, Standard Mail, and Periodicals

Table 1. FIRST-CLASS MAIL PRESORT FLATS

RATE CATEGORY	ACTUAL (CENTS)	PRESORT-ADJUSTED (CENTS)
Nonautomation Flats	**61.583**	
Mixed ADC Nonauto Presort		**61.005**
ADC Nonauto Presort		**57.424**
3-Digit Nonauto Presort		**46.031**
5-Digit Nonauto Presort		**31.320**
Mxd ADC Auto Presort	**55.542**	**55.542**
ADC Auto Presort	**49.280**	**49.280**
3-Digit Auto Presort	**43.900**	**43.900**
5-Digit Auto Presort	**29.591**	**29.591**

TABLE 2. STANDARD MAIL FLATS

RATE CATEGORY	ACTUAL (CENTS)	PRESORT-ADJUSTED (CENTS)
Nonauto MADC	**42.072**	**42.072**
Nonauto ADC	**36.203**	**36.203**
Nonauto 3-Digit	**30.128**	**30.128**
Nonauto 5-Digit	**24.358**	**24.358**
Auto MADC	**39.934**	**37.558**
Auto ADC	**37.779**	**33.037**
Auto 3-Digit	**31.915**	**28.456**
Auto 5-Digit	**23.227**	**22.943**

Source: First-Class Mail and Standard Mail cost models worksheets ‘CRA ADJ UNIT COSTS’ & ‘PRESORT LEVELS HELD CONSTANT’

TABLE 3. OUTSIDE-COUNTY PERIODICALS COSTS

CRA Controlled Total (Allied and Direct) Piece Costs by Bundle Level, Barcode Status and Machinability

Bundle	NBC/NM	NBC/M	BC/NM	BC/M
MADC	$0.51	$0.37	$0.51	$0.34
ADC	$0.37	$0.30	$0.37	$0.27
3-Digit	$0.36	$0.25	$0.36	$0.23
5-Digit	$0.19	$0.14	$0.18	$0.13
FSS	$0.00	$0.00	$0.00	$0.16
CR	$0.00	$0.02	$0.00	$0.00

CRA Controlled Bundle Costs by Bundle Level and Presort Container

Table B2c: Total Per-Bundle Unit Costs, By Bundle & Container Presort Level, Including Weight

Bundle	Sacks								Pallets						By Container					
Presort	MADC	ADC	SCF/3-D	FSS Fac	FSS Sch	5-Digit	5-D CR	CR	MADC	ADC	3D-SCF	FSS Fac	FSS Sch	5-Digit	MADC	ADC	SCF/3-D	FSS Fac	FSS Sch	5-Digit
MADC	$0.28								$0.28						$0.28					
ADC	$0.93	$0.39							$1.00	$0.39					$0.95	$0.39				
3-Digit	$1.34	$0.82	$0.39						$1.45	$0.87	$0.39				$1.39	$0.85	$0.39			
5-Digit	$1.42	$0.90	$0.46	$0.39	$0.00	$0.39			$1.54	$0.96	$0.47	$0.39	$0.00	$0.36	$1.51	$0.95	$0.47	NA	NA	$0.39
FSS	$1.36	$0.87	$0.39	$0.39	$0.00				$1.47	$0.92	$0.39	$0.39	$0.00	$0.00	NA	$0.91	$0.39	$0.39	$0.00	
CR	$1.74	$1.27	$0.80	$0.39	$0.00	$0.39	$0.36		$1.90	$1.36	$0.84	$0.39	$0.00	$0.36	NA	$1.36	$0.84	NA	NA	$0.35
Firm	$1.74	$1.27	$0.80			$0.39	$0.36	$0.00	$1.90	$1.36	$0.84			$0.36	$1.79	$1.33	$0.83			$0.36

Table B1: Unit Costs Of Sack/Pallet Handling By Entry Point & Container Presort

Container		Entry Point						
Type	Presort	DDU	DSCF	DADC	DBMC	OBMC	OADC	OSCF
Sacks	MADC				$0.00	$0.00	$2.25	$2.76
	ADC			$2.25	$4.12	$5.52	$6.27	$6.44
	3-d		$2.25	$3.55	$4.24	$5.74	$6.58	$6.90
	FSS Fac		$2.25	$3.55	$4.24	$5.74	$6.58	$6.90
	FSS Sch		$2.25	$3.55	$4.24	$5.74	$6.58	$6.90
	5-d	$2.51	$2.92	$4.17	$4.95	$6.56	$7.50	$7.85
	5-d CR	$2.51	$3.75	$4.95	$5.76	$7.21	$8.00	$8.71
	CR	$2.51	$3.75	$4.95	$5.67	$7.46	$8.59	$8.71
Pallets	MADC					$46.68	$26.40	$46.04
	ADC			$26.40	$46.68	$55.35	$63.37	$70.81
	SCF/3D		$25.16	$45.70	$51.07	$64.97	$78.22	$84.20
	FSS Fac		$25.16	$45.70	$51.07	$64.97	$78.22	$84.20
	FSS Sch		$14.35	$34.69	$40.25	$54.15	$67.41	$73.39
	5D	$3.21	$42.76	$63.67	$66.31	$79.17	$91.38	$104.50

Source: ‘Summary’ sheet from USPS-FY12-11.PER_OC.xls