FY 2011 Special Cost Studies Workpapers -

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

Cost Summary Tables

I. Preface

A. Purpose and Content

USPS-FY11-11 documents the development of the FY 2011 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: Prop18FCMFlatsRevised.xls (Proposal 18 filed in Docket No. RM2012-2, as revised on Dec 12, 2011);

Periodicals model: Prop18PERFlatsRevised.xls (Proposal 18 filed in Docket No. RM2012-2, as revised on Dec 9, 2011) and;

Standard Mail model: Prop18STDFlats.xls (Proposal 18 filed in Docket No. RM2012-2 on Nov 30, 2011).

Ordinarily the Commission'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. Each of these models reflects the Commission's FY2010 ACD models, with the modifications described in section D below.

C. Methodology

USPS-FY11-11 uses the PRC's Docket No. ACR2010 cost methodology, except for the methodological changes described in the next section.

D. Changes to Models and Methodology

On Nov 30, 2011, the Postal Service filed Proposal 18 (Docket No. RM2012-2) with methodological changes included in the ACR documents and spreadsheets. The

proposal contains four modifications described along with the background, rationale and impact of each modification below:

Modification 1:

This modification incorporates FSS processing costs in the flats costs models.

Background: The deployment of FSS is now complete which makes it necessary to cost-estimate FSS operations. In the past ACRs, any elements of FSS costing in the models were voided due to lack of reliable data. While all FSS-related input data are still not available for the 2011ACR, the models have been set-up to make the computation of FSS costing.

Rationale: This modification makes necessary changes in flats models to accommodate the deployment of Flats Sequencing System (FSS). This modification incorporates new inputs that are FSS-specific i.e., costpool, productivity, volume-variability factor, coverage factors, accept rates, piggyback factors, Mail Characteristics Study data etc. into the cost model worksheets. This modification is applicable to all FCM, PER, and STD flats models.

Impact: The FSS modification is not the classical methodological change where the method of estimating costs changes but the underlying phenomena remains static. Here the FSS modification has been forced on the model by a change in the underlying phenomena. Evaluating the impact of this change in the classical sense presupposes that the mail processing costs in the absence of FSS can be known, which they cannot. The FSS modification is more akin to an extension of the existing methodology to new phenomena. The underlying effect of the calculations in the modification can be

evaluated in the cost summary worksheet by turning the switch “on” or “off” in the Switches worksheet but caution should be used in evaluating the change as it is not possible to generate an estimate of the FY11 costs in the absence of FSS processing.

Modification 2

Correct anomalous cost difference between MADC auto and ADC auto costs by excluding single-piece data from MADC mail.

Background: Adjustments to the Piece Density Tables – The piece downflow density estimates for the Outgoing Primary (OP) schemes were developed using bin statistics for all mail processed on the OP scheme and not restricted to mail prepared in MADC bundles or containers.

Rationale: MADC mail is a small portion of the mail worked in the OP scheme. The bulk of the mail processed in the OP scheme is single-piece or collection mail. Single-piece mail and MADC mail have different density characteristics. Single-piece mail can both originate and destinate in the same SCF service territory, i.e., a piece mailed across town. On the other hand MADC mail, by construction, generally precludes the incidence of intra-SCF mail. By rule any mail that originates and destinates in the service territory of the SCF where the mail is entered is to be isolated and presented separately in origin 3-Digit containers and bundles.

The use of downflow densities for the OP scheme derived using a mailstream that includes single piece mail results in biased estimates of the cost of MADC mail. This

bias is caused by overstating the proportion of MADC mail that flows from the OP scheme directly to the Incoming Secondary (IS) scheme. To reduce this bias the OP densities are adjusted by setting the percentage of flow from OP to IS to zero and scaling the remaining to 100 percent. The Commission accepted a similar approach in letter models. This modification is applicable to all FCM, PER, and STD flats models.
Impact: This modification corrects the anomaly of ADC costs being higher than MADC costs. The impact can be observed by turning the modification switch “on”.

Modification 3

This modification corrects an error in the calculation of the ADC pallet mechanized bundle sortation in the Periodicals flats costs model.
Background: In the previous model cell references for ADC pallet mechanized bundle sortation coverages incorrectly referenced the mechanized bundle coverages for MADC containers.
Rationale: These formula errors are corrected by remapping the proportion of broken ADC pallet bundles. This modification is only applicable to the Periodicals costs model.
Impact: The modification has been set up with a switch in the Switches spreadsheet. The impact can noticed across multiple cost cells by turning the switch “on”.

Modification 4

This modification calculates the costs for bundles entered on MADC pallets – a new classification proposed.

Background: As a new classification approved in Docket No. R2012-3, the Postal Service will allow the entry of bundles on MADC pallets, effective January 22, 2012. Since no volumes exist for such a classification in FY11, the Postal Service proposed to use ADC pallets entered at the destination ADC as a proxy for MADC pallets.
Rationale: Due to the fact that an MADC pallet entered at the origin ADC will incur operations identical to those applied to an ADC pallet entered at the destination ADC the modeled costs of an OADC entered MADC pallet will have identical modeled costs as a DADC entered ADC pallet. The modeled cost of an OSCF or ONDC MADC pallet will have similar modeled costs to an ADC pallet entered at the DNDC as both pallets are similar in that they require transportation to a relatively nearby processing facility where they will be opened and the contents distributed.
Impact: The new classification adds new cost cells under the MADC pallet categories in bundle and container costs in the Summary worksheet. This modification is applicable to the Periodicals model only. This modification cannot be turned off in the model, but does not affect the FY2011 results because there was zero volume of MADC pallet flats in FY 2011 (this classification will not be implemented until January 22, 2012).

Changes to worksheets

Prior to the 2009ACR, flats prep costs were determined residually by taking the CRA cost of the flats prep costpool times annual Periodicals volume and dividing this by the estimated the number of pieces that incur flats prep. In the 2009 ACR, this methodology was changed to model the flats prep activity directly using observed field productivities for flats preparation. The new methodology renders the calculations in

sheet ‘Flats Prep Costs (Op 035)’ unnecessary so this sheet has finally been removed in 2011ACR.

The ‘Direct Piece Calc’ and ‘Allied Piece Calc’ previously accessed calculations on the ‘Flats Prep Costs (Op 035)’ worksheet. These references were obtained from the ‘Bundle Probabilities’ sheet and were not dependent on any calculations in the ‘Flats Prep Costs (Op 035)’ sheet. The ‘Flats Prep Costs (Op 035)’ previously offered convenient access to the information extracted from the ‘Bundle Probabilities’ sheet. In the current model the necessary information is taken directly from the ‘Bundle Probabilities’ sheet breaking the link to the ‘Flats Prep Costs (Op 035)’ sheet. This step, along with the change in methodology" enables the ‘Flats Prep Costs (Op 035)’ to be removed.

Changes in past ACRs -

In Docket No. R2006-1, the Commission 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 Commission filed its version of the Periodicals cost model (PRC-ACR2008-LR5), in which the Commission 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 Commission 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 described in section D above. The proposal is pending decision by the PRC at the time of filing of this ACR.

E. 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. Deployment of the FSS is complete. 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

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. Phase I of FSS deployment began in May 2008 for the deployment of the first 100 machines and ended in mid 2011. 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.

[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.

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 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-FY11-11 Spreadsheets

A. Organization

The USPS-FY11-11 workpapers consist of three separate Microsoft Office Excel workbooks, one each for the First-Class Mail Presort, Standard Mail, and Periodicals Outside-County flats model cost estimates. There are no non-public documents associated with USPS-FY11-11.

All three 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 18 (Docket No. RM2012-2). Pending approval by the PRC, FSS cost estimation (Modification 1) has been turned "on" to reflect the actual processing environment during FY 2011, while residual modifications have been turned "off". An alternate version has been filed with all modifications turned "on" to yield methodology proposed in Proposal 18.

B. Input/Output

The cost models rely on FY 2011 data inputs from several sources. Volume Variability factors are from Part 1 of USPS-FY11-7 (Cost Segment 3 Cost Pools & Other Information). Overhead and Premium Pay Factors are from Part 7 of USPS-FY11-7. The disaggregated wage rates are from Part 8 of USPS-FY11-7. MODS productivity figures are from USPS-FY11-23 (MODS Productivity Data). Operation Specific Piggyback factors are from USPS-FY11-25 (FY 2011 Mail Processing Piggyback Factors). Mail processing unit cost estimates by shape are from USPS-FY11-26 (FY 2011 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-FY11-14 (Mail Characteristics Study).

First-Class Mail Presort, Standard Mail, and Periodicals Outside-County flats model cost estimates are used by USPS-FY11-3 (FY 2011 Discounts and Passthroughs

of Workshare items). First-Class Mail and Standard Mail unit cost estimates are provided to USPS-FY11-30 (FY11 NSA Market Dominant Materials).

Unless otherwise specified, any data inputs that were not explicitly replaced by FY 2011 actual data have remained the same as in Docket No. ACR2010, 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 2011, the Postal Service relied on FSS in addition to the equipment described in the preface to USPS-FY10-11 (Docket No. ACR2010), section III.A; see page 8 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

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-FY11-7.

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 2011 mail volumes. This cost is tied back to the FY 2011 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

[2] USPS-FY11-11 spreadsheets; see worksheet "CRA PRESORT FLATS' in the First-Class Mail model and worksheet 'CRA FLATS' in the Periodicals and Standard Mail models.

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 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-FY11-14 reflect the FY 2011 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 Commission 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.

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

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 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

[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.

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.

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 includes 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 2011 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

Source: First-Class Mail and Standard Mail cost models worksheets 'CRA ADJ UNIT COSTS' & 'PRESORT LEVELS HELD CONSTANT' & Periodicals cost model worksheet 'SUMMARY'.

Table 1. FIRST-CLASS MAIL PRESORT FLATS

RATE CATEGORY	ACTUAL (CENTS)	PRESORT-ADJUSTED (CENTS)
Nonautomation Flats	**55.297**	
Mixed ADC Nonauto Presort		**55.999**
ADC Nonauto Presort		**50.557**
3-Digit Nonauto Presort		**46.099**
5-Digit Nonauto Presort		**27.891**
Mixed ADC Auto Presort	**53.152**	**53.152**
ADC Auto Presort	**47.824**	**47.824**
3-Digit Auto Presort	**43.494**	**43.494**
5-Digit Auto Presort	**26.020**	**26.020**

TABLE 2. STANDARD MAIL FLATS

RATE CATEGORY	ACTUAL (CENTS)	PRESORT-ADJUSTED (CENTS)
Nonauto MADC	**40.650**	**40.650**
Nonauto ADC	**36.113**	**36.113**
Nonauto 3-Digit	**31.172**	**31.172**
Nonauto 5-Digit	**24.224**	**24.224**
Auto MADC	**38.839**	**38.540**
Auto ADC	**37.869**	**34.096**
Auto 3-Digit	**33.310**	**29.231**
Auto 5-Digit	**22.822**	**22.714**

Table 3. PERIODICALS

Table 3A- CRA Controlled Total (Allied and Direct) Piece Costs by Bundle Level, Barcode

Bundle	NBC/NM	NBC/M	BC/NM	BC/M
MADC	$0.4364	$0.3369	$0.4308	$0.3105
ADC	$0.3149	$0.2854	$0.3084	$0.2654
3-Digit	$0.2974	$0.2333	$0.2901	$0.2154
5-Digit	$0.1149	$0.1177	$0.1130	$0.1084
FSS	$0.0000	$0.0000	$0.0000	$0.0938
CR	$0.0021	$0.0148	$0.0000	$0.0000

CRA Controlled Bundle Costs by Bundle Level and Presort Container

Table 3B: Total Per-Bundle Unit Costs, By Bundle & Container Presort Level, Including

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	$0.2744								$0.2744						$0.2744					
ADC	$0.9151	$0.3827							$0.9847	$0.3827					$0.9151	$0.3827				
3-Digit	$1.2938	$0.7839	$0.3810						$1.4046	$0.8303	$0.3810				$1.2938	$0.8108	$0.3810			
5-Digit	$1.3572	$0.8472	$0.4676	$0.3810	$0.0000	$0.3810			$1.4749	$0.9009	$0.4771	$0.3810	$0.0000	$0.4125	$1.3572	$0.8972	$0.4676			$0.4125
FSS	$1.3119	$0.8325	$0.3810	$0.3810	$0.0000				$1.4247	$0.8844	$0.3810	$0.3810	$0.0000	$0.0000						
CR	$1.7850	$1.3223	$0.8836	$0.3810	$0.0000	$0.3810	$0.4125		$1.9492	$1.4309	$0.9388	$0.3810	$0.0000	$0.4125		$1.4307	$0.8836			$0.3814
Firm	$1.7850	$1.3223	$0.8836			$0.3810	$0.4125	$0.0000	$1.9492	$1.4309	$0.9388			$0.4125	$1.7850	$1.4013	$0.8836			$0.3943

CRA Controlled container costs by presort Level, container type, and entry point

Table 3C: 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						$2.27	$2.73
	ADC			$2.27	$4.16	$5.58	$6.32	$6.49
	3-d		$2.27	$3.57	$4.28	$5.80	$6.63	$6.95
	FSS Fac		$2.27	$3.57	$4.28	$5.80	$6.63	$6.95
	FSS Sch		$2.27	$3.57	$4.28	$5.80	$6.63	$6.95
	5-d	$2.88	$3.09	$4.34	$5.14	$6.77	$7.71	$8.06
	5-d CR	$2.88	$4.11	$5.31	$6.14	$7.61	$8.39	$9.10
	CR	$2.88	$4.11	$5.31	$6.05	$7.86	$8.99	$9.11
Pallets	MADC					$46.97	$26.49	$46.17
	ADC			$26.49	$46.97	$55.73	$63.67	$71.13
	SCF/3D		$24.87	$45.45	$50.99	$65.03	$78.27	$84.26
	FSS Fac		$24.87	$45.45	$50.99	$65.03	$78.27	$84.26
	FSS Sch		$14.38	$34.77	$40.50	$54.54	$67.77	$73.76
	5D	$3.71	$46.07	$67.02	$69.83	$82.81	$95.00	$108.14