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WASHINGTON, D.C. 20268-0001

POSTAL RATE AND FEE CHANGES, 2001	:	**Docket No. R2001-1**

DIRECT TESTIMONY
OF
MICHAEL W. MILLER
ON BEHALF OF
UNITED STATES POSTAL SERVICE

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DIRECT TESTIMONY
OF
MICHAEL W. MILLER

AUTOBIOGRAPHICAL SKETCH

My name is Michael W. Miller. I am an Economist in Special Studies at the United States Postal Service. Special Studies is a unit of the Office of Cost and Rate Case Development in Finance at Headquarters. I have testified before the Postal Rate Commission on four separate occasions.

In Docket No. R2000-1, I testified as the direct witness presenting First-Class Mail letters/cards and Standard Mail letters mail processing unit cost estimates and worksharing related savings estimates. My testimony also included the cost study supporting the nonstandard surcharge.

In that same docket, I also testified as a rebuttal witness. My testimony contested key elements of the worksharing discount proposals presented by several First-Class Mail intervenors as well as the Office of the Consumer Advocate (OCA).

In Docket No. R97-1, I testified as a direct witness concerning Prepaid Reply Mail (PRM) and Qualified Business Reply Mail (QBRM) mail processing cost avoidances.

In that same docket, I also testified as a rebuttal witness concerning the Courtesy Envelope Mail (CEM) proposal presented by the OCA.

Prior to joining the Special Studies unit January 1997, I served as an Industrial Engineer at the Margaret L. Sellers Processing and Distribution Center in San Diego, California. In that capacity, I worked on field implementation projects. For example, I was the local coordinator for automation programs in San Diego such as the Remote Bar Coding System (RBCS) and the Delivery Bar Code Sorter (DBCS). I was also responsible for planning the operations for a new Processing and Distribution Center (P&DC) that was activated in 1993. In addition to field work, I have completed detail assignments within the Systems/Process Integration group in Engineering.

Prior to joining the Postal Service, I worked as an Industrial Engineer at General Dynamics Space Systems Division, where I developed labor and material cost

estimates for new business proposals. These estimates were submitted as part of the formal bidding process used to award government contracts.

I earned a Bachelor of Science degree in Industrial Engineering from Iowa State University in 1984 and a Master of Business Administration from San Diego State University in 1990.

I. PURPOSE AND SCOPE OF TESTIMONY

This testimony discusses the cost studies that estimate the test year volume variable mail processing unit costs for the First-Class Mail, Periodicals, and Standard Mail presort flats rate categories. Two sets of estimates are provided. The first set represents the mail processing unit costs based on the actual mail piece characteristics. The second represents the mail processing unit costs when the levels of presortation for certain rate categories are held constant. These estimates are referenced in the testimonies, workpapers, or library references of witnesses Eggleston (USPS-T-25), Robinson (USPS-T-29), Moeller (USPS-T-32), and Taufique (USPS-T-34).

II. DATA SOURCES

Numerous data sources have been used to calculate the cost estimates included in this testimony. The following data sources from Docket No. R2000-1 have been relied upon to develop these estimates:

Docket No.	Data Description	Data Source
R2000-1	Flats Bundle Study	LR-I-88
	Flats Coverage Factors	LR-I-89
	Flats Mail Processing Cost Model	LR-I-90
	MTAC Package Integrity Work Group Data	LR-I-297

In addition, the Docket No. R2001-1 volume variability factors found in Table 1 of witness Van Ty Smith's testimony (USPS-T-13) have been relied upon to develop these estimates. Finally, the following Docket No. R2001-1 library references are associated with this testimony:

Docket No.	Data Description	Data Source
R2001-1	Wage Rates	LR-J-50
	Piggyback/Premium Pay Factors	LR-J-52
	CRA Mail Processing Unit Costs/ Cost Pool Piggyback Factors	LR-J-53
	MODS Productivities/BCS Accept Rates	LR-J-56
	USPS-T-24 Electronic Spreadsheets	LR-J-61
	Flats Density Study	LR-J-63
	Base Year Mail Volumes	LR-J-98

The introductory paragraphs in USPS LR-J-61 and USPS LR-J-63 explain the purpose and contents of these library references, and both are incorporated by reference in this testimony.

III. FLATS TOTAL MAIL PROCESSING UNIT COST ESTIMATES

The cost methodology that has been used to estimate total flats mail processing unit costs in this docket is similar to the cost methodology used in Docket No. R2000-1.[1] In some cases, the methodology has been modified. These modifications are discussed in detail throughout this testimony. In addition, the Postal Service has continued to enhance the flats mail processing technologies that are used to process First-Class Mail, Periodicals, and Standard Mail flats. These enhancements have affected costs and are discussed as well.

A. FLATS MAIL PROCESSING TECHNOLOGIES AND SUBSEQUENT IMPACT ON COSTS

The equipment that has been used to process flat-shaped mail has changed in recent years. Five years ago, the Flat Sorting Machine 881 (FSM881) was used to process machinable flats and the Flat Sorting Machine 1000 (FSM1000) was used to process nonmachinable flats. The FSM881 contained a Bar Code Reader (BCR), while the FSM1000 did not. Both machines primarily sorted mail using manual "keying" methods. Due to equipment capacity shortages, the FSM1000 was occasionally used to process machinable mail. In addition, facilities that did not have any flats equipment, or had a shortage of flats equipment, had to rely on a great deal of manual processing, especially for the incoming secondary operations.

1. TEST YEAR EQUIPMENT

By test year 2003, the flats mail processing network will have changed. This network will rely on three types of equipment: the Advanced Flat Sorting Machine 100 (AFSM100), the FSM881, and the FSM1000.

The AFSM100 will become the cornerstone of the network. All AFSM100s will be deployed by the test year.[2] This machine has 120 bins, three feeding mechanisms, and is capable of operating at a much higher throughput than either the FSM881 or

[1] Docket No. R2000-1, USPS LR-I-90.
[2] Docket No. R2001-1, USPS-T-39, page 16.

FSM1000.[3] It will be used to process machinable flats and is equipped with both a BCR and an Optical Character Reader (OCR). In addition, the AFSM100 is also linked to the Video Coding System (VCS) located within each plant.

The VCS is a keying operation similar to the Remote Encoding Center (REC) operation used to process letters and cards. However, the VCS operation is not completely identical to that used for letters and cards. Letter and card "images" are lifted by various mail processing equipment and are "buffered" in the Image Processing Sub System (IPSS) before being transmitted to the REC. In addition, letters and cards are first processed through the Remote Computer Read (RCR) image recognition hardware and software before being diverted to the REC. As a result, letters and cards have to be staged and reprocessed later after the REC Data Conversion Operators (DCOs) have had a chance to key the images.[4]

Unlike the situation for letters, the flats images that are lifted on the AFSM100 are not buffered. The images proceed directly to the VCS. The mail pieces are circulated through the machine a fixed number of times before "timing out."[5] Mail pieces that are not finalized at that time will be rejected. In addition, flats mail processing equipment does not apply barcodes to mail pieces. As such, any flat-shaped mail piece that cannot be read by the AFSM100 will have to be processed through the VCS at each level of processing as it travels through the AFSM100 network.

Once the AFSM100s have been deployed, the FSM881s will either be excessed or relocated to facilities that do not have flat sorting equipment. The FSM881 has 100 bins and four feeding mechanisms. These machines currently have BCR and OCR capabilities and can be used to process machinable flats.

Finally, the AFSM100 has increased the Postal Service's flats processing capacity. As such, the FSM1000 will ultimately be used for its original intended purpose: the processing of nonmachinable flats. This machine has 101 bins and four feeding mechanisms. By the test year, all FSM1000s will have both BCR and OCR

[3] The AFSM100 can operate at a throughput in excess of 17,000 pieces per hour. Docket No. R2001-1, USPS-T-39, Chapter II at Section B.2.
[4] The REC staff would only need to key a given mail piece if the RCR were unable to determine the finest-depth-of-sort barcode and "finalize" the mail piece.
[5] Flats operating guidelines specify that these mail pieces should be allowed to circulate three times before timing out.

capabilities. Nonmachinable mail pieces that do not have access to the FSM1000 will have to be processed manually.

2. LETTERS COSTS AND FLATS COSTS

In developing the next generation of flats mail processing equipment, the Postal Service has relied on technologies that have proven successful in controlling letter mail processing costs. While there are some similarities between letter and flat mail processing operations, there are still many differences that result in flats costing more to process. These are addressed in more detail below.

First, as stated previously, flats mail processing equipment cannot apply barcodes to mail pieces. As such, a flat mail piece that cannot be read by the AFSM100 will have to be processed through the VCS at each level of processing. By contrast, the application of barcodes to letters and cards usually results in those mail pieces avoiding certain downstream operations, which can result in mail processing savings. Furthermore, the flats sorting equipment does not incorporate RCR image recognition hardware and software that can be used to reduce the keying costs for mail pieces that cannot be read by the OCR.

Second, the flat sorting equipment operates at much slower throughputs than does the letter sorting equipment. The AFSM100 may be able to process flats in excess of 17,000 pieces per hour, but the Delivery Bar Code Sorter (DBCS) can sort letters at rates approaching 40,000 pieces per hour.[6] The diverse mail characteristics associated with flats make it difficult to achieve flat mail processing equipment throughputs approaching those of letter mail processing equipment.

Third, the flat sorting machines have higher staffing requirements than do letter mail processing equipment. For example, a fully staffed AFSM100 requires six mail processing clerks.[7] This figure does not include those employees required to "prep" mail into Flat Mail Carts (FMC), nor does it include the VCS staff. For letter mail operations, a DBCS generally requires two mail processing clerks.[8]

[6] Docket No. R2001-1, USPS-T-39, Chapter II at Section A.2.
[7] Docket No. R2001-1, USPS-T-39, Chapter II at Section B.2.
[8] Docket No. R2001-1, USPS-T-39, Chapter II at Section A.2.

Fourth, unlike letters, flat-shaped mail is predominantly entered in packages.[9] Consequently, additional workhours are required to sort packages and "prep" the mail (e.g., unpackage the mail) for FSM operations. In addition, package breakage has proven to be a problem in the past.[10] However, the Postal Service continues to work with mailers to improve package integrity and identify alternative preparation methods for flat-shaped mail.

Finally, letters and cards are "faced" in the same direction through the entire postal mail processing network.[11] Flats, on the other hand, do not have to be faced in the exact same direction. The BCR and OCR on the three FSM models can read barcodes or addresses oriented in any of four directions as long as the address side of the mail piece faces the scanning equipment. In addition, flat sorting machines "drop" mail pieces into chutes that feed flats tubs. On occasion, these mail pieces can lose their orientation during that process. Letters are less likely to lose their orientation because mail processing clerks must "sweep" them directly from the bins (or "stackers") into nearby letter trays.

The test year flats technologies described in witness Kingsley's testimony (USPS-T-39) have been incorporated into the cost models. These measures will improve the Postal Service's ability to contain flats mail processing costs; however, these improvements are not identical to those that were implemented for letters.[12] Consequently, they may not have the level of impact that the enhanced letter technologies have had on letter mail processing operations.

B. ACTUAL TOTAL MAIL PROCESSING UNIT COST METHODOLOGY

In Docket No. R2000-1, a hybrid cost methodology was used to calculate flats mail processing unit cost estimates.[13] The Commission accepted that methodology. Consequently, a hybrid cost methodology is again used to calculate the mail processing unit cost estimates.[14] However, some modifications have been made. These

[9] Nonautomation presort "NON-OCR" letters and automation carrier route letters can contain some packaging. For the most part, letter mail processing operations are now tray based.
[10] Docket No. R2000-1, USPS LR-I-297.
[11] For single-piece letters and cards, the mail pieces would be faced properly once they have been processed through cancellation operations.
[12] Docket No. R2001-1, USPS-T-22, page 3.
[13] Docket No. R2000-1, USPS LR-I-90.
[14] Docket No. R2001-1, USPS LR-J-61.

modifications will be discussed in detail later in this testimony. The estimates of total mail processing unit costs by rate category are summarized below in Table 1 on page 14.

1. CRA MAIL PROCESSING UNIT COSTS

The flats cost analysis relies upon shape-specific Cost and Revenue Analysis (CRA) mail processing unit costs, which are reported by cost pool in the In-Office Cost System (IOCS).[15] These CRA mail processing unit costs are subdivided into 54 cost pools. Each cost pool represents a specific mail processing task performed at either Bulk Mail Centers (BMC), Management Operating Data System (MODS) plants, or non-MODS plants. The costs are "mapped" to each cost pool using the Productivity Information Reporting System (PIRS) or MODS operation number associated with each IOCS tally.

Each cost pool has been classified into one of three categories: worksharing related proportional, worksharing related fixed, or non-worksharing related fixed.[16]

The "worksharing related proportional" cost pools contain the costs for piece or package distribution operations that are directly affected by the presorting and/or prebarcoding activities performed by mailers. These cost pools are "proportional" in that the magnitude of the costs, and therefore worksharing related savings, are directly related to the specific level of presorting and/or prebarcoding. In addition, these costs pools contain the costs for the tasks that have actually been modeled. The flat sorting machine ("/fsm") cost pool is an example of a worksharing related proportional cost pool. This classification represents the largest percentage of the CRA mail processing unit costs (typically 50-70 percent).

The "worksharing related fixed" cost pools contain costs for other activities that are also affected by worksharing. However, these costs do not vary as a direct result of the specific worksharing options chosen by a given mailer. These costs represent tasks that have not actually been modeled. The bulk mail entry and verification ("LD79") cost pool is an example of a worksharing related fixed cost pool. As an example, the acceptance and verification unit costs for automation 3-digit and automation 5-digit flat

[15] Docket No. R2001-1, USPS LR-J-53.
[16] Docket No. R2001-1, USPS LR-J-61.

mail pieces should be roughly the same. Had a proportional classification been used, the cost differences between these two rate categories would have been artificially expanded after the model costs were tied back to the CRA. Thus, assigning these costs as worksharing related fixed is reasonable. This classification represents 15-20 percent of the CRA mail processing unit costs.

The "non-worksharing fixed" category consists of those remaining costs that are not affected at all by the types of worksharing activities covered in this testimony. The Express Mail ("express") cost pool is an example of a non-worksharing related fixed cost pool.

2. MODEL-BASED MAIL PROCESSING UNIT COSTS

When it is not possible to isolate CRA mail processing unit costs at the rate category level, an alternative method of cost estimation is needed. In this testimony, cost models are used to de-average the CRA mail processing unit cost categories. Cost models have been developed for each rate category. For example, cost models have been created for the First-Class Mail flats nonautomation presort, mixed Area Distribution Center (ADC) automation presort, ADC automation presort, 3-digit automation presort, and 5-digit automation presort rate categories. These models are then used to de-average the CRA mail processing unit costs for "First-Class Mail presort flats."

Each of the flats cost models consists of two spreadsheets: a mail flow spreadsheet and a cost spreadsheet. These spreadsheets are used to calculate model costs. A weighted model cost for all the rate categories being de-averaged is then computed using base year mail volumes and tied back to the CRA using adjustment factors. These factors are used to estimate the total flats mail processing unit costs by rate category.

a. MAIL FLOW SPREADSHEET

For this docket, mail flow spreadsheets have been created which incorporate recent mail processing changes.[17] Each spreadsheet "flows" 10,000 flat 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

[17] Docket No. R2001-1, USPS LR-J-61.

box is separated into two parts. The right-hand section represents the actual 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 what is ultimately accessed by the cost sheet and used to calculate model costs. The 10,000 mail pieces are flowed from one operation to the next using various input data that are described below.

i. BASE YEAR MAIL VOLUMES

The Docket No. R2000-1 base year (1998) mail characteristics data for First-Class Mail, Periodicals, and Standard Mail flats were used as the starting point in developing mail flow spreadsheets in this docket.[18] These mail characteristics include the mail volumes by package and container presort level for each rate category. The 1998 data were adjusted with mail volume information for base year 2000.[19]

ii. PACKAGE SORT

The base year 2000 mail volume data were then used to estimate the number of packages finalized and broken in each package sorting operation. In addition, Docket No. R2000-1 data related to the package sorting productivities, package breakage rates, package mail flow densities, and the number of package handlings were used in this analysis.[20] In terms of package breakage, the data from Docket No. R2000-1 USPS LR-I-297 have been used to determine the percent of packages broken for each first handling of that package. For pallets and sacks, these percentages are 1.1 percent and 17.5 percent, respectively.

The percent of broken packages for all subsequent handlings has been taken from Docket No. R2000-1, USPS LR-I-88. The results from this study measured breakage rates for pallets and sacks of 10 percent and 20 percent, respectively. In order to be conservative, the 10 percent figure has been used for both pallets and sacks.

iii. ENTRY PROFILE

[18] Docket No. R2000-1, USPS LR-I-90.
[19] Docket No. R2001-1, USPS LR-J-61, pages 35, 65, and 92.
[20] Docket No. R2000-1, USPS LR-I-88 and LR-I-297.

The point at which packages are broken and finalized is then used to develop an "ENTRY PROFILE" spreadsheet. This spreadsheet translates the number of packages back into pieces, with the 10,000-piece figure being used for each rate category.

The mail flow spreadsheet for each rate category then pulls these data into the corresponding cell on 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 10,000 mail pieces are entered into the model.

iv. COVERAGE FACTORS

In general, a coverage factor represents the amount of mail that has access to a specific type of equipment. Coverage factors are expressed in percentage terms and have historically been used in the flats mail processing cost models. The coverage factors used in this docket are taken from two sources.

First, the originating and destinating coverage factors, by class of mail, that were calculated in Docket No. R2000-1 are again used in this docket.[21] The FSM1000 coverage factors are used for both the AFSM100 and the FSM1000 machines. In general, the same facilities tend to have both machines. Furthermore, all FSM1000s were deployed by the Docket No. R2000-1 test year when that analysis was conducted. The results would therefore not change significantly were a new analysis undertaken.

The second set of coverage factors that are used concern the percent of incoming secondary mail that is processed in AFSM100/FSM881 operations.[22] These figures are estimates that have been provided by operations personnel.

v. ACCEPT RATES

The accept rates used in the mail flow spreadsheets reflect the fact that, for a variety of reasons, some mail will not be accepted by the different types of automated flat mail processing equipment and will have to be diverted to manual operations for processing. These accept rates are taken from two sources.

The FSM "keying accept", "refed/misfaced VCS time out," and "total accept rates" were calculated using End-Of-Run (EOR) data from a recent field study.[23] The

[21] Docket No. R2000-1, USPS LR-I-89.

[22] It is assumed that the remaining incoming secondary flats mail volume would be processed manually; the FSM1000 will not be used for incoming secondary processing.

FSM "keying accept" rate is the percentage of mail successfully keyed by employees feeding the machine itself; it is not related to VCS keying activities. The FSM1000 is the only equipment in the mail flow models that requires such keying. The rejects from the automated FSM1000 operation are assumed to be keyed one time only. Subsequent rejects are diverted to manual operations. The "refed/misfaced VCS timeout" accept rate reflects the percentage of total mail volume that must be refed through the machine because the VCS keyers did not finalize the mail piece before the mail piece "timed out." The models assume that this mail is refed only once. The "total accept rate" represents the total percentage of the AFSM100 mail that is finalized.

The results from engineering studies were also used in the mail flow models. 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. Finally, the "VCS image finalization rate" represents the percentage of mail in which DCO keyers in the VCS were able to achieve a finest-depth-of-sort result.

vi. MAIL FLOW DENSITIES

A “sort plan” is a software program which designates the bin on mail processing equipment to which each mail piece is sorted based on ZIP Code information. 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 density percentages are used to flow mail to succeeding operations. In this docket, these mail flow densities have been updated using the results from a recent field study.[24] In this analysis, the manual densities are assumed to be the same as those for the FSM1000. A separate manual analysis was not conducted.

The data inputs described above are used in the mail flow spreadsheets to “flow” 10,000 mail pieces through a modeled representation of the postal mail processing network. After the 10,000 mail pieces are finalized in either 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

[23] Docket No. R2001-1, USPS LR-J-63, page 15.
[24] Docket No. R2001-1, USPS LR-J-63, page 14.

calculation is performed to ensure that all 10,000 pieces that are entered into the model are also processed through the model.

b. COST SPREADSHEET

Each cost spreadsheet accesses the mail volumes from each operation in the corresponding mail flow spreadsheet.[25] This volume information, in conjunction with the other data inputs described below, is used to calculate a mail processing cost for the mail volumes flowing through each operation. Each operation cost is then divided by the "PCS OUT" mail volumes in order to determine the weighted operation cost. The sum of these weighted operation costs is the model cost.

i. MARGINAL (VOLUME VARIABLE) PRODUCTIVITIES

In this docket, the productivity values have come from three sources. The productivities for manual package sorting operations have been taken from a Docket No. R2000-1 study.[26] The productivities for the FSM881, FSM1000, and manual operations are taken from a study that was conducted using FY 2000 MODS data.[27] The AFSM100 productivities that were calculated in this latter study have not been used. Few AFSM100 machines had been deployed at the time FY 2000 ended on September 8, 2000. As an alternative, AFSM100 productivities for Accounting Period (AP) 10 Year to Date (YTD) FY 2001 have been used. The marginal productivity values are calculated by dividing the actual productivity values for each operation by the volume variability factors found in USPS-T-13, Table 1.

ii. WAGE RATES

Two separate wage rates are used to calculate model costs. The first wage rate reflects the wages for mail processing employees working at REC sites. It is assumed this same wage rate applies to VCS employees. The "other mail processing" wage rate is an aggregate rate for all other mail processing employees who do not work at REC sites.[28]

iii. “PIGGYBACK” (INDIRECT COST) FACTORS

[25] Docket No. R2001-1, USPS LR-J-61.
[26] Docket No. R2000-1, USPS LR-I-88.
[27] Docket No. R2001-1, USPS LR-J-56.
[28] Docket No. R2001-1, USPS LR-J-50.

"Piggyback" factors are used to estimate indirect costs.[29] This methodology is consistent with the methodology used by the Commission in Docket No. R2000-1.

iv. PREMIUM PAY FACTORS

Premium pay factors are used to account for the fact that employees earn "premium pay" for evening and Sunday work hours. As an example, First-Class Mail is processed during the premium pay time periods (Tours 3 and 1) while Standard Mail is processed during regular business hours (Tour 2). Therefore, the First-Class Mail factor is greater than the Standard Mail factor.[30]

v. PACKAGE SORTING COSTS

The package volumes calculated on the "PACKAGE SORT" spreadsheet by operation are used to calculate the package sorting costs in the cost spreadsheet for each rate category. Separate productivities are also available for each operation as described above.

c. CRA ADJUSTMENTS

The model costs for each rate category are weighted together using base year mail volumes.[31] The sum of the CRA worksharing 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 two cost pool classifications are used as fixed adjustments. The total mail processing unit costs are calculated as follows:

(Mail Processing Model Cost) * (Worksharing Related Proportional Adjustment Factor) + (Worksharing Related Fixed Factor) + (Non-Worksharing Related Fixed Factor)

The actual total mail processing unit costs by rate category for First-Class Mail, Periodicals, and Standard Mail presort flats can be found in Table 1 below on page 14.

C. PRESORT-ADJUSTED MAIL PROCESSING UNIT COST METHODOLOGY

The actual figures shown in Table 1 are not always an accurate measure of the value associated with the prebarcoding of flat-shaped mail. For example, First-Class Mail has one nonautomation presort rate category. An examination of the mail characteristics for these mail pieces reveals that a great deal of this mail is presorted to

[29] Docekt No. R2001-1, USPS LR-J-52.
[30] Docket No. R2001-1, USPS LR-J-52.
[31] Docket No. R2001-1, USPS LR-J-98.

either 3-digits or 5-digits. As such, the actual total mail processing unit costs for First-Class nonautomation presort flats are lower than those for First-Class automation mixed ADC presort flats. In order to make a more insightful 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, Periodicals, and Standard Mail flats.

For First-Class Mail 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, 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 Periodicals and Standard Mail, a similar analysis was performed, but the adjustments were made to the automation 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. For example, the Periodicals automation basic presort mail flow model uses the same entry profile as the Periodicals nonautomation basic presort 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.

TABLE 1:
FLATS TOTAL MAIL PROCESSING UNIT COST ESTIMATES

RATE CATEGORY	ACTUAL TOTAL MAIL PROCESSING UNIT COST (CENTS)	PRESORT-ADJUSTED TOTAL MAIL PROCESSING UNIT COST (CENTS)
FIRST-CLASS MAIL FLATS		
Nonautomation Flats	32.614	---
Nonautomation Mixed ADC Flats	---	49.901
Nonautomation ADC Flats	---	37.732
Nonautomation 3-Digit Flats	---	36.839
Nonautomation 5-Digit Flats	---	23.129
Automation Mixed ADC Flats	40.757	40.757
Automation ADC Flats	31.844	31.844
Automation 3-Digit Flats	31.845	31.845
Automation 5-Digit Flats	21.666	21.666
PERIODICALS FLATS		
Nonautomation Basic Flats	25.051	25.051
Nonautomation 3-Digit Flats	20.126	20.126
Nonautomation 5-Digit Flats	13.308	13.308
Nonautomation Carrier Route Flats	6.927	6.927
Automation Basic Flats	20.529	21.489
Automation 3-Digit Flats	17.422	17.936
Automation 5-Digit Flats	12.454	12.707
STANDARD MAIL FLATS		
Nonautomation Basic Flats	19.729	19.729
Nonautomation 3/5-Digit Flats	12.866	12.866
Automation Basic Flats	17.748	17.009
Automation 3-/5-Digit Flats	11.709	11.662