USPS-T-23

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

POSTAL RATE AND FEE CHANGES, 1997	Docket No. R97-1

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 Product Finance at Postal Service Headquarters. Prior to joining the Product Cost Studies group in January 1997, I was an Industrial Engineer at the Margaret L. Sellers Processing and Distribution Center in San Diego, California.

I have worked on various field projects since joining the Postal Service in February 1991. 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 OF TESTIMONY

The purpose of this testimony is to determine the mail processing cost avoidance for a prebarcoded reply mail piece. This cost avoidance applies to letters and cards and supports the testimony of Postal Service witness Fronk (USPS-T-32) concerning Qualified Business Reply Mail (QBRM) and Prepaid Reply Mail (PRM).

II. BACKGROUND

Businesses can provide their customers with two types of prebarcoded reply envelopes and cards: Courtesy reply mail (CRM) and Business Reply Mail (BRM).

CRM requires that the customer affix a stamp to each mail piece. CRM may be barcoded, but it requires no special sortation on BCS programs. It can be finalized on any sort program.

Unlike CRM, BRM pieces require no stamp. Mailers distribute BRM to their customers and then pay the postage and a per-piece fee for those mail pieces which are returned. Annual permit and accounting fees are also required. Recipients of prebarcoded BRM letters and cards can qualify for a reduced per-piece fee if they meet the Business Reply Mail Accounting System (BRMAS) requirements. In order to qualify, they must maintain an advanced deposit account and adhere to postal barcoding standards. Qualifying prebarcoded BRM letters and cards can be sorted using special Bar Code Sorter (BCS) programs that determine the mail volumes for individual firms. [1] These BRMAS piece counts can be used to calculate the postage and per-piece fees that are debited from advanced deposit accounts. After this accounting is completed, the mail is delivered to the BRM recipient.

In this proceeding, the Postal Service is proposing to establish two prebarcoded reply mail products on which the sender does not have to affix postage and on which the recipient pays a rate of postage below the basic single-piece First-Class Mail (FCM) rate: Qualified Business Reply Mail (QBRM) and Prepaid Reply Mail (PRM).

[1] The testimony of witness Schenk (USPS-T-27) reflects that a variety of alternative methods are employed to perform this accounting function.

QBRM postage will be collected, at a discounted rate, in a manner similar to BRM. Advanced deposit accounts will be required and barcoding standards will have to be met. Permit, advance deposit account and per-piece fees for counting, rating, and billing will also be charged.

For PRM, this same discounted postage will be paid by the recipient before the mail pieces are distributed to customers. After delivery, the recipient will be responsible for counting the mail volumes, subject to postal auditing. In addition to the permit fee, a monthly PRM accounting fee will be charged to cover any costs associated with auditing this process and reconciling the postage charges. PRM can be finalized on any sort program.

III. COST METHODOLOGY

The cost avoidance for both QBRM and PRM is calculated as the difference in mail processing costs between a prebarcoded First-Class reply mail piece and a handwritten First-Class reply mail piece. This handwritten benchmark does not mean that prebarcoded mail pieces will necessarily migrate from the handwritten reply mail stream. The benchmark simply recognizes that the appropriate point of comparison for pre-approved, prebarcoded reply mail generated by reply mail recipients is handwritten mail that would be generated by households. When customers use pre-approved, prebarcoded reply mail pieces provided by businesses or other entities, the Postal Service avoids mail processing costs.[2] If no reply mail pieces are provided, households must generate mail pieces that are not postal-certified. In a sense, the use of postal-certified reply mail pieces can be viewed as a form of worksharing.

This worksharing concept can be easily applied to QBRM and PRM pieces on which the sender is not required to affix postage. This is not the case for CRM which requires that postage be affixed. If the postage rate on CRM pieces deviated from the basic single-piece First-Class Mail rate, such a circumstance would raise administrative and enforcement issues of the nature and magnitude discussed by Postal Service witnesses Alexandrovich (USPS-RT-7) and Potter (USPS-RT-6) in Docket MC95-1.

[2] These costs are avoided with a higher degree of certainty than the costs associated with typed or barcoded mail pieces generated by households (which are not subject to postal automation-compatibility testing).

A. SCOPE OF ANALYSIS

The cost avoidance for postage-paid reply mail pieces is driven by the fact that handwritten reply mail pieces incur additional costs as they are processed through the Remote Bar Coding System (RBCS). In the test year, 92.59% of collection letter mail will have access to RBCS.[3] The vast majority of handwritten mail pieces will therefore have been barcoded before they leave the originating facility. It is not possible to develop extensive mail flow models as no single-piece density information is currently available. Accordingly, I have developed models which show the outgoing primary mail processing costs up to the point where each mail piece receives its first barcoded sortation on a BCS.

B. RBCS MAIL FLOW

RBCS processes mail that either does not have a barcode, or has an incomplete barcode. The desired result is usually an 11-digit barcode, but in some cases, a 5-digit or 9-digit result is all that is required (e.g., many addresses have unique ZIP Codes).

AFCS-ISS: The RBCS mail flow is depicted in Exhibit USPS-T-23A. Reply mail pieces first enter postal facilities as collection mail. Collection mail is loaded onto a series of conveyors that cull mail and ultimately feed the Advanced Facer Canceler System (AFCS). The primary AFCS function is to cull, face, cancel, and sort collection letter mail. The AFCS can sort this mail into one of four categories: reject, barcoded, machine printed, or handwritten mail.

In the test year, the AFCS will perform an additional function for handwritten mail. The AFCS will be retrofitted with an Input Sub-System (AFCS-ISS) that can apply an identification (ID) tag on the back of each mail piece and "lift an image" (i.e., take a picture) of the front of that mail piece. These images will be transferred electronically from the AFCS-ISS to a computer called the Image Control Unit (ICU).

[3] USPS LR-H-128: RBCS 3D Originating Coverage Factor

RCR: The ICU will transmit the images to the Remote Computer Read (RCR) system. RCR uses advanced image processing and pattern recognition software to resolve images. RCR is not included as a separate operation in Exhibit USPS-T-23A; the impact of this system is realized in the Remote Encoding Center (REC) productivity.

After the image has been processed by RCR, it is transmitted back to the ICU. If the image is resolved, it is transmitted to a computer called the Decision Storage Unit (DSU). Otherwise, the image is transmitted to the offsite REC facility.

REC: At the REC, Data Conversion Operators (DCO) are shown the images on Video Display Terminals (VDT) and are prompted to enter specific information such as the ZIP Code, the street address, or the city and state. Special keys are also available for specific cases like reject (unreadable), double fed, foreign and misfaced mail. Once the image has been processed, the ZIP Code results are transmitted back to the DSU at the plant.

MPBCS-OSS: After an appropriate amount of time has passed, the staged mail from the AFCS-ISS is processed on a MPBCS with an Output Sub-System retrofit (MPBCS-OSS). The MPBCS-OSS reads the ID tag on the back of each mail piece and queries the DSU for the associated result. If a result is achieved, a POSTNET barcode is applied to the front of the mail piece and it is sorted as dictated by the software.

MPBCS-OSS Errors: In some instances, errors can be resolved by processing mail back through all or part of the RBCS system. These errors are processed in the operations shown below. The numbers correspond to those in Exhibit USPS-T-23A.

(1.) LMLM - Most MPBCS-OSS rejects are verifier errors. After the MPBCS-OSS applies a barcode, a verifier rereads the barcode to ensure accuracy. If anything interferes with the barcode (e.g., another barcode, graphics, handwriting) or the barcode quality is poor, the mail piece is rejected. These mail pieces are isolated and taken to a Letter Mail Labeling Machine (LMLM) where a label is applied over the barcode area. This label provides a clean surface where a new barcode can be applied. The mail is then taken back to the MPBCS-OSS for reprocessing.

(2.) MLOCR-ISS - Other errors can be resolved by sending the mail piece back through the entire RBCS system. For example, misfaced and double fed mail can be refaced and fed through a Multi-Line Optical Character Reader that has been retrofitted to an ISS (MLOCR-ISS). The MLOCR-ISS relifts the image and the mail is processed back through the RBCS. Old ID tags can be used (if in the proper location) when the mail pieces are refed through the machine. Otherwise, a new ID tag is applied.

(3.) MPBCS-OSS - Mail can also be isolated and reprocessed on the MPBCS-OSS later. For example, if a series of mail pieces are immediately processed on the MPBCS-OSS after the images are lifted, they will be rejected because the REC will not be finished keying the mail. Another example occurs when the system is down; "time out" errors are the result of an electrical disconnect between the DSU and the MPBCS-OSS. In both cases, the mail pieces can be reprocessed on the MPBCS-OSS.

(4.) Manual - Finally, it is not always possible to find a match on the national database for some addresses. Therefore, no barcode is applied. In this case, the mail is sorted to an unassigned bin and routed to manual operations for further processing.

Leakage: Despite barcoding efforts, a certain amount of mail is "leaked" through the RBCS network. "Leakage" refers to the situation where a mail piece is processed through the REC, but the result is never obtained from the DSU. Leakage is usually the result of timing. If the system goes down or a processing window expires, mail is sometimes processed manually even though a result was obtained at the REC.

C. DATA SOURCES

The model inputs used in this testimony are shown in Exhibit USPS-T-23B. Many of these inputs are also used in other letter models. A few inputs, however, are specific to this study and require further explanation.

REC Productivity: The presort models[4] use a REC productivity that is calculated using data from Postal Quarter 4 Fiscal Year 96.[5] That figure includes an appreciable RCR impact, as many sites had received RCR by the end of the year.

[4] USPS-T-25: First-Class Letter Models
[5] USPS LR-H-113: REC Keying Productivity for PQ4 FY96

The productivity used in this cost study is lower because it is calculated using data from all of Fiscal Year 96.[6] The impact from RCR deployments is therefore minimized. Since handwritten mail pieces are the least likely candidates for RCR resolution, this lower productivity is used in this analysis.

Accept/Upgrade Rates: The MLOCR and MPBCS-OSS accept and upgrade rates are different from those used in the presort models. The rates for handwritten mail are used in this analysis.[7] Since presort discounts are not extended to handwritten mail pieces, these rates are not used in the presort models.

Leakage Factor: Recent RBCS information indicates that the system leakage is operating near the 7 percent level.[8] An operations target of 5 percent, however, is used in the models.

D. COST MODELS

Ten thousand mail pieces flow through each model. Costs are collected by operation and totaled in the "next operation" box. The ten thousand pieces are also balanced in that box to ensure that all related costs have been captured.

The models show the operations where the main cost differences occur between handwritten reply mail and prebarcoded reply mail. As stated previously, the main cost differences occur within the originating facility and are related to the fact that handwritten mail must be processed through RBCS in order to obtain a barcode.

Handwritten Reply Mail Flow: The RBCS coverage factor (92.59%) is used to determine the amount of mail that will have an image lifted on the AFCS. All image lift mail is routed directly to the REC for image processing. This mail then flows through the RBCS operations previously discussed. It is assumed that the leakage will occur before these mail pieces are processed on the MPBCS-OSS. It is also assumed that all MPBCS-OSS errors will be reprocessed only once.

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[6] USPS LR-H-113: REC Keying Productivity for all of FY96
[7] USPS LR-H-130: Accept and Upgrade Rates for Handwritten Mail
[8] EXHIBIT USPS-T-23C: RBCS System Leakage

A percentage of the mail originates at a facility that has access to an MLOCR, but not to RBCS. This percentage (4.98%) is estimated by subtracting the RBCS coverage factor (92.59%) from the MLOCR coverage factor (97.57%).[9] Since these sites do not have the AFCS, the handwritten mail will be mixed with the machine printed mail. Older cancelation machines, like the M-36, can recognize Facer Identification Marks (FIM) that identify barcoded mail, but they cannot distinguish between handwritten and machine printed mail. A small percentage of the handwritten mail will be accepted and upgraded on the MLOCR. The vast majority of this mail will be separated from the machine printed mail by the MLOCR and processed manually.

The percentage of mail (2.43%) that did not originate at either an RBCS or MLOCR site is also processed manually.

Prebarcoded Reply Mail Flow: In the prebarcoded model, the MPBCS/DBCS coverage factor (98.18%) is used to determine the amount of mail that has access to either an MPBCS or a DBCS for the outgoing primary sortation.[10] The rejects from these operations are processed manually.

The remaining percentage of mail (1.82%) originates at non-automated sites and is also processed manually.

Weighted Model Cost Calculations: For each operation, a direct labor cost is calculated by dividing the wage rate by the productivity. (The hourly wage rate is first multiplied by 100 and converted to cents.) The following example is taken from the MLOCR-ISS outgoing primary operation in the handwritten model:

Cents/Piece = (Test Year Wage Rate * 100) / Productivity
Cents/Piece = ($25.45/hr *100 cents/dollar) / 7,350 pieces/hr
Cents/Piece = 0.346 cents/piece

[9] USPS LR-H-128: MLOCR 3D Originating Coverage Factor
[10] USPS LR-H-128: MPBCS/DBCS 3D Originating Coverage Factor

A premium pay adjustment is then calculated to account for the fact that many of these operations occur when employees earn premium pay. This adjustment is calculated by multiplying the premium pay adjustment factor by the direct labor cost:

Premium Pay Adjustment = (Premium Pay Adjustment Factor - 1) * cents/piece
Premium Pay Adjustment = (1.02036 - 1) * 0.346 cents/piece
Premium Pay Adjustment = 0.007 cents/piece

Piggyback factors are also used to account for indirect labor costs such as supervision, equipment, facilities, and maintenance costs. These factors are included in the formulas used to calculate the weighted cost for each operation. The weighted operation cost is calculated using the Total Pieces Fed (TPF):

$$\text{Weighted Operation Cost} = \frac{\text{TPF} * ((\text{Cents/Pc}) * (\text{Piggyback Fact.}) + \text{Prem Pay Adjust.})}{10{,}000 \text{ Total Pcs}}$$

$$\text{Weighted Operation Cost} = \frac{347 \text{ Pcs} * ((0.346 \text{ cents/pc}) * (2.095) + 0.0007 \text{ cents/pc})}{10{,}000 \text{ Total Pcs}}$$

Weighted Operation Cost = 0.025 cents

A weighted model cost is then calculated by totaling all the weighted operation costs. In the handwritten and prebarcoded models, the weighted model costs were 4.408 cents and 0.942 cents, respectively.

CRA Adjustment: The results from mail processing cost models do not always match the CRA data for comparable cost pools. In the presort models, costs are tied back to CRA using adjustment factors.

The first step in this process is to "weight" the models (based on mail volume) within the rate category. These weights, or percentages, are multiplied by the corresponding model costs and then added together to get one aggregate cost.

This aggregate cost is then compared to the CRA costs in that rate category for only those operations that are included in the models. An adjustment factor is then calculated by dividing the CRA costs by the model costs.

The model costs are then adjusted using this factor. I applied the adjustment factor for First-Class non-carrier route presort to account for the fact that my reply mail models do not capture all costs.[11] The CRA adjustments for the handwritten and prebarcoded models were 0.699 cents and 0.149 cents, respectively.

The application of this factor is appropriate since the models do not consider some elements which would have contributed to further increasing the cost avoidance. These elements include: bin capacity constraints, barcoding limitations , REC keying errors, system failures, and REC Productivity.

(1.) Bin Capacity Constraints - The models assume that the handwritten and prebarcoded mail pieces are processed to the same depth of sort. In reality, a higher percentage of the prebarcoded mail will have been finalized and ready for dispatch as many sites use the DBCS for outgoing operations. The DBCS has more bins when compared to the MPBCS-OSS. DBCS sizes vary, but most machines have at least 150 bins when they are deployed in the field. In contrast, the MPBCS-OSS has 96 bins.

(2.) Barcode Percentage - By definition, prebarcoded mail pieces contain an 11-digit barcode. The handwritten mail pieces, however, are not all barcoded due to leakage, as described earlier. In addition, some handwritten mail may not obtain a complete 11-digit barcode through RBCS. Accordingly, mail processing costs for handwritten mail will be incurred in subsequent operations.

(3.) REC Keying Errors - Prebarcoded reply mail is more likely to be accurately barcoded because the recipient is responsible for the creation and pre-approval (through the Postal Service) of the mail pieces.[12] In contrast, handwritten mail pieces are subject to human error from both the sender and the DCO.

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[11] USPS-T-25: FCM Non-Carrier Route Presort CRA Adjustment Factor is 1.1586.

[12] Moreover, in contrast to barcodes which might be generated by personal computers and other sources which are not routinely certified by the Postal Service, prebarcoded reply mail pieces generated by QBRM and PRM recipients (and pre-approved by the Postal Service) are more likely to be accurately barcoded.

The sender could write the incorrect address on a mail piece. The DCO could transpose numbers when keying a mail piece. In both cases, the mail piece could be routed to the incorrect address. These errors might not be spotted until the carrier receives the mail. At that point, these mail pieces would have to be isolated and routed back through the system until they reach the correct destinating facility.

(4.) System Failures - The RBCS system can also have an impact on mail processing operations when an unforeseen system failure occurs. Power failures, staffing problems, and console capacity constraints can all affect how mail is processed in a plant. For example, in December, the amount of handwritten mail increases substantially. This increase in candidate RBCS mail volume can cause capacity problems. Plants may have to divert mail directly to manual operations because the REC does not have the consoles to meet the demand. The leakage factor accounts for mail if the image is lifted prior to the diversion, but it does not account for mail that bypasses the system entirely.

(5.) REC Productivity - The RBCS reporting system does not collect data by mail type. Therefore, separate processing characteristics for machine printed and handwritten mail are not available. Machine printed mail is often partially resolved to the five-digit level when it reaches the REC site. Handwritten mail is less likely to be partially resolved. As a result, handwritten mail pieces will generally require more keystrokes than machine printed mail. The productivity used in the models is a cummulative value for all mail types. The productivity for keying handwritten mail only would have been lower, had it been possible to obtain separate processing statistics.

Total Cost Calculations: The total cost for the models is calculated by adding the weighted model cost to the CRA adjustment. The total costs for the handwritten reply mail and prebarcode reply mail models are 5.108 cents and 1.091 cents, respectively.

IV. COST RESULTS

The cost avoidance for Qualified Business Reply Mail (QBRM) and Prepaid Reply Mail (PRM) is calculated by subtracting the total costs for prebarcoded reply mail from the total costs for handwritten reply mail. The result is a cost avoidance of 4.016 cents. This cost avoidance is driven by the fact that a handwritten mail piece incurs additional costs as it is processed through RBCS.

For cards, a handwritten benchmark would also be used. The plant performance statistics (e.g., accept rates, productivities, etc.) might differ to some extent, but this information is not currently available. Therefore, the prebarcoded model would also be the same. As a result, the cost avoidance that I can measure can be applied to cards as well as letters.

EXHIBIT USPS-T-23A: OUTGOING PRIMARY RBCS MAIL FLOW

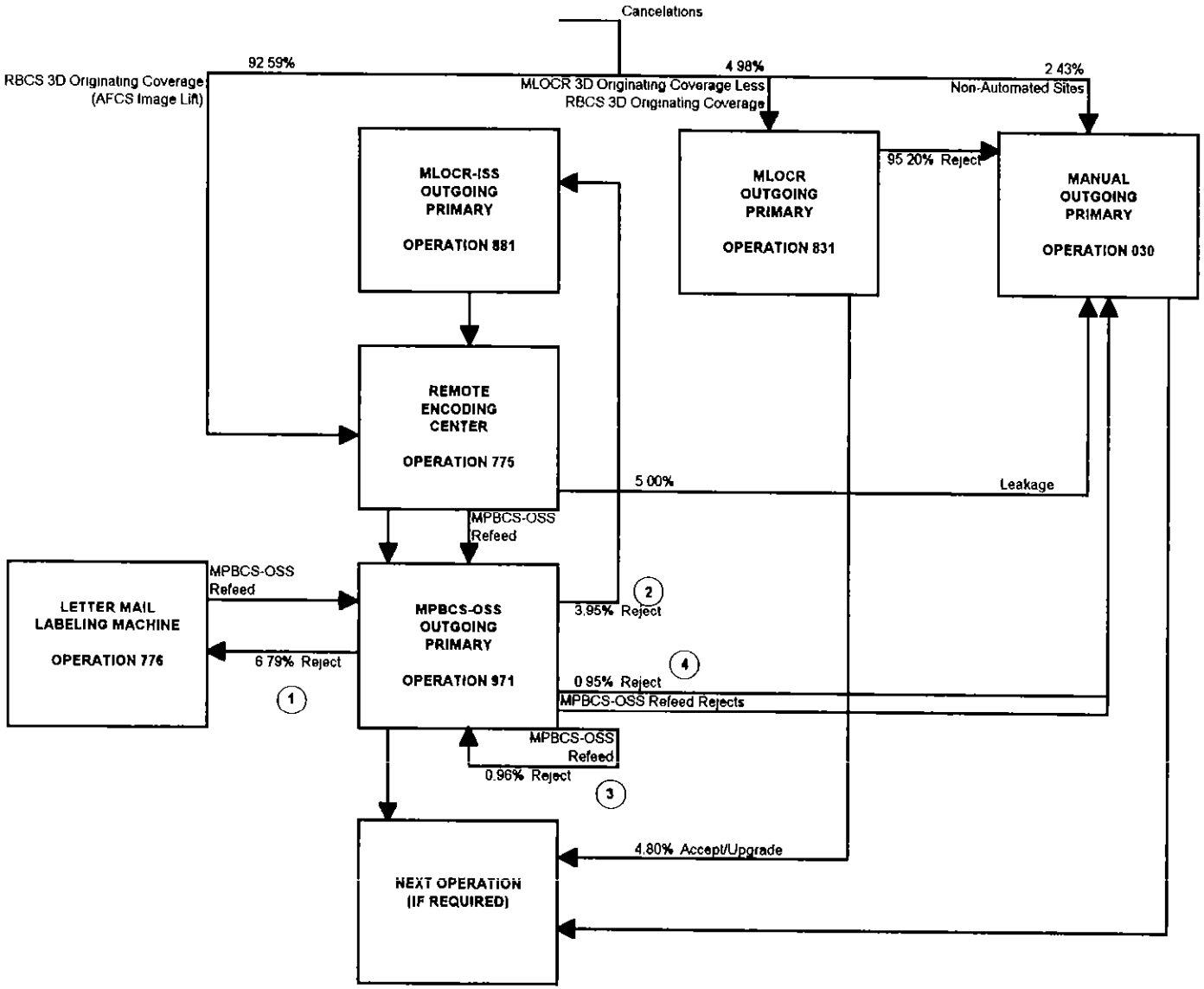


EXHIBIT USPS-T-23B: MODEL INPUTS

DESCRIPTION	SOURCE	VALUE
1.) Coverage Factors		
RBCS 3D Originating	USPS LR-H-128	92.59%
MLOCR 3D Originating	USPS LR-H-128	97.57%
MPBCS/DBCS 3D Originating	USPS LR-H-128	98.18%
2.) Test Year Wage Rates		
Remote Encoding Centers (REC)	USPS LR-H-146	$14.92
Other Mail Processing	USPS LR-H-146	$25.45
3.) Premium Pay Adjustment Factor	USPS LR-H-77	1.020
4.) Productivities		
MLOCR	USPS LR-H-113	7,350
REC	USPS LR-H-113	660
MPBCS - OSS	USPS LR-H-113	11,984
MPBCS/DBCS	USPS LR-H-113	7,467
LMLM	USPS LR-H-113	4,985
Manual Outgoing Primary	USPS LR-H-113	662
5.) Piggyback Factors		
MLOCR	USPS LR-H-77	2.095
REC	USPS LR-H-77	1.450
MPBCS	USPS LR-H-77	1.719
LMLM	USPS LR-H-77	1.450
Manual Outgoing Primary	USPS LR-H-77	1.372
6.) Accept/Upgrade Rates		
MLOCR Accept	USPS LR-H-130	8.36%
MLOCR Upgrade	USPS LR-H-130	57.42%
MPBCS OSS Accept	USPS LR-H-130	87.35%
MPBCS OSS Errors:		
OSS Refeeds	USPS LR-H-130	0.96%
ISS Refeeds	USPS LR-H-130	3.95%
LMLM	USPS LR-H-130	6.79%
Manual	USPS LR-H-130	0.95%
MPBCS/DBCS Accept	USPS LR-H-130	95.00%
7.) Miscellaneous		
Leakage Factor	USPS-T-23C	5.00%
CRA Adjustment Factor	USPS-T-25	1.1586

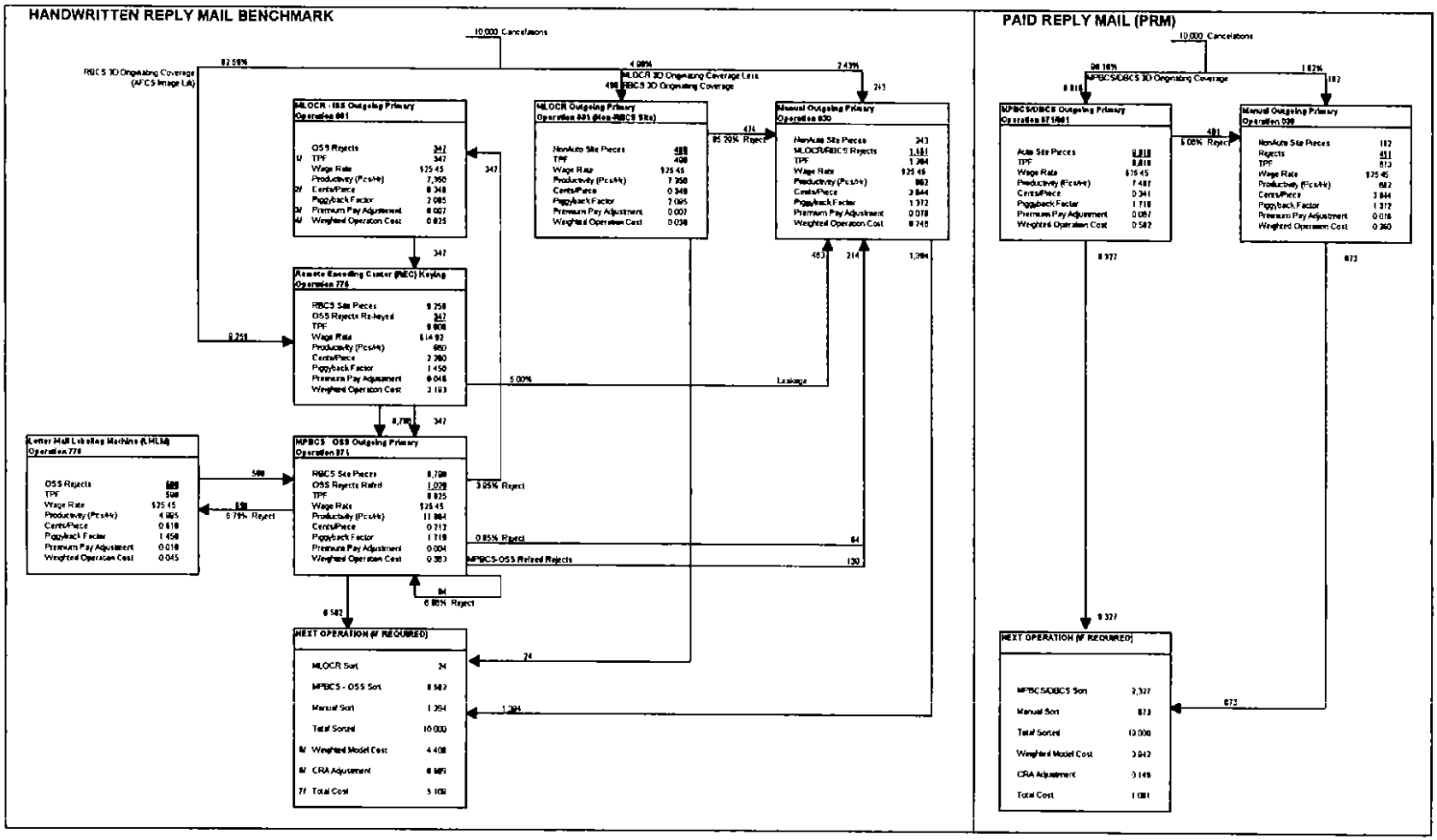
EXHIBIT USPS-T-23C: RBCS SYSTEM LEAKAGE

FY	AP	Percent Leakage
97	1	7.50%
	2	7.60%
	3	7.10%
	4	6.10%
	5	7.00%
	6	6.70%
	7	6.30%
Cummulative		6.98%
Target		5.00%

NOTE: DATA OBTAINED FROM IMAGE PROCESSING SUB-SYSTEM (IPSS) REPORTS

EXHIBIT USPS-T-23D: HANDWRITTEN REPLY MAIL AND PREBARCODED REPLY MAIL COST MODELS

a/ COST AVOIDANCE = 5.108
-(1.091)
4.016



NOTES:

1/ TPF = TOTAL PIECES FED

2/ CENTS PER PIECE = (WAGE RATE * 100) / PRODUCTIVITY

3/ PREMIUM PAY ADJUSTMENT = (PREMIUM PAY FACTOR - 1) * (CENTS PER PIECE)

4/ WEIGHTED OPERATION COST = TPF *((CENTS PER PIECE) * (PIGGYBACK FACTOR) + (PREMIUM PAY ADJUSTMENT)) / 10,000

5/ WEIGHTED MODEL COST = SUM (WEIGHTED OPERATION COSTS)

6/ CRA ADJUSTMENT = (CRA ADJUSTMENT FACTOR - 1) * WEIGHTED MODEL COST

7/ TOTAL COST = WEIGHTED MODEL COST + CRA ADJUSTMENT

8/ COST AVOIDANCE = HANDWRITTEN TOTAL COST - PREBARCODED TOTAL COST