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

POSTAL RATE AND FEE CHANGES

Docket No. R2006-1

DIRECT TESTIMONY OF
HALSTEIN STRALBERG
ON BEHALF OF
TIME WARNER INC.

CONCERNING PERIODICALS COSTS

SEPTEMBER 6, 2006

TABLE OF CONTENTS

		Page:
	AUTOBIOGRAPHICAL SKETCH	1
I	PURPOSE OF TESTIMONY	3
II	SUMMARY.....	4
III	AN IMPROVED MAIL FLOW MODEL FOR PERIODICALS FLATS …..	8
1	The Cost Of "Prepping" Bundled Flats In A Separate Operation Is Part Of The Overhead Associated With Automated Flats Sorting And Should Be Included In A Worksharing Related Model	9
2	A Mail Flow Model Should Make Realistic Assumptions About How Many Flats Receive Automated Sorting. Miller's Model Does Not ……	11
3	A Realistic Model Of The UFSM-1000 Must Recognize The Different Uses Of Its Two Sorting Modes …….	14
4	The Impact Of Bundle Breakage …….	19
5	The Costs Modeled By Miller Occur In More Cost Pools Than Those He Includes In His "CRA Adjustment"……	23
6	Firm Bundles ……	26
7	Miller Fails To Distinguish Between Carrier Route Direct Sacks, Which Do Not Require Bundle Sorting, And 5-Digit Carrier Routes Sacks, Which Do ……..	26
IV	EXTENDED BILLING DETERMINANTS FOR OUTSIDE COUNTY FLATS …….....	29
1	Container Volumes ……..	30
2	Bundle Volumes ……..	33
3	Piece Volumes ……..	33
V	AN EXTENDED MAIL PROCESSING COST MODEL FOR FLATS …..	35
1	Container Unit Costs …….	36
2	Bundle Unit Costs …….....	43
3	Piece Unit Costs ……	44
4	The CRA Adjustment …….	46
VI	CONCLUSIONS.....	48

LIST OF EXHIBITS

		No. Of Pages:
A	ESTIMATED MAIL PROCESSING COSTS OF OUTSIDE COUNTY FLATS PER RATE CATEGORY UNDER USPS AND PRC COSTING METHODS……...….	1
B	OUTSIDE COUNTY NON-LETTERS EXPANDED BILLING DETERMINANTS …….	2
C	OUTSIDE COUNTY NON-LETTERS - MAIL PROCESSING UNIT COSTS OF HANDLING PIECES, BUNDLES, SACKS AND PALLETS ….....	10

LIST OF TABLES

		Page:
1	Utilization & Productivity at Different UFSM-1000 Operations.	15
2	UFSM 1000 Productivities Rates According To LR-L-56 (BOZZO) And LR-L-43 (Miller) ..…….	17
3	IOCS Tallies Of Outside County Flats at FSM/UFSM-1000. ….....	18
4	Use Of MADC Sacks By Circulation Size …….....	40
A1	Presort/Automation Related Mail Processing Unit Costs ……..	A-1
A2	Presort/Automation Related Mail Processing Unit Costs With Presort Levels Held Constant …….……	A-1
A3	Piece Counts By Bundle & Container Presort Level And Piece Characteristics …….……..…	A-2
B1	Outside County Sack & Pallet Counts By Entry Point & Container Presort - TY08 …….	B-1
B2	Estimated Counts Of Bundles By Bundle & Container Presort Level - TY08 ……...	B-1
B3	TY08 Piece Counts By Bundle & Container Presort Level And Piece Characteristics …….……..	B-2
C1a	Unit Costs Of Sack/Pallet Handling By Entry Point & Container Presort (PRC Costing)…….	C-2
C1b	Unit Costs Of Sack/Pallet Handling By Entry Point & Container Presort (USPS Costing**)** ……...	C-2
C2a	Per-Bundle Unit Costs By Bundle & Container Presort Level - Excludes Weight Related Bundle Costs - Used In Mitchell's Rate Design - PRC Costing ……..…….	C-3

C2b	Weight Related Per-Bundle Unit Costs By Bundle & Container Presort Level - PRC Costing …….……..	C-3
C2c	Total Per-Bundle Unit Costs, By Bundle & Container Presort Level, Including Weight Related Costs - PRC Costing ……..….	C-3
C2d	Per-Bundle Unit Costs By Bundle & Container Presort Level - Excludes Weight Related Bundle Costs - USPS Costing …….	C-4
C2e	Weight Related Per-Bundle Unit Costs By Bundle & Container Presort Level - USPS Costing …….	C-4
C2f	Total Per-Bundle Unit Costs, By Bundle & Container Presort Level, Including Weight Related Costs - USPS Costing …….....	C-4
C3a	Unit Piece Processing Costs By Bundle & Container Presort Level & Piece Characteristics - Excludes Weight Related Costs - Used In Mitchell's Rate Design - PRC Costing …….....	C-5
C3b	Unit Piece Processing Costs By Bundle & Container Presort Level & Piece Characteristics - Weight Related Costs Only - PRC Costing ……..	C-6
C3c	Unit Piece Processing Costs By Bundle & Container Presort Level & Piece Characteristics - Includes Weight Related Piece Handling Costs - PRC Costing ……...	C-7
C3d	Unit Piece Processing Costs By Bundle & Container Presort Level & Piece Characteristics - Excludes Weight Related Costs - USPS Costing …….....	C-8
C3e	Unit Piece Processing Costs By Bundle & Container Presort Level & Piece Characteristics - Weight Related Costs Only - USPS Costing …….....	C-9
C3f	Unit Piece Processing Costs By Bundle & Container Presort Level & Piece Characteristics - Includes Weight Related Piece Handling Costs - USPS Costing …….…	C-10

AUTOBIOGRAPHICAL SKETCH

My name is Halstein Stralberg. I am a consultant to Time Warner on issues related to distribution of magazines through the postal system. Until June 1999 I was a principal at Universal Analytics, Inc. (UAI), a management consulting firm in Torrance, California. and manager of its Operations Research Division.

My academic background is in mathematics, with a master's degree from the University of Oslo, Norway in 1963. I received a bachelor's degree in mathematics, physics and astronomy at the University of Oslo in 1961. Most of my professional experience is in the area of management science and operations research. I have directed and performed more than 30 years of postal related studies as well as management studies for other clients in government and private industry, including production scheduling and control, corporate planning and finance, investment analysis, design and optimization of transportation systems, health care and computer system design.

I have previously presented 21 pieces of testimony before this Commission on a variety of postal costing and rate design issues: two rebuttal testimonies on behalf of the Postal Service in Docket No. R80-1; four testimonies on behalf of Time Inc. in R87-1; four on behalf of Time Warner Inc. in R90-1; one in MC91-3; two in R94-1; two in MC95-1; two in R97-1, two in R2000-1, and two on behalf of Time Warner Inc. et al. in C2004-1.

Since 1987 most of my work has been in support of Time Warner's participation in postal rate cases. Besides presentation of testimony, I have advised Time Warner on a variety of postal issues and directed the development of computer models for analysis of postal costs and rate design. I participated actively as a member of the joint industry/USPS Periodicals Review Team whose report and recommendations are included in LR-I-193 of Docket No. R2000-1, as an industry representative in an MTAC data collection on bundle breakage (LR-I-297), and in a USPS/Time Warner task force to evaluate the feasibility of tailoring the preparation of Periodicals mailings to the processing methods and sort schemes used in each postal facility.

From 1973 until 1987, I directed UAI's efforts under several contracts with the U.S. Postal Service. My activities under these contracts included:

- Design and development of the Mail Processing Cost Model (MPCM), a weekly staffing and scheduling computer program for postal facilities, with an annualized extension (AMPCM), using linear programming for long term staffing planning in a postal facility.

- An extensive data collection in 18 postal facilities designed to (1) establish a Postal Service data base on mail arrival rates and mail attributes affecting costs (subclass, shape, indicia, presort, container method, etc.), and (2) develop the model input data needed to apply MPCM for each facility.
- The "Study of Commercial Mailing Programs" under the Long Range Classification Study Program. This study involved a detailed cost and market evaluation of several rate and classification concepts, including various presort concepts, destinating SCF discounts for second class, plant loading and barcoding of preprinted envelopes.
- A BMC cost analysis which resulted in the establishment of the Inter/Intra-BMC parcel post rate differential in R80-1.
- Numerous simulation studies requested by USPS management.

My two testimonies on behalf of the Postal Service in R80-1 addressed the Intra/Inter BMC cost analysis and Dr. Merewitz's use of MPCM to analyze peak load costs.

I conducted a number of classes and seminars on the use of MPCM for Postal Service employees and interested outside parties. I have made extensive visits, including many multiple repeat visits, to over 40 USPS mail processing facilities and have observed all aspects of mail processing operations on all tours, as well as methods of mail collection, acceptance and transportation, and various ongoing postal data collection systems. I estimate that in total I have spent more than 2000 hours on site in postal facilities.

Besides my postal activities, I directed a study for the department of Health and Human Services of the impact of alternative regulatory policies used by state Medicaid agencies, which included an extensive data gathering effort and multiple regression analysis to determine factors influencing utilization and cost in the Medicaid program.

Before joining UAI I was an Operations Research Analyst at the Service Bureau Corporation (IBM), where I performed several large-scale simulation studies, including a design analysis of the Dallas/Fort Worth Airport's people mover system and simulations to improve design and response time in large interactive computer systems.

As Operations Research Analyst at Norsk Hydro, a Norwegian petrochemical company, my work included design, development and implementation of factory production scheduling systems, studies of transportation and distribution systems and risk analysis of investment decisions.

For three years I was assistant Professor of Mathematics at the University of Oslo.

I. PURPOSE OF TESTIMONY

My testimony analyzes Periodicals mail processing costs and the characteristics of Periodicals mailings that drive those costs. My objective in doing so is to facilitate a rate design that is more cost based and more beneficial for the long term health and viability of the Periodicals class than either the current rate structure or the rates proposed in this docket by witness Tang.

I correct a number of deficiencies and errors in the Periodicals mail flow model contained in USPS LR-L-43 and supported by witness Miller (USPS-T-20) and present an alternative model.

As was explained in Docket No. C2004-1, the Time Warner et al. complaint case, Time Warner believes that the rate categories in current Periodicals rate design are deficient because they fail to identify several important drivers of Periodicals costs and therefore make cost based rates impossible. My current testimony offers an updated version of the cost model I presented in C2004-1. Model results include test year per-piece, per-bundle, per-sack and per-pallet unit costs.

I also provide, as I did in C2004-1, an extended set of billing determinants that identify the Periodicals volumes corresponding to each identified cost category.

Both the unit costs and extended billing determinants are used by witness Mitchell (TW-T-1), who proposes an alternative and more cost based Periodicals rate design that is responsive to the Commission's order addressing the Time Warner et al. complaint in Docket No. C2004-1.

II. SUMMARY

My testimony in Docket No. C-2004-1 demonstrated that developing properly cost based Periodicals rates requires viewing Periodicals costs as driven, not only by pieces and pounds as in traditional rate design, but also by the bundles, sacks and pallets used in a Periodicals mailing. It explained in some detail how bundle and container presort levels, as well as the number of bundles, type and number of containers and container entry point into the postal system, all influence the costs incurred by the Postal Service. Additionally, it demonstrated the cost impact of piece characteristics such as machinability on the current generation of flats sorting machines.

That discussion is subject to a pending motion to designate it as evidence in the current docket. Motion of Time Warner Inc. to Designate Evidence from Other Commission Dockets, filed August 9, 2006. I will not repeat it here. Instead, this testimony describes my recent work in preparing cost models and mail volume data that can support either a traditional Outside County rate design along the lines proposed by witness Tang (USPS-T-35), or a more cost based and in my opinion superior rate design such as that proposed by witness Mitchell (TW-T-1).

Section III identifies specific deficiencies and mistakes in the Periodicals flats mail flow model contained in USPS LR-L-43, sponsored by witness Miller (USPS-T-20). It presents an alternative model, for the Commission's use should it decide to retain the traditional rate design approach. That model, referred to in the following as FlatsModel.xls, is an Excel spreadsheet contained in TW LR-2. It produces estimates of mail processing costs per rate category, in the same format as Miller's model. For convenience, the model can be set to use either PRC or Postal Service assumptions regarding volume variability of mail processing costs.

The major corrections and improvements I have made to Miller's mail flow model, as described in Section III, are:

- I added the capability to distribute the flats preparation cost pool (MODS 035) to rate categories in proportion to how much each rate category uses the pool.

Miller treats this pool as “fixed” relative to worksharing. I demonstrate that it is not “fixed” at all.

- Miller’s model vastly underestimates the degree to which Periodicals flats are still being sorted manually. My corrected model shows more manual processing but still incorporates an assumption that by the test year the Postal Service will have succeeded in moving significantly more flats onto flats sorting machines.

- Miller’s model fails to properly distinguish between the sorting of machinable and non-machinable flats on UFSM-1000 machines, which use dual sorting modes with very different productivities. I correct the problem at incoming secondary operations, where it was causing the greatest distortion.

- I have corrected some demonstrably false assumptions in Miller’s model regarding bundle breakage.

- I have expanded the “CRA adjustment” used by Miller because the mail processing costs he models are incurred in more cost pools than the ones he included.

Exhibit A shows the rate category costs, under PRC and USPS costing, produced by the corrected mail flow model.

Section IV describes the development of extended “billing determinants,” or mail volume data, needed by witness Mitchell to develop a cost based rate design that meets the Periodicals revenue requirement.

Development of such volume data was in some ways easier than the similar task I faced in preparing for C2004-1, due to the availability of more complete, recent and I hope accurate base year data. The main challenge was to “simulate” the substantial migration that will occur, forced by the new 24-piece sack minimum, of sacked pieces and bundles to fewer, larger and less presorted sacks.

Exhibit B shows the resulting test year volume estimates for Outside County non-letters

and the corresponding bundles, sacks and pallets. The format is the same as in my C2004-1 testimony (TW et al.-T-2), except that the OSCF and OAO entry point categories have been combined into one, due to data limitations.

Section V describes the development of per-piece, per-bundle, per-sack and per-pallet unit costs, as used in witness Mitchell's rate design. The results are presented in Exhibit C, which has a format similar to Exhibit B in my C2004-1 direct testimony.

The cost model used to derive these results is a collection of inter-linked Excel spreadsheets which include the FlatsModel.xls described above. It is an updated, improved and substantially simplified version of the corresponding cost model I used in C2004-1. That model was itself an updated, improved and simplified version of the LR-I-332 model developed in Docket No. R2000-1 by Christensen Associates.

One significant change relative to the C2004-1 model is in the treatment of the flow of sacks and pallets from origin facilities through intermediate and to destinating facilities. New survey data released by the Postal Service regarding the number of facilities that various types of sacks and pallets pass through allowed a simplified and presumably more accurate model logic. The new data indicate that containers entered far from their destination pass through more intermediary facilities, therefore causing more handling costs, than my C2004-1 model indicated.

Even with the reduced number of sacks expected in the test year, my model estimates that, including all piggyback costs, the test year mail processing costs of handling Outside County bundles, sacks and pallets (under PRC costing) are about $640 million, versus about $497 million directly associated with piece sorting.[1] The fact that pieces are rate elements in traditional rate design, while bundles, sacks and pallets are not (apart from the container charge proposed in this docket by witness Tang) already shows that the current rate structure does not correspond to costs and does not provide mailers with the proper cost based rate incentives. The rate design being proposed by

[1] This estimate considers "flats preparation" costs to be piece sorting related.

witness Mitchell will, on the other hand, assign some (but not all) of the costs incurred in handling bundles, sacks and pallets directly to the mailers who use them.

Supplementary statement (added 11/03/06)

On September 29, 2006, Presiding Officer's Information Request No. 18 requested that Time Warner "provide billing determinants and estimates of test year after-rates volumes and revenues . . . separately for Regular Rate, Nonprofit, and Classroom Periodicals." In response, I generated TYBR (test year before rates) volumes of pieces, bundles, sacks and pallets separately for each of those former subclasses, which I then provided to witness Mitchell (TW-T-1), who computed the corresponding TYAR (test year after rates) volumes and revenues. The methodology I used is described in my response to POIR No. 18 and in Time Warner Library Reference No. 4, TW-LR-4, filed October 19, 2006, of which I am the sponsor.

III. AN IMPROVED MAIL FLOW MODEL FOR PERIODICALS FLATS

I have a long history of analyzing and critiquing the mail flow models that the Postal Service uses to support its rate proposals. Since Docket No. R87-1 I have focused particularly on the various generations of models used to determine presort and barcode related cost differentials for Periodicals flats. The main question I have always asked about these models is whether they provide a realistic simulation of the way flats are actually handled and the way costs are actually incurred in postal facilities.

On occasion, as in dockets R87-1, R90-1 and R2000-1, I have submitted testimony that supported alternative mail flow models.[2] In this case again I present an alternative mail flow model that I recommend the Commission use. This section describes the major deficiencies I found in witness Miller's present model, and the corrections I propose.[3]

Prior to preparing this testimony, I had several conversations with Sander Glick, who I understand is submitting, on behalf of the Magazine Publishers of America (MPA), another alternative to Miller's model. Mr. Glick and I had noticed many of the same problems with the Miller model. Our ideas for correcting those problems converge in some cases and differ in others. Our objectives are somewhat different, in that Glick's model is intended to support a traditional rate design, with a few new features. My model can also be used for the purpose, but I believe, as does Time Warner, that the time has come for a departure from the traditional Periodicals rate design, in favor of

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[2] In Docket No. R2000-1, the last rate case in which I presented testimony, I pointed out certain errors in the Postal Service's flats mail flow model, then sponsored by witness Yacobucci. The Commission in that case adopted the alternative model I had prepared as the basis for calculating presort related worksharing cost avoidances.

[3] Some of these deficiencies were already present in the model's R2001-1 and/or R2005-1 versions. My C2004-1 testimony described some improvements I believed could be made to the R2001-1 version. See TW et al.-T-2, pp. 17-36 (Tr. 35-54).

I believe some of the improvements I am proposing would also apply to Miller's Standard and First Class flats models. I have, however, not studied those models in sufficient detail to be able to propose specific changes.

one that recognizes all major factors driving Periodicals costs. The model described in this section is therefore linked to a more general model, described in Sections IV and V, that provides the volume and cost input needed for the rate design presented by witness Mitchell.

I urge the Commission to review closely the model changes proposed both by Mr. Glick and myself, and to implement those it concludes will make the model most accurate.[4]

1. The Cost Of "Prepping" Bundled Flats In A Separate Operation Is Part Of The Overhead Associated With Automated Flats Sorting And Should Be Included In A Worksharing Related Model

The terms "flat preparation," "bundle preparation," or simply "prepping," refer to an operation intended to facilitate the entry of flats into a flats sorting machine, so as to maximize the utilization of the machine. It includes removing the bundling material from a flats bundle, facing the flats and placing them neatly in a specially designed cart or other equipment that will be sent to a flats sorting machine. Since the advent of the AFSM-100, flats preparation has become more formalized and is recorded under MODS operation 035.

The 035 "prepping" generally is performed for bundled flats that are intended for machine sorting. Carrier route bundles and bundles of flats that will be sorted manually bypass that operation. In fact, as confirmed by Postal Service witness McCrery, the 035 operation is intended only to facilitate loading the flats into a machine; it is inefficient to apply it to flats that will be sorted manually.[5] The equivalent operation to

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[4] In response to MPA/USPS-3, the Postal Service in this case has filed an alternative mail flow model for Outside County flats, as LR-L-153. I reviewed that model closely and concluded that it has some features that Miller's current model lacks, but that it also has its share of problems.

[5] In Docket No. R2005-1, McCrery listed the duties performed by 035 personnel as including:

1. Removal of strapping or banding from flat bundles that are processed on flat sorting machines or in manual flat cases.
2. Separating, facing and loading flats into mail transport equipment that will be sent to flat sorting machines or manual flat cases.
3. Securing flats into an AFSM 100 Flat Mail Cart that will be sent to an AFSM 100.

the part of the 035 that involves removal of bundling material is typically performed by a manual sorting clerk and is incorporated in the recorded productivity rates for manual flats sorting.[6]

According to Table 3 in witness Van-Ty-Smith's testimony (USPS-T-11), the mail processing costs attributed to Outside County flats in the 035 cost pool, intended to facilitate entry into the AFSM-100 machines, actually exceed the costs attributed in the AFSM-100 pool itself.[7] Clearly these costs must be considered when evaluating claims of improved flats sorting productivity. If all flats sorting were still performed manually, the 035 cost pool would have no reason to exist. Its costs are therefore part of the cost of using flats sorting machines.

Even though the 035 costs clearly differ among the rate categories he studies, Miller simply ignores them, as if they were fixed and irrelevant to presort related costing. Miller acknowledged this in response to an interrogatory in docket no. R2005-1,[8] but he continued to ignore the costs in the present docket.

I propose here a straightforward way to distribute flats preparation costs in the 035 cost pool among rate categories. The method is incorporated in my FlatsModel.xls.

Basically, the 035 pool costs should be attributed to the different flats categories

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Response to TW/USPS-T11-6, redirected from Van-Ty-Smith. (Tr. 5/1715-16) However, in response to further questions in the present docket, McCrery clarified that the operation is not used for flats that will be sent directly to manual sorting, and that it would be inefficient to do so. See response to TW/USPS-T42-30. (Tr. 10/3071-73).

[6] Similarly, for a carrier route bundle, the cost of breaking the bundle is part of the segment 6 unit cost for carrier route presorted flats, as determined by IOCS.

[7] $62.9 million versus $61.7 million. Flats preparation costs appear to be significantly higher for Periodicals than for other flats. Overall, AFSM-100 costs are more than twice as large as the 035 flats preparation costs, but for Periodicals the 035 costs are larger. I don't know why this is so, but I suspect one reason is that employees in the 035 operation often are asked to produce a given number of feet of prepared flats per hour. Because Periodicals flats are thicker, this productivity goal is reached more easily than for thinner Standard or First Class flats.

[8] Docket No. R2005-1, responses to TW/USPS-T19-2-6 (Tr. 6/1800-08).

according to how much they use the pool. As confirmed by McCrery, the pool is used by the flats that subsequently are sent to a flats sorting machine. Flats that go directly to manual piece sorting, and carrier route sorted flats that go directly to the carriers, do not use the services of the 035 pool and should not be charged with its costs. Response to TW/USPS-T42-30 (Tr. 11/3071-73),

Total test year costs in the 035 pool attributed to Outside County non-letters (flats and parcels) are, with all piggyback costs included, an average of 0.99 cents per piece (1.06 cents under PRC costing). But according to my calculations, only about 37.2% of Outside County flats encounter the 035 pool. For the flats that do receive machine sorting and incur 035 preparation costs, the average per-piece costs are then 0.99/0.372 = 2.66 cents per piece (2.85 cents under PRC costing.)

Under this approach, very little of the 035 costs are attributed to carrier route presorted flats, since few of them encounter the 035 operation. Also, few non-machinable flats are likely to incur 035 costs, which helps reduce the cost differential between machinable and non-machinable flats.

<u>2. A Mail Flow Model Should Make Realistic Assumptions About How Many Flats Receive Automated Sorting. Miller's Model Does Not.</u>

All large processing plants today are equipped with AFSM-100 machines able to sort machinable flats much faster than they could be sorted manually. Enhancements to the AFSM-100 described by McCrery, e.g., deployment of automated tray sorters in some facilities, will improve AFSM-100 productivity even more. USPS-T-42 at 15-17. However, in reality not all machinable flats are sorted on these machines. That is particularly true for incoming secondary sorting, which distributes mail already at the 5-digit level to carrier routes.[9]

[9] Incoming secondary sorting is of particular importance in the study of Periodicals and Standard flats costs, because most such flats are presorted either to the 5-digit or carrier route level and bypass all sorting operations that precede the incoming secondary.

Miller's model assumes that flats that are machinable and come to a plant that has flats sorting machines will always be machine sorted. More precisely, as confirmed by Miller, he assumes that a non-carrier route flat will undergo a manual incoming secondary sort if and only if at least one of the following four conditions holds:

(1) the flat's 3-digit destination ZIP code is served by a postal facility that uses neither AFSM-100 nor UFSM-1000 machines;

(2) the flat is non-AFSM-100 machinable and its 3-digit destination ZIP code is served by a postal facility that does not use UFSM-1000 machines;

(3) the flat was sorted manually in an upstream sorting operation; or

(4) the flat is rejected from an attempt to sort it at an AFSM-100 or UFSM-1000 machine.

Response to TW/USPS-T20-8 (Tr. 3/280). Under these idealized assumptions, it follows that only about 20% of Outside County non-carrier route flats and about 15% of Standard non-carrier route flats receive manual incoming secondary sorting. Miller response to TW/USPS-T20-10 (Tr. 3/281). Yet McCrery confirms that, in reality, about 44.7% of all non-carrier route flats are sorted manually in the incoming secondary. Response to MPA/USPS-T42-1 (Tr. 11/2853).

As McCrery explained, there are many reasons why incoming secondary flats sorting often is done manually, even if the flats are machinable and destined to facilities equipped with flats sorting machines. Response to TW/USPS-T20-9, redirected from witness Miller (Tr. 11/3091-92). Some of those reasons apply to Periodicals but do not apply to Standard flats, from which one may infer that the percent of Periodicals non-carrier route flats that receives manual incoming secondary probably is even larger than 44.7%.[10]

The Postal Service says, of course, that it is trying to increase the volume of flats that receive automated sorting, and one must assume that in the test year some progress

[10] In my visits to postal facilities over the years, I have always been given the impression that Periodicals flats are much more likely than Standard flats to be sorted manually, for many reasons, including those cited by McCrery.

will have been made on that front. But the Postal Service has been saying the same thing for a long time, certainly at least since the FY99 publication of the report by the Periodicals Review team, of which I was a member. Additionally, some of the reasons Periodicals continue to receive manual sorting are not going to change, such as (1) the fact that zones with only a few carrier routes always receive manual incoming secondary; (2) service related issues that apply to Periodicals but not to Standard mail and; (3) the higher percentage of non-machinable flats in the Periodicals mailstream.

I have given considerable thought to how one could make this model correspond more closely to the reality in postal facilities. Section III.3 below describes one change I have made with regard to the non-machinable flats that Miller's model routes to incoming secondary sorting on UFSM-1000 machines. That change raises the percent whose incoming secondary sorting is finalized manually to 29.9%, still far less than the 44.7% cited by McCrery for all flats (and the still higher, but unknown, percentage for Periodicals).

My proposed solution for a more realistic model is as follows. For each flat that would be flowed, based on all the model's other decision rules, to an incoming secondary sorting by a machine, I assume that it has an 85% chance of actually being machine sorted, while the remaining 15% will be manually sorted. The 85% can be changed by changing a single cell in my spreadsheet.[11] That figure was chosen based on the following analysis.

I found that setting the percentage to 75% results in 47% of non-carrier route flats receiving manual incoming secondary. That is probably a fairly realistic representation of the processing Outside County flats received in the base year. I recommend setting it to 85%, which brings the 47% down to 40% and reflects an assumption that the Postal Service will succeed, before the end of the test year, in significantly increasing its

[11] This percentage can be found in cell 'coverage factors'!D52 in FlatsModel.xls, which is my version of Miller's model. It is applied in cells c83:c87, I83:I87 and n83:n87 in each of the flowchart worksheets. This method differs from and should not be confused with the somewhat similar method used in the alternative LR-L-153 model.

use of automation in the processing of Outside County flats.

3. A Realistic Model Of The UFSM-1000 Must Recognize The Different Uses Of Its Two Sorting Modes

I have made one significant change in the way Miller's model simulates the use of UFSM-1000 machines. In my model, non-machinable flats from 5-digit bundles are not processed on the UFSM-1000, even in facilities where such machines exist, but are sent directly to manual incoming secondary sorting. This section explains why I believe such a change is justified and corresponds more closely to operational reality. It also explains why, given perfect data, some further model changes would be justified, and shows that inability to make those additional changes has the effect of understating the cost difference between machinable and non-machinable flats.

The UFSM-1000 machines, formerly known as FSM-1000, have undergone several transformations since their introduction in the 1990's. In the present configuration, the machines operate in two very different modes. One is an automatic feed/automatic read mode, similar to the way flats are sorted on the AFSM-100 (though not as fast and less reliable because there is no remote video backup.) In the second and much slower mode, operators at three consoles hand feed flats one at a time and manually key the address information.

The automatic feed mode is mostly performed under MODS numbers 811 through 817, while the manual keying mode uses numbers 441-448. Response to TW/USPS-T42-37.[12]

Table 1 summarizes the MODS hours and TPH, as provided by Bozzo, for the major

[12] Some other MODS numbers are also used, but according to the data provided by witness Bozzo, the above MODS ranges account for 98.68% of the volume sorted on these machines and 97.15% of the clerk hours. Each sorting mode accounts for about half of the total volume, but the slower keying mode accounts for 74% of the clerk hours. See Bozzo response to TW/USPS-T11-1b-c, redirected from witness Van-Ty-Smith (Tr. 10/2562-87). Bozzo also provided MODS data for the various UFSM-1000 sort schemes in LR-L-56.

sorting modes used on FSM/UFSM-1000 machines.

Table 1: Utilization & Productivity At Different UFSM-1000 Operations				
Type Sorting Operation	MODS No.	MODS Hours	TPH	Productivity
Keying Outg, Inc. Primary	441-445	4,062,281	1,765,926,399	435
Keying Inc. Secondary	446-448	213,990	71,064,052	332
Automated Outg, Inc. Primary	881-885	750,414	987,900,737	1,316
Automated Inc. Secondary	886-887	587,625	917,824,970	1,562
All FSM/UFSM-1000 Operations		5,778,729	3,792,762,447	656

As the table shows, for outgoing sorting operations and for incoming primary, most flats on UFSM-1000 (almost two thirds) are sorted in the slow keying mode and the predominant use of workhours is devoted to keying. But for incoming secondary, the sorting operation most relevant to Periodicals, almost all the volume is sorted in automation mode, and there is in fact very little keying done, little enough that it may be done for the rejects from the automation mode.

Why would postal facilities sort so many outgoing and incoming primary flats in the much slower keying mode rather than automated feed mode? Obviously, it is because not all flats are suitable for sorting in the automation mode.

The Postal Service often refers to flats that are not AFSM-100 machinable as UFSM-1000 machinable. Of course they are in the sense that the manual keying mode where each piece is handfed one at a time can handle just about any flat. But clearly not all such flats are machinable in the UFSM-1000 automation mode, since if they all were there would be no need to use the keying mode to sort them.

That still leaves open the question of whether there are some flats that are not machinable on the AFSM-100, but can be sorted in the automation mode on the UFSM-1000. But at least for Periodicals there do not appear to be many such flats, because when McCrery was asked which mode typical examples of non-machinable Periodicals flats would be sorted in if sent to a UFSM 1000, he said they were likely to be keyed.

Response to TW/USPS-T42-37f and g (Tr. 11/3086).[13]

So the reality appears to be that machinable flats are sorted on the UFSM-1000 in the automated feed mode, while non-machinable flats are hand-fed and hand-keyed with much lower productivity. But that is not how Miller models it. He shows both machinable and non-machinable flats being sorted in the automated mode, with only rejects sorted by keying.[14]

This clearly cannot be true, because if we consider the outgoing and incoming primary operations, where according to the above table two thirds of the volume is sorted by keying, Miller's assumption would mean a reject rate from the automated mode of 67%, in other words an acceptance rate of only 33%.[15]

Having in fact combined the flows of machinable and non-machinable flats on the UFSM-1000, Miller compensates by using productivity rates in the automated mode that are weighted averages of the productivities in the keying and automated modes. This is illustrated in Table 2 below, which compares the two sets of productivity rates extracted

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[13] The definition of what is machinable is somewhat fluid for both types of machine. As I reported in my Docket No. C2004-1 testimony, I have observed flats considerably heavier than the stated machinability limit being fed into the AFSM-100 without any apparent problem. But I have later been told that this is possible if only a few overweight pieces are fed at a time, but if too many of them are fed at the same time both productivity and acceptance rates drop significantly. Similarly, when I observed a UFSM 1000 machine a few years ago I was told that the automatic feeder works fine on pieces that are also AFSM-100 machinable. When the machine was fed AFSM-100 non-machinable pieces on the other hand, many of them went through, but reject rates quickly became unacceptably high.

[14] See for example worksheet "Basic NonAuto Model," or the worksheets for each of the other rate categories, in Miller's spreadsheet. Column G shows the volumes that Miller assumes end up being sorted in keying mode. But those volumes are small and, as can be verified by examining the formulas used, only flats that first are processed in the automated mode and then rejected would find their way to be sorted in keying mode.

[15] MODS data show an average acceptance rate in the UFSM 1000 automated mode of 89.7%. Miller's model assumes 99.87% for barcoded flats, whether or not they are machinable, and 73.63% for flats without barcodes, whether or not they are machinable. In the case of outgoing primary sorting, only about 25% of the volume is finalized in the automation mode. That would mean, if Miller's assumption were true, an acceptance rate of only 25%.

from LR-L-56 (Bozzo) with the rates Miller uses.

Table 2: UFSM 1000 Productivities Rates According To LR-L-56 (BOZZO) And LR-L-43 (Miller)

Sorting Scheme	LR-L-56		LR-L-43
	Automated	Keying	(Miller)
Outgoing Primary	1,599	460	570
Outgoing Secondary	2,115	553	695
Managed Mail	1,798	409	549
Incoming SCF	1,430	497	732
Incoming Primary	1,723	490	606
Incoming Secondary	1,647	513	1,436

Since Miller's assigned task, unlike mine in this testimony, did not include development of separate costs for machinable and non-machinable flats, his approach could perhaps be justified if the ratio of machinable and non-machinable flats his model sends to the UFSM 1000 were the same as the ratio of the automation and keying MODS volumes that he used to average the productivities. But it is not, because almost all the flats Miller sends to these machines are non-machinable, while in reality large numbers of such flats, according to McCrery, could also have been sorted on the AFSM-100, i.e., they are machinable.[16]

The distortion becomes particularly large in the case of incoming secondary flats sorting. Here Miller uses a high productivity, as shown in Table 2, because the MODS volumes he used to weigh the two productivity rates shows almost all incoming secondary being done in the automated mode, while at the same time Miller's model feeds almost only non-machinable flats to the machine.

I have therefore changed the model so that non-machinable flats with 5-digit presort are routed to manual incoming secondary sorting, rather than to a UFSM 1000, even if such machines happen to be available in the destinating facility. This change appears to be

[16] Only for the 7% that destinate in facilities with UFSM-1000 but without AFSM-100 (according to Miller's "coverage factors"), does Miller's model flow any machinable flats (except for AFSM-100 rejects) to the UFSM-1000.

consistent with reality, as revealed by the MODS data referred to above.[17]

The MODS data are for all flats sorted on UFSM-1000, not only Periodicals. To remove any doubt that the above change is also consistent with how Outside County flats are handled, Table 3 shows the direct FY2005 IOCS tallies for such flats, along with the MODS numbers, tally counts and corresponding tally dollars.

Table 3: IOCS Tallies Of Outside County Flats at FSM/UFSM-1000

MODSNo	Tallies	Tally $
305	10	$148,167
306	2	$37,719
441	53	$4,254,384
442	7	$551,190
443	75	$6,480,429
444	77	$6,864,014
445	16	$1,433,250
446	7	$752,934
447	2	$178,382
448	1	$76,049
461	1	$54,629
811	3	$198,459
812	1	$74,489
813	7	$724,523
814	15	$1,214,029
815	1	$75,030
816	30	$2,441,381
Totals	308	$25,559,055

Consider the tallies in the 441-8 and 811-6 series.[18] For outgoing and incoming primary (MODS numbers ending in 1 through 5) almost all tallies show sorting in the slow keying mode, i.e., non-machinable flats. But for incoming secondary (MODS numbers ending

[17] It is also consistent with the assumptions in the Postal Service's alternative model, contained in LR-L-153. Note that this change does not keep all non-machinable flats away from incoming secondary sorting at the UFSM-1000. That is because both types of sortation are performed on the UFSM-1000 in upstream sorting steps, and the flats from automated and keyed sorting on the same machine will be mixed, machinable and non-machinable flats, in the output flats trays that then may be passed on to a further sorting step on a similar machine.

[18] The fact that 12 tallies are associated with MODS numbers for international mail (MODS 305-6) suggests that some UFSM-1000 costs perhaps should not have been attributed to Outside County Periodicals at all.

in 6, 7 or 8) there are many more tallies for the automation mode. Since that mode is much faster, each of the 30 tallies with MODS number 816 corresponds to four or five keying tallies in terms of volume handled, indicating that the few incoming secondary keying tallies probably just represent keying of flats rejected from the automation mode.

4. The Impact Of Bundle Breakage

I am proposing a few simple changes in the way Miller's model handles bundle breakage. Bundle breakage and its impact on mail processing costs are complex issues and there is more that could and ideally should be done. Due to a shortage of reliable data as well as time, I have focused on fixing the problems in Miller's model that cause the greatest distortion and were relatively easy to fix.

My direct testimony in Docket No. R2000-1 included a quite detailed analysis of the dynamics and cost effects of bundle breakage (TW-T-1 at 43-53). I repeat below only as much of that discussion as I believe necessary to explain my present model.

Bundle breakage occurs during the process of sorting bundles and, in the case of sacked bundles, during the handling and transportation of the sacks. The way sorting is performed affects the probability of breakage. Generally, for reasons explained below, manual bundle sorting causes less breakage than the high volume, highly mechanized sorting performed with APPS or SPBS machines in large processing plants.

Consider first the initial bundle sort, for bundles coming out of mailer prepared sacks or pallets. Sacked bundles must always be dumped on an opening belt of some kind, whether the sorting will be manual, mechanized or automated. Surveys, as well as observations by many people including myself, have shown that a relatively high percentage of the sacked bundles are already destroyed when they come out of the sack – in other words the damage must have been done during sack transportation or handling (e.g., on BMC sack sorters).

For palletized bundles, on the other hand, there is virtually no chance of damage as long as the bundles stay on the pallet. But the process of dumping a pallet onto an APPS or SPBS sorting belt, as well as the rubbing under high stress against other

bundles on the belt, does entail significant danger of breakage. Yet, the only reliable study of bundle breakage, applied to large numbers of observations in various facilities, showed that breakage of bundles that had come off pallets was only about one percent.[19]

The other mode of bundle sorting is manual. For manual sorting of bundles on pallets, the pallet is stationary, i.e., there is no pallet dumping. Bundles are lifted from the pallet one at a time, then thrown into various receptacles (e.g., hampers, APC's, sacks) that are placed around the opening area. The only time a bundle can break during this type of sort is when it lands in the receptacle. But by that time, even if a bundle has broken, its pieces have already made it to the next sort level and the breakage therefore has less impact.

To illustrate this point, consider a case where 3-digit, 5-digit and carrier route bundles are sorted from a 3-digit pallet. If it is a mechanized/automated sorting, a bundle may break during the dumping stage. If it cannot be recovered, the pieces from the bundle must then be sent to a 3-digit (i.e., SCF or incoming primary) piece sorting operation. If the bundle was a carrier route bundle, its pieces would be forced to undergo both an incoming primary and an incoming secondary piece sort, which would have been avoided had the bundle not broken.

Miller's model assumes that when bundles from a 3-digit sack, pallet or any other container are being sorted and a bundle breaks, then whether it is a manual, mechanized or automated operation, the pieces from that bundle will need to undergo both an incoming primary and an incoming secondary piece sort.

But in a manual sorting operation the bundle will not break until it lands in a 5-digit

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[19] LR-I-297, reporting a study performed in the fall of 1999. About a year earlier, as member of the Periodicals Review team, I visited a number of postal facilities where mechanized pallet dumpers had been installed fairly recently. It appeared then that careless use of these dumpers, e.g., dumping too much on the belt too soon, could lead to significantly higher breakage percentages. During the LR-I-297 study it appeared that the dumping machines were being operated more carefully and the damage was limited.

container.[20] Even if the bundle cannot be recovered, the pieces in that container will be sent to a 5-digit (incoming secondary) piece sort, and will bypass the incoming primary.

Miller's assumption is corrected in my model. That is, <u>if a bundle breaks during a manual sorting operation from a pallet, then its pieces are assumed to require piece sorting starting at the presort level of the receptacle the bundle was sorted into. If the presort level of the receptacle is the same as the presort level of the bundle, then breakage at that point effectively causes no extra piece sorting.</u>

When the bundle sorting operation is from a 5-digit container, e.g., a 5-digit pallet with carrier route bundles, and the sort is performed manually, as it almost always is at DDU's, bundle breakage simply does not occur, as confirmed by witness Kingsley in her response to an R2001-1 interrogatory.[21]

Next consider subsequent sorting operations that typically occur from a hamper or other wheeled container into which bundles were sorted in an earlier operation. Sorting from the hamper can again occur at either a manual, mechanized or automated operation. If it is a manual sort, then just as for bundles on pallets, any breakage will occur only after the bundle reaches the next sort level. In particular, if it is an incoming secondary sort, i.e., distribution of carrier route bundles to each carrier, then bundle breakage simply is not an issue, as confirmed in the Kingsley answer cited above.

To summarize, the only change I have made in Miller's model of bundle breakage impact is to assume that when a bundle is broken in a manual sort from a pallet or

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[20] According to Miller's "Coverage Factors," about 25% of all sorts from 3-digit containers are done manually. From 5-digit containers, 93% of all sorts are done manually.

[21] See Docket No. R2001-1, response to AOL-TW/USPS-T39-14 (Tr. 2179-80). In response to a question about sorting of carrier route packages from a 5-digit pallet or hamper to carrier route, Kingsley stated that: "Packages are typically not thrown into a hamper or U-cart for each carrier route. The packages are typically placed into flat tubs or other containers where breakage should not be an issue at this point." Yet Miller's model shows considerable breakage at this point and large numbers of carrier route presorted pieces being sent back to incoming secondary piece sorting, after a bundle sort in which breakage simply does not and cannot occur.

wheeled container, the bundle will already have made it to the next sort level and therefore requires less additional piece sorting.

There are, however, other issues not addressed in Miller's model that should be addressed in order to assess the extent of damage caused by bundle breakage.

One such issue concerns the extensive emphasis postal management has placed on recovering and restoring broken bundles. When a bundle is recovered, the cost to the Postal Service is considerably less than if its pieces simply are removed and sent to piece sorting. McCrery estimates that over 50% of bundles that break on SPBS machines today are recovered, but that the percentage may be less on the APPS machines. Response to TW/USPS-T42-35f (Tr. 11/3080). Miller admits that his model does not analyze the impact of bundle recovery at all. Response to TW/USPS-T20-4 (Tr. 3/275). He also admits, effectively, that if a broken bundle is recovered, the fact that his model does not recognize bundle recovery has the effect of exaggerating the costs for highly presorted bundles (particularly carrier route bundles) relative to bundles with lower presort. Response to TW/USPS-T20-6 (Tr. 3/278).

Finally, Miller assumes that in each subsequent bundle sorting operation ten percent of the remaining bundles break. I have not changed that assumption, except as noted above in the case of manual sorting operations. However, there is no empirical basis for it and I tend to think it is excessive. Miller justifies his ten percent estimate by referring back to a "study" presented in LR-I-88. As I noted in my R2000-1 testimony, the numbers in that study are meaningless and should not be relied on.[22] The Commission should urge the Postal Service to produce a more meaningful study of bundle breakage in downstream operations.[23]

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[22] A "study team" asked managers in various facilities what percent of bundles they believed break. Most managers gave thoughtful answers but a few chose to spout off meaningless numbers, up to 80% for sacked bundles and 40% for pallets. Those few excessive estimates drove up the averages reported in LR-I-88, whose results I believe should just be ignored. See Docket No. R2000-1, TW-T-1 at 47 (Tr. 24/11394).

[23] The Postal Service has placed great emphasis on reducing bundle breakage in recent years.

5. The Costs Modeled By Miller Occur In More Cost Pools Than Those He Includes In His "CRA Adjustment".

It has become established practice that postal witnesses who present worksharing related mail flow models also include a "CRA adjustment," meant to bring a model closer to reality by assuring that the total modeled costs correspond to the CRA costs for the activities being modeled.

Miller's adjustment uses CRA unit costs for Outside County flats at each mail processing cost pool, obtained from library references LR-L-53 (USPS costing) or LR-L-99 (PRC costing), sponsored by witness Smith. He designates each pool as either "proportional" or "fixed," where "proportional" means that a given pool performs modeled activities. Implicit in this approach is an assumption that a given pool is either 100% proportional or not at all. However, in some instances this assumption clearly does not hold, as explained below:

Miller's model deals with piece and bundle sorting and related support activities. It does not deal with container handling. It follows that if a cost pool consists mainly of bundle sorting activity, then it is "proportional" relative to Miller's model and should be included in his adjustment, whereas a cost pool that mainly handles containers (e.g., the MODS platform pool) is "fixed" relative to Miller's model and should not be included. But what

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Yet it appears that it still:

(1) Doesn't know how effective its various measures (including complex regulations for bundle preparation, mailer awareness campaigns, etc.) have been;

(2) Has no empirical data at all on bundle breakage in subsequent bundle sorts; and

(3) Has no reliable information on how successful its program to recover broken bundles is.

Responses to TW/USPS-T42-35 (Tr. 11/3079-80), MPA/USPS-T20-2a (Tr 11/2853), MPA/USPS-T42-1 (Tr. 3/258). It is also puzzling that in Docket No. R2000-1 the Postal Service supported the belief that by TY01 significant Periodicals cost reduction would be achieved through the program to recover broken bundles, which then had just started but today appears to have enjoyed some success. Yet now, six years later, the Postal Service has no idea how much it is saving by bundle recovery, and its mail flow models assume no reduction in breakage and no savings from bundle recovery.

if the pool includes some container handling and some bundle sorting? Then it cannot possibly be either fully "proportional" or fully "fixed." Such a pool is the NonMODS "allied" pool. As Miller admits, some of the bundle sorting in his model occurs at DDU's and would be recorded in the "allied" pool at NonMODS offices. Yet he calls that pool "fixed" relative to his model. Response to TW/USPS-T20-12 (Tr. 3/284-65). Upon request, witness Van-Ty-Smith calculated, from IOCS tallies, that 37% of the costs attributed to Periodicals in that particular pool consists of bundle sorting. I therefore call it 37% "proportional." Response to TW/USPS-T20-13, redirected from witness Miller (Tr. 10/2474-75).

I also believe it is a mistake to use only unit costs for flats in this adjustment. There are very few "parcel shaped" Periodicals; in fact it is not entirely clear what kind of magazines or newspapers the IOCS clerks chose to call parcel shaped.[24] Yet some parcel related costs for Outside County Periodicals appear at most of the cost pools. Whatever these "parcels" are, they are probably more like non-machinable flats than letters. There is no separate mail flow model and no separate rate structure for Periodicals parcels. Since the flats mail flow model is all there is, it must be assumed to be a model of "non-letters," and the proper basis for comparing model costs with CRA costs must therefore be the CRA costs for Outside County "non-letters," i.e., both flats and parcels.

As is well known, IOCS clerks record the MODS operation a sampled employee is logged into, which is not necessarily the one in which the employee is actually working. This gives rise to the phenomenon of flats appearing to have been worked at letter and parcel operations, letters at flats and parcel operations, etc. If, for example, some flats costs appear at the pool MANL (manual letter sorting), it is because someone was working with flats while, according to IOCS tallies, logged into the letter operation.

I have therefore, unlike Miller, included in the CRA adjustment non-letter Outside

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[24] It is, however, possible that these "parcels" that IOCS clerks observed simply were extra heavy issues of magazines like "in Style." Such magazines are non-machinable flats and their costs in bundle and piece sorting operations are clearly among the costs that Miller models.

County costs recorded at all piece sorting operations, including letter operations. I do not, on the other hand, include any letter costs, even those that were recorded at flats operations.

Costs in the flats preparation (MODS 035) pool are clearly relevant to worksharing, because they are plainly part of the costs of automated or mechanized flats sorting. But because, as described above, I distribute the exact costs in this pool directly to the modeled rate categories, there is no need to apply a CRA adjustment to it. I therefore apply the adjustment, modified as discussed above, to all other modeled costs.[25]

While I have included pool costs that Miller did not include in his CRA adjustment, one could argue that I perhaps should have gone further. For example, there are some pools where one would not expect to see any Periodicals (e.g., the "Express" pool). That Periodicals were observed at all in such pools by IOCS tally takers most likely indicates that the sampled employees were at a Periodicals operation but clocked into a different pool. Closer examination of IOCS tallies for such pools might indicate that some of them do relate to piece or bundle sorting. I have, however, not pursued this issue further.[26]

Section V.4 describes an additional CRA adjustment, based on the philosophy indicated above, applied to the extended model that represents a much greater portion of Periodicals mail processing costs.

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[25] Stated differently, I first apply the CRA adjustment to all other costs, then add the flats preparation costs. See the table in cells B32:H47 on the first worksheet in FlatsModel.xls.

[26] Another example might be support function pools such as "1MISC" and "1Support." Under the Postal Service's costing method, these are combined into one "piggyback" pool called "1Supp F1," whose costs, according to witness Van-Ty-Smith, are attributed to subclasses on the basis of all other Function 1 (MODS plants) costs. Response to MPA/USPS-T11-1 (Tr. 5/2454-55). One could argue that the portion which is distributed over the cost pools included in the CRA adjustment then should also be included.

6. Firm Bundles

In Miller's flowchart for the Nonauto Basic rate category it appears that for every 10,000 pieces in that category there are 1,204 firm bundles. Firm bundles are used by classroom publications and by other Periodicals mailers who wish to send more than one copy to the same address. Use of firm bundles allows several copies to travel together as one piece. A firm bundle is not to be opened by postal employees, only by the addressee.

As I understand it, a firm bundle is processed exactly the same way that a carrier route bundle is, until it gets to the carrier. That means it travels as a bundle and is sorted at bundle sorting operations, not at piece sorting operations.

While it may not have much impact on overall results, I noticed that Miller's firm bundles are handled both as bundles and as pieces. I changed that – as a result, the flowchart for NonAuto Basic shows only 8,798 (10,000 – 1,204) pieces being finalized in incoming secondary piece sorting operations.

The net impact of this change, assuming no other change, would be to slightly lower the estimated cost for the NonAuto Basic rate category.

7. Miller Fails To Distinguish Between Carrier Route Direct Sacks, Which Do Not Require Bundle Sorting, And 5-Digit Carrier Route Sacks, Which Do.

Carrier route sacks are sacks that contain carrier route bundles. They are used mainly by smaller or medium-sized mailers that have six or more pieces to certain carrier routes but insufficient overall volume to make pallets. Until recently, there were two kinds of such sacks:

(1) CR or direct carrier route sacks, with bundles only to a single carrier route; and

(2) CRs or 5-digit carrier route sacks, sometimes called carrier routes sacks, with

bundles to more than one carrier route within a given 5-digit zone.[27]

The operational difference between CR and CRs sacks might seem clear enough. The first contains bundles to only one carrier and can therefore be taken directly to that carrier, bypassing all bundle sorting. The second contains bundles to multiple carriers and must be sorted in an incoming secondary bundle sort, normally performed manually at the DDU.

But witness Miller evidently does not believe there is any operational difference between the two types of sacks. Since Docket No. R2001-1, his flat models have treated CR and CRs sacks in exactly the same way. In the present docket he even refers to them by a single name and shows only their combined volumes. An R2001-1 Time Warner interrogatory inquired about this, but Miller insisted in his answer that his model was correct and that CR sacks (like CRs sacks) must be dumped at an incoming secondary operation. Docket No. R2001-1, response to AOL-TW/USPS-T24-5 (Tr. 6/014-15). That is where things were left then. Since I am testifying in this case, I think I should point out that Miller's answer doesn't make sense, for the following reason.

According to Miller, a CR sack, which could be taken straight to the carrier, is instead sent to an incoming secondary bundle sort operation where 18% of the bundles break and their pieces (about 11.5 on the average) are sent back to an incoming secondary piece sorting operation. In this way, a form of mail preparation that was supposed to require no work by mail processing clerks other than handing the sack (or the bundles in it) to the carrier, becomes instead the source of substantial inefficiency and extra work. It seems unlikely that a DDU manager would allow such a situation to exist.[28]

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[27] A related category is carrier route 5-digit scheme sacks, which contain carrier route bundles to two or more 5-digit ZIP codes whose mail is delivered from the same delivery unit (DDU). They are handled the same way that 5-digit carrier route sacks are handled.

[28] Another improbability in this scenario is that pieces from a broken bundle would be sent back to the incoming secondary, often performed at the main office rather than the DDU, instead of simply being recovered and taken from the opening belt directly to the carrier. Postal

Because the volume data used by Miller does not distinguish between pieces in CR and CRs sacks and because the impact of changing this part of Miller's model would be small, I have not attempted to change it. However, the extended model described in Sections IV and V does distinguish between the costs incurred by bundles in CR and CRs sacks.

There are likely to be fewer CR as well as 5-digit CRs sacks in the future, since many of them contained far fewer than 24 pieces. The Postal Service has provided a migration path for these bundles to the recently established categories of 3-digit and SCF sacks with carrier route bundles. Bundles in such sacks will require more bundle sorting. The new sack types do not appear in Miller's model, nor in my modified version of it, but they are considered in the extended model described in the following.

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management has repeatedly stressed the importance of recovery when dealing with broken bundles. At a DDU manual bundle sort operation, such recovery should be easier and much more probable than in large mechanized bundle operations in large facilities.

IV. EXTENDED BILLING DETERMINANTS FOR OUTSIDE COUNTY FLATS

This section explains the development of estimates of test year volumes of Outside County sacks, pallets, bundles and pieces, as summarized in Exhibit B. These volume estimates, more detailed than conventional billing determinants, are used by witness Mitchell, who also uses the unit cost data described in Section V to develop an alternative and more cost based set of Outside County rates.

The main data source used to develop the piece volumes in Table B3, the bundle volumes in Table B2 and the container volumes in Table B1, is the mail characteristics study reported in USPS LR-L-91, sponsored by witness Loetscher (USPS-T-28).

While he performed a quite comprehensive study of Periodicals mail characteristics, the results Loetscher made available in LR-L-91 are limited to the data that other postal witnesses have made direct use of in their testimonies. But the unit costs developed in this testimony, and the corresponding Periodicals rates proposed by Mitchell, recognize many important cost drivers that are overlooked in traditional rate design. More detailed volume data are therefore needed to develop such rates.

Loetscher provided much additional information in a series of Excel tables filed as part of his response to interrogatories TW/USPS-T28-1-11 (Tr. 7/1507-18). In the following, those tables (1 through 17) are simply referred to as Loetscher's tables. They do in fact provide almost all the mail characteristics data needed for the base year. However, because of the 24-piece per sack minimum requirement that recently took effect there are expected to be many fewer sacks in the test year than there were in FY2005. Furthermore, the bundles that were in those former "skin sacks" are expected to "migrate" to larger and in most cases less presorted sacks. I have developed test year sack and bundle profiles that reflect this "migration."

Spreadsheet VolumesR2006.xls in TW LR-2 contains the calculations of the container, bundle and piece volumes presented in Exhibit B. The methodology used is described below.

1. Container Volumes

According to Loetscher's first table (response to TW/USPS-T28-2c [Tr. 7/1507]), there are about 98 million Outside County Periodicals pieces that are letter shaped and are entered in about 817 thousand letter trays. Periodicals non-letters are generally entered either in sacks or on pallets. Although the "non-letters" include a very small volume identified as parcel shaped, I will in the following simply refer to them as flats.

The cost of a container depends on the container type, its level of presort and its entry point into the postal network. A breakdown of base year sack and pallet counts by entry point and presort level can be obtained from Loetscher's Table 13 or 17. As they are based on different sample stratifications, they give slightly different results. I have used the results from Table 13 in order to be consistent with the Postal Service's own estimate of base year sack volumes.[29]

The entry point categories used in Docket No. C2004-1 were:

(1) DDU (destinating delivery unit);
(2) DSCF (destinating SCF);
(3) DADC (destinating ADC);
(4) DBMC (destinating BMC/transfer hub);
(5) OBMC (originating BMC/transfer hub);
(6) OADC (originating ADC)
(7) OSCF (originating SCF); and
(8) OAO (originating associate office, station or branch).

[29] The difference between the two tables produced by Loetscher is that Table 17 splits up the sampling strata for Periodicals with circulation under 5,000 by segregating in separate strata those with circulation under 1,000. That yields an estimate of 68,075,913 outside county sacks in FY2005, versus the 67,371,060 obtained from the Table 13 data. The latter figure is cited in Tang's rate design spreadsheet and is the one I have used, although I believe the Table 17 figure may be more accurate. A large portion of the total number of sacks is used by very small publications. For example, almost half of all MADC sacks in FY2005 were used by publications with circulation less than 1,000. It therefore seems likely that a finer stratification of the samples of the smallest publications would give more accurate estimates of sack volumes.

However, in the current case the distinction between the OAO and OSCF categories was eliminated in the answers provided by Loetscher (i.e., the two entry point categories were combined into one). A later Postal Service interrogatory response indicated that very few samples were found of mail being entered at the OAO. Response to TW/USPS-3b (filed July 12,2006). Exhibit B therefore shows OAO and OSCF entry as a single category.[30]

In Docket No R2005-1 Loetscher reported a Periodicals mail characteristics study very similar to the one described in LR-L-91 in this case. The reports made available from that previous study are in LR-K-91. Comparing the results, it appears that the volume of Outside County sacks declined from 84 million to 67 million from FY2004 to FY2005. Furthermore, the LR-K-91 study in R2005-1 identified 50 million sacks as "skin sacks," i.e., as containing less than 24 pieces. In this docket Loetscher reports, in LR-L-91, that there were 32 million skin sacks. In other words, the number of skin sacks already declined by about 18 million, even before the 24 piece sack minimum took effect.

Since the 24 piece requirement now has taken effect, the remaining 32 million skin sacks will be gone by the test year. Tang assumes a sack reduction of 65% of the FY2005 skin sack volume; in other words she assumes that as the 32 million skin sacks disappear they will be replaced by 35% of 32 million larger and generally less presorted sacks. Tang does not specify what kind of sacks that will be, though she does make some assumptions regarding non-auto bundles moving to larger sacks and thereby qualifying for a lower presort discount. Loetscher declined to provide any further guidance as to exactly what kinds of sacks will exist in the test year.

I have developed a simple algorithm, included in spreadsheet VolumesR2006.xls in TW LR-2, that carries out a skin sack consolidation and corresponding migration of sacked bundles that is consistent with the Postal Service's assumptions. The steps followed

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[30] The Postal Service's claim that there is hardly any OAO volume is not quite consistent with the findings reported in LR-J-114 from Docket No. R2001-1. Nor is it consistent with my C2004-1 analysis of small local newspapers, many of which have such small volumes that taking their mail to an often distant SCF makes no economic sense.

can be summarized as follows:

From LR-K-91 I obtained distributions by presort level of all FY2004 sacks and skin sacks. The numbers are changed to corresponding FY2005 numbers using the ratios of Outside County volumes for the two years. The large FY2004 to FY2005 decline in almost all sack categories except SCF and ADC sacks is assumed to be due to reduction of skin sacks. The small increase in SCF and ADC sacks is assumed to be due to consolidation of bundles from former 5D and 3D skin sacks. This gives an approximation of the skin sack population in FY2005 by presort level. The migration of bundles from FY2005 skin sacks is assumed to occur as follows:

(1) bundles from CR skin sacks migrate to CRs sacks;

(2) bundles from CRs skin sacks migrate to the new 3-digit or SCF carrier route sacks;

(3) bundles from 5-digit skin sacks migrate to 3-digit or SCF sacks

(4) bundles from 3-digit skin sacks migrate to SCF or ADC sacks;

(5) bundles from SCF skin sacks migrate to ADC sacks;

(6) bundles from ADC skin sacks migrate to MADC sacks; and

(7) bundles from MADC skin sacks migrate to larger MADC sacks.

While some of the migration outlined above may be to existing sacks, I presumed, to be consistent with Tang's 65/35% assumption, that for every hundred skin sacks eliminated at one presort level, 35 new sacks would be created at the less presorted level indicated above. In this manner, I end up with exactly as many test year sacks as are assumed in Tang's rate design spreadsheet.

Table B-1 (Exhibit B) shows the resulting test year before rates estimates of sack and pallet counts by container presort and entry point.

2. Bundle Volumes

Based on Loetscher's 14th table[31] I tabulated the number of bundles entered by Outside County mailers, per bundle and container presort level and container type. But because some bundles will transfer to sacks with different presort levels as a result of skin sack elimination, it remained to determine how these bundles would be distributed over container presort levels in the test year. I did this in the same way that I estimated the migration of sacks.

The precise steps can be inferred from worksheet R2006Bundles in spreadsheet VolumesR2006.xls in TW-LR-2. Basically, after determining how many skin sacks will be removed from a given sack presort level, its bundles being consolidated into sacks with a given lower presort level, I estimated the number of pieces that would be moved, based on pieces per skin sack estimates derived from LR-K-91. To determine bundles moved I then divided by the smallest of: (1) the number of pieces per skin sack; and (2) the average number of pieces per bundle for the given sack presort level.

Table B-2 (Exhibit B) shows the resulting test year before rates estimates of bundle counts by bundle and container presort level.

3. Piece Volumes

I used Table 9 in Loetscher's interrogatory answers to Time Warner in order to extract base year estimates of flats in all required categories.

One problem with the Table 9 data is that it does not distinguish between carrier route and carrier routes sacks. The first type contains bundles only to a single carrier route and can be taken directly to the carrier. The second is a 5-digit sack that contains bundles to more than one carrier within a 5-digit zone, which requires that the bundles be sorted before they can go to the carriers. Additionally, in the test year many sacked carrier route bundles will be in 3-digit sacks, due to the migration caused by skin sack

[31] See response to TW/USPS-T28-9 (Tr. 7/1517).

elimination, as described in the preceding section. To solve this problem I used the test year distribution of carrier bundles among the three types of sacks (carrier route, carrier routes and 3-digit) and applied the same percentages to distribute sacked carrier route pieces among the three sack types. [32]

Additionally, as described above, I adjusted the piece counts for pieces in non-carrier route bundles in accordance with the estimated migration of bundles from skin sacks. A total of 295 million pieces were expected to migrate to a different sack presort level due to the elimination of 32 million skin sacks.

Table B-3 (Exhibit B) shows the resulting test year before rates estimates of Outside county non-letter pieces by piece characteristics (machinability and auto/nonauto), bundle presort, and container type and presort level.

[32] This problem is reflected also in Miller's mail flow model, as discussed in Section III.7.

V. AN EXTENDED MAIL PROCESSING COST MODEL FOR FLATS

The mail flow model described in Section III represents only a subset of the mail processing costs incurred by Periodicals Outside County flats.[33] Furthermore, it identifies only seven cost drivers, namely the piece volumes for the traditional presort and auto/non-auto related rate categories. But as explained in my C2004-1 testimony,[34] piece handling causes less than half of the mail processing costs attributed to Periodicals in today's postal facilities. More costs are caused by the handling of sacks, pallets and bundles, and those costs are affected by such factors as container presort level and entry point.

The cost model described here produces unit costs for all major drivers of flats mail processing costs. It is meant to facilitate the alternative rate design proposed by witness Mitchell in this docket. It is a modified and improved version of the model I presented in C2004-1. Rather than repeat the description from my C2004-1 testimony, I will focus in the following on improvements and updates made in the present model. They include:

(1) use of current wage rates, piggyback factors and, when available, productivity rates from the current docket;

(2) the model is linked to and derives its per-piece unit cost estimates from the modified flats mail flow model described in Section III;

(3) extensive changes have been made in the logic to determine the flow of sacks and pallets from their entry points through intermediate facilities and to the destinating facilities, based on USPS interrogatory answers;

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[33] Miller's CRA adjustment assumes his modeled costs to represent slightly less than 50% of the processing costs for flats. In my version of the CRA adjustment, which recognizes more pools as including modeled costs, the percentage is 61% under USPS costing and 63% under PRC costing. However, many of those costs are incurred handling bundles, sacks or pallets, rather than individual mail pieces.

[34] TW et al.-T-2, at 5-12 (Tr. 23-30).

(4) inclusion of APPS machines as a bundle sorting option;

(5) an update of the CRA adjustment used in the C2004-1 model to conform to the current configuration of mail processing cost pools;

(6) a substantial simplification of the model through elimination of many redundant worksheets and formulas;

(7) origin associate office or station/branch (OAO) was eliminated as a distinct type of entry point, due to lack of current data and Postal Service testimony that this entry point is little used; and

(8) a flag has been included to allow the model to be switched between PRC and USPS costing methods.

The model consists of a series of inter-linked Excel spreadsheets, contained in TW LR-2. Described below is the model's handling of per-container, per-bundle and per-piece unit processing costs, and the application of the CRA adjustment to the final results.

Exhibit C shows the unit costs that I provided to witness Mitchell.

1. Container Unit Costs

Unless entered directly at the facility where it will be opened, a mailer prepared sack or pallet must be transferred through one or more intermediate facilities before reaching its destination. Costs are incurred at each intermediary as well as at the destinating facility. The per-container costs determined by my model include all costs incurred in moving and processing the container, up to and including the cost of opening the container and, if appropriate, dumping its contents.

Both the sack and pallet unit costs, shown in Table C1, are substantially higher than those I derived in C2004-1. That is not only because the TY08 wage rate is 23% higher than the TY03 rate used in that case, but also because, as described in the following, new mail flow data available in this docket indicate that containers entered far from their destination pass though more intermediate facilities, and therefore incur more costs, than assumed in C2004-1.

Given the high handling costs for containers entered far from their destination I am concerned that the Postal Service in this case is proposing to weaken and even eliminate some of the existing dropship discounts, which in recent years have led to a significant increase in dropshipping by many mailers, when instead it should be strengthening the incentives for mailers to dropship.[35]

Section a below describes methodological changes since C2004-1 in the way I estimate container unit costs. Sections b and c discuss some special issues relating to, respectively, 5-digit and Mixed ADC (MADC) containers. Section d discusses some of the reasons why true container costs are as high as they are.

a. Methodological Changes

In C2004-1 I relied on a complex set of flow formulas, developed by the creators of LR-I-332, that determined the probabilities of a container of a given type and presort, at a given type of intermediate facility, flowing next to each type of subsequent facility. Unfortunately, the method relied on some percentages that turned out to be little more than guess work. I was able to reduce the guesswork by using the entry point data presented in Docket R2001-1 by witness Loetscher and contained in LR-J-114.

In this case, however, a more accurate method has been made possible by a recent Postal Service "web-based survey," the results of which were revealed in the responses to MPA/USPS-T25-2b (redirected from witness Mayes, filed June 19, 2006) and to MPA/USPS-2b (filed July 13, 2006). They specify, for each sack or pallet and presort level, and for each type of entry point, the number of facilities such a sack or pallet will pass through.[36]

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[35] It is true that the discounts being eliminated are on a per-piece basis and therefore flawed because the costs saved by dropshipping are not incurred on a per-piece basis. Nevertheless, those discounts clearly have had an effect. If eliminated, they should be replaced by more cost based incentives, such as the cost based rates being proposed in this docket by witness Mitchell.

[36] The "number of facilities a container passes through" is defined as the total number of

The results of the Postal Service's reported survey are included in worksheet MPA2b, in spreadsheet Cost_Variables.xls in TW LR-2. The same worksheet shows the conclusions I drew from this information regarding what types of facilities a given type of container would pass through. In response to TW/USPS-3d (filed July 12, 2006) regarding why the results for OBMC (originating BMC or transfer hub) seemed somewhat counter-intuitive, the Postal Service answered that there were very few samples of OBMC pallets in its survey. I therefore chose to ignore the OBMC results and rely, for this particular entry point, on the simplified assumption that a container of given type entered at an OBMC would have the same probability of seeing a DBMC, a DADC, a DSCF and a DDU as it would had it been entered at the OADC.[37]

The new Postal Service survey data indicate that non-dropshipped sacks and pallets on the average pass through <u>more</u> intermediate facilities than followed from my C2004-1 assumptions. Consequently, they receive more handlings and incur more costs than I previously assumed. For example, the highest pallet unit cost I estimated, after the CRA adjustment described in Section V.4, is $73.11, for a 5-digit pallet entered at the originating SCF (OSCF). In C2004-1 I estimated the cost of such a pallet to be $43.07. Similarly, the highest estimated sack cost is $6.23, versus $3.50 in C2004-1.

<u>b. 5-Digit Containers</u>

The Postal Service explained that while its special survey assumed that all 5-digit containers are taken to the DDU before they are opened, that assumption is not accurate, because many such containers are opened at the plant level. While no data appear to be available as to exactly how many such containers go to the DDU, I believe

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handling facilities minus one (i.e., it is zero if the container is brought directly to the facility where it will be opened). The Postal Service emphasized that the survey assumed that all 5-digit containers are opened at a DDU and that this is not always the case. Therefore its estimates of the number of facilities a 5-digit container passes through may be excessive.

[37] This assumption happens to result in fewer sack handlings and more pallet handlings (i.e., lower sack costs and higher pallet costs) than if I had used the Postal Service's OBMC survey results. According to Loetscher's data tables there were, in FY2005, more that 5 million Periodicals sacks entered at OBMC's.

the following assumptions are reasonable:

For containers that primarily contain carrier route bundles, such as carrier route and carrier routes sacks, one must assume that the vast majority go directly to the DDU where the bundles are distributed to carriers. I have assumed for modeling purposes that 90% go to the DDU. On the other hand, 5-digit containers that primarily contain 5-digit bundles will be opened at the plant if incoming secondary distribution for the particular 5-digit zone is done at the plant. As mentioned earlier, McCrery indicated that over 44% of incoming secondary flats distribution is done manually, and such manual distribution is normally done at the DDU's. The percentage is likely larger than 44% in the case of Periodicals. On the other hand, the Postal Service is trying to perform more distribution on its machines. It therefore seems reasonable to assume that in the test year about 40% of 5-digit (non-carrier route) sacks will be taken to the DDU.

Regarding 5-digit pallets, there are some that primarily contain carrier route and some that primarily contain 5-digit bundles. Based on Loetscher's data tables, I estimated that about 78% have primarily carrier route bundles. Consistent with the above assumptions regarding sacks, I assumed that 90% of the 78% are taken to the DDU, and that 40% of the remaining 22% (containing mostly 5-digit bundles) also go to the DDU. Taking the average for pallets with primarily carrier route and primarily 5-digit bundles, I estimated that about 79% of 5-digit pallets are taken directly to the DDU.

c. MADC Sacks

Mixed ADC sacks are used by publications of all sizes, but as Table 4 indicates, they are mostly used by very small publications. A major portion of the Periodicals cost reduction initiative, as described by McCrery, is focused on reducing the considerable costs associated with the small Periodicals volume that is entered in MADC sacks. Under that initiative, these sacks will be treated in a different manner than in the past, and this needs to be considered in order to determine their test year handling costs.

Table 4: Use Of MADC Sacks By Circulation Size (Source: Loetscher tables in response to TW/USPS-T28-1-11)		
Pieces/Issue	% MADC Sacks	% Piece Volume
0 - 1K	45.99%	1.88%
1K - 5K	8.88%	2.48%
5K - 15K	8.22%	3.90%
15K - 100K	18.13%	19.72%
100K - 300K	8.53%	11.62%
Over 300K	10.25%	60.40%
Total	100.00%	100.00%

Until recently, all MADC sacks were taken to the nearest ADC where they were opened and their contents distributed in outgoing bundle and flats sorting operations. Because of the low volume, these operations were often performed manually. At other times, such flats were mixed with First Class flats and ended up traveling to remote locations on airplanes, even though Periodicals are supposed to travel only by surface transportation.[38]

However, under changes recently implemented, there are now two types of MADC sacks. One contains mail only to destinations to which First Class mail travels by surface from the facility the sack is entered at. These are referred to as L201 sacks, after DMM labeling list L201. The other type of MADC sacks contains mail going anywhere else. The Periodicals in these sacks need to be kept separate from First Class flats in outgoing operations in order to avoid being transported by air. They are referred to as L009 sacks, after labeling list L009, which contains the 36 facilities into which outgoing Periodicals processing (except for flats in L201 sacks) is consolidated.

The costs incurred by L009 and L201 sacks differ. If a sack of each type is entered at an SCF that is not an L009 facility, then the L201 sack is opened at that facility while the L009 sack has to first be transferred, at additional cost, to another facility. In other words, L201 sacks generally cost less. I have, however, presented only one MADC sack cost figure, using the assumption that 40% of them will be of the L201 variety. I believe this assumption is reasonable because many small Periodicals, the major users

[38] See Docket No. R2001-1, Responses of USPS to AOL-TW/USPS-11-12, 25-26 (Tr. 2689-93, 2720-2724).

of MADC sacks, are mostly local publications whose mail travels a fairly short distance, mostly to areas where First Class would travel by surface.

In Table C1 (Exhibit C), the MADC cost at entry point OADC should be interpreted as the cost of either an L201 type sack being entered at any SCF or an L009 type sack being entered at an L009 facility. The OSCF cost should be interpreted as the cost of an L009 sack being entered anywhere else.

My cost calculations rely on the generally true assumption that when a sack enters a postal facility it must undergo a sack sorting operation (manual or mechanized) in order to separate it from other sacks that may have different destinations. It is possible, however, that by arranging to have designated drop-off areas on postal platforms for the two types of MADC sacks, so that the sacks are segregated from the start from other types of sacks and therefore are able to avoid the sack sorting step, the cost of MADC sacks could be lower than the figures indicated in Table C1. For this reason, and because its users are mostly very small publications, I believe that if in a rate design based on these costs any tempering were to be considered in the form of lower cost passthrough, then MADC sacks might be a good candidate for such tempering.[39]

d. Why Container Costs Are So High

It may seem surprising that my estimates of sack and pallet costs are as high as they are, given that the Postal Service sometimes has released figures indicating that those costs are considerably lower. For example, in Dockets No. R2001-1 and R2005-1 the Postal Service proposed and the Commission approved a per-piece pallet discount. The R2001-1 proposal relied on a study (LR-J-100) that indicated a per-sack cost of only 87 cents and a per-pallet cost of $13.23. In the present docket, these figures have

[39] Additionally, McCrery has indicated that other alternatives, such as entering small outgoing flats volumes in tubs or hampers, from which they can be dumped directly onto an outgoing sorting belt, may be made available in postal facilities. See LR-L-49 at 20 and USPS-T-42 at 20. As I noted in my C2004-1 surrebuttal testimony, entering low volumes of flats or flats bundles via tubs may cost less than if they are entered in sacks, which take time to open and then need to be stored and recycled. TW et al.-RT-2, at 22-23 (Tr. 5/1561-62).

become $1.15 (USPS costing) or $1.24 (PRC costing) for sacks and $19.57 (USPS costing) or $21.01 (PRC costing) for pallets. See LR-L-85 and LR-L-108, both sponsored by witness Talmo.

Additionally, when it stated its intention, in Docket R2005-1, no longer to allow Periodicals mailers to use skin sacks, the Postal Service relied on a similarly understated cost per sack to estimate how much this would reduce Periodicals costs. Docket No. R2005-1, revised response of USPS witness McCrery to POIR 4, question 6 (Tr. 5/1690-93).

There are two reasons for concluding that the above costs are understated. First, as Talmo admitted,[40] his model, originally developed by witness Schenk in R2001-1, only considers costs incurred in the destinating facility, where sacks and pallets are opened, and not the costs incurred in upstream facilities through which sacks and pallets are transferred, incurring additional costs. And as explained above, data available in this docket indicate that containers entered far from their destination go through more intermediate facilities than previously assumed.

Second, in the case of sacks, Talmo's model does not even include all the costs incurred in the destinating facility. As Talmo acknowledges,[41] his model assumes that sacks are unloaded and then cross-docked directly to an opening unit where the sack is opened and emptied. It does not consider that a sack may arrive at a facility with many other sacks (typically in a hamper or other wheeled container) that are going to many different places; i.e., some sacks may be transferred to other facilities or to different opening units. These sacks must first undergo a sack sorting operation, as confirmed by McCrery. Response to TW/USPS-T27-3-4, redirected from Talmo (Tr. 11/3093-94). In today's environment, such sorting operations are almost always performed manually and, again as confirmed by McCrery, the Postal Service is even removing the sack sorters now in BMC's, so that sack sorting will need to be performed manually in those

[40] Response to MPA/USPS-T27-1 (Tr. 13/3611-12).

[41] Response to TW/USPS-T27-1 (Tr. 13/3613-14).

facilities also.[42]

Pallets also incur substantial transfer costs if entered far from their destination. Given that the Postal Service estimates costs of over $20 per pallet just in a destinating facility, my estimates of pallet costs when entered at OSCF or OADC facilities are reasonable.

To summarize, Postal Service container handling costs are high and are likely to stay high for a long time. One can hope that the Postal Service, through network reorganization, will at least succeed in making its pallet handling more efficient.[43] But for Periodicals mailers a more realistic way to avoid those costs is to bypass them, by dropshipping as deep into the system as possible. The rapidly growing availability of consolidators, pool shipping, co-palletization programs and comailing is making the ability to dropship available to all but some of the very smallest publications. The more mailers that convert to dropshipping through one of these programs, the more the options that will be available to even smaller mailers. But for this desirable development to happen, the Periodicals rate structure must give adequate recognition to these avoidable costs.

2. Bundle Unit Costs

My model estimates all costs involved in the handling of bundles from the time they are removed or dumped from the sacks and pallets in which mailers have placed them until the time the bundles themselves are broken. Once a bundle is broken, the further

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[42] McCrery indicates that by the end of the test year only 12 BMC's will still have sack sorters. Response to TW/USPS-T42-1 (Tr. 11/3023).

[43] As indicated in my C2004-1 direct testimony, I suspect that the productivity rates I use for pallet unloading, cross-docking and loading, which are the same rates that postal witnesses use, are on the conservative side, since they were measured in BMC's where pallet transfer, at least in the traditional BMC configuration, is fairly inefficient. TW et al.-T-2, at 29-30 (Tr. 47-48). As the BMC's are modernized, removing the space consuming sack sorters and facilitating cross-docking of pallets and rolling containers, actual pallet costs may become lower than they are today.

processing costs are incurred by individual pieces, not bundles. Firm bundles are not broken by the Postal Service and are treated as bundles throughout. Similarly, carrier route bundles are not opened (unless by accident) before they get to the carriers.

As in C2004-1 (TW et al.-T-2, at 26 [Tr. 44]) I distinguished between bundle costs that are directly related to bundle sorting and those that I term "weight-related." The latter are costs related to the movement of bundles between bundle operations, or from bundle sort to piece sorting or "flats preparation." And as in C2004-1 I recommended to witness Mitchell that only the costs related directly to bundle sorting be used as a basis for rate design. Were Mitchell's rate design to also include the weight related bundle costs, his bundle rates would be, on the average, more than twice as high.

The major model change affecting bundle sorting is the inclusion of the APPS machines as a bundle sorting option. While their use in the base year was still quite limited, the Postal Service expects extensive deployment in the test year. I have used witness Miller's coverage factors to determine the relative use of APPS, SPBS/LIPS and manual bundle sorting at each container presort level. Consistent with McCrery's answers, I have assumed that the APPS is not used in incoming secondary bundle sorting. Response to TW/USPS-T42-13(e) (Tr. 11/3049-50).

3. Piece Unit Costs

Piece related costs measured by the model are basically all processing costs that occur between the time that bundles arrive at a piece sorting or flats preparation operation and the time that the finished sorted product is presented to the carriers, who then do their own additional processing before delivering the mail. Piece related costs include the cost of flats preparation performed in the 035 cost pool as well as the preparation performed at the piece sorting operations themselves.

As in the case of bundles, the model distinguishes between pure piece sorting costs and those that I have labeled "weight related." The latter category includes the costs of moving partially sorted pieces between piece operations and from the incoming secondary sort to the carriers. Unlike costs for bundles, the weight related costs for

pieces are a relatively small portion of the total piece related costs. For reasons similar to those applied to bundles, witness Mitchell uses only the costs related directly to piece sorting as a basis for his recommended piece rates.

The piece sorting costs are obtained via a link to the flats model described in Section III, which is a modified version of the model proposed by witness Miller.[44]

The resulting costs, shown in table C3a (Exhibit C), are higher than the corresponding piece costs I calculated in C2004-1. There seem to be several reasons for this, including:

(1) the TY08 wage rates used are 23% higher than the TY03 rates used in C2004-1;

(2) I have added the costs of flats preparation (MODS 035) that could not be quantified in the earlier docket; and

(3) the CRA adjustment applied to piece sorting costs, described in the following section, had a different outcome.

The cost differentials between machinable and non-machinable flats at different presort levels have also increased since my C2004-1 estimates, even though the cost of flats preparation in the MODS 035 cost pool was added mostly to machinable flats. In my opinion, the true difference may be even larger. It would have been larger in my model had I not, as explained in Section III.3, kept witness Miller's averaged productivity rates on the UFSM-1000, even though in reality there is a wide gap between that machine's productivity rates for machinable and non-machinable flats.[45]

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[44] The last six worksheets in Flatsmodel.xls provide the information needed by the extended model.

[45] A further consequence of fully disaggregating the UFSM-1000 productivity rates for machinable and non-machinable flats would be a virtual disappearance of the auto/non-auto cost differential for non-machinable flats. Those flats do not receive machine sorting, except in the sense that they may be keyed manually on the UFSM-1000. But the manual keying is not affected by the presence or absence of a barcode. In other words, the barcode on these pieces is really useless. However, the discipline of maintaining good address quality that is required of a mailer in return for the automation discount may still have value (even if the barcode itself doesn't). For example, it may reduce the amount of UAA mail, so that such a discount may be justified even for non-machinable flats.

4. The CRA Adjustment

The CRA adjustment I applied to the extended model is similar to that described in Section III.5, except that many more cost pools are involved.

As in C2004-1, I calculated a separate CRA adjustment for the purely piece-sorting related costs, since those are fairly easy to isolate in the piece-sorting related cost pools. This gave a CRA factor equal to 1.083 for piece sorting, versus only 0.893 for the bundle, sack and pallet costs. The average factor is 0.971.

Applying the above adjustment factors would have meant multiplying the piece related costs by 1.083 and other modeled costs by 0.893. For reasons explained below, I chose instead to use a factor of exactly one for the piece related costs, which caused the factor for remaining costs to become 0.951. Consequently, the piece related costs in Table C3 are exactly equal to the unadjusted model costs. The bundle and container costs in Tables C1 and C2 are, on the other hand, the result of multiplying the modeled costs by 0.951.

The piece related CRA factor was calculated as the ratio between CRA costs for non-letters at all piece sorting related cost pools and the modeled piece sorting costs. The reasons I chose to reduce it from 1.083 to 1 were: (1) to avoid too large a gap between the adjustment applied to piece costs and that applied to other costs; and (2) because it is reasonable to assume that some of the modeled bundle and perhaps even container handling costs were incurred by employees who were logged into piece sorting operations, particularly at smaller offices where employees commonly move frequently between different tasks.

Details of the adjustment are shown on worksheet "CRA" in CostsVolumes.xls, contained in TW LR-2 The adjustment excludes a total of $125 million (PRC costing) in Outside County mail processing costs that are in the pools assumed "to be non-proportional."[46] It could be argued that some of those costs should have been included,

[46] Under Postal Service costing, the "non-proportional" costs come out higher, at $143 million,

which would have raised the bundle and container costs in Exhibit C. For example, Periodicals costs appear in some pools where Periodicals should not be found at all, such as the Priority and Express pools, and examination of the IOCS tallies for such pools might reveal that some of the processing that my model represents is being done by employees who happen to be logged into those other pools. One might argue that portions of the costs the 1Support and 1Misc pools, which are attributed on top of costs in other pools, should also have been included in the CRA adjustment. Doing so would have led to higher unit costs than those shown in Exhibit C.

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even though the Postal Service overall attributes fewer costs. As a result, the various CRA adjustment factors described above take on somewhat lower values than under PRC costing.

VI CONCLUSIONS

This testimony has sought to achieve two main objectives.

The first was to identify and correct some deficiencies in the LR-L-43 Periodicals flats mail flow model that is the basis for the Postal Service proposed Periodicals rate design. In addition to its failure to include costs obviously related to worksharing, including flats preparation costs, I found that the Postal Service model, sponsored by witness Miller, is simply not consistent with the reality described by operational witnesses such as McCrery and Kingsley, or with my own observations in numerous postal facility visits, or in some cases with available MODS and IOCS data. If the Commission decides to continue to accept a rate design built around the traditional Periodicals piece rate categories, I recommend that the it base its recommendation on the alternative mail flow model that I have labeled FlatsModel.xls, rather than the Postal Service's version.

My second objective, as it was in Docket No. C2004-1, was to present a set of unit cost estimates that reflect, as accurately as possible with available data, how Periodicals mail processing costs vary with the number of pieces, bundles, sacks and pallets, as well as with piece characteristics, bundle and container presort levels and container entry points relative to the destinating facility. I have also identified the piece and bundle related costs that are most appropriate to consider as weight related.

This information, presented in Exhibits B and C, provides a foundation for the development of Periodicals postal rates that are truly cost based and therefore can give mailers the most accurate price signals. Postal rates consistent with this information, such as the rates proposed by witness Mitchell, will give mailers strong incentives to prepare their mail in a manner that reduces the Postal Service's costs of handling it.

The cost model I used to develop the unit cost data provided to witness Mitchell is an updated, improved and simplified version of the model I used in C2004-1. I believe some of the data available in the current docket to be generally more accurate than what was available in Docket No. C2004-1, including the volume data obtained from

witness Loetscher's data collection and the Postal Service's new data on facilities through which non-dropshipped sacks and pallets are transferred. But the model data are of course still not perfect, for example, much of the productivity data is still the same very old data that Postal Service witnesses have been relying on for many years and even decades.[47]

These imperfections notwithstanding, the cost and mail flow data presented here provide a much more accurate and realistic picture of the factors that determine Periodicals costs, and a better basis on which to build a Periodicals rate structure, than the information provided by the Postal Service in this docket.

[47] As in C2004-1, and consistent with the practice established by USPS witnesses, I addressed the problem of imperfect data, in the aggregate, by a "CRA adjustment" that assures that the total Periodicals processing costs predicted by the model are consistent with the rolled forward test year costs presented by witness Smith.

EXHIBIT A:

CORRECTED ESTIMATES OF PRESORT/AUTOMATION RELATED MAIL PROCESSING COSTS

Table A-1: Presort/Automation Related Mail Processing Unit Costs
(Cents/Piece - CRA Adjusted)

Rate Category	PRC Costing	USPS Costing
Basic Nonauto Presort	36.613	32.019
3-Digit Nonauto Presort	28.571	25.215
5-Digit Nonauto Presort	18.830	17.199
Carrier Route Nonauto Presort	9.079	8.283
Basic Auto Presort	31.531	27.884
3-Digit Auto Presort	26.400	23.582
5-Digit Auto Presort	18.320	16.682

Table A-2: Presort/Automation Related Mail Processing Unit Costs
(With Presort Levels Held Constant - To Determine Automation Savings)

Rate Category	PRC Costing	USPS Costing
Basic Nonauto Presort	36.613	32.019
3-Digit Nonauto Presort	28.571	25.215
5-Digit Nonauto Presort	18.830	17.199
Carrier Route Nonauto Presort	9.079	8.283
Basic Auto Presort	34.739	30.434
3-Digit Auto Presort	26.454	23.438
5-Digit Auto Presort	18.254	16.663

EXHIBIT B:

OUTSIDE COUNTY NON-LETTERS EXPANDED BILLING DETERMINANTS

ESTIMATED TEST YEAR TY08 VOLUMES

Table B1: Outside County Sack & Pallet Counts By Entry Point & Container Presort - TY08

Container		Entry Point						
Type	Presort	DDU	DSCF	DADC	DBMC	OBMC	OADC	OSCF
Sacks	MADC				9,260	310,041	2,135,142	1,887,740
	ADC			893,364	12,602	825,501	3,445,964	4,004,466
	3-D/SCF		3,680,672	1,286,352	65,834	2,025,101	8,734,705	8,303,499
	5-d	163,882	1,621,488	491,451	16,045	109,819	1,510,562	713,148
	5-d CR	25,431	760,518	94,865	6,188	383,604	354,279	487,241
	CR	91,852	1,265,044	336,018	8,784	146,112	292,168	173,523
Pallets	ADC			384,018	5,224	4,821	197,203	193,212
	3-D/SCF		1,567,649	294,941	13,456	8,948	236,185	220,408
	5-Digit	2,383	621,870	48,228	963	143	16,582	14,406

Table B2: Estimated Counts Of Bundles By Bundle & Container Presort Level - TY08

Bundle	Sacks						Pallets		
Presort	MADC	ADC	SCF/3-D	5-Digit	5-D CR	CR	ADC	SCF/3-D	5-Digit
MADC	3,377,363								
ADC	8,374,659	7,832,023					389,513		
3-D	7,553,858	19,052,651	37,616,166				11,494,403	8,741,777	
5-D	2,518,024	6,799,910	42,114,434	5,457,519			34,429,457	95,793,823	867,027
CR			5,698,233		8,703,549	3,555,743	14,120,210	238,662,371	36,746,960
Firm	7,237,502	5,714,208	5,216,415	269,160	752,419		927,125	197,866	2,068
Total	29,061,406	39,398,792	90,645,248	5,726,679	9,455,967	3,555,743	61,360,708	343,395,837	37,616,056

Table B3: TY08 Piece Counts By Bundle & Container Presort Level And Piece Characteristics

Bundle Level	Piece Type	Sacks						Pallets		
		MADC	ADC	3-D	5-D	5-D CR	CR	ADC	3-D	5-D
MADC	NBC/NM	1,981,562								
	NBC/M	17,009,405								
	BC/NM	2,915,249								
	BC/M	9,132,816								
ADC	NBC/NM	5,529,917	4,605,692					791,926		
	NBC/M	24,265,462	21,562,280					567,807		
	BC/NM	13,911,873	9,307,309					608,434		
	BC/M	52,678,203	61,446,955					1,821,024		
3d	NBC/NM	4,157,139	10,345,489	36,368,636				9,609,077	8,270,623	
	NBC/M	16,243,462	29,993,140	76,709,265				12,625,643	14,182,972	
	BC/NM	6,849,984	25,939,309	87,480,731				43,178,464	32,382,568	
	BC/M	39,797,082	143,875,862	382,821,854				160,116,608	118,693,266	
5d	NBC/NM	318,820	1,525,836	20,503,228	20,333,248			11,652,554	37,739,366	758,230
	NBC/M	2,796,558	5,566,676	25,993,330	22,422,354			18,249,904	80,660,615	2,107,003
	BC/NM	1,357,985	7,733,019	72,609,977	17,171,332			74,631,842	244,255,446	2,714,479
	BC/M	8,101,077	39,552,079	293,995,190	90,105,839			363,855,954	1,293,663,641	9,673,130
CR	NM	0		14,590,235		22,285,297	9,104,424	21,351,087	340,716,875	76,960,760
	M	0		51,792,401		79,108,325	32,318,874	105,073,896	2,534,592,451	665,906,870
Firm	NM	2,249,918	614,149	1,655,570	0	0		309,123	176,547	2,068
	M	4,774,372	5,430,625	2,732,027	434,585	1,298,458		618,002	21,319	0
Total Pieces:		214,070,885	367,498,419	1,067,252,445	150,467,358	102,692,080	41,423,298	825,061,346	4,705,355,692	758,122,540
					Sacked:		1,943,404,485	Palletized:		6,288,539,577
								Total TY08:		8,231,944,062

EXHIBIT C:

OUTSIDE COUNTY NON-LETTERS - MAIL PROCESSING UNIT COSTS OF HANDLING PIECES, BUNDLES, SACKS AND PALLETS

ADJUSTED TO CRA TY08 COSTS – PRC OR USPS COSTING

Table C1a: Unit Costs Of Sack/Pallet Handling By Entry Point & Container Presort (PRC Costing)								
Container		Entry Point						
Type	Presort	DDU	DSCF	DADC	DBMC	OBMC	OADC	OSCF
Sacks	MADC						$1.94	$2.31
	ADC			$1.58	$2.85	$3.90	$4.50	$4.62
	3-d		$1.58	$2.48	$2.93	$4.05	$4.71	$4.96
	5-d	$1.69	$2.01	$2.91	$3.40	$4.59	$5.33	$5.96
	5-d CR	$1.69	$2.55	$3.43	$3.93	$5.01	$5.63	$6.23
	CR	$1.69	$2.55	$3.54	$3.86	$5.18	$6.05	$6.20
Pallets	ADC			$22.06	$32.11	$44.04	$43.57	$48.68
	SCF/3D		$16.53	$30.16	$35.65	$46.43	$55.11	$59.22
	5D	$2.85	$19.90	$38.35	$43.39	$53.35	$61.25	$73.11

Table C1b: Unit Costs Of Sack/Pallet Handling By Entry Point & Container Presort (USPS Costing)								
Container		Entry Point						
Type	Presort	DDU	DSCF	DADC	DBMC	OBMC	OADC	OSCF
Sacks	MADC						$1.62	$1.93
	ADC			$1.28	$2.34	$3.23	$3.74	$3.85
	3-d		$1.28	$2.04	$2.41	$3.36	$3.92	$4.13
	5-d	$1.45	$1.68	$2.43	$2.84	$3.85	$4.48	$5.03
	5-d CR	$1.45	$2.18	$2.92	$3.32	$4.24	$4.78	$5.29
	CR	$1.45	$2.18	$3.01	$3.27	$4.39	$5.13	$5.26
Pallets	ADC			$18.34	$26.67	$36.64	$36.24	$40.50
	SCF/3D		$13.70	$25.08	$29.63	$38.61	$45.86	$49.29
	5D	$2.46	$16.94	$32.66	$36.86	$45.16	$51.76	$61.65

Table C2a: Per-Bundle Unit Costs By Bundle & Container Presort Level - Excludes Weight Related Bundle Costs - Used In Mitchell's Rate Design - PRC Costing

Bundle	Sacks						Pallets		
Presort	MADC	ADC	SCF/3-D	5-Digit	5-D CR	CR	ADC	3D-SCF	5-Digit
MADC	$0.2697								
ADC	$0.3491	$0.1047					$0.1047		
3-Digit	$0.3658	$0.1672	$0.1064				$0.1748	$0.1064	
5-Digit	$0.4348	$0.2407	$0.2191	$0.0000			$0.2543	$0.2255	$0.1476
CR			$0.2409		$0.1435	$0.0000	$0.2743	$0.2493	$0.1434
Firm	$0.4182	$0.2536	$0.2409	$0.1435	$0.1435		$0.2743	$0.2493	$0.1434

Table C2b: Weight Related Per-Bundle Unit Costs By Bundle & Container Presort Level - PRC Costing

Bundle	Sacks						Pallets		
Presort	MADC	ADC	SCF/3-D	5-Digit	5-D CR	CR	ADC	3D-SCF	5-Digit
MADC	$0.0945								
ADC	$0.4958	$0.0945					$0.0945		
3-Digit	$0.6436	$0.3605	$0.0945				$0.3386	$0.0945	
5-Digit	$0.7116	$0.4215	$0.3120	$0.0660			$0.4394	$0.3268	$0.0660
CR			$0.3092		$0.0000	$0.0000	$0.4064	$0.3233	$0.0000
Firm	$0.8560	$0.3927	$0.3092	$0.0000	$0.0000		$0.4064	$0.3233	$0.0000

Table C2c: Total Per-Bundle Unit Costs, By Bundle & Container Presort Level, Including Weight Related Costs - PRC Costing

Bundle	Sacks						Pallets		
Presort	MADC	ADC	SCF/3-D	5-Digit	5-D CR	CR	ADC	3D-SCF	5-Digit
MADC	$0.3642								
ADC	$0.8449	$0.1992					$0.1992		
3-Digit	$1.0094	$0.5277	$0.2009				$0.5134	$0.2009	
5-Digit	$1.1464	$0.6622	$0.5311	$0.0660			$0.6936	$0.5523	$0.2137
CR			$0.5501		$0.1435	$0.0000	$0.6807	$0.5726	$0.1434
Firm	$1.2742	$0.6462	$0.5501	$0.1435	$0.1435		$0.6807	$0.5726	$0.1434

Table C2d: Per-Bundle Unit Costs By Bundle & Container Presort Level - Excludes Weight Related Bundle Costs - USPS Costing

Bundle	Sacks						Pallets		
Presort	MADC	ADC	SCF/3-D	5-Digit	5-D CR	CR	ADC	3D-SCF	5-Digit
MADC	$0.2085								
ADC	$0.2773	$0.0787					$0.0787		
3-Digit	$0.2867	$0.1257	$0.0800				$0.1314	$0.0800	
5-Digit	$0.3490	$0.1925	$0.1758	$0.0000			$0.2037	$0.1813	$0.1261
CR			$0.1948		$0.1225	$0.0000	$0.2210	$0.2020	$0.1224
Firm	$0.3427	$0.2038	$0.1948	$0.1225	$0.1225		$0.2210	$0.2020	$0.1224

Table C2e: Weight Related Per-Bundle Unit Costs By Bundle & Container Presort Level - USPS Costing

Bundle	Sacks						Pallets		
Presort	MADC	ADC	SCF/3-D	5-Digit	5-D CR	CR	ADC	3D-SCF	5-Digit
MADC	$0.0794								
ADC	$0.4126	$0.0794					$0.0794		
3-Digit	$0.5388	$0.3039	$0.0794				$0.2842	$0.0794	
5-Digit	$0.6027	$0.3632	$0.2705	$0.0593			$0.3786	$0.2835	$0.0593
CR			$0.2669		$0.0000	$0.0000	$0.3489	$0.2792	$0.0000
Firm	$0.7280	$0.3371	$0.2669	$0.0000	$0.0000		$0.3489	$0.2792	$0.0000

Table C2f: Total Per-Bundle Unit Costs, By Bundle & Container Presort Level, Including Weight Related Costs - USPS Costing

Bundle	Sacks						Pallets		
Presort	MADC	ADC	SCF/3-D	5-Digit	5-D CR	CR	ADC	3D-SCF	5-Digit
MADC	$0.2879								
ADC	$0.6899	$0.1580					$0.1580		
3-Digit	$0.8255	$0.4296	$0.1593				$0.4156	$0.1593	
5-Digit	$0.9517	$0.5557	$0.4463	$0.0593			$0.5823	$0.4648	$0.1854
CR			$0.4616		$0.1225	$0.0000	$0.5699	$0.4812	$0.1224
Firm	$1.0708	$0.5408	$0.4616	$0.1225	$0.1225		$0.5699	$0.4812	$0.1224

Table C3a: Unit Piece Processing Costs By Bundle & Container Presort Level & Piece Characteristics
Excludes Weight Related Costs - Used In Mitchell's Rate Design - PRC Costing

Bundle	Piece	Sacks						Pallets		
Level	Type	MADC	ADC	3-D	5-D	5-D CR	CR	ADC	3-D	5-D
MADC	NBC/NM	$0.4143								
	NBC/M	$0.2449								
	BC/NM	$0.3642								
	BC/M	$0.2163								
ADC	NBC/NM	$0.3237	$0.3131					$0.3131		
	NBC/M	$0.1900	$0.1827					$0.1827		
	BC/NM	$0.2827	$0.2730					$0.2730		
	BC/M	$0.1691	$0.1625					$0.1625		
3d	NBC/NM	$0.2736	$0.2586	$0.2530				$0.2534	$0.2530	
	NBC/M	$0.1716	$0.1620	$0.1598				$0.1600	$0.1598	
	BC/NM	$0.2409	$0.2273	$0.2225				$0.2228	$0.2225	
	BC/M	$0.1534	$0.1447	$0.1429				$0.1430	$0.1429	
5d	NBC/NM	$0.1555	$0.1325	$0.1231	$0.1096			$0.1124	$0.1104	$0.1096
	NBC/M	$0.1144	$0.0996	$0.0946	$0.0857			$0.0875	$0.0862	$0.0857
	BC/NM	$0.1484	$0.1284	$0.1204	$0.1096			$0.1119	$0.1103	$0.1096
	BC/M	$0.1041	$0.0907	$0.0862	$0.0780			$0.0797	$0.0786	$0.0780
CR	NM					$0.0000	$0.0000	$0.0043	$0.0015	$0.0000
	M					$0.0000	$0.0000	$0.0027	$0.0009	$0.0000

Table C3b: Unit Piece Processing Costs By Bundle & Container Presort Level & Piece Characteristics
Weight Related Costs Only - PRC Costing

Bundle	Piece	Sacks						Pallets		
Level	Type	MADC	ADC	3-D	5-D	5-D CR	CR	ADC	3-D	5-D
MADC	NBC/NM	$0.0641								
	NBC/M	$0.0634								
	BC/NM	$0.0641								
	BC/M	$0.0634								
ADC	NBC/NM	$0.0443	$0.0443					$0.0443		
	NBC/M	$0.0421	$0.0421					$0.0421		
	BC/NM	$0.0443	$0.0443					$0.0443		
	BC/M	$0.0421	$0.0421					$0.0421		
3d	NBC/NM	$0.0340	$0.0402	$0.0340				$0.0402	$0.0340	
	NBC/M	$0.0340	$0.0402	$0.0340				$0.0402	$0.0340	
	BC/NM	$0.0340	$0.0402	$0.0340				$0.0402	$0.0340	
	BC/M	$0.0340	$0.0402	$0.0340				$0.0402	$0.0340	
5d	NBC/NM	$0.0000	$0.0000	$0.0039	$0.0000			$0.0000	$0.0043	$0.0000
	NBC/M	$0.0000	$0.0000	$0.0039	$0.0000			$0.0000	$0.0043	$0.0000
	BC/NM	$0.0000	$0.0000	$0.0039	$0.0000			$0.0000	$0.0043	$0.0000
	BC/M	$0.0000	$0.0000	$0.0039	$0.0000			$0.0000	$0.0043	$0.0000
CR	NM					$0.0000	$0.0000	$0.0000	$0.0000	$0.0000
	M					$0.0000	$0.0000	$0.0000	$0.0000	$0.0000

Table C3c: Unit Piece Processing Costs By Bundle & Container Presort Level & Piece Characteristics
Includes Weight Related Piece Handling Costs - PRC Costing

Bundle	Piece	Sacks						Pallets		
Level	Type	MADC	ADC	3-D	5-D	5-D CR	CR	ADC	3-D	5-D
MADC	NBC/NM	$0.4784								
	NBC/M	$0.3083								
	BC/NM	$0.4283								
	BC/M	$0.2797								
ADC	NBC/NM	$0.3679	$0.3573					$0.3573		
	NBC/M	$0.2321	$0.2248					$0.2248		
	BC/NM	$0.3270	$0.3173					$0.3173		
	BC/M	$0.2112	$0.2046					$0.2046		
3d	NBC/NM	$0.3076	$0.2989	$0.2871				$0.2936	$0.2871	
	NBC/M	$0.2056	$0.2022	$0.1939				$0.2002	$0.1939	
	BC/NM	$0.2749	$0.2675	$0.2565				$0.2631	$0.2565	
	BC/M	$0.1874	$0.1850	$0.1769				$0.1832	$0.1769	
5d	NBC/NM	$0.1555	$0.1325	$0.1270	$0.1096			$0.1124	$0.1147	$0.1096
	NBC/M	$0.1144	$0.0996	$0.0985	$0.0857			$0.0875	$0.0905	$0.0857
	BC/NM	$0.1484	$0.1284	$0.1243	$0.1096			$0.1119	$0.1145	$0.1096
	BC/M	$0.1041	$0.0907	$0.0900	$0.0780			$0.0797	$0.0828	$0.0780
CR	NM					$0.0000	$0.0000	$0.0043	$0.0015	$0.0000
	M					$0.0000	$0.0000	$0.0027	$0.0009	$0.0000

Table C3d: Unit Piece Processing Costs By Bundle & Container Presort Level & Piece Characteristics
Excludes Weight Related Costs - USPS Costing

Bundle	Piece	Sacks						Pallets		
Level	Type	MADC	ADC	3-D	5-D	5-D CR	CR	ADC	3-D	5-D
MADC	NBC/NM	$0.3560								
	NBC/M	$0.2288								
	BC/NM	$0.3152								
	BC/M	$0.2018								
ADC	NBC/NM	$0.2789	$0.2697					$0.2697		
	NBC/M	$0.1784	$0.1717					$0.1717		
	BC/NM	$0.2451	$0.2365					$0.2365		
	BC/M	$0.1585	$0.1524					$0.1524		
3d	NBC/NM	$0.2374	$0.2244	$0.2197				$0.2200	$0.2197	
	NBC/M	$0.1616	$0.1527	$0.1508				$0.1509	$0.1508	
	BC/NM	$0.2099	$0.1980	$0.1939				$0.1942	$0.1939	
	BC/M	$0.1442	$0.1361	$0.1344				$0.1345	$0.1344	
5d	NBC/NM	$0.1429	$0.1235	$0.1155	$0.1045			$0.1068	$0.1052	$0.1045
	NBC/M	$0.1083	$0.0945	$0.0899	$0.0815			$0.0832	$0.0820	$0.0815
	BC/NM	$0.1371	$0.1201	$0.1133	$0.1045			$0.1064	$0.1051	$0.1045
	BC/M	$0.0983	$0.0858	$0.0816	$0.0740			$0.0755	$0.0744	$0.0740
CR	NM					$0.0000	$0.0000	$0.0037	$0.0013	$0.0000
	M					$0.0000	$0.0000	$0.0025	$0.0009	$0.0000

Table C3e: Unit Piece Processing Costs By Bundle & Container Presort Level & Piece Characteristics
Weight Related Costs Only - USPS Costing

Bundle	Piece	Sacks						Pallets		
Level	Type	MADC	ADC	3-D	5-D	5-D CR	CR	ADC	3-D	5-D
MADC	NBC/NM	$0.0550								
	NBC/M	$0.0545								
	BC/NM	$0.0550								
	BC/M	$0.0545								
ADC	NBC/NM	$0.0381	$0.0381					$0.0381		
	NBC/M	$0.0363	$0.0363					$0.0363		
	BC/NM	$0.0381	$0.0381					$0.0381		
	BC/M	$0.0362	$0.0362					$0.0362		
3d	NBC/NM	$0.0294	$0.0350	$0.0294				$0.0350	$0.0294	
	NBC/M	$0.0294	$0.0350	$0.0294				$0.0350	$0.0294	
	BC/NM	$0.0294	$0.0350	$0.0294				$0.0350	$0.0294	
	BC/M	$0.0294	$0.0350	$0.0294				$0.0350	$0.0294	
5d	NBC/NM	$0.0000	$0.0000	$0.0033	$0.0000			$0.0000	$0.0037	$0.0000
	NBC/M	$0.0000	$0.0000	$0.0033	$0.0000			$0.0000	$0.0037	$0.0000
	BC/NM	$0.0000	$0.0000	$0.0033	$0.0000			$0.0000	$0.0037	$0.0000
	BC/M	$0.0000	$0.0000	$0.0033	$0.0000			$0.0000	$0.0037	$0.0000
CR	NM					$0.0000	$0.0000	$0.0000	$0.0000	$0.0000
	M					$0.0000	$0.0000	$0.0000	$0.0000	$0.0000

Table C3f: Unit Piece Processing Costs By Bundle & Container Presort Level & Piece Characteristics
Includes Weight Related Piece Handling Costs - USPS Costing

Bundle	Piece	Sacks						Pallets		
Level	Type	MADC	ADC	3-D	5-D	5-D CR	CR	ADC	3-D	5-D
MADC	NBC/NM	$0.4110								
	NBC/M	$0.2833								
	BC/NM	$0.3702								
	BC/M	$0.2563								
ADC	NBC/NM	$0.3170	$0.3078					$0.3078		
	NBC/M	$0.2147	$0.2079					$0.2079		
	BC/NM	$0.2832	$0.2746					$0.2746		
	BC/M	$0.1947	$0.1886					$0.1886		
3d	NBC/NM	$0.2667	$0.2594	$0.2491				$0.2550	$0.2491	
	NBC/M	$0.1910	$0.1878	$0.1802				$0.1859	$0.1802	
	BC/NM	$0.2393	$0.2330	$0.2233				$0.2292	$0.2233	
	BC/M	$0.1735	$0.1711	$0.1638				$0.1695	$0.1638	
5d	NBC/NM	$0.1429	$0.1235	$0.1188	$0.1045			$0.1068	$0.1089	$0.1045
	NBC/M	$0.1083	$0.0945	$0.0932	$0.0815			$0.0832	$0.0857	$0.0815
	BC/NM	$0.1371	$0.1201	$0.1166	$0.1045			$0.1064	$0.1088	$0.1045
	BC/M	$0.0983	$0.0858	$0.0849	$0.0740			$0.0755	$0.0781	$0.0740
CR	NM					$0.0000	$0.0000	$0.0037	$0.0013	$0.0000
	M					$0.0000	$0.0000	$0.0025	$0.0009	$0.0000