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POSTAL RATE COMMISSION

WASHINGTON DC 20268-1001

POSTAL RATE AND FEE CHANGES, 2006: **Docket No. R2006-1**

DIRECT TESTIMONY

OF

MARC D. McCRERY

ON BEHALF OF THE

UNITED STATES POSTAL SERVICE

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Direct Testimony
of
Marc D. McCrery
Autobiographical Sketch

My name is Marc McCrery. I have been the Manager, Operational Requirements and Integration within Operations Planning since April 2004. My office serves as the focal point for operations planning related to operational impacts of rate and mail preparation issues. We interface with pricing, finance, mailing standards, and customers to evaluate and implement various internal and external rate and mail preparation changes. Specific responsibilities include assisting in the development of mail preparation standards and rate-related changes to ensure compatibility with operational processing, determining operational impacts resulting from rate and mail classification cases, and preparing the field for the expected changes before implementation.

I joined the Postal Service in 1990 as an Industrial Engineer Trainee. My first assignment was to work at the Des Moines, IA Processing and Distribution Facility with the purpose of learning mail processing operations. A large portion of this period was spent supervising automation on Tour 1. This was followed by supervisory responsibilities at a delivery station in Des Moines, IA, followed by project work in the Engineering Technical Unit (ETU). My second year of training was spent in Harrisburg, PA working in the ETU primarily supporting the plant on staffing, scheduling, and quality projects.

Upon leaving the training program in late 1992, I moved to USPS Headquarters as a member of the Facility Activation group, with responsibilities to activate new, large mail processing facilities throughout the country. From that office, I moved to Bulk Mail Center Operations and then to Processing and Distribution Center Operations. During these assignments, I visited dozens of mail processing plants and every Bulk Mail Center within the network. In 1996, I joined the staff of my current office, Operational Requirements and Integration. My responsibilities included developing enhancements to mail preparation requirements and support work on the proposals, testimony, interrogatories, and implementation activities for the R97-1, R2000-1, and R2001-1 rate cases. In 2003, I was promoted to the Manager, Business Mailer Support within Marketing where I was responsible for the management of major mailer postage payment systems and a mail preparation total quality management program for presort bureaus and letter shops. Then in 2004, I was again promoted to the Manager, Operational Requirements and Integration. Last year, I testified as the Operations witness in Docket No. R2005-1. I also had a temporary assignment lasting 3 ½ months in 2004 as the Plant Manager of the Burlington, VT Processing and Distribution Facility.

I have a Bachelor of Science Degree in Industrial Engineering from the University of Wisconsin – Madison.

I. Purpose of Testimony

The purpose of my testimony is to provide operational support for various elements of the Postal Service's pricing and classification proposals. In Chapter Two, Processing Operations, I provide an overview of the Postal Service's processing operations for the current environment, the test year, and beyond. I specifically address:

1. Basic processes by shape;
2. Types and capabilities of equipment;
3. Equipment deployments and processing changes planned through the test year and beyond;

In Chapter Three, Volume and Workhours in Mail Processing, I discuss the relation between long term (e.g., quarter-to-quarter) volume changes and the resulting workhour changes in support of Dr. Bozzo's (USPS-T-12) calculation of volume variabilities.

Finally, I am sponsoring Sections 1A and 2A of USPS-LR-L-49, Explanation of Cost Reductions, Other Programs, and Corporate Wide Activities which is a Category 2 Library Reference and details the programs and initiatives that we expect will produce operational savings through the test year. I have used pieces of information within this library reference during the development of my testimony.

II. Processing Operations

In this part of my testimony, I provide an overview of postal processing operations, with a focus on the equipment and methods used to process mail in today's environment, changes that are scheduled in the near term, and changes that are being investigated that could impact processing operations further in the future. Since we process letters, flats, and parcels as distinct mailstreams with very different methods and varying productivities, each one is discussed separately.

A. Letter and Card Mail Processing

1. Preparation

Letter mail preparation operations first require that letters and cards are sorted into three separations: barcoded, non-barcoded machinable, and nonmachinable (manual) to the greatest extent possible. Whether volumes are presented in trays, bundles (such as metered mail), or as single pieces (such as collection mail), these separations are necessary for subsequent piece distribution operations that either read an existing barcode, read and resolve an address then print a barcode, or sort letters or cards manually.

The operation where collection mail is prepared is often referred to as "010"[1] and encompasses the culling, facing, and sorting of mail by shape and indicium. This operation is where letters, flats, and parcels are separated for subsequent handling. For bundled mail, bands are removed and sometimes loose pieces are cancelled on the AFCS while other times the pieces are faced and placed in trays. Trays of metered letters are forwarded directly to sortation equipment, while stamped mail is first faced and canceled. Hampers of single-piece collection mail are dumped into the dual-pass rough cull feed system for the Advanced Facer Canceller System (AFCS) described further in the following section. This machine culls out non-letter sized pieces (over 6 1/8 inches tall, over ¼ inch thick, and/or over 11 ½ inches long). It faces letters based

[1] "010" refers to MODS operations 010-019, 020-029, and 02B for volume and workhour reporting.

on the location of the stamp, meter, or Facing Identification Mark (FIM)[2], and cancels the stamp.

The volume arrival profile of collection mail into the 010 operation is dependent upon mail arrivals from stations, branches, associate offices, and collection runs. Due to varied distances and demographics, the arrival profile varies by facility, and may vary by day depending on volume, weather, traffic, day of the week, or month. The status of the outgoing mail preparation operation dictates whether the subsequent operations will meet the operating plan's clearance times (the time processing must be completed), since none of the outgoing operations can be finalized until the 010 operation is clear of all mail volume.

Letter mail is also received from sources other than collections. The Business Mail Entry Unit (BMEU) supplies bulk mail at origin. At destination, the primary sources are presorted mail from mailers and mail sorted by origin postal facilities. At destination, letters are again separated into barcoded, non-barcoded machinable, and manual mail flows for subsequent processing.

Generally speaking, letters and cards are handled the same within the automated and manual letter processing environments with no significant differences in the piece distribution productivities.

2. Equipment

Letter processing operations are geared towards barcoding and/or sorting as much letter volume through automated operations as possible, with the ultimate goal of processing letters into Delivery Point Sequence (DPS)[3] or, to a lesser extent, to the carrier route level. Letter sorting equipment sorts letters into bins that subsequently have to be manually swept into letter trays. Therefore, processing may commence without first setting up all of the trays.[4]

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[2] FIM is the series of vertical bars to the left of the postage area such as on courtesy reply (FIM A) and business reply (FIM C) mail indicating the letter is barcoded.

[3] DPS provides letters to the carrier in walk sequence of the route, thereby eliminating the need for the carrier to case letters in walk sequence in the office.

[4] This affects the time required to change a scheme and differs from the FSMs, which sort directly into trays that must be set up each scheme change.

- The Advanced Facer Canceller System (AFCS) - The AFCS culls, faces, cancels, and enables on-line sortation of letters and cards into either local destinations, non-local destinations, barcoded FIMs A and C, and rejects. AFCSs have recently received the Optical Character Reader (OCR), Remote Computer Reader (RCR) and Input Sub System (ISS) modifications to capture images for the Remote Bar Coding System (see RBCS below). AFCS image lift has reduced the pressure on the downstream outgoing operations, thereby easing the constraints on the outgoing processing window and allowing incoming processing to start earlier. Throughput[5] of the 1,083 AFCSs is approximately 32,000 pieces per machine hour and the staffing index is one mailhandler per machine.

  Improvements are underway for all AFCS machines which include a cancellation upgrade with full deployment expected by April 2006. The inkjet canceller (IJC) automates the update process of the cancellation postmark eliminating the daily manual effort required to update the AFCS machine's date stamp. The AFCSs have received a doubles detector and an OCR upgrade. The doubles detector recognizes double feeds as they occur and creates a more efficient rehandling process. The OCR upgrade results in the machine being capable of identifying the 5-digit destination ZIP Code of each letter it processes enabling the machine to make the local and non-local splits described above. The separation of local and non-local addresses provides the opportunity for the two downstream flows to be processed on separate machines thereby reducing handlings. Recently, all AFCSs were retrofitted with OCRs as part of the Video Facing Modification program and networked into a second processor, the RCR (see RBCS).

- Multiline Optical Character Reader (MLOCR) - Non-barcoded machinable letters, typically metered and presorted volume, are fed through MLOCRs to obtain a postal applied barcode. A total of 875 MLOCRs have been deployed. Previous

[5] Throughput is entirely distinct from productivity. Throughput is the number of pieces that can be fed through the machine during one machine run hour. Productivity is the total pieces finalized (pieces fed minus rejects) divided by the total workhours used (includes setup, sweep, jam clearance time, etc.).

enhancements have improved the overall encode rate of the MLOCR and reduced the amount of mail that obtains a barcode through Remote Bar Coding. Throughput of an MLOCR is approximately 29,000 pieces per hour. It has a staffing index of two clerks, one feeding and the other sweeping its 60 stackers. Since MLOCRs currently are experiencing end of life parts issues, it has been determined that replacement of 646 MLOCRs with the more efficient DBCS Input/Output Subsystem - Expanded Capability (DIOSS-EC) machines (see below) is necessary. It is expected that by May 2007 there will be only 294 MLOCRs remaining in operation at smaller plants with further reductions planned.

- Remote Bar Coding System (RBCS) - RBCS has three distinct components: the Input Sub System (ISS), the Image Processing Sub System (IPSS), and the Output Sub System (OSS). The ISS consists of a retrofitted MLOCR (MLOCR-ISS), retrofitted Advanced Facer Canceller System (AFCS-ISS), and/or retrofitted DBCS Input/Output Subsystem (DIOSS) and is used to "lift images" of non-barcoded unreadable machinable letters. A fluorescent ID tag is sprayed on the back of all mailpieces and an electronic image of the mailpiece not resolved by the MLOCR is forwarded to the IPSS. The IPSS is the computer system, which controls the image flows, contains the barcode result information, and communicates with the Remote Encoding Center's (REC) system. While in the IPSS, the image may be resolved through the use of a Remote Computer Reader (RCR)[6]. If not resolved, it will be forwarded on to a REC where an operator keys the address information into a computer. Once the address is resolved to the depth of sort required (5, 9 or 11-digits), the mailpiece is fed back through the OSS. The OSS is a retrofitted Mail Processing Barcode Sorter (MPBCS-OSS), DBCS (DBCS-OSS), or DIOSS where the fluorescent ID tag is read and the barcode information is accessed from the IPSS Decision Storage Unit to apply the barcode to the piece. RBCS is fully deployed to over 330 plants. In FY 2005, the total REC volume was approximately

[6]RCR is an off-line optical character recognition device that is part of RBCS. It uses advanced recognition techniques and is currently able to resolve 78.39 percent of the letter mail images introduced to it for processing. Percentage of images keyed at the REC that were not finalized at the OSS (System Leakage) was 8.26.

6.4 billion images[7]. As of March 2006, there were 12 RECs, a reduction of 13 since March 2001. The Letter Recognition Enhancement Program (LREP) is further enhancing the handwritten and machine-print address recognition technology used in letter mail automation equipment (i.e., OCRs and RCRs). The primary benefit from this program is a reduction in keying workhours required at RECs. Incremental improvements were deployed through February 2006.

- Delivery Bar Code Sorter (DBCS) - This machine is used for processing letters already barcoded either by the OCR, RBCS, or our customers. DBCSs come in multiple configurations; most machines have between 190 and 220 sortation bins. Due to the greater number of sort stackers compared to the MPBCS (see below), the DBCS is used for outgoing processing, incoming primary sortation[8], and Delivery Point Sequencing (DPS). The DBCS deployment is complete with over 5,200 sorters currently operational. Throughput is approximately 37,000 pieces per hour and the staffing index is two clerks. Currently, 94 machines have been modified with expanded capabilities (DBCS-EC), which allow the machine to process letters with a wider range of mail characteristics. A number of DBCS machines and all 94 DBCS-EC machines are expected to be converted to DIOSS-EC machines (see below) in the near future.
- As the automation workhorse, some DBCSs have undergone other changes to better fit specific processing needs. An additional 1632 stacker modules were added to some machines at 216 postal processing facilities to accommodate the growth in delivery points and volume for DPS. Deployment was completed in November 2004. The new stackers provide the capability to process more mail in DPS order, thereby reducing the number of handlings required to sort letter mail to

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[7]The RECs also receive images from the PARS, AFSM 100, and APPS image lift systems (see respective sections further in the testimony). Also, RBCS system will be enhanced in the future with a Universal Coding System (UCS) replacing the IPSS that will better manage the images and allow keying stations to resolve images from all sources.

[8]Incoming is defined as operations that process mail volume for one or multiple destination 3-digit ZIP Codes. Incoming primary generally involves processing volume to the 5-digit ZIP Code level, while incoming secondary generally involves further distribution to the carrier-route level.

its final destination. In addition, new Wide Field Of View (WFOV) cameras have replaced the aging Wide Area Bar Code Readers (WABCRs) to provide improvements to current reader acceptance rates, reduce operations disruptions due to unsupportable WABCR equipment, support Information Platform initiatives, and facilitate deployment of new letter mail sorting technologies.

- DBCS Input/Output Subsystem (DIOSS) - The DIOSS is a combination of DBCS/OCR/ISS/OSS technology in one machine. One of the main advantages of DIOSS is that it provides all capabilities in a small footprint with up to 300 sorting bins, depending on the DBCS configuration. The DIOSS can be operated in DBCS mode for the processing of a barcoded mail stream or OCR/ISS mode for a predominately non-barcoded mail stream. Currently there are 222 DIOSS machines deployed in the field. Throughput is approximately 37,000 pieces per hour while operating in the DBCS/OSS modes and 32,000 pieces per hour operating in the OCR/ISS operation modes. The different throughputs are the result of a variable speed motor that slows the machine in the OCR/ISS mode to allow for the additional time for address look-up. The staffing index is two clerks.
- DBCS Input/Output Subsystem – Expanded Capability (DIOSS-EC) – The ultimate DBCS retrofit available is the DIOSS-EC (DBCS Input/Output Subsystem – Expanded Capability). This machine has expanded capabilities that allow processing of a wider range (e.g., thicker, heavier, and stiffer pieces) of mail characteristics than is handled by a DBCS today while processing at the same throughput as the current DIOSS equipment. The Postal Service plans to purchase 395 new DIOSS-EC machines together with the 222 converted DBCS machines. This will bring the total number of DIOSS-EC machines to 617. Deployment began in January 2006 and is expected to end in June 2007. The staffing index is two clerks.
- Carrier Sequence Bar Code Sorter (CSBCS) - This machine is primarily located in delivery units and is used for Delivery Point Sequencing. The CSBCS sequences barcoded letters and cards already sorted by carrier route into delivery sequence order in three passes. Letters are processed for one to six carrier route(s) at a time because the number of stackers (17, 21, or 25) supports a limited number of delivery

points and volume. There are approximately 3,500 CSBCSs at approximately 1,000 sites and all have been retrofitted with Wide Field of View (WFOV) cameras since the original deployment. Throughput is approximately 19,000 pieces per hour with a staffing index of one. There are no future purchases planned, and the utilization of CSBCS equipment has been declining as an attempt has been made over the last several years to maximize the number of zones processed on DBCS equipment due to the increased productivity and improved performance in comparison to CSBCS equipment. It is expected that the trend of zones shifting from CSBCS to DBCS equipment will continue.

- <u>Mail Processing Bar Code Sorter (MPBCS)</u> - This machine is a generation prior to the DBCSs and is nearing the end of its useful life. It has 96 bins, and is used primarily for outgoing primary, incoming primary, and incoming secondary carrier-route processing with OSS modifications. The number of operational MPBCSs in the field has declined from 626 last year to 547 this year, and the decline is expected to continue. Throughput is approximately 35,000 pieces per hour. Staffing is two clerks.
- <u>ID Code Sortation (ICS)</u> - The ICS system, installed on all types of BCS equipment, allows sortation using the ID tag as well as the POSTNET barcode. The system provides a redundant opportunity for sorting a mailpiece. If the barcode becomes unreadable for any reason, the BCS will look for an ID tag. If an ID tag exists, it will look up the unique tag number (every mailpiece in the national system is unique for 30 days) in the national database for the barcode information associated with the mailpiece. The BCS will then sort the mailpiece to the correct stacker based on the destination information from the database. The ICS reduces the need to apply LMLM (see below) labels to letters with unreadable POSTNET barcodes.
- <u>Letter Mail Labeling Machine (LMLM)</u> - The LMLM is an integral piece of equipment of the RBCS and allows more mail to remain in the automated mail stream by providing another opportunity to put a clean, readable, barcode or ID tag on the mailpiece. LMLM labels are also applied to mailpieces before processing when machinable, yet too glossy for the barcode and/or ID tag to be applied without smearing. This machine applies a white label to either the front of a letter to provide

a barcode clear zone or to the back of the letter for application of a clean, readable fluorescent ID tag. The machine is also used to cover bad barcodes in order to prevent "loop mail", for example, on return to sender letters. There are 360 LMLMs deployed with an approximate throughput of 20,000 pieces per hour and each is staffed by one clerk.

- <u>Postal Automated Redirection System (PARS)</u> – This program automates the handling of machinable Undeliverable-As-Addressed (UAA) letter mail. It intercepts approximately fifty percent of move-related mail at the originating processing facility and as appropriate either forwards, returns, or wastes the piece, thus eliminating many multiple downstream handlings. Letter automation equipment is retrofitted with hardware in addition to software containing the national change-of-address (NCOA) database which allows the equipment to intercept approximately fifty percent of UAA mail at originating processing facilities as part of the first handling similar to the *FASTforward*[SM] process.[9] The identified UAA mail is discharged into output stackers and their images are sent to an Advanced Forwarding Reader (AFR) which determines the disposition of each UAA mailpiece. If the AFR is unsuccessful in processing the captured image, then the image is transmitted to a Remote Encoding Center (REC) for resolution. Carriers identify the remainder of the PARS-candidate UAA mail in delivery units. For mail that requires additional handling such as forwarding, return, or services associated with ancillary service endorsements, the carrier sends it to mail processing facilities. Both of these streams are processed on a specially modified DBCS, called a Combined Input/Output Subsystem (CIOSS), which lifts images of mailpieces then generates and applies the Postal Service's yellow labels for re-directed mail (e.g., return-to-sender, forwarded). CIOSS also lifts the information needed to provide electronic and hardcopy notifications required for Address Change Service.

The change of address (COA) notification process also changes under the PARS program. A redesigned Change of Address Order (PS Form 3575) is scanned, then

[9] Refer to DMM 507.3.3 for more information concerning *FASTforward*[SM].

analyzed by multiple OCR engines or resolved through REC coding, and the information is uploaded to the NCOA database.

The initial phase of the PARS program, Phase I, covered comprehensive implementation in 49 Postal Processing & Distribution Centers (P&DCs), all of the Postal Service's Remote Encoding Centers (RECs), and the delivery units that they serve. Additionally, CFPS (COA Forms Processing Sub-System) scanners have been deployed into 87 Computerized Forwarding System (CFS) sites and "Key from Paper" terminals have been deployed to all CFS sites to automate COA entries into the national PCOA (PARS Change of Address). CFS units are removing their mechanized letter terminals and some are being consolidated because their automated letter mail workload is being redirected to a nearby processing plant. The Change-of-Address Reporting System (COARS) accompanies PARS. This system archives COA data and enables delivery unit personnel to view electronic images of scanned COAs.

PARS Phase 1 deployment was completed in November 2004. Phase 2 of the program will cover comprehensive implementation for handling letter mail in 233 Postal Processing & Distribution Centers (P&DCs) and the delivery units they serve. Deployment of Phase 2 is underway and is expected to be completed in September 2007.

- Reject Encoding Machine (REM) – The REM will encode letter mail rejected by the OCR/ISS and DBCS/OSS systems and currently being re-handled in manual operations, thereby reducing manual hours and increasing DPS. The REM can also apply a POSTNET or ID Tag label on the envelope; as a result, the mail avoids re-handlings on the Letter Mail Labeling Machine (LMLM). It can also read and process remaining Address Change Service (ACS) mail found in the Return-to-Sender (RTS) stream. Other potential uses of this machine include the processing of Postal Automation Redirection System (PARS) pieces rejected by the Combined Input/Output Sub-system (CIOSS), return-to-sender mail for small non-CIOSS sites, loop mail, missent mail, shiny postcard mail, and bulk mailings with poor read rates. Eleven pre-production machines have been deployed in sites across the country, and it is expected that approximately 110 machines will be deployed by March 2008.

- Distribution Quality Improvement (DQI) – The DQI will further enhance the address recognition technology used in mail automation equipment. The program will resolve to a finer depth of code much of the letter mail that cannot be otherwise fully resolved, resulting in additional volume encoded to delivery points. It will improve RCR acceptance and finalization rates and reduce error rates. Increases in acceptance and finest depth of sort rates will reduce keying workhours required at the REC and manual distribution workhours at the plants and delivery units. Higher RCR encode rates will produce workhour savings in manual distribution and carrier casing. There will be several incremental software releases over the next two years.

3. Processing/Mailflow

The availability of extra sort bins on the DBCS equipment provides the ability to process a significant portion of the letters to the 5-digit ZIP Code level on the incoming primary sort scheme even when the scheme has been established to sort the entire service area of the plant, a service area likely containing multiple 3-digit ZIP Codes. Therefore, a pure 3-digit letter tray versus a multiple 3-digit letter tray can have similar value in terms of the reduction in pieces handlings. Barcoded automation letters presorted to the 5-digit level provide additional value, since these trays bypass the additional upstream handlings prior to incoming secondary distribution.

Non-barcoded presorted letters must first be barcoded on an MLOCR/DIOSS. Due to the relatively small volume of non-barcoded letters at destination, incoming MLOCR/DIOSS sort programs are typically configured to process letter mail for the entire service area of the plant. Therefore, letters already sorted to the 5-digit or in many cases 3-digit level have little or no additional value compared to letters sorted into trays for the entire service area of the plant. In other words, even when non-barcoded letter mail is sorted into 5-digit or single 3-digit letter trays, the mail is typically processed on a plant level sort scheme on the MLOCR/DIOSS.

4. Manual

Volume that is still left in manual letter operations is primarily composed of pieces that are deemed to be nonmachinable on letter automation due to one of several factors. Any letter-size piece is considered nonmachinable if it meets any of the nonmachinable criteria listed in DMM 201.2.0.

These mailpieces are excluded from automated processing for various reasons, but primarily due to the incompatibility with automated processing, which may impede the mail flow or damage the mail or mail processing equipment. Manual letters are considerably more costly to operations (approximately 13 times more labor cost per handling) to process than machinable letters. Pieces over 6 1/8 inches in height, ¼ inch thick, and/or 11½ inches in length are considered a flat or a parcel.

Rejects from automation also end up in the manual operation. Pieces may have been rejected due to an unreadable barcode and ID tag, inadequate customer addressing, or insufficient barcode (e.g., 5- or 9-digit code) for DPS processing. For example, the street directional (North or South) or suffix (St, Rd, Dr) may be missing, yet is required for coding to the delivery point when duplication exists in the address range. As stackers are swept in automated operations, many of these rejects arrive in manual operations close to the clearance time, which is the completion time necessary to meet dispatches. Manual operations are staffed accordingly to meet service commitments.

5. Automation Update

During FY 2005, the total letter mail volume was approximately 154 billion pieces, of which approximately 99 billion were barcoded through automation discounts, or 64.7 percent of all letters. Customer applied barcodes comprised almost 76 percent of the total letter mail barcodes. The remaining 24 percent were applied by the Postal Service. Of the postal applied 9- or 11-digit barcodes, 59.4 percent were applied by the OCR, with the balance resolved remotely.

During this same period, 90 percent of all barcoded incoming secondary letter mail[10] and approximately 23,000 zones were sorted in DPS. This includes Enhanced Carrier Route letters, which are often captured at or backhauled to the plant for DPS processing, negating the benefit of customer destination entry of letters into delivery units**.** This includes Detached Address Labels (DALs), which are also often transported back to the plant for DPS processing in order to eliminate the need to manually case the

[10] This DPS letter volume also represents 79 percent of all incoming secondary letters (barcoded and nonbarcoded).

cards in delivery.[11] Of the total incoming secondary distribution performed on automation, 90 percent was sorted to DPS, 4 percent to sector/segment, and 6 percent to carrier route. Sector/segment operations require two passes to sort to the ZIP+4 and are usually for a “Firm” or post office box program for 9-digit unique holdouts.

To further increase the percentage of letter mail in DPS, enhanced address improvement systems utilize information from our carriers to resolve more incorrect or incomplete addresses. This is particularly beneficial when the address is missing crucial elements (e.g., suite number) in parts of the country with a high concentration of apartment buildings and high rises.

Also, as letter mail piece distribution has become more efficient, the tradeoff between piece sorts and tray handlings has been impacted. When letters are prepared in presort destination trays by customers, piece handlings are saved but an additional tray handling cost will likely be incurred. With more productive piece distribution operations, a reevaluation of the requirements for the preparation of carrier-route letter trays and overflow letter trays containing very few pieces is needed.

6. Description of Future Systems Beyond the Test Year

Ongoing improvements in image recognition technology and equipment modifications will continue to be pursued to increase automated volumes. Beyond the various enhancements and new programs (e.g., PARS) previously discussed, there are only limited opportunities to increase efficiencies within letter mail processing operations through the application of proven technologies.

B. Flat Mail Processing

This portion of my testimony is devoted to piece distribution operations where individual flats are processed. The processing of bundles of flats in opening unit operations is covered later in my testimony, under parcels and bundles.

1. Preparation

Depending on the class of mail, flats destined for piece distribution operations can originate from several different operations. First-Class metered or permit flats that

[11] Cards that are 3.5” x 5” or larger must be at least 0.009” in thickness in order to be successfully processed on automation on a consistent basis.

are prepared in flat tubs by mailers generally can be sent from the platform or BMEU directly to flats sorting operations. Flats obtained through the collection mail stream that subsequently go through the 010 operation are faced, canceled (if necessary), and containerized before they are sent to flats sorting operations. Flats that originate from opening unit[12] operations must also be "prepped" before they can be inducted into piece distribution operations. Depending on where the prepping is performed, it can consist of unloading containers, separating bundles for subsequent operations, removing the packaging material, orienting, and stacking the flats in postal containers or on ledges of distribution equipment. All of the prepping operations are performed manually and are labor-intensive.

Barcoded and non-barcoded flats are "prepped" together in a single operation and are directed to piece distribution operations based on machinability (see "Equipment" section below), mail class, and presort level. All flats sorting equipment is able to process both barcoded and non-barcoded pieces together in the same operation. Most non-carrier route presort flats receive some level of processing on flats sorting equipment.

2. Equipment

There currently are two different types of equipment used in the Postal Service to process flats:

- <u>Upgraded Multi-Position Flats Sorting Machine 1000 (UFSM 1000)</u> - This machine is intended to process the vast majority of flats that are nonmachinable on the AFSM 100 (see below). There are 350 machines deployed, and most have three keying stations, one Optical Character Reader (OCR), and one automatic high-speed flats feeder that sorts to 100 bins. The machine can be operated in keying mode, automatic feed mode, or both simultaneously. There is no on-line video coding for OCR rejects nor does it spray a barcode on the mail piece. The throughput is approximately 5,000 pieces per hour with a staffing index of five in keying mode and 9,000 pieces per hour and a staffing index of three in automatic feed mode. The Flats Recognition Improvement Program (FRIP) enhances the

[12] Opening units are operations within processing facilities where containers of mail are opened and prepared for distribution, or closed and prepared for dispatch.

address recognition technology used on the UFSM 1000, resulting in an improvement in OCR acceptance rates and a reduction in error rates. Three incremental software releases are projected to occur in the next three years. Deployment of secondary address readers for the UFSM 1000s is anticipated in September 2006, while deployment of new cameras is expected in September 2007. There are no plans to purchase additional UFSM 1000s.

- Automated Flats Sorting Machine 100 (AFSM 100) - This machine is the workhorse for flats distribution in processing plants. Currently, there are 534 machines in use. The processing and technological capabilities of this machine are vastly superior to those of the UFSM 1000. The machine has three automatic feeders and can sort to 120 bins. It has both BCR and OCR capability, as well as remote video coding[13] for the OCR rejects. Similar to the UFSM 1000, the AFSM does not spray a POSTNET barcode on a flat mail piece. Throughput of the AFSM 100 is approximately 17,000 pieces per hour and the staffing index is five clerks on the machine. Unlike letter sorting equipment which sorts to bins, all FSMs sort mail directly into flat trays.

There are a number of current and new programs which will increase productivity on the AFSM 100. The Flats Identification Code Sort (FICS) program adds the capability to place a label and print an Identification (ID) Tag on all non-barcoded flat mail that is processed on the machine. This tag is used to sort the mail in subsequent operations. Deployment began in May 2004 and ended in June 2005. Similar to the UFSM 1000, the Flat Recognition Improvement Program (FRIP) will also improve the OCR acceptance rate and reduce the error rate on the AFSM 100.

The Flat Remote Encoding System (FRES) program for the AFSM 100 will be used to improve the efficiency of the video encoding operation being performed at Remote Encoding Centers (RECs). It will increase the "pooling" capabilities for flat

[13] Addresses unreadable by the OCR are resolved at REC keying sites. When the machines were originally deployed, the images were keyed at on-site video terminals, but this responsibility has been shifted to the RECs due to increased keying efficiency.

video coding personnel by providing load balancing of coding requirements at each REC. FRES will increase the number of AFSM 100 machines for which each REC keying workstation can process images at any one time from 10 to 99. The resulting primary benefit from this program will be a reduction in the number of flat keyers needed as each keying terminal will be able to see images from a much larger number of AFSM 100 machines. FRES deployment began in November 2005 and is expected to end in July 2006.

In addition to current enhancements to the AFSM 100, there are a number of new programs to increase the efficiency of flat mail processing:

- Automatic Induction Systems for the AFSM 100 - The Automatic Induction (AI) System consists of three main components – a flat mail preparation system, an Automation Compatible Tray (ACT) transport system and automatic feeders. This program will improve the flat mail preparation operation by relocating the current preparation operation and by replacing the arrangement of flat mail carts and other containers with a state-of-the-art preparation and transport system. The tray transport system will provide for controlled flow of full ACTs from preparation workstations to AFSM 100 feeding stations. The automatic feeders will remove the front panel of the ACT, slide it forward against the existing stack of flats, and slip the ACT out from under the mail while maintaining forward pressure on the new, larger stack of flats. The flats will be automatically fed into the AFSM 100 feeding module with minimal operator assistance required. This initiative will reduce the clerks needed to feed the machines from three down to one, with two to five mailhandlers needed to prep the mail, a slight increase in the prepping hours.

  Phase 1 deployment began in October 2005 and will end in August 2006. During Phase 1, AI systems will be added to 210 (206 operational systems plus 4 training systems) Automatic Flat Sorting Machines (AFSM) 100s. Under the Phase 2 effort, Automatic Induction (AI) systems will be purchased and added to approximately 145 additional Automatic Flat Sorting Machine (AFSM) 100s. Thus, it is anticipated that a total of 351 operational AFSM 100s will be retrofitted with the AI system. Deployment of Phase 2 is anticipated to begin in January 2007 and end in August 2007.

- Automatic Tray Handling Systems (ATHS) for the AFSM 100 - The ATHS will increase the machine's automation capabilities and reduce the labor required to operate the machine. It will replace the tray take-away conveyors on the original AFSM 100 with more elaborate fixed mechanization. The ATHS will replace the transport belts with powered rollers, add Automatic Tray Destackers and label printer/applicators, and replace the existing 'bin full' paddles with photo sensors to improve the consistency of the volume of flats discharged into each flat tray. Each ATHS will automatically eject full trays onto the transport conveyor and produce a properly labeled empty tray to replace the one just dispatched. When the run is completed, the ATHS will systematically dispatch all of the required trays and label and insert a new set of trays for the next sort plan. Phase I deployment began in June 2005 and is expected to be completed in June 2006. During this phase, ATHS will be added to 350 operational AFSM 100s and 4 training machines. Phase II of this program is expected to add ATHS to approximately 50 additional AFSM 100 machines. The ATHS will reduce the AFSM 100 operation staffing requirement from five employees to four by eliminating one sweeper position. It will improve the utilization of flat mail trays by reducing misorientation of mail pieces dropping into the trays and ensuring that trays are more uniformly filled to the optimal level.
- Automatic Flats Tray Lidders (AFTLs) - This program has deployed Automatic Flats Tray Lidders (AFTLs) for use in dispatch operations nationwide. A total of 120 AFTLs have been deployed including one training system. The AFTL is a self-contained mechanized system that will be installed either in-line or as a standalone device. It eliminates the need to manually put lids on flat trays during dispatch operations, significantly reducing labor requirements associated with the current operation. With an AFTL, flats trays ready for dispatch can be fed manually (standalone) or automatically from a tray line (in-line). The AFTL design includes a staging section where at least 400 flats tray lids can be stored. The machine accesses a stack of flats tray lids from the staging section, picks a lid, folds two flaps, and inserts the lid into the tray. The tray is automatically passed onto the next processing operation for banding and/or airline assignment. In-line installations can be fed and swept automatically, and require about 15 minutes of

manual labor per hour to restock lids. Deployment was completed in September 2004.

- Postal Automation Redirection System (PARS) for Flats – The Postal Automated Redirection System (PARS) for Flats will handle Undeliverable-As-Addressed (UAA) flat mail more efficiently than today's process. UAA mail will be intercepted earlier in the sorting process resulting in a reduction in total handlings. This phase will cover comprehensive implementation of PARS for flats at all processing plants that handle flat mail and the delivery units they serve. Deployment of PARS for flats is projected to begin in February 2008 and be completed in September 2010.
- Flats Sequencing System (FSS) – The FSS will be used to walk sequence flat mail pieces for delivery within a single or multiple 5-digit delivery zones. The production machine is expected to have 360 sortation bins and flat mail will be passed through it twice, resulting in flats in walk sequence for each carrier. For the portion of flats that can be processed on FSS, manual carrier casing and pull-down activities at the carrier's case will no longer be necessary. Deployment is expected to begin in April 2008 contingent upon successful testing and board approval.

3. Processing/Mailflow

Most flats that require piece distribution are machinable on the AFSM 100, and as a result, field sites flow flats to that machine first. The BCR/OCR scans the mailpiece in search of a barcode/address block/ID tag. If a POSTNET barcode or ID tag is found, the piece is sorted based on the information read by the BCR or stored in an ICS database. If a barcode or ID tag is not found or cannot be read, the OCR looks for the delivery address and the piece is subsequently ID tagged and sorted based on the information returned by the OCR. Flats that contain extraneous information, thereby interfering with OCR address recognition, or addresses that cannot be read by the OCR, have their images keyed on-line, sent to the UFSM 1000 for mechanized keying, or to manual operations.

The AFSM 100 sort plans often process multiple ZIP Codes concurrently based on the number of sort bins required for each ZIP Code. For example, an incoming primary sort plan can process multiple 3-digit ZIPs within the plant's service area. In recognition of this fact, starting in January 2005 mailers were able to prepare AFSM

100-compatible flat mail pieces from multiple 3-digit ZIP Codes into 3-digit scheme bundles in accordance with a new DMM labeling list (L008) in lieu of preparing the pieces in separate 3-digit bundles. This list is similar to the existing list (L007) that allows multiple 5-digit ZIPs to be prepared in scheme bundles that match the incoming secondary sort plans, thus collapsing pieces into fewer bundles. The L008 labeling list was implemented in January 2005 and became required for certain preparation in April 2005. The new scheme further reduces the bundle sorting and prepping requirements associated with flat mail.

A portion of the flats that are non-machinable on the AFSM 100 are diverted to the UFSM 1000. Although the UFSM 1000 is able to process a wider variety of flats and has reduced the volume processed in manual operations, it is not intended to process parcels. The pieces processed on the UFSM 1000 in today's operating environment have many of the same characteristics as those processed on the AFSM 100s, but the flats can be thicker and/or heavier. In plants with both AFSM 100s and UFSM 1000s, the UFSM 1000s are often utilized as an additional piece of flat sorting equipment, with unique responsibilities in terms of the schemes processed on the machine. UFSM 1000s are being relocated to smaller plants that do not have AFSM 100 equipment.

4. Manual

Flats that remain in manual operations at the plant today are pieces that do not meet the processing specifications for the AFSM 100s or UFSM 1000s or rejects off of this equipment. Examples of these types of flats include rolls, lightweight pieces, thick/heavy flats, pieces that are not uniform in thickness, and pieces with insufficient addressing. The amount of manual volume also depends on the equipment set at any given facility and the schemes processed on each type of equipment. Occasionally, when flats sorting equipment is at full capacity some flat mail must be processed in manual operations in order to ensure that service standards are met. More commonly, small volumes of flats for a particular destination are processed manually when the volume is insufficient to justify the fixed costs of setting-up and sweeping a scheme for such a small volume. Manual flats are considerably more costly to operations (approximately 3 times more labor cost per handling) to process than machinable flats.

Very few delivery units have an FSM, so the vast majority of the incoming secondary processing at the delivery units is manual. Very little manual incoming secondary distribution takes place at plants. Within the last five years, this distribution has been decentralized from the plants and moved to the delivery units for all shapes of mail.

Rigid flats do not process well on the AFSM 100. Even at plants that still have UFSM 1000s that could process such pieces, rigid flats are commonly processed manually or on mechanized or automated bundle/parcel sorting equipment. These items are then sorted manually in an incoming secondary sorting operation at the delivery unit. As witness Coombs (USPS-T-44) describes, carriers would otherwise incur additional time to remove rigid flats and carry these items as parcels because otherwise the rigid pieces would destabilize their flats bundle and may not fit into smaller mail receptacles. Generally, carriers cannot even case rigid flats beyond a modest size.

Also, extremely small and large flats are problematic in processing even though they may fall within the physical limitations of the UFSM 1000s. These would be pieces less than 5” x 6” or larger than 12” x 15” x ¾”. Such pieces can cause jams or feeder problems when mixed with flats of varying sizes, particularly on the AFSM 100, and they do not stack well in the output tubs. Small and large flats can also create problems in delivery, as these pieces can also destabilize the carrier’s flats bundle. Therefore, small, large, thick, and rigid flat-shaped mail pieces are unlikely to be processed in an automated flat mail stream.

Over the next six months, particular attention will be paid to decreasing processing costs associated with flat mail, particularly Periodicals. The outgoing processing and distribution of flat mail pieces prepared in new mixed (residual) bundles and sacks will be performed at the origin processing facility along with First-Class Mail for destinations served by surface transportation. This allows the mixed bundles and sacks to be processed in existing outgoing distribution operations and utilize existing surface transportation networks. Also, any automation compatible Periodicals volume currently processed in a manual incoming secondary operation will be moved to an automated processing operation to the greatest extent possible when the processing window exists. Periodicals, particularly weekly and daily publications, are processed in some cases manually in order to avoid service failure.

5. Automation/Mechanization Update

In FY 2005, 59 percent of flat mail incoming secondary (non carrier-route presort) volume was processed in the plants, and 93 percent of this volume was finalized on automated operations. At the same time, the percent of total flats workload in plants was 82 percent on the AFSM 100, 10 percent on the UFSM 1000, 8 percent in manual sortation. Currently, incoming secondary distribution is performed on automation/mechanization for 12,160 zones.

Overall, deployments of the current and future programs to enhance flats processing have resulted and will continue to result in positive improvements for processing operations.

6. Description of Future System Beyond the Test Year

With the deployments of the AFSM 100 and the UFSM 1000 complete, new methods to distribute and deliver flats are being researched and developed to ensure that current methods are continually improved. The value of DPS flats is still being reviewed and explored. While the specifics are yet to be fully resolved, it is envisioned that the Postal Service could likely proceed with sequencing flats in the near future using a piece of technology that will incorporate an automated two-pass process for sorting the flats in delivery sequence order.

It is expected that the sequencing equipment will be able to accommodate much of the volume currently processed on the AFSM 100s and UFSM 1000s, however, certain mail pieces (e.g., items prepared in rigid containers) are not likely to be processed into delivery point sequence since doing so would create unstable flats bundles for the carriers. Testing is being conducted at the Indianapolis, IN mail processing annex using a prototype piece of equipment, and it is expected that by early next calendar year further sequencing will be performed using a pre-production machine.

Three significant changes for mailers are expected if and when the Postal Service moves toward a DPS environment for flats. First, all flats that claim the barcode discount will be required to bear an 11-digit barcode, similar to letters, in order to sort to delivery point. Second, more restrictive addressing standards are likely to be placed on discounted flat mail. For the opportunities of flats sequencing to be fully realized, the flats must be taken directly to the street with little or no manipulation. To facilitate effective delivery on the street, the addresses must be aligned and visible to the carriers. Since the flat mail pieces will likely require consistent feeding into the equipment in relation to the bound edge, the address must be placed in relation to the bound edge to ensure proper orientation when the flats are presented to the carriers. Third, with the possible exception of saturation Enhanced Carrier Route (ECR) mail, carrier route presorted bundles will not have value for DPS zones, with 5-digit or 5-digit scheme presort being the finest sort required, similar to the situation with letters. Larger scheme bundles or stacks of flats prepared on pallets for one or multiple sort plans could likely be a more appropriate preparation for flats in a sequencing environment. This could reduce the bundle sorting requirements and minimize the bundle securing methods in place today. Emphasis will also be placed on mail piece machinability and the appropriate entry requirements to maximize the candidate flat volume for DPS. As flats are shifted to a fully-automated sequenced environment, there will increasing importance for non-letter mail to be processed and delivered entirely within the flat mail stream. The Postal Service intends to continue working with the mailing industry on these issues, providing ample time for mailers to make any needed changes in the future.

C. Parcels, Bundles, Sacks, and Trays

In this part of my testimony, I provide an overview of operations as they relate to the processing of parcels, bundles, sacks, and trays today and in the test year.

1. Parcel Processing

Standard Mail and Package Services parcels are predominantly processed within the bulk mail network consisting of 21 Bulk Mail Centers (BMCs) and seven Auxiliary Service Facilities (ASFs)[14]. Priority Mail and First-Class Mail parcels are predominantly

[14] The Buffalo, NY ASF does not sort Destination Bulk Mail Center (DBMC) Standard Mail and Package Services parcels. The parcels for this service are processed at the Pittsburgh, PA BMC.

processed in processing and distribution centers and Logistics and Distribution Centers (L&DCs).

a. Equipment

Apart from the recent enhancements described below, machinable parcels have been processed in the BMCs with the same basic equipment for approximately 30 years. ASFs are not similarly equipped. Non-machinable outside parcels (NMOs) are either sorted manually or with the use of mechanized sorting equipment at several BMCs depending on the non-machinability characteristics of the parcel.
This equipment ranges from basic rolling conveyors to more elaborate keying and sorting machines. Priority and First-Class Mail parcels are processed either manually or using parcel and bundle sorting equipment (see the Bundle Processing section that follows).

- Parcel Sorter Machines (PSM) are fed by mechanized conveyors which feed parcels onto slides. Parcels are then manually separated and inducted into a tilt tray sorter. Parcel barcodes enhance the sortation of machinable parcels and reduce manual keying requirements for greater efficiencies and increased productivity. If a barcode does not exist on the parcel, the ZIP Code information is read by the operator, manually keyed, and a 5-digit barcode label is applied to the parcel for subsequent handlings. The NJ and Chicago BMCs have received the Top OCR upgrade which replaces the current Package Bar Code Sorting System (PBCS) and provides single sided OCR capability. These two BMCs do not have SSIU technology (see below) and will not receive the SSIU-OCR upgrade.
- The Singulate, Scan, Induction Unit (SSIU) – This equipment has been deployed to 19 of 21 BMCs. The SSIUs, two per BMC, improve the singulation process and automate induction of barcoded parcels onto the sortation equipment (i.e., secondary parcel sorter). The device allows parcels to be sent, one at a time, through a dimensioning unit, a weigh-in-motion scale, and through a scanning tunnel that reads the package barcode. Packages are then automatically inducted

onto the sorter. This greatly reduces the need for High Speed Induction Units (HSIUs)[15] and the clerks who operate them.

The Singulate, Scan, Induction Unit (SSIU) Optical Character Reader (OCR) program will add OCRs to 38 SSIUs. This purchase includes two units deployed to each of 19 small or medium Bulk Mail Centers (BMCs). It will reduce parcel processing costs by decreasing the manual keying of ZIP Code information on non-barcoded parcels. Deployment is expected to begin in October 2006 and be completed in June 2007.

b. Mailflow

Non-presort or non-dropshipped parcels entered into the mailstream are transported to the origin BMC either directly from retail/delivery unit or more commonly consolidated through the plants. The origin BMC sorts the machinable parcels on the primary PSM which sorts parcels to the high-volume 5-digit destinations within the BMC service area as well as to each destination BMC. Parcels for the lower-density destinations within the BMC service area are sorted from the primary PSM directly to the secondary PSM, which sorts parcels to 5-digit destinations for a total of approximately 2,000 separations. The 5-digit containers of machinable parcels are transported to the delivery units either directly from the BMCs on occasion or, more commonly, transferred through a plant.

NMO parcels are processed to the 3-digit level in the BMCs for their service area and transferred to the plants[16]. Plants then process the NMOs received from the BMCs to the 5-digit level. This operation is performed manually and requires regular set-up (gathering of rolling stock and placarding containers) and breakdown, regardless of the volume processed.[17]

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[15] HSIU equipment is still in use at the two BMCs that did not receive SSIUs.
[16] In limited instances, NMOs can also be sorted to the 5-digit level in the BMCs for high-volume zones.
[17] Another example of fixed costs that cause workhours to vary less than volume.

Parcels presorted to BMC level and drop shipped at the destination BMC are processed on PSMs to the 5-digit level. Many BMCs induct these parcels directly into the secondary PSM based on the preparation of the parcels and BMC configuration. Parcels presorted to 5-digits and drop shipped at an SCF are cross-docked to delivery units. For the most part, parcels are sorted to carrier route at the delivery unit regardless of class.

Priority Mail pieces are processed at plants using manual, mechanized, or automated distribution (see SPBS and APPS in the following section). Within certain regions of the country, the outgoing and incoming Priority Mail processing is consolidated at a regional distribution facility making extensive use of mechanized and automated sorting equipment. These facilities were previously called Priority Mail Processing Center (PMPCs), but have now been converted to Logistics and Distribution Centers (L&DCs). With this conversion, the facilities have taken on additional processing responsibilities and no longer have just one primary responsibility. These facilities have also assumed pallet, tray, and bundle sorting responsibilities in addition to Priority Mail (parcel and flat) piece distribution.

In general, operations will expand the utilization of parcel barcodes as additional equipment is deployed that can read and sort via the barcode (e.g., APPS) and more volume is shifted to these machines. In addition to the enhanced readability and productivity savings associated with barcode sorting, unique barcodes can also provide diagnostic information for use in service performance improvement and, I have been told, will enhance our ability to streamline the acceptance function in the near future. For these reasons, barcode placement on a significant majority of our parcel volume is of increased importance.

2. Bundle Processing

Flat mail bundles that arrive at a mail processing plant in sacks, on pallets, or in flat trays, are often sorted before they are dispatched or opened for piece distribution. When pallets and sacks contain bundles made up to finer sortation levels than the container, a bundle sort is required. This is accomplished in a manual, mechanized, or automated operation. Bundles are usually sorted into rolling containers.

Bundle integrity can have a significant impact on the productivity of any bundle sorting operation. If and when a bundle breaks prematurely, the value of the bundle presort can be partially or completely lost, and the bundle may require distribution in a residual distribution operation. Also, productivity can suffer when, for example, a mailhandler attempts to capture and repair a ruptured bundle within the bundle sorting operation. Any improvements to bundle integrity either through customer mail preparation, changes in mailing standards, or more rigid mail acceptance procedures will reap significant savings within mail processing.

a. Equipment

- Small Parcel and Bundle Sorter (SPBS) - The SPBS is deployed with four, five, or six induction stations, and requires a staffing of no more than three people per induction station. The SPBS can sort to 100 separations. However, some sites have added either 16 or 32 additional bins to these machines. There are currently 335 machines deployed in the field. The average throughput of the SPBS is between 678 and 945 pieces per hour per induction station. The majority of plants and 19 of the 21 BMCs have SPBSs. Many of the SPBS have been modified to include a specially designed feed system which consolidates all the induction lines into a centralized network capable of transferring mail from all types of mail containers and transporting the contents on mechanized conveyors to all the induction/keying consoles. There are currently 272 feed systems deployed in the field. With the SPBS Feed System, a staffing reduction equivalent to 0.5 to 3 people per crew can be realized, depending on the number of induction stations.
- Automated Package Processing System (APPS) – The APPS is the next generation machine for sorting parcels and bundles of mail. Depending on the configuration, a single APPS can replace up to two SPBS machines. The APPS further automates package processing by providing greater processing capacity through automatic package induction, singulation and address recognition. It utilizes a carousel-type cross belt sorter subsystem capable of processing 9,500 pieces per hour and providing a sustained high-speed throughput. The APPS has the ability to process pieces of a lighter weight that the PSMs, in many cases pieces even below two

ounces, providing the ability to automate many of the otherwise smaller, nonmachinable items.

Some of the unique features of the APPS include a Feed Subsystem that handles pallet unloaders, All Purpose Container Unloaders, or bulk loads from other standard containers. The Singulation Subsystem de-stacks the packages/bundles and aligns the items into a single file. The Data Collection Subsystem collects detailed information about each package such as package type, size, and weight. Using the state-of-the-art Optical Character Reader / Barcode Reader (OCR/BCR), the APPS Address Recognition Subsystem, consisting of a multi-sided image capture unit, lifts images of the mail pieces (four-sided imaging) for further processing. Recorded images are presented to the OCR/BCR to determine the correct destination ZIP Code and the type of package. If unsuccessful, the images are then transmitted to an on-line Video Coding System (VCS) in one of four RECs, where images will be keyed remotely. The most efficient means of sorting is via an accurate and readable barcode, since the presence of a barcode increases the accept rate and decreases the dependence on the less productive VCS keying.

The APPS program will deploy 76 machines (74 operational and 2 training) designed to replace the older, labor-intensive SPBS in larger offices. At most of the sites receiving an APPS, the SPBS at that site will be redeployed to another location. Each new APPS will be deployed with either one or two feed systems and will have 100, 150, or 200 sort bins. Deployment is underway and is expected to be completed in August 2006. The Phase 2 potential purchase is expected to be for approximately 20 machines which will be deployed in 2007.

- <u>Linear Integrated Parcel Sorters (LIPS)</u> - The LIPS machine is not part of a national program and is procured locally. The configuration and performance vary based on the vendor, but the basic design consists of a feed station where mailpieces or bundles are keyed and sent down a rolling conveyor for deposit into rolling containers or pallet boxes.

b. Mailflow

Bundles, or packages of flats, are processed in both BMCs (Standard Mail and Package Services) and mail processing plants (all classes). Mixed-ADC bundles are transported to the origin plant to be opened for piece distribution to the ADC network. Destination BMCs and ADC plants sort bundles primarily to 3-digit and SCF separations. Plants subsequently sort 3-digit and SCF containers for either piece distribution or a bundle sort depending on the presort level of the bundle. Other separations, in addition to separations based solely on the presort level, may be performed at the plants on bundles for various operational reasons. For example, machinable volumes may be separated from non-machinable volumes.

Until recently, the SPBS has been the equipment of choice for these bundle-sorting operations, but the Postal Service is undergoing a shift to a greater dependency on the more productive APPS machine. The remaining sortation of bundles is performed with LIPS equipment or in manual operations. Manual distribution involves either dumping the bundles on a conveyor belt and sorting to containers, or sorting the bundles into containers directly from the pallet.

Mechanized and manual bundle distributions require manual labor for operational set-up and breakdown. This involves the collection and placement of containers and placards for set-up. Also, at the time of dispatch, containers are closed and moved to the dock to meet transportation. No matter the volume received during a specific operating window, set-up and breakdown are fairly fixed.[18]

3. Sack Processing

The Postal Service is aggressively exploring options for postal and customer preparation of bundles and parcels in order to reduce the dependency on sacks. One option is to maximize the amount of mail prepared on destination pallets by optimizing the presort rules and adjusting the pallet preparation minimums. Multiple options have been made available to customers over the last 12 months that shift mail from sacks to pallets. Also, options will be investigated that allow the entry of smaller, local mailings at destination facilities in alternate containers or possibly by unloading the bundles straight into a container (e.g., rolling stock, pallet box) provided by the plant. Finally, non-sack alternatives for the preparation of origin entered sacks will be explored (e.g., further use of tubs, origin mixed pallets). Based on the cost associated with sorting,

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[18] This is one reason why workhours fluctuate less than volume in these operations.

transporting, and dumping sacks, as well as the impact to the contents (e.g., bundle breakage) any decrease in sack utilization is expected to produce significant benefits.

a. Equipment

- Sack Sorting Machine (SSM) - Sacks are sorted in BMCs on the SSM to the BMC network for origin sacks and, for intra-BMC volume, to the 3-digit/SCF level. Keying or automated reading of the barcoded label occurs at the induction station, while the clerk places the sack into a bucket that inducts it onto the tilt tray system. In limited instances, plants utilize mechanized sack sorters to process sacks from the 3-digit/SCF level to incoming primary piece distribution operations and to 5-digit direct containers. Efforts are being made to remove many of the sack sorters in use today due to the low productivity, high maintenance cost, and a decrease in sack volume. Most of the sack sorters in plants have already been removed. Removal of BMC sack sorters is underway and will continue in the near future. As the success of the reduction in sacks effort is realized, sack sorters will continue to be decommissioned.

b. Mailflow

Sacks arrive at plants and BMCs from customers and other plants and may be containerized or bedloaded in vehicles. Containers are unloaded with either pallet handling equipment or, if wheeled, with manual labor. Containerized loads are much more efficient for unloading than bedloads. Bedloaded sacks are unloaded manually and, in some cases, the unloading is accomplished with the assistance of mechanized conveyors. Bedloads can maximize transportation cube utilization, yet are labor intensive and time consuming to unload.

Intra-BMC sacks are transported to the plants for opening or, in the case of carrier-route and some 5-digit sacks, further sortation to downstream facilities. Mechanized sack dumping equipment assists with emptying sacks of parcels into the parcel sorter system in the BMCs. Sack sortation is performed in plants, in a few cases with mechanized sack sorters, but primarily with manual labor. Sacks are opened in the plants and delivery units with manual labor.

The costs associated with processing sacks are largely unaffected by the number of pieces in the sack. When a customer chooses to optionally prepare a sack with fewer than the minimum number of pieces for that presort level as opposed to consolidating the flats in a higher-level sack, additional costs result from the required processing, transporting, and opening of the additional sacks. Customers are often motivated to prepare these sacks for service reasons. A decision has been made to eliminate the option to prepare sacks with fewer than the minimum number of pieces in order to produce the significant savings associated with the consequent reduction in sacks. Standard procedures will be reemphasized with plant personnel to mitigate any negative impact on service as a result of this change.

4. Tray Processing

a. Equipment

- Low Cost Tray Sorter **–** LCTS is being deployed to support material handling operations in our plants, Bulk Mail Centers (BMCs), and Air Mail Centers (AMCs). They are being deployed in inbound tray sorting operations and outbound dispatch operations and are allowing us to reduce material handling workhours required for those operations. The machines sort letter trays and flat tubs using roller conveyors to runouts (e.g., 3-digit destination), where the trays/tubs are then placed onto pallets or into containers. The cost of LCTS varies depending on configuration and the ability to scan barcodes on tray labels and/or dispatch and routing tags.
- Tray Management System (TMS) - TMS uses tray identification, transport, storage, and process control technologies to automate the movement and staging of trayed letter and flat mail between most sortation operations. TMS is assembled from a family of common components that can be easily reconfigured. TMS is currently in use in 29 plants throughout the country. There are no further plans for additional systems at this time.
- Integrated Dispatch & Receipt (IDR) Program - The IDR will automate, streamline, and organize mail dispatch and receipt functions, allowing continuous flow and minimizing or eliminating manual handling between operations at 229 mail processing facilities. Each IDR will be a unique, site-specific combination of up to 10 different equipment types. Seven of these 10 machines have been successfully

deployed in prior efforts while three are new and will be deployed for the first time under this program. A variety of equipment, such as Automatic Tray Sleevers (ATS), Enhanced Airline Assignment (EAA) systems, and Robotic Containerization Systems (RCS), are being deployed under this program. Fifty-three new Gantry style robots will be purchased under the IDR program by March 2007 in addition to the 114 existing systems. The mix of equipment to be deployed was determined on a site-by-site basis as dictated by each site's dispatch requirements. Deployment began in November 2004 and is expected to be completed in September 2006.

The ATS equipment automatically sleeves all letter trays used in postal operations. The EAA system automatically processes sleeved and strapped letter trays or flat tubs for integration into a facility's tray dispatch line. The RCS is a self-contained module that can be integrated into a site's existing source conveyor system. RCS automatically sorts and loads trays/tubs into a mail container or onto a pallet for dispatch. Tray systems will also be deployed to connect IDR machines to each other and to mail processing equipment, as appropriate. Receipt and Dispatch Unloaders are being developed which will automate the unloading of trays from mail transport equipment, thus improving the efficiency of platform operations. This program will develop one or two standard machines which will unload trays/tubs from either rolling stock or pallets. The Receipt and Dispatch Unloaders will complement the equipment currently being deployed under the IDR program.

b. Mailflow

Standard Mail letter trays are no longer sorted in the BMCs using the SSMs due to the low productivity and the impact on the trays associated with this method of sortation (e.g., lost tray labels). Origin trays are sorted to the BMC network and intra-BMC trays are sorted to the 3-digit/SCF level now using either Low-Cost Tray Sorters or other mechanized equipment that in certain cases is also used to sort NMOs. In the plants, trays are sorted manually, with the assistance of the tray handling equipment described above, or by TMS. Trays sorted at origin are either transported to the Airport Mail Center (First-Class Mail only), sorted to the appropriate containers for dispatch to surface transportation, or flowed to the appropriate piece distribution operation. Destination trays are sorted and flowed to the appropriate piece operation, dispatched to a downstream distribution facility, or dispatched directly to a delivery unit (e.g., CSBCS and manual sites). Mixed ADC/AADC trays are sent to a nearby plant for outgoing piece distribution.

5. Description of Future System Beyond the Test Year

The Postal Service continues to evaluate new technologies that have the potential to process a wide range of products at higher throughputs and sort into separations with varying configurations. In the near term, the Postal Service will continue to explore enhancements to existing parcel, bundle, sack, and tray sorting equipment with the goal of reducing labor and improving equipment reliability.

D. Allied Operations

In addition to the distribution of individual mailpieces as described above, there are operations, termed “Allied Operations”, which handle mail in bulk. These include platform, opening units, cancellation, flat mail preparation, and pouching. The automation of distribution operations places a premium on consistency and dependability in the allied operations that provide mail for piece distribution. New support systems for the AFSM 100 are described above and include the Automatic Induction System (AI), Automatic Tray Handling System (ATHS), Automatic Flat Tray Lidders (AFTLs), and the Integrated Dispatch and Routing System (IDR), which also handles letter trays. All of these systems automate a portion of the allied workload and increase the consistency and dependability of these operations. The return on these new systems can only improve as the characteristics of the mail improve. For example, poorly prepared bundles that disintegrate and cause jams when handled by the new Automated Package Processing System (APPS) cause a much greater loss in productivity compared to manual or mechanized handling. We have published suggestions on how to prepare bundles to reduce breakage and are working with individual mailers to improve their bundles. Not only are pallets of bundles more cost-effective to handle than sacks, but there is less damage to bundles on pallets according to an MTAC study (USPS-LR-I-297/R2000-1).

E. The Breakthrough Productivity Initiative (BPI) in Mail Processing

In FY 1999, efforts were underway to develop and establish a mechanism that would fairly measure the performance for plant and delivery Operations. From this effort the Breakthrough Productivity Initiative (BPI) was developed and implemented.

BPI for Operations (Mail Processing, Customer Service and Delivery Services) is a tool that is used to measure production efficiency. This is accomplished by collecting data (volume and actual hours) by processing category type, (e.g., automation or manual, office or street delivery).

The Performance Achievement measure is the computed value that corresponds to the production efficiency for a unique operation and is represented as a percent value, 0% to 100%, with 100% representing the highest. The Performance Achievement Percent is computed as follows:

- Total Mail Volume by unique category - Actual
- Total Work Hours by unique category - Actual
- Predefined Target Productivity – Computed yearly based on actual productivity by category
- Earned Hours – Computed value based on Total Mail Volume divided by Predefined Target Productivity
- Opportunity Hours – Computed value based on Total Work Hours minus Earned Hours

Although opportunity hours are calculated for each type of operation, it is unlikely that field initiatives will result in the same percentage reduction in opportunity hours for each type of operation. Since savings estimates are more predictable for larger groups of operations, BPI savings are assumed distributed to each of the following groups in direct proportion to the opportunity hours in each group.

- Letter Distribution such as the Delivery Barcode Sorter (DBCS) and manual casing.
- Flats Distribution such as the Advanced Flats Sorting Machine 100 (AFSM 100) and manual casing.
- Bulk Mail Centers.
- Manual Priority and Parcels.

- Other Mechanized operations such as the Small Parcel and Bundle Sorter (SPBS) and the Tray Sorter.
- Allied operations such as the Platform and Opening Units.

F. Future Network Considerations

As trends in mail volume alter the product mix, the Postal Service continues to explore options to modify the processing and transportation networks to realize greater efficiencies and extract savings when and where possible. When considering the necessary nodes within the network and the processing responsibilities of those nodes, this evolutionary process will take into consideration both service standards and our ability to make the capital commitments. Objectives include shifting much of the allied activities (e.g., bundle sorting, parcel distribution, container breakdown) to Regional Distribution Centers (RDCs) when efficiencies can be realized and consolidating outgoing and incoming piece distribution operations into a more shape-based processing environment.

As part of the effort to implement a network of RDCs, the BMCs will be retrofitted to serve in this capacity. In addition to removing the sack sorters, many of the Primary PSMs will be removed freeing space for the installation of one or more APPS machines. In addition, a family of equipment will be deployed to distribute letter trays, flat tubs, sacks, and NMOs at all RDCs. Together, this equipment will enable efficient allied operations for the activities targeted for consolidation into this network.

For more information about the network realignment and facility consolidations, refer to the testimonies of Witness Shah (USPS-T-1) and Witness Williams (USPS-T-2) in Docket No. N2006-1. Network realignment is another process for achieving current and future BPI savings goals as discussed in Section E above.

III. Volume and Workhours in Mail Processing

The response of mail processing workhours to changes in volume is important for field budgeting. When the volume forecast indicates a change, we expect a less than proportionate impact on mail processing workhours. Precisely how much less depends on the specific operations where the change is expected. In Docket No. R97-1 Dr.

Bradley (USPS-T-14) used mathematical models to estimate the proportionality factor, called "volume variability", for various groups of operations (e.g., DBCS) called "cost pools". Beginning in that docket, Operations witnesses have gone to considerable lengths to explain the operational realities that result in volume variabilities well below 100 percent. In Docket No. R97-1, Mr. Moden (USPS-T-4) explained the Management Operating Data System (MODS), which is the fundamental data system for control of mail processing operations in the Postal system and the source of data for volume variability models. He also explained in general terms why volume variability differs among operations. In the same docket, Mr. Steele (USPS-RT-8) described the management incentives and activities that drive staffing to the minimum consistent with good service. Although the incentive systems have been modified several times in the last eight years, the cost reductions and record service levels in recent years demonstrate that the drive to minimize cost while maximizing service has only intensified.

In Docket No. R2000-1, Ms. Kingsley (USPS-T-10) explained the planning and analysis system that results in the actual staffing levels in each plant. She also described why the Postal Service prefers centralized distribution. Costs can be minimized by centralizing distribution within the largest delivery area that can be reliably served from a single plant. In Docket No. R2001-1 she (USPS-T-39) explained how the network of plants, post offices, carrier routes, etc., that must be served by the centralized plant define a major part of the plant's workload by determining the sort schemes that must be run every day. As she observes, even if volume declines, perhaps due to a rate increase, all of the sort schemes must still be run. This results in what she calls the "schemes effect". This effect is, in my judgment, a major reason why workhours commonly vary less than volume, measured quarter-to-quarter, in individual mail processing operations.

Ms. Kingsley used automated sorting operations at two local plants to illustrate her point. At these two plants the sort plan or "scheme" must be changed, collectively, 129 times each day on the 12 Flat Sorting Machines (FSM) and 226 times per day on the 49 (Letter) Barcode Sorters (BCS). This multitude of daily sort schemes -- 10.7 per FSM and 4.6 per BCS -- is required to distribute mail to other postal plants and, most especially, to all the delivery points in the plant's local service area. For example, to "set-up" a sorting machine to, say, separate Alexandria mail into all of the 5-digit ZIPs in Alexandria, the data file that associates ZIP Codes with output bins (i.e., the scheme or sort-program) must be input to the sorting machine computer. Trays to receive mail from each bin must be labeled with the ZIP Code corresponding to each bin. When the "run" of mail for Alexandria has been separated by ZIP, then the bins must be emptied (i.e., "swept") so that Alexandria mail will not be mixed with mail for the next scheme which might, say, sort Arlington mail. If there were more or less Alexandria mail, the Alexandria run would be longer or shorter, but the time for set-up and sweep would remain the same.

Out of the hundreds of schemes run each day, a few very large schemes (e.g., the initial outgoing and incoming schemes, i.e., the "primaries") may be run on multiple sorters due to time constraints. But for the vast majority of schemes, this is neither necessary nor desirable. If time did not allow for sorting, say, all the Alexandria letter mail, then Standard Mail letters would be held for later processing. Indeed, in the final sort for most letter mail -- when the mail is arranged in delivery sequence -- we are unable to split a run among machines even if there was a desire to do so, since there would be no practical means to merge the results. This contrasts with the erroneous idea, expressed in the Docket No. R2005-1 Opinion and Recommended Decision, paragraphs I-124 and I-125, that additional mail would result in additional runs in direct proportion to the additional mail or, alternatively, result in running mail continuously without bothering to change the sort scheme. As this example demonstrates, the nature and purpose of a sort run is much more mundane and not susceptible to the abstract alternatives proposed in the referenced paragraphs. Absent other factors, volume variability in an automated distribution operation that involves significant set-up incident to scheme changes must be less than 100 percent.

The redesigned In-Office Cost System (IOCS) provides additional information on the time spent waiting for mail and changing schemes. It is my understanding that the PRC methodology identifies the workhours waiting for mail as fixed in computing volume variability in mail processing. Certainly, the time required to change the multitude of schemes for all the different destinations is at least as fixed as the time waiting for mail.

As shown in the Machine Sorting Operations table that follows, this suggests a simple bookkeeping method for estimating volume variability in the base year   Using data supplied by witness Bozzo (USPS-T-12, Table 2), first add the waiting and scheme percentages as entirely fixed costs and then assume that all other work hours are fully variable, ignoring fixed elements in auxiliary activities like container handling. This lacks the comprehensive refinement and sophistication of the econometric methods used to estimate the average variability over a period of several prior years, but its very simplicity illustrates why volume variability is a practical, everyday reality used in planning and budgeting postal distribution operations.

Machine Sorting Operations

	IOCS Waiting % (1)	IOCS Scheme % (2)	Bookkeeping Estimate % 100-(1)-(2)	Econometric Estimate %
Letters	1	9	90	88**
Flats*	1/1	8/6	91/93	99/72
Parcels / Bundles	2	6	92	87

* AFSM 100 / UFSM 1000

** USPS-T-12, Table 1

At facilities with both AFSM 100s and UFSM 1000s, the UFSM 1000 is used for both small volume schemes that are not cost-effective to run on the AFSM 100 and as backup for that machine. As backup, the UFSM 1000 processes mail that falls outside of the AFSM 100s processing schedule or physical capabilities. For example, the physical characteristics of many publications require UFSM 1000 processing (e.g., heavier and thicker publications). Late arrivals and service requirements for many Periodicals ensure that there will be workhours incurred with the machine idle waiting for Periodicals. Significantly lower volume variability is to be expected.

Manual distribution operations are also subject to the schemes effect. They are operator paced and suffer from the normal human tendency to slow down when there is not much backlog. In plants with automated sorting machines, manual casing is limited to mail that requires special service (e.g., daily Periodicals) or cannot be efficiently run on the automated equipment. We no longer have the clerks or manual cases to sort large volumes of letters or flats manually. If equipment goes out-of-service, the mail volume is directed to operational equipment when available and delivery units are notified that their mail will arrive late. Because manual operations process automation rejects, they normally provide the last increment of mail needed for a dispatch and must be staffed late in a tour to ensure that the last bit of mail gets to the dock on time to meet service. All of these factors combine to produce low volume variability in manual operations.

The size of the material being processed also has an effect. It simply requires more time to handle containers of larger items when changing schemes. Quickly replacing flat tubs during a scheme change on the AFSM 100 is relatively straightforward as flat tubs are light and not especially bulky. Changing out pallet-boxes on the APPS is considerably more time consuming.

Allied operations such as the platform, opening units, and pouching are subject to the size problem and have elements that are analogous to scheme changes. For example, many truck arrivals and departures are partially full and occur daily to support a particular office or customer. A radical change in volume might result in a different size truck, but the time required to seal and unseal the truck door will remain the same regardless of how much mail is on the truck.

In addition to mailers like small local newspapers that will always have exactly one truck, the Postal Service has a disproportionate number of very small offices. Of the 32,894 Post Offices, Stations and Branches, 8,197 service only post office boxes and another 12,971 have one to three carrier routes (Source: Address Management System). Despite changes in volume, each can be expected to send and receive exactly one less-than-full container (e.g., hamper or APC) of mail per day. Regardless of volume, that single unchanging container must be loaded and dumped each day – a fixed cost required to support the network. Similar considerations apply on a national level. Every plant prepares single containers for numerous distant AADCs, ADCs, and SCFs that have little volume but must receive a separate shipment to achieve national service standards. Handling such containers is a fixed cost independent of volume.

Allied operations tend to be gateway and dispatch operations that must move mail into the facility rapidly for processing or out to the dock to meet the dispatch schedule. They must be staffed regardless of whether trucks and mail volume appear as planned. The AFCS is a prime example. To ensure that sorting operations will finish on time, it is essential to start them as early as possible. The AFCS cancellation operation is staffed to get mail cancelled and moved into sorting as early as possible. In the late afternoon, there will usually be times when this operation is staffed but idle for lack of mail as trucks struggle to reach the plant through rush hour traffic or bad weather. Mail handlers will be assigned other work while they are waiting, but are commonly not clocked out and back into the cancellation operations during the brief periods involved. In addition to the AFCS, cancellation involves flats and manual cancellations, culling and dumping. Dumping in particular involves significant fixed costs due to all the single containers from small offices described in the preceding paragraph.

Because of all these other fixed costs, the simple bookkeeping approach of waiting time and scheme changes does not produce the low volume variabilities for manual sorting and cancellation measured by the econometric approach as shown in the table below. Indeed, the econometric results illustrate the importance of these other costs. These fixed costs are not just a theory debated among economists; they are a reality that we live with every day in our distribution operations.

Manual Sorting and Cancellation

	IOCS Waiting % (1)	IOCS Scheme % (2)	"Bookkeeping" Estimate % 100-(1)-(2)	Econometric Estimate %
Letters	2	3	95	89
Flats	2	4	94	94
Parcels	3	5	92	80
Cancellation	4	NA	96	50

Collectively, the testimonies of Mr. Moden, Mr. Steele and Ms. Kingsley provide an impressively comprehensive description of the aspects of mail processing that are relevant to volume variability. I especially recommend Chapter 3 in Ms. Kingsley's Docket No. R2001-1 testimony, also entitled "Volume and Workhours in Mail Processing", for both its solid description of fixed time in mail processing and as a capstone for all the Operations testimony that preceded it.