BEFORE THE
POSTAL RATE COMMISSION
WASHINGTON, DC 20268-0001

POSTAL RATE AND FEE CHANGES, 1997

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# DIRECT TESTIMONY OF RALPH J. MODEN ON BEHALF OF UNITED STATES ~~POSTAL~~ SERVICE

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Direct Testimony

of

Ralph J. Moden

Autobiographical Sketch

My name is Ralph J. Moden. I am the Manager, Operational Requirements within Operations Support. My office serves as the focal point for operations planning (processing and delivery). We manage the coordination of operations planning to ensure integration across functional areas. We evaluate the impact of programs and plans outside of Operations. We have specific responsibility for the development and integration of operational and customer requirements. We also have responsibility for maintenance of the Corporate Automation Plan, and Operations Models.

I joined the Postal Service in 1975. For three years I held various field positions in Mail Processing and Delivery. I came to the Mail Processing Department at Headquarters in 1978 and held various staff level positions until being promoted in 1983 to Manager, Operations Systems within the Information Resource Management Department. In that position, I was responsible for development of information requirements and systems for the Operations Group. I served as Special Assistant to the Deputy Postmaster General from June 1986 to June 1987.

I was promoted to General Manager of Distribution Operations in 1987. In that position, I was responsible for development of national policies and procedures relating to the distribution activities within processing and distribution centers. In 1991, I was promoted to Manager, Customer Mail Preparation where I was the Postal Service's primary interface with industry on issues pertaining to preparation requirements for mail entry and discount qualification. In 1993, I became Manager of Future Product Requirements within Marketing. I was responsible for ensuring that new product development plans considered operational capabilities and requirements. I held that position until assuming my current responsibilities in 1995.

I have appeared before the Postal Rate Commission on two previous occasions. First in R-90 where I presented testimony in support of the Postal Service's rate proposals based upon automated operations in the mail processing and delivery functions. My second appearance before the PRC was in MC 93-2 where I testified regarding mailer and vendor readiness for conversion to Delivery Point Barcoding.

I have a Bachelor of Science Degree in Business Administration from George Mason University and a Masters of Business Administration Degree from the University of Maryland at College Park.

I. Purpose of Testimony

The purpose of my testimony is to support various elements of the Postal Service's rates proposals. In Chapter Two, I provide an overview of the current and test year processing operations, the Postal Service will be employing in the coming years to improve operating efficiencies. In Chapter Three, I provide an operations perspective on the new Management Operating Data System (MODS) based costing methodology in support of witnesses Degen and Bradley.

Specifically, I address the following:

1. The types and capabilities of automation equipment employed in the operations analyzed in pertinent Postal Service testimony.
2. The equipment deployments planned through the test year and beyond.
3. The progress made in utilization of the barcoded mailstream.
4. The design/structure, purpose, and usage of MODS.
5. The reasonableness of the MODS-based cost pools and volume variabilities.
6. The Productivity Information Reporting System (PIRS) used to collect workhour and workload information in the Bulk Mail Centers (BMCs).
7. The appropriateness of applying the MODS-based cost pools to non-MODS facilities.

II. Letter and Flat Processing Operations

In this part of my testimony, I will provide an overview of our operations as they relate to the processing of letters and flats. Specifically, I will focus on how we are processing more mail in automated operations. Since we process letters and flats as two distinct mailstreams, I will treat each one as a separate topic. Each topic includes four sections:

1. The volume of barcoded mail has increased significantly over the past three years. In the first section, I will highlight the growth that we have realized in barcoded letters and flats.
2. We have been aggressive in deploying equipment to automate the processing of mail. In the second section, I will review the equipment that we are currently using to process barcoded mail.
3. The combination of our equipment deployments along with the growth in barcoded mail has allowed us to achieve savings in the automation program. In the third section, I provide an update on how we are utilizing barcodes including our progress with Delivery Point Sequencing (DPS).
4. In the final section, I will describe the future operating environment and highlight equipment modifications and additional deployments that will support our automation program. I will also describe our distribution concepts.

A. Letter Mail Processing

1. Growth in Barcoded Letters

Barcoded letter mail has grown dramatically. Barcoded letters, as a percentage share of all letter mail, has increased by about 10 points in each of the past two years. In Fiscal Year 1995, 60.4 percent of all letters were barcoded; in Fiscal Year 1996, 70.1 percent of all letters were barcoded; and through AP 9, Fiscal Year 1997, the percentage share is at 80.5 percent.

The growth in barcoded letters has already allowed us to remove over seventy five percent of the Letter Sorting Machines (LSMs) from our automated plants. At one time, the majority of letter mail was processed on LSMs. However, as the Postal Service's automation program has evolved, the LSM's value to

operations has diminished. When the LSM operated at full capacity, 12 employees were needed to staff keying consoles and an additional five employees were needed to sweep and load the machine. Letters were processed at a rate of 50 to 60 per minute, depending on the sort plan. The cost of processing mail on the LSM was relatively high and the equivalent volume of mail can now be processed by two employees on an Optical Character Reader (OCR). We will continue to remove LSMs as we approach our goal of barcoding 88 percent of all letters in FY1998.

Customer rate incentives for prebarcoding have produced substantial growth in prebarcoded letters. Through AP 9, Fiscal Year 1997, mailer applied barcodes comprise 57.5 percent of the total letter mail barcodes. The remaining 42.5 percent of all barcoded letters are barcoded by the Postal Service with 19.1 percent applied by a Multiline Optical Character Reader (MLOCR) and 23.4 percent applied by Remote Bar Coding (RBCS). The mailer share of total barcoded letters exceeds our original projections.[1]

2. Equipment

The following is an update on the equipment that we use to apply and/or sort barcodes.

a. Barcode Application

- Multiline Optical Character Reader (MLOCR) — Mail that is not prebarcoded receives its first chance to obtain a postal applied barcode on this piece of equipment. The last 38, of a total 875, MLOCRs were deployed in Fiscal Year 1996. No additional deployments are planned, but several enhancements that are currently being, or have recently been, made to the MLOCR include a new Grayscale Camera, a co-directory lookup, and a co-processor. The new Grayscale Camera facilitates better image capture and recognition while the co-

[1] In 1989, the Postal Service projected, that in a "full-up" automated letter environment, the first 40 percent of the barcodes would be applied by mailers, the second 40 percent of the barcodes would be applied by USPS' Optical Character Readers (OCRs), and the remaining 20 percent would be applied by USPS Remote Bar Coding Systems (RBCSs).

directory and co-processor augment the address matching process. These enhancements should help to improve the overall encode rate of the OCR and reduce the amount of mail that obtains a barcode through Remote Bar Coding.

- Low Cost MLOCR — This machine is a result of a modification to a Delivery Barcode Sorter (DBCS) that enables it to function as a MLOCR. As of June, 1997, the first 46, of a scheduled 100 machines, have been deployed to the field. Deployment is scheduled to continue through the remainder of Fiscal Year 1997 and will be targeted to sites as a replacement for outdated Single Line OCRs (SLOCRs) that are not able to read more than one line of an address. The SLOCRs cannot apply a Delivery Point Bar Code (DPBC) and are therefore incompatible with our overall automation objectives.
- 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, which consists of a retrofitted MLOCR (MLOCR-ISS) and/or a retrofitted Advanced Facer Canceller System (AFCS-ISS)[2], is used to "lift images" of mailpieces that are not OCR readable. A flourescent ID tag is sprayed on the back of the mailpiece and an image of the mailpiece is forwarded to the IPSS. While in the IPSS, the image may be resolved through the use of a Remote Computer Reader (RCR)[3] or may be forwarded on to a Remote Encoding Center (REC) where an operator keys the address information into a computer. Once the address is resolved to the DPBC level, the mailpiece is fed back through the OSS, which consists of a retrofitted DBCS (DBCS-OSS) and/or a retrofitted Mail Processing Barcode Sorter (MPBCS-OSS), where the delivery point information is matched to the

[2] The AFCS faces, cancels, and sorts letter mail by mail type. AFCSs that have received the ISS modification can also lift images of non-readable mailpieces.

[3] RCR is an off-line optical character recognition device that is part of RBCS. It uses advanced recognition techniques and the additional time available because it operates off-line to resolve script images and other difficult to read addresses. RCR reduces keying work by 25 percent.

flourescent ID tag and a barcode is applied. RBCS is currently deployed to 238 plants and is scheduled to be deployed to an additional 12 for a total of 250 sites. There are 55 RECs.

b. Barcode Sorting

- Delivery Bar Code Sorter (DBCS) — This machine is primarily used for processing barcoded mail on an incoming secondary sort plan such as Delivery Point Sequencing. The DBCS comes in multiple configurations; most machines have either 190 or 206 bins. The DBCS can sequence 5-digit presort barcoded letter mail in the order of delivery in two passes. The DBCSs are in the final phase of deployment. As of May 1997, we have deployed over 3,900 units and will have nearly 4,800 operational when deployment is completed later this year.
- Carrier Sequence Bar Code Sorter (CSBCS) — This machine is located in many of the larger delivery units and is used principally for Delivery Point Sequencing. The CSBCS can sequence carrier route presorted mail in the order of delivery in three passes — the mail is processed on this machine to one carrier route at a time due to the limited number of bins (i.e., two machine configurations — 13 and 17 bins). The deployment of 3,732 CSBCSs was completed in March 1997.
- Mail Processing Bar Code Sorter (MPBCS) — This machine has 96 bins and is used primarily for outgoing primary and incoming primary processing. There are 1,369 MPBCSs deployed.

3. Utilization of Barcodes

The strong growth in customer-prebarcoded letters combined with a steady deployment schedule of automated equipment has yielded positive results. As of Accounting Period 9, 1997, Processing & Distribution plants processed 87 percent of their total incoming secondary letter volume in automated operations, an eight point increase over the same period last year (SPLY).[4] Another relevant

[4] This is determined at the incoming secondary level by dividing the number of piece handlings in automated operations by the piece handlings in all incoming secondary operations.

indicator of utilization is that 72 percent of the total letter barcodes received automated secondary processing in the plants.[5] This percentage is representative of only the volumes that are processed in the plants, so the overall percentage of barcodes that received automated secondary processing is actually higher when CSBCS processing is considered. As mentioned earlier, CSBCSs are located at delivery units and the volume of automated secondary processed on them is not reflected in the plant totals.

a. Status of Delivery Point Sequencing

A considerable portion of the barcoded mail processed in secondary operations received Delivery Point Sequencing (DPS). As of Accounting Period 5, 1995, 58,710 routes in 3,020 delivery zones were receiving DPS mail.[6] As of Accounting Period 9, 1997, the number of routes has more than doubled to 133,462 in 7,122 zones, and the average volume of DPS mail is over 109 million pieces a day.

Our delivery units have worked closely with the plants to increase the amount of DPS mail. They have worked together to identify and capture bundles of non-barcoded Enhanced Carrier Route (ECR) Basic letters in order to barcode them at the plant. By doing so, they have been able to incorporate these pieces into the carriers' DPS mail, thus eliminating the need for manual casing. As barcoding non-barcoded ECR basic letters has become a common practice and as the number of DPS zones has increased, the value of ECR Basic letters has diminished. This mail is processed on the OCR to the 5-digit level, so the carrier route sortation provides no value. As we continue to increase the number of DPS zones, the value of this mail will diminish even more. As a result, the Postal Service is proposing that the

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[5] This is determined by dividing the number of piece handlings in automated incoming secondary operations by the total destinating 9- and 11-digit barcoded letters.

[6] Docket No.MC95-1, Testimony of Jeff W. Lewis, USPS-T-4.

pricing of the ECR Basic letter tier be changed to better reflect its reduced value to operations.

The quality of the DPS sort has improved dramatically as evidenced by the fact that over 96 percent of the routes receiving sequenced mail take it directly to the street instead of using office time to case the mail.[7] Through Accounting Period 9,1997, overall city carrier workhours are 1.1 percent below SPLY and 0.2 percent below the planned budget. As further evidence of the success of DPS processing, the number of career city carriers is 5,280 below SPLY.

4. Description of Future System

a. Equipment

The Postal Service is nearing completion of equipment deployments that support the automated letters program. As a result, there are no major new equipment deployments planned in the near term. However, scheduled deployments of existing equipment and technologies will continue in order to broaden our existing automation capabilities. As I mentioned earlier, we will expand the number of DBCSs from over 3,900 to nearly 4,800; the number of Low Cost OCRs from 46 to 100; and the number of RBCS sites from 238 to 250. Similarly, we will continue to look for possible enhancements to our existing equipment in order to leverage evolving technologies for additional operating efficiencies.

b. Operating Concepts

We will continue to strive to maximize the benefits of automated letter processing. Our corporate objective is that barcoded letters destinating at automated plants will be sorted to DPS for zones having 10 or more city routes and/or rural routes with city style addressing. Zones having five to nine routes will receive automated sortation to the route level. Some zones with fewer than 10 routes may also receive DPS as a result of local decisions. By the end of Fiscal Year 1998, we anticipate that there will be 154,000 routes on DPS. The increase in

[7] Carriers take the DPS mail directly to the street once the quality of the sort for their routes is certified at 98 percent correct or better for three consecutive days.

the number of routes on DPS, along with additional barcoded volume, will enable us to better manage our costs and improve the level of service to our customers.

B. Flat Mail Processing

1. Growth in Barcoded Flats

The percentage of flat mail that is barcoded has grown significantly with much of the increase occurring since the implementation of Classification Reform in July of 1996. Our indicator of barcoded growth is the percentage of all non-carrier route flats that are barcoded. Only the non-carrier route flats are used as the base since we only process flats to the carrier route level and no sequencing is performed. In Fiscal Year 1995, 37.4 percent of all non-carrier route flats were barcoded; in Fiscal Year 1996, 43.2 percent of all non-carrier route flats were barcoded; and through AP 9, Fiscal Year 1997, the percentage is 58.8 percent.

2. Equipment

- Multi-Position Flat Sorting Machine (MPFSM 881) —This machine is the primary piece of equipment that is used for processing flats. There are 812 machines deployed and each machine has four consoles that can be used for manual keying or inducting barcoded flats. Flats are manually fed into the machine and are sorted to 100 separations.
- Multi-Position Flat Sorting Machine (MPFSM 1000) —This machine is the newest generation of flat sorter and is intended to process nearly all of the flats that are non-machinable on the FSM 881. It is estimated that this machine will ultimately process about 25 percent of all non-carrier routed flats; currently, these flats are processed manually. The FSM 1000 has four keying stations and 100 bins, but is not presently equipped with barcode readers. Phase one deployment of 100 FSM 1000s was completed in June, 1997. Phase two deployment of an additional 240 FSM 1000s will start in July of this year.

3. Utilization of Barcodes

Through AP 9, Fiscal Year 1997, Processing & Distribution plants processed 28 percent of their total incoming secondary flat volume using barcode readers on flat sorters, a six point increase over the same period last year (SPLY). Keying

operations on the flat sorter accounted for an additional 24 percent of their total incoming secondary flat volume. The net result was that 52 percent of the total incoming secondary volume was processed on the flat sorter.[8] This percentage is somewhat understated since it includes both the machinable and non-machinable flats. The percentage is higher when only the machinable mailbase is considered. Another relevant indicator of utilization is the achievement of 21 percent of the total flat barcodes processed in incoming secondary operations using barcode readers.[9]

The utilization of flats barcodes, when compared to letter barcode utilization, may seem low. However, it is important to recognize that there are significant differences in the two automation programs. Letter barcodes can be applied by both the Postal Service and mailers, but flats barcodes can be applied only by mailers. While mailer barcode participation in letters has exceeded expectations, the participation in flats barcoding has been below expectations although, as indicated earlier, there has been recent significant growth in the volume of barcoded flats. The relatively small proportion of barcoded flats volume has made it difficult to identify and capture all of the barcoded flats. Likewise, the deployment of letter mail processing equipment is near completion while future flats processing equipment is still under evaluation and testing. These deployments will continue well past Fiscal Year 1998 and should help to improve barcode utilization.

a. Costing of Barcoded versus Non-barcoded

I have been advised that there are a couple of peculiar outputs from the cost models that do not reflect the aforementioned value of barcoding to operations. In both Periodicals and Standard (A) Nonprofit flats, the cost model outputs do not appear to adequately reflect the inherent differences in processing efficiencies

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[8] This is determined at the incoming secondary level by dividing the number of piece handlings in flat sorter operations by the piece handlings in all incoming secondary operations.

[9] This is determined by dividing the number of piece handlings processed by FSM barcode readers in automated incoming secondary operations by the total destinating 9- and 11-digit barcoded flats.

between barcoded and non-barcoded mail. This circumstance is enigmatic, and we are determined to identify the factors that may have led to these results.

Our preliminary assessment of this matter in Periodicals shows that the unique preparation requirements and options that apply only to that class of mail may have had some impact. One way in which the requirements are unique is that mailers have the option to prepare a less than required sack when they deem it appropriate for service reasons. For instance, a mailer may elect to prepare a 5-digit sack with only six pieces instead of placing the mail in a 3-digit sack.[10] This behavior creates a shift of mail to the 5-digit level. It is probable that this behavior occurs more frequently in non-barcoded flats than in barcoded flats because of the difference in rate eligibility requirements within the Periodical class as described below.

For barcoded mail, the 3/5 flat rate eligibility requirement is six or more pieces sorted to 5-digit or unique 3-digit packages, placed into 5-digit, 3-digit, ADC, and mixed ADC sacks. For non-barcoded mail, the 3/5 flat rate eligibility requirement is six or more pieces sorted to 5-digit or unique 3-digit packages, placed into 5-digit and unique 3-digit sacks only. Because of these sacking differences, the non-barcoded packages, of six or more pieces, have significantly less opportunity to qualify for the 3/5 rate. There is, therefore, a financial incentive to shift the non-barcoded flats into a 5-digit sack, when there is less than required volume (i.e., 24 pieces), in order to obtain the lower 3/5 rate. Consequently, a significant portion of the non-barcoded packages shift to the 5-digit sack and bypass a handling that would have been received had the packages remained in a lower level (e.g., 3-digit) sack. This shift results in reduced handlings for these packages. In contrast, the barcoded packages can obtain the same 3/5 rate by being placed in any level (e.g., ADC) sack.

It is probable that the aforementioned circumstances have had an impact on the output of our Periodicals cost models. They are not however intended to be

[10] The Domestic Mail Manual (DMM) allows the preparation of a less than required 24 piece sack when the publisher believes it will improve service.

inclusive of all of the factors that could have created this situation. We will therefore, be looking at both Periodicals and Standard (A) Nonprofit mail over the coming months to determine the causes and develop solutions which we expect to have in place in time for implementation of the new rates.

4. Description of Future System

a. Equipment

- OCR for FSM 881s — All 812 FSM 881 flat sorters will be retrofitted with OCR capabilities including full address recognition. The retrofit will enable the FSM 881 to process non-barcoded mailpieces that are manually keyed at present. The OCR will read and sort the mailpiece, but will not spray a barcode. The modification was approved by the Board of Governors in May 1997; deployment is scheduled to begin in early Fiscal Year 1998 and continue through the remainder of calendar year 1998.

There are two additional modifications that are being evaluated for possible deployment over the next couple of years.

- HSFF on FSM 881s — A High Speed Flats Feeder (HSFF) for the FSM 881 would provide automated feeding at the end of the flat sorter thus eliminating the need for manual induction. The HSFF is currently under review and is being field tested at one site.
- BCR for FSM 1000s — Adding a barcode reader to the FSM 1000 will allow us to process both barcoded and keyed mail. We are currently field testing the modification at one site and expect to have results later this year. If we see positive results from the test, deployment could begin in Fiscal Year 1998, assuming approval by the Board of Governors.

b. Operating Concepts

Our distribution concept for flats is somewhat similar to the concept for letters as the main emphasis is placed on automated zones with 10 or more routes. However, unlike letters, barcoded flats to those zones will be sorted only to carrier route level using barcode readers and/or OCR technology. In addition, some zones with fewer than 10 routes may also receive carrier route processing of automated

flats as a result of local decisions. There are no plans to sequence flats in delivery order.

Prior to this fiscal year, forecasts indicated that the volume of barcoded flats generated by customers would not result in the attainment of a fully automated flats mailstream. Accordingly, the Postal Service started development and testing of the flat mail OCR. As indicated earlier, we have realized a significant increase in the level of growth in barcoded flats since the implementation of Classification Reform. This growth in customer barcodes combined with the equipment deployments, that are planned or being considered, will enhance our ability to process more mail on flat sorters.

The flat mail OCR (FMOCR) will also help us improve our overall barcode utilization by reducing the number of barcodes that are keyed on the flat sorter. Barcoded pieces sometimes get keyed on the flat sorter as a result of poor segregation. The FMOCR should help to improve flat barcode utilization because it works in conjunction with the barcode reader to determine if a flat has a barcode. If a barcode is found on the flat, the piece is sorted based on the barcode. If a barcode is not found, the piece is sorted based on the address information read by the FMOCR. As a result, we achieve better barcode utilization by not keying pieces that have barcodes.

The additional equipment deployments and modifications, that I have highlighted, should help us significantly increase the amount of flats that we can process on the flat sorter thus improving our overall efficiency.

III. An Operations Perspective on MODS Based Costing

This portion of the testimony relates the workroom floor to "volume variabilities", as developed by witness Bradley. It interprets his mathematically derived results in terms of work flow, data collection, equipment, staffing and the mail base.

The Management Operating Data System (MODS) is used by the Postal Service to collect workload and workhour data on activities performed in mail processing plants. Section A briefly describes this system, Section B discusses how MODS is used by the Postal Service, and Section C describes how it was applied to form cost pools to estimate mail processing costs.

The Productivity Information Reporting System (PIRS) is used by the Postal Service to collect workload and workhour data on the Bulk Mail Centers (BMCs). Section D briefly describes the distinction between the mail processing plants and the BMCs, and how those distinctions are reflected in PIRS.

Productivity, defined as pieces processed per hour in a mail processing operation, is a familiar measure in operations that is closely related to volume variability. Section E discusses why greater volume at a specified operation and plant generally results in better productivity; seasonal effects on productivity; productivity in automated and manual sorting operations; productivity in support operations; and how the increase in automated processing has affected manual productivity.

Section F briefly discusses why volume variability results derived for cost pools at large facilities using MODS are also appropriate for similar cost pools at smaller facilities.

A. System Description

MODS has been used by postal management for over 25 years to plan and control activities within postal facilities. The system collects workload and workhour data and accumulates it centrally. The information is reported to all levels of management.

MODS uses standard three-digit operation numbers to designate all activities performed in plants. Some of these numbers designate a combination of mail type, processing function performed and the technology used to perform it. For example, Operation 831 is an Outgoing Primary Sort performed on letters using a Multiline Optical Character Reader (MLOCR). In other cases, operation numbers designate a general function. For example, "Platform Load/Unload" is the series 210-229 with individual numbers defined locally to accommodate the facility's arrangement of docks, loading bays, and related platform functions. MODS records and reports actual workhours by operation.

Piece-handlings are the usual measure of workload in Mail Processing since its fundamental purpose is to sort each individual piece of mail to an appropriate destination, and most Mail Processing workhours are expended in support of that purpose. Mail volume is measured for each piece-handling operation by machine meter, machine printouts, actual piece counts, or, if these methods are not feasible, by weight, feet, or containers, which are then converted to pieces within MODS using national conversion factors. For many activities such as administration or maintenance, there is no associated mail volume. In other instances where mail is handled in bulk or workhours are expended to support piece-handling operations (e.g. platform, pouching, etc.) only the workhours are recorded.

For additional details on MODS, refer to Handbook M-32: Management Operating Data System (MODS), USPS-LR-H-147.

B. Use of MODS Data

MODS data are used by postal management at both the local and national levels. Local operations management uses MODS to plan and control activities by comparing actual versus projected workhours and workload. Calculations used to develop local staffing plans and work schedules depend on MODS data.

Operations management at the Area and National level uses MODS to study trends in productivity, equipment utilization, and similar planning related factors. MODS data is used in the calculations for both operational decisions such as

equipment deployments and financial analyses such as workhour requirements and budgeting.

Engineering uses MODS to monitor equipment performance and to provide the basic data used in equipment investment decisions.

C. MODS Based Cost Pools

The grouping of MODS operations into cost pools based on similarity of function and equipment is discussed by witnesses Bradley and Degan. For example, optical character reading operations are grouped in one cost pool and manual letter sorting operations in another.

The cost pools generally mimic the layout of the workroom floor because equipment of the same type is normally grouped together to facilitate maintenance and management control of the mail flow. As the worknight progresses from sorting originating mail early in the evening to preparing mail for local delivery as the morning nears, the function of, say, the barcode letter sorters will change from sorting mail to destinations throughout the country to sorting mail for each carrier route in local post offices. However, the basic functionality of barcode sorter operations (i.e. individual piece distribution using a barcode representation of an address) does not change. Also, while in the haste to meet dispatch schedules, mail volume or workhours may occasionally be assigned to the wrong barcode sorting function, there is little chance of data integrity problems at the cost pool level. For example, while an individual clerk may remain clocked into an operation after the sorting scheme has changed to another operation, the clerk's hours are still assigned to the correct cost pool.

USPS-LR-H-146 Part I defines cost pools in terms of MODS operations. However, for convenience the most significant cost pools are described here. These cost pools represent six major varieties of mail sorting activities and three main support activities in a mail processing plant. The last three of the six sorting activities described here use the automated processing equipment described above in Chapter 2. The sorting activities are:

1. Manual Letter operations sort individual letters by hand into a rectangular case containing "pigeonholes" by destination.
2. Manual Flat operations sort larger than letter size mail pieces into larger cases in the same manner.
3. In Letter Sorting Machine operations the operator(s) reads the Zip code or the address and depresses an appropriate key combination to tell the machine into which bin to sort the letter. These operations are being phased out due to continuing improvements in automated processing.
4. Flat Sorting Machine operations include both mechanized (i.e., operator keyed similar to the letter sorting machine process described above) and automated (i.e., barcode sort) capabilities.
5. Optical Character Readers read the address, apply a barcode, and do an initial sort on the letters. If they are unable to read an address, they send an image of the piece to the Remote Barcoding System (RBCS) to decipher the address and assign a barcode.
6. Barcode Sorters sort letters using the barcodes imprinted on them.

The three main support activities are:

1. Opening Units are the operational areas within a plant where pouches, sacks, pallets, and other containers of mail are opened and the contents prepared for distribution.
2. Pouching Operations place sorted mail in containers for dispatch.
3. Platform Operations load and unload mail from trucks.

D. The Productivity Information Reporting System (PIRS)

The PIR system records workload and workhour information for the National Bulk Mail System consisting of 21 Bulk Mail Centers (BMCs). In contrast to the piece distribution emphasized in the mail processing plants covered by MODS, the 21 BMCs act as hubs and transfer points oriented to processing containers of mail and parcels. Each BMC serves as the central processing and transfer point for a designated geographic area; receiving, processing, and distributing originating and

destinating volumes of Standard and Periodical Letter and Flat Mail, and Standard Parcels. BMCs are highly mechanized facilities with the work oriented around parcel and sack sorters, sortation of pallets and similar containers, manual sortation of non-machineable parcels, and support activities such as the platform. Workload for each operation is measured in the natural handling unit for the operation (e.g. sacks for a sack sorter). However, to compute comparative productivities across BMCs in PIRS, workload in each operation is converted to an equivalent parcel sorting workload using standard conversion factors for each operation.

E. Changes in Productivity

Even at the level of an individual facility and cost pool, productivities have changed significantly over the long period, FY 88 to FY 96, covered by the cost study. This section provides an operations perspective on major factors that affect productivity.

1. Volume Increases Improve Productivity

A sustained increase in volume at a cost pool in a single facility will generally result in some increase in productivity. There are several reasons for this:

a. Most activities have some associated work such as obtaining mail, positioning rolling stock, or changing schemes that does not change proportionately with changes in volume, but is driven more by the operating schedule for the activity.

b. Mail volumes are inherently difficult to forecast so the staffing plan in an operation will match the workload only roughly on any given night. As mail volume increases it becomes easier to avoid briefly running short of mail in the middle of an operation.

c. In human--paced operations such as manual sorting, experience suggests that people work faster when there is a steady inventory of mail waiting to be processed. As volumes increase, it is easier to maintain such an inventory.

2. Seasonal Effects

Operational analyses compare current productivity to the same period in previous years because the volume and characteristics of the mail vary significantly with the mailing seasons. The largest seasonal effect is certainly the holiday mail each November and December. The beneficial effect on productivity of a greater mail volume is overwhelmed by detrimental changes in mail characteristics and the temporary surge in staffing requirements. There is a large increase in letters and packages with illegible handwriting and incomplete addresses. Many of the letters use colored envelopes which are difficult for the OCRs and many of the packages are poorly wrapped. To process the workload in manual operations, temporary clerks are needed who are significantly less productive than the regular staff.

3. Automated Sorting Operations

The volume in automated operations has grown substantially. In the last few years, a large portion of the growth has been due to mailer barcoding with added impetus from the recent Classification Reform.

In letter OCR operations, the shift of readable mail to pre-barcoded mail, leaving less readable mail for the OCR, has resulted in increased OCR rejects despite engineering improvements in the equipment read capability. Recent engineering improvements such as the Grayscale Camera, co-directory, and co-processor described earlier should help to improve the reject rate. Nonetheless, the reject rate in the OCR cost pool has grown. This has effected productivity since credit is not given for rejects in the calculation.

Each facility is unique. Its mailbase is determined by the mailing pattern of the community it serves and the location of major mailers. Its operating schedule is determined by the distance to neighboring post offices and airline schedules. The physical plant is often one-of-a-kind, and work practices, negotiated in local labor agreements, can differ significantly. Because of these factors there is an adjustment period when automated equipment is installed at a facility. A performance history is developed and staffing adjustments are planned. Under terms of the local and national labor agreements, each staffing change, including schedule adjustments,

requires a seniority based bidding process which cascades through the facility as each successful applicant's old position must be bid under the same procedure. If knowledge of a sorting scheme is required, a training period is provided for the applicant to acquire the skill or revert to another position. This adjustment period can delay achievement of the optimal productivity.

4. Manual Sorting Operations

The increased proportion of mail processed in automation has affected the operating strategy in this area. More of the manual mail is mail rejected by automation, and many of these rejects arrive in manual operations close to a dispatch time as automated operations sweep their stackers, including the reject stacker, before a scheme change. Manual cases become the method-of-last-resort, especially late in the evening as rejects from automated operations appear in quantity. To meet service commitments, manual cases must be staffed to handle these late surges.

These effects are compounded in some operations by low and even erratic volumes. Manual Parcel operations frequently suffer from these problems but must be staffed for service reasons whether there is much mail or not. Likewise, there is a higher degree of "overhead" activities in manual parcel operations due to the requirement to prepare the operation for start-up (i.e., hang sacks), as well as the associated non-distribution activities of "dropping," labeling and handling the sacks when full or at dispatch time. In other words, those activities must take place whether there is one or twenty parcels in a sack.

Priority mail can be affected by all of these issues as well. In particular, the time sensitive nature of this product has a significant influence on local staffing decisions.

5. Support Operations

Adding a sophisticated automated processing stream to existing mechanized and manual streams also required an increase in workhours for non-distribution activities, such as moving mail between operations, to handle the complex mail flows that resulted. Most support activities occur in the Allied Labor Operations – Platform,

Pouching, and Opening Units – described earlier. These activities are largely manual and are affected by many of the same factors that affect manual sorting.

Other operations such as the cancellation / mail preparation operations are critical support activities for mail sorting. The cancellation / mail preparation activity accepts the originating mail collected locally, orients this mail, separates the metered mail, cancels the stamped mail, and divides the mail into functional processing categories: non-machineable mail for hand-cancellation and manual sorting, barcoded mail to go directly to the BCSs, and mail for the OCRs and RBCS. The first evidence of the night's volumes and arrival times are seen in these operations and they are critical to the success of the night's processing. Outgoing sorting activities cannot work at capacity until the cancellation / mail preparation activities get the mail to them. These operations act as a gateway through which mail for subsequent sorting operations must pass. It is critical to the success of the outgoing distribution operations that mail be processed through the cancellation operations as expeditiously as possible.

F. Similar Operations at Non-MODS Facilities

In smaller facilities not covered by MODS, sorting schemes are often simpler, the workroom floor is smaller, clerks have greater personal knowledge of the local delivery area, and their very size makes it easier to keep a steady flow of mail to operations such as manual letters and flats. Nonetheless, the equipment and mailflows are similar to those at facilities reporting to MODS, and the factors accounting for volume variability would thus be much the same regardless of facility size.