Postal Rate Commission
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UNITED STATES OF AMERICA
POSTAL RATE COMMISSION

Before:

Chairman Omas,
Vice Chairman Tisdale,
Commissioners Acton, Goldway, and
Hammond

Evolutionary Network Development
Service Changes

Docket No. N2006-1

ADVISORY OPINION
CONCERNING A PROPOSED CHANGE
IN THE NATURE OF POSTAL SERVICES

Washington, DC 20268-0001
December ^^, 2006

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I. OVERVIEW AND ADVISORY RECOMMENDATIONS

[1001] The United States Postal Service proposes a program — which it has designated the Evolutionary Network Development (END) strategy — to review and realign its mail processing and transportation networks for the purpose of adapting them to the current and anticipated future needs of the nation's postal system. The program's objectives include enhancement of operational flexibility and efficiency, capture of resulting cost savings, and preservation of current service standards. The Commission finds these goals to be fully consistent with the policies and criteria of the Postal Reorganization Act, and endorses them.

[1002] The Commission has carefully considered the evidence presented by the Postal Service to explain how END is designed to achieve these goals, as well as the contributions of other participants in this proceeding. The Presiding Officer solicited supplemental evidence from the Postal Service through eight detailed information requests in order to further elucidate this program. The Commission finds that the resulting evidentiary record does not provide assurance that the proposed realignment program, as currently envisaged, will meet its declared goals. In particular, the record reflects flawed or absent information on certain crucial aspects of the Postal Service's plan for network realignment. The Commission advises the Governors to obtain and integrate reliable information in these areas before proceeding with full implementation of the contemplated program.

A. Questionable or Incomplete Cost and Service Estimates

[1003] The END strategy wisely seeks to enhance efficiency in the postal system's network of mail processing facilities through the use of modern computerized simulation and optimization models. However, the Commission finds that the use of inappropriate

inputs and assumptions may compromise their results. Computer-aided network design is an excellent tool, but the Commission concludes that the Service uses inappropriate measures in its Optimization and Simulation Models. Specifically:

- the use of national average productivities instead of facility-specific data is likely to result in misestimates of the cost impact of shifting operations among facilities, and the consequences of such shifts on service;
- the use of national average machine throughputs instead of actual productivities is likely to result in misestimates of the ability to process mail within given service standards;
- assuming that the workload of a facility is a reliable indicator of its marginal cost is likely to result in misestimates of the impact of realignment on costs.

The Commission advises postal management to address and remedy these questionable data choices and assumptions before proceeding to completion of the design of the new mail processing network.

[1004] The record also indicates that the END program's assessment of efficient facility utilization is incomplete in one important respect. While the program aims to identify where efficiencies can be achieved by consolidating operations, it does not take into account the potential residual value of the facilities that may no longer be needed to process mail, and savings that might be attained by closing unnecessary facilities. The Commission advises postal management to correct this significant oversight.

[1005] Similarly, the Postal Service's presentation articulates the objective of improving efficiency in the current transportation network, but does not include any specific plan or supporting analyses for achieving that goal in the process of network realignment. In the Commission's view, postal management should be directed to develop a comprehensive analysis of the financial and service impacts of the associated transportation reconfiguration for the Governors' review in tandem with the facility realignment program.

B. Inadequate Review of Local Impacts

[1006] The Postal Service intends to use its existing Area Mail Processing (AMP) review to assure that every change "makes sense" locally before it is implemented. Recent AMPs conducted by the Postal Service do not comport with applicable guidelines. They do not reflect systematic, consistent, or replicable projections of costs; they provide limited review of service impacts; and they utilize no discernable standards for evaluating or balancing cost and service impacts. Furthermore, required post implementation reviews have not been done. The Commission recommends that management be directed to assure that AMP reviews document the use of appropriate cost and service data to evaluate both the potential and actual impact of realignment, and that a process for promptly correcting any unexpected negative impacts be established.

C. Insufficient Provisions for Public Participation

[1007] Finally, the record indicates that procedures for assuring significant public participation in the process of network reconfiguration have, thus far, been insufficient. Decisions regarding current and planned postal facilities can be expected to affect mail users, postal employees, and the communities in which facilities are or may be located. In particular, the Commission advises that the Postal Service should solicit information from major mailers concerning how they are likely to alter practices such as dropshipping after realignment occurs, and to the extent feasible, incorporate this information into its models.

[1008] In order to identify and accommodate the interests of affected stakeholders in the postal system to the greatest extent feasible, the Commission recommends that the realignment process be supplemented with procedures that will assure appropriate public participation earlier in the decisionmaking process.

II. PROCEDURAL HISTORY

[2001] This proceeding was initiated by a Request filed by the United States Postal Service on February 14, 2006.[1] The Postal Service declares that it seeks an advisory opinion pursuant to section 3661 of the Postal Reorganization Act, 39 U.S.C. § 3661, on anticipated changes in the application of current service standards to numerous 3-digit ZIP Code service area origin-destination pairs for different classes of mail. The Postal Service states that these changes "are expected to result from a system-wide review and realignment of the Postal Service's mail processing and transportation networks."[2]

[2002] Specifically, the Postal Service plans to implement a network realignment initiative known as the Evolutionary Network Development strategy. END is intended to aid in developing a long-term solution for mail processing and transportation networks that will provide the Service with the flexibility to respond to current and future mail trends — particularly the decreasing prominence of First-Class Mail in the postal system.

[2003] The Postal Service anticipates that it will take several years to subject all major components of the mail processing network to an initial realignment review and to implement any resulting operational changes. However, in order to obtain the benefit of the Commission's advice prior to implementing the service changes resulting from the initial wave of operational changes produced by its network realignment review program, the Service included with its Request a motion for adoption of a procedural schedule that purportedly would have enabled the Commission to issue an opinion by May 5, 2006.[3]

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[1] Request of the United States Postal Service for an Advisory Opinion on Changes in Postal Services, February 14, 2006 (Request).

[2] *Id.* at 1. (Footnote omitted.)

[3] *See* Motion of the United States Postal Service for the Adoption of Proposed Procedural Schedule and Special Rules of Practice, February 14, 2006.

[2004] While the Commission did not find it feasible to implement the extremely expedited procedural schedule suggested by the Postal Service, it has undertaken to consider this Request with the maximum expedition consistent with the procedural rights guaranteed to other participants by 39 U.S.C. § 3661(c). Unfortunately, throughout this proceeding it has appeared that the Postal Service did not, for whatever reason, commit the level of resources necessary to support expeditious presentation and consideration of its proposal. The Presiding Officer in this case commented on this regrettable source of procedural hindrance on several occasions.[4]

[2005] The Postal Service presented the testimony of two witnesses in support of its Request: Pranab M. Shah (USPS-T-1) and David E. Williams (USPS-T-2). Participants' discovery on the direct case of the Postal Service continued until June 16, 2006, the initial deadline having been extended in Presiding Officer's Ruling No. N2006-1/14.[5] In addition, the Presiding Officer issued eight written information requests to the Postal Service. Hearings on the Service's direct case were held on July 18 and 19, 2006. One participant, the American Postal Workers Union, filed the testimony of Margaret L. Yao (APWU-T-1) in response to the Postal Service's case. In accordance with the final procedural schedule adopted by the Presiding Officer, initial briefs of participants were filed on October 19, 2006,[6] and reply briefs on October 26, 2006.[7]

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[4] *See, e.g.,* Presiding Officer's Ruling No. N2006-1/36, September 11, 2006.

[5] Presiding Officer's Ruling No. N2006-1/14, May 31, 2006. The Presiding Officer declined to further extend discovery in Presiding Officer's Ruling No. N2006-1/22, July 7, 2006.

[6] Initial Brief of the American Postal Workers Union, AFL-CIO; Douglas F. Carlson Initial Brief; Initial Brief of the Office of the Consumer Advocate; Brief of David B. Popkin; and Initial Brief of the United States Postal Service, all filed on October 19, 2006.

[7] Reply Brief of David B. Popkin; Reply Brief of the Office of the Consumer Advocate; and Reply Brief of the United States Postal Service, all filed on October 26, 2006.

III. LEGAL FRAMEWORK FOR THE COMMISSION'S ADVISORY OPINION

[3001] Section 3661 establishes both policy and procedural frameworks for deliberations on proposed changes in the nature of postal services. First, section 3661(a) mandates two policy considerations to guide Postal Service actions regarding services: "The Postal Service shall develop and promote adequate and efficient postal services." In this opinion the Commission will review the evidence on how END will affect both the adequacy and efficiency of postal services.

[3002] In a footnote to its Request of February 14, 2006, the Postal Service raises the question whether section 3661 *requires* it to seek an advisory opinion regarding its proposed network realignment. However, the Service also states that it has determined in its discretion to do so before proceeding with the END program.[8]

[3003] In the Commission's view, it is unnecessary to address the abstract jurisdictional question posed in the footnote for several reasons. First, neither the Postal Service nor any other participant argues that this proceeding should not have gone forward for lack of jurisdiction under section 3661. Second, the changes to be made in implementing the END strategy are likely to involve qualitative "changes in the nature of postal services" because they contemplate moving from mail class-based distinctions in designing postal operations to alternative, largely shape-based processing and distribution concepts.[9] Finally, as the Service concedes, implementation of its proposal is likely to cause at least a small degradation in the current level of service provided to First-Class Mail on a nationwide basis.[10]

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[8] Request at 1, n.1. On brief, the Postal Service states: "In the absence of any basis for excluding an affirmative finding, it is appropriate under the circumstances of the request before it, for the Commission to assume that the END initiative could result in substantially nationwide changes for affected mail classes." Postal Service Brief at 25-26.

[9] *See* USPS-T-1 at 6-7.

[10] *See* the discussion in Chapter VI of this Opinion, *infra.*

[3004] In reviewing Postal Service proposals under section 3661, the Commission has examined and addressed them from a comprehensive policy perspective under the Postal Reorganization Act. In an early Advisory Opinion rendered by the Commission under section 3661, it found that:

> The pertinent provisions of the Reorganization Act require this Commission to consider all the Act's applicable policies when formulating an advisory opinion under § 3661. Section 3661(a) of title 39 specifically requires the Postal Service to 'develop and promote adequate and efficient postal services.' Section 3661(c) broadens our perspective by requiring that '[t]he opinion shall be in writing and shall include a certification by each Commissioner agreeing with the opinion that in his judgment the opinion conforms to the policies established under this title.' Thus our advisory opinion jurisdiction under § 3661 requires a comprehensive examination of the consistency of actions and programs proposed by the Postal Service with the relevant policies to be found throughout title 39.

PRC Op. N75-1, April 22, 1976, at 33.

[3005] In a Notice of Inquiry[11] issued shortly after the initiation of this proceeding, the Commission solicited the views of participants concerning the scope of the issues upon which an advisory opinion had been requested by the Postal Service. While several respondents argued for more expansive definitions of the issues to be addressed, the Postal Service espoused a restrictive view, stating that "[t]he Commission's goal should be to evaluate the reasonableness of the [END] process from the standpoint of its policy judgment[,]" and arguing that the goals and processes described in its testimony "in some respects, delimit that role."[12] In addition to arguing that section 3661 does not require the Commission to ascertain estimated costs of the proposed change or its precise overall impact, the Postal Service asserts:

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[11] Notice of Inquiry No. 1, March 28, 2006.

[12] Response of the United States Postal Service to Notice of Inquiry No. 1, April 4, 2006, at 2.

> Nothing in the history or scheme of the Postal Reorganization Act, however, suggests that the Commission's role in this section of the Act is to provide specific operational guidance in the management of the Postal Service, or to second-guess particular operational decisions at a level that examines comprehensively the localized cost or service effects of any planned change. On the contrary, the entire history and purpose of postal reorganization supports the goal of freeing the Postal Service to make sound business decisions independently and shielding it from the tendency of the institutions that developed prior to reorganization to deprive postal management of the freedom.[13]

[3006] The Service reiterates this position in its Reply Brief, asserting that: "The authority to offer non-binding advice on plans for service changes does not include authority to interfere in management or to act as overseer."[14]

[3007] By contrast, OCA advances a more expansive model of Commission scrutiny, extending not only to the overall structure of the END program, but also to its reasonably foreseeable consequences, the soundness of its methodology, and the degree to which the Service's proposal would introduce rational decision-making into the realignment process.[15] In OCA's view, "[w]hen rendering advice, the Commission should determine whether the changed service, taken in its entirety, will conform to the policies of the Act."[16]

[3008] The Commission believes that the Postal Service's restrictive view of the scope of the Commission's responsibilities in this proceeding — as well as its misgivings concerning the possible usurpation of the Service's managerial functions — are misplaced. The Commission disclaims any intention to substitute its appraisal of the END program for the decisions already made or to be made in the future by Postal Service management. Indeed, in view of the purely advisory nature of the opinion to be

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[13] *Id.* at 1.

[14] Postal Service Reply Brief at 4.

[15] OCA Brief at 19-20.

[16] OCA Reply Brief at 7. (Citations omitted.)

rendered — and the lack of prescribed action to be taken by the Governors following their receipt of it — it is difficult to foresee how any expression of the Commission's opinions could produce that result.

[3009] Moreover, the Commission cannot fully perform its statutory responsibilities under section 3661 within the confines of scrutiny suggested by the Postal Service. While the goals, processes, and criteria employed in network realignment all merit careful inspection, they do not exhaust the considerations mandated by section 3661. Efficiency of postal services cannot be ascertained without reference to costs both before and after potential changes in the postal network.[17] Further, the degree to which the END program is likely to achieve both efficiency and adequacy in providing postal services cannot be predicted without examining the methods to be used in the process of modifying current mail processing and transportation operations.

[3010] In this regard, useful guidance can be found in the Commission's approach to the first request filed under section 3661 in Docket No. N75-1. In that case, the Postal Service proposed to implement a "Retail Analysis Program" (RAP) which would apply market analysis techniques for the purpose of locating postal retail facilities, staffing them with window clerks and their supervisors, and scheduling the workhours of postal employees in retail facilities.[18] Addressing the scope of inquiry required by section 3661 in that case, the Commission found:

> In this proceeding, we believe that our inquiry into the merits of RAP must focus on two questions: (1) whether the program conforms, in terms of its stated objectives, to the policies of § 3661 and the remainder of title 39; and (2) whether the methodology employed in the program is sufficiently sound to enable the program to meet those objectives. This two-part analysis is required here because of the nature of RAP--the Postal Service

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[17] As the Commission observed in the first advisory opinion it issued pursuant to section 3661, "[u]ntil there are cost, revenue, volume and service data showing the impact of the program, neither we nor the Service's management can know whether there will be significant financial impact." PRC Op. N75-2, September 8, 1975, at 17.

[18] *See* PRC Op. N75-1, April 22, 1976, at 1, 34-43.

> in this instance proposes to advance certain objectives by the application of a methodology which is both diagnostic and corrective. Therefore, the results of the program's implementation cannot be known in advance, and it is necessary to appraise the program's eventual effects from the goals toward which it is directed and the soundness of its methodological details. For these reasons, we address both the latter in weighing the merits of the Retail Analysis Program.[19]

[3011] As in Docket No. N75-1, the Postal Service proposes in this case to reconfigure parts of its operating network using methods intended to serve both diagnostic and corrective purposes in achieving goals it identifies. While there is a small amount of evidence illustrating the effects of implementing the END program on the record in this case, its overall effects on the postal system cannot be known in advance. Therefore, it is once again appropriate to appraise the Service's stated goals in light of the Postal Reorganization Act's policy declarations, and to assess the apparent soundness of all the methods it intends to use in achieving those goals. Accordingly, the Commission's analysis of the merits of the Postal Service's proposal, and its advice to the Governors, will address the dual topics of the goals pursued in the proposed network realignment program, and the methods the Service proposes to use in achieving them.[20]

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[19] *Id.* at 33-34.

[20] This dual focus on a proposal's objectives and its supporting methodology also characterizes the Commission's approach in Docket No. N89-1, which concerned a proposed realignment in delivery standards for First-Class Mail. *See* PRC Op. N89-1, July 25, 1990, at 6-35.

IV. POSTAL SERVICE NETWORK REALIGNMENT PROGRAM

A. Goals of the Program

[4001] In its Request, the Postal Service identifies four goals the proposed END program is intended to achieve: "The objectives of this realignment are to develop mail processing and transportation networks suited to current and future postal operational needs, to reduce inefficiency and redundancy, to make operations flexible, and to capture the resulting cost savings."[21] The Service plans to implement these goals through a centrally-directed program involving numerous mail processing and transportation changes. Specific changes will be studied at the local level and submitted to Postal Service Headquarters for approval.

[4002] The Postal Service recognizes that the network and transportation changes it contemplates are likely to involve adjustments in some of the service standards that now apply to numerous 3-digit ZIP Code area origin-destination pairs for different classes of mail. However, the Service explicitly disclaims any intention to change currently-established service standards as part of its proposal. It states:

> The Postal Service is not proposing to change the current service standard day ranges for any mail class. Nor is the Postal Service proposing to apply different service standards within any subclass to mail pieces based upon differences in physical characteristics.[22]

[4003] Thus, the Service's proposal in this case incorporates a fifth goal: preservation of the levels of service currently afforded to all classes of mail, and within

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[21] Request at 2.

[22] *Id.* at 2, n.2.

those classes and subclasses, to the extent practicable, in the realignment of its mail processing and transportation networks.

[4004] In general, the Commission finds the stated goals of the END program — which no participant opposes in principle — to be responsive to the dual considerations of adequacy and efficiency in postal services prescribed by section 3661(a), and compatible with the postal policies established elsewhere in the Postal Reorganization Act.

1. Operational Goals

[4005] Witness Shah testifies that the current mail processing network reflects prior logistical decisions based on population, mail volume growth, and other conditions in past decades. Over time, he states, the mail distribution system has evolved into a series of overlapping, single-product networks. It also prominently reflects the fact that, until recently, the majority of mail volume consisted of First-Class Mail.

[4006] Now, however, single-piece First-Class Mail volume has been declining for most of the past decade, and while prebarcoded and/or presorted First-Class categories have increased, Standard Mail has overtaken First-Class as the volume leader in the postal system. As these trends continue, existing mail processing infrastructure accumulated over past decades is being utilized less fully, and less revenue is being generated to support it. Although the Postal Service has implemented a number of measures to contain costs and improve efficiencies across the current network, Mr. Shah reports that postal management has concluded that redundancies built into the current network will persist until it examines alternative network distribution concepts.[23]

[4007] To address these developments, and adapt to operational needs now and in the future, the Postal Service proposes to employ the END models described by witness Shah to realign its network. Using those models in conjunction with the Area Mail

[23] USPS-T-1 at 2-4.

Processing (AMP) review procedures described in the testimony of witness Williams, the Postal Service aims to identify opportunities for reducing the number of mail processing plants while enhancing flexibility in processing and transportation.

[4008] The Commission finds the operational objectives of the END program are consistent with the policies and criteria of the Postal Reorganization Act. Pursuing these goals will advance the Postal Service's performance of its general responsibility "to maintain an efficient system of collection, sorting, and delivery of the mail nationwide[.]" 39 U.S.C. § 403(b)(1). The objectives also respond directly to the Postal Reorganization Act's specific command in 39 U.S.C. § 2010 that "[t]he Postal Service shall promote modern and efficient operations…." Finally, in seeking to enhance the efficiency with which all types of mail are processed and transported, pursuit of these operational goals will "promote…efficient postal services[,]" in furtherance of 39 U.S.C. § 3661(a).

2. Capturing Cost Savings from Network Realignment

[4009] In reconfiguring its mail processing and transportation networks to meet current and future operational needs, the Postal Service intends to identify and capture potential cost savings resulting from that process. Witness Shah testifies that the END network optimization and simulation models objectively analyze costs associated with each mail processing facility, and that the Postal Service will assess the impact that each processing and distribution facility has on overall network costs to make more economical decisions in selecting facilities for consolidation.[24] Similarly, witness Williams testifies that AMP studies evaluate the potential cost savings of a contemplated consolidation, and that post-implementation review (PIR) of consolidations under AMP assess the extent to which projected cost savings are achieved.[25]

[24] USPS-T-1 at 7-9. *See also* Postal Service Library Reference N2006-1/17 at 4-8, 17-20.

[25] USPS-T-2 at 4-5, 7.

[4010] Implementing procedures for identifying and realizing potential cost savings in network realignment would further several policies of the Postal Reorganization Act. By aiming to produce cost savings throughout the network, it would further the basic policy of providing "efficient services to patrons in all areas[,]" as directed in 39 U.S.C. § 101(a). The objective of capturing cost savings in implementing the END process would likewise comply with the consideration of efficiency prescribed in 39 U.S.C. §§ 403(b)(1), 2010, and 3661(a). Accordingly, the Commission also endorses this goal of the proposed END program.

3. Preserving Current Service Standards

[4011] As noted above, the Postal Service's Request in this proceeding denies any intention to change established service standards for any category of mail in implementing its END proposal. Witness Shah concedes that, in implementing network realignment, the Postal Service may determine to either expand or contract specific 3-digit ZIP Code areas, with resulting upgrades or downgrades in service applicable to specific 3-digit ZIP Code origin-destination pairs. However, he also expresses the Service's commitment to preservation of current service standard definitions, and testifies that changes in service affecting particular origin-destination pairs will be made incrementally as the AMP review process is applied to local mail processing facilities and operations.[26]

[4012] The Commission finds that the Postal Service's declared objective of preserving current service standards comports with the policies and criteria of the Postal Reorganization Act, and endorses this goal. As noted earlier in this Opinion, section 3661 directs the Postal Service to promote, and the Commission to consider, the adequacy of postal services. On the level of postal policy, section 101(a) generally directs the Postal Service to provide prompt and reliable services, and section 101(e)

[26] USPS-T-1 at 12-14.

more specifically establishes that, "[i]n determining all policies for postal services, the Postal Service shall give the highest consideration to the requirement for the most expeditious collection, transportation, and delivery of important letter mail." In view of these statutory mandates, the maintenance of current levels of service — and their improvement, wherever feasible — should constitute a cardinal goal of network realignment. This conclusion applies with particular force to First-Class letter mail.

[4013] For these reasons, the Commission finds the stated goals of the proposed END program to be consistent with the Postal Reorganization Act's criteria and policies. We next consider the methods devised by the Postal Service for achieving these laudable goals, and their likelihood of success.

B. Process to Achieve Goals

[4014] To achieve its goals the Postal Service is in the midst of an ambitious program it refers to as Evolutionary Network Development. This program employs computerized quantitative decision modeling techniques — an Optimization Model and a Simulation Model — to inform the complex managerial decision-making inherent in the development of the future network. In conjunction with these models the Postal Service is using its Area Mail Processing (AMP) review suggested process to review opportunities for realignment and consolidations.

1. Network Design Models

a. Description of Distribution Concept

[4015] The Postal Service guides the END modeling process with a predetermined distribution concept described in the following manner:

> Essentially the backbone of the network's infrastructure is a Regional Distribution Center (RDC). RDCs will consolidate parcel and bundle distribution to take advantage of shape-based efficiencies. They will serve as mailer entry points and Surface Transfer Centers (STC) to enable shared product transportation. They will act as concentration points for subordinate Local Process Centers (LPCs). LPCs will handle most of the letter and flat process workload for both originating and destinating sorts. Destinating Processing Centers (DPCs) handle the same shapes as LPCs but only conduct destinating sorts and do not have outgoing processing. Some RDCs are co-located with LPCs, where both roles are supported in one geographic location; we call these COLOCs. Air Transfer Centers (ATCs) facilitate the exchange of mail with the air carriers.

Tr. 2/251.

[4016] In general, this distribution concept is a regional hub-and-spoke network where mail is entered into the system at an origin LPC, sorted to the destination LPC, and transported either directly or through RDCs and ATCs. According to the Postal Service, the intent of the distribution concept is to, "greatly simplif[y] both [the] mail processing flows and transportation networks." USPS-T-1 at 12. The Postal Service has indicated that this concept is a move toward shape-based, rather than class-based, processing and an effort to reduce excess capacity and redundant operations.

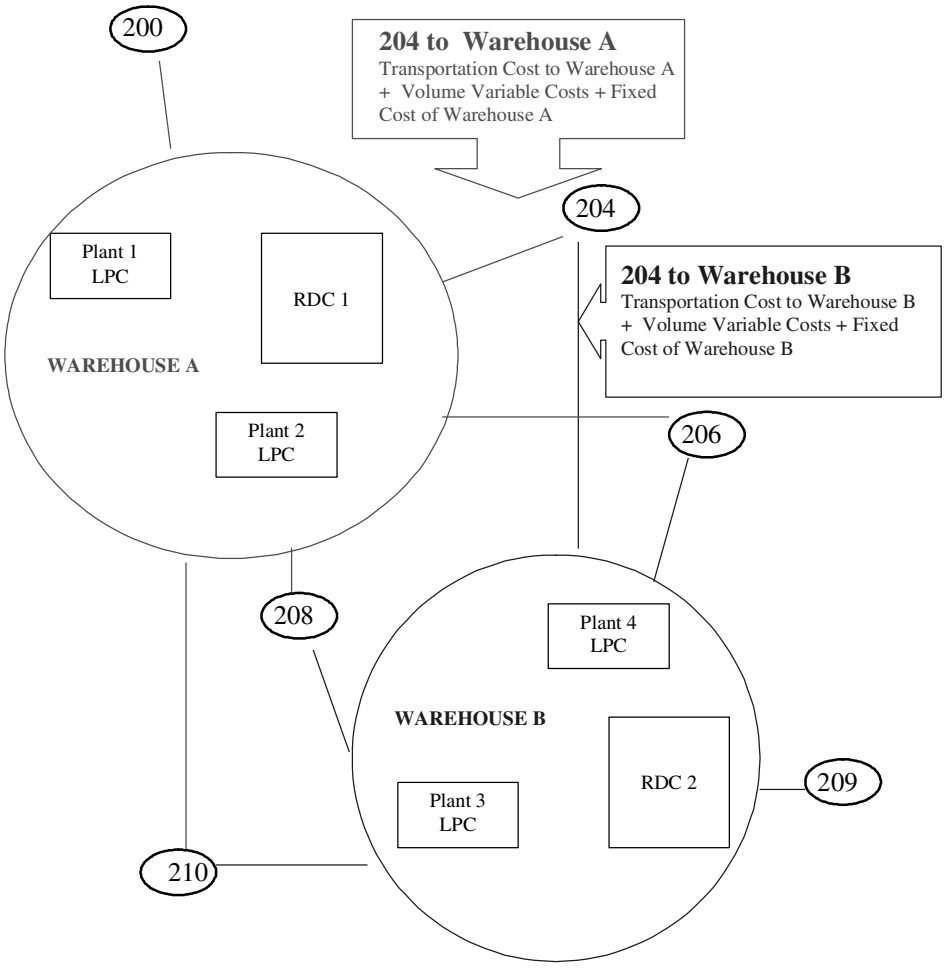
b. Description of Optimization Model

[4017] On a broad level the END Optimization Model is intended to determine the best location for the Postal Service's mail processing and distribution facilities given the pre-determined distribution concept and certain constraints.[27] The model is adapted from a mixed integer linear program produced by LogicNet Plus software, a well-respected, widely used logistic software applications firm.

[27] The description of the END models is constructed from witness Shah's testimony (USPS-T-1), USPS-LR-N2006-1/17, USPS-LR-N2006-1/18, and numerous interrogatory and POIR responses.

[4018] The LogicNet Plus software was designed for a manufacturing network where plants produce output, ship to warehouses, and then ship to customers. According to the LogicPlus website, the software analyzes various tradeoffs between production costs, warehousing costs, transportation costs and service requirements to arrive at the best solution. The idea is to lower supply chain costs, align supply chains with business strategy, and improve customer service. In adapting the software for use by the Postal Service the following assignments were made: mail processing facilities are the plants; LPC mail and RDC mail are the products; the combination of LPC and RDC location are the warehouses; and the 3-digit ZIP Codes are the customers. Transportation and variable costs are applied on the arc between the customer and the warehouse. Tr. 2/267-68. Fixed facility costs are applied either at the production line (LPC, RDC) or at the warehouse. For example, as depicted in Figure 4-1, the Optimization Model compares the cost on the arcs — 204 to A and 204 to B — in deciding where to map the 3-digit ZIP Code 204.

Figure 4-1



In the initial run, the volume variable unit costs are kept constant so the determinations are based on transportation costs, fixed costs, and available capacity.

[4019] To determine available capacity the Postal Service conducted a field survey to verify the square feet of each facility separated into work floor square footage and non work floor square footage. Available capacity is defined as total square feet minus non-workroom square feet. Required capacity is a function of volume, equipment, and operating plans. For each 3-digit ZIP Code the Postal Service calculates required capacity by: (1) translating volume into workload;[28] (2) applying average machine

[28] Workload = volume x total handlings per piece.

throughput to workload to determine required equipment sets given specific operating plans; and (3) determining square footage needed to accommodate this equipment set.

[4020] In attempting to minimize costs, the model determines the optimal workload for each operation for each 3-digit ZIP Code given the following constraints:

- use existing infrastructure;
- every 3-digit ZIP Code must be assigned to only one LPC;
- every LPC must be assigned to only one RDC.

It determines optimal workload by comparing the cost of processing the mail at various LPC locations. Rather than using facility specific costs for each potential LPC, the Postal Service estimates the cost of processing mail in a given operation using the following steps:

(1) classify the size of the operation based on workload;

(2) determine the variable cost of the operation by multiplying the workload by the estimated marginal cost of the operation given its size;

(3) determine the fixed cost of the operation based on its size; and

(4) add the fixed costs of the facility.

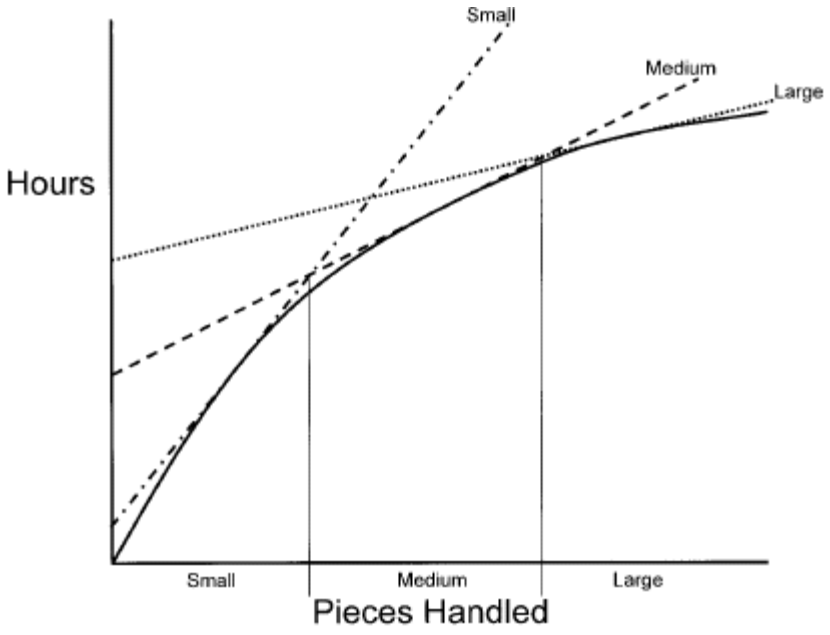
[4021] The marginal cost of processing a piece of mail in a given operation is assumed to be the same for all operations of a given size — small, medium, or large. As the Postal Service explains:

> The cost functions are designed at the operation, not facility level. The marginal cost at the operation level is based off of the structural cost equations of the United States Postal Service. The marginal cost solution is the cost of adding an additional piece of mail to an operation. The linear functions are designed to reflect the underlying structural equation, and mimic the economies of scale inherent within the structural equations.

Tr. 2/152.

The Postal Service illustrates the process with Figure 4.2, below:

Figure 4-2



This linear approximation procedure is described and evaluated in more detail in Appendix A.

[4022] To simplify the enormous computing task required of the Optimization Model the Postal Service ran a number of "pre-processor" models and incorporated the output into the model. These pre-processors include the required capacity and cost models discussed above as well as feasible paths, transportation costs, and a model that translates volume into workload.

[4023] In February 2004, the Postal Service formed an internal Independent Verification and Validation (IV & V) team to verify the assumptions, inputs, calculations, and outputs associated with the END models. The IV & V team validated the structural integrity of the model by reviewing an assessment by IBM Business Consulting Services that was used to select the software, interviewing representatives of prominent companies that had used the software, and stressing the model by running it under different assumptions and comparing the results. The team concluded, the core Optimization Model does perform as it is supposed to perform. USPS-LR-N2006-1/18 at ii.

c. Description of Simulation Model

[4024] The Simulation Model tests the feasibility of an Optimization Model network alternative, based on service performance — ability to meet Critical Entry Times and service standards — and resource utilization (based on processing capacity). The Simulation Model is a customized version of ARENA simulation software and uses data from various Postal Service databases as inputs. The application used by the Postal Service is based on simulation modeling done in foreign postal systems:

> PriceWaterhouseCooper had developed a postal simulation tool for a number of different European postal services, although the scale was an issue because the network for a lot of these northern European postal services is much smaller compared to our network. The characteristics of mail flow and basic postal operations that we needed to simulate remained the same, so we took that existing product and then customized it to our need.

Tr. 2/202.

[4025] The Simulation Model is used to test the feasibility of both Optimization Model results and AMP consolidation proposals. The Simulation Model runs a mail flow simulation to test the performance of the proposal against existing service standards. A feasible solution results as long as the workload can be processed within the operating window. The determining factor in whether the workload can be processed through the facility in time to make service standards is capacity. "Capacity — is made up of a number of facility specific factors including: the number and type of mail processing equipment and the associated throughputs and reject rates, mail flows to subsequent operations, material handling times, and detailed operation plans." *Id.* at 59.

[4026] The Simulation Model does not validate the estimated costs of the optimized network. Simulation can be used to test "what-if" scenarios. According to the Postal Service, "[f]or any particular mail processing plant or cluster of related mail processing

plants, Headquarters and the affected Area Office may consider a number of alternative scenarios during the iterative simulation process." USPS-T-1 at 10.

2. Implementation Process

[4027] Postal Service witness Williams states that the Postal Service intends to use Area Mail Processing (AMP) reviews "as a basis for studying and implementing realignment opportunities identified by the END initiative." USPS-T-2 at 1. While the AMP process has been used to consolidate operations for over three decades,[29] the Postal Service intends to significantly increase the number of AMP reviews conducted as a result of the END process. According to the Postal Service, 28 AMP reviews have been implemented since 1995. Tr. 3/670. This equates to approximately two or three AMPs per year. In FY 2006, the Postal Service intends to begin 46 AMP feasibility studies which it calls Phase 1. Additional phases will follow in 2007 and beyond. USPS-T-2 at 12. The Postal Service has developed a similar process for activating the Regional Distribution Centers (RDC) that will form the backbone of the future network.

a. Description of Area Mail Processing (AMP) Review

[4028] In the *Area Mail Processing Guidelines*, Handbook PO-408, March 1995 submitted in USPS-LR-N2006-1/3, AMP is defined as the consolidation of originating/destinating distribution operations from one or more postal facilities into other facilities to improve operational efficiency and/or service. The Postal Service's purported underlying principle for consolidation is to make efficient use of space, staffing, equipment and transportation to process mail more efficiently. As stated at page 1,

[29] USPS-LR-N2006-1/8 at 1, 2.

Handbook PO-408 has evolved from different guideline versions that have apparently directed the AMP process.[30]

[4029] Handbook PO-408 divides the AMP development and evaluation process into five different phases: AMP Feasibility Study; AMP Proposal Documentation; Proposal Approval (3 levels); AMP Implementation; and Post-Implementation Reviews (PIR). During the AMP feasibility study phase, the feasibility of relocating processing, distribution operations, and the support functions needed is assessed.

[4030] First, the AMP feasibility study is required to examine the impact of consolidation on the affected employees, community, customers, service, costs, productivity, and future strategic initiatives. The guidelines state that AMP feasibility studies may be initiated by either the District offices or the Processing and Distribution Center (P&DC) management, and must be completed in six months. In addition, the guidelines provide that if a "preliminary" AMP feasibility study establishes that service and efficiency will be improved by the AMP, then the sponsoring District Office or P&DC must inform the senior vice president, Operations, and Headquarters, that an AMP feasibility study is being performed.

[4031] The second phase is described at page 5 of Handbook PO-408 and concerns the compilation of the AMP Proposal Documentation. The AMP proposal is expected to involve the development and submission of the supporting documentation through the appropriate approving channels for final Headquarters consideration. The actual AMP proposal documentation is supposed to consist of an executive summary, supporting worksheets (1-10), and a geographical map of the area. The 10 supporting worksheets are required to, at least, include the methods used to provide the mail arrival profile; operation window availability; flows used to determine total piece handling volume and workhours; service impacts; employee impacts; and transportation impacts.

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[30] Handbook PO-408, *Developing and Implementing Area Mail Processing*, May 1984, and Handbook M-82, *Developing Area Mail Processing Proposals,* March 1995.

[4032] Review and Approval of the AMP Proposal at three levels occurs during the third phase of the AMP process as explained in Handbook PO-408 at pages 6-7. Signatures are then needed from the affected P&DC plant managers, vice president, and Area Operations at the local level, on up through the area and headquarters levels.

[4033] The fourth phase is where AMP Implementation occurs, and the process is briefly described at page 9 of Handbook PO-408. Following final approval of the AMP proposal, a date is set announcing the effective date to the managers of the affected plants, district, and area. Notification is supposed to be provided to affected employees, national and local employee organization representatives, government officials, and customers. Handbook PO-408 states at page 9 that close coordination between area and local human resources is required to ensure compliance with the Employee and Labor Relations Manual (ELM) and employee organization National Agreement.

[4034] The fifth and final phase of the AMP process is Post-Implementation Review (PIR) and is discussed in Handbook PO-408 at 11-13. The results of actual changes must be reviewed twice during the first year after implementation.

b. Description of Regional Distribution Centers (RDCs)

[4035] A key part of END is the activation of RDCs. RDCs will consolidate parcel and bundle sorting and house surface transfer centers, which will be the hubs of the Postal Service's transportation network. The future network configuration is based on the concept of RDCs that will operate in concert with subordinate Local Processing Centers (LPCs) and Destinating Processing Centers (DPCs). USPS-T-1 at 11-12. For the most part, RDCs will be created from existing facilities although some will require new construction. *Id.* at 11; USPS-LR-N2006-1/23 at 5. Conversions from existing BMCs or P&DCs will require removal of some equipment, retrofitting with new equipment, and may require alteration or expansions of buildings. USPS-LR-N2006-1/23 at 5. During the conversion, mail processing operations may need to be, at least

temporarily, shifted to a processing annex or other nearby processing facility to maintain continuity of operations. *Id.*

[4036] While RDCs are designed to be standardized, they are expected to vary in size depending upon anticipated mail density. *Id.* The RDC process will involve renaming and probable reconfiguration of various regional processing hubs into RDCs, replacing BMCs and integrating them with other transportation hubs such as Hub and Spoke Program facilities (HASPs) and smaller mail processing and consolidation facilities. The number and location of RDCs have not yet been determined; the actual number of RDCs could range from 28 to as many as 100. USPS Brief at 5. The Postal Service has indicated a given iteration of the END Optimization Model may suggest approximately 70 RDCs as optimal. *Id.*

[4037] An RDC is considered activated when required facility projects have been completed, the necessary processing and material handling equipment is deployed, supporting transportation is in place, and the tasks for allowing both internal and external mail flow changes are completed. USPS-LR-N2006-1/23 at 5. The activated RDC will be processing its destination entry products, and packages and bundles of all classes.

[4038] Primary sorting equipment for RDCs will include:

- the Automated Package Processing System (APPS); or Small Parcel and Bundle Sorters (SPBSs) at low volume density RDCs, and existing parcel sorting equipment at converted BMCs;
- a tray sorter system (High Speed Tray Sorter); and
- a universal sorter (High Speed or Low Cost Universal Sorter) for oversized or odd-shaped items or sacks.

Id. at 4.

[4039] The Postal Service is developing an RDC Activation Communication Plan (Tr. 2/68), a draft of which was not filed until very late in the proceedings. OCA Brief at 62, n.59. The RDC plan will "consolidate parcel and bundle distribution to take advantage of shape-based efficiencies, in addition to other responsibilities." USPS-LR-2006-1/23 at 3. RDCs will process parcels and bundles of "all" classes and service at a mail entry location. Tr. 3/1104. The RDC planning concept document will

include worksheets which will contain an executive summary, provide for management concurrence, service information, workload/workhour data, mail processing equipment set, distribution changes, surface and air transportation impacts, etc. Tr. 2/67.

V. ANALYSIS OF EACH STEP AND HOW EACH IMPACTS LIKELY PROGRAM RESULTS

[5001] The Postal Service has identified important goals that it is attempting to achieve through its END process. The Commission finds these goals laudable. However, it is not clear that the Postal Service's network realignment process will achieve these goals. Section A discusses the Commission's assessment of three goals: developing a network that reflects current and future operational needs, reducing inefficiency and redundancy, and creating a flexible network.

[5002] The Commission's analysis of the Postal Service's ability to capture cost savings is imbedded in the discussion of the END models and the AMP process in Section B of this chapter.

A. Overall Assessment of Likelihood of Postal Service to Achieve Goals

1. Goal: Network That Reflects Current and Future Operational Needs

[5003] One of the Postal Service's stated goals is to develop mail processing and transportation networks suited to meet current and future postal operational needs. However, the Postal Service has not considered the impacts of its Flat Sequencing System (FSS) on its future network. According to the Postal Service, "[t]he FSS will be used to walk sequence flat mail pieces for delivery within a single or multiple 5-digit delivery zones … . Deployment is expected to begin in April 2008 … ." Docket No. R2006-1, USPS-T-42 at 18. These machines will require approximately 25,000 square feet of workroom space. Deployment of these machines will not only impact the capacity calculations, but will also affect where in the system mail will need to be merged and where mailers will be entering mail in the future. Witness Shah states, "[w]hen the FSS program is far enough along to generate a reliable quantifiable basis for estimating the impacts, it will be integrated into the future mail processing network." Tr. 2/97. However,

the Postal Service has already begun consolidations and RDC activations based on its vision of the future network.[31] The Postal Service should take precautions to ensure that changes it makes now will be able to accommodate deployment of the FSS without incurring unnecessary expense.

[5004] The Postal Service also does not consider how dropship patterns will change after the future network is fully operational. This could have significant impacts on both the mailers and the Postal Service. The IV & V report noted that:

> [D]rop points for products by mailers could be in entirely different geographic locales … the lack of an incentive for mailers could lead to drops in a location other than that desired … comprehensive plan for implementation of the network and the required mailing requirements changes should be developed to ensure the appropriate timing of events.

USPS-LR-N2006-1, Appendix B, Assumptions 13, 14 and 15.

The Postal Service evidence does not indicate that it modified its Optimization Model in response to this recommendation. The Commission agrees with the IV & V team that this is an important aspect of the future network that should be given careful consideration.

2. Goal: Reduce Inefficiency and Redundancy

[5005] The Postal Service has stated that it hopes to reduce redundancy and inefficiencies and capture the resulting cost savings. The Postal Service believes that the RDC concept will help it reduce redundancy by de-emphasizing class-based processing and transportation. Responses to several interrogatories and Presiding Officer's Information Requests seem to suggest that some redundancy may continue in

[31] *See generally*, USPS-T-2 and Tr. 2/37.

the future. For example, according to the Postal Service, the percentage of direct trips between processing facilities will only decrease 15 to 25 percent.

> Based on existing HCR's, approximately 70-80 percent of today's trips do not connect through one of the 14 national HASPs/HUBS. A fundamental tenet of the future network is transportation consolidation. An estimated 60 percent of the future trips do not stop at a national STC … .

Tr. 4/1389.

[5006] Likewise, the merging of different mail classes for processing purposes seems to be quite similar in both the current and the future network. The following quote discusses where classes of mail will be merged in the future:

> The merging of like-shaped products will mostly occur downstream from the destination processing facilities, a point after which the service standards can be considered essentially the same for all mail … .

Tr. 2/40 (Shah).

[5007] The next three quotes are from Docket No. R2006-1 discussing where mail is merged in the current network:

> "[c]lass-specific" schemes generally merge significant volumes of mail from multiple subclasses.

USPS-RT-5 at 9 (Bozzo).

> Barcoded machinable Periodicals flats are routinely merged with First-Class Mail flats at incoming secondary sortation scheme on the AFSM 100.

Tr. 11/3114 (McCrery); and

> If the operational window allows, barcoded machinable Standard Regular flats are routinely merged with First-Class Mail flats during incoming secondary sortation on the AFSM 100.

Id. at 115 (McCrery).

Incoming secondary sortation is downstream sorting that involves distribution to the carrier route.

[5008] It is unclear from this record to what degree the RDC concept will reduce redundancy. In response to Presiding Officer's Information Request No. 5, Question 7, the Postal Service provided an equipment list for the facilities in a theoretical future network. The equipment list for future LPCs is similar to current P&DCs, except that Small Package and Bundle Sorting machines have been removed. It appears that the main difference in processing in the future network will be for small parcels that can be processed on the Automated Package Processing System (APPS) machine. Witness Shah confirms that "priority parcels, standard parcels, and bundles all use the same type of equipment; the APPS. Under the shape-based processing practice, these three products would be sorted in the same building, on the same machine, as opposed to three separate buildings." Tr. 3/1170. However, he also states:

> [M]ultiple mail classes can be processed together only at the point in each mail stream where merger will not affect service distinction. At an RDC, originating Priority Mail parcels and originating Parcel Post will not be processed on the same sort plan. They will potentially be run on the same machine, just at different times; whereas, at the destinating RDC, these classes can be processed at the same time when they are both committed for delivery the next day.

Tr. 3/1049.

[5009] The opportunity to reduce redundancy may be quite limited on the mail processing side. The Postal Service may be able to reduce redundancy more effectively in its transportation network. In the current network, there are two distinct transportation

networks, the HASP network for First-Class and Priority Mail and the BMC network for Standard and Package Service Mail. By merging these two networks and locating them at the RDCs, the Postal Service may be able to realize economies of scale. It should be noted, however, that the Postal Service has said the merging of subclasses will only occur at a point where the service standards will not be affected. Therefore, even these potential economies of scale may be limited.

[5010] Eliminating inefficiency and redundancy is important, and network realignment appears likely to accomplish this to some, currently unquantified, extent. The Commission recommends that estimates of savings likely to result from this process be developed for use in evaluating future realignment proposals.

3. Goal: Create a More Flexible Network

[5011] According to witness Shah, "[f]lexibility from an operation standpoint is really one of the objectives of this process." Tr. 2/204. He goes on to explain that:

> [T]he goal is that by creating a more standard and well-defined role for every facility in the future where you are either processing letter and flat mail and you only have that kind of equipment in your building or you're processing packages and doing transportation consolidations in the future, you increase the ability to respond to these macroeconomical market forces if I may say so in terms of mail volumes or changing characteristics of mailer behavior.
>
> Increase in standard mail versus, you know, at the same time a decline in first-class allows us to change our operating plans, our operating characteristics in our mail processing infrastructure at a much better pace and a much more flexible manner than we can do it today.

Id. at 204-05.

[5012] There is a potential trade-off in flexibility gained through standardizing operations and flexibility lost through consolidating numerous operations into fewer facilities. Consolidating operations could reduce flexibility unless adequate provision is made for projected volume and demographics shifts. Consolidating operations may also lead to longer transit times for mail which might reduce flexibility in meeting operating windows. In addition, according to the IV & V Report, merging subclasses of mail for transport will lead to "an increase in the amount of destinating containers to be staged. This will be a significant change to our current operating environment, especially with Standard and [Package Mail] where traditionally the volumes are stored in trailers or yards to aid in management of floor space." USPS-LR-N2001/18, Assumption 12. This could result in less flexibility for managing floor space and timing processing operations. The Postal Service should consider this trade-off carefully when implementing network realignment.

B. Evolutionary Network Development

[5013] An important function of the realignment process is to identify and capture cost savings associated with reducing redundancy and inefficiency. The Postal Service's primary means for estimating systemwide mail processing costs savings is its END models. These models are used to guide consolidations of mail processing operations. The Postal Service presentation does not attempt to quantify expected savings, and the Commission was unable to develop any reliable estimates.

[5014] First, the opportunities for mail processing cost savings may be limited by the Postal Service's universal service mandate. Because of this mandate, incoming secondary sort schemes cannot be easily consolidated. Incoming secondary sortation accounts for the majority of mail processing costs. Consolidating outgoing sorts is feasible and may result in economies of density. However, outgoing sortation accounts for only a minority of mail processing costs so the opportunity for cost savings is relatively limited.

[5015] Second, the Postal Service does not assume that facilities will be closed after mail processing operations are consolidated. If, in fact, facilities are not closed, the Postal Service will continue to incur the fixed cost of maintaining them.

[5016] Third, key model inputs are averages, rather than facility-specific data, which may lead to inefficient operations. This point is discussed in detail in the following sections.

1. Analysis of the Optimization Model

a. Model Structure

[5017] To develop evidence on the cost, cost savings, and service impacts of the Postal Service's planned network realignment, the Commission has attempted to analyze the method employed by the Postal Service to optimize its network. The Postal Service downplays the importance of the END Optimization Model stating, "it would be a mistake to say that the END model outputs will dictate or determine specific outcomes." USPS-T-1 at 10. However, there is sufficient record evidence to conclude that the END models will substantially drive future consolidations. For example, witness Williams states:

> We use that output of the END model and compare that with the current network. And we identified through exceptions which current facilities that are processing either originating and/or destinating volumes that are not planned for the future and we've come up with our candidate list. And that's the input used in the AMP process.

Tr. 2/515.

[5018] The important role that the END models play in reconfiguring the Postal Service mail processing and distribution network led the Commission to attempt to gain a thorough understanding of the modeling process used by the Postal Service.

Unfortunately, the Postal Service was not forthcoming in providing the computer code or even process flows of the Optimization and Simulation Models. It did, however, conduct a technical conference and provide documentation on various modeling steps. It also provided responses to interrogatories and Presiding Officer's Information Requests. On brief, the OCA concludes, "despite not having the models available for analysis, for several reasons OCA has concluded the record sufficiently demonstrates the *bona fides* of the models: that they function as represented by the Postal Service … ." OCA Brief at 25. Given the reputation of the software company chosen by the Postal Service and the results of the Independent Validation and Verification Report, it appears that the program that forms the basis of the Optimization Model does what it purports to do, i.e., select the least cost alternative from the ones it has been given.

[5019] The model results, however, are dependant on the data inputs. In this regard, the model may suffer from serious flaws that could result in a future network that fails to accomplish the Postal Service's stated goals. For example, using a pre-determined distribution concept influences the form the future network will take. Additionally, questionable assumptions about the productivity and costs characteristics of the existing network heavily influence the final selection of facilities.

b. Pre-determined Distribution Concept

[5020] According to the Postal Service, the result of an initial run of the Optimization Model was not a hub-and-spoke network, but instead recommended unique solutions by region, and in some cases by facility. The consequent recommendation contained fewer facilities and resulted in lower overall network costs than the result obtained using the RDC concept. However, according to the Postal Service, "[i]t provided a non-standardized solution at the facility, regional and national level." Tr. 3/1169. The Postal Service claims that these initial results were operationally infeasible and impractical to implement. The Postal Service states:

> While this network may have resulted in the fewest facilities and the least cost theoretical solution, the complexities created due to the nonstandardized outcome would significantly increase the disruption and transition costs to migrate to such a network, as well as eliminate indirect savings associated with simplification and standardization.

Id.

[5021] Thus, the hub-and-spoke distribution system the END model seeks to optimize was chosen outside of the model, based on subjective judgments. Use of this distribution concept may be reasonable, given the fact that the Postal Service's major competitors use similar network configurations, even though a non-standardized solution could very well be a more cost-optimizing network for the Postal Service.

[5022] Carriers such as FedEx, UPS and DHL are refining their networks to adapt the hub-and-spoke network concept to their particular needs and infrastructure, leaving only limited residual point-to-point transport utilized for specialized long-haul carriage. FedEx Air operates a multiple hub-and-spoke system.[32] The primary sorting facility and center of the network is located in Memphis, Tennessee, while a second national hub is located in Indianapolis.[33] FedEx Air also operates regional hubs in Newark, Oakland and Fort Worth, and major metropolitan sorting facilities in Los Angeles and Chicago, and in 2005 opened a South American gateway hub in Miami, Florida.[34] Like FedEx Air, FedEx Ground is a multiple hub-and-spoke sorting and distribution system, consisting of 500 facilities and 29 hubs in the U.S. and Canada.[35] FedEx Ground is in the midst of a large network expansion which is expected to include nine new hubs, expansion of

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[32] FedEx 10-K annual corporate filings to the SEC (2000 to 2006 passim).

[33] FedEx 10-K annual corporate filing to the SEC (2006).

[34] FedEx 10-K annual corporate filings to the SEC (2000 to 2006 passim).

[35] *Id.*

approximately 30 existing hubs, and expansion or relocation of more than 290 existing facilities.[36]

[5023] UPS operates aircraft in a hub-and-spoke pattern in the United States.[37] Its principal air hub is located in Louisville, Kentucky.[38] UPS also has regional air hubs in Columbia, South Carolina; Dallas, Texas; Hartford, Connecticut; Ontario, California; Philadelphia, Pennsylvania and Rockford, Illinois.[39] The system involves three facets: consolidation, distribution and fragmentation. Distribution works on a hub-to-hub basis, allocated by a distance threshold (400 miles) to either air or truck routes.[40]

[5024] In 2004, DHL also began shifting from a centralized super hub system to a national hub-and-spoke system analogous to the UPS and FedEx operational designs.[41]

[5025] The Postal Service, however, differs from these competitors in ways that may indicate a unique optimal network configuration. One very important difference is the Postal Service's universal service mandate. This essentially requires that the Postal Service must have the capability to deliver to every address in the country six times a week. Consequently, incoming mail processing, which accounts for a majority of total mail processing costs (more than 65 percent) must be performed relatively close to its final destination, limiting the opportunity for centralized processing. Tr. 3/128.

[5026] The Postal Service has indicated that its optimal solution will use existing infrastructure to the greatest extent possible. This current network dates back to the early 1900s and exhibits significant differences in physical infrastructure and productivity among its facilities. The Government Accountability Office (GAO) observed, "[t]he growth

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[36] *Id.*

[37] UPS 10-K annual corporate filings to the SEC (2002 to 2006 passim).

[38] *Id.*

[39] *Id.*

[40] *Id.*

[41] Federal Highway Administration (FHWA) conference presentation by DHL staff, October 2004 ("By shifting to a hub and spoke system, we are now able to provide competitive service, while taking advantage of the economies of scale that come with consolidation," concludes the presentation.).

in infrastructure over time has resulted in differences in processing plants and contributed to variations in productivity and cost among plants." USPS-LR N2006-1/7 at 28. The Postal Service acknowledges that there is a wide variation in productivity due to factors such as these that are not easily isolated and rectified. Docket No. R2006-1, Tr 10/2482-85. Therefore, solutions that recognize the unique characteristics of individual facilities and shift mail processing to more efficient facilities may provide increased cost savings and fewer service disruptions.

[5027] The Postal Service indicates that actual facility-specific costs were not used because the model would become unwieldy.[42] Much of the Optimization Model's complexity arises from the proliferation of binary variables that are intended to indicate the size category to which the operation belongs.[43] These binary variables may add unnecessary complexity because workload may not be a reliable indicator of marginal costs at the plant level.[44]

[5028] It might be possible to substantially simplify the Optimization Model by eliminating the binary decision variables that indicate operation size, and by modeling processing operations as shape-based sets of operations. The Postal Service should investigate whether these changes in approach would simplify the Optimization Model sufficiently to allow it to incorporate actual productivity figures specific to shape-level operation sets within each plant. This might provide a close substitute for plant-level volume variable cost to guide the model's decisions as to what candidate plants to retain in the optimized future network. If so, the widely varying productivities and variable costs

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[42] "With a logistics network as complex as the United States Postal Service, it is impossible to model every facet of every facility and have an optimization solve in a reasonable period of time; therefore, simplifying assumptions need to be made." Tr. 2/155.

[43] The Optimization Model separately models 19 mail processing operations. USPS-LR-N2006-1/17 at 5. It adds binary decision variables that categorize each of the 19 operations by size, according to its throughput level. *Id*. at 12. These are further multiplied by 12 shape/product variables. *Id*. at 14.

[44] The Postal Service could test its assumption that size is a reliable indicator of cost by modeling a subregion of the network using facility-specific data. If the results of the subregional model are significantly different from the model output from the aggregated run, this would indicate that using size of operation as an indicator of marginal cost is not likely to accurately estimate the costs of the network.

of specific processing plants could be taken into account in arriving at the model's optimized network configuration. If the dominant sources of productivity differences among plants are essentially fixed, as the Postal Service's cost analysts maintain, this approach to reconfiguring the network has the potential to substantially improve productivity without degrading service, and lower the unit processing costs of the reconfigured network.

c. Standardization and Average Productivities

[5029] As noted above, the Postal Service rejected the original solution produced by the Optimization Model and adopted the RDC concept, in part, because it wanted to standardize its operations. According to witness Shah, "standardizing the role of operations within these facilities … cannot be overstated in terms of importance … ." Tr. 2/205.

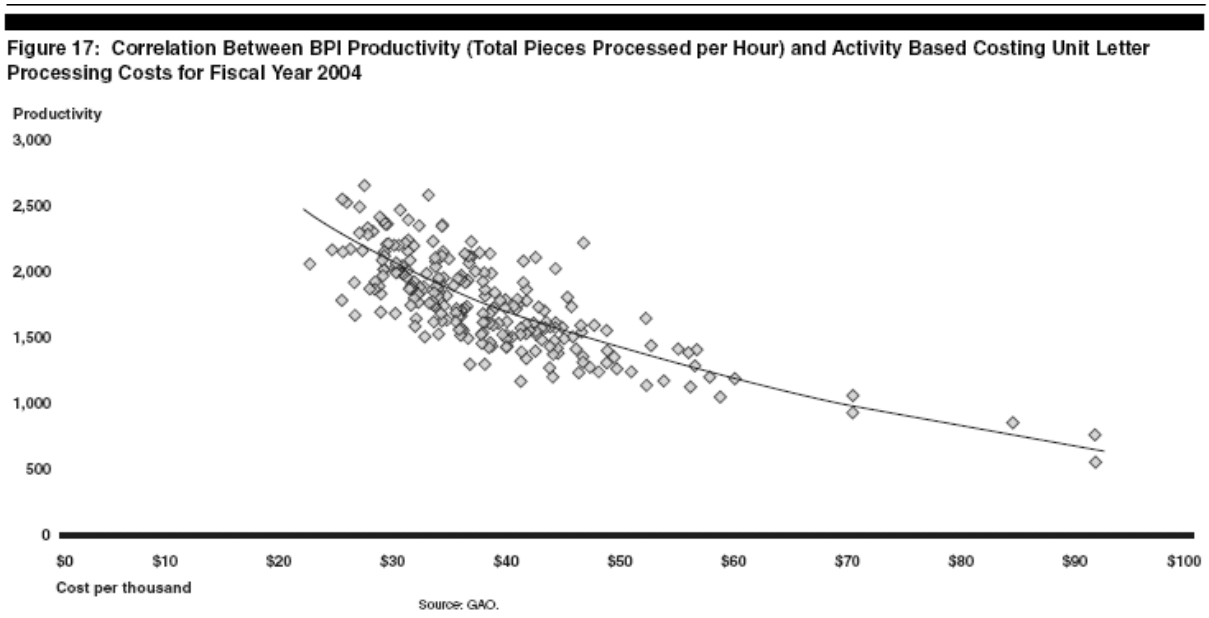
[5030] The focus of the Postal Service's END Model is to minimize the cost of mail processing. This must be done through an increase in productivity, since the unit cost of mail processing is tied so closely to productivity.[45] There is a remarkably wide gap in productivity among plants. This gap has remained largely unchanged since the Postal Service was reorganized in the early 1970s. There is no evidence that the Postal Service has systematically studied the sources of the wide disparity in productivity among plants, and no evidence that it has a program in place that is likely to remove its causes. Yet, in crucial respects, the success of the Postal Service's network realignment program depends on the validity of the network realignment team's assumptions that imputing system average productivity and cost characteristics to individual plants throughout the system can accurately guide the model's selection of which plants to close, which to enlarge, and which to convert to hubs.

[45] Unit marginal cost is the reciprocal of unit marginal productivity.

[5031] The basic disconnect between the actual productivity and cost characteristics of processing plants in the current network and the plant characteristics that are assumed in the inputs to the END Optimization Model raises the risk it will recommend shifting workload from more productive, lower-cost plants to less productive, higher-cost plants. This could leave the Postal Service with a less productive and more costly set of processing plants. To understand the extent of the risk, it is first necessary to understand the extent of the differences that characterize the current mail processing network.

[5032] Mail processing productivity is important because in the postal system, wage rates (for comparable positions) are the same system-wide. Consequently, productivity largely determines mail processing unit costs. There is extraordinarily wide variation in productivity at postal facilities. This is demonstrated by the figure below, taken from page 49 of the report of the Government Accountability Office entitled, *U.S. Postal Service: the Service's Strategy for Realigning Its Mail Processing Infrastructure Lacks Clarity, Criteria and Accountability*, GAO-05-261, filed as USPS-LR-N2006-1/7.

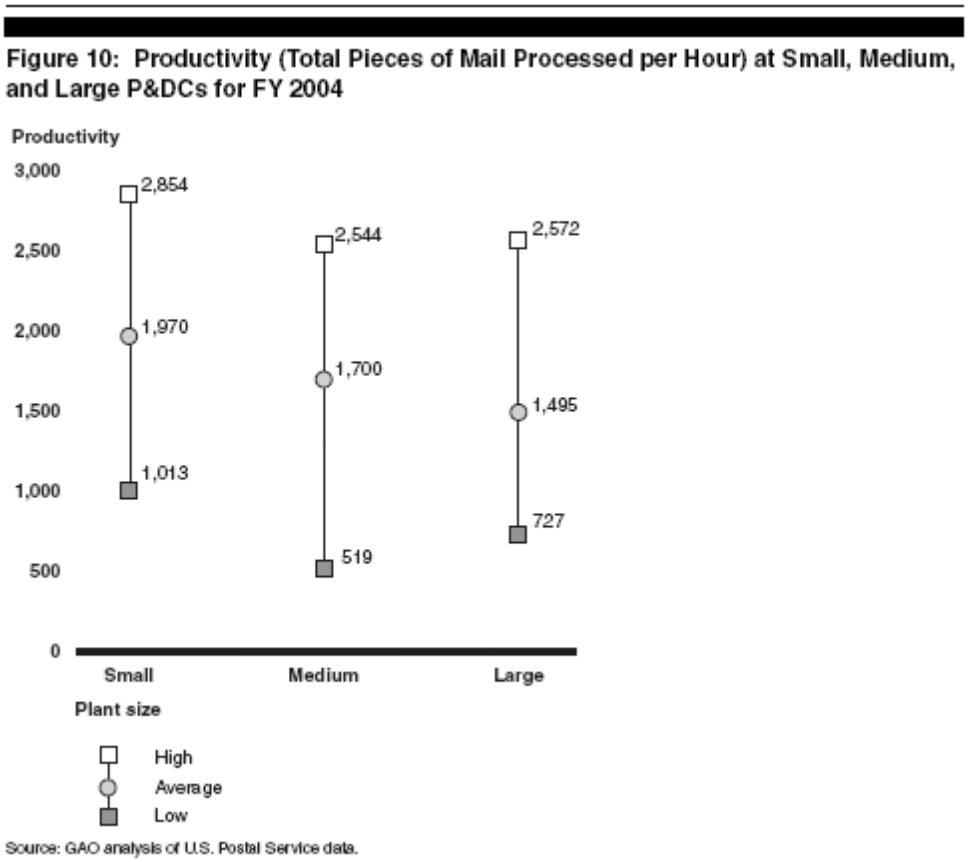
Figure 5-1



It plots pieces processed per hour against unit mail processing costs for individual facilities. In addition to the tight correlation between productivity and costs, the figure shows that in FY 2004, even disregarding outliers, unit mail processing costs in the less productive plants differ substantially from those of the more productive plants.

[5033] The GAO Report also shows that there is an enormous gap in productivity among mail processing facilities. Figure 5-2 below, taken from page 30 of that study, shows that productivity varies by more than a factor of five across mail processing plants.

Figure 5-2



What is true at the plant level is also true at the level of individual processing operations within plants. Appendix C presents frequency distributions of productivity for each of the 11 sorting operations that the Postal Service models econometrically as part of its ratemaking cost presentation. They show that even after the "tails" are eliminated from these distributions, productivity differs from the least productive to the most productive plants by from several hundred percent to over 1,000 percent.[46]

[5034] Not only is the gap in productivity across plants and operations remarkably wide, it has been remarkably durable. During a recent seminar on mail processing costs held at the Commission, a veteran Postal Service costing consultant noted that a roughly

[46] The AFSM 100 operation is the only exception. It displays more than a 50 percent difference in productivity across plants, after the tails of the distribution are eliminated.

three-fold difference in mail processing productivity among plants has existed since the early 1970s, despite the transformation of mail processing from an all-manual activity to a highly specialized and automated process.[47]

[5035] Postal management has recognized that there are large productivity differences among mail processing plants and attempted to narrow them as part of an ambitious program that it calls its "Breakthrough Productivity Initiative" or BPI program. Begun in 1999, the BPI program attempts to achieve standardized performance through an incentive system. The BPI program measures the productivity of specific processing operations at its best-performing group of plants, and establishes a productivity standard for that operation for plants throughout the system. The performance of each operation is evaluated against the BPI standard, and the gap is defined as the measure of its "opportunity" for improvement. *See* discussion in Docket No. R2006-1, USPS-LR-L-49. Managers at each plant are assigned a targeted improvement in productivity. This target is incorporated into the manager's annual budget in the form of a budget reduction. The manager's performance evaluation and pay is tied to his adherence to the budget that reflects the productivity improvement targets. *See* Docket No. R2006-1, USPS-RT-15 (Oronzio) at 5-6.

[5036] The charts in Appendix B (seven charts taken from Tr. 3/1198-1221) show that the gap in productivity among plants has increased for some operations and decreased for others over the life of the BPI program, but there is no overall trend reducing the gap in productivity among plants and operations. The Postal Service regards its network realignment program as "another process for achieving current and future BPI savings goals … ." Docket No. R2006-1, USPS-T-42 (McCrery) at 34. With respect to standardization, there is no indication that the Postal Service approach to managing network realignment will differ materially from its approach to managing the

[47] Workshop by Professor Mark Roberts on His Economic Framework for Modeling Mail Processing Costs, March 14, 2006, Afternoon Session at 18-19. Available at *www.prc.gov* ("Consumer Advocate," "OCA Papers," "Workshop Transcript").

broader BPI program. For that reason, it may not be prudent to expect a materially different result.

[5037] One obstacle to closing the gap in productivity among mail processing plants is that its causes have not been identified in any systematic way. Another is that the most important causes appear to be inherent and unchangeable, in the view of the Postal Service's own cost analysts.

[5038] The Postal Service's current network dates back to the early 1900s. Partly for that reason, plants exhibit significant differences in age, physical layout, proximity to transportation, to other plants, to large customers, etc. There are also differences in demographic setting (inner city/suburb/rural). These differences in service area result in differences in complexity of sorting tasks, and differences in age and quality of workforce. USPS-LR-N2006-1/7 at 28-35.

[5039] The Postal Service's cost analysts work primarily in the ratemaking arena. There, they assert that the wide disparity in productivity that is observed in the historical data reflects plant-specific "fixed effects," such as age, number of floors, and physical location, that have persisted, and will continue to persist, over time and foreseeable ranges of volume. The specific causes of these fixed effects are not known, and therefore cannot be explicitly modeled. Nevertheless, the Postal Service's cost analysts view them as having a greater effect on productivity levels than the effect of changes in the level of volume processed by the plant. *See* Docket No. R2006-1, Tr. 10/2056-57. They believe that distinguishing these effects from volume-related effects is an essential task in modeling the volume variablility of mail processing costs. *See* Docket No. R2006-1, Tr. 10/2482-95.

[5040] The Postal Service's END development team has built its model on the assumption that the wide productivity differences among plants that characterize the current system will become irrelevant in the process of network realignment. Yet that team has not offered any reason for expecting that network realignment will transform the current mail processing landscape with its wide disparities in productivity into one of standardized productivities.

[5041] Postal Service testimony in Docket No. R2006-1 addresses the implications of the network realignment program for estimating volume variable mail processing costs. There, the Postal Service cost analysts argue that no dramatic change in cost behavior is to be expected. The chief Postal Service mail processing cost witness maintains that his estimated cost functions, which are based entirely on historical productivity data, should accurately predict mail processing cost behavior in FY 2008 (the Docket No. R2006-1 test year) even though the Postal Service will be in the middle of network realignment. He contends that with respect to marginal mail processing productivity and costs, past will be prologue, because "existing sorting technologies will remain in use, and the general organization of sorting activities appears likely to undergo evolutionary rather than revolutionary changes in the near future." Docket No. R2006-1, USPS-T-12 (Bozzo) at 13.[48]

[5042] If the changes in mail processing technology and organization associated with the network realignment program are as modest as the Postal Service's mail processing cost expert describes, it may be unrealistic to expect that the productivity and cost characteristics of plants will be transformed as a result. There is no evidence that the Postal Service has identified the causes of these differences or determined what the remedies would be. Its mail processing costing experts cannot identify the dominant causes of most of these differences sufficiently to model them, and postal management has not been able to eliminate them despite intense pressure to do so with its BPI program. Accordingly, it would seem to be unrealistic to simply assume that the wide gap in productivity among mail processing plants that has persisted for so long will become irrelevant as a result of network realignment.

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[48] He observes that "[a] large majority of the costs covered by the econometric volume-variability analysis—80 percent—are in letter and flat piece sorting operations in which the outgoing (LPC) and incoming (LPC and DPC) piece sorting operations will substantially resemble their current P&DC counterparts." Docket No. R2006-1, Tr. 10/2484. He emphasizes that most of the consolidations from network realignment "involve absorbing mail processing operations (or portions thereof) at smaller facilities into considerably larger neighboring plants" where the added workload should be easily absorbed, due to the spare equipment capacity that is routinely available in outgoing sorting operations. *Id.* at 2485.

[5043] The Postal Service's END development, nevertheless, incorporates this assumption. As the Postal Service describes it, the model's objective function is to "maximize utilization of available capacity, thus minimizing costs." Tr. 2/81.[49] Thus, excess capacity is a key concept underlying the Optimization Model. For all plants eligible to serve a given 3-digit ZIP Code, the model's pre-processor determines how many machine hours and associated square feet are available to process mail of various kinds. It then determines how many machine hours and square feet are actually needed to process current volumes. This difference is an estimate of excess capacity available to serve that 3-digit ZIP Code. In calculating excess capacity, eligible plants are assumed to have system-average productivity.[50]

[5044] This calculation of excess capacity shapes the optimal future network recommended by the model. In the initial run of the model, the main criterion for eliminating certain plant/operations from further consideration for inclusion in the optimal future network is whether another eligible plant has sufficient capacity to absorb its workload. Generally, if one does, the workload is absorbed, regardless of the actual productivity or cost characteristics of either the shedding plant or the absorbing plant. Setting up the first run this way is designed to "encourage the most consolidation." USPS-LR-N2006-1/17 at 18.

[5045] If the absorbing plant has significantly lower-than-average productivity, however, it may not be able to absorb the workload. This raises serious risks that service will suffer and processing costs will increase. If the shedding plant had

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[49] It is important to note that maximizing utilization of available capacity and minimizing total network costs are not necessarily synonymous. For example, moving all operations out of a facility with low fixed and variable costs into a facility with high fixed and variable costs may maximize utilization of capacity but could increase actual costs.

[50] There is conflicting evidence on this point. The Postal Service states in response to OCA/USPS-36(b) that "[i]ndividual plant productivities are taken into consideration as inputs as capacity functions are developed." Tr. 3/1051. However, during extensive oral cross-examination, witness Shah, the Postal Service's Optimization Model expert, testifies that average productivities are used to determine capacity. Tr. 2/187-190.

significantly higher productivity than the absorbing plant is able to achieve, the consequence is simply an increase in system processing costs.

[5046] The likelihood that the systemwide average productivity may substantially overestimate or underestimate the productivity of any given plant/operation is high, in view of the wide range of productivity of plants and operations across the system shown in Figure 5-2 and Appendix C.

[5047] The END development team knowingly assumes the risk of seriously misestimating excess capacity in particular plants "because we would like to give every facility the benefit of the doubt that given certain steps or actions taken that you can improve productivity at a minimum to be average. . . . We did not want to preclude any facility from playing a role in the future network just based upon its current productivity." Tr. 2/189-90. In view of the wide range of productivity among plants, and its predominantly permanent causes (in the view of the Postal Service's costing analysts), this amounts to a "leap of faith" with little empirical or analytical support.

d. Confusing Size with Marginal Costs

[5048] The method the Postal Service uses to develop plant level marginal costs as inputs for its Optimization Model rests on several basic assumptions that appear to be seriously flawed. The most important misassumption is that plant size is a reliable proxy for plant marginal processing cost. This assumption lacks both theoretical and empirical support.

[5049] Another issue that warrants re-evaluation by the Postal Service is whether the cost functions that it has developed for ratemaking purposes, which some view as capturing only short-run marginal costs, provide appropriate guides for the long-term reconfiguration of the postal network. If the cost functions that it has developed for ratemaking purposes are appropriate guides for long-term network reconfiguration, another issue arises that requires re-evaluation by the Postal Service. The outgoing operations are the ones for which consolidation makes operational sense. For the

outgoing operations that are the most significant in terms of cost, the Postal Service estimates volume variable costs that rise in direct proportion to volume, implying that consolidation of those operations would not reduce marginal costs. *See* Docket No. R2006-1, USPS-RT-5 at 10.

[5050] According to the END development team, assuming that group size is a proxy for the marginal mail processing costs of individual plants allows the model to capture "economies of scale" in its selection of mail processing plants/operations for inclusion in the optimal future network. The team infers that mail processing exhibits economies of scale because most of the cost functions that the Postal Service has developed for ratemaking purposes show that costs rise less than proportionally with volume.

[5051] The assumption that the cost functions developed for ratemaking indicate economies of scale in mail processing misinterprets that research. Rather than indicate economies of scale, the Postal Service analysts who developed these cost functions, believe that they indicate that there are "economies of density."

[5052] "Economies of scale" have been defined in the academic literature as reductions in average cost that occur when all inputs increase proportionally to produce greater output. This is usually regarded as a long-run phenomenon. "Economies of density," also called "economies of fill," are a more short-run phenomenon in which the variable inputs (in this case, mail processing labor) increase in order to increase output (sorted mail) while other inputs remain fixed (in this case, the labor time needed to prepare a machine to sort mail to a unique pattern or "scheme"). As output rises, marginal cost falls and the cost of the fixed input is spread over more units of output. When the capacity of the fixed input is reached, a second unit of the fixed resource is obtained, or a less efficient substitute for it is used. *See* William W. Sharkey, *The Theory of Natural Monopoly*, Cambridge University Press (1982) at 198-200.

[5053] The difference between "economies of scale" and "economies of fill" are significant in the context of network realignment because economies of fill do not depend

on the size of the fixed input. As the Postal Service's cost analysts recognize, smaller mail processing plants are as likely to exhibit economies of fill as larger plants.[51] Interpreting the cost functions borrowed from the ratemaking arena as reflecting economies of fill leads to the conclusion that the size of operations at plants is not relevant in estimating their marginal costs.

[5054] This misassumption that size is a reliable indicator of marginal mail processing costs plays a key role in shaping the optimal future network that the model recommends. As described earlier, the first run of the Optimization Model pares down the set of candidate plant/operations for each 3-digit ZIP Code area by shifting workload from one eligible plant to any other eligible plant with enough excess capacity to absorb it. It does this without regard to any productivity or cost differences that these plants might actually have.

[5055] The second run of the model takes that reduced set of candidate plants and considers the "true size" of each (as an indication of its true marginal cost). It makes any adjustment in workload assignments that would reduce costs relative to the first run (by shifting workload to a larger candidate plant, if there is sufficient excess capacity to absorb it). Additional iterations where the "true size" and implied cost of eligible plants is considered are run, if necessary. USPS-LR-N2006-1/17 at 18-19. Therefore, in the second and subsequent runs of the Optimization Model, an assumption that "biggest is best" (all else being equal) guides the selection of plants to be retained in the optimal

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[51] In Docket No. R2006-1, Dr. Thomas Bozzo, who developed the Postal Service's mail processing cost variability models that were adapted by the End development team, observed

> Intuitively, a plant serving 750,000 delivery points will have many more scheme changes than a plant serving 150,000 delivery points, and the former plant will also tend to have greater sorting volumes. As a result, the two plants may not differ very much in the extent to which non-volume-variable scheme change costs are spread over their volumes. Consequently, both sizes of plants may have similar opportunities to achieve economies of density—e.g., by processing more mail to their respective (existing) delivery networks.

Docket No. R2006-1, Tr. 10 at 2659-60.

future network. The ultimate result of this modeling approach is to maximize consolidation of plants/operations into the largest eligible plants.

[5056] Assuming that all facilities of a given size have the same marginal mail processing cost means that the model is oblivious to differences in age, layout, or other factors that the GAO Report identified as sources of differences in productivity across plants.[52] The END development team agrees that the END model ignores these factors. Tr. 3/1109.

[5057] The risks involved in the approach that the END model takes to redesigning the postal network is actually greater than simply using an irrevelant factor (size) as a proxy for the cost characteristics of individual facilities. The productivity of processing plants/operations not only varies over a remarkably wide range, but it varies inversely with size. Figure 5-2 from the GAO Report shows that smaller plants are, on average, more productive than medium-sized plants, and that medium-sized plants are more productive, on average, than large plants. GAO Report at 30.

[5058] This pattern holds at the level of individual operations as well. In the ratemaking arena, the Postal Service estimates systemwide mail processing variability for 11 operations. Each model regresses workhours in the operation on Total Piece Handlings (TPH) in that operation. At the Commission's request, the Postal Service ran these operation-level models on data that was partitioned into thirds by size of operation (small, medium, and large). The results are presented in Appendix A. They show that the small group was the most productive in five of the operations, the medium group was the most productive in three, and the large group was the most productive in three. Lower volume variability implies lower total marginal cost for a plant. In terms of volume variability, the small group was lowest in two, the medium group was lowest in four, and the large group was lowest in five. This means that by following the size-based

[52] In the postal system, wages are standardized systemwide, and labor costs are 85 percent of total costs. This means that labor productivity essentially determines unit processing costs, whether the focus is on average or marginal cost. Since the Postal Service has average productivity data at the plant level, but does not have sufficiently detailed data to measure marginal effects at the plant level, average productivity is the best available empirical indication of marginal cost at the plant level.

approximation procedure used in the END model, it would misidentify the least cost group the majority of the time (6/11 = 55 percent).

[5059] This illustrates the inappropriateness of using the mail processing cost models that were designed for ratemaking as guides for restructuring the postal network. The ratemaking models are designed to find a systemwide volume variable cost to use as a base for making systemwide rates. They aggregate MODS data from processing plants into a systemwide panel, then regress workhours on piece handlings to infer how labor hours respond to volume. Most of them use a mathematical formula (translog) that forces system workhours to change monotonically as system workload changes. The partitioned models reveal that workhours and workload may move in opposite directions.

[5060] For this reason, the monotonic cost curves borrowed from the ratemaking arena do not provide information about how workhours for particular operations at particular facilities respond to workload. This is the task that the Optimization Model faces. It needs to use the actual mail processing costs for particular facilities/operations in order to determine which facilities could handle a given workload at the lowest cost.

[5061] *Volume Variability.* The assumption that marginal cost decreases as the size of the operation increases is based on the Postal Service's models of volume variable mail processing costs developed for ratemaking. For most operations, they estimate a volume variability that is less than 100%. In the past, these models have been rejected by the Commission as unreliable. One concern is that the MODS workload data exhibit a high proportion of measurement error. Measurement error tends to push regression estimates toward zero because of attenuation bias.

[5062] If the Postal Service's estimated volume variabilities are lower than actual volume variabilities, it raises the likelihood that consolidation of those operations will not reduce unit mail processing costs as expected.

[5063] The Commission has previously found the Postal Service's volume variability models as flawed in another important respect that tends to understate the relevant measure of variability. By limiting its models to individual processing operations, an important contributor to volume variability is not measured, namely, adjustments to

volume that are made in the mix of operations, both within shape-based processing streams, and at the plant level. These volume effects appear when longer time horizons are considered, such as the multi-year rate cycle. Estimates that cover a multi-year time horizon may be more appropriate to use as guides to optimal network reconfiguration.

[5064] Expert witnesses have renewed these long-standing criticisms in Docket No. R2006-1, which remains pending. They provide evidence that when longer-term cross-operation adjustments to volume are included in the models, volume variability in many individual operations is estimated to be at or above 100 percent. This implies that those operations do not exhibit economies associated with higher volumes — including economies of density. If these criticisms are valid, consolidation of those operations should not be expected to reduce their volume variable costs.

[5065] Another concern is that the Service's models are not robust, since they yield substantially different results when subsampling and other standard tests are applied. *See* Appendix A. Partitioning the MODS dataset into thirds by level of output causes seven of the 33 elasticities that contribute to the Postal Service's processing cost estimates that it uses in ratemaking to change by statistically significant amounts. Tr. 4/1341-45.

[5066] Figure 5-2 and Appendix B both show large processing operations typically have been less productive than small ones over the period covered by the Postal Service's models. A recent study of mail processing in Great Britain by the LECG Consulting Group also concluded that large mail processing facilities in that network exhibit diseconomies of scale.[53] All of this should cause the Postal Service to re-examine its belief that there are substantial economies of scale or output that consolidation could capture.

[5067] If one were to assume that the volume variability estimates produced by the Postal Service's mail processing cost models are accurate despite the quality of the

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[53] *See* LECG, Future Efficient Costs of Royal Mail's Regulated Mail Activities, 2 August, 2005 at 365. *See www.psc.gov.uk/postcom/live/policy-and-consultations/consultations/price-control/LECG efficiency review report excised.pdf*.

MODS data, and that they measure volume responses over an appropriate time horizon, for operational reasons there will still be limits on potential mail processing cost reductions.

[5068] Mail processing costs are almost entirely labor costs, and labor costs are almost entirely variable with respect to output. The most plausible source of significant fixed labor costs in mail processing is the time associated with "setting up" and "tearing down" a unique sort scheme on a mail processing machine.[54]

[5069] Consolidation of mail processing functions makes sense for the outgoing stages of mail processing. Mail sent outward from a given 3-digit ZIP Code area needs to be separated into a relatively few distinct destinations, such as locally-destined turnaround mail, mail going to a small set of regional concentration points (ADCs or AADCs) and a few large metropolitan areas. Mail sent outward from processing plants have most of these destinations in common with neighboring plants. This means that outward mail from neighboring plants could be combined on one machine running the same sort scheme. This would spread the "overhead" represented by the time spent on the initial set-up and the final sweeping of that particular scheme.

[5070] Incoming secondary sort schemes, where the Postal Service mail processing costs are concentrated, must sort all of the mail, and only the mail, that destinates in a particular ZIP Code. This is the last sort before the mail goes to the delivery unit. Each separation is unique to either a specific carrier or a specific address. There is no opportunity to further aggregate mail from different sources into the scheme that must be run. The only way to spread the "overhead" represented by set up/tear down time associated with an incoming secondary scheme is to increase the amount of mail sent to those destinations into that scheme.

[5071] Outgoing sorting operations account for less than 35 percent of total sorting costs. Tr. 3/1128. In Docket No. R2006-1, the Postal Service estimates that for the

[54] Setting up a sort scheme may involve loading mail on ledges, appropriately labeling bins, and loading the sort scheme pattern on the machine's computer. Tearing down a sort scheme may involve sweeping bins and putting the contents in trays, or removing trays themselves, depending on the machine.

major outgoing operations (outgoing BCS and outgoing AFSM 100 operations) volume variabilities are statistically indistinguishable from 100 percent. Docket No. R2006-1, USPS-T12-1 at 10. This implies that consolidation of those operations will not achieve significant output-related economies. Consolidating other outgoing operations that the Postal Service estimates do have significant economies of density (the cancellation operation and the Optical Character Reader operation) independently of the BCS and AFSM 100, would seem to have limited value, since the purpose of the latter operations is to prepare mail to go through the basic sorting operations of BCS (for letters) or the AFSM 100 (for flats).

e. Transportation Cost Savings

[5072] The Postal Service has not provided an estimate of transportation cost savings that will be realized from redesigning the processing and distribution network. The Postal Service believes that transportation cost savings will be realized through merging subclasses of mail together. However, as noted above, merging of mail classes will only occur at a point where service standards will not be compromised, usually where incoming secondary sortation occurs. Therefore, it is not clear how the Postal Service expects to realize substantial cost savings. In fact, according to the Postal Service, "the current networks total HCR miles are approximately 994 Million annually. The theoretical network estimated miles are 997 Million." Thus, surface mileage, and presumably cost, actually increases in the future network. The Postal Service has indicated that the increase in highway mileage will be offset by a decrease in air mileage, however, there is no way to verify that on this record. In addition, there is no estimate of capital expenditures needed for transportation changes even though the IV & V Report found that dock space may be inadequate at many potential RDC locations.[55]

[55] IV & V Report, Appendix C, Assumption 18.

[5073] A key component of achieving transportation cost savings is maximizing truck capacity. That component is not considered by the END models. Witness Shah testified:

> We do not have [truck capacity utilization] at the moment as part of the END models that optimizes transportation routing and scheduling for surface mail. That is correct, but we are developing one. It has been a project approved by the board of governors and will be ready for use early next year.

Tr. 2/325.

[5074] The END models also do not attempt to optimize transportation at the local level.

> [W]e have not optimized the transportation routes and schedules between mail processing facilities and the long-haul transportation in the network. The transportation from areas of post offices to a plant is more for localized transportation, and it's more of a shuttle run that carries mail back and forth, and we have assumed no savings opportunities out of that transportation.

Tr. 2/326.

[5075] It would seem that the ability to effectively utilize truck capacity and minimize local transportation costs would be an integral part of an optimized future network. The Postal Service seems to agree, but finds it more important to optimize its mail processing network first:

> [O]pportunities are costs from an annual standpoint, you know, are close to $14-15 billion, while the transportation that you consider for the long-haul transportation for surface, because that's really what we're talking about here, is basically two-and-a-half, three billion dollars. So, not that it's a small amount or not that it's not important to optimize, which is why we're making all of these investments, but the

> first thing that we need to solve or we needed to design was a mail processing infrastructure, making sure that there is the right network in place.
>
> The second step, then, obviously, would be to optimize the transportation routing and scheduling between those nodes in the network, as we start implementing the network.

Tr. 2/329.

[5076] The Postal Service should consider integrating its transportation Optimization Model with the END models.

2. Analysis of Simulation Model

[5077] The Postal Service properly tests the feasibility of its Optimization Model by running a Simulation Model on the output. Witness Shah states that more facility-specific data is reviewed during this stage of the process.

> The optimization model outputs suggest the facility roles and ZIP Code assignments for a given distribution concept. These roles and assignments are then used as inputs into the simulation to further test the feasibility of the network design with more site specific information.

Tr. 2/81.

[5078] According to witness Shah, the Simulation Model runs the optimization output through a "facility with given equipment sets, with the existing service standards as constraints…[to] see if we can actually clear that workload through that facility in the time given based on operating parameters and the equipment given to it." Tr. 2/273. This is a vital step in the overall process. Confirmation of feasibility from a suitable Simulation Model could mitigate some of the concerns expressed above. However, the use of appropriate productivity measures is imperative if the Simulation Model is to

produce accurate results. The Commission has concerns about this aspect of the modeling. According to the IV & V Report, "national average run time throughputs were utilized for all operations in the simulation model." USPS-LR N2006-1/18, Appendix C, Assumption 18. The same concerns that the Commission expressed in the previous section regarding the use of averages in determining required capacity and facility costs apply here as well. Namely, there are such wide variations in the productivities, operating plans, and other factors between postal facilities that national averages may not be representative of specific facilities. Witness McCrery, in Docket No. R2006-1, points out:

> [F]actors like daily preventative maintenance, site-specific work practices, cross-clocking by employees, volume and the arrival profile of mail, size and shape of facility, etc. can cause differences in throughput and productivity.

Docket No. R2006-1, Tr. 11/3117.

By using national averages to determine whether an optimized solution is feasible, the Postal Service runs the risk of implementing changes that may not, in fact, be feasible.

[5079] The IV & V Report also found that runtime throughputs were not always the best measure of operational throughput actually achievable. Table 5-1 is a summary of the IV & V Report findings for the DBCS operation at 10 different facilities. The table shows that throughput varies widely among facilities depending on the specific measure used. For example, facility specific runtime throughput varies from the national average by a range of -1 percent to 9 percent. When downtime is added, the throughput measure varies from the national average runtime by a range of -13 percent to 2 percent. If idle time is included, the range increases to -38 percent to -5 percent.

Table 5-1
Throughputs From Independent Verification and Validation Report

		FACILITY SPECIFIC MEASURES					
		Runtime		Runtime + Downtime		Runtime + Downtime + Idle time	
DBCS Operation at Facility:	Model Throughput (National Average Runtime)	Throughput	Percentage Difference from Model Throughput	Throughput	Percentage Difference from Model Throughput	Throughput	Percentage Difference from Model Throughput
1	37,895	40,435	7%	36,151	-5%	31,852	-16%
2	37,895	41,137	9%	38,685	2%	35,933	-5%
3	37,895	40,870	8%	36,481	-4%	31,855	-16%
4	37,895	40,518	7%	36,546	-4%	29,829	-21%
5	37,895	37,532	-1%	32,880	-13%	26,623	-30%
6	37,895	39,303	4%	34,948	-8%	29,547	-22%
7	37,895	39,812	5%	35,721	-6%	29,451	-22%
8	37,895	39,069	3%	35,342	-7%	23,327	-38%
9	37,895	39,561	4%	36,537	-4%	33,587	-11%
10	37,895	39,821	5%	36,036	-5%	32,473	-14%

Source: USPS-LR-N2006-1/18, Appendix C, Assumption 7.

[5080] The IV & V Report concluded that the most accurate measure of achievable throughput for the DBCS operation is runtime, plus downtime, plus idle time. USPS-LR-N2006-1/18, Appendix C, Assumption 7. It is not difficult to see how using a throughput of 37,895 to determine if a specific workload can be processed within a given time, as the Simulation Model does, can yield erroneous results if the actual average achievable throughput is only 30,447, as it is for the facilities in Table 5-1. The IV & V Report characterized the throughput assumption as "a critical assumption that requires comprehensive review, analysis, and conclusions." *Id.* The Commission agrees that this is a vital component of the Simulation Model and that the Postal Service should be careful to ensure that the throughput measures used accurately reflect the actual throughput achievable at the given facility.

C. Area Mail Processing Review

[5081] AMP review is intended to be a "reality check" on the consolidation proposals that arise from the END models. At this stage, cost savings and service

impacts are quantified using more site-specific data. It is only at this stage that a balancing of one against the other is made. Documentation for 11 completed AMPs was filed with the Commission to illustrate the process. The Service emphasized that these were not intended to be representative of future AMPs. The Commission notes that the accuracy of the AMPs is particularly important given the IV & V Report findings on the Optimization and Simulation Models. *See* Chapter V, section A.

[5082] The Commission is concerned about several aspects of the AMP process. First, a review of the AMP proposals provided reveals that the AMPs lack consistency. Second, the decision to approve or disapprove an AMP is not guided by a set of principals or criteria. Third, the PIR process was not followed for any of the AMPs provided. While the Postal Service did provide a PIR for the Marina Del Rey AMP, it was completed significantly later than the date the guidelines would suggest.

1. AMP Reviews Lack Consistency

[5083] The Postal Service provided the AMP Guidelines as USPS-LR- N2006-1/3. This handbook is supposed to guide the preparation of AMPs. However, in reviewing the 11 AMPs provided in this docket, the Commission found that they did not consistently follow the guidance in Handbook PO-408.

[5084] According to Handbook PO-408, each AMP is supposed to include in the executive summary the reason(s) for consolidation, the impact of the consolidation on productivity, a list of all existing mail processing equipment, and a discussion on the impact of the consolidation on the community. None of the AMPs included any of these items.

[5085] Handbook PO-408 also describes the analysis that should be done and the supporting worksheets that should be included. Three of these worksheets — mail arrival profile, operation window availability, and mail flows — were missing from all of the AMPs. In addition, the calculation of proposed workhours at the gaining facilities is inconsistent between AMPs.

a. Calculation of Total Pieces Handled (TPH) After Consolidation

[5086] The Commission attempted to replicate the calculation of TPH at the gaining facility for all AMPs provided in USPS-LR-N2006-1/6. In most cases the proposed TPH was the sum of the current TPH at the losing and the gaining facility. In some cases, however, some operations appear to have been combined at the gaining facility. In other cases, the Commission was unable to determine how the TPH was calculated.

Calculation of Workhour Savings

[5087] The calculation of proposed workhour savings prepared by local management is also inconsistent among AMPs. In some cases, the workhours appear to be the proposed TPH divided by the current productivity at the gaining facility. In other cases, the workhours are a combination of current workhours at the gaining facility and a portion of the current workhours at the losing facility. In still other cases, it cannot be determined how the workhours were calculated, even when the Postal Service explained the calculation. For example, witness Williams explained the calculation of proposed workhours for the Pasedena AMP as, "workhour productivity for the AMPC [Santa Clarita] facility is applied to the projected volume." Tr. 2/404. However, the Commission found that this calculation yielded the proposed workhours in only 13 of the 31 applicable operations.[56] In most cases, the projected post-consolidation workhours were less than those that resulted from applying the given calculation. This indicates that the estimated workhour savings could be overstated.

[5088] The Postal Service's Office of the Inspector General (OIG) performed an audit of the Pasadena AMP and found "discrepancies with the AMP proposal in the areas of transportation costs, the number of employees affected, and changes in service standards. Because of these discrepancies, the cost savings as projected in the AMP

[56] The analysis of calculated versus reported workhours used site-specific data subject to protective conditions. This analysis, denominated Appendix D, is subject to the same conditions. *See* P.O. Ruling N2006-1/45, October 24, 2006.

may be significantly overstated, and the service impacts are not fully described." USPS-LR-N2006-1/8, OIG Report at i.

b. Changes in Staff Complement

[5089] The Commission finds that the majority of the 11 completed AMPs may overestimate the number of staff employees that can be excessed, given the projected workhours saved.

Table 5-2

AMP Workhour Savings vs. Personnel Changes

[1]	[2]	[3]	[4]	[5]	[6]	[7]
AMP Review	**Workhours Saved at Losing Facility**	**Workhours Added to Gaining Facility**	**Net Change in Workhours**	**Workhours per Position**	**Implied Positions Saved**	**Projected Positions Saved as Reported in AMP**
Olympia	32,746	(28,962)	3,784	1,840	2	5
Bridgeport	28,871	(12,809)	16,062	1,840	9	23
Greensburg	22,073	(4,859)	17,214	1,840	9	11
Monmouth	344,181	(275,782)	68,399	1,840	37	39
NW Boston	132,509	(60,836)	71,673	1,840	39	42
Kinston	37,582	(25,640)	11,942	1,840	6	8
Marysville	64,463	(46,956)	17,507	2,080	8	7
Mojave	31,134	(15,499)	15,635	1,840	8	9

[2], [3] AMP worksheet 4
[4] = [2] + [3]
[5] AMP notes
[6] = [4] / [5]
[7] AMP worksheet 5

Source: USPS-LR-N2006-1/5.

[5090] In addition, there is no analysis of the overall net cost to the Postal Service, assuming the excessed employees will continue working at a different facility. The cost savings estimates for each AMP review include workhour savings that are a function of workhours saved and average productive hourly wage rate at each facility. In order to actually achieve the cost savings estimated in the AMP, the workhours from the excess

employees must either be lost due to attrition or used to fill openings that would otherwise require additional hiring. Even if the employees move to positions that would otherwise require additional hiring, the savings may be affected by whether employees are senior level or entry level. This may not have posed a significant problem when the AMPs were used relatively infrequently and were confined to local consolidations. However, if the Postal Service is planning to substantially increase its use of AMPs in an effort to realign its entire processing network, the cost savings estimates should be developed more rigorously. The Commission recommends that AMP cost savings estimates take into account how the AMP affects labor costs in the entire district, not just the losing and gaining facilities.

c. Calculation of Transportation Costs

[5091] An integral part of the Postal Service's END initiative is the minimization of transportation costs. However, in 6 of the 11 AMPs, the annual transportation costs increase. In 2 of the remaining 5, transportation costs are not affected. Only 3 of the 11 AMPs show transportation cost savings. These AMPs may not be representative of the AMPs that will occur under the centrally directed process. It is plausible, however, that consolidating operations may increase transportation costs for the mail that will be traveling greater distances.

[5092] In addition, the estimated transportation costs are based on assumptions that may not accurately reflect reality. The OIG Report on the Pasadena AMP found that the annual transportation cost after consolidation was severely underestimated. The original estimated annual transportation cost increase after consolidation was $12,500. These estimated costs increased to $550,000 over the course of the audit. The total annual cost savings in the original estimate was $1.3 million; the reduction in savings from the misestimate of transportation costs was $537,500, or 41 percent. The Marina Del Rey Post Implementation Review also highlighted problems in estimating transportation costs. In that case, the actual transportation costs were 39 percent lower

than estimated due to lower indemnity and contract costs. Such wide variations in estimated and actual transportation costs could undermine the value of the AMPs. The Commission recommends that the Postal Service review how these transportation costs are estimated and determine if more accurate estimates can be achieved.

2. AMP Process Lacks Criteria for Approval

[5093] The Postal Service has stated that there will be a shift from AMPs initiated on a local level to "a centrally-directed approach to identifying AMP opportunities … ." Tr. 2/414. The Postal Service has stated that the AMP review balances cost savings against service changes. However, the Postal Service has admitted that, "[t]he AMP Guidelines do not set specific criteria regarding the magnitude of changes in delivery service standards, collection box impacts, or savings and cost expectations per facility." Tr. 2/478. Without set criteria or guidelines, the decision-making process can lose objectivity. Both the OCA and the APWU found the lack of criteria to be troublesome.

[5094] The APWU states:

> [t]he Postal Service must balance efficiency and service. However, the Postal Service's realignment strategy contains no clear, consistent, and auditable criteria to direct such balancing.

APWU Brief at 16.

[5095] The OCA suggests that:

> The Commission should recommend the Postal Service implement decision rules and guidelines to:
>
> (1) avoid potentially inconsistent application of the AMP process to consolidations; and

> (2) reduce the potential for the appearance that AMP consolidations discriminate in favor of one geographic area over another geographic area.

OCA Brief at 52.

The Commission agrees that the Postal Service should establish a set of criteria, or at a minimum, guiding principles for making realignment decisions.

[5096] The OIG attributed many of the problems with the Pasadena AMP to the Postal Service's efforts to get approval of 10 AMPs through the process quickly. This led to "the AMP progress[ing] through the approval process, even though some of the analysis had not been finalized." *See* OIG Report, September 2006. The need for better management control to assure proper conduct of the AMP process may be particularly important given the Postal Service's stated goal of drastically increasing the number of AMPs conducted. If the headquarters personnel reviewing the AMPs are the same personnel suggesting the opportunities, there is a risk of approving AMPs with less than rigorous review. The Commission recommends that these responsibilities — suggesting and reviewing AMPs — be kept separate.

3. The Post Implementation Review Process (PIR) is Flawed

[5097] The formal PIR process established by the Postal Service for evaluating consolidations and their attendant changes has not functioned properly. PIR must be completed within 30 days after the second full quarter following implementation and after the first full year following implementation. USPS-LR-N2006-1/3 at 11. According to witness Williams, "the purpose of PIR is to make mid-course adjustments to ensure the achievement of the objectives of the AMP." Tr. 3/622-23. PIR reports have been tardy or nonexistent. This lack of documentation is troublesome when one considers both the number and magnitude of the changes made using the AMP procedure over the past decade. Indeed, the lack of guidance from PIRs is even more vexing given the indication that there will be increased use of AMPs over the next several years. PIRs could have

been a valuable tool in determining how the AMP process could be improved. However, because they have not been completed in a timely manner, their value may be limited. The Postal Service admits that it is experiencing difficulty in getting the tardy PIRs completed because of the amount of time that has passed since the implementation of the AMPs:

> There are other PIRs that are in process from the 2004 AMPs that were implemented. Those are undergoing headquarters review. Those are very difficult because they're being completed so late in the process that there are a lot of questions. There's a lot of back and forth that's being conducted on those.

Id. at 619.

Better management oversight of the PIR process is needed.

[5098] The PIR process is designed to measure the performance of the AMP after implementation. PIRs use the same set of worksheets that are employed in the initial AMP review:

> All of the worksheets that serve as inputs into the executive summary on Worksheet 2 are then analyzed in the post-implementation review before and after, and then those assessments are done and a comparison is made at the time that the PIR is completed versus what was proposed and that's how the post-implementation assessment occurs. So we use the same worksheets, but we have a column for before and after.

Id. at 658.

[5099] The PIRs do not evaluate the cost impacts of AMP implementation on the overall network. They do not report how many of the excessed employees have filled active openings, changed crafts, or left the Postal Service altogether. Therefore, the process cannot ensure that the estimated workhour cost savings are being realized at the overall network level.

[5100] The Commission recommends that if the AMP process is used to implement a national network realignment, PIRs should analyze cost savings on a network-wide basis. In particular, the PIRs should evaluate and report on any downstream problems that may have occurred as a result of a consolidation at delivery units, and identify any attendant cost effects.

VI. THE IMPACT OF NETWORK REALIGNMENT ON SERVICE

[6001] The aspect of the Postal Service's network realignment program that triggers the review provisions of section 3661 is its potential to have a nationwide impact on service. In the Request that initiated this docket, the Postal Service explained that its network realignment program is a centrally directed program that will reconfigure its logistical network over the course of the next several calendar years to reduce redundancy and inefficiency through consolidation of operations and transportation links. Because current service standards are based, for the most part, on logistical considerations, the Postal Service expects that these changes to its logistics network will inevitably cause changes in the service standards that are applicable to various flows of mail. Request at 2.

[6002] Although it concedes that some changes in service will occur throughout the network, it views them as likely to be minor, and essentially local in character:

> It should be remembered that the primary goal of the Evolutionary Network Development initiative is to realign and consolidate the network and to eliminate excess mail processing and transportation capacity. Local changes to service standards are not a goal of either END or the Area Mail Processing review, but can be a consequence of an AMP consolidation proposal that would achieve the goals of END. Potential service upgrade and/or downgrades are considered at every level of AMP review. However, the fact that implementation of a particular AMP consolidation proposal could lead to either service upgrades or downgrades is not, by itself, determinative of whether to proceed with the proposal.

Tr. 3/1096-97.

[6003] The Postal Service asserts that it cannot estimate what the impact of the END process on service will be since it cannot anticipate how its network will be

configured in the future. Supplemental Response of the United States Postal Service to Presiding Officer's Information Request No. 4, Question 6, July 28, 2006. For that reason, the Postal Service did not volunteer any estimates of what the nationwide impact of its END program on service would be. Request at 3. As a result, little information is available that allows the Commission to directly assess the impact of realignment on service.

[6004] The Commission has only been able to obtain information about expected impacts of the END program on service for First-Class single-piece letter mail. With respect to that mail, the available information indicates only how many 3-digit ZIP Code originating/destinating pairs the Postal Service expects to upgrade from a two-day delivery standard to an overnight standard, and how many it expects to downgrade from an overnight standard to a two-day delivery standard, as a result of realignment.[57] Estimates of the volume of First-Class single-piece letters that would be affected by such changes have also been obtained.

[6005] Two estimates of the impact of realignment on First Class single-piece letter mail service standards from runs of the END models are available. The Postal Service's internal Independent Verification and Validation (IV & V) team validated a run of the END models in March 2003. That run identified an optimal future network consisting of 187 processing plants (150 fewer than currently exist).

[6006] The optimal network identified by that model run reduced the number of 3-digit ZIP Code pairs that qualified for overnight service from 8,780 (which represented 48 percent of all First-Class single-piece letters), to 8,132 — a reduction of 7.4 percent. In volume terms, 4.48% of First-Class single-piece letter mail was downgraded while 1.37% was upgraded. The net reduction of overnight First-Class single-piece letter mail

[57] About 1% of the 25,000-plus total Zip Code pairs receive overnight service.

was 3.11 percent. The changes estimated for these overnight pairs are summarized in the following table.

Table 6-1
First Class Single-Piece Letters Received Overnight Service
(2006 END Model)

	Total Pairs[1]	Annual Volume	Percent of FCSP Volume
Same	5,600	20,052,219,392	43.59%
Upgrade	2,532	630,191,867	1.37%
Downgrade	3,180	2,061,686,154	4.48%
Total Overnight RDC	8,132	20,682,411,259	44.96%
Total Overnight Baseline	8,780	22,113,905,557	48.07%
Total FCSP Volume		46,002,775,192	

[1] There is no volume between 648 of the pairs.

Source: USPS-LR-N2006-1/18, Appendix C, Assumption 2.

[6007] The Commission asked the Postal Service to estimate the impact on service of the most recent optimal configuration identified by its END model. It provided estimates associated with an early 2006 configuration that retained 303 processing plants, far more than the 187 retained in the 2003 run. Tr. 4/1329-31. This configuration had less impact on First-Class single-piece letter mail overnight service. The Postal Service estimated it would result in an upgrade of 2,507 3-digit ZIP Code pairs and a downgrade of 2,701 pairs — a net reduction of 0.61 percent in the number of First-Class single-piece letter 3-digit ZIP Code pairs that qualify for overnight service. In terms of

volume, the net reduction in overnight FCSL would be 1.55 percent. The results are summarized in the table below.

Table 6-2
First Class Single-Piece Letters Receiving Overnight Service
(2006 END Model)

	Number of Pairs	Volume	Percent of FCSP Volume
Upgraded	2,507	183,863,687	0.44%
Downgraded	2,701	834,527,579	1.99%
Net Effect	–194	– 650,663,892	– 1.55%
Approximate FCSP Volume	42,000,000,000		

Source: Tr. 4/1372-77.

[6008] These data are more significant for what they do not reveal than what they do reveal about the service impacts that are likely to result from network realignment. They address service impacts for only one subset of one class of mail. There is no indication of the impact on service standards applicable to ZIP Code pairs for First-Class presorted or other bulk letters, First-Class flats, Priority Mail, Periodicals, Standard Mail, or Parcel Post.

[6009] Nor is there any information available on the system-level impacts of network realignment on dimensions of service other than the applicability of official service standards to ZIP Code pairs. There is no information on how network realignment might impact various kinds of service from the mailer's point of view, such as collection box cut-off times, the time of day when mail is delivered, and changes in dropship entry points for bulk mailers. All of these dimensions of service potentially could be degraded when operations are consolidated into processing plants that lie further from the 3-digit ZIP Code service area, particularly with respect to processing local turnaround mail.

[6010] The Postal Service expects the RDC concept to be implemented by substituting more than 60 RDCs for the current 21 BMCs. Mailers who currently receive a DBMC discount for dropshipping to the 21 BMCs would have a greatly expanded set of dropship points required and separations required in order to receive a comparable discount. This would increase the effort (and expense) required of the mailer to qualify for dropship discounts, and reduce the value of those discounts to the mailer. *See* USPS-LR-N2006-1/18, Assumptions 13, 14, and 15.

[6011] The Commission believes that these aspects of service performance are sufficiently important to warrant examination before a nationwide network realignment plan is implemented.

[6012] *The role of service in the Optimization Model*. The Postal Service says that it attempts to limit the impact that consolidations will have on current service standards to the greatest extent possible. This is done primarily through the use of mileage constraints in the pre-processor stage to determine which facilities qualify as candidates to serve a particular 3-digit ZIP Code area. The Postal Service describes these constraints on page 10 of USPS-LR-N2006-1/17:

> [w]e calculated travel time for all possible combinations of ZIP Code to LPC/DPCs and LPC/DPCs to RDCs. We then limited these to feasible options by applying the following rules:
>
> - Zip Codes could be no more than 2 hours from an LPC/DPC;
> - LPC could be no more than 3 hours from an RDC.

[6013] Minimum mileage bands constrain the Optimization Model in a way that is intended to generally preserve existing service performance. Service performance, therefore, is not a decision variable in the Optimization Model. This is confirmed by Postal Service witness Shah, who observed that "service performance is not considered within the optimization model." Tr. 3/1094.

[6014] *The role of service in the Simulation Model*. The purpose of simulation modeling is to test whether the optimization network configuration recommended by the Optimization Model is feasible at the plant level, in the sense that the volumes involved can be processed and transported within applicable service windows. If the analysis concludes that they cannot, however, the simulation model may relax this constraint rather than reject the optimization results as infeasible.[58]

[6015] As discussed in Chapter V, Section B.2, the Postal Service uses national average machine throughputs (applied to plant-specific complements of sorting equipment) rather than productivities (plant-specific mail processing labor productivities), to determine whether it is feasible for a plant to produce the output called for by the Optimization Model. As noted above, productivity for an operation can be very different than average machine throughput. The use of national average throughput for a given type of sorting machine may wrongly indicate that a plant has the ability to process the assigned workload within the available operation window. This could lead the Simulation Model to assume that a plant can process a given workload within applicable service standards when it cannot. Relying on the Simulation Model results, therefore, could lead to either a failure of service, or an increase in the unit cost of that service.

[6016] *The role of service in AMP review.* The AMP review process is the final step before implementing consolidation of mail processing operations. According to the Postal Service, "during the AMP process, consideration of whether to implement a

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[58] Postal Service witness Shah states,

> [T]he simulation model accepts inputs to simulate, and will report the performance against a given service standard. The results of the simulation model will indicate the performance of the proposed network developed by the optimization model. This performance can be used to determine which service standards could be considered for adjustment.

Tr. 3/1082.

consolidation proposal takes place. The impact of a proposal on service is considered as part of that process." Tr. 3/691.

[6017] The AMP handbook states that, "it must be established that the overall service/cost relationship for the combined service area improves." USPS-LR-N2006-1/3. However, it appears on this record that the AMP process is somewhat ad hoc, and has not been carefully applied in the past. There are no criteria for identifying service impacts, other than estimating the number of 3-digit ZIP Code pairs that qualify for various standards of service. There is no requirement that changes in cut-off times for depositing mail be evaluated, or changes in the time that mail is actually delivered. *See* Tr. 3/657. There is no established threshold level identified for finding a degradation of service to be unacceptable, just as there is no minimum level of estimated cost savings that must be achieved before an AMP will be approved. APWU argues that § 403(b)(3) of the Postal Reorganization Act requires the Postal Service to balance efficiency and service when reconfiguring its mail processing and transportation networks. APWU Brief at 16. The Postal Service's realignment strategy contains no clear, consistent or auditable criteria to direct such balancing.

[6018] In the summer of 2005, the Postal Service embarked on a coordinated review and implementation of 10 pending AMP consolidation proposals submitted by different Area Offices. This was intended to ensure that these AMPs would fit within the future network identified by the END models. USPS-T-2 at 8-9. These AMP reports were filed as USPS-LR-N2006-1/5. The Postal Service cautions that these AMPs were submitted to illustrate the review process. They were not selected to be representative of the substantive determinations that could be expected from the AMPs generated by a "full up" implementation of END. *Id.* at 9-10.

[6019] The net service impacts estimated to arise from these AMPs are small. Most of the facilities are expected to maintain current service or upgrade more mail than is downgraded. Table 6-3 summarizes the expected net changes to overnight volume for First-Class Mail and Priority Mail for these 10 AMPs and the AMPs performed prior to the consolidation of the Marina Del Rey facility.

Table 6-3
Daily Volumes Affected by AMP-induced Service Changes
(1,000s)

	First-Class Mail		Priority Mail		
AMPS Facility	**Overnight/ 2-Day**	**2-Day/ 3-Day**	**Overnight/ 2-Day**	**2-Day 3-Day**	**Service Change**
Santa Clarita P&DC	2,500	–2,500	500	–500	Improve
Tacoma P&PC					No Change
Southern CT P&DC					No Change
Stamford P&DC	–4,087	–44	0	0	Worsen
Pittsburgh P&DC	–2031	0	–98	0	Worsen
Trenton P&PC and Kilmer P&DC	55,874	–55,874	433	0	Improve
Boston P&DC					No Change
Fayetteville P&DC	11,972	0	0	0	Improve
Sacramento P&DC	8,212	–8,212	424	–424	Improve
Bakersfield P&DC	4,729	–4,729	75	–75	Improve
Actual (implementation date 1-14-05)					
Los Angeles P&DC	39,117	–2,583	499	–48	Improve
Long Beach P&DC					No Change

Source: USPS-LR-N2006-1/5.

[6020] A major shortcoming of the current AMP review process is that the actual impact on service is not tracked after implementation.[59] While Handbook PO-408 requires Post Implementation Reviews (PIRs) to be completed after the second and fourth full postal quarter after implementation, these reviews do not attempt to analyze service degradation or improvement.[60]

[6021] The need for more thorough consideration of service impacts during the AMP review process is illustrated by a report of the Postal Service's Office of the Inspector General that evaluated the AMP review that preceded the consolidation of the Pasadena, California facility. It found that both the cost savings estimates and the predicted changes in applicable service standards upon which the consolidation had been predicated were substantially in error.

[6022] *The role of service in decisions to create an RDC*. Moving the locations of various outgoing mail processing facilities should alter available locations for drop shipments. This may also alter the zone boundaries for certain 3-digit Zip Code pairs. Tr. 3/1057.

[6023] As the OCA observes, there are no decision rules to guide management in its decision to create an RDC, and no established policies for weighing potential negative service impacts from proposed RDCs against the reduced costs anticipated. OCA Brief at 68. Developing a more systematic approach to evaluating facility consolidation would help assure that actual changes achieve the lauditory goals for network realignment established by management.

[6024] The Postal Service is a service organization, perhaps the largest such organization in the country. It does not seem prudent, in the Commission's view, for an

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[59] Prior to this docket, no post-implementation review had been documented for any AMPs implemented since 2000.

[60] The Postal Service's position is that routine monitoring of service performance will detect any problems arising from consolidation. Routine monitoring, however, relies on the EXFC tracking system to detect changes in service performance for First-Class Mail. This system will not identify localized service problems. For that reason, it is an inadequate method of monitoring service changes impacting particular ZIP Codes. *See* Tr. 3/636-37.

organization of its size and economic importance to commit itself to a logistics network restructuring program of this magnitude, without first having a full grasp of its likely effect on the service that it provides its customers. If the Postal Service's representations in this docket are accurate, however, that is what the Postal Service is considering. The Commission recommends that the Postal Service choose a "most likely" network realignment outcome for planning purposes, and estimate the full range of service impacts that would result from that outcome before it commits further resources to this program.

VII. PUBLIC PARTICIPATION

[7001] Contrasting views have emerged about the consistency of the Service's network realignment initiative with Postal Reorganization Act policies as they pertain to public involvement. The disagreement centers on the appropriate role for the public in realignment-related planning, execution and review. In brief, the Service contends that its statutory responsibilities with respect to public involvement in END are limited to satisfying section 3661's filing requirement. Other efforts — namely those it initially identified in the instant filing or has since indicated it intends to adopt — are "extraordinary" steps the Service says it is willing, but not statutorily obligated, to undertake. Postal Service Brief at 10.

[7002] APWU, OCA and Popkin generally view the Service's public input approach (in whole or in part) as too late, too limited, and too lopsided. They generally contend that consistency with the statute requires a communications strategy for END that incorporates more transparency about the Service's intentions and actions, more information and involvement, and more accountability.

A. Resolution of Preliminary Question of Appropriate Focus of the Inquiry

[7003] The Service is correct that compliance with certain statutory filing requirements triggers a congressionally-mandated opportunity for disclosure to the public, and public comment on, management's plans for network realignment in an open forum at the Commission. However, its position that the inquiry into the statutory adequacy of public involvement in this initiative starts and stops with satisfying technical filing requirements with the Commission misreads its obligation as a public establishment that provides essential services to the nation.

[7004] In particular, the Service errs in implying that a section 3661 filing insulates components of the program — such as its provision for public input — from Commission review. OCA sagely notes that in addressing the potential benefits of postal reform, Senators discussed the need for improved transparency in the network realignment program. OCA Brief at 3.

[7005] The role of the public in specific aspects of the Service's realignment initiative is a legitimate issue for consideration because, given a program of this nature, the Commission cannot fairly assess whether implementation is likely to allow the Service to provide "adequate and efficient services" within the meaning of the Postal Reorganization Act without knowing how citizens' views will be taken into consideration. Thus, a section 3661 filing does not automatically relegate the public, without recourse, to whatever role the Service deems appropriate in the deployment of END.

[7006] The Service's position is also misguided because a fundamental aspect of its network realignment initiative is that it is evolutionary, and expected to change over time in response to factors such as changes in mail volumes, technology and modes of transportation. The "needs of the public" is a factor that may evolve while realignment is underway. It is essential that the Service structure this program in a way that will allow it to reflect changes in these needs. This section 3661 proceeding will only provide interested members of the public with highly generalized indications of how network realignment may affect the provision of "adequate and efficient services." It is no substitute for the Service providing the public with a continuing, meaningful role in area-specific rollouts of the program.

B. Public Input

[7007] The Postal Service correctly views network realignment as essential to its role of providing efficient postal service to the nation under the Postal Reorganization Act. One aspect of carrying out this public service role, as the Service observes, is developing and implementing changes — some far-reaching — that entail intricate knowledge of postal operations. However, the Service's public service role entails responsibilities beyond the duties relating to developing efficient factors of production; it also involves recognizing that the public itself should be involved in a meaningful way in the planning of major initiatives such as network realignment.

[7008] Involving key stakeholders in affected communities at an early stage in the process and allowing them to participate should enhance the chances for the Service's success in this role. One set of stakeholders includes major mailers who need to learn how an anticipated consolidation might affect their operations and their clients. While postal managers in the field are clearly familiar with the major users of their facilities, this familiarity may not extend to knowledge of constraints these users face in making alternate transportation arrangements, obtaining adequate space, or scheduling their employees. Adopting a formal process for obtaining information from major mailers in a systematic way would improve the likelihood that mailers will be able to quickly and effectively adapt their practices to a realigned postal network.

[7009] Community leaders also need reasonable notice, and the opportunity to offer suggestions, before changes that will affect their traffic patterns in their communities become cast in stone.

[7010] Lastly, individual customers are important stakeholders in the realignment process. They can provide management with their perspective on a proposed consolidation in terms of factors such as perceived service needs and community identity (usually in terms of familiar postmarks). The Service should also adopt a formal, systematic method for allowing individual customers to participate in a meaningful way.

C. The Service's Ability to Provide "Adequate and Efficient Services" Through Adoption of the END Initiative, Given Initial Provisions for Public Involvement

1. Alternatives to Postal Service's Initial Approach (APWU Witness Yao's Proposal and OCA's Suggestions on Brief)

[7011] APWU witness Yao (APWU-T-1), who has evaluated five Postal Service-sponsored END-related Area Mail Processing public programs and has professional experience in the field, finds significant shortcomings in the Service's initial strategy when measured against certain recognized principles of public engagement and other approaches to public involvement.[61] She identifies these principles as: enunciating a clear purpose; obtaining a commitment from the top, providing objective and complete information; framing issues in a neutral way; using appropriate timing; selecting appropriate tools and resources; ensuring diversity; reporting public consensus; requiring accountability; and supporting sustained involvement. *Id.* at 7-8.

[7012] The following table summarizes key aspects of Yao's comparative analysis and recommendations.

[61] The meetings Yao evaluated were held in Sioux City, Iowa (April 20, 2006), Rockford, Illinois (June 5, 2006), St. Petersburg, Florida (June 14, 2006), Jackson, Tennessee (June 14, 2006), and Yakima, Washington (June 15, 2006). APWU-T-1 at 9.

Table 7-1
Yao's Analysis of Public Engagement Approaches

Relevant Guiding Principles	The Postal Service's Current Approach	APWU Witness Yao's Proposed Alternative
A. Purpose, Commitment and Timing	The Service's "one-way" communication in an add-on process occurs too late to constructively influence proposal	The Service should utilize a two-way, integrated approach to inform proposal development during the feasibility study period
B. Information		
Cost Information	The Service provides the public with the cost data that support messaging about cost savings associated with consolidation	The Service should provide objective and complete information to the public, demonstrating a commitment to transparency, building better decisions and trust
Customer Service Information	The Service does not provide customer service data	The Service should demonstrate transparency by fully disclosing local customer service data and standards and discuss options for balancing costs and service
C. Format for Engaging the Public	The Service holds traditional public hearing-style meetings; it is unclear who is in the room; few speak; most listen	The Service should apply a two-phase approach which taps citizens as a resource to identify issues that then become the focus of a larger demographically diverse town hall
D. Accountability	The Service's accountability to the public is missing and unclear; no follow-up communications are in place	The Service should build accountability and transparency into the process, particularly regarding customer service

Source: Adapted from APWU-T-1 at 10-23.

[7013] Yao considers the Service's strategy "needlessly" flawed, but capable of being repaired.[62] APWU-T-1 at 33. She offers several recommendations, along with multiple related implementing action steps, that form a comprehensive alternative approach to the Service's current plan for public involvement in network realignment. This approach is modeled on a process Yao asserts has proven successful in large-scale public discussions about issues such as Social Security policy, re-development of the World Trade Center site, regional planning and the global economy. *Id*. at 29.

[7014] The action steps Yao provides for each recommendation vary in number, scope and specificity and, in some instances, come with timetables for completion.[63] Some entail having the Service:

- hire third-party public engagement specialists to facilitate certain aspects of network realignment;
- establish standing 6-to-8 member citizen advisory panels (CAPs) for each AMP study early in the process, possibly including a representative from the local Postal Customer Council;
- develop, with the assistance of a public engagement specialist, a scope of work plan for the CAP;
- use technology-enabled town hall meetings to allow the public, through roundtable discussions and professional facilitation, to develop a consensus about realignment issues;
- conduct test mailings, along with follow-up mailings (or allow independent groups to do so);
- create a discussion guide with balanced, objective data; and
- create a public engagement office.

Id. at 25-31.

[7015] OCA shares APWU's view that the public should be involved sooner in the process, but does not identify with specificity when it should occur. It also believes that,

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[62] Yao is a principal in America*Speaks*. The organization is a nonprofit that provides expertise in public engagement. *See http\\:www.AmericaSpeaks.org*.

[63] An attachment to Yao's testimony provides a detailed project management table illustrating her ideas regarding how a new public engagement process could be implemented for an AMP feasibility study.

to the extent the dialogue and public participation Yao advocates can be incorporated into the Service's revised approach, the overall process would be further improved. OCA Brief at 46.

[7016] *Postal Service response.* The Service's response to Yao's proposed alternative focuses primarily on some of her detailed implementation steps, rather than the recommendations from which those steps flow. The Service dismisses certain suggestions (such as hiring third-party facilitators, assigning elected officials a formal role, and creating citizen advisory panels well in advance of each potential AMP study) on the basis that Yao (and her public engagement colleagues) lack hands-on experience in facilitating town hall meetings specifically related to closing or consolidating government facilities. Postal Service Brief at 14-15. It further implies that the suggestion that critical data be developed and shared with each of potentially hundreds of panels, if mutually acceptable protective conditions can be established, is beyond reason. *Id.*

[7017] Accordingly, the Service urges the Commission to decline to suggest "the injection of multiple layers of overly burdensome complication into the process of making END-related capital expense decisions, selecting postal personnel and equipment deployment options, determining postal floor space utilization, … ." *Id.* at 15. Instead, it argues that: "[w]ith good reason, Congress enacted the Postal Reorganization Act, out of recognition that the Postal Service could better balance its public service obligations and operate in a more business-like manner, if day-to-day postal management decisions were placed in the hands of experienced, professional, subject matter experts whose primary focus is the operation of the nation's postal system." *Id.*

[7018] The Service simply maintains, with respect to the larger themes that APWU, OCA and Popkin address, that it has established opportunities for pubic input in its consideration of AMP consolidation proposals and RDC activation decisions. It asserts that the public is free to provide relevant information regarding potential impacts of proposed service changes. Moreover, it argues that these established public input processes — as reflected in revisions to AMP PO-Handbook 408 — are "well-suited" to permit experienced postal operations, financial and customer service experts to utilize

their knowledge and judgment to evaluate that information in relation to refined network realignment proposals developed internally by postal experts that may involve service upgrades or downgrades as part of an overarching national strategy to improve network efficiency.[64] *Id*.

[7019] *Commission assessment*. The Commission acknowledges that the Postal Service, in apparent recognition of certain criticisms aired on this record, has revised its original plan for public involvement during the course of this hearing. Among other things, public meetings have been added during the Area Mail Processing feasibility study phase, a communications plan (including public notice) has been introduced for Regional Distribution Center activations, and a formal plan has been adopted to make it more certain that Post-Implementation Reviews are conducted as intended and on schedule. *See generally* USPS-LR-N2006-1/16 and Tr. 3/670-71.

[7020] This response, however, fails to fully come to grips with the heart of the "capsule criticism" that the Service's approach, even as modified, is still too late, too limited and too lopsided. Review of the record reveals that the public has an interest in obtaining notice of the potential for an Area Mail Processing consolidation much earlier in the process; believes disclosure of more information on a broader range of topics is necessary; seeks more meaningful inclusion in town hall meetings and in the development of alternatives; and wants feedback on the results of consolidations. *See*, for example, APWU Library Reference N2006-1/2, Transcript (at 18) of United States Postal Service Northern Illinois District, Public Input Forum, Rockford, IL (June 5, 2006) and APWU Library Reference N2006-1/3,Video of United States Postal Service Town Meeting, St. Petersburg, FL (June 14, 2006).

[7021] This interest is not unreasonable in light of what the END program puts into play for individual citizens, for major mailers and suppliers, and affected communities. The consequences, in fact, appear to have the potential — at least for some

[64] The Service filed a library reference (USPS-LR-N2006-1/12, entitled Area Mail Processing Notifications Tool Kit, dated May 2006, which appears to contain these revisions.

stakeholders — to be far-reaching. Thus, the changes the Service has taken pains to make during the course of this proceeding are not sufficient because the public does not simply want notice of key developments, but wants this notice much earlier in the process; does not simply want the limited information the Service deems relevant, but what they deem relevant to the provision of "adequate and efficient service," such as whether there will be a need to adjust dropshipping schedules or whether any rate consequences will ensue. They also want a true dialogue with the Service, rather than perfunctory public meetings. Moreover, it appears that most of the public would be satisfied with information that falls far short of proprietary data and analyses, so the Service's resistance to providing information on that basis is not well founded.

[7022] On the other hand, the Service is correct that some of Yao's specific action steps, such as creating citizen panels with broad rights and responsibilities and allowing the public to frame the issues in "networked" town hall meetings, are not well suited to its network realignment effort. However, these criticisms do not vitiate the potential benefits of meaningful public involvement and Postal Service accountability.

[7023] As Yao's assessment starkly indicates, the Service faces a critical juncture in terms of its public involvement process: it can stand by the set of procedures she summarizes as "Option A" or adopt a version of "Option B." Under Option A, the Service remains in the position of responding to unhappy legislators by holding a public input session at the end of a closed feasibility study; enduring a public venting and overwhelming opposition by a largely uninformed public in response to a presentation of limited facts supporting the consolidation proposal; and delaying implementation and potentially ignoring important considerations that may have unintended consequences. APWU-T-1 at 33.

[7024] Under Option B, the Service is able to achieve a better quality decision by providing, and receiving, useful information from the impacted community as part of the analytical study process, not after it**,** by engaging stakeholders and citizens in phased, structured ways to help inform a thoughtful analysis to develop options and recommendations. *Id*.

2. Concerns About AMP Handbook PO-408

[7025] Three concerns about the Service's AMP Handbook PO-408 have emerged on this record. One is that the Postal Service has not yet formally adopted certain changes in public involvement it has announced during the course of this proceeding. OCA Brief at 9-10 and 47. The second is that this longstanding handbook (even assuming incorporation of the recent changes) is an inadequate guide for providing public notice and input for Area Mail Processing decisionmaking. Finally, and most important, is the question of management's commitment to assuring that all steps in the process, including the two-stage Post-Implementation Review, are carried out.

[7026] The record idenfies several areas of concern with respect to Post-Implementation Reviews. The first two are that, at least until recently, many of these reviews have not been conducted, despite being identified as requirement in the handbook. These reviews are the single most powerful tool management has to evaluate the results of consolidations and to ensure that adequate service is maintained for affected customers. Management must implement a process to ensure that review of Area Mail Processing consolidations occur according to plan. It is critical that management at every level makes a commitment to timely completion of this important phase of network realignment. Moreover, management should share the results of these reviews with the public, especially if additional changes to the network appear to be needed.

a. Formal Adoption of Public Process Changes (OCA Proposal)

[7027] The record makes clear that the Service, during the course of this hearing, has modified its original public input process. *See* Tr. 3/613-14; USPS-LR-N2006-1/16. OCA compliments the Service for modifying its original public input process during the course of this hearing, and characterizes these changes as "substantially improving" the AMP process to provide for earlier public notice and input, and for consideration of that

input by management. OCA Brief at 42. Its expectation is that *if* the Service follows the letter and intent expressed in its revised documentation, the public communications process will be improved. In particular, it expects that notices to appropriate stakeholders will be more timely; notices will go to those more likely to be interested with greater opportunity for their comment; and that public input might be considered by the Postal Service. *Id*. at 45. It anticipates that there will be opportunity for limited dialogue between management and the public at the public meeting. *Id*. In addition, it says that a question and answer period following an AMP video, briefing and PowerPoint presentation has been added to the process. *Id*. at 45-46.

[7028] OCA recommends that the Postal Service modify Handbook PO-408 to include the recently-issued communications documents and that it clarify AMP worksheet 3 with appropriate cross-references to the new documents. This recommendation is based on OCA's assessment that neither of the revised communications plans indicates the source of these documents, the office responsible for issuing the documents, or whether they are found with the official documentation for the AMP process which resides generally within Handbook PO-408. *Id*. at 46.

[7029] The OCA considers the source and applicability of the several operable communications plans confusing, and given their recent issuance, so asks that the Commission advise the Service to update and modify Handbook PO-408 to include these documents (or to otherwise formalize them) and clarify AMP worksheet 3 with appropriate cross-references. *Id*. at 47. It also says: "the Commission should advise the Postal Service to update the Handbook PO-408 to take into account the recent modifications of its communications policies, and also to specifically establish a more consistent policy that, as part of the AMP process, … the public's comments and concerns must be seriously considered at all levels of management early in the process." *Id*. OCA is correct that Handbook PO-408 must be reviewed and updated in order for the AMP process to function effectively.

3. Concerns About Adequacy of AMP Handbook PO-408 for Purposes of END

[7030] Another, more significant, issue that has emerged on this record is the Service's apparent confidence that adoption of the guidelines in its longstanding AMP Handbook PO-408 is the appropriate approach for satisfying any notice-related requirements for network realignment.[65] The Service, for example, indicates that the level of notice provided in its public involvement process is rooted in "the long-standing AMP Handbook PO-408 Worksheet 3 notification process." Postal Service Brief at 11. It maintains that use of this process "reflects an understanding by postal management that the dissemination of a reasonable level of public information beyond anything mandated by law is consistent with its public service responsibilities." *Id*. The Service argues that this should also be regarded by the Commission as evidence that the Postal Service has "an abiding commitment to keep the public informed of potential operational changes that could lead to changes in service." *Id*. at 11-12.

[7031] However, the record indicates that the Service's reliance on this handbook is misplaced. First, the Service's perception of the scope of inquiry and issues pertinent to AMP studies and RDC activations is at odds with that of the public. APWU, for example, notes that concerns raised by the public in town hall meetings include issues that do not appear to be considered as part of END, such as timeliness of delivery of financial and legal statements and filings important to institutions, citizens and the judicial system; timeliness of the delivery of invoices, accounts receivables, and other billing-related issues affecting small businesses, their customers, and customer relations; loss of one-day delivery of newspapers; loss of community identity-related postmarks; and the effect on area employment. APWU Brief at 20.

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[65] The Service filed *Area Mail Processing Guidelines*, Handbook PO-408 (March 1995) as USPS-LR-N2006-1/3.

[7032] The Service defends its much narrower scope by saying that it has allowed the process to include matters that "are not germane," rather than recognizing the public's inquiries as the heart of their concerns about area consolidations.

[7033] The timeliness of the handbook's requisite issuance of notices is also an issue, as is the absence of a requirement for public notice during the PIR phase. The Handbook's Worksheet 3, entitled Communication Documentation, requires notice at the point where an AMP feasibility study has matured to the stage of a being considered a proposal. USPS-LR-N2006-1/3 at 1. However, by the terms of the handbook, a significant amount of analysis occurs during the feasibility study stage: relocation of processing and distribution operations and necessary support functions; impacts on employees, the community and customers; and effect on service, costs, productivity and future strategic initiatives. *Id*. Thus, it is only *after* this data and information has been gathered and evaluated that notice to the public is to be provided, assuming an AMP proposal ensues.

[7034] In addition, while involvement of the public comes too late in the early and mid-stages of the consolidation process, it does not enter into the PIR phase at all. Instead, the handbook affirmatively states: "However, it is not necessary to fill in Worksheet 3 when conducting a PIR." APWU-LR-N2006-1/3 at 12. Thus, there is no officially-authorized channel to communicate a consolidation's area-specific results to the public. OCA Brief at 11. This is a serious omission that management should rectify.

4. Conclusions and Recommendations Regarding Public Input

[7035] The Commission urges the Governors to direct postal management to further modify its approach to public involvement in the following ways:

[7036] First, management should be advised to promptly reconsider its reliance on AMP Handbook PO-408 as the main tool for meshing AMP feasibility studies with its END initiative. Specific areas that warrant attention are:

- the need to involve the public at an earlier stage;
- the need to provide the public with more information about the type of concerns raised in the town meetings that have been held;
- the need to extend public involvement through the implementation of individual AMPs; and
- the need to provide a more interactive process.

[7037] Second, pending consideration of the items listed above, management should be advised to update AMP Handbook PO-408 as soon as feasible.

CERTIFICATION

It is the opinion of each of the undesigned Commissioners, pursuant to 39 U.S.C. § 3661(c), that this Opinion conforms to the policies established under Title 39, United States Code.

George Omas, Chairman

Dawn A. Tisdale, Vice-Chairman

Mark Acton, Commissioner

Ruth Y. Goldway, Commissioner

Tony Hammond, Commissioner

CONCURRING OPINION OF VICE-CHAIRMAN TISDALE

There is widespread recognition today that the Postal Service needs to realign its networks to more efficiently and effectively meet the needs of its current and future customers. *See* Postal Accountability and Enhancement Act of 2006, SEC. 302 (c).

Furthermore, it has been recognized from essentially the beginning of recorded history that prior to initiating a project of the size and scope of realigning postal processing and transportation networks, there must be careful advance planning to assure success. See, for example, "Suppose one of you wants to build a tower. Won't you first sit down and estimate the cost to see if you have enough money to complete it?" Luke 14:28.

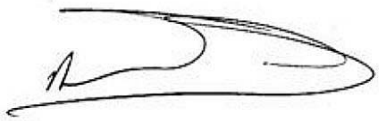
The Postal Service has asked the Postal Rate Commission to hold a public proceeding to review the process it is using to evaluate the feasibility and impact on service of potential realignment decisions. The Commission's Advisory Opinion discusses in extensive detail the strengths and weaknesses of that process.

I offer this separate statement to make it clear that in my opinion the Postal Service should be commended for initiating a realignment program, and for seeking advice from an independent source before taking irrevocable steps that might be financially harmful or negatively impact service.

The Postal Service appears to be using state-of-the-art modeling techniques. However, even the most technically advanced models produce valid results only when they use appropriate data.

The Commission finds that in some instances the Postal Service is using inappropriate inputs in its models, and that this casts doubt on the outputs from those models.

This does not mean that realignment is a bad idea — it means that proper data must be employed so that the Postal Service's models will reliably identify beneficial courses of action. If this is done, the Postal Service, its employees, its customers, and the Nation as a whole will benefit.



Dawn A. Tisdale, Vice-Chairman

CONCURRING OPINION OF COMMISSIONER GOLDWAY

The Commission's Advisory Opinion thoroughly analyzes the need for, and provides excellent suggestions for, improving the accuracy of the Postal Service's forecasting and planning for systemwide consolidation and network reorganization as envisioned in the END process. I urge the Board of Governors and the operations management of the Service — not just the attorneys assigned to Commission cases — to carefully review our advisory opinion and to fully adopt our recommendations for improved econometric and statistical analysis and more meaningful public involvement in the planning process.

However, I believe that the Commission's opinion fails to express sufficiently serious concern about the problems that have arisen in initial stages of the Postal Service's consolidation efforts, in places such as Southern California, El Paso, Texas and Las Vegas, Nevada.

I am concerned that unless the Postal Service management is truly attentive to improving the AMP change process, implementation of network realignment is likely to result in substantial, unexpected, and potentially expensive service disruptions throughout the nation. A clear example is that the AMP change analysis performed prior to the recent consolidation of the Marina Del Rey facility into the existing Los Angeles facility totally failed to predict the myriad of service disruptions that occurred in the weeks and months after implementation.

I understand that no single AMP change is representative of all of the types of effects that might result from network realignment. But because the Marina Del Rey AMP change failed to predict or prevent the service problems that immediately followed this consolidation, and, perhaps more importantly, because the belated Post-Implementation Review document failed to analyze and identify the causes of this disruption, I must conclude that the Postal Service is at substantial risk of experiencing unexpected, major service disruptions if it employs its present AMP process to evaluate proposed consolidations.

The Marina Del Rey AMP proposal estimated the volume of mail that would be transferred as a result of the consolidation as 2.8 billion pieces. Total first year savings were projected to be $17.4 million.[1] The net effect on service commitments, assessed by comparing the relative number of mailpieces expected to undergo service upgrades with the number expected to undergo downgrades, was anticipated to be positive.[2]

However, I am personally aware that for many weeks and months following the consolidation, mail service in this region was severely disrupted. Late deliveries following the Marina Del Rey consolidation received considerable attention in the popular press.[3] Congressional representatives from all over Southern California received angry letters from constituents. The Postal Service received hundreds of direct complaints. Other consolidations in other parts of the country have apparently caused remarkably similar delays.[4]

It was further reported that local postal service management was then required to spend time and resources to respond to the press, to plan to redress the service problems and then to expend considerable sums to rebuild service levels to an acceptable level, if not as good as before consolidation.

The AMP change process not only failed to predict service disruption, but the subsequent Post Implementation Review of the Marina Del Rey consolidation neither recognized any failure nor provided a guide for avoiding similar problems in the future.

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[1] Reduced workhours were expected to result in a reduction of 264 craft and 29 management employees. USPS-LR-N2006-1/6.

[2] *Id.*

[3] *See*, for example, *Message in a Bottleneck*, May 25, 2006, C*ongressman Delivers Strong Message to USPS*, August 19, 2006, SANTA MONICA DAILY PRESS.

[4] *See*, for example, *Mail Delivery Outcry*, EL PASO TIMES, March 22, 2006; *Mail Slow,* EL PASO TIMES, March 16, 2006; *Calabasas Goes Postal over Mail Delays*, *T*HE ACORN, March 16, 2006; and *Mail Collection Time Change Vexes Some*, THE BIRMINGHAM NEWS, April 4, 2006.

Post implementation reviews are the best way for the Postal Service to evaluate its current AMP process, and to identify ways it can improve this process to more accurately project the impacts of facility consolidations.

The Post Implementation Review of the Marina Del Rey AMP found the savings to be slightly overestimated. The projected savings of $17.4 million was reduced to $14.6 million.[5] It further concluded a "net increase in the volume committed to overnight service was accomplished by the AMP."[6]

Behaving as though it is not at all accountable to the end users of the mail (whether households or businesses), Postal Service management did not even discuss how the consolidation of the Marina Del Rey facility might have contributed to service disruptions in the Los Angeles basin, and no analysis of the short term and long term costs of fixing those problems was conducted. Local Postal officials acknowledged to the press and to Congress that there had been excessive workforce cuts during consolidation. They promised to and ultimately did rehire additional workers after the AMP implementation. But the added costs of these additional work hours were not recognized or included in the Post Implementation Review, leading me to conclude that the reported cost savings were overstated. Thus, the existing cost savings measurement procedures in the systemwide AMP change process may well be inaccurate.

> "Service performance is one area of concern. Quarter III, fiscal year 2006 External First-Class (EXFC) overnight service performance for the Los Angeles District was 94.3 percent, 0.7 percent points below our target."

Id., Galligan Memorandum, September 15, 2006.

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[5] USPS-LR-N2006-1/27, Galligan Memorandum, September 15, 2006.

[6] *Id.* at 3.

Service performance reviews (*supra*) that focus on EXFC scores for an entire district such as Los Angeles are inadequate. They measure only a fraction of the mail volume in the area. The vast majority of mail is workshared, yet there is no measurement system for such mail. Furthermore, the large mail volume in such a large district can mask substantial service deterioration in those portions of the district directly affected by a facility consolidation. Completely absent from the current Postal Service methodology is any means to factor in customer complaints in assessing service levels. Post-implementation reviews should include analyses of service degradation or improvement for individual facilities, should factor in actual customer complaints, and should focus on to what extent, and why, the initial AMP evaluation proved to be inaccurate.

Before the Postal Service implements the dozens of consolidations required by network realignment, it should improve the AMP change process to insure that service disruptions are minimized. The best way to improve that process is to fully review each consolidation that has already occurred. It should honestly face and thoroughly analyze mis-estimates and determine the lessons learned. Going forward, the Postal Service should require forecasts of possible changes in service levels to the end users in planning every AMP change, require measurement of customer feedback in any post implementation review, and then accurately measure the net cost savings by including changes in post-implementation workforce, transportation or other adjustments.

Adequate up-front attention to the impact on service performance of facility consolidations and network reorganization actions will ultimately save the Postal Service money and will help preserve its value to the nation.

Ruth Y. Goldway, Commissioner

VALIDITY OF POSTAL SERVICE'S COST MODEL FOR END

The cost model used in the END Optimization Model was designed to find a systemwide marginal cost to use as a base for making system-wide rates. The ratemaking model aggregates MODS data from its processing plants into a systemwide panel, then regresses workhours on piece handlings to infer how labor hours respond to volume. It uses a mathematical formula (translog) that forces system workhours to respond monotonically as system workload changes.

In this cost model, workhours rise at a slower rate than piece handlings. This implies that increasing the size of a processing operation will consistently reduce marginal costs (capture economies of scale). In order to simplify this cost curve for use in its END Optimization Model, the END development team approximates it with three linear cost curves for the "small," "medium," and "large" regions of the curve. The marginal cost of a "small," "medium," or "large" facility is then imputed to each facility according to the size group that its workload falls within.

This mail processing cost model distorts the relationship of workhours and workload in a way that is unimportant when designing rates, but is important when used to select the processing operations/plants that should be eliminated from the optimal Future Network. Because the translog model is a second-order equation (its highest terms are squared terms) its results cannot reflect the inconsistent relationship that exists between mail processing productivity and scale. It mathematically requires that this relationship uniformly rise or uniformly fall (be "monotonic"). Estimating processing cost behavior this way makes it easier to identify the systemwide marginal cost associated with the average workload for a given processing operation (its system mean). This can provide an appropriate basis for selecting a single rate to charge for the entire range of volume of a particular category of mail, but it does not provide an appropriate basis for choosing one facility over another when eliminating processing operations/plants from the network.

In order to test the validity of the linear cost functions used in the END Optimization Model, the Commission asked the Postal Service to calculate marginal productivities and cost elasticities for the small, medium, and large operations based on workload in Presiding Officers Information Request No. 6, Question 1(c). In the analysis, the Postal Service partitioned the MODS 2005 data submitted in R2006-LR-L-56 into three subsets by operation size (small, medium, and large workload), and applied the Postal Service's ratemaking cost model to each size within an operation. Partial results of this analysis are displayed in Table A-1 below. In its response to Question 1(c), the Postal Service calculated marginal productivities. From these, marginal costs can be calculated, since marginal productivity is the inverse of marginal cost. From marginal costs, a cost elasticity, or volume variability, can be calculated by dividing marginal cost by average cost.

Since cost is the inverse of marginal productivity, the higher the marginal productivity, the lower the marginal cost will be. The assumption built into the END Optimization Model is that marginal cost declines consistently with operation size. The equivalent of this assumption is that marginal productivity rises consistently with operation size. Inspection of Column 7 in Table A-1 below shows that of the 11 operations only Manual Flats exhibits the pattern that the END models assume. Two sorting operations (DBCS outgoing for letters, AFSM 100 for flats) exhibit the opposite of the relationship assumed by the END models. For them, marginal productivity consistently declines with operation size. Every other possible combination of size and productivity can be observed in the remaining eight operations.

Table A-1
USPS Productivity and Variability Calculations by Operation Size

[1] Operation	[4] USPS Volume-variability (elasticity)	[5] Standard Error	[6] Average Productivity (TPF/Hour)	[7] Marginal Productivity ([6]/[4])	[8] Marginal Cost (Reciprocal of [7])
D/BCS Incoming					
Small	0.752	0.145	9,931	13,206	0.0000757
Medium	0.819	0.092	9,285	11,337	0.0000882
Large	0.734	0.100	8,380	11,417	0.0000876
D/BCS Outgoing					
Small	0.753	0.084	9,820	13,041	0.0000767
Medium	1.011	0.065	9,836	9,729	0.0001028
Large	1.057	0.079	7,908	7,482	0.0001337
OCR					
Small	0.822	0.083	7,382	8,981	0.0001114
Medium	0.892	0.066	7,125	7,988	0.0001252
Large	0.654	0.092	5,304	8,110	0.0001233
FSM/1000					
Small	0.752	0.054	591	786	0.0012724
Medium	0.807	0.045	601	745	0.0013428
Large	0.628	0.061	586	933	0.0010717
SPBS					
Small	0.845	0.070	330	391	0.0025606
Medium	0.657	0.082	293	446	0.0022423
Large	0.853	0.069	294	345	0.0029014
Manual Flats					
Small	1.518	0.301	463	305	0.0032786
Medium	0.635	0.114	506	797	0.0012549
Large	0.716	0.103	433	605	0.0016536
Manual Letters					
Small	0.934	0.131	776	831	0.0012036
Medium	0.784	0.437	621	792	0.0012625
Large	0.160	0.099	492	3,075	0.0003252
Manual Parcels					
Small	0.307	0.154	211	687	0.0014550
Medium	1.778	0.965	295	166	0.0060271
Large	0.957	0.545	338	353	0.0028314
Manual Priority					
Small	2.880	3.210	274	95	0.0105109
Medium	0.660	0.081	326	494	0.0020245
Large	0.339	0.289	354	1,044	0.0009576
Cancellation					
Small	0.857	0.101	4,140	4,831	0.0002070
Medium	0.198	0.122	3,834	19,364	0.0000516
Large	0.356	0.185	3,350	9,410	0.0001063
AFSM 100					
Small	1.101	0.108	2,094	1,902	0.0005258
Medium	1.094	0.104	2,028	1,854	0.0005394
Large	1.135	0.145	1,983	1,747	0.0005724

Source: Tr. 4/1343.

It is clear that the assumption that marginal costs uniformly decline with operation size embodied in the linearlized cost functions used in the Postal Service's END models does not hold when the effect of operation size is directly estimated from partitioned data.

Question 5 of Presiding Officer's Information Request No. 7 asked the Postal Service to illustrate how the "linear" small, medium, and large facility cost equations used in the END Optimization Model were developed, using the AFSM 100 and Manual Flat operations as examples. The response showing the derivation of the linear AFSM 100 operation equations cited file "NIA-Results.doc" as the source. That file purports to contain the estimated coefficients for the AFSM 100 nonlinear equation produced by USPS witness Bozzo in R2005-1. The coefficients estimated in that file are presented in column 1 of Table A-2, below.

The relevant documentation actually submitted in Docket No. R2005-1 is the TSP program file "varmp-tpf-by2004.tsp" in USPS LrK-56 by witness Bozzo. The Commission extracted the variability coefficients estimated for the AFSM 100 from a run of the program submitted in LR-K-56. These coefficients are reproduced in column 2 below.

Table A-2

Docket No. R2005-1 Estimated Coefficients for the AFSM 100 Operation

Variable	Coefficient	
	[1]	[2]
lnTPH	-1.08399	-1.1582
lnTPH SQ	0.044006	0.044006
TREND	0.069896	0.033494
TREND SQ	-1.14E-03	-0.00113758
ln DEL. POINTS	17.3708	17.5166
ln DEL.PONTSS SQ	-0.627112	-0.627112
ln CAPITAL	0.179482	0.073405
ln CAPITAL sq	0.05302	0.05302
ln WAGE	2.9987	2.59284
ln WAGE SQ	0.172177	0.172177
lnTPH * TREND	-4.64E-03	-0.00463782
lnTPH * ln DEL. POINTS	0.061612	0.061612
lnTPH * LN CAPITAL	0.025865	0.025865
lnTPH * ln WAGE	-0.199126	-0.199126
TREND * ln DEL. POINTS	9.11E-03	0.00911181
TREND * LN CAPITAL	-6.63E-03	-0.00662977
TREND * ln WAGE	-0.025366	-0.025366
ln DEL. POINTS * ln CAPITAL	-0.11992	-0.11992
ln DEL. POINTS * ln WAGE	0.089783	0.089783
ln CAPITAL * LN WAGE	-0.123631	-0.123631
QTR2	8.35E-03	8.35E-03
QTR3	2.64E-03	2.64E-03
QTR4	-7.29E-03	-7.29E-03
lnTPH -1	-0.826931	-0.826931
lnTPH -2	0.688921	0.688921
lnTPH -3	0.332239	0.332239
lnTPH -4	0.022793	0.022793
lnTPH SQ -1	0.046321	0.046321
lnTPH SQ -2	-0.031016	-0.031016
lnTPH SQ -3	-0.013082	-0.013082
lnTPH SQ -4	-6.72E-04	-6.72E-04

Source: Tr. 4/1346 and LR-K-56 varmp-tpf-by2004.tsp output [2].

The Total Piece Handlings (TPH) variable is the essential variable in the linear transformation of the Postal Service's ratemaking cost functions. The coefficient taken from the "NIA-Results.doc" file and used in the END models shown in Column 1 [-1.08399], differs from the one actually submitted by witness Bozzo in R2005-1 [-1.1582]. Perhaps the most notable aspect of the comparison of what are supposed to

be equivalent model runs is that while the coefficients for lnTPH and other explanatory variables differ, their squares, cross-products, and lagged variables are the same. This is unexpected, and raises concerns about the validity of the results on which the linearized cost functions are based.

The Postal Service's response to Question 5 of Presiding Officer's Information Request No. 7 describes how the small, medium, and large operation boundaries in the linearized equations are defined using 2004 MODS data for the AFSM 100 operation. The boundaries of the three operation ranges are

Small	5% to 25%
Medium	25% to 75%
Large	75% to 95%

These have distribution ranges of 20%-50%-20% for small, medium, and large, respectively. The slopes of these linear equations yield the END Optimization Model's predicted marginal cost for small, medium, and large operations. In each operation, they fit the pattern that the END model development team expects. Marginal costs consistently decline as operation size increases.

This pattern, however, conflicts with the marginal productivity/marginal cost pattern observed in Table A-1, which is based on the Postal Service's non-linearized cost functions. It has size distribution ranges of 33%-33%-33%. Table A-3 compares the results of the AFSM 100 and Manual Flat operations from Table A-1 with those from Table A-2.

The slopes (marginal costs) of the small, medium, and large linearized cost equations appear to depend on how the operations distribution ranges are defined. The large inequality of these distribution ranges also appears to affect the resulting estimated marginal costs.

Table A-3
2004 Marginal Cost and 2005 Marginal Productivity Comparisons

Operation	Range* 20-50-20 (R2005 data)	Range** 33.3-33.3-33.3 (R2006 data)	Rank Compared
AFSM 100			
Small	high	low	different
Meduim	middle	middle	same
Large	low	high	different
Manual Flats			
Small	high	high	same
Meduim	middle	low	different
Large	low	middle	different

* Source: Response to POIR No. 7, Question 5.
** Source: TR 4/1343.

In developing the linear equations for the END Optimization Model, the medium range occupies 50% of the distribution, while the large and small operation ranges occupy only 20% of the distribution each. No rationale has been offered for the inequality of these range distributions. As the second column in Table A-3 shows, they result in marginal costs that consistently decline as group size increases from small to large. The size-based marginal cost differences shown in the second column were calculated using the same underlying cost functions, but used three equal range distributions. They result in marginal costs that consistently rise with group size for the FSM 100, but show no correlation with size for Manual Flats.

There are differences between the methods used to calculate marginal costs in the first column and those in the second column other than the ranges of the size distributions. The data used to calculate the second column was more recent by a year, and partitioned models were used to estimate the size/cost relationship (rather than segmenting the output of a single model, as was done in the first column). All of these differences might contribute to the differences observed in the second column, but the

selection of very different distribution ranges would appear to have made a substantial contribution

The coefficients from which the linearized Manual Flats cost function was derived were based on the program results found in the "NIA-Results.doc" file. Those coefficients are shown in Column 1 in Table A-4. The coefficients from the results actually submitted by USPS witness Bozzo in R2005-1 are shown in Column 2.

Table A-4
Docket No. R2005 Estimated Coefficients for the
Manual Flats Operation

Variable	Coefficients	
	[1]	[2]
C	2.39327	2.26108
ln TPH	0.903388	0.903388
TREND	-8.26E-03	-8.26E-03
ln DEL. POINTS	-0.05812	-0.05812
ln CAPITAL	0.019999	0.019999
ln WAGE	-0.043835	-0.043835
QTR2	0.068513	0.068513
QTR3	0.019071	0.019071
QTR4	0.042686	0.042686
FY00	-0.044893	-0.044893
FY01	-0.051313	-0.051313
FY02	-0.015997	-0.015997
FY03	-3.40E-03	-3.40E-03
FY04	0	0
TECH05	1.71E-03	1.71E-03
TECH06	0.05197	0.05197
TECH39	0.044936	0.044936

Source: Tr. 4/1348 and LR-K-56 varmp-man-by2004.tsp output [4].

The program run from which the linearized Manual Flats cost function was derived has a different constant term than the one actually used by witness Bozzo in Docket No.

R2005-1, although all of the other coefficients are the same. This discrepancy warrants reexamination of the underlying model.

PRODUCTIVITY DIFFERENCES OVER TIME

The following tables are recreated from the Postal Service's Response to VP/USPS-T1-16, redirected from witness Shah. They show that for most operations, the gap in average total pieces handled per hour among mail processing facilities of different sizes has not decreased since fiscal year 1999.

Table B-1

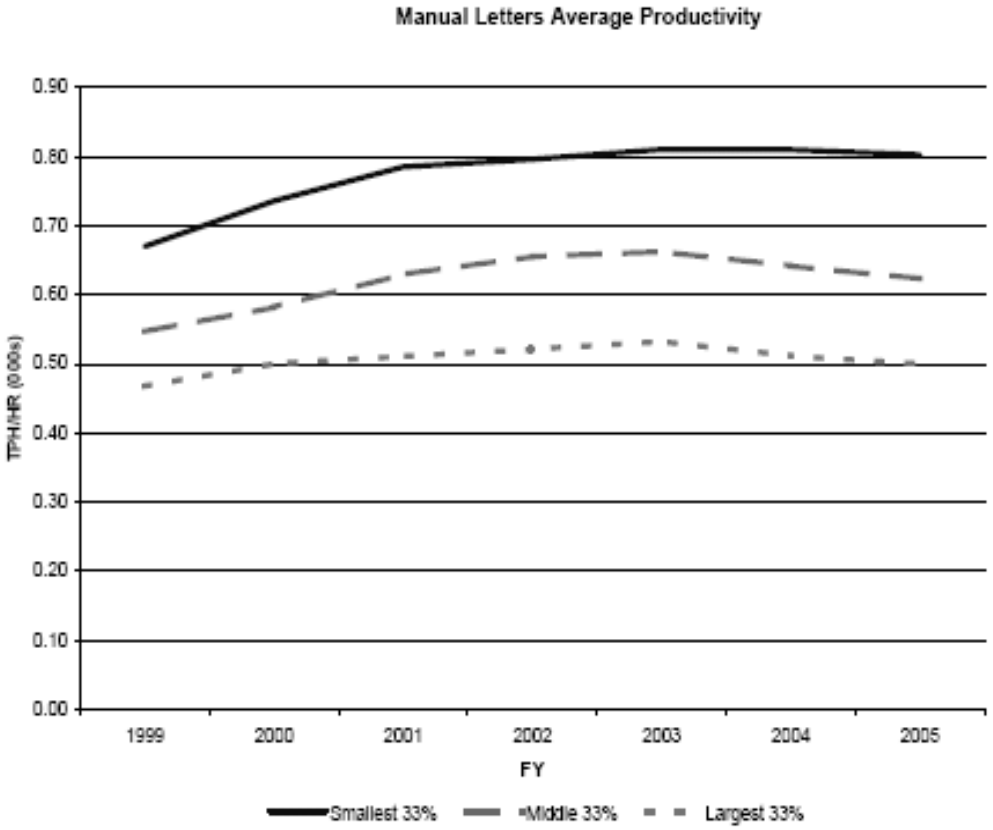


Table B-2

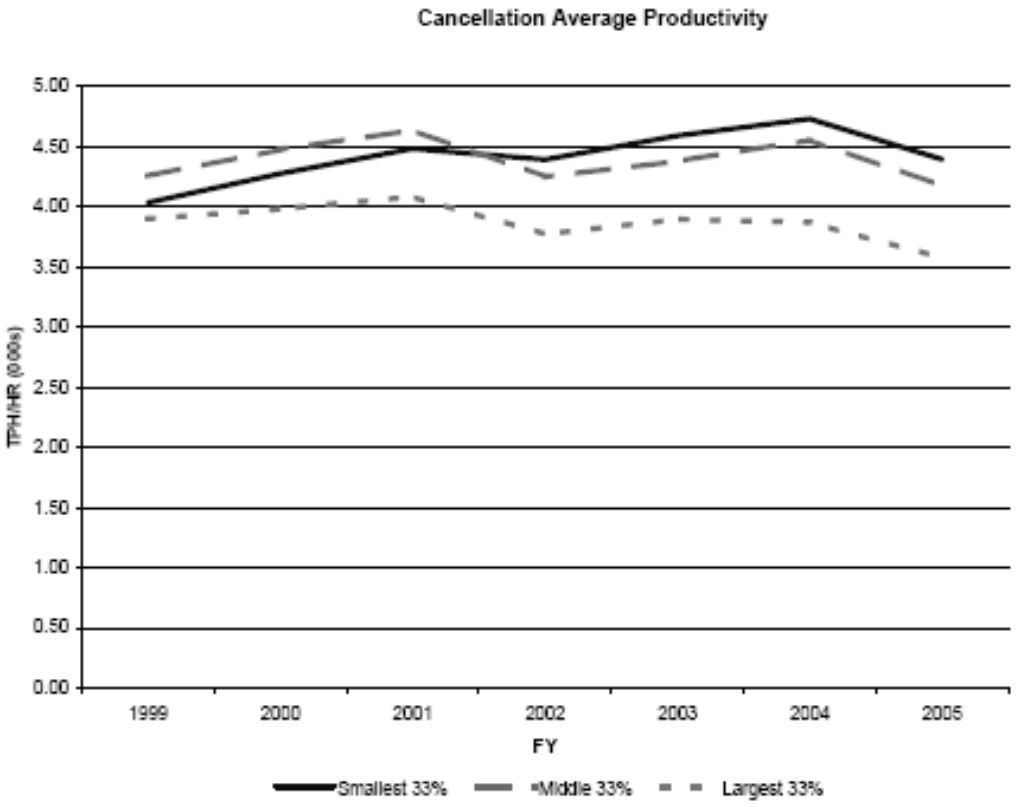

Cancellation Average Productivity
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
TP/H/HR (000s)
1999
2000
2001
2002
2003
2004
2005
FY
Smallest 33%
Middle 33%
Largest 33%

Table B-3

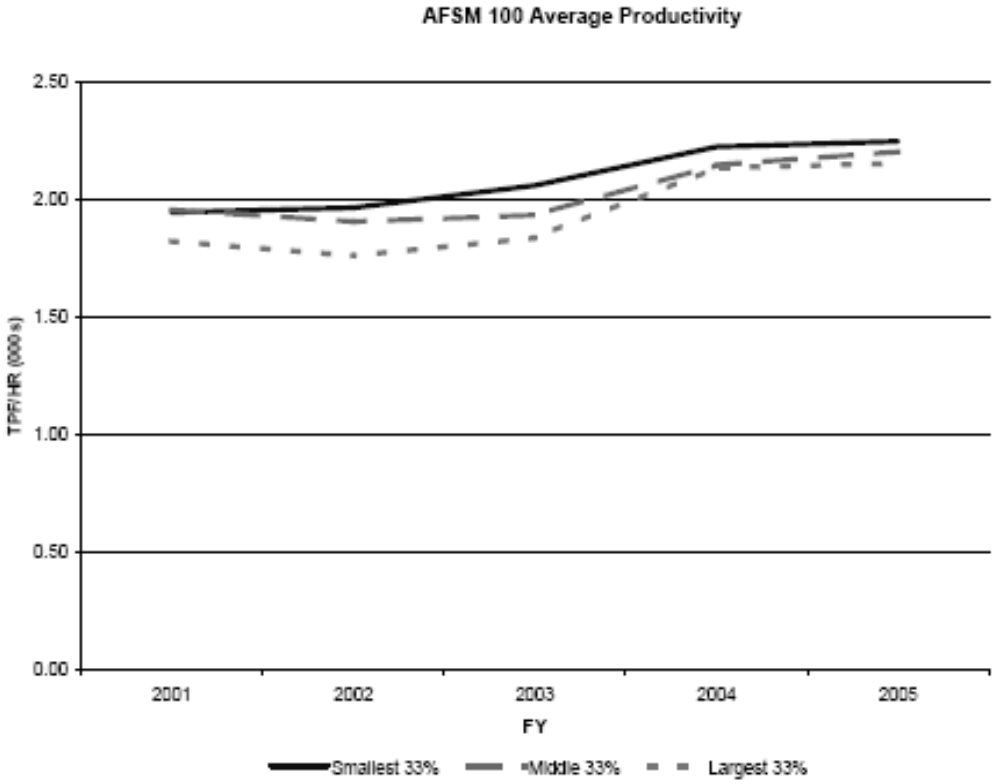

AFSM 100 Average Productivity
2.50
2.00
1.50
1.00
0.50
0.00
TPF/HR (000's)
2001
2002
2003
2004
2005
FY
Smallest 33%
Middle 33%
Largest 33%

Table B-4

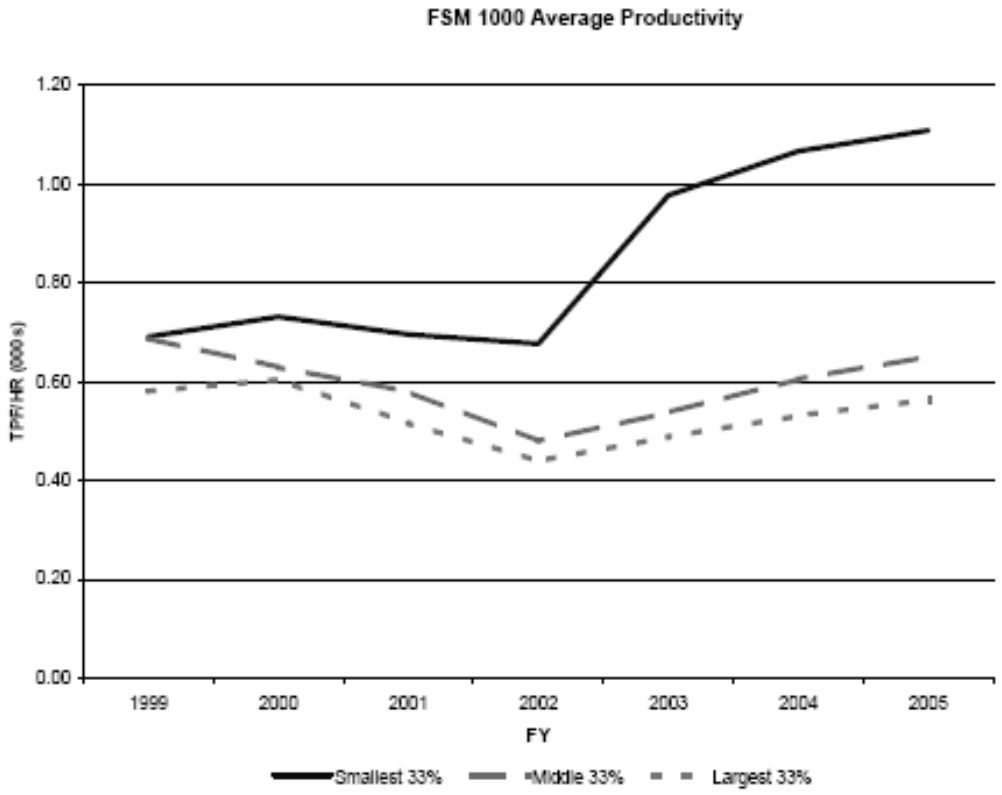

FSM 1000 Average Productivity
1.20
1.00
0.80
0.60
0.40
0.20
0.00
TPF/HR (000's)
1999
2000
2001
2002
2003
2004
2005
FY
Smallest 33%
Middle 33%
Largest 33%

Table B-5

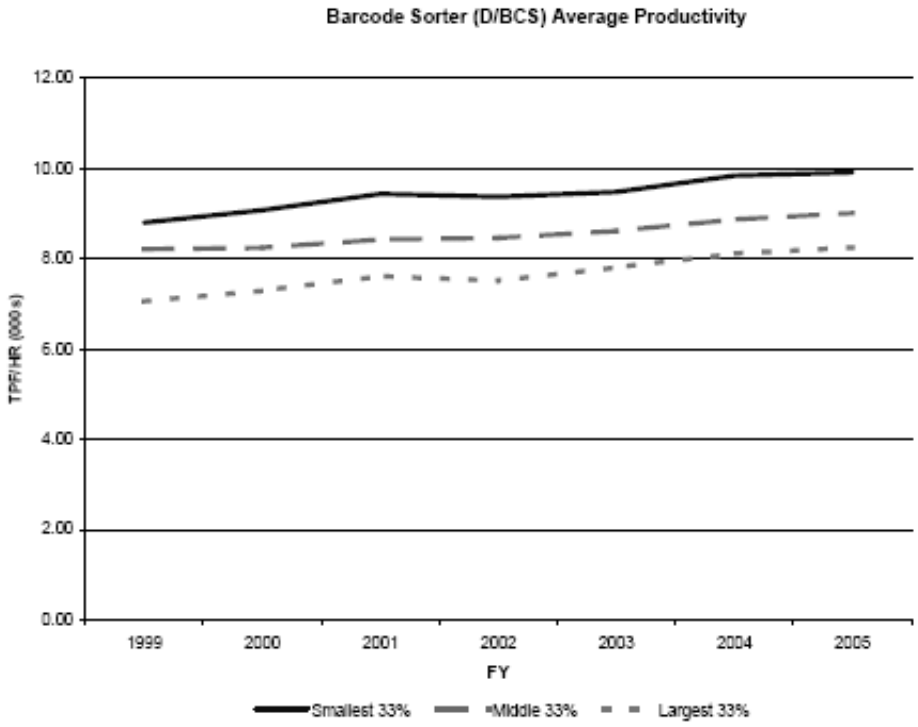

Barcode Sorter (D/BCS) Average Productivity
12.00
10.00
8.00
6.00
4.00
2.00
0.00
TPF/HR (000's)
1999
2000
2001
2002
2003
2004
2005
FY
Smallest 33%
Middle 33%
Largest 33%

Table B-6

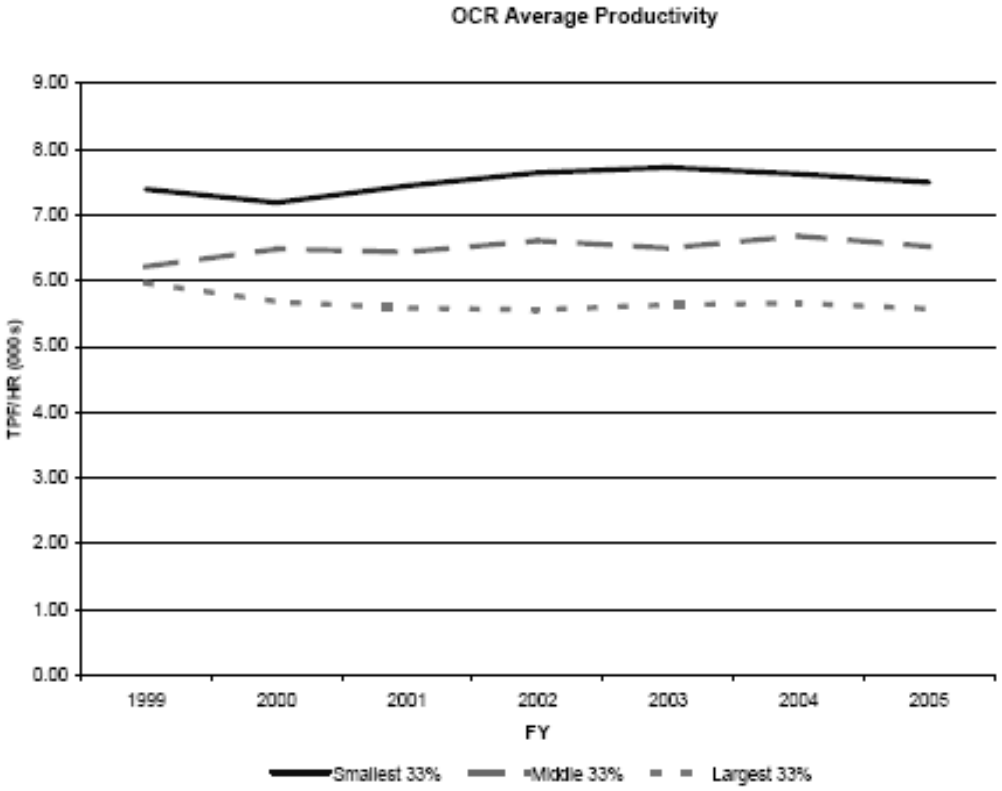
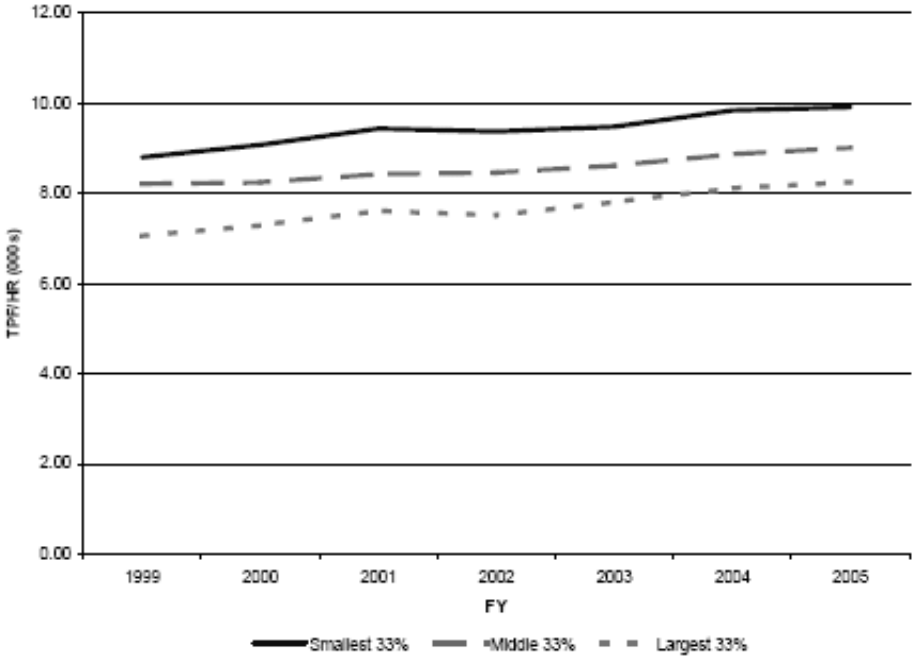

OCR Average Productivity
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
TPF/HR (000's)
1999
2000
2001
2002
2003
2004
2005
FY
Smallest 33%
Middle 33%
Largest 33%

Table B-7

Barcode Sorter (D/BCS) Average Productivity



PRODUCTIVITY INFRASTRUCTURE

This appendix depicts frequency distributions of MODS TPH per hour for 11 mail processing operations. The data is from Docket No. R2006-1, USPS-LR-L-56, Excel file vv9905.xls. It reflects FY2005 data for a total of 368 facilities.

When available, screens used in USPS-LR-L-56 were used to remove anomalies. Prior to removing anomalies based on USPS-LR-L-56, obvious anomalies (mismatched and empty data fields) were also removed. Productivities below the minimum or above the maximum given by witness Bozzo as appropriate cutoffs were eliminated from the data set. The mail processing operations, along with their corresponding minimum and maximum screens are listed below:

Table C-1
Productivity Screen Limits

Operation	Minimum	Maximum
OCR	500	15,000
*MPBCS	0	33,563
DBCS	500	22,500
Manual Letters	100	1,400
Manual Flats	100	1,000
FSMs	150	2,000
Manual Priority	25	700
Manual Parcels	25	800
*AFCS	0	37,554
AFSM 100	750	3,000
SPBS	50	725

* Indicated mail processing operations where Docket No. R2006-1, USPS-LR-L-56 did not establish screens to remove outliers from the data set, and an alternate method was used.[1]

[1] When screens developed in Docket No. R2006-1, USPS-LR-L-56 were not available, the mean and standard deviation were computed. All observations greater than five standard deviations away from the mean were removed. Then, a new mean and standard deviation were computed. All data greater than five standard deviations away from the mean were removed. This process was continued until all data greater than five standard deviations away from the mean were removed. Note: the minimum value for TPH/Hour cannot be less than zero.

[1] Not all facilities provided data for each mail processing operation.

The data used to create the graphs below is located in the corresponding Excel file.

Figure C-1
Optical Character Reader

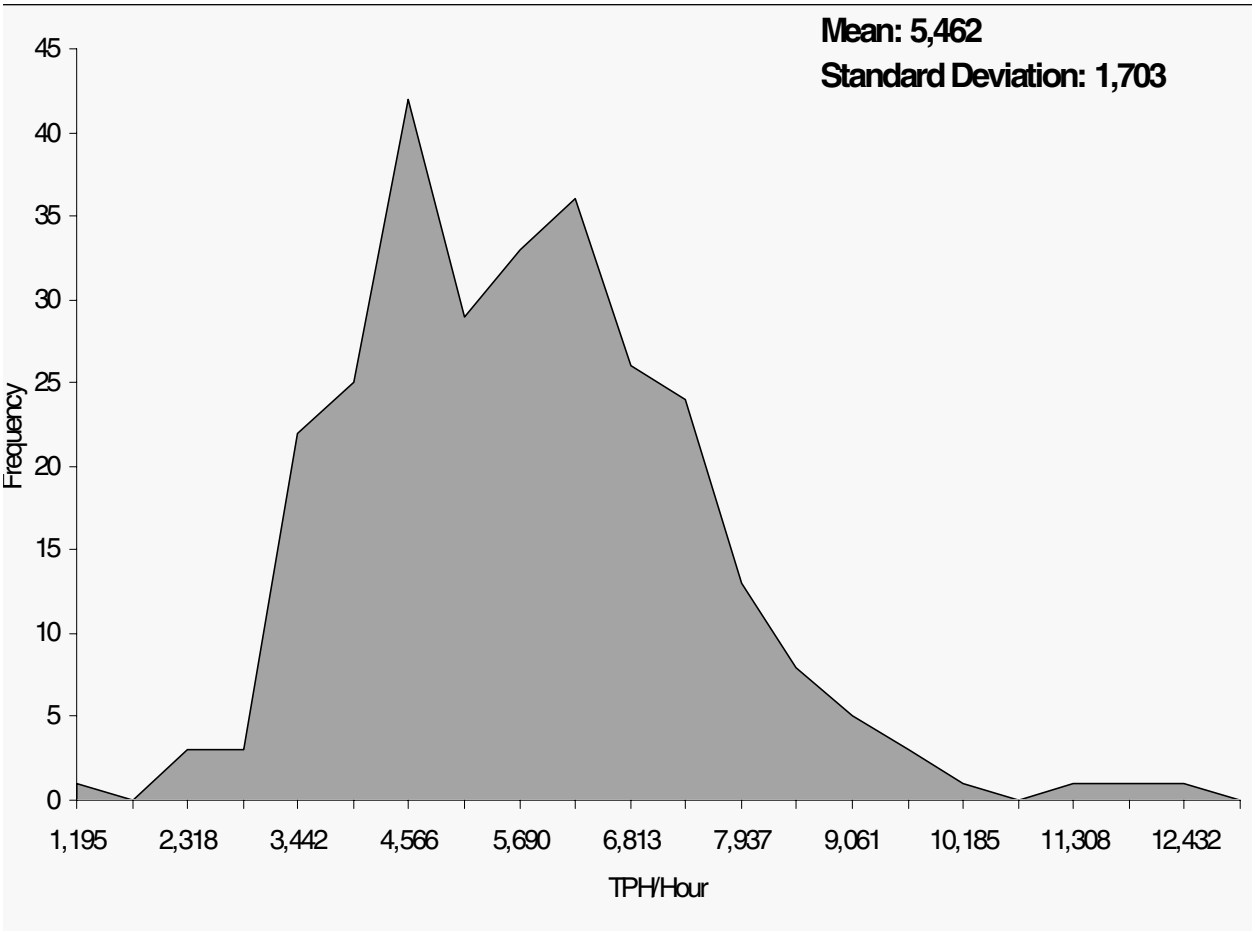


Figure C-2
Multi-Pass Barcode Sorter

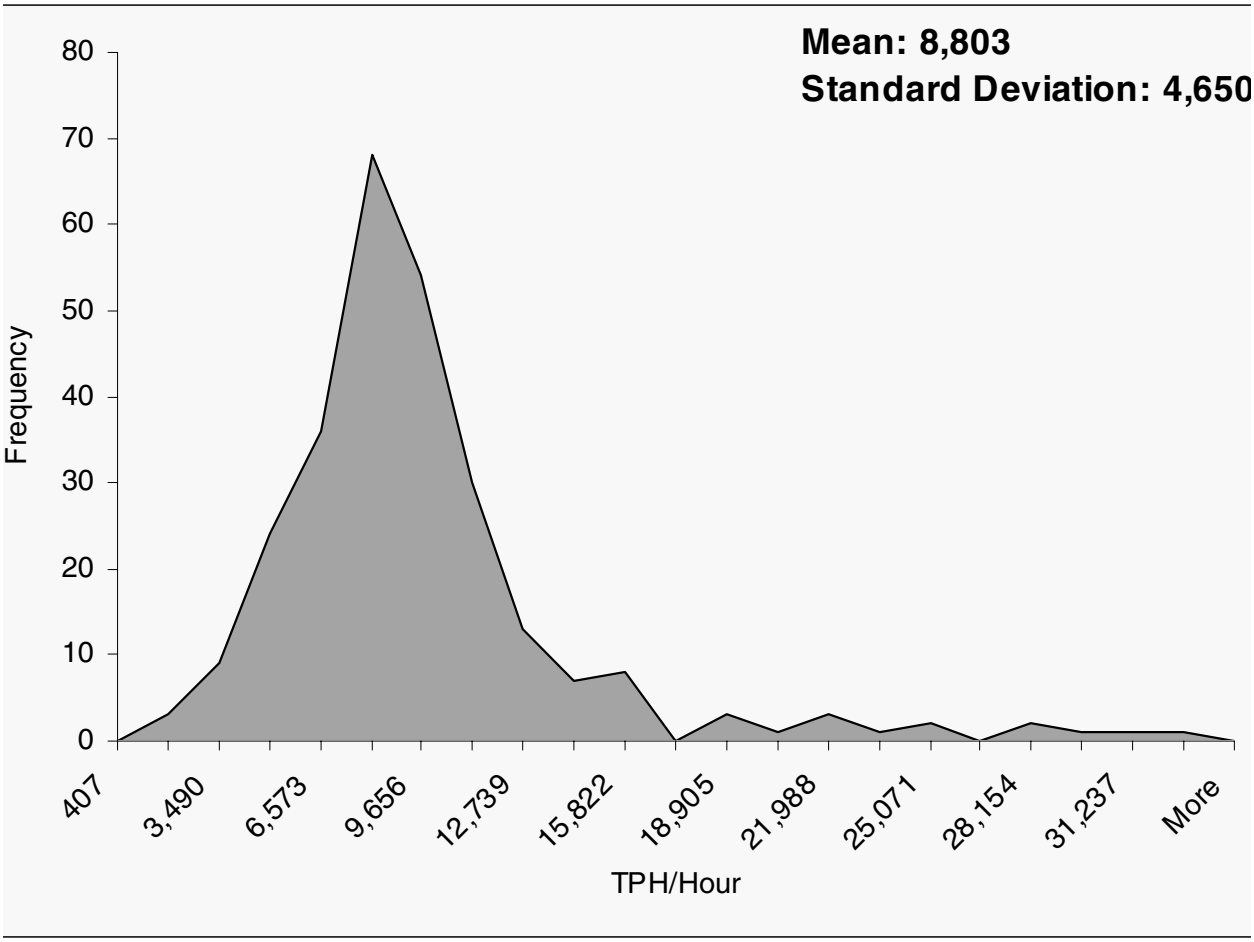


Figure C-3
Delivery Barcode Sorter

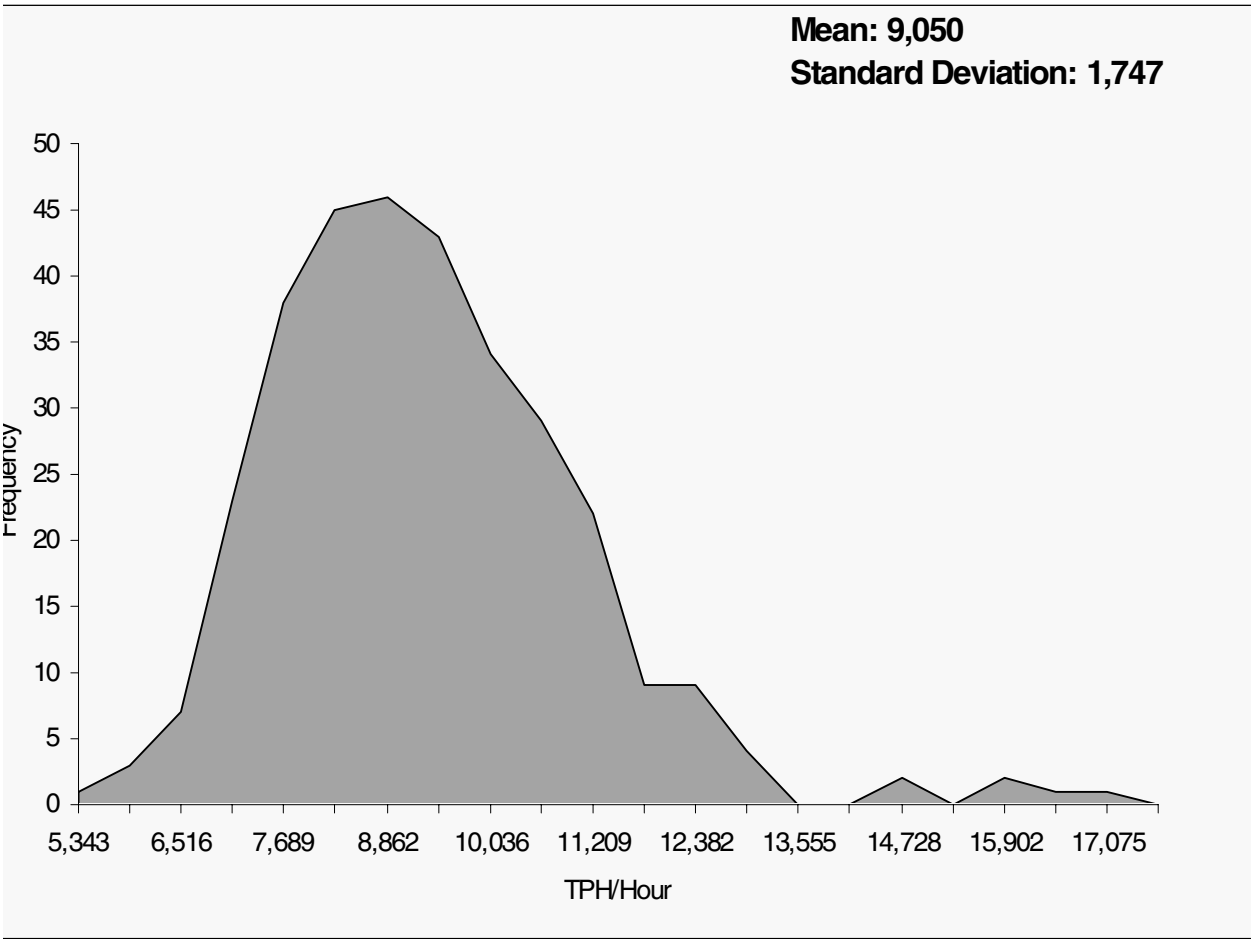


Figure C-4
Manual Letters

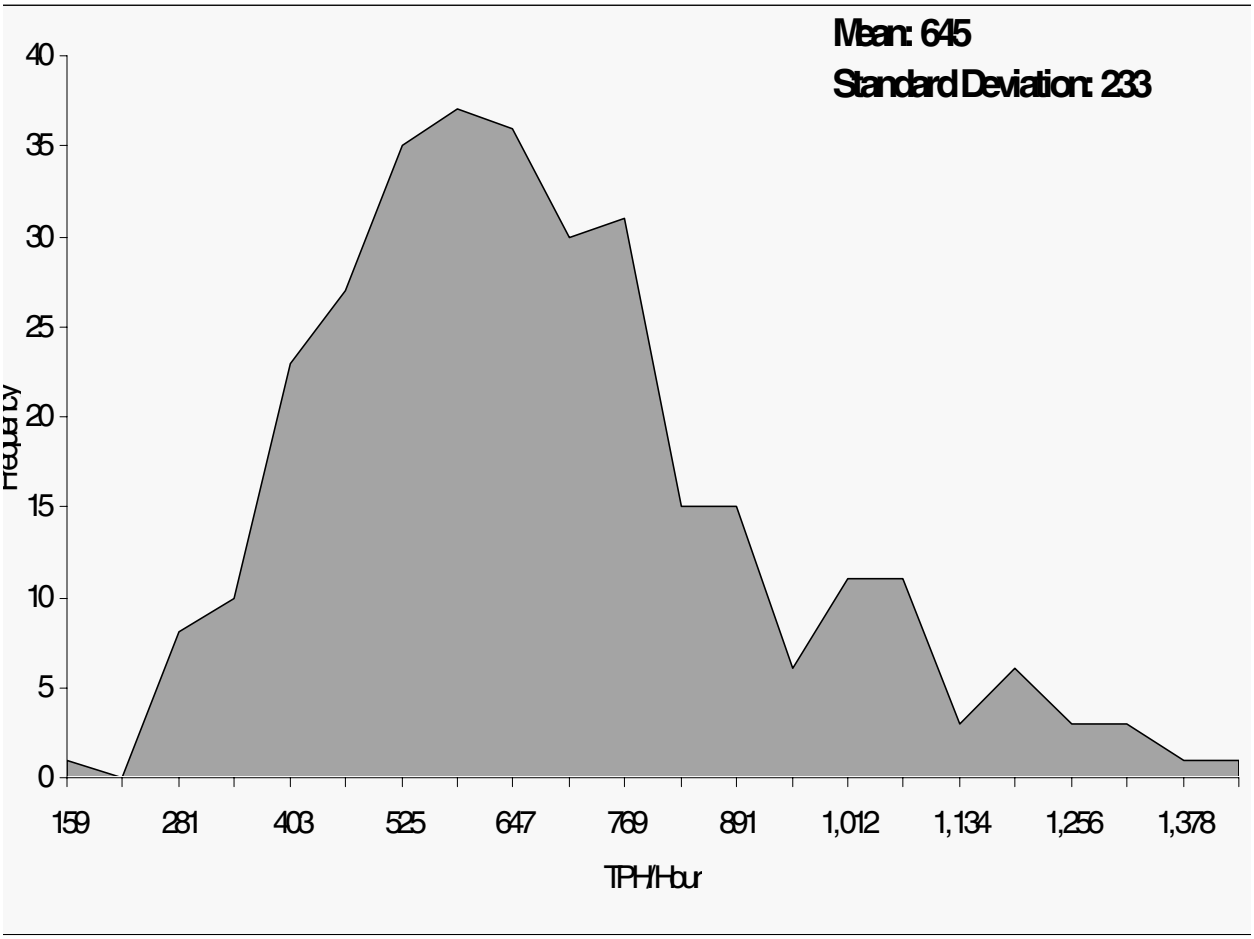


Figure C-5
Manual Flats

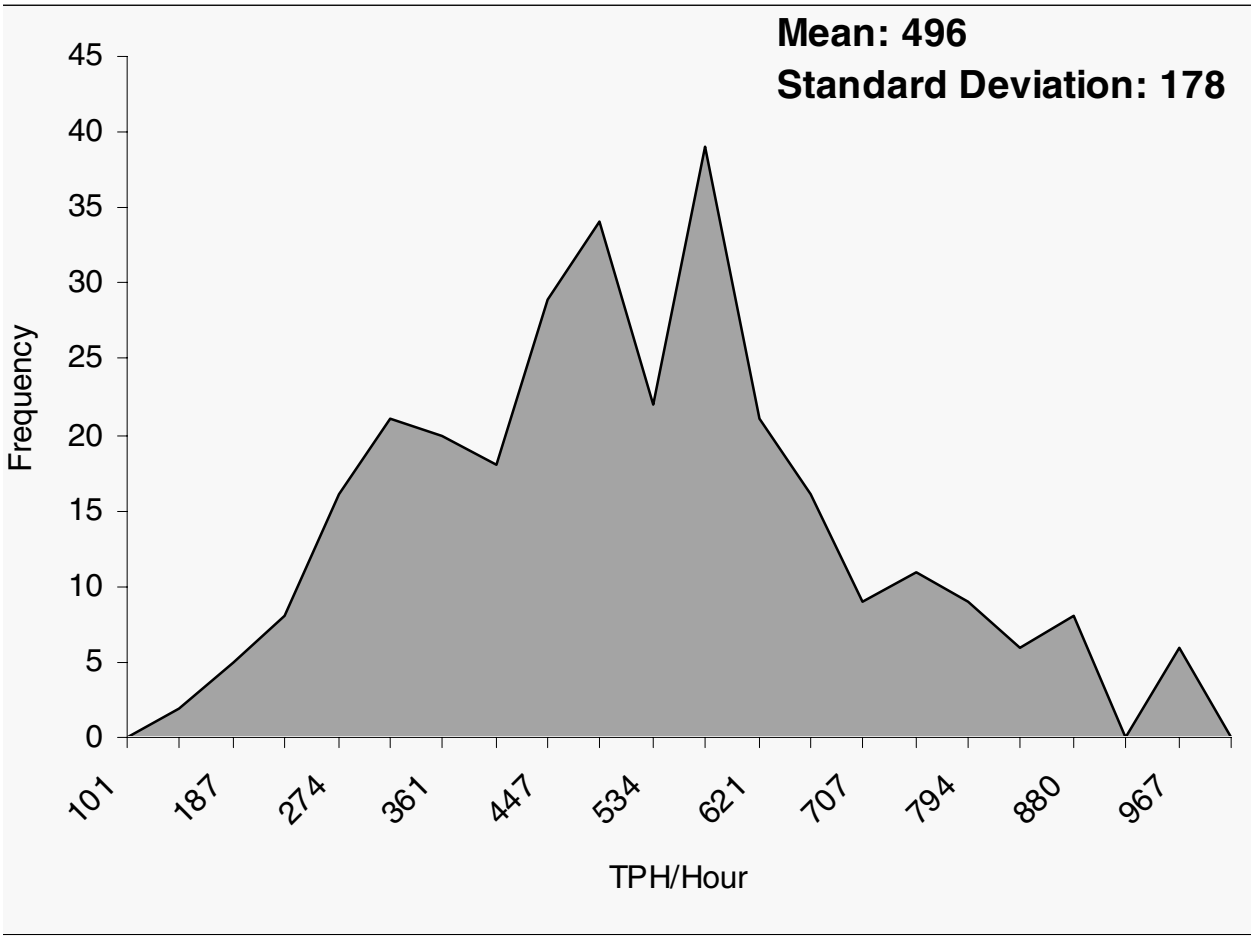


Figure C-6
Flat Sorting Machine

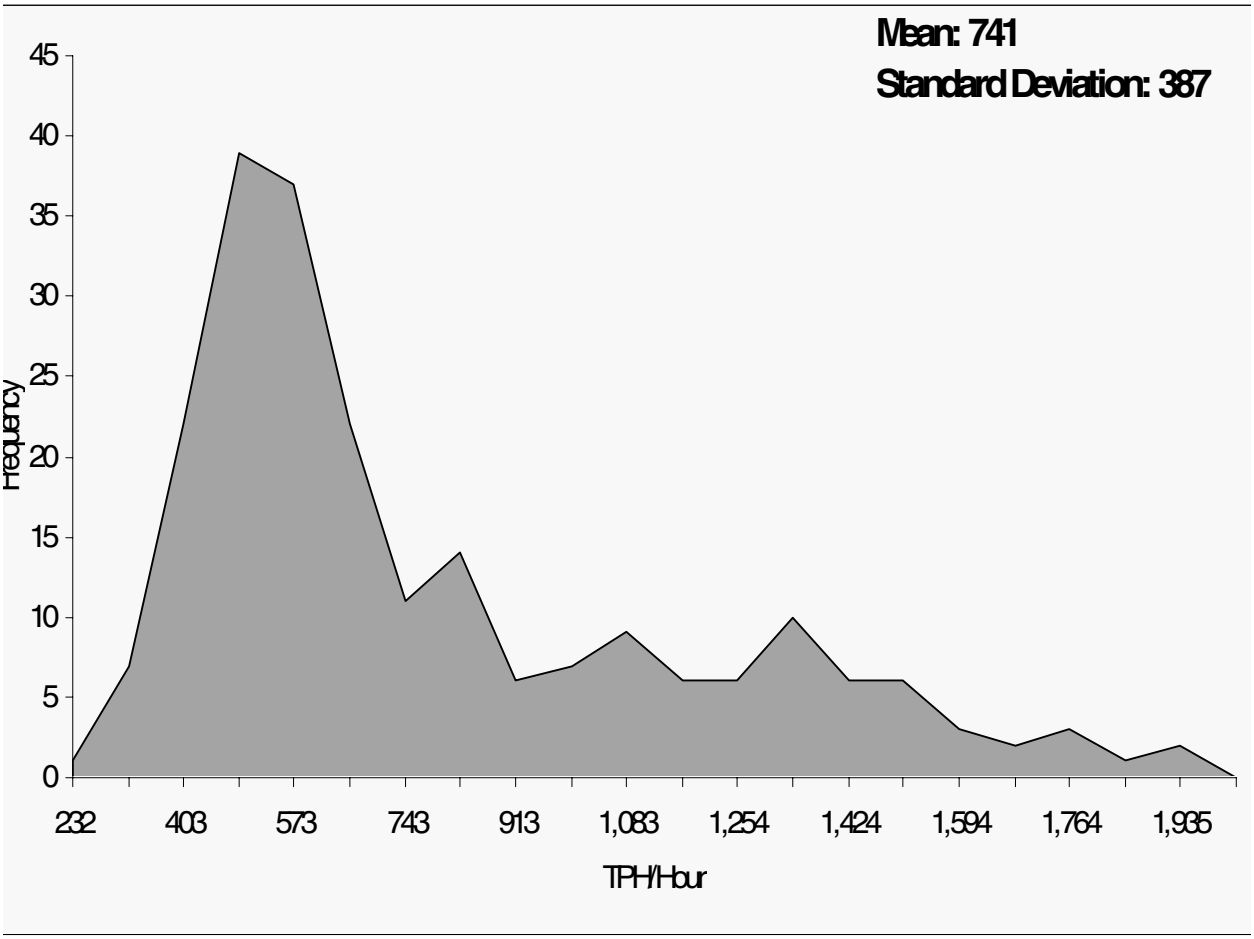


Figure C-7
Automated Flat Sorting Machine

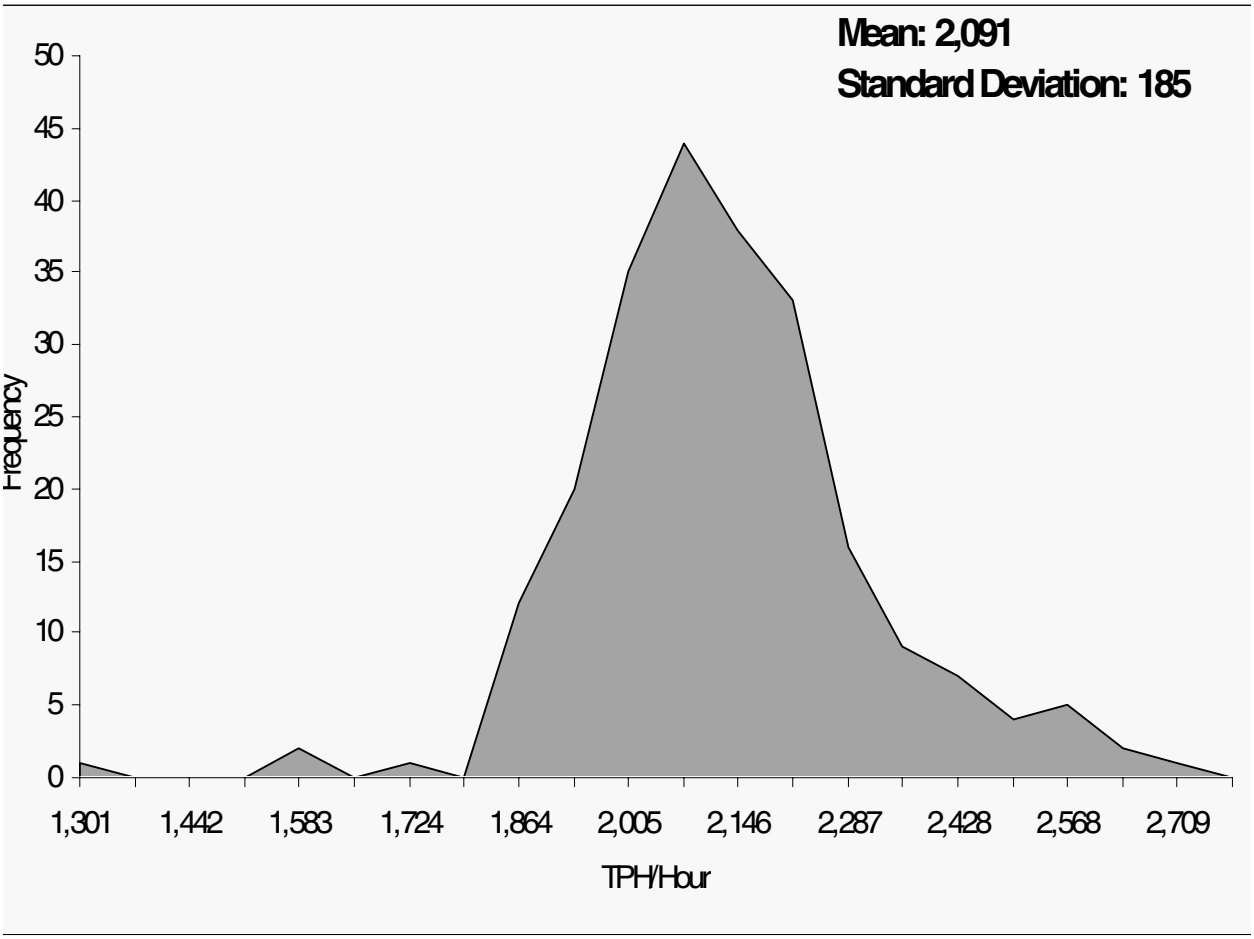


Figure C-8
Small Parcel and Bundle Sorter

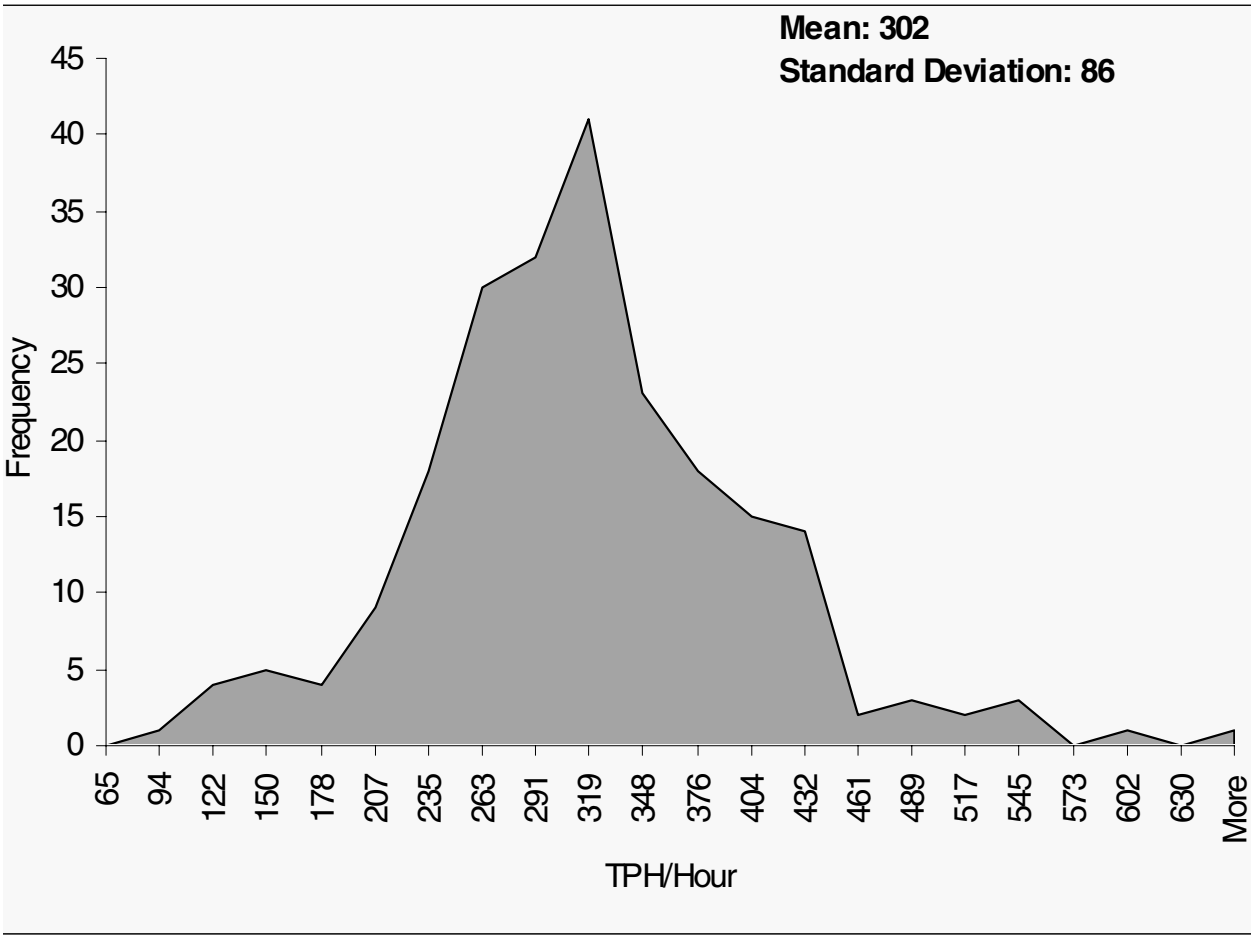


Figure C-9
Advanced Facer Cenceller

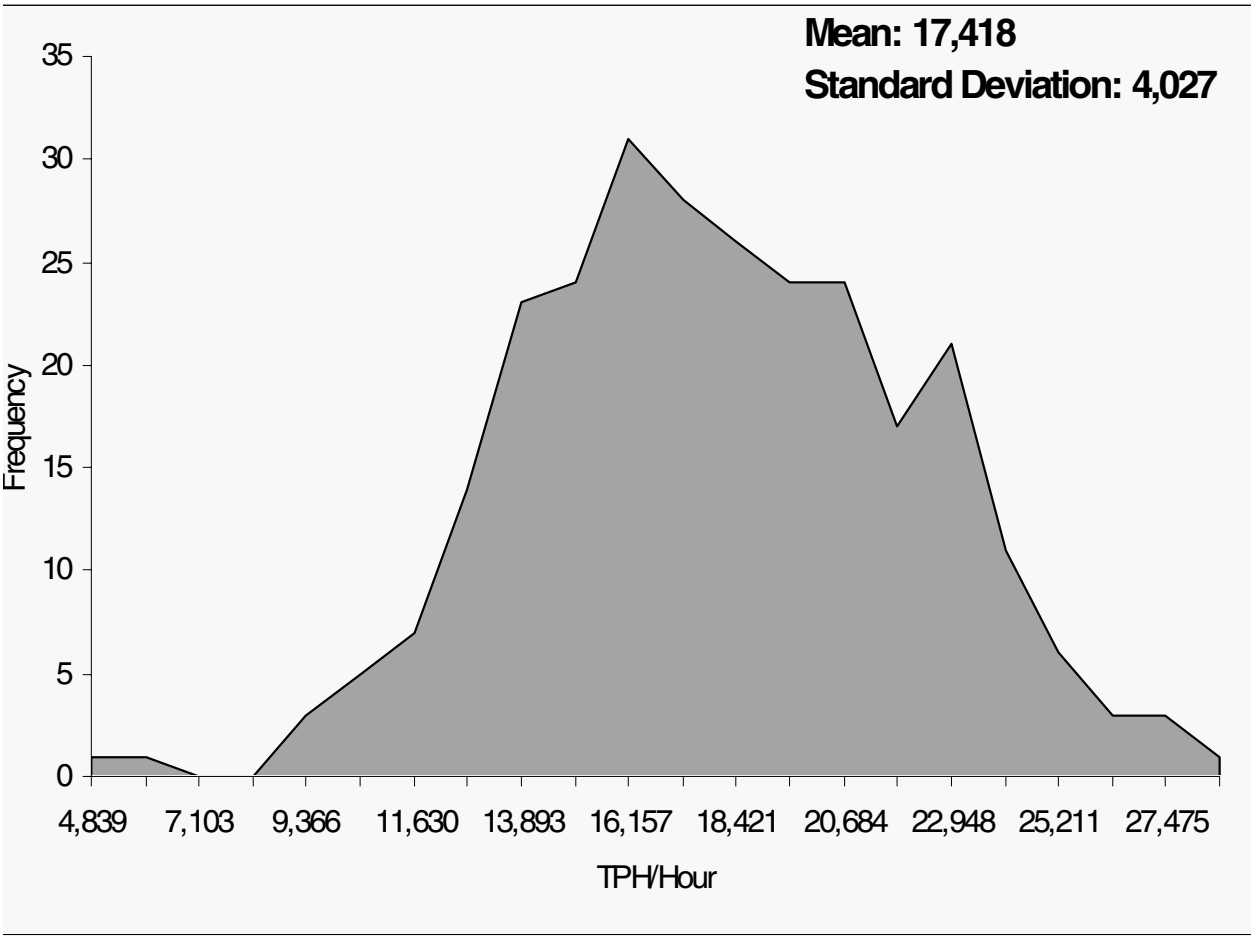


Figure C-10
Manual Parcels

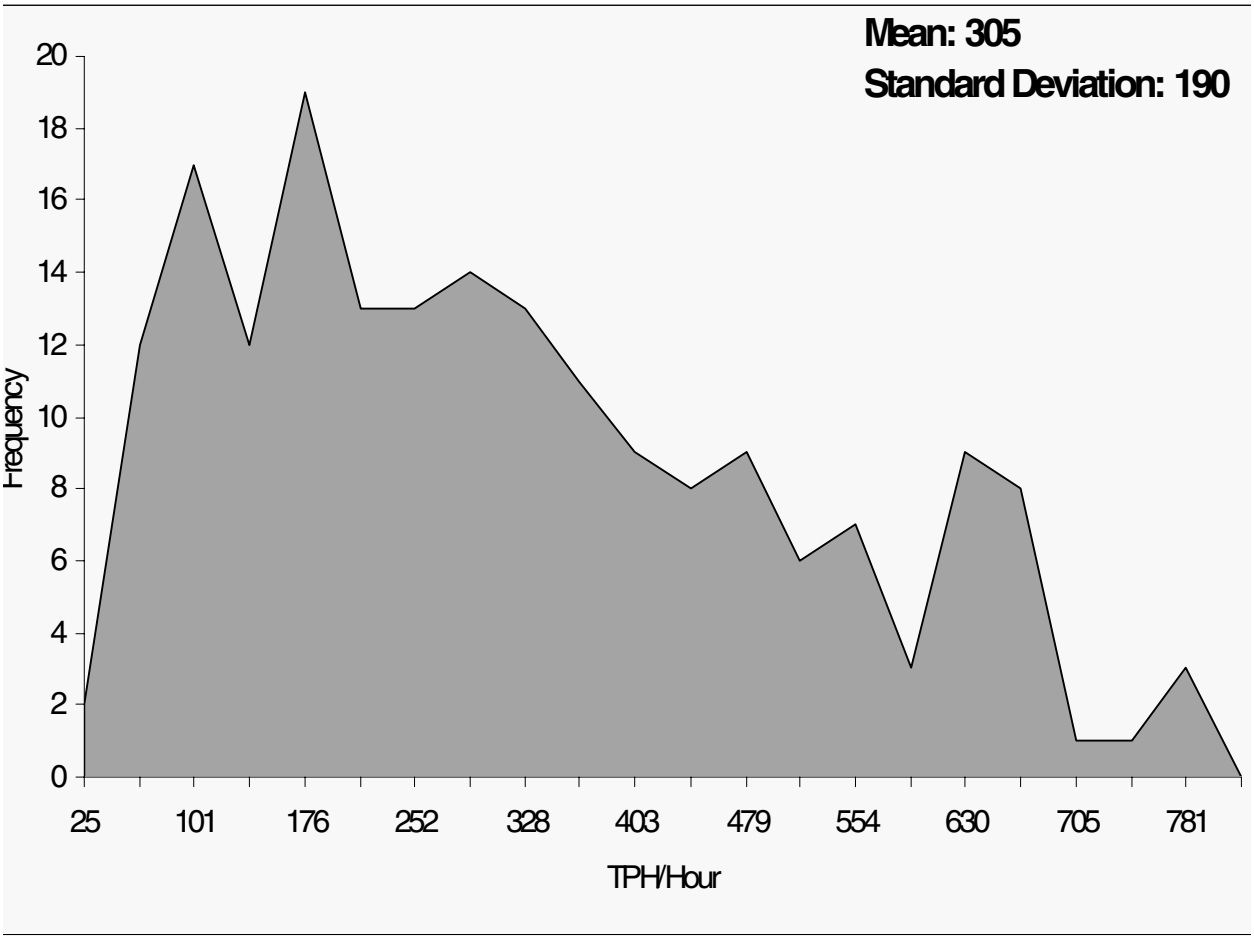
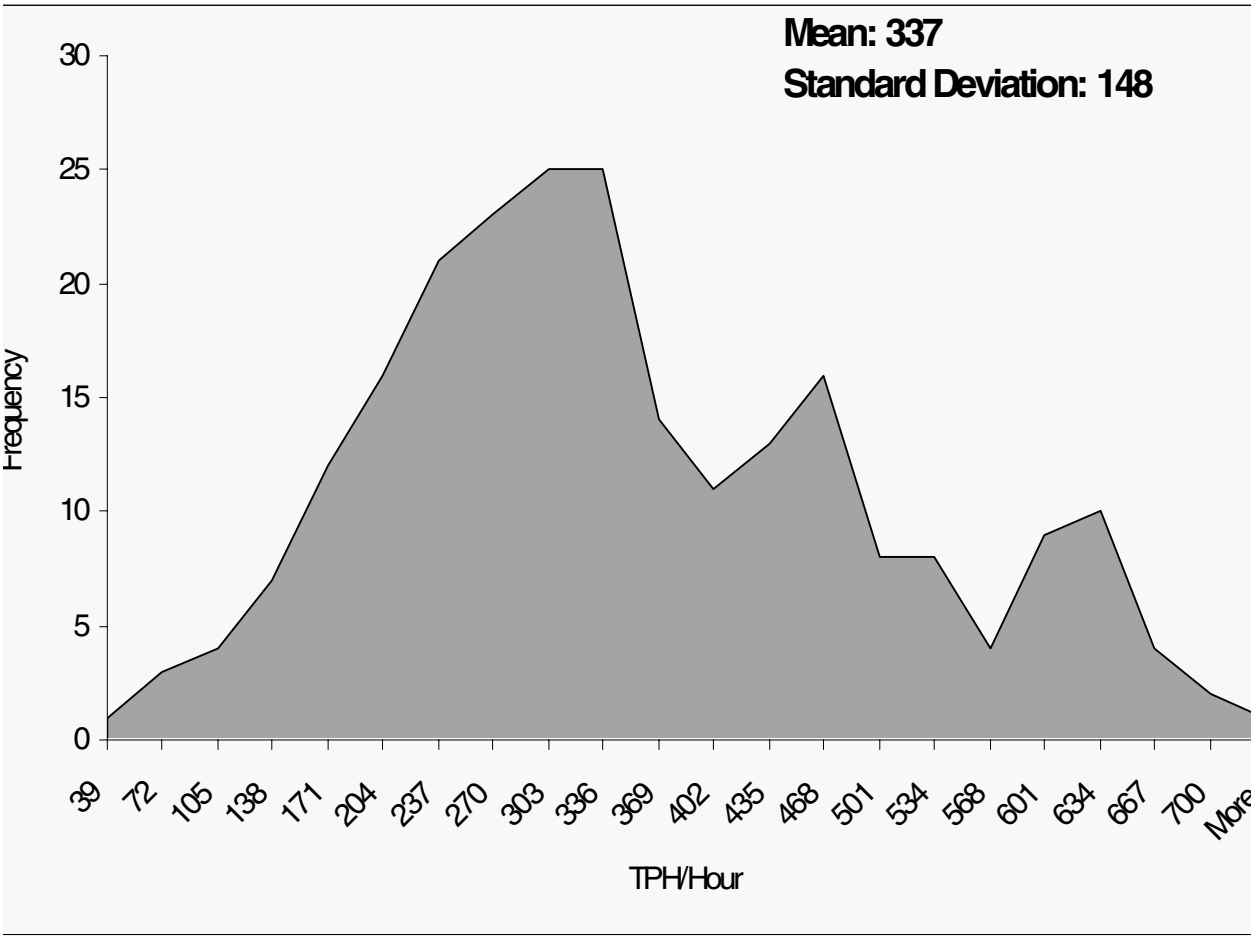


Figure C-11
Manual Priority



PARTICIPANTS AND COUNSEL OR REPRESENTATIVE

Alliance of Nonprofit Mailers (ANM)
David M. Levy

American Business Media (ABM)
David R. Straus

American Postal Workers Union, AFL-CIO (APWU)
Darryl J. Anderson

Association for Postal Commerce (PostCom)
Ian D. Volner

Association of Priority Mail Users, Inc. (APMU)
William J. Olson
John S. Miles
Jeremiah L. Morgan

Bank of America Corporation (BOA)
David M. Levy

Douglas F. Carlson (Carlson)*
Douglas F. Carlson

Direct Marketing Association, Inc. (DMA)
Dana T. Ackerly II

Discover Financial Services LLC (DFS)
Robert J. Brinkmann

Magazine Publishers of America, Inc. (MPA)
James Pierce Myers

Mail Order Association of America (MOAA)
David C. Todd

* Limited Participant

National Association of Letter Carriers, AFL-CIO (NALC)
Bruce H. Simon

National Association of Postal Supervisors (NAPS)
Bruce Moyer

National Association of Postmasters of the United States (NAPUS)
Robert M. Levi

National Association of Presort Mailers (NAPM)
Joel T. Thomas

National Newspaper Association (NNA)
Tonda F. Rush

National Postal Mail Handlers Union (NPMHU)*
Bruce R. Lerner
Kathleen Keller

Netflix, Inc. (Netflix)
Timothy J. May

Newspaper Association of America (NAA)
Paul J. Boyle
William B. Baker

Office of the Consumer Advocate (OCA)
April E. Boston
Kenneth E. Richardson

Parcel Shippers Association (PSA)
Timothy J. May

Pitney Bowes, Inc. (Pitney Bowes)
John Longstreth
Michael F. Scanlon

David B. Popkin (Popkin)*
David B. Popkin

* Limited Participant

Time Warner Inc. (Time Warner)
John M. Burzio
Timothy L. Keegan

United States Postal Service (Postal Service)
Daniel J. Foucheaux, Jr.
Sheela Portonovo
Michael T. Tidwell

Valpak Dealers' Association, Inc. (VPDA)
William J. Olson
John S. Miles
Jeremiah L. Morgan

Valpak Direct Marketing Systems, Inc. (VDMS)
William J. Olson
John S. Miles
Jeremiah L. Morgan

* Limited Participant