



# **A Primer on Postal Costing Issues**

**March 20, 2012**

**Prepared by U.S. Postal Service Office of Inspector General  
Risk Analysis Research Center  
Report Number: RARC-WP-12-008**

# A Primer on Postal Costing Issues

## Executive Summary

The current system used to estimate the cost of postal products has not been changed fundamentally in many years, though significant inputs are updated annually. There have been calls for an examination of the accuracy and relevance of the system and for specific changes to be made. There is merit to some of these suggestions, as discussed below. In particular, the business needs of the organization have changed since the passage of the Postal Accountability and Enhancement Act of 2006 (PAEA).<sup>1</sup> Those changes include the need for more finely disaggregated cost information, as well as for cost estimates more closely tied to operations. This paper includes a brief discussion of postal costing and identifies and discusses the most salient of the concerns that have been raised by executives and analysts at the U.S. Postal Service<sup>®</sup> (the Postal Service) and by customers.

The Postal Regulatory Commission (PRC), the Board of Governors (BOG), and Postal Service management use cost estimates to evaluate the financial performance of products and judge compliance with the PAEA.<sup>2</sup> Currently, the Postal Service allocates only 55 percent of its costs to products (attributable costs), leaving the remaining 45 percent of costs as institutional. Most of the calls for examination concern the accuracy of the attribution methods and assumptions and the issues related to having such a large amount of institutional costs. The main issues that have been raised are:

1. Should the Postal Service use fully distributed costs (a methodology for distributing institutional costs to products) to evaluate the financial performance of products?
2. How should the system be adapted to reflect the excess capacity currently present in the postal network (short-run versus long-run marginal costs)?
3. Should the Postal Service move toward developing bottom-up costs?
4. How should the new postal data sources (such as Intelligent Mail barcode or IMb) be used in the costing system to improve accuracy and reduce costs?
5. What can be done to improve the timeliness of cost studies?

---

<sup>1</sup> P.L. 109-435 (2006).

<sup>2</sup> The PRC examines whether or not products cover their cost, a requirement for competitive products (39 U.S.C. § 3633(a)) and a factor that must be considered for market dominant products (39 U.S.C. § 3622(c)(2)). The PRC also ensures that workshare discounts do not exceed their avoided costs, unless certain exemptions apply. 39 U.S.C. § 3622(e)(2).

The seven key points that emerge from this discussion are:

1. The current costing system is a time-tested, well-recognized system, reviewed by many agencies, and lauded by many well-known economists. On the other hand, the system relies upon data gathered at significant expense, and its attribution methods have been questioned by critics of the system. Opportunities exist to make important improvements, though care should be taken to preserve the elements of the system that are of value.
2. Fully-distributed cost (FDC) methods that allocate institutional costs to products may be misleading indicators of a product's financial performance. An important achievement of the current cost system is the estimation of economic costs, as these are highly valuable for product pricing and development.
3. The current volume decline has created a strong interest in short-run cost measurement, as proponents believe that the use of long-run costs to set prices unfairly burdens their products with costs associated with excess capacity. Using short-run costs for pricing can pose risks, as short-run costs can be difficult to measure and can fluctuate rapidly.
4. Bottom-up costing<sup>3</sup> may significantly improve the utility of the cost system as a tool for management. The introduction of more disaggregated cost information, however, carries with it certain difficulties that must be overcome, including the potential disruption associated with moving to a new cost system, the difficulty of reconciling bottom-up costs with total costs, and the significant resource commitment that would be needed to implement the new system.
5. The question of what new data can be used to improve the cost systems is under study at the Postal Service. At this point, the new data systems such as IMb may not be mature enough to use in support of the cost system in any material way. However, the goal of cost system improvement needs to be a driver of decisions governing the development of operational data systems.
6. Some of the periodic cost studies that support the cost systems are significantly out of date and should be updated as they no longer reflect operational reality. Also, in some cases, the methodology originally used was not accepted by all analysts and may need to be revisited (e.g., mail processing volume variability).<sup>4</sup>
7. The Postal Service should develop a vision for what cost data it will need in the future to support management decisions and develop an implementation plan to

---

<sup>3</sup> Bottom-up costing refers to estimating the cost of each individual element of the mail handling process and then adding together those costs to develop the product cost.

<sup>4</sup> Volume variability refers to how much costs vary with respect to a change in volume. The Postal Service has previously argued that mail processing costs are less than 100 percent volume variable. In other words, if volume increases by one percent, costs will increase by less than 1 percent. The PRC disagrees; it believes that mail processing costs are close to 100 percent volume variable. After PAEA, the Postal Service adopted the PRC's methodology.

move toward this vision, including the development and adjustment of operational data systems to provide useful inputs to the cost system.

## Table of Contents

Introduction .....	1
Basics of Postal Costing.....	2
Evaluation of the Current System.....	3
Should the Postal Service Use Fully Distributed Costs To Evaluate the Financial Performance of Products?.....	3
How Should the System be Adapted To Reflect the Excess Capacity Currently Present in the Postal Network (Short-Run Versus Long-Run Marginal Costs)?.....	5
Should the Postal Service Move Toward Developing Bottom-Up Costs? .....	6
How Should the New Postal Data Sources (Such as IMb) Be Used in the Costing System To Improve Accuracy and Reduce Costs? .....	7
What Can Be Done To Improve the Timeliness of Cost Studies? .....	7
Cost Data Needs in the Future.....	8
Cost Data Needs Will Change with Decline in Physical Mail and Increase in Digital Mail .....	9
Incentive Regulation Drives the Need for Activity-Based Costing.....	10
Cost Data Needs To Support Negotiated Service Agreements .....	11
Conclusion .....	11

## Tables

Table 1	Marginal Cost Example .....	14
Table 2	Public Cost and Revenue Analysis FY 2010 (in millions) .....	24
Table 3	Three-Product Firm Example.....	25
Table 4	Three-Product Firm Example, Institutional Cost Allocated Evenly.....	26
Table 5	Three-Product Firm Example, Institutional Cost Allocated Based on Volume .....	27
Table 6	Three-Product Firm Example, Institutional Cost Allocated Based on Attributable Costs .....	27
Table 7	Long-Run (LR) and Temporary Short-Run (SR) Attributable Costs Per Piece (FY 2008).....	30

## Figures

Figure 1	Marginal Cost for Postal Products Falls as Volume Increases.....	15
Figure 2	Find Total Cost of Each Cost Activity .....	16
Figure 3	Measure Volume Variable Costs .....	17
Figure 4	Distribute Volume Variable Costs to Product.....	17
Figure 5	Estimate the Volume Variable Cost of Each Segment.....	19
Figure 6	Attributable and Institutional Costs .....	20
Figure 7	Components of Institutional Cost.....	21
Figure 8	Price above Marginal Cost is No Guarantee that Price Exceeds Cost .....	22
Figure 9	Incremental Cost .....	23

## Appendices

Appendix A	Marginal Costs.....	14
Appendix B	Incremental Costs.....	22
Appendix C	Fully Distributed Cost .....	25
Appendix D	Short-Run versus Long-Run Marginal Costs .....	29
Appendix E	Bottom-Up Costing .....	32
Appendix F	New Data Sources.....	34
Appendix G	Timeliness of Cost Data .....	36

## A Primer on Postal Costing Issues

### Introduction

The U.S. Postal Service's product costing system<sup>5</sup> has been developed over the past 40 years, roughly since the passage of the Postal Reorganization Act (PRA). Until 2006 its main use was found in rate cases, to assist the Postal Rate Commission<sup>6</sup> in determining the rate structure, though it has also been used by postal management to develop pricing proposals and to assist in field budgeting, investment decisions, and product marketing. Since the enactment of the Postal Accountability and Enhancement Act (PAEA) in 2006,<sup>7</sup> the newly named Postal Regulatory Commission (PRC) has used the system to ensure that competitive products are not subsidized by the customers of market dominant products (a requirement under PAEA) and to establish the contribution of competitive products to institutional cost (a minimum contribution is set by the PRC under PAEA).<sup>8</sup> The PRC also uses the cost estimates to verify that workshare discounts do not exceed avoided cost (unless certain exceptions are met) and that the revenue exceeds costs for market dominant products.<sup>9</sup> Further, the Board of Governors (BOG) and Postal Service management use the cost estimates to evaluate discounts and the price of new products.

There have been calls for change in the system, both from Postal Service personnel and from postal customers.<sup>10</sup> As discussed in this paper, there is merit to some of these suggestions, although some are good ideas that present resource challenges. Currently, the Postal Service's finance function is leading an examination of the cost system, with input from mailers and postal executives. The project aims to identify the appropriate changes that should be made to the system. After a general introduction to postal costing, this paper briefly addresses five of the main issues that have been recently raised and discusses the need for the Postal Service to develop a vision for its future cost data needs. A more detailed discussion of postal costing and the issues involved is included in the appendices.

---

<sup>5</sup> The Postal Service's "costing system" refers primarily to the Cost and Revenue Analysis (CRA) and to the sampling systems that feed the CRA, including the In-Office Cost System (IOCS), the Carrier Cost System (CCS), and the Transportation Cost System (TRACS).

<sup>6</sup> Prior to PAEA, the regulatory body was called the Postal Rate Commission. PAEA changed the name to Postal Regulatory Commission.

<sup>7</sup> P.L. 109-435.

<sup>8</sup> See 39 U.S.C. § 3633.

<sup>9</sup> See 39 U.S.C. § 3622(c) and (e).

<sup>10</sup> For example, see Jessica Dauer Lowrance and Gregory Dawson, "Rationalizing Postal Costing in the 21<sup>st</sup> Century" (presentation at the 30<sup>th</sup> Annual Eastern Conference of the Center for Research in Regulated Industries, May 18-21, 2011) *The Postal Journal* (2011) at <http://postaljournal.com/2011/04/rationalizing-postal-costing-in-the-21st-century/>.



## Basics of Postal Costing

The current cost system was developed over time with much thought and insight from well-known economists including William Baumol,<sup>11</sup> John Panzar,<sup>12</sup> and William Vickrey.<sup>13</sup> It is worth noting that the Postal Service's cost procedures have been thoroughly reviewed over the years. In addition to numerous audits, the cost methodologies are reviewed annually by the PRC and have been debated during numerous public proceedings. In addition, a joint 1999 study by the Postal Service, the PRC, and the Government Accountability Office found Postal Service costing methods adequate for ratemaking purposes.<sup>14</sup>

***The Postal Service is a multiproduct firm, in a network industry, and has many common costs.***

The cost system was developed with a specific framework in mind in order to address the cost characteristics of the Postal Service organization. Specifically, the Postal Service is a multiproduct firm, has many common costs, and operates in a network industry. Any changes to the cost system must be able to address these characteristics.

- The Postal Service is a multiproduct firm – This characteristic is important because average cost, the fundamental cost datum useful in single product industries, has no meaning in a multiproduct firm. For example, imagine a simple industry in which firms produce widgets and nothing else. In such an industry, annual unit widget costs can be easily calculated by dividing the total annual cost by the number of widgets. However, the Postal Service delivers several different types of product (e.g., delivered letters, parcels). Each of these products has different cost characteristics, so dividing total cost by number of total pieces of mail does not provide a meaningful number.  
*The concept of average cost has no meaning in a multiproduct firm like the Postal Service.*
- The Postal Service has many common costs – There are many activities in which several of the Postal Service's products are handled simultaneously. An excellent example is the time spent by a mail carrier on his delivery route. The carrier leaves the carrier office and passes by each address, all the time carrying different products (e.g., letters, flats, parcels). The cost of the carrier time expended in such an activity is both fixed with respect to volume and common to many products. Therefore, there is no justifiable economic algorithm for determining how much of such common costs should be assigned to an individual product.
- The Postal Service is a network industry – In network industries there are cost advantages to handling products together, either more of the same product

<sup>11</sup> William J. Baumol, Direct Testimony before the PRC, Dockets No. R87-1, and R90-1, Remand.

<sup>12</sup> John C. Panzar, Rebuttal Testimony before the PRC, Docket No. R90-1, Remand, and Direct Testimony before the PRC, Docket No. R97-1.

<sup>13</sup> William Vickrey, Direct Testimony before the PRC, Docket No. R74-1.

<sup>14</sup> A.T. Kearney, *Summary Report of the Data Quality Study*, 1999.

(economies of scale) or several different products (economies of scope). In the postal example, it may be cheaper on a per piece basis to deliver a letter and a package together than to have separate delivery routes for each type of mail product. As a practical matter, the presence of such “economies” makes estimating the cost of products difficult, because costs vary as more (or less) of a specific product or service is provided.

Given the complexity associated with costing products in a multiproduct network industry like the postal industry, the cost framework was developed to answer two key questions:

1. What is the additional cost of providing more of a given product in the long run?<sup>15</sup> This cost is referred to as marginal cost. Marginal cost is useful in determining the price floor of a product, since the Postal Service’s net income can only be improved wherever marginal revenue (price) equals or exceeds marginal cost. Due to economies of scale, the marginal cost of postal products declines as volume increases. The reverse is also true, that is, marginal cost increases as volume decreases. Marginal cost is discussed in more detail in Appendix A.  
*Marginal cost measures the additional cost of providing additional pieces of mail in the long run.*
2. What is the total cost associated with providing the product — in other words, what costs would not exist if the product did not exist? This metric is referred to as incremental cost and it is useful in evaluating whether the Postal Service should enter or continue in a specific line of business. Clearly, if a product earns revenues that are less than the total cost it incurs, there likely is not a good business reason to provide it. Incremental costs are discussed in more detail in Appendix B.  
*Incremental costs are costs that would not exist if the product were not offered.*

## Evaluation of the Current System

Five key questions have surfaced as a result of the recent critiques of the costing system. Each issue is discussed briefly below and in more detail in the appendices.

### ***Should the Postal Service Use Fully Distributed Costs To Evaluate the Financial Performance of Products?***

As discussed above, the Postal Service’s cost systems estimate the marginal cost of each product. The marginal cost of a product should be viewed as the absolute price

---

<sup>15</sup> The “long run” refers to a time period long enough to allow for significant adjustments to the volume change to be made. While the exact timeframe is not precisely defined, the time period historically considered appropriate for postal costing is around 3 years.

floor, since it is not financially viable to price below marginal cost in the long term.<sup>16</sup> However, 45 percent of total costs do *not* change when volume rises or falls. These

*If every product were priced at its marginal cost, the Postal Service would lose money.*

costs, which are not allocated to specific products, are termed “institutional costs.” Therefore, if every product were priced at its marginal cost, the Postal Service would lose a lot of money each year. Hence, an important issue is, for each product how much higher than its marginal cost to set its price.

Over the years, some have suggested that the Postal Service move toward fully distributing all of its costs to product.<sup>17</sup> Under fully distributed costing (FDC) any of several methodologies is used to assign institutional costs to products. For example, institutional costs could be allocated to products in proportion to revenue, volume, attributable costs, or any other factors the analyst might care to devise. The benefit of using FDC to set prices is that if every product were successfully sold at a price that covers its FDC, then the Postal Service could not lose money. Those in favor of FDC procedures claim that they provide a better assurance that prices are compensatory, as well as a better way to assign corporate responsibility for performance to product managers.

However, the problem with FDC is that institutional costs by definition are not caused by any product. Therefore, any method used to allocate institutional costs to products is by its very nature arbitrary. FDC neither reflects cost-causing activities nor the demand characteristics of the product. And the choice of allocation method can lead to significantly different results, including whether or not it appears that a product is making or losing money. Therefore, the choice of allocation method can be misleading in evaluating the financial performance of a product line. And when used to develop prices, FDC can lead to prices that do not reflect the right economic signals.

*The choice of FDC allocation method can lead to significant errors in evaluating the financial performance of a product line.*

FDC does provide a price floor that ensures products make a significant contribution to fixed cost; however, the procedure introduces numerous distortions into the calculus of pricing. In that sense, the cure may be worse than the disease. A more detailed discussion of FDC can be found in Appendix C.

---

<sup>16</sup> Private firms sometimes price below cost to introduce and grow a new product that is believed will be profitable in the future (often referred to as penetration pricing), but it is unlikely that the PRC would allow the Postal Service to follow this practice.

<sup>17</sup> In his testimony before the President’s Commission on the Postal Service on February 20, 2003, witness Mike Eskew, Chairman and Chief Executive Officer of UPS, criticized the Postal Service for not allocating more of its costs, saying that it was essentially subsidizing its parcel service through low cost attribution and low mark-ups. This testimony can be found at <http://govinfo.library.unt.edu/usps/offices/domestic-finance/usps/meetings.html>.

### ***How Should the System be Adapted To Reflect the Excess Capacity Currently Present in the Postal Network (Short-Run Versus Long-Run Marginal Costs)?***

The general complaint surrounding this issue is that mailers do not want to bear the burden (through higher prices or through the appearance of a lower cost coverage) of excess capacity (e.g. idle workers, less-than-full trucks). This issue looms large today, as the “perfect storm” of recession and diversion has left the Postal Service with significant excess capacity.

The economic intuition behind this complaint involves whether costs of products should include or exclude costs that only change with volume over a longer period of time. For example, even though it is true that facility space will eventually be adjusted to changes in mail volume, it may be some time before an actual change occurs (e.g., a plant is opened or closed). The marginal cost estimates found in the Cost and Revenue Analysis (CRA)<sup>18</sup> do include these costs that vary with volume over a longer time period and are often referred to as long-run costs.

It times of excess capacity, CRA long-run costs will overstate the costs experienced in the short run (the “short run” refers to a time period too short to make all the adjustments to volume changes that would be made in the “long run”). Therefore, some have argued that the use of long-run costs to set prices unfairly burdens products, and the Postal Service should be using short-run marginal costs to set prices.

While it is true that in the current environment short-run costs would be lower than long-run costs, the use of long-run marginal costs was a purposeful decision to avoid the limitations of short-run cost estimates. What to include or not include in short-run costs can be a complex subjective decision. For example, how should costing be handled if there were over-capacity in some plants and under-capacity in others? In addition, short-run costs tend to fluctuate more rapidly than long-run costs. This could lead to more fluctuations in prices and generate confusion over whether products do or do not cover their costs. And while short-run costs would be lower in times of excess capacity, the opposite would be true if the Postal Service realigned its network to cut capacity and then experienced a volume surge.

***The use of long-run marginal costs is a purposeful decision to avoid the limitations of short-run cost estimates.***

A better alternative to replacing long-run costs with short-run costs would be to provide information on both, when possible. Although there are some serious issues in properly estimating short-run costs, the Postal Service could probably provide an approximate estimate of short-run costs as a complement to its long-run CRA analysis. In fact, the Postal Service has produced rudimentary estimates of short-run costs for the purpose of

---

<sup>18</sup> The CRA is produced every year and reports data by product including revenue, attributable cost, volume variable cost, and product specific cost. The Postal Service produces both a public and nonpublic version of the CRA. The nonpublic version contains product-specific information about the Postal Service’s competitive products. The public version of the CRA can be found on the Postal Service’s website at <http://about.usps.com/who-we-are/financials/welcome.htm#>.

evaluating summer sales.<sup>19</sup> A more detailed discussion of short-run versus long-run costs can be found in Appendix D.

### ***Should the Postal Service Move Toward Developing Bottom-Up Costs?***

The current system employs a top-down costing approach. The Postal Service develops retail rates (single-piece) and then offers mailers discounts off these rates for work that they perform, such as presorting the mail. The discounts are based on the estimated cost avoided by the Postal Service as a result of the work the mailer performs.<sup>20</sup>

In the top-down approach, the mailer only gets credit for activities in which it would not otherwise engage. Mailers complain that they do not get discounts for such practices as address hygiene even though these types of practices save costs. Recently, some mailers have advocated that costs should be developed using “bottom-up” costing, in which the cost of each element of the mail handling process is estimated and then the individual element costs are summed up to determine the product cost. It is their belief that the use of bottom-up costing will result in lower costs, and therefore lower prices, for workshare mail. In fact, moving from a top-down to a bottom-up approach to pricing would result in “winners,” those that would benefit through lower estimated costs (and prices), but it would also result in “losers,” those who would be worse off through higher estimated costs (and prices, assuming the same average price for the overall rate category).

*While there would be numerous benefits to having more disaggregated cost information, it is both difficult and costly to develop marginal costs for each activity.*

Bottom-up costing has merit, as there would be many benefits to having more disaggregated cost information. However, it is both difficult and costly to develop marginal cost estimates for each activity (e.g., culling letters of a certain address quality). There is nothing fundamentally impossible about estimating bottom-up costs but estimating the marginal cost of every activity with the same degree of rigor currently required by the PRC for major products would present a significant resource challenge, at a time when resources are especially scarce. A more detailed discussion on bottom-up costing can be found in Appendix E.

---

<sup>19</sup> The Postal Service had two summer sales, special incentives for customers to send mail during the summer, when mail volumes are typically low. Unlike most discounts, summer sale incentives were only in effect for a few months.

<sup>20</sup> More information can be found in the U.S. Postal Service Office of Inspector General Report *Assessment of Worksharing*, Report No. RARC-WP-10-005, July 12, 2010, [http://www.uspsoig.gov/foia\\_files/RARC-WP-10-005.pdf](http://www.uspsoig.gov/foia_files/RARC-WP-10-005.pdf).



## ***How Should the New Postal Data Sources (Such as IMb) Be Used in the Costing System To Improve Accuracy and Reduce Costs?***

New data systems, designed for operations or marketing purposes, such as the intelligent mail barcode (IMb), Point of Sale (POS), and advanced facer/canceller image lift, are coming online all the time. The Postal Service should be taking full advantage of these new systems and using them to develop costs as they become available for use, in order to both reduce the expense of collecting cost data and to increase the accuracy of its cost system. The Postal Service is and should continue to study the feasibility of using new data systems to improve its cost systems. However, at this point in time, it is questionable if any of the new data systems are sufficiently mature and comprehensive to use in support of the cost systems in any material way (discussed in more detail in Appendix F). But this could change in the future, as the new data systems, and the technology that supports these systems, mature. Part of the maturity may even be as simple as adjustments made to better conform to the cost system's needs, such as investing in sufficient memory to collect and maintain a higher level of detail than is currently collected. Clearly, an important driver of decisions regarding the development of operational data systems should be the usefulness of such data in constructing a cost system that is meaningful and useful as a management tool.

*It is questionable if any of the new data systems are sufficiently mature and comprehensive to use in support of the cost systems in any material way.*

## ***What Can Be Done To Improve the Timeliness of Cost Studies?***

While some data are collected every year, other data rely on studies that are updated on a periodic basis. Everyone agrees that some of the data that support the cost systems is seriously out of date. In some areas, this causes little harm since there has been little change in the underlying cost-generating activity since the last study update. However, in some areas, operations have changed in ways that make the old studies inapplicable.

*Some of the data that supports the cost system is seriously out of date.*

*To increase transparency, the PRC ruled that the Postal Service could not make any change to its costing system without first getting its permission.*

Although part of the problem is due to resource constraints and/or neglect by management, another part is a side effect of the new regulations that were put in place to increase the transparency of changes to the cost systems. The PRC ruled that the Postal Service could not make any change to its costing system without first getting permission from the PRC. This rule has alleviated stakeholders' concerns about transparency of changes to

the cost methodology, but it may have had the unintended effect of placing additional roadblocks in the way of timely updates to cost studies. Although the Postal Service has successfully gotten approval for small changes, the approval (or disapproval) for these changes has at times occurred after the time the Postal Service needed to incorporate the change into its Annual Compliance Report. Undoubtedly, the combination of new responsibilities and requests for service changes has strained the resources at the PRC

and the Postal Service.<sup>21</sup> The PRC has recently issued decisions that should move the process forward, and the Postal Service has begun planning for larger studies, such as updates to its variability studies.

An important issue that needs to be addressed is identifying what can be done to maintain transparency while facilitating more current cost analysis. Even more fundamentally, how can cost estimates keep up with the rapidly changing operational and market realities now envisioned for the future?

## Cost Data Needs in the Future

Since the current cost system was developed to support a regulatory environment that no longer exists — specifically, rate cases under a break-even requirement — it may not provide all the cost information the Postal Service needs in the future to support managing the business. While the Postal Service is undergoing significant financial constraints that may limit its ability to make large investments, it should develop an implementation plan for a cost system that meets its future needs. Initially, new cost data may serve not as a substitute for the existing cost system as much as a supplement to the cost data that already exists. Ultimately, however, it may be possible to replace the current system with one based on operational data. This would be optimal if new procedures provide useful and accurate cost estimates at a reasonable cost.

The incorporation of new costing data should not be made on an *ad hoc* basis. Rather, the Postal Service should develop a vision for the type of cost information that will provide the most useful guide to management actions in the future. Without a vision, the Postal Service may make decisions that will ultimately restrict its ability to develop the cost data it needs in the future. For example, many of the data systems at the Postal Service were developed with the purpose of supporting operations and are not easily used to provide cost data. With more foresight, it may be possible to create systems, or to modify existing systems, that would serve both purposes.

*The Postal Service should develop a vision for the type of cost information that will provide the most useful guide to management actions in the future.*

There are at least three likely characteristics of future postal markets that will challenge the existing cost system and provide a space in which a modified/improved system can significantly inform management decisions:

1. Continued electronic substitution. Postal life in the digital world will feature shrinking demand for physical mail, as well as growing efforts to integrate physical and digital product offerings.

---

<sup>21</sup> Under PAEA, the PRC was responsible for developing the new regulatory process for approving market dominant and competitive product prices. The PRC is also now responsible for regulating international mail, which involves a significantly large number of contracts. In addition, the request in service changes has become a significant workload for the PRC. The PRC currently receives, on average, an appeal a day on Post Office™ closings alone.

2. Some form of incentive regulation. Even if the structure of the price cap established by the PAEA is altered, it seems likely that price increases will continue to be constrained under mechanisms designed to enhance innovation and improvements in efficiency.
3. Special contract pricing. Negotiated Service Agreements (NSAs) have been an important aspect of postal product development under PAEA and are likely to remain so.

### ***Cost Data Needs Will Change with Decline in Physical Mail and Increase in Digital Mail***

Even if electronic substitution slows somewhat in the future, it is likely that the Postal Service network is fated to shrink. This has implications for costing. Not only does declining volume turn the benefits of economies of scale, upon which the postal network was largely built, into disproportionately rising costs, but the cost/volume relation itself, so central to cost estimation, is unstable between rising and falling volumes.

Specifically, it is more difficult to take costs out of the system when volume falls than to employ added resources when it grows.<sup>22</sup> Hence, volume variability estimates would at the very least need to be re-estimated under conditions of falling volumes.

Secondly, the Postal Service has enjoyed growing volumes for many years and gained much experience in analyzing the cost properties of this growth. Analyzing the costs of a shrinking network is a relatively new effort, which will require some painful “learning by (un)doing” to gain full command of the methods and analysis needed.

Apart from the question of the size of the network in the digital future, there is a cornucopia of digital products the Postal Service might choose to offer. These digital products have different cost characteristics than physical mail. The Postal Service already has struggled with the appropriate way to cost more electronic services such as Confirm services, which allow senders to receive tracking information about their mail. The Postal Service OIG has suggested that the Postal Service consider developing other digital products such as a prepaid card,<sup>23</sup> an e-mail service (eMailbox)<sup>24</sup>, and a digital storage service (eLockbox).<sup>25</sup>

Digital products present special problems in cost-benefit analysis relative to traditional postal products. For example, digital products often require technologies that are less well-known than traditional products, often involve joint production or shared

---

<sup>22</sup> Michael J. Bradley, Jeff Colvin and Mary K. Perkins, “Do Volume Increases and Decreases Have the Same Effect on Labor Hours?” *Multi-Model Competition and the Future of the Mail* (2012).

<sup>23</sup> U.S. Postal Service Office of Inspector General Report, Risk Analysis Research Center, *Digital Currency: Opportunities for the Postal Service*, Report No. RARC-WP-12-001, October 3, 2011, [http://www.uspsoidg.gov/foia\\_files/RARC-WP-12-001.pdf](http://www.uspsoidg.gov/foia_files/RARC-WP-12-001.pdf).

<sup>24</sup> U.S. Postal Service Office of Inspector General Report, Risk Analysis Research Center, *eMailbox and eLockbox: Opportunities for the Postal Service*, Report No. RARC-WP-12-003, November 14, 2011, [http://www.uspsoidg.gov/foia\\_files/RARC-WP-12-003.pdf](http://www.uspsoidg.gov/foia_files/RARC-WP-12-003.pdf).

<sup>25</sup> Ibid



infrastructure, sometimes share research and development efforts (and expenses) with each other and with traditional products, may involve high start-up costs, and may be rolled out in market-driven sequences that complicate the cost attribution problem.<sup>26</sup>

These problems doubtless have solutions, but future cost systems will need to provide information on topics not currently considered in the postal costing world. What, for instance, is the cost of adding an electronic application to a server previously dedicated to another product? Are there any variable costs associated with digital products or are they all fixed? If fixed, how are the costs of servers that must ultimately be added (as digital product offerings are expanded over time) attributed to existing digital products? If several digital products share the same infrastructure, does the first product rolled out bear the entire infrastructure cost? While there may be opportunities to learn from how other entities address these costing issues, these questions and others will need to be studied in the context of postal costing, as the methodology could have a significant impact on what products are considered profitable, and as a result, which products are introduced in the market.

### ***Incentive Regulation Drives the Need for Activity-Based Costing***

Under incentive regulation, there is a shift of attention away from focusing on product cost toward focusing on the total cost of all activities.<sup>27</sup> Although product costs continue to be of importance in analyzing whether products cover their costs, the fundamental datum for pricing is the price in the previous period. The drive to efficiency, however, requires a detailed look at activities to determine what steps in the production chain have the greatest cost impact. Some have argued that the Postal Service should move towards estimating “should be” costs, that is, the costs that the Postal Service should incur if the mail were handled in the most efficient manner. “Should be” costs could be used in combination with actual costs, to determine where the greatest inefficiencies exist in the mail flow.

The development of activity-based costs is hindered by the lack of standardization of mail processing across facilities. Nevertheless, an important limitation upon developing detailed activity costs is the availability of data, and increasing that availability would require significant resources. The Postal Service may want to consider the importance of being able to manage its costs on an activity-based level. If deemed important, the Postal Service could create a long-term plan to move toward developing activity-based costs, including increasing its use of more standardized processing, and revising its operating data systems so that they can provide more detailed cost information.

---

<sup>26</sup> For example, there could be a “first mover disadvantage,” where the first product introduced bore the entire cost of the infrastructure. If this methodology were used, there would be a very large disincentive for products to be offered quickly, as product managers would want to avoid introducing the first product to the market. Similarly, such a method might incentivize the simultaneous introduction of products that might better be introduced sequentially.

<sup>27</sup> The PRA established a “cost of service” regulation that enshrined a break-even goal in the price-setting process. With the PAEA, the break-even requirement was replaced by “incentive regulation” that includes a price cap for market dominant products where price increases cannot exceed the Consumer Price Index. 39 U.S.C. § 3622(d).

### ***Cost Data Needs To Support Negotiated Service Agreements***

A new pricing flexibility tool developed in recent years is the negotiated service agreement (NSA). Similar to worksharing, an NSA typically offers a lower price to those customers who can avoid certain costly activities or increase their volume of mail. In contrast to a workshare discount, which is offered to all customers who can avoid the activity for a specific rate category, NSAs are designed with a specific customer in mind (though for market dominant products, “similarly situated” customers must be offered the same type of NSA). NSAs have increased the desire for more detailed and disaggregated data.

The list of attributes that ideally would be costed under NSAs is greater than those under workshare; furthermore, these types of attributes are different. Data for workshare include cost information related to depth of presort, entry point, and how mail is prepared. Data to support NSAs would include these as well as speed, reliability, specific customer or customer type, geographic region (origin or destination), and information about the specific cost characteristics of the customer’s mailpiece (shape, weight, addressing standards). Were such attribute cost information available, it would make the design, implementation, and review of NSAs easier. This approach would address a critical need as NSAs grow in significance.

### **Conclusion**

There has been much criticism of the Postal Service cost system. Some of the criticisms have merit, though they may also require significant resource commitment. Improvements to the cost methodology have the potential to increase the accuracy of costs, as well as the efficiency with which cost data are gathered. It is worth noting that cost system changes would not directly reduce total costs, though they could bring about a change in the percent of costs attributed to individual products. Also, given the mechanism of the cap, changes in cost allocation by product do not directly translate into prices. Nevertheless, a change in cost methodology will most likely result in “winners” and “losers,” and it’s not generally possible to know in advance which will be which. However, regardless of how costs are attributed to product, the Postal Service still needs to earn revenues that cover its total operating costs. So even if attributable costs overall decline, prices overall will not go down. A decline in the measurement of attributable costs will simply result in an increase in the measurement of institutional cost, and prices will still ultimately need to be set so that revenues sufficiently cover total operating costs.

The Postal Service should carefully study and consider potential improvements to its cost system. As described above, the drive for efficiency gains and for more finely disaggregated product development requires an enhanced cost system. Moreover, the current system was developed to support a regulatory environment in which the Postal Service was required to break even and physical mail volume had the potential to increase on an annual basis. Both the regulatory and market conditions have changed. The Postal Service is now under a price cap for the majority of its revenue, and physical

mail volume is declining in favor of digital alternatives. In addition, the Postal Service is increasingly relying on contracts with individual mailers for greater amounts of its physical volume. As the Postal Service continues to focus on cutting costs, creating specific rates for customers, and evolving to a more digital environment, it will need improved cost data. In order to meet this need, the Postal Service should develop a plan which integrates the development of operations data systems and the estimation of product costs. Ways should be sought, in such a plan to fully utilize operations data, making revisions to the way cost data are developed where necessary, with a goal of producing the most useful and accurate cost estimates at a reasonable cost. Naturally, the plan should be cognizant of the need to maintain the successful features of the current system.

## Appendices

## Appendix A Marginal Costs

As discussed in the main body of this paper, the most important statistic produced by the cost system is the marginal cost of each postal product. This appendix explains this concept in more detail and describes how the estimate is conducted by the Postal Service. For a simple example of marginal cost, Table 1 displays the daily cost of delivering one, two, and greater than two letters. Assume that the cost of delivering one letter is high, \$100, as the carrier has to drive around all the addresses, even though he/she only delivers a single letter to each address. Things improve slightly when the daily volume rises to two letters, because the fixed cost of covering the entire route can be spread over both letter costs. Since some of the costs are fixed and do not increase with the number of letters, the cost of delivering two letters is not \$200, it is \$188. So the marginal cost of the “last letter” is just \$88 (\$188 - \$100). This is still very expensive, but the marginal cost continues to decline as the number of letters increases. With three letters, the marginal cost is \$80, with four letters it is \$74, and with 400 letters the marginal cost falls to only 5 cents.

**Table 1: Marginal Cost Example**

Letters Delivered	Total Cost	Marginal Cost
1	\$100	
2	\$188	\$88
3	\$268	\$80
4	\$342	\$74
5	\$412	\$70
6	\$479	\$67
7	\$544	\$65
...	...	...
400	\$700	\$.05

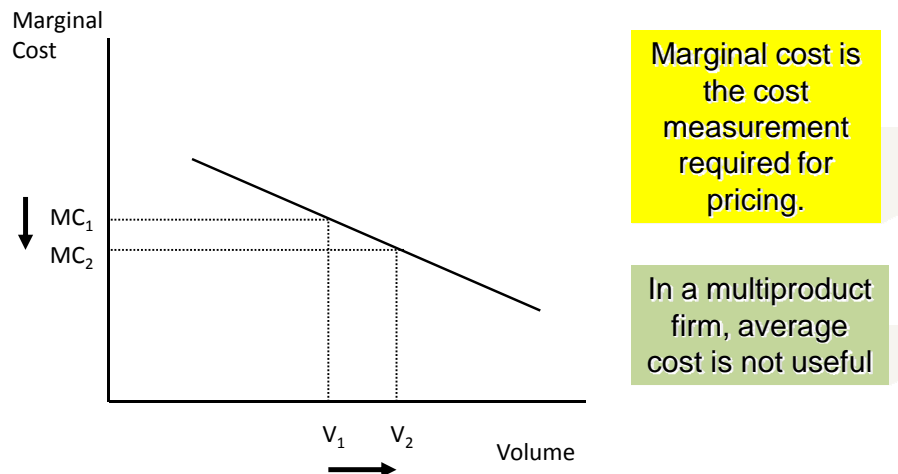
Source: Adapted from U.S. Postal Service presentation

When the Postal Service measures marginal cost, it does not actually look at the change in cost of one additional (or one fewer) letter. Mail volume varies by the day, so the marginal cost estimated by the Postal Service is actually the cost associated with larger increments of volume changes. However, the fact that the Postal Service estimates the cost associated with larger increments of volume should not be interpreted to mean that the marginal cost of one letter is actually zero.

In the postal industry, as in other network industries, marginal cost falls as volume increases (either of the same product or many different products). This is due to economies of scope, density, and scale. Economies of scale refer to the efficiencies enjoyed from producing more of the same product, or in other words, unit cost declines as volume increases. Economies of scope refer to the efficiencies that occur as a result of producing multiple products. And economies of density are present when the unit cost is reduced due to a greater volume per delivery point.

Figure 1: Marginal Cost for Postal Products Falls as Volume Increases

**Marginal cost is declining for postal products due to economies of scope, density, and scale.**



Source: Adapted from U.S. Postal Service presentation

The Postal Service estimates the marginal cost of its main products each fiscal year, and publishes them in the Cost and Revenue Analysis (CRA). In 2010, there were over 30 major products whose costs were analyzed in many activities. Activities are selected at the most disaggregated level that will support reliable economic analysis to identify volume variable costs. For example, within city carriers, there would be cost information for the activity of casing mail in the office, but not reliable information on the cost of sorting a specific customer's mail on a specific day.<sup>28</sup>

The Postal Service measures the marginal cost of its major products in five steps:

- Step 1: Find the total costs of each activity.
- Step 2: Discover how the total costs of each activity vary with volume (a crucial step in discovering marginal cost) — volume variable cost.
- Step 3: Distribute the volume variable costs to products.
- Step 4: Within each activity, divide the volume variable cost of each product by its originating volume.<sup>29</sup>
- Step 5: Add up the cost of each activity to get the marginal cost of the product.

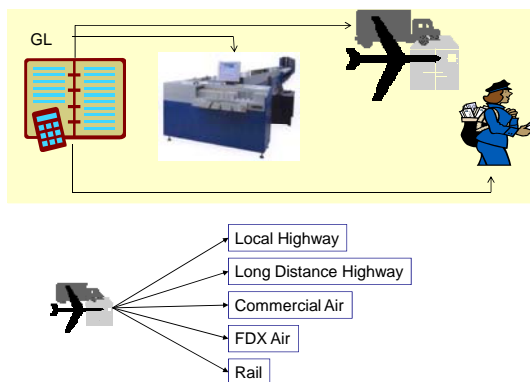
<sup>28</sup> The reader interested in the details may see U.S. Postal Service, *Summary Description of USPS Development of Costs by Segments and Components, Fiscal Year 2010*.

<sup>29</sup> Sometimes referred to as RPW volume, after the Revenue, Pieces and Weight (RPW) report in which they are reported.

### **Step 1: Find the total costs of each cost activity**

The total cost of an activity is taken directly from the general ledger. Examples are the cost of purchased transportation and the cost of city carriers (salaries and benefits).<sup>30</sup>

**Figure 2: Find Total Cost of Each Cost Activity**



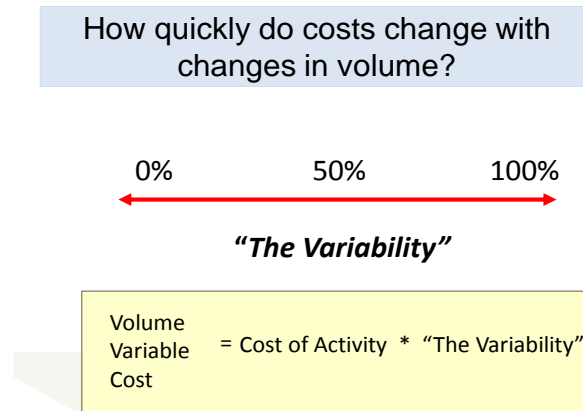
Source: Adapted from U.S. Postal Service presentation

### **Step 2: Discover how the total costs of each activity varies with volume — volume variable cost**

In this step, special studies are conducted to determine how the cost of an activity changes as volume increases or decreases. For instance, the cost of city carrier street delivery, while sensitive to changes in volume, does not vary in proportion to it. The variability of the city carrier street activity is about 38 percent (if volume increases 100 percent, city carrier street delivery costs increase 38 percent). Multiplying the total cost of city carrier labor, \$10.5 billion (from Step 1) by this 38 percent variability, yields an annual volume variable cost of about \$4 billion. Please note that “volume variable cost” is just a postal term for the mathematical product of the marginal cost of a postal product and its volume.

<sup>30</sup> For more information on segments and components see U.S. Postal Service, *Summary Description of USPS Development of Costs by Segments and Components, Fiscal Year 2010*.

**Figure 3: Measure Volume Variable Costs**

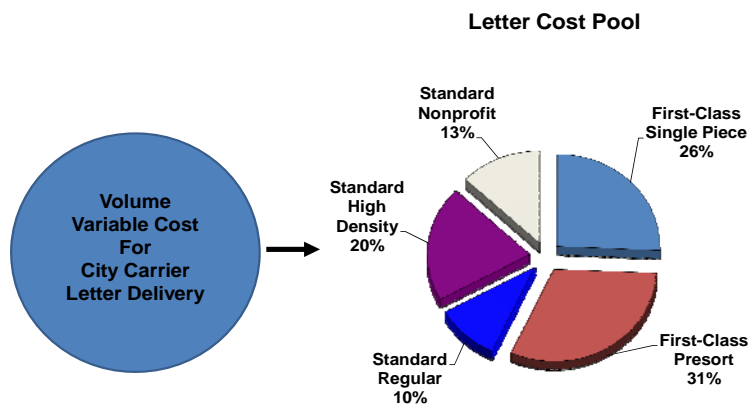


Source: Adapted from U.S. Postal Service presentation

**Step 3: Distribute volume variable costs to products**

Thus far, volume variable costs of all products are known in a given activity — city carrier delivery, in our example — but to find out the marginal cost of a specific product in an activity requires another step. In Step 3, the volume variable costs are divided up, or distributed, among the products that are handled in the activity. In the example of city carrier delivery, that consists of all the products delivered on city routes. Volume variable costs are distributed by means of “distribution keys” produced by any of several Postal Service sampling systems. The distribution key is based on characteristics of the mail that reflect the cost drivers of the variable costs, such as time spent handling the mailpiece or space taken up on a truck.

**Figure 4: Distribute Volume Variable Costs to Product**



5

Source: Adapted from U.S. Postal Service presentation



The main sampling systems are:

- the In-Office Cost System (IOCS) used for mail processing, supervision, and in-office city carrier costs (650,000 tests/year);
- the City Carrier Cost System (CCS) used for city carrier costs (9,400 tests/year);
- the Rural Carrier Cost System (RCCS) used for rural carrier costs (6,400 tests/year); and
- the Transportation Cost System (TRACS) used for transportation costs (18,000 tests/year).

Each of the systems samples postal activities and provides a key to distribute the relevant volume variable cost to product.

***Step 4: Divide the volume variable cost of each product by its volume to produce unit volume variable cost (UVVC) by product and activity***

Step 4 unitizes the activity cost of each product. There is a somewhat subtle point here: the city carrier volume variable cost for a First-Class Single-Piece (FCSP) letter is not simply the cost of delivery of a letter. That is because the unit variable cost is calculated as the total volume variable cost attributed to FCSP letters divided by the RPW volume of FCSP letters and not all FCSP letters are delivered (some are picked up at Post Office boxes or at Post Offices). This means that the delivery cost per *all* FCSP letters depends upon what proportion of FCSP letters get delivered. If only half of them are delivered, then the delivery cost per originating letter is just 50 percent of the actual marginal cost of delivery. In other words, the marginal cost of a product is a weighted average of its cost in each activity, where the weights are the product volumes.

$$UVVC \text{ FCSP Letter Delivery} = (\text{FCSP Letter Delivery VVC} \div \text{FCSP RPW Volume})$$

***Step 5: Add up the cost of each activity to get the marginal cost of each product***

The intuition behind this calculation is as follows. From Step 2, the variability step, it is known how the activity cost changes as volume changes. It is assumed that this general behavior applies to each product within the activity in the same way. For example, if it is known that as the volume of letters doubles, the street delivery cost of letters rises by 30 percent, then it is assumed that the cost of First-Class Mail<sup>®</sup> (FCM) letters and Standard Mail<sup>®</sup> letters behaves in the same manner. Of course, the validity of the assumption depends upon getting the definition of the activity right, and restricting the application of the variability estimate to that activity. In other words, delivering a FCM letter on the street is not substantially different from delivering a Standard Mail letter.<sup>31</sup>

---

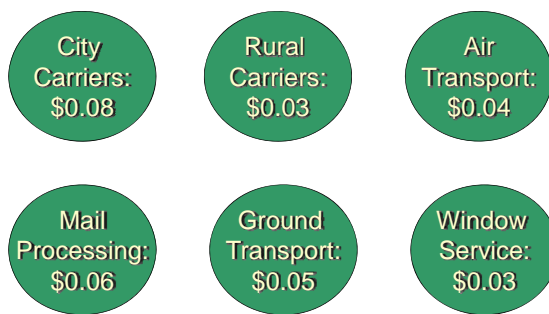
<sup>31</sup> The same might not be true for in-office handling of letters, for example, if Standard Mail letters can be delayed and FCM letters cannot.

For a more rigorous and academic explanation of why this procedure provides a good estimate of marginal cost, see Bradley, Colvin, and Panzar (1999).<sup>32</sup>

**Figure 5: Estimate the Volume Variable Cost of Each Segment**

---

**In the CRA Volume Variable Cost is Calculated  
Within Each Segment and then Summed.**



Source: Adapted from U.S. Postal Service presentation

---

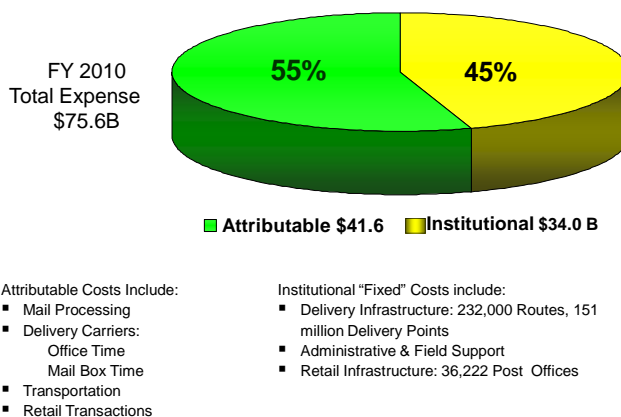
As mentioned in the introduction, the CRA has traditionally estimated long-run marginal costs. In other words, certain cost elements are included as part of the marginal cost of a product that might, in fact, be fixed when viewed from a short-run perspective. To adjust the costs for long-run changes in capacity, the Postal Service applies factors that add these costs as a proportion of labor costs. It is these adjusted (long-run) costs that are shown in the CRA.

Since marginal cost falls as volume increases, the sum of volume variable costs will be less than the total cost incurred by the Postal Service in providing all of its products. In other words, since volume variability is used to attribute costs, only a fraction of total costs are attributed. The portion of costs that are not attributed is referred to as “institutional cost.” In 2010, 55 percent of costs were attributed; 45 percent were institutional.

---

<sup>32</sup> Michael D. Bradley, Jeff Colvin, and John Panzar, “On Setting Prices and Testing Cross-Subsidy with Accounting Data,” *Journal of Regulatory Economics*, Vol. 16 (1999), pp. 83-100.

Figure 6: Attributable and Institutional Costs



Source: Adapted from U.S. Postal Service presentation

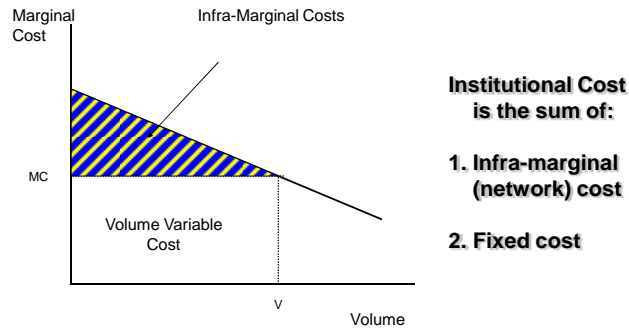
Note that only a relatively small portion of institutional costs are “fixed” costs in the economist’s sense of that term, that is, a cost that is incurred even if output in the period is equal to zero. Advertising costs might fit that definition, as might other truly “fixed” costs such as the flagpole in front of the headquarters building at L’Enfant Plaza, but most postal costs do increase as volume rises. It is simply that they do not rise in proportion to the volume increase because of scale economies. As might be expected, most institutional costs have their origin in the delivery infrastructure.

It will also be useful below to note that institutional cost is composed of two parts: fixed costs and “infra-marginal costs.” Recall how costs are incurred in delivery: it costs much less to provide the “last” letter than what it would cost if only one letter were delivered. Therefore, the total cost of providing all letters includes not only the volume variable cost but the cost of all those letters delivered at a higher cost. Economists have given these costs the ungainly name “infra-marginal.”

Because volume variable cost measures the cost incurred *if* all letters cost the same as the marginal letter, it does not capture all of the variable cost of delivering those letters. The difference between the total variable cost of delivering those letters and the volume variable cost of delivering those letters is the infra-marginal cost.

**Figure 7: Components of Institutional Cost**

---



Source: Adapted from U.S. Postal Service presentation

---

## Appendix B Incremental Costs

There is a second very important question that the Postal Service cost system was designed to answer: What is the total cost caused by the product — in other words, what costs would not exist if the product did not exist? The tool used for this purpose is called incremental cost. It is useful for determining whether the price of a product is compensatory, i.e., whether one can be sure that the product covers its “cost” and is not subsidized by the customers of some other product or products. The tool is also useful to help decide if a line of business should be pursued at all. For internal business purposes, it is important to note that while a price above marginal cost is a necessary condition for net revenue generation, it is not sufficient. Suppose the post delivered five letters with a marginal cost of \$70 per letter, at the price at \$75 per letter (shown in Figure 8). Even though the price exceeds marginal cost, the result would be a \$37 loss.

**Figure 8: Price above Marginal Cost is No Guarantee that Price Exceeds Cost**

### How can we tell if a product is covering its costs?

A price above marginal cost is required but no guarantee.

If the price were \$75 and we delivered 5 letters

Total Revenue = \$375  
 Total Cost = \$412

Net = - \$ 37

#### Return to our letter example:

Letters Delivered	Total Cost	Marginal Cost
1	\$100	
2	\$188	\$88
3	\$268	\$80
4	\$342	\$74
5	\$412	\$70
6	\$479	\$67
7	\$544	\$65
8	\$609	\$65

To ensure a product covers its cost, a product's revenue > its incremental cost

Source: Adapted from U.S. Postal Service presentation

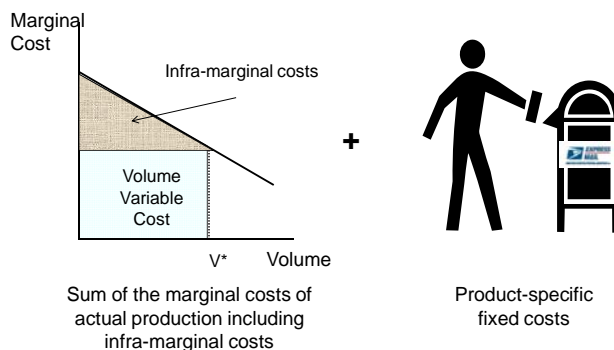
For a product to make money, revenue must exceed the total cost of providing a product at its current output level, i.e., its incremental cost. In our example, the post has to earn enough revenue to cover not only the cost calculated at the margin (the volume variable cost), but the entire cost of the delivery of all the letters, including the “infra-marginal” cost of those letters. Recall that volume variable cost assumes that each letter can be delivered as cheaply as the last one and does not include the total variable cost of letter delivery. To see if a product is truly covering its cost, the product's total cost, including infra-marginal, must be considered.

Finally, incremental cost includes not only that portion of institutional cost called infra-marginal, but also certain costs that are fixed, yet specific to a particular product.

Figure 9: Incremental Cost

Incremental cost is the total cost caused by provision of a product.

Incremental Cost has two parts:



Source: Adapted from U.S. Postal Service presentation

For most postal products, product-specific fixed cost is a very tiny portion of cost. In fiscal year (FY) 2010, product-specific fixed cost was about 3 percent of total cost. However, in some new products, especially digital products, product-specific fixed costs, such as software development costs, can be very significant.

Though the Postal Service developed a methodology for estimating infra-marginal costs in the 1990s, the PRC has never accepted that methodology.<sup>33</sup> Hence, since PAEA was enacted, the PRC has relied upon “attributable cost” (the sum of volume variable cost and product specific cost) as an estimate of incremental cost.<sup>34</sup> The PRC uses attributable cost to determine if each competitive product is meeting the requirement to earn revenues in excess of its cost. It should be noted that for some of the most relevant competitive products, such as Express Mail, the difference between incremental and attributable cost is small.

In sum, the Postal Service produces an annual estimate of the product revenues and costs. Table 2 shows a sample of the data from the public FY 2010 CRA. The CRA report shows revenue, volume variable cost, product-specific cost, and attributable cost (used by the PRC to test for cross-subsidy) by product.

<sup>33</sup> Part of the problem has to do with quantifying the incremental cost of really high volume categories. To calculate the incremental cost of a product, one asks: How much would be saved if it were not offered or if it were discontinued? However, trying to imagine how the postal system would be configured without FCM (or Standard Mail for that matter) is challenging and leaves a lot of room for error.

<sup>34</sup> PRC calculation is attributable cost = volume variable cost + product-specific fixed cost. The Postal Service calculation of incremental cost is incremental cost = volume variable cost + infra-marginal cost + product-specific fixed cost.

**Table 2: Public Cost and Revenue Analysis FY 2010 (in millions)**

	<b>Revenue</b>	<b>Volume Variable Cost</b>	<b>Product- Specific Cost</b>	<b>Attributable Cost</b>
First-Class Mail	\$34,026	\$17,045	\$31	\$17,076
Standard Mail	\$17,330	\$11,806	\$12	\$11,818
Periodicals	\$1,879	\$2,489	\$0	\$2,490
Package Services	\$1,516	\$1,698	\$0	\$1,698

Source: U.S. Postal Service FY 2010 Cost and Revenue Analysis Report

## Appendix C Fully Distributed Cost

Currently, the Postal Service only allocates around 55 percent of its costs to products (these costs are often referred to as volume variable costs) and the remaining costs are assumed to be institutional or not caused by any one product. For years, some have argued that it would make more sense to use fully distributed costing (FDC), i.e., use some sort of methodology to allocate institutional costs to products. Otherwise, or so the argument goes, a huge portion of costs is left unassigned and unanalyzed. Adherents of FDC argue that FDC provides a better way to evaluate the contribution of products, a better way to be sure that rates are compensatory (involve no cross subsidy), a better way to assign corporate responsibility for performance to product managers, and a buffer in case projected product cost and revenue are inaccurate.

Opponents of using FDC argue that using FDC is contrary to using economic costs for product pricing and development. The problem with FDC is that institutional costs by their very definition are not caused by any product. Therefore, the allocation method (allocating based on volume, revenue, costs, or any other factor) is arbitrary and not based on cost causation. In fact, it is easy to show that the choice of

*The problem with FDC is that institutional costs by their very definition are not caused by any product and therefore, any allocation method is arbitrary and could be misleading.*

*The choice of allocation method can have a significant impact on the evaluation of a product's financial performance.*

the allocation method can have significant impact on the evaluation of a product's financial performance.

Suppose that a post had three products: letters, parcels and expedited parcels. The volume, cost, revenue, and contribution information for the three

products are shown in Table 3 below.<sup>35</sup>

**Table 3: Three-Product Firm Example**

	Volume	Attributable Cost	Rate	Revenue	Contribution (Rev – Cost)
Letters	7,000	\$1,400	\$0.60	\$4,200	\$2,800
Parcels	2,000	\$1,600	\$1.25	\$2,500	\$900
Expedited	1,000	\$3,500	\$4.00	\$4,000	\$500
All Products	10,000	\$6,500		\$10,700	\$4,200*

Source: Michael Bradley's testimony before the 2003 President's Commission on the United States Postal Service.

\* In this case, contribution (\$4,200) is equal to institutional cost (\$3,500) plus profit (\$700).

<sup>35</sup> This example is drawn from Michael Bradley's testimony before the Presidential Commission on the United States Postal Service on May 28, 2003, entitled "The Postal Service Product Costing System," <http://govinfo.library.unt.edu/usps/offices/domestic-finance/usps/pdf/Bradley.pdf>.



Suppose the post faces a total cost of \$10,000, so that it makes a profit of \$700 (revenue of \$10,700 – total cost of \$10,000). Its institutional costs are \$3,500 (total costs of \$10,000 minus attributable costs of \$6,500). This means that 65 percent of the costs are attributable to products and 35 percent of costs are institutional. It is important to note that all products earn more revenue than their attributable costs; all the products contribute to covering institutional costs. How would various FDC allocation schemes work with this example?

In the first case, as shown in Table 4, the \$3,500 institutional costs are allocated evenly across all three products.

**Table 4: Three-Product Firm Example, Institutional Cost Allocated Evenly**

	<b>Attributable Cost</b>	<b>Institutional Cost</b>	<b>Total Cost</b>	<b>Revenue</b>	<b>Contribution (Rev – Cost)</b>
Letters	\$1,400	\$1,167	\$2,567	\$4,200	\$1,633
Parcels	\$1,600	\$1,167	\$2,767	\$2,500	-\$267
Expedited	\$3,500	\$1,167	\$4,667	\$4,000	-\$667
All Products	\$6,500	\$3,500	\$10,000	\$10,700	\$700

Source: Michael Bradley's testimony before the 2003 President's Commission

This allocation method provides the same total profit as before, but the relative contribution signals are much different. It appears as if the post is losing money on its relatively low volume products, parcels, and expedited letters. The implication of this FDC allocation is that the post should exit those business lines. If it did, however, the cost of providing regular letters would increase dramatically because it would be the only product left to contribute to paying for institutional costs.

This is just one of many ways to allocate institutional cost to products. Two other examples are provided below in Tables 5 and 6. In Table 5, institutional costs are allocated on the basis of volume and in Table 6 institutional costs are allocated on the basis of relative attributable cost.

**Table 5: Three-Product Firm Example, Institutional Cost Allocated Based on Volume**

	Attributable Cost	Institutional Cost	Total Cost	Revenue	Contribution (Rev – Cost)
Letters	\$1,400	\$2,450	\$3,850	\$4,200	\$350
Parcels	\$1,600	\$700	\$2,300	\$2,500	\$200
Expedited	\$3,500	\$350	\$3,850	\$4,000	\$150
All Products	\$6,500	\$3,500	\$10,000	\$10,700	\$700

Source: Michael Bradley's testimony before the 2003 President's Commission

**Table 6: Three-Product Firm Example, Institutional Cost Allocated Based on Attributable Costs**

	Attributable Cost	Institutional Cost	Total Cost	Revenue	Contribution (Rev – Cost)
Letters	\$1,400	\$754	\$2,154	\$4,200	\$2,046
Parcels	\$1,600	\$861	\$2,462	\$2,500	\$38
Expedited	\$3,500	\$1,885	\$5,385	\$4,000	-\$1,384
All Products	\$6,500	\$3,500	\$10,000	\$10,700	\$700

Source: Michael Bradley's testimony before the 2003 President's Commission

The main point to be made is that all of these methods might be considered reasonable, yet each allocation method provides a very different picture of product cost and contribution. Although one can pick the method that seems “most” reasonable, there is no sense in which it can be considered accurate or, for that matter, inaccurate.

The argument in favor of using FDC for pricing is that it is one way to ensure that the prices are not only compensatory, in the sense of covering attributable cost, but make a significant contribution to covering institutional costs as well. That is, if the Postal Service were able to sell all its products at prices above fully distributed costs, it could not fail to at least break even. FDC is used for at least some postal-related calculations. The European Directive (2008/6/EC) gives explicit directions on how all costs should be allocated when estimating the cost of universal service.<sup>36</sup> Some, including UPS, have argued that the Postal Service should move towards using FDC.<sup>37</sup>

<sup>36</sup> European Postal Directive requires that costs be allocated based on

a ) costs which can be directly assigned to a particular service shall be so assigned; b) common costs, that is costs which cannot be directly assigned to a particular service, shall be allocated as follows: c) whenever possible, common costs shall be allocated on the basis of direct analysis of the origin of the costs themselves; d) when direct analysis is not possible, common cost categories shall be allocated on the basis of an indirect linkage to another cost category or group of cost categories for which a direct assignment or allocation is possible; the indirect linkage shall be based on comparable cost structures; when neither direct nor indirect measures of cost allocation can be found, the cost category shall be allocated on the basis of a general allocator computed by using the ratio of all expenses directly or indirectly assigned or allocated, on the one hand, to each of the reserved services and, on the other hand, to the other services.

Found at [http://ec.europa.eu/internal\\_market/post/doc/legislation/2008-06\\_en.pdf](http://ec.europa.eu/internal_market/post/doc/legislation/2008-06_en.pdf).

<sup>37</sup> In his testimony before the President's Commission on the Postal Service on February 20, 2003, Witness Mike Eskew, Chairman and CEO of UPS, criticized the Postal Service for not allocating more of its costs, saying that it was

The argument against using FDC for purposes of evaluating a product's financial performance is that it is too conservative and can actually lead to decisions that harm the Postal Service financially. The opponents of FDC argue that FDC results in prices that are too high to be competitive, and these high prices can stop a product from even being offered (either because market data will show the market cannot bear the price or because a customer refuses to agree to a high contract price). They further argue that the Postal Service is worse off without these new products, because any mark-up over attributable cost at least makes some contribution toward institutional cost. Essentially, the argument against FDC is that FDC discourages new volume even when that new volume would lead to increased efficiencies for all mail. That said, some mechanism may be needed to ensure that the Postal Service sets prices in such a way as to at least cover its costs.

*The argument against FDC is that it discourages new volume even when that new volume would lead to increased efficiencies for all mail.*

---

essentially subsidizing its parcel service, due to the low cost attribution and low mark-ups. The testimony can be found at <http://govinfo.library.unt.edu/usps/offices/domestic-finance/usps/meetings.html>.

## Appendix D Short-Run versus Long-Run Marginal Costs

Another issue that has arisen with regard to cost measurement is whether the Postal Service's cost system is accurately measuring product costs over this period of sustained excess capacity. The general complaint stems from the fact that no one wants the products they use to bear the burden of the costs associated with excess capacity (e.g., idle workers, less-than-full trucks). The economic argument behind this issue has to do with the time frame the Postal Service should use in estimating the marginal costs of products and what costs vary with volume in that timeframe.

*No one wants the products they use to bear the burden of the costs associated with excess capacity*

As mentioned briefly in the description of postal costing above, only costs that are considered to vary with volume are attributed to products. Which costs vary with volume are dependent on the time frame. The current costing framework estimates marginal costs in the "long run," with the long run being defined as a period of time long enough so that important adjustments can be made.<sup>38</sup> The development of long-run costs includes a factor that suggests that there is an investment stream (or disinvestment in the case of falling volumes) that ultimately goes along with volume changes over time.

Short run, on the other hand, refers to a time period so brief that certain important adjustments cannot be made. In the short run, managers could make staffing changes (e.g., use overtime, handle excess mail in manual operations). However, managers could not make bigger changes such as changing the layout of a facility.

Short-run costs and long-run costs are often quite different as each includes the costs that vary with volume within the timeframe. For example, the Postal Service may ultimately respond to a reduction in volume by eliminating a facility, but it takes time to sell a building. In this case, the short-run marginal cost of a product worked in such a facility will be lower than its long-run cost, because the short-run cost does not include the facility cost, since this cost does not vary with volume in the short run.

The recent criticism has been that the CRA overstates product costs by including costs that exist due to excess capacity. This criticism gains more ground as the Postal Service experiences sustained excess capacity and faces resistance in making changes to its network to adjust to the excess capacity. Hence some have argued that the Postal Service should move toward using short-run costs.

*Short-run costs are not necessarily a panacea.*

However, short-run costs are not necessarily a panacea. Short-run costs tend to have more fluctuations and are not always lower than long-run costs. For example, assume the Postal Service is successful in reducing its network, and makes so many reductions, that in some plants it does not have enough equipment to sort all the mail. The short-run

---

<sup>38</sup> The "long run" refers to a time period long enough to allow for significant adjustments to the volume change to be made. While the exact timeframe is not precisely defined, the time period historically considered appropriate for postal costing is around three years.

marginal cost would reflect the higher cost of manually sorting this mail. The long-run marginal cost would not, as it would reflect an average from periods of both capacity shortages and excesses. Under conditions of capacity shortage, long-run marginal costs are actually lower than short-run marginal costs.

In fact, the fluctuation over time of short-run costs is the reason the Postal Service and the PRC employ the long-run approach. If costs were to vary wildly over the period during which postal prices are in play, it would be hard to decide if a given product was making money or not.

In addition, there are a variety of complex issues involved in estimating short-run costs, such as how to handle simultaneous overcapacity in some plants or areas, and capacity shortage in others, how to choose an appropriate sample period for variability analysis, etc. That said, there is no obvious reason the Postal Service could not produce some approximation of short-run costs, particularly as an adjunct to the current CRA approach. In fact, the Postal Service has produced rudimentary estimates of short-run costs for the purpose of evaluating summer sales.

In determining the appropriate cost base for a potential summer sale<sup>39</sup> in 2009, the Postal Service identified those portions of its network that were not able, in the short run, to reduce capacity as quickly as volume. Facility space is a good example of a cost that cannot be added (or shed) quickly. The Postal Service then eliminated (or greatly reduced) the marginal cost estimates in those areas. Table 7 compares short- and long-run costs for selected products in FY 2008. Under this approximation, short-run costs ranged approximately 40 percent to 60 percent lower in that year.

However it should be noted that for the following summer sale, different assumptions were used. The FY 2008 analysis included eliminating significant delivery costs from the short run, on the grounds that in that time period routes could not be eliminated. However, by the time of the second summer sale, which required short-run costs for the next fiscal year, some 12,000 routes had been eliminated. Hence, in that analysis delivery costs were not removed from short-run costs and the resulting short-run and long-run costs were much closer in magnitude.

**Table 7: Long-Run (LR) and Temporary Short-Run (SR) Attributable Costs per Piece (FY 2008)**

<b>Product</b>	<b>Temporary SR Attributable Cost</b>	<b>LR Attributable Cost</b>
High Density and Saturation Letters	\$0.023	\$0.057
High Density and Saturation Flats and Parcels	\$0.020	\$0.062
Carrier Route	\$0.079	\$0.150
Standard Regular Letters	\$0.054	\$0.096
Standard Regular Flats	\$0.260	\$0.389

Source: U.S. Postal Service FY 2008 Summer Sale, Docket No. 2009-3

<sup>39</sup> The Postal Service had two summer sales, special incentives for senders to send mail during the summer, when mail volumes are typically low. Unlike most discounts, summer sale incentives were only in effect for a few months.

It is due to these fluctuations that care needs to be taken in using short-run costs for pricing of products beyond something like the summer sales, which were only offered for a limited time. Short-run pricing is likely to require more frequent price adjustments, as short-run costs are likely to change rapidly.

*Short-run pricing is likely to require more frequent price adjustments as short-run costs can change rapidly.*

## Appendix E Bottom-Up Costing

Currently, the workshare discounts are developed using the following steps:

- Identify the activities that will be avoided for each type of workshare.
- Estimate the cost savings associated with avoiding these activities.
- Set the discount as close to the estimated cost savings as possible. While the PRC encourages discounts being set at 100 percent of the cost savings, a concept referred to as the Efficient Component Pricing Rule (ECPR), there are at times reasons the discount is more or less than the cost savings.

This method is sometimes referred to as “top-down” because it begins with the total incurred cost of the end-to-end product and estimates savings from off of that full cost. Note that when the discount is set equal to the cost savings, the mark-up (the “contribution” to the Postal Service) is the same for both the end-to-end and the workshare product.

Some mailers feel that this methodology leads to prices that are unfairly high for workshare mail. Their argument is two-fold:

- The estimated cost savings associated with workshare discounts do not always include all characteristics of workshare mail that make it less costly than end-to-end mail. Therefore the resulting discount is too low, and they are actually paying a higher true mark-up than end-to-end mail.
- Workshare mail is more elastic (more sensitive to price) than end-to-end mail and therefore should pay a lower, more competitive price.

These mailers believe that a more reasonable approach would be to develop prices using a bottom-up approach, where each product is charged its marginal cost plus a markup, based mostly on what the market will bear. For that to happen, however, there has to be an estimate of marginal cost for each activity. That’s where the pricing philosophy issue (bottom-up pricing versus ECPR) becomes a costing problem.<sup>40</sup>

While bottom-up costing may significantly improve the utility of the cost system as a tool for management, there are difficulties associated with the creation of more disaggregated cost information. It is both difficult and costly to develop marginal cost estimates for each activity (e.g., culling letters of a certain address quality). Estimating the marginal cost of every activity with the same degree of rigor currently in place by the PRC for major products will present a significant resource challenge. And there exists the issue of what to do if the sum of the marginal cost estimates does not add up to the total cost. Would there need to be a method to reconcile the two? The methodology to

---

<sup>40</sup> Note that measures of demand elasticity would also be required in a bottom-up pricing approach, but this is beyond the scope of this paper.

reconcile would most likely be a contentious issue, as currently there is a lot of debate about the manner in which the workshare models are reconciled to CRA data.

Even if the Postal Service wasn't under a resource constraint, it is unclear if it would be possible to develop accurate and usable marginal costs by activity. Mail sorting procedures vary widely from plant to plant, so there would still be considerable averaging, unless reported costs are allowed to vary from area to area. If the latter, the impact on prices is unclear. Some estimates of activities are already included in the workshare cost avoidance models, but the actual mail flow may be more complicated than can be captured in a model, especially as it varies from plant to plant. In fact, the activities most difficult to model, such as allied labor activities, are often the ones with the most costs.

It is not clear how far up from "bottom-up," costing is supposed to go. The Postal Service currently has information on mail processing costs, as a result of the cost avoidance studies, but whether separate costs for each different delivery and/or retail activity are required in this approach is not clear.



## Appendix F New Data Sources

As mentioned above, one of the steps involved in estimating marginal costs is distributing volume variable costs to product using a distribution key. Typically these distribution keys are from sampling systems including the mail processing In-Office Cost System (IOCS), the Carrier Costing System (CCS), and the Transportation Accounting System (TRACS). Mailers and others have suggested that some of these sampling systems either be replaced or enhanced with systems that collect census data (systems that do not rely on a sample). The Postal Service does claim to examine and use census data as distribution keys when appropriate. The Postal Service's finance department conducts ongoing examinations of new data as they become available, but some have argued that it needs to do more.

The new data sources suggested for use in cost estimation include Surface Visibility data, End-of-Run data, Intelligent Mail barcode data (IMb), and the mail images lifted from advanced facer/cancellers at plants.<sup>41</sup> For example, the OIG recommended the use of Surface Visibility data, linked to End-of-Run data, should replace the TRACS data currently used to distribute purchased transportation volume variable costs. In addition, mail images have been suggested as useful in distributing mail processing costs to products, currently accomplished via the IOCS. In general, the Postal Service has disputed the readiness of census data for cost estimation, but is actively engaged in pursuing this effort as the new data become available and are shown to be accurate.

The Intelligent Mail barcode is a new barcode used to sort and track letters and flats. The data produced by the system should provide greater visibility into the mail stream.<sup>42</sup> These data are most often suggested as a replacement for IOCS, the work sampling system currently used to produce distribution keys for mail processing labor. The Postal Service should certainly pursue the use of IMb data, as well as images, as supplements or substitutes where savings are possible. However, there are certain positive properties of the current data collection systems that should not be lost in the transition to census systems.

IOCS samples mail processing and city carrier in-office employees at a moment in time in order to quantify the labor time expended in a given activity and caused by the provision of a specific product. Though it can be criticized for the size of the sample and how it is selected, the system does embody one powerful characteristic: it measures what is actually happening. If a flat shows up on a letter sorting machine, it gets some of the cost of the labor running that machine, even if the flat is not supposed to be there at all. This virtue sets IOCS apart from any form of modeled cost or standard cost that is forced to assume that postal activities occur, in every case, the way they are supposed to occur.

---

<sup>41</sup> U.S. Postal Service Office of Inspector General, *Transportation Cost System Inputs into the Cost and Revenue Analysis Report*, Report No. CRR-AR-11-004, September 19, 2011, [http://www.uspsig.gov/foia\\_files/CRR-AR-11-004.pdf](http://www.uspsig.gov/foia_files/CRR-AR-11-004.pdf).

<sup>42</sup> IMb barcodes are not on all mail.

One problem with using IMb data as a replacement for IOCS is that it does not provide a means for tracking labor costs. While IMb data is designed to tell you that a product has been in a certain operation, it cannot tell you how much labor has been expended in working that piece. This is precisely what a work sampling system like IOCS is designed to do. If some product (a heavier piece, for example) requires more time to work in an activity, then it has a greater probability of being selected, and the product gets a correspondingly higher cost in that activity. It is unclear how mail processing costs could be developed without this measurement of labor cost.

Another problem with IMb is that while the Postal Service could potentially do scans on its automation equipment, it currently does not have the technology needed to do scans in manual operations, platform operations, and moving containers. This is especially important since these are areas that have a lot of costs.

The Postal Service should continue to examine the possibility of using new data to support its cost development. However, it is unclear if the suggested alternatives in their current state are mature and comprehensive enough to be used to support the cost systems in any material way.

## Appendix G Timeliness of Cost Data

Unfortunately, as highlighted in OIG Audit Report CRR-AR-10-002,<sup>43</sup> Postal Service cost studies are out of date.<sup>44</sup> In some areas, this causes little harm as there has been little change in the underlying cost generating activity since the last study update. However, in other areas, operations have changed in ways that make the old studies inapplicable. A good example of the latter is city delivery cost, which, since it was last studied in 2004, has experienced significant reduction in delivered volume, the introduction of flat sequencing machines, and the elimination of many routes.<sup>45</sup>

Under the Postal Reorganization Act, the Postal Service initiated studies as resources were available, generally on a three-year schedule. With the new law in 2006, the PRC made it very clear it wanted a different, and much more inclusive, procedure that included the PRC laying out a priority list of studies and allowing interested parties to comment on the list and on how studies should be conducted.<sup>46</sup> The idea was that the PRC would oversee the studies and involve interested parties. This rule has alleviated stakeholders' concerns about the transparency of changes to the cost methodology; however it may have had the unintended effect of placing additional roadblocks in the way of timely updates to cost studies. While the Postal Service has requested approval for small changes to its costing systems, it has not requested approval for more significant changes. The PRC has recently issued decisions that should move the process forward, and the Postal Service has begun planning for larger studies.

Stakeholders, including the Postal Service, the PRC, the OIG, and mailers, need to combine efforts to develop a system in which at least the most important studies can be completed on a frequency that is more responsive to the changing business needs of the Postal Service. The key factors in evaluating the criticality of a study update are 1) the resources required, 2) the impact on product costs, and 3) the extent of operational changes since the last update.

---

<sup>43</sup> See the U.S. Postal Service Office of Inspector General Report *Management of Special Studies*, Report No CRR-AR-10-002, March 19, 2010, [http://www.uspsoig.gov/foia\\_files/CRR-AR-10-002.pdf](http://www.uspsoig.gov/foia_files/CRR-AR-10-002.pdf).

<sup>44</sup> The Annual Compliance Determination (ACD) contains a description of variability studies and the year in which they were conducted.

<sup>45</sup> For an analysis of the asymmetry in delivery cost response as volume rises or falls, see Michael D. Bradley, Jeff Colvin, and Mary Perkins, "Do Volume Increases and Decreases have the Same Effect on Labor Hours?", forthcoming in *Expanding Competition in the Postal and Delivery Sector* (2012).

<sup>46</sup> See Docket No. RM2008-4, Order 203 *Notice of Final Rule Prescribing Form and Content of Periodic Reports*, April 2009, pp. 10 -23.