
**Study on Universal Postal Service and the Postal Monopoly**

**Appendix F**

**Section 3**

# Estimates of the Current Costs of the USO in the U.S.

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# Contents

# 1 Summary

## *1.1 Scope of the Analyses*

In the U.S. there has been little discussion, let alone agreement, on the elements that are part of the postal "USO." This is unlike Europe where there have been many policy analyses, quantitative estimates and governmental statements, directives and actual legislation concerning the postal USO. In this analysis, we infer the elements from the specific requirements that are contained in the statutory language (*statutory elements*). In addition, we examine the most reasonable changes that might be made if Congress were explicitly to define a postal USO (*potential statutory elements*). The following is meant to summarize the assumptions that lie behind our approach to defining the USO:

By "universal" we mean that it applies to virtually every person or address. There will always be exceptions in the real world. For example, remote addresses that can only be served by mule train may not get daily delivery or isolated groups living many miles from a town may not have convenient access to a postal facility.

By "service" we mean an aspect of the Postal Service that affects persons or businesses as senders or recipients. This would include reasonable access to counter service, frequency of delivery, speed and reliability of delivery, range of products offered, affordability of products, ability to lodge complaints, rate design, rate discounts, type of retail facility (USPS or contractor), etc. It does not mean aspects of the Postal Service that may indirectly affect senders and recipients such as:

- wages and benefits of postal employees
- whether functions that are invisible to customers such as transportation and sorting are provided by Postal Service employees or contractors
- activities tangential to its mission such as cooperating with the Census Bureau or assisting civil defense efforts
- services provided informally by employees such as checking on infirm recipients, collecting food for the needy or helping a customer filling out a form

By "obligation", we mean what is required of the Postal Service by statute. Statutes may be modified and additional obligations may be imposed on the Postal Service. Thus, a reasonable analysis of the cost of the USO should, in addition to current statutory

obligations, include those additional obligations that might reasonably be imposed on the Postal Service. We do not mean that these additional obligations be simply theoretical possibilities, but rather, that they stand a realistic chance of being imposed given the issues surrounding the Postal Service and the economic pressures that it faces today.

## *1.2 Summary of the Results*

In this section, the cost of the USO for the year 2007 is estimated according to the method described in section F2, where the cost of each element of the USO is the additional profit or net income that a profit maximizing post would earn if it no longer had an obligation to provide it. This involves first calculating the savings from eliminating the element and then subtracting any revenue loss that would be caused by the discontinuance of the element. The cost of the USO, then, is the sum of the additional net income that would be realized if all the elements of the USO were eliminated.

In this section, each element of the USO is introduced and a summary table of costs is presented.

*Statutory elements:*

1. Frequency of Delivery
2. Discounts for Nonprofit Categories of Mail
3. Uniform Rate with respect to Distance required for Media Mail/Library Rate Mail
4. Losses on Market Dominant Products
5. Measuring Service Performance of Market Dominant Products
6. Maintaining Small Rural Post Offices (CAG K&L offices)

*Potential statutory elements:*

7. Alaska Air Subsidy
8. Uniform Rate for First Class
9. Delivery to all Addresses Who Involuntarily Receive No Delivery
10. Six day a week Delivery for all (except for businesses served by five day a week business routes)

**Cost of the Statutory Elements of the USO**

| Elements | 2007 Cost ($ billion) |
|---|---|
| Six day a week delivery | 5.20 |
| Nonprofit Mail Discounts | 1.15 |
| Unzoned Media/Library Rates | 0.06 |
| Losses on Market Dominant Products | 0.45 |
| Measuring Service Performance | 0.18 |
| Maintain Small Rural Post Offices | 0.59 |
| **Total** | 7.63 |

**Cost of the Potential Statutory Elements of the USO**

| Elements | 2007 Cost ($ billion) |
|---|---|
| Alaska Air Subsidy | 0.107 |
| Uniform Rate for First Class | 0.130 |
| Require Delivery to All Addresses | 0.101 |
| Six Day a Week Delivery to all Addresses | 0.001 |
| **Total** | 0.339 |

The statutory USO cost of $7.63 billion in 2007 was 10 percent of total Postal Service revenue for the year ($74.97 billion). The potential statutory USO cost of $0.339 billion in 2007 was one half of one percent of revenue.

Below are the separate analyses of each element of the statutory and potential statutory USO. They are followed by an analysis of the claim that there is a cross-subsidy from urban areas to support delivery to rural areas of the nation.

# 2 Estimates of the Current Level of the USO in the U.S.

## *2.1 Analysis 1: Savings from Reducing Frequency of Delivery*

### 2.1.1 Background

Every year since 1984 the Congress has had language in the Postal Appropriations Act that requires the Postal Service to maintain delivery for both city and rural routes at least at the levels that prevailed in 1983.[1] The USO cost of this requirement as stated in the previous section on methodology is its effect on the profits of the USPS if it were a profit maximizing institution. In order to make this calculation we must first establish a minimum frequency of delivery for a post that has a monopoly to deliver all letters to all addresses in the country. This minimum is a matter of judgment and given the current state of delivery economics it must be somewhat arbitrary. The method for calculating this cost element of the USO would be the same regardless of the minimum frequency of delivery.

It is our judgment that a minimum frequency of delivery for a postal universal service provider is every other day or three days per week, given the current role of the post in our communications infrastructure, If a competitor were to enter the market, it might deliver fewer days per week, but we would not consider it a universal service provider.[2] Delivery by a universal provider on business routes would continue at 5 days per week since businesses are more dependent on frequent mail delivery than are households. Box section delivery would remain unchanged.

As shown in Table 1 below, rural and city delivery costs for FY 2007 were approximately $29.4 billion[3], or about 38% of the total USPS accrued costs of $77.2 billion for that period. The fixed costs of delivery amount to $15.1 billion, so the fixed cost percentage is about 51%. Fixed costs include a variety of activities that are necessary each delivery day regardless of the volume being delivered, such as the travel

[1] This is discussed in detail in Appendix B, section 5.2.

[2] City Mail delivers to about half the addresses in Sweden one and a half days a week or every third business day. Sweden Post delivers 5 days per week as do several other European posts.

[3] Sources: Files FY07.CRPT.xls and FY07PbackAll.xls, both in PRC-ACR2007-LR2, Docket ACR2007. These costs include "piggyback" costs (indirect costs which are proportional to delivery costs).

time required to walk or drive the route with no deviations to deliver mail. Virtually all attributable costs vary with mail volume.

**Table F3-1. FY 2007 Delivery Costs ($ billion)**

| | Attributable Costs | Fixed Costs | Accrued Costs | Attributable % |
|---|---|---|---|---|
| City Delivery Carriers - In Office | 5.70 | 1.15 | 6.84 | 83.2% |
| City Delivery Carriers - Street | 5.43 | 9.23 | 14.66 | 37.0% |
| Rural Carriers | 3.21 | 4.70 | 7.91 | 40.6% |
| Total Carrier Delivery Costs | 14.34 | 15.07 | 29.41 | 48.8% |

Note: These costs include indirect costs such as supervision and administration. Total costs rounded.

Rural and city carrier costs are modeled differently in PRC regulatory proceedings because of the difference in the way they are paid. Most rural routes are evaluated routes, meaning that each rural carrier's salary is based on established time standards for each volume variable or fixed activity. A rural carrier's pay is thus based on such items as the delivered volume of each mail type, the numbers of the various types of retail transactions performed, as well as route parameters such as total mileage and number of stops. The pay depends on the results of an annual route evaluation, not on how much time is actually spent on the route on a given day – there is no undertime or overtime. On the other hand, pay for city carriers is based on the actual time spent each day on the route, both in-office and on the street. As with rural carriers, each city carrier's route is evaluated annually with the goal of making the average time required to service the route about eight hours. However, when more time is required to complete the route on high-volume days, the city carrier receives overtime; on low-volume days, the city carrier still receives eight hours pay. For this reason, the average number of daily hours paid for city carriers always exceeds eight – in FY 2007, the average number of city carrier hours per route was 8.57.

Previous researchers have demonstrated that considerable savings in fixed delivery costs could be achieved by reducing the number of delivery days per week, which obviously increases daily volume per delivery point. For example, in one study it was estimated that reducing the frequency of delivery for residential routes from six to three times a week could save as much as half the fixed costs of delivery, which in FY 1999

amounted to almost $6 billion, or 9% of total costs.[4] In that study, for simplicity the assumed cost function was one commonly used in postal analyses, in which total costs are assumed to equal fixed costs plus marginal costs times volume. This estimate of fixed cost savings was characterized as an upper bound, since no additional costs or loss of volume due to the reduction of delivery frequency were considered.

In this analysis, we first update the earlier estimates of fixed cost savings as a function of number of delivery days using more recent FY 2007 data. Next, since these delivery frequency cost savings are large in comparison to other USO components, it seemed appropriate to examine the sensitivity of the rural and city carrier savings estimates when more complex but also more realistic assumptions are used. In the second section, we analyze the savings impact of adjusting the size of the new expanded carrier routes to conform to an 8-hour standard carrier day,[5] assuming a linear cost function. Next, we examine the effect on the savings of using a non-linear city carrier street time cost function introduced by USPS witness Bradley in the R2005-1 rate case and continued in the R2006-1 rate case. We also discuss estimates of savings from reducing delivery frequency by one day that were recently presented by Michael Bradley et al.[6] In a fourth section, we address the effect on the net savings of potential lost net revenue due to losses in demand caused by reducing delivery frequency. Finally, we summarize our discussion of whether and how the Table 2 carrier savings should be revised, based on the more realistic assumptions about rural and/or city carrier cost behavior described in this analysis.

### 2.1.2 Case 1: Update of Fixed Costs Savings Using Linear Cost Model

Table 2 below shows the estimated FY 2007 delivery fixed costs savings resulting from changes in delivery frequency from six days per week to five, four, and three days a week, using the assumptions of the previously-mentioned study. Further reductions in delivery frequency did not seem appropriate to maintain a viable Postal Service. With a

[4] See Cohen, et al (2002). Delivery frequencies of 5, 4, 3, 2, and 1 day per week were considered.

[5] This is intended to reflect the Postal Service's stated general policy of maintaining a regular (eight-hour) workday for its carriers, which would require route adjustments in response to significant, sustained volume increases of the type discussed here. See PRC Op., Docket No. R2005-1 at 66.

[6] For the subsequent report, see "Quantitative Analysis of the Universal Service Obligation." Prepared by IBM for the USPS. (October 8, 2008) Available at http://www.usps.com/postallaw/_pdf/IBMReport.pdf

linear cost function, fixed costs are reduced in direct proportion to the change in delivery days, e.g., half the fixed costs are saved when delivery days are changed from six to three.[7]

**Table F3-2. Updated Delivery Fixed Cost Savings (FY 2007)**

| Delivery Days per Week | Cost Savings ($ bil) | Percent of Total Costs |
|---|---|---|
| 5 | 2.51 | 3.3% |
| 4 | 5.02 | 6.5% |
| 3 | 7.53 | 9.8% |

Note: same assumptions used as in original paper by Cohen et al. (2002).

### 2.1.3 Case 2: Effect of Eight-Hour Day Constraint on Savings (Linear Model)

Decreases in delivery frequency would be accompanied by large increases in delivered daily volume per route, so that the time spent by the carrier on a delivery day would significantly exceed the normal eight-hour workday. Under current Postal Service policy, existing routes would probably have to be cut back in terms of delivery points to reach the eight-hour workday target, and new routes would then have to be added to handle the excess volume. In this section, we use the linear cost model as we address possible reductions in fixed cost savings due to this constraint. A series of simple examples will be used to illustrate the different assumptions described here.

Example 1. Assume first that a geographical area has two carrier routes, each with 6-day delivery, 600 delivery points and 3,000 pieces per day, and that each takes 8 hours to complete. Also assume that volume-variable costs are 50% of total costs, so each route would have four hours per day of fixed cost activities and four hours of volume-variable activities. The weekly volume for each route with six-day delivery is 3000x6 = 18,000 pieces, and weekly total hours per route are 8x6 = 48 hours, with 24 fixed and 24 volume variable. This scenario represents the current delivery frequency situation, and is summarized in the table below:

[7] About 9 percent of delivery points are businesses, some of which receive delivery only five days a week. See 2007 USPS Annual Report, p.56. For purposes of this approximate analysis, business deliveries will be treated the same as residential deliveries.

*Example 1: 6 delivery days, 8-hour routes, linear model*

| | |
|---|---|
| Number of Routes | 2 |
| Delivery Points Per Route | 600 |
| Volume | 3,000 pieces per route day; 36,000 pieces per week |
| Fixed Time | 4 hours per route day, 48 hours per week |
| Variable Time | 4 hours per route day, 48 hours per week |
| Variability | 50% |

Example 2. Assume now the delivery frequency is reduced from six days per week to three days. Then the delivered volume on each route would double to 6,000 pieces on each of the three delivery days. Since we are assuming that the carrier cost function is equal to fixed costs plus marginal cost times volume, with twice as much volume the fixed costs per route would still be four hours, but the variable costs per route would double to eight hours. Thus each carrier's workday would increase by one-third to 12 hours and the volume variability of each route would increase to 66.7%. Total weekly volume for the two routes would be 6000x3x2 = 36,000 pieces as before. Total weekly variable time would be 8x3x2 = 48 hours as before, but weekly fixed time per route would now be 4x3x2 = 24 hours, a reduction of 50 percent, as estimated in the earlier research. The savings in fixed costs are due to the increase in daily volume per delivery point, which improved the efficiency of the delivery process. This example is summarized below.

*Example 2: 3 delivery days, 12-hour routes, linear cost function*

| | |
|---|---|
| Number of Routes | 2 |
| Delivery Points Per Route | 600 |
| Volume | 6,000 pieces per route day, 36,000 pieces per week |
| Fixed Time | 4 hours per route day, 24 hours per week |
| Variable Time | 8 hours per route day, 48 hours per week |
| Variability | 66.7% |

Example 3. This four-hour route time increase would be sustained rather than temporary, so the Postal Service would most likely have to restructure these routes to restore the

standard eight-hour workday for its carriers. A straightforward and efficient way for the Postal Service to achieve this goal would be to reduce the number of delivery points for each route by one-third to 400[8]. Weekly variable cost for the two routes decreases by one-third to (2/3) x8x3 = 16 because there would be one-third less volume (4,000 pieces per day instead of 6,000). If all fixed costs were proportional to the number of delivery points on the route, a one-third reduction in delivery points would also reduce weekly fixed costs per route by one third (to (2/3)x4x3 = 8 hours instead of 12). Under these conditions, weekly volume for the two original routes would be 2x4,000x3 = 24,000 pieces. Volume variability for each of the original routes would remain at 66.7%, so the increase in delivery efficiency would remain. To handle the remaining 12,000 pieces of weekly volume (one-third of the original 36,000 pieces for the two routes combined), the number of routes would have to be increased from two to three (a 50% increase), with the new route also having 400 delivery points and 4,000 pieces. The new route would have the same volume, fixed cost, and variable cost as the original two routes. The combined weekly fixed costs for the old and new routes would now be 3x8 = 24 hours. But this means that even after restructuring to accommodate the eight-hour workday, the same 50% of fixed costs would be saved as calculated in the earlier research.

*Example 3: 3 delivery days, 8-hour routes, linear cost function, and fixed costs vary directly with delivery points*

| | |
|---|---|
| Number of Routes | 3 |
| Delivery Points Per Route | 400 |
| Volume | 4,000 pieces per route day, 36,000 pieces per week |
| Fixed Time | 2.67 hours per route day, 24 hours per week |
| Variable Time | 5.33 hours per route day, 48 hours per week |
| Variability | 66.7% |

Example 4. Now consider the consequences if some of the fixed delivery activities do not vary with the number of delivery points. Although a proper analysis of this issue would require a more formal econometric analysis, we can get a rough idea of its effect on savings by examining the sub-components of city carrier time. For example, it is

[8] Other methods are possible, including regular use of overtime.

likely that the fixed costs for the "Travel to/from Route," "Training," "Break and Personal Needs" and "Clocking in/out" activities for city carriers would remain about the same during a delivery day even if the number of delivery points were reduced substantially. According to data from the ACR2007 PRC Report[9], the fixed cost of these four sub-activities is about 4.2% of total delivery cost, or about 20 minutes of a full eight-hour day. A one-third reduction in the number of delivery points for each original route will not reduce the 20 minutes by one-third to 13.7 minutes as with the other delivery components. The workday would instead be 8 hours and 7 minutes, so a slightly larger reduction factor in delivery points (0.3429) would be required. The larger reduction factor will also reduce volume per route, and it follows that somewhat more than one new route (1.0438) would be needed on average to handle the remaining volume. This means that instead of saving 24 hours during the week (50% of city delivery fixed costs) as with the earlier examples, only 22.95 hours would be saved (48% of city delivery fixed costs). A summary of this example is shown below.

*Example 4: 3 delivery days, 8-hour routes, linear cost function, and 4.2% of fixed costs do not vary with delivery points*

| | |
|---|---|
| Number of Routes | 3.0438 |
| Delivery Points Per Route | 394 |
| Volume | 3943 pieces per route day, 36,000 pieces per week |
| Fixed Time | 2.7435 hours per route day, 25.05 hours per week |
| Variable Time | 5.2565 hours per route day, 48 hours per week |
| Variability | 65.7% |

This example suggests that the effect of fixed costs that do not vary with delivery points is relatively small. Based on this and the ad hoc nature of the estimate, we recommend no changes to the methods of the earlier study assuming the cost function is linear with volume.

[9] See Docket No. ACR2007, Library Reference PRC-ACR2007-LR2, workbook CS06&7.xls.

### 2.1.4 Case 3: Effect on Savings of Using New Bradley Nonlinear Model

Now we will consider the results of using the nonlinear cost function proposed for city carrier street time by witness Bradley in Docket No. R2005-1 and updated in Docket No. R2006-1.[10] Prof. Bradley submitted a formal econometric analysis of the variability of city carrier street time with volume, which was later approved by the Commission in both dockets. Unlike earlier city delivery analyses that used a route-day as the unit of observation, his analysis used a 5-digit zip code area-day. In other words, his daily observations of volumes, costs, and other variables were based on all the routes in a set of sampled zip code areas. His econometric equation involved both linear and quadratic terms for five different volume variables: letters, flats, sequenced mail, collection mail, and small parcels. His equation also included linear and quadratic terms for non-volume related variables: delivery points and geographic density (delivery points per square mile in the zip code area).

The two terms in the equation for each volume type were of the following form:

$$\text{Time} = aV + bV^2$$

where Time was the variable city carrier street time for that type of mail, V was the volume for that mail type, and the coefficients a and b were estimated by the econometric model. If the constant b is close to zero, the equation is in effect linear just as the ones discussed in the examples above. If b is positive, the marginal cost for that type of mail grows with increasing volume. Similarly, if b is negative, the marginal cost will decline with increasing volume. Prof. Bradley's results showed that the b coefficients for letters, sequenced mail, and collection mail were negative, but the coefficients for flats and small parcels were positive.[11] Although his quadratic model was not designed to model the effect of total volume on delivery costs, it is interesting to note that if one multiplies each volume type by the same scalar factor c, then plots the total cost as a function of c, the nonlinear (squared) terms almost cancel out, and one is left with a near-linear function.

[10] See the testimony of Prof. Michael Bradley in Docket No. R2005-1.

[11] See Docket No. R2005-1, USPS-T-14 at page 38 for all the estimated coefficients. Also, see LR-K-81.doc in USPS-LR-81 for the means of the various variables.

On August 14, 2008, Prof. Bradley presented a briefing at the PRC on behalf of the Postal Service that was related to USO costs. In his presentation, he included an overview of his recently-estimated savings from reducing delivery frequency from six to five days a week. At that time, he presented an example of how the Postal Service might save attributable as well as network-related fixed costs by eliminating Saturday delivery. The savings in attributable costs were said to be achieved via the concept of a "volume absorption rate," meaning that a portion of the extra Monday-Friday volume could be absorbed with no additional costs. In his briefing, he assumed a volume absorption rate of 50 percent for city delivery and 15 percent for rural delivery, and estimated total savings of $3.5 billion, which included savings of more than $900 million in attributable cost.[12] This example was also mentioned in the recent IBM/USPS Quantitative Analysis of the Universal Service Obligation, Final Report (October 8, 2008).

On November 7, 2008, Prof. Bradley had a follow-up meeting with the PRC staff to present his preliminary thoughts on the concept of volume absorption and how it might allow attributable delivery cost savings to be estimated. The volume absorption rate seems to be the variability of the marginal cost function (the first derivative of the total cost function). Prof. Bradley noted that his PRC-accepted quadratic model of city delivery street time costs could not be used to calculate the volume absorption rate for delivery costs and therefore the savings in attributable costs. Instead, he used a backup translog model from R2005-1 where he used mail volume as a single output instead of different mail shapes. According to Prof. Bradley, this model can be used to estimate a volume absorption rate of minus 26.6%, and attributable cost savings of approximately $500 million, for a total cost savings of about $3 billion from eliminating Saturday delivery.

In summary, there are a number of empirical issues that must be thoroughly reviewed by the Commission and other analysts before a decision can be made as to whether this approach is suitable for developing reliable estimates of attributable cost savings from delivery.

[12] The 50% /15% absorption rate case was merely an example, and had no empirical underpinning.

### 2.1.5 Case 4: Effect of Volume Losses on Delivery Frequency Savings

FY 2007 contribution per piece was about 13.73 cents, and total contribution was about $29.14 billion.[13] It is reasonable to expect that demand and thus USPS net revenue would decline due to decreases in delivery frequency, especially for advertising mail where the time of arrival of the mail piece often must coincide with a planned marketing event. Also, customer dissatisfaction resulting from fewer delivery days would likely cause more rapid diversion of First-Class Mail to electronic alternatives and parcel volumes to competitors' services.

In this analysis, we assume a simple profile of volume losses as a function of delivery frequency, and estimate the effects on the savings as a sensitivity analysis. It was assumed that the effect of changing from six to five days per week would be modest (a 2% loss), but that further decreases in frequency would reduce volume by 3% for each additional day of frequency reduction. These results are shown are in the first three rows of Table 3 below.[14] It can be seen by comparing Table 2 and the first three rows of Table 3 that about one-third of the Case 1 savings are lost due to these assumed demand effects.

The last two rows of Table 3 are included to show the sensitivity of the savings loss to different assumed demand effects for the three-day delivery case: a 6 percent volume loss and a 10 percent volume loss.

[13] See PRC Annual Compliance Report for 2007, p. 24.

[14] Reductions in savings due to the eight-hour constraint (Case 2) were not considered for this case.

**Table F3-3. Cost Savings from Reducing Delivery Days with Assumed Volume Losses (FY 2007)[15]**

| Delivery Days Per Week | Volume Loss % | Contribution Loss ($ bil) | Case 4 Cost Savings ($ bil) | Percent of Total Costs |
|---|---|---|---|---|
| 5 | 2.0 | 0.58 | 1.93 | 2.5% |
| 4 | 5.0 | 1.46 | 3.56 | 4.6% |
| 3 | 8.0 | 2.33 | 5.20 | 6.7% |
| 3 | 6.0 | 1.75 | 5.78 | 7.5% |
| 3 | 10.0 | 2.91 | 4.62 | 6.0% |

It should be noted that the column labeled "Case 4 Cost Savings" is the same as the net improvement in USPS profits.

At present, there is great uncertainty about how much volume would decline at the various delivery frequencies. It is therefore interesting to calculate how much volume could be lost at a given delivery frequency before the net profit from the reduction in frequency actually goes to zero. Using this same analysis, the percentage volume losses that lead to net revenue losses equal to delivery frequency savings were calculated for 5, 4, and 3 delivery days and are shown in Table 4 below.

**Table F3-4. Volume Loss Necessary to Negate Savings from Delivery Frequency Reduction**

| Delivery Days | Cost Savings ($ bil) | Percent of Total Cost | Percent Volume Loss Required for Zero Net Income |
|---|---|---|---|
| 5 | 2.51 | 3.3% | 8.6% |
| 4 | 5.02 | 6.5% | 17.2% |
| 3 | 7.53 | 9.8% | 25.8% |

Note: Average contribution/piece = 13.7 cents; $1 bil = 7,284 mil pieces or 3.43 percent of total volume.

It seems likely that a profit maximizing post would choose 3-day delivery, because it is very doubtful that the resulting lost volume would even approach 25 percent of total volume. For this reason, we have adopted 3-day delivery as our base case for calculating USO costs related to delivery frequency.

[15] The Table 3 calculations are documented in the Excel workbook analysis1.xls (Sheet Tables 1-4).

### 2.1.6 Summary

At this point, our analyses of cost savings from reducing delivery frequency have shown that except for demand effects, we have found no compelling reason to alter the linear-model method of estimating savings used by the earlier researchers. This method involves estimating the fraction of delivery fixed costs saved as the number of eliminated delivery days divided by the current six days. For example, as shown in Table 2 above, going from six-day to three-day delivery would reduce delivery fixed costs by 50 percent, or about $7.5 billion. The linear model of delivery costs seems adequate for estimating fixed-cost savings and the loss of savings due to restructuring delivery routes to maintain eight-hour workdays seems to be minimal. Prof. Bradley's PRC-accepted quadratic model cannot be used to estimate savings in attributable delivery costs. Finally, demand effects could reduce these estimated delivery frequency savings considerably, as shown in Table 3. We have chosen three-day delivery with an 8 percent volume loss as our base case, so the associated cost savings would be $5.20 billion.

## *2.2 Analysis 2: Nonprofit Discounts*[16]

### 2.2.1 Background

The table below lists the five categories of mail in the USPS classification schedule that have legislatively-mandated preferred rates, along with their for-profit counterparts.[17]

| Class | Nonprofit Category | Corresponding For-profit Category |
|---|---|---|
| Periodicals | Within County | Regular Rate |
| Periodicals | Nonprofit | Regular Rate |
| Periodicals | Classroom | Regular Rate |
| Standard | Nonprofit | Regular |
| Standard | Nonprofit ECR | ECR |
| Packages | Library Rate | Media Mail |

In this section, we estimate the magnitude of increased USPS net revenue (profits) under the assumption that nonprofit rates are increased to be the same as their for-profit counterparts.[18] These increased profits are part of the cost of the USO.

This analysis utilizes the PRC forecasting model contained in PRC Library Reference PRC-LR-23 from Docket No. R2006-1.[19] This model, which consists of seven linked

[16] The discounted categories are technically referred to as "preferred" because not all the mailers eligible to use these discounts are nonprofit organizations. The vast majority, however are nonprofit organizations and so we use the term "nonprofit" here.

[17] § 3626. Reduced rates:

(a)(1) Except as otherwise provided in this section, rates of postage for a class of mail or kind of mailer under former section 4358, 4452(b), 4452(c), 4554(b), or 4554(c) of this title shall be established in accordance with section 3622.

(2) For the purpose of this subsection, the term "regular-rate category" means any class of mail or kind of mailer, other than a class or kind referred to in section 2401(c)

(3) Rates of postage for a class of mail or kind of mailer under former section 4358(a) through (c) of this title shall be established so that postage on each mailing of such mail reflects its preferred status as compared to the postage for the most closely corresponding regular-rate category mailing.

[18] The price caps in the PAEA may prevent the Postal Service from increasing the prices of the nonprofit mail to the level charged to other mail in the subclasses. In that case, our calculation represents an upper bound on the actual amount that could be saved if the required discount were eliminated.

Excel workbooks, provides a self-contained tool for evaluating a variety of alternative pricing scenarios. It incorporates the Postal Service's test year volume forecasting procedures and input data as described in library references USPS-LR-L-63 and USPS-LR-L-66. It also includes the detailed after-rates pricing information for all major mail categories needed to estimate after-rates revenues, attributable costs, and contribution to institutional costs.

### 2.2.2 Results

Table 5a below presents volume, revenue, attributable cost, contribution to institutional costs, and revenue per piece information for the nonprofit and for-profit categories as shown in PRC Docket No. R2006-1 (Opinion and Recommended Decision.)[20] Table 5a shows that the contribution levels for the nonprofit categories of Periodicals and Package Services are very small compared to the Standard mail nonprofit categories, so most of the improvement in contribution would be expected from the latter. Table 5b presents the same financial information as in Table 5a under the assumption that each nonprofit rate cell is set equal to its for-profit counterpart.

[19] PRC-LR-23 reflects the changes described in the Commission's Opinion and Recommended Decision on Reconsideration (4/27/08). PRC-LR-2, which contains additional documentation, reflects the rates recommended by the Commission in its initial Opinion and Recommended Decision (2/26/07).

[20] Within county is not included because its affect on the results of this analysis is *de minimis*

**Table F3-5a. Contribution from For-Profit and Nonprofit Rate Categories (Docket No. R2006-1 Test Year 2008 Rates)[a]**

| Mail Category | Volume (000) | Revenue ($ 000) | Attributable Costs[a] ($ 000) | Cont. to Institutional Costs[b] ($ 000) | Revenue Per Piece (Cents) |
|---|---|---|---|---|---|
| | | | | | |
| Periodicals: | | | | | |
| Regular Rate | 6,287,446 | 2,016,728 | | | 32.1 |
| Nonprofit | 1,697,440 | 358,001 | | | 21.1 |
| Classroom | 60,230 | 17,571 | | | 29.2 |
| Outside County | 8,045,116 | 2,392,300 | 2,388,687 | 3,613 | 29.7 |
| | | | | | |
| Standard Mail: | | | | | |
| Regular | 63,478,847 | 15,672,195 | | | 24.7 |
| Nonprofit | 12,416,064 | 1,802,679 | | | 14.5 |
| Regular and Nonprofit | 75,894,910 | 17,474,874 | 10,233,260 | 7,241,614 | 23.0 |
| ECR | 29,677,241 | 5,624,459 | | | 19.0 |
| Nonprofit – ECR | 2,529,325 | 293,963 | | | 11.6 |
| ECR and NECR | 32,206,566 | 5,918,422 | 2,869,200 | 3,049,222 | 18.4 |
| | | | | | |
| Package Services: | | | | | |
| Media Mail | 153,674 | 390,476 | | | 254.1 |
| Library Rate | 12,352 | 30,829 | | | 249.6 |
| Media and Library | 166,026 | 421,305 | 406,428 | 14,877 | 253.8 |
| | | | | | |
| **Totals** | **116,312,619** | **26,206,901** | **15,897,574** | **10,309,326** | **23.7** |

[a] Source: PRC-LR-23, Docket No. R2006-1

[b] Separate cost estimates are not available for nonprofit and for-profit categories within a combined category.

It can be seen that this increase in nonprofit rates results in an increase in contribution of about $1.20 billion in TY 2008, or about $1.15 billion in FY 2007 dollars[21]. In FY 2007 dollars, about $940 million of this increase is due to higher nonprofit revenues, but another $210 million arises because of lower attributable costs, which in turn are caused by reduced nonprofit volume resulting from the price increases. About 98 percent of the increased contribution is from the Standard mail nonprofit categories, with the remaining two percent from the nonprofit categories in Periodicals and Package Services.

[21] Data from the PRC web site shows that the 12-month change in the CPI-U as of August 2008 is 4.3%.

**Table F3-5b. Contribution from Nonprofit and For-Profit Rate Categories (Docket R2006-1 Rates With Equal Nonprofit and For-Profit Rates)[a]**

| Mail Category | Volume (000) | Revenue ($ 000) | Attributable Costs[a] ($ 000) | Cont. to Institutional Costs[b] ($ 000) | Revenue Per Piece (Cents) |
|---|---|---|---|---|---|
| | | | | | |
| Periodicals: | | | | | |
| Regular Rate | 6,287,446 | 2,016,728 | | | 32.1 |
| Nonprofit | 1,681,051 | 371,710 | | | 22.1 |
| Classroom | 59,637 | 18,258 | | | 30.6 |
| Outside County | 8,028,134 | 2,406,697 | 2,383,645 | 23,052 | 29.7 |
| | | | | | |
| Standard Mail: | | | | | |
| Regular | 63,478,847 | 15,672,195 | | | 24.7 |
| Nonprofit | 10,939,011 | 2,614,744 | | | 23.9 |
| Regular and Nonprofit | 74,417,858 | 18,286,939 | 10,034,102 | 8,252,837 | 24.6 |
| ECR | 29,677,241 | 5,624,459 | | | 19.0 |
| Nonprofit – ECR | 2,384,979 | 448,663 | | | 18.8 |
| ECR and NECR | 32,062,219 | 6,073,123 | 2,856,340 | 3,216,782 | 18.9 |
| | | | | | |
| Package Services: | | | | | |
| Media Mail | 153,674 | 390,476 | | | 254.1 |
| Library Rate | 11,619 | 30,616 | | | 263.5 |
| Media and Library | 165,293 | 421,091 | 404,632 | 16,459 | 254.8 |
| | | | | | |
| **Totals** | **114,673,504** | **27,187,849** | **15,678,719** | **11,509,131** | **23.1** |

[a] Source: Excel workbook nonprof1.xls from workpapers

[b] Separate unit costs are not available for nonprofit and for-profit categories within a combined category.

## *2.3 Analysis 3: Uniform Rate for Media Mail and Library Rate Subclasses*

The Media Mail and Library Rate subclasses have a statutory restriction[22] that requires their rates to be uniform with respect to distance. Consisting largely of books, their total FY 2007 revenue is $407 million and total contribution to institutional cost is a negative $38 million.[23]

The issue here is to estimate the additional contribution that could be earned if the two subclasses were zoned. They have a cousin subclass, Bound Printed Matter (BPM), which also consists largely of books but is zoned. The average weight of BPM is 2.2 pounds and the combined average weight of Media Mail and Library Rate is 2.1 pounds.[24] Our approach to estimating the additional contribution from zoning uses the unit contribution of Bound Printed Matter as a proxy to estimate the increase in contribution from Media Mail and Library Rate. This approach is supported by the high cross-elasticity of Media/Library Rate with Bound Printed Matter of 1.005. This is the highest cross price elasticity between two USPS products in the set of demand equations estimated by USPS witness Thress in the R2006-1 rate proceeding.[25] For FY 2007, the combined unit contribution of Media/Library was –21.7 cents and the unit contribution from BPM was 13.9 cents, so BPM's contribution was 35.6 cents higher than Media/Library.[26] Multiplying the combined volume of Media/Library Rate (176.6 million) by 35.6 cents results in an estimated additional $63 million contribution if Media/Library were zoned.

[22] 39 U.S.C. sec. 3683.

[23] See FY 2007 PRC Annual Compliance Report, p. 24.

[24] See FY 2007 USPS RPW Report.

[25] USPS-T-7, Docket No. R2006-1.

[26] FY 2007 PRC Annual Compliance Report, p. 24.

## *2.4 Analysis 4: Losses on Market Dominant Products*

### 2.4.1 Domestic Mail

A profit maximizing Postal Service would raise prices on loss-making market dominant products to at least break even or reduce the quality, and hence the cost, of such products to achieve the same end. Alternatively, the Postal Service would discontinue the loss-making products. For purposes of this analysis, we shall assume that the universal service obligation prevents the Postal Service from taking any of these remedial steps, although current law might be interpreted to permit all three.[27]

The Postal Service had four loss-making domestic market dominant products in 2007 (Within County and Outside County Periodicals, single piece Parcel Post and Media Mail/ Library Rate). Had the first rate increase under PAEA gone into effect prior to the beginning of FY 2007, it would have been possible for the Postal Service to eliminate the losses on the two parcel subclasses by using the flexibility allowed under the price cap rules. Under the PAEA price caps, the 2007 losses on the two subclasses that make up the periodical class could not have been eliminated. Thus, the loss of $448 million by periodicals is caused by the current statutory obligations and consequently, the negative contribution made by them is part of the cost of universal service. See Table 6 below.

**Table F3-6. FY 2007 Domestic Product Losses Associated with the USO**

| Product | Volume (million) | Revenue ($ million) | Attributable Cost ($ million) | Loss/piece (cents) | Loss ($ million) |
|---|---|---|---|---|---|
| Within County Periodicals | 736 | 73 | 86 | 1.6 | 12 |
| Outside County Periodicals | 8,059 | 2,115 | 2,550 | 5.4 | 436 |
| **Total** | **8,796** | **2,188** | **2,636** | **5.1** | **448** |

Source: PRC 2007 Annual Compliance Report, p.68

[27] The requirements of the universal service obligation under current law are unclear on each of these points; see Appendix B.

### 2.4.2 International Mail

Inbound International First Class lost approximately $73 million in 2007.[28] Inbound Registered Mail also lost an undisclosed amount.[29] The delivery of International Mail is a treaty obligation of the U.S. Government. A profit maximizing Postal Service would accept responsibility for this obligation because International Mail as a whole (inbound and outbound) is profitable. Revenues exceeded costs by $256 million.[30]

The USPS relies on the Universal Postal Union's (UPU) system of rates and on bilateral agreements to pay other posts and to receive payments from other posts when they deliver each other's mail. These rates are called terminal dues. There is a question of whether a profit maximizing Postal Service would attempt to negotiate new terminal dues agreements to eliminate the losses on inward mail. Under terminal dues arrangements the payments that the USPS receives for inward mail are closely related to the rates it pays for outward mail. An increase in the former would result in an increase in the latter. [31] There is insufficient public information to conclude if the Postal Service is likely to improve the overall net profitability of International Mail by renegotiating its terminal dues arrangements in an attempt to reduce or eliminate losses on inward First Class mail. A profit maximizing USPS would do this only if it improved its overall profitability. Since International Mail as a whole, is profitable, we conclude that there is no USO cost associated with the losses on inward international mail.

[28] Source: PRC Annual Compliance Report for 2007, p.118.

[29] The PRC stated that the figure was not reported by the Postal Service to the PRC.

[30] Op cit., p. 115

[31] The new rates would presumably be based on each country's domestic tariff. Because the Postal Service has a relatively low domestic tariff (owing to its large economies of scale), and most other countries have a much higher domestic tariff, it might be a net loser under a domestic tariff based system. In addition, the U.S. volume of the inward mail is smaller than outward mail and there are currency issues that would result in negative consequences for the USPS. The consequences could well be an erosion of the overall profitability of International Mail for the Postal Service.

## *2.5 Analysis 5: Cost of Measuring Service Performance*

The PAEA requires that the Postal Service measure the service performance of market dominant products on an annual basis. Without this statutory obligation, a profit maximizing USPS might not measure service performance. Thus service measurement is a cost of the USO.[32]

The Postal Service has provided what it calls "rough estimates" for service measurement:

*External costs*

$17 million for the External First Class (EXFC) measurement system.

$20 million (minimum) for the EXFC expansion to include Periodicals, Standard Package Service and Special Services.

*Internal costs*

$145 million (primarily for scanning carrier route bundles, saturation mail, post office boxes[33], containers, etc).

*Total costs*

$182 million (minimum)

[32] Before the PAEA the only category measured on an end-to-end basis was single piece First-Class mail.
[33] A P.O. box scan is a scan of a bar code next to a box section after all mail is up loaded to that section.

## *2.6 Analysis 6: Savings from Closing Small Rural Post Offices (CAG K&L)*

### 2.6.1 Background

Under section 403(a)(3), the Postal Service is required "to establish and maintain postal facilities of such character and in such locations, that postal patrons throughout the Nation will, consistent with reasonable economies of postal operations, have ready access to essential postal services." In developing rural free delivery services in the early twentieth century, Congress substituted rural carrier services for the services of small post offices in many rural areas. Since fiscal 1985, however, Congress has added a rider to the annual appropriations act that prohibits the Postal Service from using funds appropriated in that act to close or consolidate small rural and other small post offices. As a legal matter, it appears that the Postal Service is not barred from using other funds to close small or rural post offices even though the original intent of Congress was surely to prevent such closures. This conclusion is reinforced by the fact that since 1985, the Postal Service has actually closed or consolidated hundreds of small post offices.[34] At the same time, the Postal Service claims that the rider discourages closures of additional small post offices. Out of an abundance of caution, we have, for purposes of the present calculation, treated the cost of maintaining all remaining post offices as a mandatory cost of the Postal Service. The result, therefore, represents an upper bound estimate for the cost of the USO with respect to the operation of small and rural post offices since it very likely overstates the actual legal obligation of the Postal Service.

Virtually all of the approximately 9,200 CAG K&L post offices have counter transaction costs and post office box operations costs (per box) that are much higher than costs at larger offices. They typically have just one employee providing retail services to customers and filling post office boxes. Closing these offices and transferring their functions to more efficient operations could save considerable costs.[35]

[34] In 1985 there were 29,557 post offices. At the end of 2007 there were 27,276 post offices.

[35] For example, a 1982 General Accounting Office study suggested that closing 7,000 of these offices could save almost $400 million at that time.

In this analysis, we assume that rural carriers will provide all retail transactions that were formerly performed at these small offices. We also assume that post office box services at these stations will be replaced by rural carrier delivery to new Neighborhood Delivery Collection Box Units (NDCBU, cluster boxes). Delivering to an NDCBU is the lowest cost alternative and thus should result in the highest savings or cost of this element of the USO. The difference between the current costs of CAG K&L operations and the costs of these alternative methods, less the lost revenue from existing paid CAG K&L boxes, will serve as an estimate of the USO costs savings from closing small rural post offices.

### 2.6.2 Information on CAG K&L Offices

For FY 2007, there were 9,218 CAG K&L post offices,[36] with costs of $663.9 million,[37] so the annual cost per office was $72,021.[38] Recent information from the USPS-sponsored IBM study of smaller post offices showed that average retail revenue per CAG K&L office was $30,374, so the total FY 2007 retail revenue for these offices was about $280 million.[39].Also, the USPS Finance department estimated that there were about 0.552 retail transactions per retail revenue dollar at small offices in FY 2007,[40] so the estimated number of FY 2007 retail transactions at CAG K&L offices would be 154.5 million.

The number of paid post office boxes at CAG K&L offices plus the number of "free" post office boxes is assumed to be the number of additional delivery points that must be served by rural carriers as a result of closing the CAG K&L offices. Free boxes are provided by the Postal Service for all delivery points to customers who involuntarily

[36] See the Postal Service Active Employee Statistical Summary for year-end pay period 20, FY 2007.

[37] See PRC-ACR2007-LR2 from Docket No. ACR2007. This figure includes direct costs such as customer transactions and sorting incoming mail to boxes, as well as indirect costs such as depreciation and energy costs.

[38] As a comparison, the FY 2007 cost of contract stations, which are comparable in size and functions to CAG K&L offices, was $79.135 million (see PRC-ACR2007-LR2, Excel workbook FY07CRpt.xls, in Docket No. ACR2007. The number of contract stations in FY 2007 was 3,131 (see FY 2007 Annual Report, p. 56). Thus the annual cost per contract station was $25,274.

[39] Information provided on September 30, 2008 from Linda Kingsley, SAPMG, USPS. The ongoing IBM study was the source.

[40] Information provided on August 5, 2008 by Jay Lewis, Cost Attribution, Finance, USPS.

receive no delivery from rural carriers.[41] In FY 2007, there were about 390 thousand free boxes and 712 thousand paid boxes in CAG K&L offices, so the total number of boxes was about 1.102 million.[42] This would be the total number of additional delivery points that would have to be served by rural carriers.

There are five sizes and eight rate groups (including free boxes) of post office boxes, each with its own annual price. USPS FY 2007 PO Box billing determinant data[43] were used to compute the lost annual revenue from all sizes and groups of CAG K&L post office boxes as $26.4 million.

### 2.6.3 Information on Rural Carrier Costs

The FY 2007 cost of each rural carrier transaction was estimated to be $0.092.[44] A separate analysis of the Rural Mail Count data was used to arrange the routes by density in terms of boxes (delivery points) per mile. The cost to deliver to a box that was part of an NCDBU for each quintile of these density-ordered routes was then determined, and the average cost for the bottom three density quintiles turned out to be $0.113 per box.[45] This figure was used to estimate the costs of the extra delivery points.

### 2.6.4 Calculation of FY 2007 Savings from Closing CAG K&L Offices

Multiplying the 1,102 million post office boxes in current CAG K&L offices times $0.113 per NCDBU box delivery times 300 delivery days per year yields about $37.4 million dollars per year as the cost of providing CAG K&L post office box service by rural carriers. The cost of providing the current CAG K&L annual retail transactions by rural carriers would be 154.5 million times the unit transaction cost of $0.092, or about $13.9 million. As noted above, the lost paid CAG K&L post office box revenue would be $26.4 million. The sum of these three items is $77.7 million. The annual savings from replacing CAG K&L post office operations by rural carrier operations would be the

[41] In FY 2007, there were 1.365 million free boxes. See FY 2007 PO Box billing determinant data from USPS-FY07-LR-4, Docket No. ACR2007.

[42] See Excel workbook CAGK AND CAGL POBOXES FY 2007, dated 10/15/08.

[43] See FY 2007 PO Box billing determinant data

[44] Source: FY 2006 Rural Mail Count and FY 2007 salary data. See workpapers for documentation.

[45] Source: FY 2006 Rural Mail Count and FY 2007 salary data. See workpapers for documentation.

current CAG K&L office cost of $663.9 million less $77.7 million, so the net FY 2007 annual savings would be about $586 million and that is the USO cost of this element.

## *2.7 Analysis 7: Alaska Air Subsidy*

The cost of domestic Alaska air transportation was about $115 million in FY 2007.[46] Air transport is used in Alaska to transport all USPS products to remote locations that cannot be reached by road or water. As can be seen from the second column of Table 7 below, most of this cost ($112 million) is caused by parcel post, which is used for transporting essential supplies to remote regions of Alaska. [47]

The PRC has taken the view that most of this cost ($107 million in FY 2007 or 93 percent of the total) should be considered institutional rather than attributable. Its adjustment is shown in the third column of the table. This adjustment in effect shifts the cost of the high-cost Alaska air transportation to the high-volume classes of mail which pay the bulk of the institutional costs. The PRC has considered its $107 million adjustment a cost of providing universal service. A profit maximizing USPS would eliminate air service for products that are only entitled to surface transportation. Potentially, an explicit USO for the USPS would require the provision of ubiquitous service for all market-dominant products, and so the Alaska air adjustment would be part of the cost of the USO.

[46] See PRC Library Reference PRC-ACR2007-LR2 in Docket ACR2007, Excel workbook FY07Crpt.xls.

[47] This is called the Alaska bypass program because most of the parcels bypass a post office and are loaded on to aircraft directly from warehouses located at airports.

**Table F3-7. Domestic Alaska Air Before and After Adjustment**

| | Before Adjustment ($ million ) | After Adjustment ($ million) |
|---|---|---|
| **Total First Class** | **.258** | **.180** |
| **Priority Mail** | **1.034** | **.730** |
| **Express Mail** | **0** | **0** |
| **Total Periodicals** | **.210** | **.150** |
| **Total Standard Mail** | **1.277** | **.900** |
| Parcel Post | 112.019 | 7.864 |
| Bound Printed Matter | .141 | .100 |
| Media Mail | .155 | .110 |
| **Total Package Services** | **112,315** | **7.885** |
| **U.S. Postal Service** | **.242** | **.170** |
| **Free Mail** | **0** | **0** |
| **International Mail** | **0** | **0** |
| **Total Attributable** | **115.336** | **8.097** |
| **Other Costs** | **0** | **107.239** |
| **Total Costs** | **115.336** | **115.336** |

## *2.8 Analysis 8: Uniform Rate for First-Class Mail*

### 2.8.1 Background

There is statutory language stating there must be at least one class of mail for letters that is sealed against inspection and whose rate is uniform throughout the US.[48]. First-Class mail fulfills this requirement. Further, the Commission has issued a ruling that that this statutory provision does not require distance-invariant rates.[49] It ruled that the statute required that First-Class rates be uniform in the sense that they be invariant with respect to where the sender is located in the US. The First-Class rate structure for a mailer in New York must be the same as for a mailer in San Juan or Seattle.

In this analysis we make the assumption that the USO requires distance invariant rates for workshared First-Class mail. To measure the cost of this possible USO provision we estimate the increased profits that the Postal Service could earn if dropship discounts were allowed for workshared First-Class mail. A profit maximizing post with the letter monopoly would likely allow dropshipping of workshared First-Class mail and in a competitive environment it would likely want to have different prices by region, three or five-digit zip code, or even by individual delivery route.

We assume that First-Class dropship discounts will be based on avoided costs as required by the PAEA. Cost avoided discounts benefit the mailer when he can do the work for less cost than the Postal Service avoids. When the discount is set at avoidable costs, the Postal Service benefits because the price elasticity effect generates increased volume and contribution in that same subclass. In the case of First-Class, there is also a major contribution benefit from worksharing discounts due to a relatively high

[48] 404 (c) The Postal Service shall maintain one or more classes of mail for the transmission of letters sealed against inspection. The rate for each such class shall be uniform throughout the United States, its territories, and possessions. One such class shall provide for the most expeditious handling and transportation afforded mail matter by the Postal Service. No letter of such a class of domestic origin shall be opened except under authority of a search warrant authorized by law, or by an officer or employee of the Postal Service for the sole purpose of determining an address at which the letter can be delivered, or pursuant to the authorization of the addressee.

(a) Notwithstanding any other provision of this title, the rates of postage established for mail matter enumerated in former section 4554 of this title shall be uniform for such mail of the same weight, and shall not vary with the distance transported.

[49] Opinion and Recommended Decision, Docket No. R77-1, at 417-18 (1978).e

conversion rate of similarly workshared for-profit Standard Regular mail to First-Class mail, because both mail categories can be effectively used for sending advertising mail. The contribution benefits of this conversion are due to the fact that workshared First-Class mail has a much higher unit contribution than for-profit Standard Regular mail.

We do not know the discount that the Postal Service would offer, since we do not know what the cost savings to the Postal Service would be. Thus we can not estimate with precision the increased contribution that could be generated from a First-Class dropship discount. However, we estimate the effect on total contribution of 1.0, 1.5, and 2.0-cent First-Class SCF dropship discounts, which are comparable to similar worksharing discounts for Standard mail. We also assume that the 40 percent[50] of turnaround mail (i.e., mail that originates and destinates in the same SCF) would not be eligible for this discount.

As with the analysis of increased contribution from eliminating nonprofit rate preferences (Analysis 2), this analysis utilizes the PRC financial forecasting model contained in PRC library reference PRC-LR-23 from Docket No. R2006-1. However, for this analysis of First-Class dropship discount discounts, special runs of the model were made to reflect the updated forecasting data available from PRC Docket No. ACR2007. For further information on this model, see the write-up of Analysis 2 and the documentation in R2006-1 library references PRC-LR-23 and PRC-LR-2.

### 2.8.2 Results

The second, third, and fourth columns of Table 8a below show the volume, contribution, and contribution per piece for First-Class and Standard mail from the PRC FY 2007 Annual Compliance Report. The last three columns of Table 8a show the FY 2007 results in terms of changes in volume and contribution from introducing an additional 1.0-cent dropship discount to non-turnaround workshared First-Class mail. Table 8b shows similar information for 1.5-cent and 2.0-cent dropship discounts. The increases in contribution resulting from the 1.0, 1.5, and 2.0-cent discount levels are, respectively, $89.4 million, $130.1 million, and $164.6 million. We will use the 1.5-cent discount as

[50] See Docket NO. R2006-1, Response of the USPS to Question 5, POIR No. 5.

our base case in this analysis, so the profit increase for non-uniform First-Class rates is estimated at $130.1 million.

It can be seen from Tables 8a and 8b that the majority of the additional contribution from these dropship discounts comes from the transfer of significant volumes from Standard Regular letters and cards to First-Class workshared mail. Some additional contribution also arises from the transfer of First-Class Single Piece letters and cards to First-Class workshared mail, and from a modest net increase of workshared First-Class volume due to lower average prices. For example, with a 1.5-cent dropship discount, about 678 million pieces of Standard Regular Mail and 426 million pieces of First-Class Single Piece letters and cards transfer to workshared First-Class. Also, workshared First-Class volume increases by about 275 million pieces due to lower average prices.

**Table F3-8a. FY 2007 Contribution from First-Class Drop-ship Discounts, 60% of Mail Available**

| | ---------- | ACR2007 | ---------- | ---------- | 1.0 cent disc | ---------- |
|---|---|---|---|---|---|---|
| Mail Category | **Volume (000)** | **Contribution ($000)** | **Cont/Pc (Cents)** | **% Volume Change** | **Volume Change (000)** | **Contribution Change ($000)** |
| First-Class Mail: | | | | | | |
| Single-Piece Letters | 40,121,742 | 7,356,510 | 18.34 | -0.67% | (267,654) | (49,076) |
| Workshared Letters | 49,978,441 | 10,598,607 | 21.21 | 1.22% | 608,954 | 129,137 |
| **Total Letters** | **90,100,184** | **17,955,117** | **19.93** | | **341,300** | **68,014** |
| Single-Piece Cards | 2,141,669 | 48,878 | 2.28 | -1.10% | (23,540) | (537) |
| Workshared Cards | 3,656,291 | 441,106 | 12.06 | 8.44% | 308,593 | 37,230 |
| **Total Cards** | **5,797,959** | **489,984** | **8.45** | | **285,053** | **24,090** |
| **Total First Class** | **95,898,143** | **18,445,101** | **19.23** | | **626,353** | **120,473** |
| | | | | | | |
| Standard Mail: | | | | | | |
| Regular | 56,555,118 | | | -0.80% | (449,724) | |
| Nonprofit | 12,113,798 | | | 0.00% | 0 | |
| **Regular and Nonprofit** | **68,668,917** | **4,742,306** | **6.91** | | **(449,724)** | **(31,058)** |
| ECR | 32,177,311 | | | 0.00% | 0 | |
| Nonprofit - ECR | 2,669,884 | | | 0.00% | 0 | |
| **ECR and NECR** | **34,847,195** | **2,884,860** | **8.28** | | **0** | **0** |
| **Total Standard Mail** | **103,516,112** | **7,627,166** | **7.37** | | **(449,724)** | **(31,058)** |
| | | | | | | |
| **Total Mail** | **199,414,255** | **26,072,267** | **13.07** | | **176,629** | **89,415** |

Sources: PRC 2007 Annual Compliance Report and library references PRC-LR-2 and PRC-LR-23 in Docket No. R2006-1.

**Table F3-8b. FY 2007 Contribution from First-Class Drop-ship Discounts, 60% of Mail Available**

| | ---------- | 1.5 cent disc | ---------- | ---------- | 2.0 cent disc | ---------- |
|---|---|---|---|---|---|---|
| Mail Category | **% Volume Change** | **Volume Change (000)** | **Contribution Change ($000)** | **% Volume Change** | **Volume Change (000)** | **Contribution Change ($000)** |
| First-Class Mail: | | | | | | |
| Single-Piece Letters | -0.98% | (392,781) | (72,018) | -1.25% | (499,764) | (91,634) |
| Workshared Letters | 1.82% | 910,637 | 193,113 | 2.36% | 1,179,269 | 250,080 |
| **Total Letters** | | **517,856** | **121,095** | | **679,505** | **158,446** |
| Single-Piece Cards | -1.56% | (33,487) | (764) | -2.04% | (43,796) | (1,000) |
| Workshared Cards | 12.84% | 469,304 | 56,618 | 14.18% | 518,464 | 62,549 |
| **Total Cards** | | **435,817** | **55,854** | | **474,668** | **61,550** |
| **Total First Class** | | **953,673** | **176,949** | | **1,154,173** | **219,995** |
| | | | | | | |
| Standard Mail: | | | | | | |
| Regular | -1.20% | (678,351) | | -1.42% | (802,370) | |
| Nonprofit | 0.00% | 0 | | 0.00% | 0 | |
| **Regular and Nonprofit** | | **(678,351)** | **(46,847)** | | **(802,370)** | **(55,412)** |
| ECR | 0.00% | 0 | | 0.00% | 0 | |
| Nonprofit - ECR | 0.00% | 0 | | 0.00% | 0 | |
| **ECR and NECR** | | **0** | **0** | | **0** | **0** |
| **Total Standard Mail** | | **(678,351)** | **(46,847)** | | | **(55,412)** |
| | | | | | | |
| **Total Mail** | | **275,322** | **130,102** | | **1,154,173** | **164,583** |

Sources: PRC 2007 Annual Compliance Report and library references PRC-LR-2 and PRC-LR-23 in Docket No. R2006-1.

## *2.9 Analysis 9: Delivery to All Addressees Who Involuntarily Do Not Receive Delivery*

There are currently 1.365 million "free" post office boxes for rural addressees in areas served by CAG H-L post offices that do not have the option of receiving their mail via home delivery.[51] An explicit USO for the Postal Service might reasonably require that all addressees be provided delivery from rural carriers unless they opt to receive post office box delivery. Not all eligible addressees would choose to do so, but our analysis will assume the worst case, i.e., all free post office boxes convert to rural delivery.

The costs of providing rural delivery to these addressees will include the cost of providing their retail transactions as well as six-day-a-week delivery to assumed new stand-alone roadside boxes. For the cost of providing retail transactions, the average number of rural carrier retail transactions per box per day is 0.29 and the cost of each one is $0.092.[52] Thus the cost for new rural carrier retail transactions for all 1.365 million free box holders would be 1.365 million x .29 x $0.092 x 300 days, or $10.7 million per year.

The daily rural carrier delivery cost per rural stand-alone box is estimated from an analysis of recent Rural Mail Count data to be $0.221.[53] The additional FY 2007 cost of providing rural delivery to the "free box" addressees would thus be 1.365 million boxes times $0.221 per box times 300 delivery days per year, or $90.5 million. The total estimated annual USO cost of providing free delivery to all addressees who cannot currently obtain it is $10.7 million plus $90.5 million, or $101.2 million.

[51] See FY 2007 PO Box billing determinant data from USPS-FY07-LR-4, docket No. ACR2007.

[52] Source: FY 2006 Rural Mail Count and FY 2007 salary data. See workpapers for documentation.

[53] This figure is the average of the stand alone box delivery costs for the 60% of rural routes with the lowest density, i.e., boxes per mile. FY 2006 Rural Mail Count and FY 2007 salary data. See workpapers for documentation.

## *2.10Analysis 10: Six-Day Delivery for All Residences*

Currently, a small number of the approximately 135 million residential delivery points[54] receive delivery less than six days a week. An explicit USO could reasonably require that all residences receive delivery six days a week.

The Postal Service reports that there are only 25,009 residential delivery points that receive delivery less than six-day-a-week delivery, and each gets delivery three days a week, mostly from Highway Contract Routes[55]. The annual number of extra deliveries for six-day delivery to these addresses would be 25,009 addresses times 3 days per week times 52 weeks a year, or 3.901 million deliveries. Assuming that these addresses are in rural areas, we use the FY 2007 estimate of daily rural carrier delivery to a stand-alone box on low-density routes[56], $0.221[57], to estimate these costs. The annual cost of these additional deliveries would be 3.901 million deliveries times $0.221 per delivery or about $862,000.

Thus, the additional cost to the Postal Service from a new USO requirement that all residences receive 6 day a week delivery would be less than a million dollars annually.

[54] See USPS Annual Report for FY 2007, p. 56.

[55] Source: Linda Kingsley SAPMG, USPS on October 8, 2008.

[56] Specifically, the average of the stand alone box delivery costs for the 60% of routes with the lowest density, i.e., boxes per mile.

[57] Source: FY 2006 Rural Mail Count and FY 2007 salary data. See workpapers for documentation.

## *2.11 Urban-Rural Cross Subsidy*

It is widely believed that rural delivery is a USO cost because profits from urban areas cross-subsidize delivery to rural areas in the U.S. This may be true for European countries where delivery is to the door of every dwelling and letter carriers must traverse every country lane and driveway. It is not a valid generalization for the U.S., however, because our rural delivery system is much less costly while providing a lower quality of service. The USPS delivers to roadside boxes that are placed along the principal routes of travel. People who live on roads that are not on the carrier's route of travel must place their mailboxes along the carrier's route. Moreover, the carrier frequently drives down the route of travel in only one direction. When this happens, customers must place their mailboxes on the side of the road that the carrier travels. A comparison was made by the staffs of the PRC and La Poste on the cost of rural delivery in the U.S. and France. Examining the most rural parts of each country, it was found that USPS carriers can serve twice as many addresses as La Poste carriers in the same amount of time even though carriers in both countries use vehicles to serve their respective routes and the distance between dwellings is much greater in the U.S.[58]

In urban areas carriers primarily deliver to curbside mailboxes or to the door. Routes that deliver to the door (called park and loop routes) cost 53 percent more per address than routes that deliver to curbside mailboxes.[59] There are approximately twice as many park and loop routes as curbline routes. Many of these are in areas with lower than average income (and mail volume) and are unprofitable. In contrast, curbside routes are usually in suburbs and less densely populated areas of cities where incomes (and mail volumes) are higher than average and the routes are profitable.

[58] See section 3.2 of "Delivery Cost Heterogeneity and Vulnerability to Entry", Bernard, Cohen, et all , Postal and Delivery Services, Delivering on Competition; Ed., Michael Crew and Paul Kleindorfer, Kluwer Academic Publishers, 2002.

[59] Email from USPS Finance Department to the authors, dated 11/8/08

Table 9 below from an earlier PRC staff paper divides delivery routes into 20 groups, each containing 5 percent of the routes (semi-deciles) sorted according to profitability.[60,61]

**Table F3-9. Annual Route Profits and Losses by Semi-Decile[a] (1999, $ million)**

| Profits | | Losses | |
|---|---|---|---|
| | | | |
| 1 | $1,690 | 12 | (4) |
| 2 | 888 | 13 | (56) |
| 3 | 701 | 14 | (112) |
| 4 | 575 | 15 | (172) |
| 5 | 471 | 16 | (236) |
| 6 | 382 | 17 | (307) |
| 7 | 303 | 18 | (391) |
| 8 | 232 | 19 | (505) |
| 9 | 168 | 20 | (764) |
| 10 | 108 | | |
| 11 | 50 | | |
| | | | |
| **Total Profits** | **5,572** | **Total Losses** | **(2,551)** |
| **Net Profits** | **3,021** | | |

a Profitable and unprofitable semi-deciles do not sum to total profits and total losses because semi-decile 12 contains both profitable and unprofitable routes.

The profitability of a route is determined by the mode of delivery and the volume of mail delivered on the route, and volume is, in turn, primarily determined by the income of the addresses on the route.[62] Since low income households are found in both urban and rural areas, loss making routes are found in both urban and rural areas.

The PRC staff conducted another study that found that, on the whole, rural routes are profitable[63] The Postal Service has two distinct delivery crafts, city delivery carriers and rural carriers. The latter serve both urban and rural areas. In the study, all Rural Carrier

[60] "An Empirical Analysis of the Graveyard Spiral"; Cohen, Robinson, Sheehy, Waller, and Xenakis; Competitive Transformation of the Postal and Delivery Sector; Ed. Crew and Kleindorfer; Kluwer Academic Publishers, 2003.

[61] The profit or loss on a route is defined as the revenue from the mail on the route minus the upstream cost of the mail on the route minus the cost of the route.

[62] Household Diary Study, 2006, United States Postal Service, p. 12.

[63] "The Cost of Universal Service in the U.S. and its Impact on Competition", Cohen, Robinson, Waller and Xenakis; Proceedings of Wissenschaftliches Institut fur Kommunikationsdienste GmbH (WIK), 7th Koenigswinter Seminar on Contestability and Barriers to Entry in Postal Markets, November 17th-19, 2002

routes were ordered by the number of boxes per mile on each route.[64] Then 60 percent of routes that serve the fewest boxes per mile were selected. These routes clearly served rural areas.[65] It turned out, that only 13.3 percent of households are served by that group of rural routes.[66] This is far less than the 21 percent of the households classified by the Census Bureau as being in rural areas.[67] Because rural carrier routes become more profitable as boxes per mile increase, and since the study clearly selected the most rural of rural routes, it understated the profits earned from delivering to all rural areas and correspondingly overstated the profits earned from delivering to urban areas. Forty-seven percent of the routes serving the study sample of rural areas of the U.S. were unprofitable and forty-four percent of the routes serving remaining (presumably) urban areas were unprofitable.

In summary, there is no urban-rural cross-subsidy in the U.S. A more accurate generalization would be that there are unprofitable rural and urban routes that are cross-subsidized by profitable rural and urban routes. The most important factors in determining profitability are the mode of delivery and the volume on the route. As noted, the most expensive mode of delivery is park and loop routes which are the predominant mode in urban areas. The least expensive mode is curbside delivery in urban areas. The cost of rural delivery to roadside boxes falls in between.

A better analysis of the role of income and route profitability could be done if the carrier route data that the PRC receives from the Postal Service was not stripped of zip code identification.

[64] We take the number of boxes per mile as a proxy for population density.

[65] The remaining 40 percent of rural routes were combined with city delivery routes to calculate profits from urban areas.

[66] We assume that each box serves one household.

[67] U.S. Census Bureau Census 2000 Summary File 1 Final National. Source: ftp://www2.census.gov/census_2000/datasets/Summary_File_1/0Final_National/ (Table P15 Households; data dictionary reference name: P015001; summary level: 010; geographic component codes: 00, 43). October 19, 2002.

List of Tables