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BEFORE THE
POSTAL RATE COMMISSION
WASHINGTON, D.C. 20268-0001

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

DIRECT TESTIMONY
OF
STEPHEN E. SIWEK
ON BEHALF OF
NATIONAL NEWSPAPER ASSOCIATION

## Table of Contents


| Section | Page |
|---|---|
| Autobiographical sketch | i |
| I. USPS Proposes a General Increase in Postal Rates | 1 |
| II. The Within-County Periodicals Subclass | 1 |
| III. Dramatic Rate Increase Proposed for Within-County Mail | 2 |
| IV. The Excessive Cost Increases Claimed for Within-County Mail | 3 |
| V. The IOCS Redesign and the Failure to Pre-Test Within County Periodicals | 4 |
| a) The IOCS Redesign Project | 4 |
| b) Failure to Conduct Beta Tests for the Within County Subclass | 6 |
| VI. The USPS' Failure to Identify Actual Within County Periodicals | 5 |
| a) Failure to Determine If Within County Rates Were Actually Paid | 5 |
| b) Failure to Determine Whether Each Piece Was Actually Eligible for WC Rates | 6 |
| c) Reliance on Inferences and Assumptions to Determine Eligibility | 8 |
| d) No Cost Data On Which to Establish Higher Rates for Within County Periodicals | 10 |
| VII. Cost Estimates That Exceed Even the 95% Confidence Intervals Estimated Last Year | 10 |
| a) The 95% Confidence Intervals Estimated for Within County in 2005 | 11 |
| b) Comparing Shaw to Czigler | 11 |
| VIII. Cost Estimates That Are Statistically Imprecise | 13 |
| a) Coefficients of Variation and Margins of Error | 14 |
| b) Higher CVs and Lower Volume Subclasses | 15 |

**c) The CVs and Margins of Error for Within County Costs are Well Beyond Acceptable Levels** **16**

**d) Increasing Sampling Size Through Pooling** **17**

***e)* Recommended Reduction in the Proposed Within County Rate Increase** ***18***

***IX.*** **Inconsistencies in the USPS' Analysis of Within County Rate Elements** **21**

**a) The Proposed Within County Rate Design is Flawed** **21**

**b) Are Within County Costs Comparable to Outside County Costs?** **21**

**c) Should Within County Passthroughs Be Comparable to Outside County Passthroughs?** **23**

***X.*** **Alternative Rate Designs For Within County Periodicals** **24**

**a) Ms Tang's Proposed Within County Rate Structure** **24**

**b) Adjustment in Revenue from Piece Rates** **24**

**c) Adjustments to Pass-throughs of Cost Avoidances** **26**

**d) Combined Rate Structure Adjustments** **27**

*Appendix A*

**Appendix B**
**Appendix C**

**Appendix D**

**Appendix E**

**Filed under protective conditions**

## Autobiographical Sketch

My name is Stephen E. Siwek. I am a Principal at Economists Incorporated, a private research and consulting firm specializing in the economic analysis of antitrust, regulated industries, and economic damages issues. My business address is 1200 New Hampshire Avenue, NW, Washington, DC 20036. I have been employed at Economists Incorporated since 1984. Prior to 1984, I was employed by the Washington DC-based consulting firm of Snavely, King and Associates, Inc.

My areas of specialization include the assessment of lost profit damages, the economic performance of US industries that depend on copyright protection, and the economic and financial analysis of telecommunications and other regulated industries. I have also studied principles and methods of business valuation and was a member of the Institute of Business Appraisers (IBA) for approximately seven years. I have been continuously involved in consulting since 1975, and I have testified as an expert witness on more than 60 occasions before regulatory bodies and courts. I have also testified as an expert witness in damage cases involving breach of contract claims, antitrust claims, patent infringement claims and tort claims.

I am experienced in the economic and financial issues that are relevant to costing and ratemaking for regulated industries including the United States Postal Service. Since the early 1980s, I have furnished consulting services to government and private parties in the areas of postal costing, ratemaking and service offerings. In connection with these activities, I have appeared before this Commission in five previous dockets, as set forth below.

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|---|---|---|
| U.S. Postal Rate Commission | R 83-1 | Financial Viability for Electronic Mail Service |
| U.S. Postal Rate Commission | R 84-1 | Class Revenue Requirement, Demand Projections |
| U.S. Postal Rate Commission | R 87-1 | Pricing of Third Class Mail |
| U.S. Postal Rate Commission | R 90-1 | Pricing of Third Class Mail |
| U.S. Postal Rate Commission | R2000-1 | Pricing and Costing of Bound Printed Matter |

I hold a Bachelor of Arts (Economics) from Boston College and a Master of Business Administration from the George Washington University in Washington DC. My testifying experience, publications and background are summarized in Appendix A.

## I. USPS Proposes a General Increase in Postal Rates

On May 3, 2006, the United States Postal Service ("USPS") filed a formal Request with the Postal Rate Commission ("PRC") for a recommended decision on proposed changes in domestic postage rates, fees and classifications. On May 5, 2006, in its Order No. 1464, the PRC established a formal proceeding (Docket No. R2006-1) in order to consider these proposals and ultimately to issue a recommended decision.

The rate proposals of the USPS are intended to generate additional revenues of $3.983 billion for the Postal Service in Fiscal 2008. This proposal translates into an overall rate increase of 8.5% for all domestic mail.

## II. The Within-County Periodicals Subclass

Within-County Periodicals is a subclass of periodicals mail created in 1845. The subclass consists primarily of newspapers but also includes city magazines, newsletters, church newspapers and related publications. Periodicals that are not primarily distributed within their county of publication or that have a circulation greater than 10,000 are not eligible. In 1970, Congress decreed an ending to all direct subsidies to the subclass and required that all such mail pay its full attributable costs. It instituted a phased-in assumption of those costs that ended in 1986 for direct and indirect costs. It continued to support institutional costs for within county mail through federal fiscal year 1993. In 1993, the Within-County subclass was also required to contribute to USPS overhead at a rate of 50% of the level of regular rate periodicals.

According to the USPS, mail volumes for Within-County Periodicals have been declining since 1985. For FY 2005, the USPS estimates Within-County piece volumes at 762.7 million pieces.[1] In the same year, the USPS reported that Within-County mail generated $72.19 million in revenue.[2]

## III. The Dramatic Rate Increase Proposed for Within-County Mail

In this case, the USPS proposes a rate increase of 24.4% for the Within-County Periodicals subclass.[3] This rate increase proposal is nearly three times the average rate increase recommended for all postal classes in this case.

According to the Postal Service' figures, with no rate increase, the USPS will incur test year (TYBR) volume variable costs of $81.867 million for Within County mail. In the same period, the USPS projects Within County revenue of only $68.296 million, yielding a deficit of ($13.570 million).[4] However, under the proposed rates (TYAR), Within County costs would decline to $79.513 million while Within County revenue would rise to $82.358 million. These changes would convert the claimed Within County deficit to a positive contribution in the test year of $2.844 million. [5]

## IV. Alternative Rate Designs For Within County Periodicals

### The Excessive Cost Increases Claimed for Within County Mail

The proposed rate increase for the Within County subclass appears to be driven almost entirely by claimed increases in costs. For example, in FY 2004, the USPS

[1] USPS-T-7 (Thress), Table 49, page 204.
[2] USPS-LR-L-126, Within County, Worksheet FY2005_BD, RPW Revenue.
[3] USPS-T-31 (O'Hara), page 26.
[4] Exhibit USPS-31A.
[5] Exhibit USPS-31B.

reported total volume variable costs for the Within County Periodical subclass in the amount of $62.803 million. Only one year later, however, the USPS claims that total volume variable costs for the Within County Periodical subclass rose by 24.1% to $77.918 million.[6]

Significantly, the alleged cost increases for the Within County subclass are not equally spread across all cost segments in the USPS. Rather, they are heavily concentrated in only two cost segments. These are C/S-3 Clerks and Mailhandlers and C/S-6 City Delivery Carriers – Office. In FY 2005, C/S-3 costs for Within County supposedly increased 38.5%. In the same period, C/S-6 costs for Within County mail allegedly grew by 24.8%. These two cost segments alone are directly responsible for 63.3% of the overall increase in volume variable costs reported for the subclass as a whole.

The magnitude of the USPS' claimed cost increases for Within County is even more dramatic when one considers the major sub-segments within these two cost segments. Within C/S-3, the Mail Processing sub-segment (C/S-3.1) allegedly has increased from $13.936 million in FY 2004 to $19.560 million in FY 2005, an increase of 40.4% in one year. In C/S-6, the In-Office Direct Labor sub-segment (C/S-6.1) supposedly increased from $6.724 million in FY 2004 to $9.682 million in FY 2005, an increase of 44.0% in only one year.

Finally, if one wishes to consider the USPS cost claims on a per unit basis, the alleged cost increase attributable to Within County is even more outlandish. According to USPS witness Bozzo, "Within County Periodicals showed the largest percentage increase in mail processing unit costs – 65 percent (USPS method, before CRA adjustments)—

[6] See USPS Cost Segment and Components, Fiscal Years 2004 and 2005.

overall; 56 percent above the general increase in mail processing volume variable cost."[7]

Absent a known extraordinary event, cost increases of this magnitude, occurring within so limited a time frame are simply not believable. As set forth below, it is far more likely that these cost increases result from significant deficiencies in the processes and data used by the USPS to estimate the volume variable costs of the Within County Periodical subclass.

## V. The IOCS Redesign and the Failure to Pre-Test Within County Periodicals

As noted above, the proposed rate increase for the Within County subclass appears to be driven almost entirely by claimed increases in volume variable costs. In particular, the Postal Service' estimates of Mail Processing and City Carrier In-Office costs for the Within County subclass have increased dramatically in BY 2005. Yet these BY 2005 cost increases reflect a substantial redesign of the Postal Service's In-Office Cost System ("IOCS"). Moreover, these changes were implemented in the IOCS with no "pre-beta" or "beta" tests that might have indicated how the redesigned system would affect the costs of the Within County subclass.

### *a) The IOCS Redesign Project*

In this proceeding, the USPS relies for the first time on a redesigned survey instrument for the collection of data used in the Postal Service's IOCS. The IOCS is a multistage probability sample that provides data on the activities of the Postal Service's supervisors, clerks, mail handlers and city delivery carriers. Data from the IOCS are used to produce volume variable costs for labor cost segments and components encompassing over half of the Postal Service's total costs, and indirectly for a number of additional cost

[7] USPS-T-46 (Bozzo), page 35, lines 2-5.

components.[8] In this case, the Postal Service's "IOCS Redesign" project resulted in "an almost totally new IOCS data collection instrument."[9]

*b) Failure to Conduct Beta Tests for the Within County Subclass*

As with any significant survey redesign, one would expect that the USPS would have conducted pre-tests of the new instrument before its eventual roll-out into the USPS IOCS system. The Postal Service did in fact conduct "pre-beta" tests, "beta tests," a "photocopy study" and a "keying study."[10] However, none of these studies separately considered the Within-County Periodicals subclass. USPS witness Bozzo stated for example that "Within County Periodicals were not studied separately from Outside-County Periodicals in the beta test…"[11] Mr. Bozzo also confirmed that neither the USPS "photocopy study" nor the "keying study" specifically analyzed Within County Periodicals pieces.[12]

For these reasons, the basic validity and reliability of the USPS' Within County cost estimates cannot simply be assumed.

## VI. The USPS' Failure to Identify Actual Within County Periodicals

*a) Failure to Determine If Within County Rates Were Actually Paid.*

The inadequacies of the Postal Service's cost analyses for Within County Periodicals are not limited to the USPS' failure to pre-test the IOCS redesign. In this case, the USPS has also failed to determine whether the piece tallies that it sampled did in fact

[8] USPS-T-46 (Bozzo) page 2, lines 2-8.
[9] USPS-T-46 (Bozzo), page 4, lines 19-20.
[10] See USPS-T-46 (Bozzo) pages 17 through 26.
[11] Response of USPS witness Bozzo (USPS-T-46) to NNA/USPS-T46-1.
[12] Response of USPS witness Bozzo (USPS-T-46) to NNA/USPS-T46-14.

reflect mail pieces for which the mailer had actually paid Within County Periodicals rates. Rather than assessing whether the mailer actually paid Within County rates, the USPS purported to determine whether the publisher was eligible to claim Within County rates.[13] By choosing to ignore actual postage payments and to focus only on eligibility, the USPS has introduced the possibility that the Within County pieces that it analyzed were eligible for Within County rates but were not assessed postage at those preferred rates. Indeed, the USPS may have actually relied on tallies for Outside County pieces (based on the actual postage paid) in order to estimate Within County processing costs in this proceeding.

In addition, the USPS' emphasis on Within County eligibility dramatically increases the complexity of determining whether a sampled Periodical piece was in fact a Within County Periodical. As noted below, the determination of eligibility for Within County rates is detailed and multidimensional.

*b) Failure to Determine Whether Each Piece Was Actually Eligible for WC Rates*

In fact, the USPS' cost analyses (both electronic and manual) do not even determine whether a specific Periodical was actually eligible for Within County rates. As noted in the USPS Handbook DM-204. "In-County rate eligibility is determined on an issue by issue basis and remains subject to your total paid distribution. Changes in paid circulation can affect In-County rate eligibility." However, in this case, the USPS could not assess the eligibility of these publications on an issue-by-issue basis because it had failed to collect information on the volume number and issue date of the Periodicals that it

[13] Response of USPS witness Bozzo (USPS-T-46) to NNA/USPS-T46-11.

analyzed. USPS witness Bozzo stated, for example, that "The volume number and issue date are not recorded in IOCS so the requested data are unavailable."[14]

The USPS also failed to gather timely circulation data for the determination of eligibility. According to the Postal Service, "An exact date of the circulations cannot be determined, but the most recent editions (2005) of the publication directories cited in USPS-LR-L-9 were used to determine circulation."[15] The two cited directories were *Gale Directory of Publications 139th Edition* and *Bowker's News Media Directory, 55th edition, 2005 Volume 1*.[16] However, the *139th Edition* of the *Gale Directory* was released on September 3, 2004. Thus, at best it contained circulation data for 2003 but not for 2005! Similarly, the *55th edition of Bowker's News Media Directory* was released on May 5, 2005. Thus, at best, it contained circulation data for 2004 but not for 2005. Neither of the publications could confirm circulation figures for 2005 yet both were used by the Postal Service to determine eligibility for Within County rates in 2005.

A related issue concerns how "paid circulation" was measured for determining the eligibility of a Periodical for Within County rates. A Periodical's paid circulation may vary based on a number of considerations including changes in subscription discounts. Such changes may render certain Periodicals unable to qualify for Within County discounts or may even affect the overall eligibility of the publication.

For one example, consider a newspaper that may be reluctant to remove late paying subscribers from its circulation roles because reduced circulation might affect advertising prices. In such cases, it is my understanding that the USPS limits the time period during which Periodicals sent to such late-paying subscribers could actually qualify

[14] Response of USPS witness Bozzo (USPS-T-46-23).
[15] Response of USPS witness Bozzo (USPS-T-46) to NNA/USPS-T46-24.
[16] USPS-LR-L-9/R2006-1, Appendix D, Page D-3.

for Within-County rates. In this kind of circumstance, a Periodical could seem eligible for Within-County rates and yet not actually qualify for such rates. Such a Periodical would have been mailed at regular Periodical rates.

NNA witness Max Heath of Landmark Community Newspapers, Inc. has also filed Direct Testimony in this proceeding.[17] In his testimony, Mr. Heath describes these "lapsed subscription" circumstances in greater detail and he lists a number of other situations in which the IOCS could identify a mail piece as Within County when it in fact was assessed postage at Outside County rates. These situations include "wandering routes," "non-subscriber complementary copies," and "advertiser purchased copies." Mr. Heath also points out that in a costing environment for a lower volume subclass like Within County Periodicals, "small errors loom large."

*c) Reliance on Inferences and Assumptions to Determine Eligibility*

As described in Appendix D of USPS-LR-L-9, the Postal Service adopted a process known as the "IOCS Periodicals Tally Edits" methodology that was intended to correct initial misidentifications of Within County and Outside County Periodicals. The IOCS Periodicals Tally Edits methodology relies on both automated and manual methods to determine the subclass of individual Periodicals tallies. However, the process attempts only to determine eligibility rather than actual postage paid. The Tally Edit process also relies on inferences and assumptions rather than on the facts.

For Within County Periodicals, the Postal Service assumes that original entry and destination counties should be the same. Indeed, the Postal Service itself describes a manual check of an IOCS Periodicals tally as follows; "several assumptions are used to determine Within County Periodicals eligibility. First, if the office of original entry county

[17] See Direct Testimony of Max Heath on behalf of the National Newspaper Association, (NNA-T-1).

and the destination county of the tally piece are the same, the tally is assumed to be Within County Periodicals."[18] (Emphasis Added). However, as noted above, there are a variety of circumstances in which a Periodical piece might fulfill that condition and still be required to pay Outside County rates.

If the original entry and destination county of a Periodical cannot be determined for a given tally, the Postal Service employs further manual "checks." One such check is described by the USPS as "…if a publication was mailed at Within County Periodicals rates at least once in the previous two years, it is assumed that it is still eligible to mail at Within County Periodicals rates."[19] (Emphasis Added).

The Postal Service also determined that Periodical tallies were eligible for Within County rates by considering whether the publication had "apparent local appeal." For example, a Periodical whose circulation exceeds 10,000 can still be eligible for Within County rates if more than half of the total paid circulation is distributed within the same county as the Post Office of original entry.[20] In this proceeding, the Postal Service considered a tally for a publication known as the Gonzales Tribune whose circulation reportedly exceeded 10,000 and determined that the publication was eligible for Within County rates. Counsel for the NNA asked the USPS to describe how, during the course of its study, the USPS had been able to verify that more than half of the total paid circulation for the Gonzales Tribune had in fact been distributed within the same county as the Post Office of original entry. The Postal Service responded that "the classification was based on the assumed local appeal of a community newspaper."[21] (Emphasis Added) Indeed,

[18] See USPS-LR-L-9, Appendix D, Page D-3.
[19] See USPS-LR-L-9, Appendix D, Page D-3.
[20] Response of USPS witness Czigler (USPS-T-1) to NNA/USPS-T1-12.
[21] Response of USPS witness Bozzo (USPS-T-46) to NNA/USPS-T46-26.

the USPS has stated more generally that "If a publication's title has apparent local appeal it may still be assigned a Within-County Periodicals activity code even if it does not meet any of the above assumptions." [22]

*d) No Cost Data On Which to Establish Higher Rates for Within County Periodicals*

Since the Postal Service has not identified actual Within County Periodicals in its cost studies, it has not measured the actual costs of Within County Periodicals for use in this proceeding. With no data as to the real costs of Within County Periodicals, it is difficult to see how the Commission can reach any conclusions with respect to the rate changes for the Within County subclass that have been proposed by the Postal Service. For this reason, I conclude that the Commission would be well justified in rejecting the USPS' proposed rate increase for the Within County subclass in its entirety.

## VII. Cost Estimates That Exceed Even the 95% Confidence Intervals Estimated Last Year

Assuming the Commission decides not to reject the proposed Within County rate increase in its entirety, the Commission should give careful consideration not only to the magnitude of the proposed rate increase but also to its context. The Commission might contemplate that a rate increase of this magnitude would have been simply unthinkable even as late as 2005 when the Postal Service presented its last set of mail processing and city carrier In-office costs for the Within County subclass. Based on last year's data, the probability that the costs attributable to the Within County subclass would reach the level proposed this year by the USPS is less than one-hundredth of one percent.

[22] USPS-LR-L-9/R2006-1, Appendix D, Page D-4.

*a) The 95% Confidence Intervals Estimated for Within County in 2005.*

A confidence interval ("CI") around an average estimate shows how accurate the estimate is. The 95% confidence interval is the most commonly used criterion. According to one textbook:[23]

"A 95% CI is often explained heuristically: If we take samples from our population over and over again and construct a confidence interval using our procedure for each possible sample, we expect 95% of the resulting intervals to include the true value of population parameter." In basic terminology, a 95% confidence interval shows that one is 95% confident that the true value lies within the interval between the 95% lower limit and the 95% upper limit.

In his 2005 direct testimony,[24] the USPS' witness Robert L. Shaw, Jr. reported the cost estimate for within county periodicals and its 95% upper limit and 95% lower limit in his Table 1 for Cost Segment 3.1 Mail Processing – Clerks and Mail Handlers. I have restated Mr. Shaw 2005 95% confidence interval in Table 1A below.[25]

*b) Comparing Shaw to Czigler*

In this case, the cost data presented last year by Mr. Shaw is now sponsored by USPS witness Czigler.[26] I have added Mr. Czigler's 2006 cost estimate for both Within County Periodicals and for the total cost for all subclasses in Table 1A. As mentioned above and shown in Table 1A, there is a 65.5% increase in the cost estimate for Within County Periodicals between 2005 and 2006. Because the total cost for all subclasses has

[23] Sharon L. Lohr, *Sampling: Design and Analysis*, Duxbury Press, 1999, p. 35.
[24] Docket No. R2005-1, USPS-T-2.
[25] I refer to the Shaw and Czigler calculations of confidence intervals by the year in which they were presented in pre-filed testimony. The actual data presented by Shaw was for BY 2004 and the Czigler data was for BY 2005.
[26] USPS-T-1 (Czigler) Tables 1, 2 and 3.

increased by 6.0% at the same time, there is a slightly lower 56.2% increase in the cost estimate for Within County Periodicals as a percentage of total cost.

**Table 1A: Confidence Interval for Within County Cost Estimate in Segment 3.1**

| | WCP Cost Est. ($1,000) | Std Deviation | 95% Lower Limit | 95% Upper Limit | Total Cost Est. ($1,000) | WCP % of Total |
|---|---|---|---|---|---|---|
| Shaw 2005 | 11,964 | 1,625 | 8,777 | 15,145 | 11,990,087 | 0.100% |
| Czigler 2006 | 19,806 | | | | 12,703,874 | 0.156% |
| % Increase from 2005 | 65.5% | | | | 6.0% | 56.2% |
| 2006 Equivalent of Shaw 2005 | 12,676 | 1,722 | 9,300 | 16,047 | 12,703,874 | 0.100% |
| 2006 Est. at 2005 95% Upper Limit | 16,047 | | | | | 0.126% |
| % Increase from 2005 | 34.1% | | | | | 26.6% |

Source: Czigler Table 1 and Shaw Table 1

To make meaningful comparisons, I first adjust Mr. Shaw's 2005 cost estimates and confidence intervals upward by 6.0%, the percentage increase in total cost from 2005 to 2006. I call the resulting estimates the "2006 Equivalent of Shaw 2005." After this upward adjustment, the 95% confidence interval is between $9.3 million and $16.0 million. It is clear that Mr. Czigler's 2006 estimate of $19.8 million for Within County Periodicals is much higher than the adjusted 95% upper limit. Based on the Shaw 2005 study, the Czigler 2006 estimate is very unlikely even after taking into account the general increase in total cost from 2005 to 2006. Indeed, based on the adjusted Shaw estimates, the probability that the true cost attributed to Within County Periodicals reaches Czigler's $19.8 million is less than one-hundredth of one percent.

Another way to understand the magnitude of the Within County cost increases presented by Mr. Czigler is to consider a cost estimate for Within County periodicals that is equal to the upward adjusted upper limit of the 95% confidence interval estimated by Mr. Shaw, that is, $16 million, for Cost Segment 3.1. This estimate still represents a

34.1% increase from the cost estimate for Within County Periodicals in 2005 and a 26.6% increase from the cost estimate for Within County Periodicals as a percentage of total cost in 2005. It is, however, considerably below the estimate that the Postal Service has actually proposed.

Using the same methodology, for Cost Segment 6.1 I have prepared a similar cost estimate for Within County Periodicals that is equal to the upward adjusted upper limit of the 95% confidence interval estimated by Mr. Shaw, that is, $9.5 million. This estimate represents a 41.4% increase from the cost estimate for within county periodicals in 2005 and a 29.3% increase from the cost estimate for within county periodicals as a percentage of total cost in 2005. See Table 1B.

**Table 1B: Confidence Interval for Within County Cost Estimate in Segment 6.1**

| | WCP Cost Est. ($1,000) | Std Deviation | 95% Lower Limit | 95% Upper Limit | Total Cost Est. ($1,000) | WCP % of Total |
|---|---|---|---|---|---|---|
| Shaw 2005 | 6,724 | 987 | 4,826 | 8,696 | 2,925,910 | 0.230% |
| Czigler 2006 | 9,682 | | | | 3,198,073 | 0.303% |
| % Increase from 2005 | 44.0% | | | | 9.3% | 31.7% |
| 2006 Equivalent of Shaw 2005 | 7,349 | 1,079 | 5,275 | 9,505 | 3,198,073 | 0.230% |
| 2006 Est. at 2005 95% Upper Limit | 9,505 | | | | | 0.297% |
| % Increase from 2005 | 41.4% | | | | | 29.3% |

Source: Czigler Table 2 and Shaw Table 2

## VIII. Cost Estimates That Are Statistically Imprecise

The Within County rate increase proposed in this case is large by any measure, including by reference to the confidence intervals presented by the Postal Service in the last proceeding. But the Postal Service has also presented additional evidence in this case that demonstrates clearly and convincingly that the USPS' cost estimates for the Within County subclass are fundamentally unreliable. This evidence comes in the form of

statistical measures that were provided by the Postal Service and that document the unacceptable degree of statistical confidence that one can have in the Within County cost estimates that have been presented in this proceeding.

*a) Coefficients of Variation and Margins of Error*

The IOCS produces cost estimates based on samples. In statistics, the reliability of an estimate based on a sample is often measured by calculating how much variance exists within the sample. A sample estimate that contains a high degree of variance (relative to the mean) is less precise than a sample estimate that contains a lower degree of variance. One way that sample variances in postal cost estimates can be measured is through "Coefficients of Variation" ("CV"). In this case, the Postal Service has provided the sample CVs that it calculated for mail processing and city delivery carrier in-office costs for each postal subclass including Within County Periodicals.

For Within County mail processing costs (Cost Segment 3.1) in 2005, the USPS reports that the mean of its sample was $19.8 million and that the sample had a CV of 11.58%. Based on these values, the USPS was 95% confident that the true mail processing costs for Within County mail was between $15.4 million and $24.4 million. This is a margin of error of plus or minus 23%. By contrast, the comparable margin of error for outside county mail processing cost in 2005 was only plus or minus 3%.

Obviously, the USPS' cost estimate for Within County Periodicals with its high margin of error is considerably less precise than the USPS' cost estimate for Outside County Periodicals. [27]

[27] USPS witness Czigler has confirmed that "all else equal, estimates having higher variation are less precise than estimates having lower variation." See Response of USPS witness Czigler to NNA/USPS-T1-2.

*b) Higher CVs and Lower Volume Subclasses*

In NNA interrogatories, USPS witness Czigler was asked to explain why the Within County CV shown in his Table 1 was so much higher than the Outside County CV reported in the same table. In response, Mr. Czigler indicated that "The reason that the CV for Within County Periodicals is higher than for Outside County is that the estimated level of costs is less. The estimated cost for Within County Periodicals is $19.806 million, only 0.16% of total costs in Cost Segment 3.1, while Outside County, at $869.487 million and 6.84% of total costs is over 40 times larger."[28] In other words, since the total mail processing costs of the Within County subclass reflect the relatively low volume of the subclass, Within County mailers should expect high CVs in all such IOCS-based cost estimates.

Mr. Czigler went on in the same response to estimate CVs based on "simple random sampling systems that measure proportions." By means of this method, he concluded that, "If IOCS were a simple random sampling system, then the ratio of the CVs of Within County to Outside County using the formula above would be 6.9. The ratio of the reported CV is 7.4."[29]

Under cross examination by counsel for NNA, Mr. Czigler reiterated the argument above but he also testified that "if the total sample size were increased very dramatically, then the CV for in county could be decreased say down to two percent."[30] When asked why such larger samples were not taken by the Postal Service, he replied that "The sample size that's taken has been determined to be appropriate for the use to which it's

[28] Response of USPS witness Czigler to NNA/USPS-T1-7.
[29] Response of USPS witness Czigler it NNA/USPS-T1-7.
[30] Hearing Transcript, Tr. 2438, lines 8-10.

put for determining CVs for the classes of interest."[31] Mr. Czigler was also asked whether the "inevitable result" was that the small volume subclasses were going to have high CVs. He replied, "yes" and agreed that the small volume classes were "pretty much" stuck with that result.[32]

*c) The CVs and Margins of Error for Within County Costs are Well Beyond Acceptable Levels*

Recall that the Within County CV for mail processing calculated by Mr. Czigler implies a margin of error in the range of + or – 23%. On its face, this error margin is enormous. It means that the USPS is 95% confident that the true mail processing costs for Within County mail lie somewhere between $15.4 million and $24.4 million. If the true mail processing cost of Within County mail were $15.4 million instead of $19.8 million, Within County rates would not have to increase by 24.4% or even by half of that amount

Not surprisingly, a 23% margin of error is also well beyond the range commonly accepted among statisticians. For example, in the statistical reference cited earlier in this testimony (*Sampling Design and Analysis* by Sharon L. Lohr) a margin of error equal to only 3% is generally used in surveys where a 95% confidence interval is measured.[33] The error margins calculated by the USPS for the Within County subclass are unacceptable. The USPS can increase the size of its sample of Within County tallies and it can do this without gathering any new tally data at all.

[31] Hearing Transcript, Tr. 2438, lines 16-19.
[32] Hearing Transcript, Tr. 2438, lines 19-25.
[33] "For many surveys of people in which a proportion is measured, $e = 0.03$ and $\alpha = 0.05$." $e$ is the margin of error and $1-\alpha$ is the confidence level. Sharon L. Lohr, *Sampling: Design and Analysis*, Duxbury Press, 1999, p. 39.

*d) Increasing Sampling Size Through Pooling*

Since Within County Periodicals are a low volume subclass, observations of WC Periodicals in the IOCS can be considered as "rare events" in sampling. If the 2006 sample is not large enough to obtain accurate and reliable estimates for this low volume subclass, one could consider the addition of previous samples. This practice is consistent with commonly accepted methods used to estimate rare events. One method for sampling for rare events is called Sequential Sampling: "If it is desired that the sample contain a certain number of members from the rare population, the initial sample could be used to obtain a preliminary estimate of prevalence, and that estimate of prevalence is used to estimate the necessary size of the second sample. After the second sample is collected, it is combined with the initial sample to obtain estimates for the population."[34]

Following the Sequential Sampling method and the statistical formula that Mr. Czigler used in NNA/USPS-T1-7, I have calculated the cost estimates for Within County Periodicals based on the sample estimates in the Czigler 2006 testimony[35] and the Shaw 2005 testimony.[36] Effectively, my cost estimates are based on a pooled sample combining the Shaw sample and the Czigler sample. My estimates are $16 million (a 34% increase from 2005) for Cost Segment 3.1 and $8.6 million (a 28% increase from 2005) for Cost Segment 6.1. In addition, my estimates show a reduced CV of 8.81% (down from 11.58% in Czigler) for Cost Segment 3.1 and 9.13% (down from 11.66% in Czigler) for Cost Segment 6.1, a significant improvement in statistical accuracy for the cost estimates. The detailed calculations are shown in Appendix B.

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[34] Sharon L. Lohr, *Sampling: Design and Analysis*, Duxbury Press, 1999, p. 403.
[35] Docket No. R2006-1, USPS-T-1, Tables 1 and 2.
[36] Docket No. R2005-1, USPS-T-2, Tables 1 and 2.

That fact that pooling two samples leads to a larger sample size and higher accuracy is not surprising. The PRC has long recognized the importance of sample size in improving the precision of cost estimation. For example, in a letter from George A. Omas, Chairman of the PRC, dated July 18, 2005, addressed to Katherine A. Siggerud of the Government Accountability Office (GAO), Chairman Omas noted that "In 1993, the Postal Service greatly reduced the number of IOCS tallies," and "The effect of reducing the size of the IOCS sample can be seen by comparing the CVs associated with IOCS tallies in FY 1989, before the sample was reduced, with CVs associated with FY 1993, after the sample was reduced."[37] For all subclasses shown in the table for Clerk Mail Handlers on page 3 of the letter, CV had increased. For example, for within county periodicals, CV increased from 3.95% in FY 1989 to 6.09% in FY 1993.

*e) Recommended Reduction in the Proposed Within County Rate Increase*

As set forth in my "Pooling" calculations in Appendix B, the combination of the Shaw and Czigler samples, when analyzed using the Czigler formula from NNA/USPS-T1-7, result in a 34% cost increase in C/S 3.1 and a 28% cost increase in C/S 6.1. These cost increases are much lower than the cost increases of 65.5% (C/S 3.1) and 44.0% (C/S 6.1) that the Postal Service has used to develop its Within County rate proposals in this case. Assuming that the Commission does not choose to reject the USPS' Within County proposal completely, my statistical analyses can be used to support lower absolute rate levels for the Within County subclass in this case.

As noted above, the USPS' base year Within County costs are overstated by varying amounts. As shown in Table 2, BY 2005 Within County costs for C/S 3.1 and C/S 6.1 should be reduced by 18.1% and 10.9% respectively. Since other costs within C/S 6

[37] GAO-05-820 Postal Data Quality, Appendix II: Comments from the Postal Rate Commission.

are allocated on the basis of the costs in C/S 6.1, a further reduction of 10.9% in all other C/S 6 costs seems appropriate. In C/S 2, a number of cost categories are also allocated to each subclass based on the class proportions in C/S 3.1 and C/S 6.1. For these cost categories, I also impose reductions of 18.1% and 10.9%.

The weighted average cost reduction in all these segments combined is 15.3%. However, reductions in C/S 3 and C/S 6 costs would also affect other cost categories that are allocated among the subclasses on the basis of broader labor factors. In this calculation, I have not attempted to use the USPS' roll forward model to calculate the precise effect that my cost changes would have on every cost segment in the Postal Service. However, based on my review of cost trends between 2004 and 2005, I conclude that costs in C/S 15, 16, 18 and 20 might be reduced by as much as 10.7%. For all other subclasses (43.7% of total costs) I have imposed no cost reductions even though a detailed modeling effort might uncover some.

As shown in Table 2, I then make some approximate calculations in order to bring forward the cost reductions to test year levels and to take account of price elasticity effects. The net results are shown in the lowest section of Table 2. Under these assumptions, the cost reductions that I have estimated through pooling would reduce the proposed Within County rate increase from 24.2% to 12.7%. With my cost estimates, the USPS would earn approximately $75.7 million in TYAR revenue and incur $73.1 million in TYAR costs from the Within County Periodicals subclass. The ratio between these figures equals 103.616%.

## Table 2: Alternative Rate Change for Within County Periodicals

| Cost Segment | BY 2005 Volume Variable Cost | Adjusted 2004 and 2005 Pooled | Change % | Weight |
|---|---|---|---|---|
| CS 3.1 | 19,560 | 16,013 | -18.1% | |
| CS 6.1 | 9,682 | 8,623 | -10.9% | |
| CS 6 others | 3,018 | 2,688 | -10.9% | |
| CS 2.1.1 | 1,252 | 1,025 | -18.1% | |
| CS 2.4.1 | 871 | 776 | -10.9% | |
| CS 3.1, 6, 2.1.1, 2.4.1 | 34,383 | 29,124 | -15.3% | 44.1% |
| CS 15,16,18, 20 | | | -10.7% | 12.2% |
| Others | | | 0 | 43.7% |
| Overall | | | -8.1% | |

Source: USPS-T-9 Exhibits A and Siwek Appendix B Exhibits 1 and 2

| Revenue/Cost | BY 2005 | TYBR 2008 | TYAR 2008 |
|---|---|---|---|
| Revenue | | 68,296 | 82,358 |
| Volume Variable Cost | 77,918 | 81,867 | 79,513 |
| Revenue / Cost | | | 103.578% |

Source: USPS-T-18 Table 1A and USPS-31 Exhibits A and B

| Elasticity Calculations | BY 2005 | TYBR 2008 | TYAR 2008 | % Change |
|---|---|---|---|---|
| Price | | 0.095 | 0.118 | 24.4% |
| Volume | 762,673 | 722,431 | 700,146 | -3.1% |
| Implicit Elasticity | -12.6% | | | |

Source: USPS-T-10 Exhibit B

| NNA Proposal | TYBR 2008 | TYAR 2008 | % Change |
|---|---|---|---|
| Price | 0.095 | 0.107 | 12.7% |
| Volume | 722,431 | 710,823 | -1.6% |
| Revenue | | 75,749 | |
| Adjusted Volume Variable Cost | | 73,105 | |
| Revenue / Cost | | 103.616% | |
| Rate Change | | 12.7% | |

For detailed descriptions of the calculations carried out in Table 2, see Appendix C.

## IX. Inconsistencies in the USPS' Analysis of Within County Rate Elements

*a) The Proposed Within County Rate Design is Flawed*

As noted earlier, the Within County rates proposed in this case by the USPS are designed to produce rate increase in excess of 24%. In this testimony, I have argued that the overall cost showing by the USPS in support of this rate increase is inadequate and unreliable. Thus, I have proposed either, that the PRC reject the proposed Within County rates in their entirety or that the Commission reduce the revenue levels to be recovered by the Within County subclass in accord with my alternative costing calculations as described above. However, the Postal Service's proposed rate structure for Within County Periodical is also flawed. As set forth below, the proposed Within County rate design is grounded on costing and ratemaking assumptions that are inconsistent with the costing and ratemaking assumptions that were used to design the proposed rate structure for Outside County Periodicals. These inconsistencies are particularly glaring since the USPS uses the cost avoidances that it has developed for Outside County Periodicals as proxies for the cost avoidances created in the Within County subclass.

*b) Are Within County Costs Comparable to Outside County Costs?*

In this case, the USPS has presented a rate design for Within County Periodicals that assumes that certain Within County costs are comparable to the costs of Outside County Periodicals and that other costs are not comparable to the costs of Outside County Periodicals. Accordingly, the proposed rate design is inherently flawed and must be revised to better reflect the underlying cost patterns of the subclass.

USPS rate design witness Tang (USPS-T-35) has asserted that the proposed 24.2%[38] increase for Within County Periodicals was "higher than the increase for the Outside County subclass because of different Within County costs…"[39] Subsequently however, Ms Tang testified that, "By 'different'" she did not "intend to refer to specific categories of costs but rather to the fact that separate costs are provided for the distinct rate design framework used for Within-County prices."[40] Ms Tang thus failed to identify any functionally "different" Within County costs that could help to explain why the USPS has proposed a 24.2 percent rate increase for Within County Periodicals and only an 11.7 percent rate increase for Outside County Periodicals.[41]

Nevertheless, in her rate design proposals, Ms Tang has retained several distinct inconsistencies in her recommendations for Within County and Outside County Periodical rates. One such inconsistency relates to Ms Tang's treatment of the "piece-side" of the Periodical rate structure. The issue is whether the "piece side" contributes more or less than 60% of the mail processing and delivery costs associated with that Periodical. For Outside County Periodicals, Ms Tang's answer seems to be "yes." However, for Within County Periodicals her answer seems to be "no." This particular inconsistency is addressed in more detail in the next section of this testimony.

Ms Tang's testimony is more certain with regard to the costs the USPS avoids as a result of mail preparation activities of Periodical mailers. She has testified that in her

[38] Note: USPS Witness O'Hara (USPS-T-31) states at page 26 that the Within County rate proposal will result in an average increase of 24.4% not 24.2%.
[39] USPS-T-35 (Tang), page 14, lines 16-17.
[40] Response of USPS witness Tang (USPS-T-35) to NNA/USPS-T35-9.
[41] USPS-T-35 (Tang), page 2, lines 14-16 and page 3, Table 3.

analysis, "Within County (Periodicals) discounts are generally based on cost avoidances derived for the Outside County subclass with appropriate passthroughs."[42]

Ms Tang did indicate that "since I do not have a cost avoidance study for Within County, the best alternative available is from the Outside County subclass."[43] For this reason, her reliance on Outside County cost avoidances does seem to reflect, at least in part, the lack of any Within County cost avoidance data. Nevertheless, the Postal Service's position on this issue seems clear enough. In this proceeding the USPS has chosen to measure cost avoidances for the Within County subclass on the basis of cost avoidances for the Outside County Periodicals subclass.

*c) Should Within County Passthroughs Be Comparable to Outside County Passthroughs?*

Despite Ms Tang's reliance on Outside County cost avoidances to measure Within County cost avoidances, she chose nevertheless to propose Within County passthroughs of those cost savings that differed substantially from the passthroughs proposed for Outside County Periodicals. Ms Tang testified that "…as a general matter, the cost avoidance passthroughs proposed for Outside County Periodicals differ from the cost avoidance passthroughs that were proposed for Within County"[44] In justifying this inconsistency Ms Tang first asserted that "The rate design objectives sometimes dictate that the rate designer use the flexibility that comes with having two separate subclasses, and choose different passthroughs for different subclasses." [45] However, during her cross-examination by NNA counsel Ms Tang explained that the different passthroughs

[42] USPS-T-35 (Tang), page 9, lines 18-20.
[43] Response of USPS witness Tang (USPS-T-35) to NNA/USPS-T35-10.
[44] Response of USPS witness Tang (USPS-T-35) to NNA/USPS-T35-11.
[45] Response of USPS witness Tang (USPS-T-35) to NNA/USPS-T35-11.

that she had proposed for Within County Periodicals resulted from the fact that "…I don't have much room to give out high passthroughs because the revenue per piece for within county periodicals is already so low."[46] In fact, the Within County Periodicals rate schedule does offer ample room to increase passthroughs in order to better match the passthroughs proposed in this case for Outside County Periodicals. I propose revised passthroughs for Within County rate elements in the last section of this Direct Testimony

## X. Alternative Rate Designs For Within County Periodicals

*a) Ms Tang's Proposed Within County Rate Structure*

In Appendix D, Page 1 of 10, I reproduce Ms Tang's proposed Within County rates and her estimates of the TYAR revenues and costs that would apply. As shown on this page, the USPS' Within County rate proposal is supposed to produce TY revenue plus fees in the amount of $82.3 million and TYAR costs of $79.5 million. With these revenue and cost levels, the USPS cost coverage from the Within County subclass would be 103.44%.

In pages 2 and 3 of Appendix D, I reproduce two of the input worksheets that were used by Ms Tang to design the proposed Within County rates. The worksheets themselves were taken from USPS-LR-L-126.

*b) Adjustment in Revenue from Piece Rates*

As shown in page 2 of Appendix D (at line 15) Ms Tang has designed the Within County rate schedule such that the proportion of revenue to be recovered from Piece

[46] Hearing Transcript page 1867, lines 21-23.

rates is set at 53.5%. In contrast to the piece rate proportion used here for Within County, the comparable proportion for Outside County Periodicals is 62.5%.[47]

In her Direct Testimony at page 6, Ms Tang justified the Outside County proportion of revenue to be recovered in piece rates by stating that her proposal was "moving toward the long-observed trend that the piece side contributes more than 60% of mail processing and delivery costs."[48] Ms Tang also cited Postal Service testimony in Docket No. R2001-1 to the effect that such a rate design "better reflects actual cost incurrence."[49]

While Ms Tang has proposed Outside County rates that recover more than 60% of revenue in piece rates, she has limited the piece rate recovery in the Within County subclass to 53.5% of revenue. Ms Tang offers no real explanation for this inconsistency. However, as noted earlier in this testimony, the Within County discounts are generally based on cost avoidances derived for Outside County Periodicals. Thus, in the proposed rate design, the costs avoided by the USPS when a Within County mailer presorts his Periodicals are assumed to be no different from the costs avoided by the USPS when an Outside County mailer presorts his publications. If the cost avoidances that are used in both sub-classes to establish presort discounts are the same then the broad patterns of cost incurrence, as between piece and pound-related costs, should also be reasonably comparable. More importantly, in this case, the Postal Service has presented no evidence to suggest that long term trends in piece/pound-related costs for Within County Periodicals differ in any way from the long term trends in Outside County piece/pound-related costs that were cited by Ms Tang. For these reasons, I propose that the Within County Periodicals rate design be recalculated so that the assumed target revenue to be

[47] See USPS-LR-L-128.
[48] USPS-T-35 (Tang), page 6, lines 22-23, page 7, lines 1-2.
[49] Response of USPS witness Tang to NNA/USPS-T35-4.

derived from piece rates is 62.5% rather than the 53.5% proposed by Ms. Tang. This change in input values is shown on page 4 of Appendix D. The revised Within County rates that result from this change are reported in page 5 of Appendix D. Note that these revised rates do not assume any reduction in the USPS' overall revenue recovery from the Within County subclass.

*c) Adjustments to Pass-throughs of Cost Avoidances*

While Ms Tang made use of the USPS' estimates of cost avoidances derived for Outside County Periodicals, she chose not to adopt the Outside County passthroughs of those same cost avoidances for the Within County rate structure. In fact, there are significant differences between the passthroughs that Ms Tang has proposed for Outside County and for Within County Periodicals.

For example, with respect to carrier-route presorted Periodicals, the USPS estimates that it avoids costs in the amount of $0.066 per piece. For the Within County subclass, Ms Tang has proposed a passthrough of 58% for this presort level so that the Within County mailers discount is $0.038 per piece. (0.58 times $0.066).[50] By contrast, for the Outside County subclass, Ms Tang has proposed a passthrough of 148% for this presort level. Under these rates, Outside County mailers will receive a discount of $0.097 per piece (1.48 times $0.066). The Outside County carrier route discount proposed by Ms Tang is more than two and half times the Within County carrier route discount.

Similarly, the passthroughs proposed for Outside County High Density and Saturation Mail are considerably higher than the passthroughs proposed by Ms Tang for comparably prepared Within County mail. But again, as with carrier route presorted mail, the cost avoidances estimated by the USPS for the two subclasses are identical.

[50] See Appendix C, page 3 of 10.

The Postal Service's Within County rate design should be revised to increase the cost avoidance passthroughs offered to Within County mailers. Specifically, I propose that the passthroughs for Within County carrier route and High Density mail be increased from 58% and 62% respectively to 100% and 70%.[51] While not as large as the passthroughs proposed for Outside County Periodicals, these revised passthroughs will provide Within County mailers with a more reasonable share of the cost avoidance savings that they provide to the USPS. The Within County rate design that results from these two passthrough adjustments is reported on page 7 of Appendix D. These revised rates do not assume any reduction in the USPS' overall revenue recovery from the Within County subclass.

*d) Combined Rate Structure Adjustments*

The Within County rate design changes that I propose need not be considered as "either-or" recommendations for the Commission in this case. In the Within County subclass, there is independent justification to revise both the proportion of revenue to be recovered from piece rates and the cost avoidance passthroughs from mailer worksharing activities. The input changes needed to implement both rate design changes are shown in pages 8 and 9 of Appendix D. The Within County rates that result from these combined changes are reported in page 10 of Appendix D. As shown on page 10, these proposed rates recover the USPS' estimated level of Within County TYAR costs ($79,513,462) plus the Postal Service' suggested cost coverage of 103.61%. I recommend that the Commission accept the Within County rate design shown on page 10 of Appendix D.

Should the Commission also find that Within County revenue levels should be reduced below the levels proposed by the USPS, I further recommend that the rate

[51] See Appendix C, page 6 of 10.

elements set forth on page 10 be reduced proportionately to recover the Commission's recommended revenues for the Within County subclass.

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Economic analysis of international trade issues relating to media and copyright industries.

**Books**
*International Trade in Computer Software*, Stephen E. Siwek and Harold W. Furchtgott-Roth, Quorum Books, Westport, Connecticut, London, 1993, ISBN: 0-89930-711-6.

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**Papers and Articles**

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**Continuing Legal Education Programs**

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Panelist, *Basic Antitrust Law*, D.C. Bar/George Washington University National Law Center.

Panelist, *Monopolization Issues Affecting Computer Software*, D.C. Bar, Antitrust, Trade Regulation and Consumer Affairs Section,
June 21, 1994.

**Other**

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## COURT TESTIMONY AND APPEARANCES

| Jurisdiction | Case | Subject |
|---|---|---|
| U.S. District Court for Eastern District of Virginia, Alexandria Division | Eden Hannon & Co. v. Sumitomo Trust & Banking Co. (USA) Civil Action No. 89-0312A | Analysis of Financial Models, Cash Flow Analysis |
| Circuit Court for Pinella County, Florida | Home Shopping Network Inc. v. GTE, GTE FLA., Inc. and GTE Communications Corp. CT. Civ. 87-014199-7 | Relevance of Planning & Budgeting<br><br>Reports to the Analysis of Damages |
| U.S. District Court for Western District of Oklahoma | Banner Industries, Inc. v. Pepsico, Inc. CIV-85-449-R | Financial Plans Financial Viability (Deposition Testimony Only) |
| Circuit Court for Baltimore City | Pulse One Communications Inc. v. Bell Atlantic Mobile Systems Inc. Case No. 90108057/CC112199 | Damages (Deposition Testimony Only) |

## COURT TESTIMONY AND APPEARANCES

| Jurisdiction | Case | Subject |
|---|---|---|
| Supreme Court of the State of New York County of New York | Scandinavian Gourmet Provisions, d/b/a Fredricksen & Johannesen<br>v.<br>Jurgela, aka Al Jurgela, aka Constantine Jurgela, aka C.R. Jurgela, Valco Equities Ltd. Charles Earle, Valco Development Corp., Chase Manahattan Bank, Clinton Barrow, Franklin Investors and Harold L. Goerlich Index No. 22891/90 | Damages |
| Chancery Court of Davidson County, Tennessee | MCI Telecommunications Corp.<br>v.<br>Dudley W. Taylor etc. et al.<br>No. 88-1227-III | Tax Treatment of Telephone Access Charges |
| Superior Court of the District of Columbia Civil Division | Robert H. Kressin, General Partner, Cellular Phone Stores Limited Partnership<br>v.<br>Bell Atlantic Mobile Systems, Inc.<br>Civil Action No. 02258-91 | Damages, Cellular Telephone Industry |
| Court of Common Pleas First Judicial District of Pennsylvania | Shared Communications Service of 1800-80 JFK Boulevard Inc.<br>v.<br>Bell Atlantic Properties, Inc. et al.<br>September Term 1900, No. 775 | Damages, Telecommunications Industry |
| Superior Court of New Jersey, Law Division, Essex County | Bell Atlantic Network Services, Inc.<br>v.<br>P.M. Video Corp., Docket No. L-6602-91 | Damages (Deposition Testimony Only) |

## COURT TESTIMONY AND APPEARANCES

| Jurisdiction | Case | Subject |
|---|---|---|
| U.S. District Court for the District of Columbia | FreBon International Corp. v. Bell Atlantic Corp. et al. Civil Action No. 94-324 | Damages (Deposition Testimony Only) |
| U.S. District Court for the Eastern District of New York | Universal Contact Communications Inc. v. PageMart Inc. | Damages (Deposition Testimony Only) |
| U.S. District Court for District of Maryland | Integrated Consulting Services, Inc. v. LDDS | Damages (Deposition Testimony Only) |
| U.S. District Court Eastern District of Virginia, Alexandria Division | Mexinox, S.A. et al. v. Acerinox | Antitrust Damages (Deposition Testimony Only) |
| U.S. District Court Eastern District of North Carolina | Broad Band Technologies, Inc. v. General Instrument Corp. | Patent Damages (Deposition Testimony Only) |
| International Chamber of Commerce International Court of Arbitration | WorldSpan L.P. v. Abacus Distribution Systems Pte Ltd. And Other Case No. 9833/FMS | Damages and License Valuation |
| U.S. District Court for Western District of Washington at Seattle Case No. C97-10732 | Arbitration between Electric Lightwave, Inc., Plaintiff v. USWest Inc., Defendant | Damages |

## COURT TESTIMONY AND APPEARANCES

| Jurisdiction | Case | Subject |
|---|---|---|
| U.S. District Court for the Western District of Oklahoma | Eateries, Inc. and Fiesta Restaurant, Inc.<br>v.<br>J.R. Simplot Company No. CIV-99-1330-C | Damages (Deposition Testimony Only) |
| American Arbitration Association | Arbitration Between Avecia Inc., Claimant<br>v.<br>Mareva Poscines Et Filtrations, S.A. Respondent | Allocation of FIFRA Data Costs |
| Commonwealth of Massachusetts, Middlesex Superior Court | Netrix, Inc and Proteon, Inc.<br>v.<br>Digital Equipment Corp. and Cabletron Systems, Inc. CIV No. MICX 98-01533 | Valuation of Software License |
| Circuit Court for the City of Richmond, VA | Interactive Return Service, Inc.<br>v.<br>Virginia Polytechnic Institute and State University<br>Case No LM 870-3 | Damages (Deposition and Testimony before Judge Only) |
| State of Connecticut Superior Court Complex Litigation Docket | Alan M. Glazer et al.<br>v.<br>The Dress Barn, Inc.<br>Case No. (X02) CV-01-0169075 S | Damages |
| Circuit Court of the County of St. Louis, State of Missouri | Biomedical Systems Corp.<br>v.<br>Mead Johnson & Company<br>Cause No. 01CC-003428 | Damages (Deposition Testimony only) |

## COURT TESTIMONY AND APPEARANCES

| Jurisdiction | Case | Subject |
|---|---|---|
| Private Arbitration | Dennis M. Donovan v. Raytheon Company | Valuation of Pension Benefits |
| World Trade Center, Victims Compensation Fund: | Raymond Murphy | (Oral Testimony and Report) |
| World Trade Center Victims Compensation Fund | Dennis McHugh | (Oral Testimony and Report) |
| World Trade Center Victims Compensation Fund | Robert Crawford | (Oral Testimony and Report) |
| World Trade Center Victims Compensation Fund | Thomas Farino | (Oral Testimony and Report) |
| World Trade Center Victims Compensation Fund | James Corrigan | (Report) |
| World Trade Center Victims Compensation Fund | John Moran | (Report) |
| World Trade Center Victims Compensation Fund | Nathaniel Webb | (Report) |
| U.S. District Court for the Northern District of Illinois, Eastern Division, No. 01-C 0067 | ChoiceParts, LLC v. General Motors Corporation et al. | (Deposition and Report) |
| Commonwealth of Massachusetts, Middlesex, ss. Superior Court, Civil Action No. 01-2590 | DataSafe, Inc. and David F. Muller .v. Federal Express Corporation et al. | (Deposition and Report) |

## REGULATORY COMMISSION TESTIMONY AND APPEARANCES

| Commission | Docket No. | Subject |
|---|---|---|
| Arizona | U-3021-96-448 et al. | Cost of Local Service |
| tah | 94-999-01 | Investigation into collocation and expanded interconnection |
| Connecticut | 96-02-22 | Cost of Local Service |
| Wyoming | 70000-TR-96-323 | US WEST Phase II Price Regulation Plan |
| Pennsylvania | 1-00960066 | Financial Analysis |
| Pennsylvania | A-310203 F0002 et al. | Cost of Local Service |
| West Virginia | 96-1516-T-PC et al. | Cost of Local Service |
| Minnesota | P-442, 5321 et al. | Generic Investigation of US WEST's Communications Cost |
| Iowa | RPU-96-9 | Generic Investigation of US WEST's Communications Costs |
| Illinois | 80-0511 | Rate Base, Expenses, Forecasting |
| Maryland | 7222 | Power Plant Certificate Issues |
| District of Columbia* | 777 | Telephone Advertising and Parent Company Transactions |
| Illinois | 82-0082 | Gas Rate Design |
| Pennsylvania | M-810294 | Energy Costs and Rate Design |
| Pennsylvania | R-822169 | Nuclear Plant Economics |

* Prefiled but not sworn. Case Settled April, 1982.

## REGULATORY COMMISSION TESTIMONY AND APPEARANCES

| Commission | Docket No. | Subject |
|---|---|---|
| New Jersey | 8011-827 | Water and Sewerage Forecast |
| District of Columbia | 798 | Telephone Price Elasticity, Centralized Costs, Working Capital |
| California | 83-06-65 | Telephone Access Charges |
| Illinois | 83-0142 | Telephone Access Charges |
| U.S. International Trade Commission | 731-TA-457 | Handtools from People's Republic of China |
| U.S. Postal Rate Commission | R 83-1 | Financial Viability for Electronic Mail Service |
| U.S. Postal Rate Commission | R 84-1 | Class Revenue Requirement, Demand Projections |
| U.S. Postal Rate Commission | R 87-1 | Pricing of Third Class Mail |
| U.S. Postal Rate Commission | R 90-1 | Pricing of Third Class Mail |
| U.S. Postal Rate Commission | R2000-1 | Pricing and Costing of Bound Printed Matter |
| Maryland | 6807, Phase I | Utility Forecasting |
| New Jersey | 762-194 | Utility Forecasting |
| District of Columbia | 685 | Utility Forecasting |
| District of Columbia | 827 | Econometric Demand Modeling for Coin Telephone Service |

## REGULATORY COMMISSION TESTIMONY AND APPEARANCES

| Commission | Docket No. | Subject |
|---|---|---|
| Maryland | 7300 | Utility Forecasting |
| Maryland | 7348 | Utility Forecasting |
| Maryland | 7427 | Utility Forecasting |
| District of Columbia | 737 | Utility Forecasting |
| Maryland | 7305 | Telephone Advertising |
| Maryland | 7163 | Service Terminations |
| Maryland | 7070 | Utility Promotional Activities |
| District of Columbia | 729 | Telephone Advertising & Parent Company Transactions |
| Maryland | 6807, Phase II | Utility Emergency Procedures |
| Maryland | 7467 | Telephone Advertising, Parent Company Transactions |
| Maryland | 7466 | Gas Utility Advertising |
| New Hampshire | 79-18 | Industrial Conservation |
| Maryland | 7236 | Utility Promotional Activities |
| District of Columbia | 834 | Electric Utility Load Management Evaluation |
| California | 85-01-034 | Telephone Rate Design, Cost of Service |
| Massachusetts | 86-213 | Paging Company; Financial Viability, Pricing Analysis |

## REGULATORY COMMISSION TESTIMONY AND APPEARANCES

| Commission | Docket No. | Subject |
|---|---|---|
| District of Columbia | 869 | Fuel Price and Electric Demand Forecasts |
| Louisiana | U-17949 B | Customer Owned Coin Operated Telephones |
| New Jersey | TO92030358 | Yellow Pages/Directory Services |
| Delaware | 41 | Development of Rules for the Implementation of Price Cap Regulation |
| Utah | 94-999-01 | Cost of Local Service |
| Connecticut | 97-04-01 | Cost of Local Service |
| New Mexico | 97-35-TC | Cost of Local Service |
| Maine | 97-505 | Cost of Local Service |
| Vermont | 5713 | Cost of Local Service |
| New York | 94-C-0095 | Access Charges/Financial Analysis |
| New Jersey | TX95120631 | Access Charges/Financial Analysis |
| New Hampshire | DE97-171 | Cost of Local Service |
| Colorado | 97F-175T | Access Charges/Financial Analysis |
| Utah | 97-049-08 | Access Charges/Financial Analysis |
| Connecticut | 98-04-03 | Joint and Common Costs |

## REGULATORY COMMISSION TESTIMONY AND APPEARANCES

| Commission | Docket No. | Subject |
|---|---|---|
| Rhode Island | 2681 | Cost of Local Service |
| Arkansas | 99-015-U | Arbitration of Interconnection Rates |
| Connecticut | 00-01-02 | Non-recurring and Recurring Costs |

## WRITTEN TESTIMONY ONLY

| Jurisdiction | Case | Subject |
|---|---|---|
| U.S. District Court of Southern District of New York | In Re "Apollo" Air Passenger Computer Reservation System (CRS) MDL DKT. No. 760-M-21-49-MP | Liquidated Damages, Actual Damages |
| Supreme Court of the Republic of Palau | Orion Telecommunications, Ltd. v. Palau National Communications Corporations, Civil Action No. 835-88 | Lost Profit Damages |
| U.S. District Court for the District of Columbia | A&S Council Oil Company, Inc. et al. v. Patricia Saiki, et al. Civil, Action No. 87-1969-OG | Damages |
| U.S. District Court for Eastern District of Texas | R & D Business Systems, et al. v. Xerox Corp. Civil Action No. 2: 92-CV-042 | Valuation of Non-Monetary Provisions of Stipulation of Settlement |
| U.S. District Court Eastern District of Michigan, Southern Division | Little Caesar Enterprises, Inc. v. Gary G. Smith, et al. Civil No. 93-CV-73354-DT | Class Certification (Joint Declaration with Philip Nelson) |

**WRITTEN TESTIMONY ONLY**

| Jurisdiction | Case | Subject |
|---|---|---|
| FCC | Various | Cellular Radio Pricing: Critique of Competing Applications for Cellular in Seattle, Miami, Denver and Detroit |
| FCC Pricing | 83-1145 | Directory Data Base and Access |
| U.S. District Court for the District of Columbia | American Association of Cruise Passengers v. Host Marriott Corp. et al. | Damages |
| U.S. District Court for Eastern District of Texas | Jason R. Searcy et al. v. Philips Electronics North America Corp. et al. Consolidated Civil Action No. 1:95-CV 363, 364 | Damages |
| U.S. District Court for Eastern District of Texas Beaumont Division | USA ex. rel. Lloyd Bortner v. Phillips Electronics | Penalties under False Claims Act |
| FCC | In Re: Applications of Motorola, Inc.; Motorola SMR, Inc.; and Motorola Communications and Electronics, Inc. and FCI 900, Inc. For Consent to Assignment of 900 MHz Specialized Mobile Radio Licenses DA 00-2352 | Wireless Dispatch Services (with Michael Baumann) |
| FCC (Market Disputes Resolution) | McLeodUSA Publishing Company v. Wood County Telephone Company, Inc. | Subscriber Listing Information |

**WRITTEN TESTIMONY ONLY**

| Jurisdiction | Case | Subject |
|---|---|---|
| FCC (Market Disputes Resolution) | Yellow Book USA, Inc. v. Broadwing Inc. and Cincinnati Bell Telephone Company | Subscriber Listing Information (Written Report and Deposition Testimony) |
| United States of America v. United Kingdom of Great Britain and Northern Ireland | U.S. – U.K. Arbitration Concerning Heathrow Airport User Changes | Participating in Negotiations Leading to Settlement of Arbitration and Related Litigation |
| FCC | In the Matter of Review of the Section 251 Unbundling Obligations of Incumbent Exchange Carriers CC Docket No 01-338 | Broadband Telecommunications Services. |
| FCC | Core Communications, Inc. v. Verizon Maryland Inc. File No. EB-01-MD-007. Report. | Damages |

# Appendix B, Page 1 of 3

This appendix simulates the *CV* calculations in Czigler's 2006 study (Docket No. R2006-1) and Shaw's 2005 study (Docket No. R2005-1) under simple random sampling and shows how pooling the 2005 and 2006 data can improve the *CV*s for the 2006 cost estimates for within county periodicals.

According to Czigler's response to NNA/USPS-T1-7, with simple random sampling,

$$CV = \sqrt{\frac{1-p}{(n-1)p}} \qquad (1)$$

$$\rightarrow \quad CV^2 = \frac{1-p}{(n-1)p}$$

$$\rightarrow \quad n-1 = \frac{(1-p)/p}{CV^2}$$

$$\rightarrow \quad n = \frac{(1-p)/p}{CV^2} + 1 \qquad (2)$$

According to Table 1 of Czigler's report and Czigler's response to NNA/USPS-T1-7, "the estimated cost for within county periodicals is $19.806M, or 0.16% of total costs in Cost Segment 3.1," where *p* = 0.16% = $19,806M/$12,703,874M after rounding (a more precise *p* is 0.156%). $12,703,874M is the total Segment 3.1 cost estimates for 2006.

According to Table 1 of Czigler's report, the *CV* for within county periodicals is 11.58%. Then using equation (2) we can infer the *n* under simple random sampling that would yield this *CV*:

$$n = \frac{(1-0.156\%)/0.156\%}{11.58\%^2} + 1 = 47{,}739 .$$

Similarly, Table 1 of Shaw's 2005 report implies a *p* of 0.100% (=$11,964M/$11,990,087M) and a *CV* of 13.58% for within county periodicals for Cost Segment 3.1. The *n* under simple random sampling that would yield this 2005 *CV* is 54,271.

If we pool the 2005 and 2006 data together, the average *p* weighted by the sample size *n* for 2005 (54,271) and *n* for 2006 (47,739) is:

$$p = \frac{0.100\% \times 54271 + 0.156\% \times 47739}{54271 + 47739} = 0.126\% .$$

The Segment 3.1 cost estimate for within county periodicals based on the pooled 2005 and 2006 data and the 2006 total cost is then $16,013M (=12,703,874M*0.126%), which is between the 2005 and 2006 estimates.

Based on equation (1), the *CV* under random sampling by pooling 2005 and 2006 data together is:

$$CV = \sqrt{\frac{1-p}{(n-1)p}}$$
$$= \sqrt{\frac{1-0.126\%}{(54271+47739-1)\times 0.126\%}}.$$
$$= 8.81\%$$

See **Exhibit 1** below for a summary of the above calculations.

**Exhibit 1: CVs for Mail Processing Costs (Cost Segment 3.1)**

| | Cost Est. ($1,000) | Std Deviation | CV | Total Cost | Within County Periodical % of Total | Implied Total Tallies | CV Under Random Sampling |
|---|---|---|---|---|---|---|---|
| Czigler 2006 | 19,806 | 2,294 | 11.58% | 12,703,874 | 0.156% | 47,739 | 11.58% |
| Shaw 2005 | 11,964 | 1,625 | 13.58% | 11,990,087 | 0.100% | 54,271 | 13.58% |
| New Estimate | 16,013 | | | | 0.126% | 102,010 | 8.81% |
| 2005-2006 Increase | 33.8% | | | | | | |

Source: Czigler Table 1 and Shaw Table 1.

The above calculations can also be applied to Cost Segment 6.1 for within county periodicals. When pooling 2005 and 2006 data, this cost estimate is $8,623M (between the 2005 and 2006 estimates) and the *CV* under random sampling is 9.13% (lower than both 2005 and 2006 values). See **Exhibit 2**.

**Exhibit 2: CVs for City Carrier In-Office Costs (Cost Segment 6.1)**

| | Cost Est. ($1,000) | Std Deviation | CV | Total Cost | Within County Periodical % of Total | Implied Total Tallies | CV Under Random Sampling |
|---|---|---|---|---|---|---|---|
| Czigler 2006 | 9,682 | 1,129 | 11.66% | 3,198,073 | 0.303% | 24,220 | 11.66% |
| Shaw 2005 | 6,724 | 987 | 14.68% | 2,925,910 | 0.230% | 20,150 | 14.68% |
| New Estimate | 8,623 | | | | 0.270% | 44,370 | 9.13% |
| 2005-2006 Increase | 28.2% | | | | | | |

Source: Czigler Table 2 and Shaw Table 2.

# Appendix C, Page 1 of 3

This appendix explains how the alternative rate is calculated for within county periodicals in four steps.

**Step 1:**

In Appendix B, I calculate alternative cost estimates for within county periodicals for CS 3.1 ($16,013,000) and CS 6.1 ($8,613,000). The increase is 18.1% and 10.9%, respectively. I then apply 18.1% to CS 2.1.1 and 10.9% to CS 2.4.1 and CS 6 others, resulting in reductions of adjusted cost estimates for these smaller categories. Based on total volume cost and adjusted cost in 2005, I calculate the weighted average reduction in cost estimate for these categories to be -15.3%. In FY 2005, within county periodicals cost increases from FY 2004 in CS 15, 16, 18 and 20 were 70% of the cost increases in CS 3 and 6. 70% of -15.3% is -10.7%. Cost in CS 3.1, 6, 2.1.1 and 2.4.1 is 44.1% of the total in FY 2005. Cost in CS 15, 16, 18 and 20 is 12.2% of the total in FY 2005. I assume the rest of the segments have zero reduction in cost. The weighted cost change for FY 2005 is -8%. See the first part of Table 2 and Appendix C, Table 1.

**Step 2:**

In TYAR 2008, the revenue-cost ratio is 103.578%. See the second part of Table 2.

**Step 3:**

Based on the rate and volume change between TYBR 2008 and TYAR 2008, I have calculated the implied elasticity as -12.6%. See the third part of Table 2.

**Step 4:**

I adjust TYAR 2008 volume cost for within county periodicals by the cost change of -8% to get $73,132,000. I then determine the alternative rate such that the ratio of the resulting revenue (after taking into account the estimated implicit elasticity) and the adjusted cost remains to be 103.578% (or slightly above it). This alternative rate, which is $0.107, represents a 12.7% increase from the TYBR 2008 rate of $0.095.

**Appendix C, Table 1**
**Within County Periodicals**

| Cost Segment | FY 2004 | FY 2005 | Change | % Change |
|---|---|---|---|---|
| CS 3 | 15549 | 21370 | 5821 | |
| CS 6 | 8957 | 12700 | 3743 | |
| Sum1 | 24506 | 34070 | 9564 | 39.0% |
| CS 15 | 1,734 | 2,269 | 535 | |
| CS 16 | 1,530 | 2,015 | 485 | |
| CS 18 | 2,727 | 3,260 | 533 | |
| CS 20 | 1,486 | 1,977 | 491 | |
| Sum2 | 7,477 | 9,521 | 2,044 | 27.3% |
| Sum2/Sum1 | | | | 70.0% |
| FY Total | 62,803 | 77,918 | | |
| Sum2 as % of Total | 11.9% | 12.2% | | |

Source: Appendix C, Table 2

# Appendix C, Page 3 of 3

**Appendix C, Table 2**

| Within County Periodicals | FY 2004 | FY 2005 | Change | Percent of Total Change |
|---|---|---|---|---|
| *Cost Segments - Summary* | | | | |
| C/S-1 Postmasters | 386 | 401 | 15 | 0.10% |
| C/S-2 Supervisors & Technicians | 3,178 | 4,545 | 1,367 | 9.04% |
| C/S-3 Clerks and Mailhandler | 15,549 | 21,370 | 5,821 | **38.51%** |
| C/S-4 Clerks CAG-K Offices | 6 | - | (6) | -0.04% |
| C/S-6 City Delivery Carriers - Office | 8,957 | 12,700 | 3,743 | **24.76%** |
| C/S-7 City Delivery Carriers -Street | 10,401 | 11,130 | 729 | 4.82% |
| C/S-8 Vehicle Service Drivers | 1,873 | 1,955 | 82 | 0.54% |
| C/S-10 Rural Carriers | 12,098 | 12,682 | 584 | 3.86% |
| C/S-11 Custodial and Maintenance Services | 1,791 | 2,443 | 652 | 4.31% |
| C/S-12 Motor Vehicle Services | 997 | 1,071 | 74 | 0.49% |
| C/S-13 Misc. Local Transportation | 10 | 12 | 2 | 0.01% |
| C/S-14 Transportation | 80 | 88 | 8 | 0.05% |
| C/S-15 Building Occupancy | 1,734 | 2,269 | 535 | 3.54% |
| C/S-16 Supplies and Services | 1,530 | 2,015 | 485 | 3.21% |
| C/S-17 Research & Development | - | - | - | 0.00% |
| C/S-18 Admin. & Area Operations | 2,727 | 3,260 | 533 | 3.53% |
| C/S-19 General Management Systems | - | - | - | 0.00% |
| C/S-20 Other Accrued Expenses (Servicewide) | 1,486 | 1,977 | 491 | 3.25% |
| | | | - | 0.00% |
| TOTAL VOLUME VARIABLE | 62,803 | 77,918 | 15,115 | 100.00% |

Sources:USPS Cost Segments and Components, FY 2004 and 2005

**USPS-LR-L-126**
**Within County**
**Worksheet TYAR B.D.**

| TYAR BILLING DETERMINANTS - AFTER RATES VOLUME & REVENUES WITHIN COUNTY PERIODICALS | | | |
|---|---|---|---|
| **Pounds** | **TY AR Pounds** | **Proposed Rates** | **Postage (Rate*Pounds)** |
| Delivery Unit - Pound Rate | 105,321,546 | $ 0.142 | $ 14,955,660 |
| General - Pound Rate | 126,766,452 | $ 0.179 | $ 22,691,195 |
| **Presort Rate Pieces** | **TY AR Pieces** | **Proposed Rates** | **Postage (Rate*Pieces)** |
| BASIC NON-AUTOMATION | 15,294,097 | $ 0.117 | $ 1,789,409 |
| BASIC AUTOMATION LETTER | 497,774 | $ 0.057 | $ 28,373 |
| BASIC AUTOMATION FLAT | 902,094 | $ 0.108 | $ 97,426 |
| 3-DIGIT NON-AUTOMATION | 15,339,480 | $ 0.108 | $ 1,656,664 |
| 3-DIGIT AUTOMATION LETTER | 4,004,446 | $ 0.050 | $ 200,222 |
| 3-DIGIT AUTOMATION FLAT | 3,533,813 | $ 0.097 | $ 342,780 |
| 5-DIGIT NON-AUTOMATION | 68,412,119 | $ 0.098 | $ 6,704,388 |
| 5-DIGIT AUTOMATION LETTER | 3,910,481 | $ 0.051 | $ 199,435 |
| 5-DIGIT AUTOMATION FLAT | 41,099,272 | $ 0.093 | $ 3,822,232 |
| CARRIER ROUTE BASIC | 404,946,190 | $ 0.060 | $ 24,296,771 |
| CARRIER ROUTE HIGH DENSITY | 108,177,430 | $ 0.044 | $ 4,759,807 |
| CARRIER ROUTE SATURATION | 34,022,501 | $ 0.032 | $ 1,088,720 |
| WKSHARING DISCNTDELIVERY OFFICE ENTRY | 258,307,013 | $ 0.008) | $ (2,066,456) |
| Total Pieces & Calculated Revenue | 700,139,698 | | $ 80,566,626 |
| Ride-along Pieces | 566,207 | 0.155 | $ 87,762 |
| Adjusted Total Revenue including Ride-along | | | $ 80,682,878 |
| TYAR Fees | | | $ 1,563,000 |
| Calculated Revenue+TYAR Fees | | | $ 82,245,878 |
| TYAR Cost | | | $ 79,513,462 |
| Cost Coverage after calculation of new rates | | | 103.44% |
| Revenue per piece | | | $ 0.117 |

**USPS-LR-L-126**
**Within County**
**Worksheet Rate Design Input**

## Inputs to Within County Rates Development

| *Line #* | Item | Amount | Source / Notes |
|---|---|---|---|
| 5 | TY Before Rates Volume | 722,431,237 | USPS-LR-L-63, Witness Thress |
| 6 | TY After Rates Volume | 853,535,270 | USPS-LR-L-63, Witness Thress |
| 7 | TYBR Cost, Without Contingency | 81,056,095 | USPS-LR-L-7, Witness Waterbury |
| 8 | TYAR Cost, Without Contingency | 78,726,200 | USPS-LR-L-7, Witness Waterbury |
| 9 | Contingency Factor | 101% | USPS-T-10, Witness Waterbury |
| 10 | TYBR Cost, (Including Contingency) | $ 81,866,656 | Calculated (Line 7*Line 9) |
| 11 | TYAR Cost, (Including Contingency) | $ 79,513,462 | Calculated (Line 8*Line9) |
| 12 | Desired Cost Coverage | 103.70% | One-Half of Initial Cost Coverage for Outside County |
| 13 | TYBR Fees | $ 1,650,649 | USPS-T-39, Witness Berkeley |
| 14 | TYAR Fees | $ 1,563,000 | USPS-T-39, Witness Berkeley |
| 15 | Proportion of Revenue From Piece Rates | 53.5% | Assumption |
| 16 | MULTIPLIER TO GET ACTUAL REVENUE | 100.035% | Base Year Worksheet |
| 17 | Transportation Cost, Without Contingency | 96,625 | USPS-LR-L-7, Witness Waterbury |
| 18 | Transportation Cost, With Contingency | $ 97,592 | Calculated (Line 17*Line 9) |
| 19 | Proportion of Transportation Cost That is Distance Related | 0.5946 | USPS-LR-L-39, Witness Kelly |
| 20 | Distance Related Transportation Cost | $ 58,028 | Calculated (Line 18*Line 19) |

**USPS-LR-L-126**
**Within County**
**Worksheet Piece Discounts 2**

## CALCULATION OF PIECE DISCOUNTS, SHEET 2

| Line # | Presort Level | Unit Cost Savings (From Discounts W/S) | Passthrough |
|---|---|---|---|
| 3 | | | |
| 4 | | | |
| 5 | BASIC NONAUTOMATION | $ - | {Benchmark unit cost} |
| 6 | BASIC AUTOMATION LETTER | $ 0.302 | 20% |
| 7 | BASIC AUTOMATION FLAT | $ 0.013 | 70% |
| 8 | 3 DIGIT NONAUTOMATION | $ 0.073 | 12% |
| 9 | 3 DIGIT AUTOMATION LETTER | $ 0.305 | 19% |
| 10 | 3 DIGIT AUTOMATION FLAT | $ 0.012 | 86% |
| 11 | 5 DIGIT NONAUTOMATION | $ 0.080 | 12% |
| 12 | 5-DIGIT AUTOMATION LETTER | $ 0.316 | 15% |
| 13 | 5 DIGIT AUTOMATION FLAT | $ 0.003 | 166% |
| 14 | CARRIER ROUTE | $ 0.066 | 58% |
| 15 | HIGH DENSITY | $ 0.025 | 62% |
| 16 | SATURATION | $ 0.045 | 63% |
| 17 | WKSHARING DISCNTDELIVERY OFFICE ENTRY | $ 0.0138 | 55% |
| 18 | | **Final Unit Cost Savings** | **Notes** |
| 19 | BASIC NONAUTOMATION | $ - | |
| 20 | BASIC AUTOMATION LETTER | $ 0.060 | Passthroughs Times Unit Cost Savings |
| 21 | BASIC AUTOMATION FLAT | $ 0.009 | Passthroughs Times Unit Cost Savings |
| 22 | 3 DIGIT NONAUTOMATION | $ 0.009 | Passthroughs Times Unit Cost Savings |
| 23 | 3 DIGIT AUTOMATION LETTER | $ 0.058 | Passthroughs Times Unit Cost Savings |
| 24 | 3 DIGIT AUTOMATION FLAT | $ 0.011 | Passthroughs Times Unit Cost Savings |
| 25 | 5 DIGIT NONAUTOMATION | $ 0.010 | Passthroughs Times Unit Cost Savings |
| 26 | 5-DIGIT AUTOMATION LETTER | $ 0.047 | Passthroughs Times Unit Cost Savings |
| 27 | 5 DIGIT AUTOMATION FLAT | $ 0.005 | Passthroughs Times Unit Cost Savings |
| 28 | CARRIER ROUTE | $ 0.038 | Passthroughs Times Unit Cost Savings |
| 29 | HIGH DENSITY | $ 0.016 | Passthroughs Times Unit Cost Savings |
| 30 | SATURATION | $ 0.028 | Passthroughs Times Unit Cost Savings |
| 31 | WKSHARING DISCNTDELIVERY OFFICE ENTRY | $ 0.008 | Passthroughs Times Unit Cost Savings |
| 32 | | **TY BR Leakage** | **Notes** |
| 33 | BASIC NONAUTOMATION | $ - | |
| 34 | BASIC AUTOMATION LETTER | $ 30,817 | Final Discount times Volume |
| 35 | BASIC AUTOMATION FLAT | $ 8,377 | Final Discount times Volume |
| 36 | 3 DIGIT NONAUTOMATION | $ 212,455 | Final Discount times Volume |
| 37 | 3 DIGIT AUTOMATION LETTER | $ 239,653 | Final Discount times Volume |
| 38 | 3 DIGIT AUTOMATION FLAT | $ 40,110 | Final Discount times Volume |
| 39 | 5 DIGIT NONAUTOMATION | $ 2,223,628 | Final Discount times Volume |
| 40 | 5-DIGIT AUTOMATION LETTER | $ 189,644 | Final Discount times Volume |
| 41 | 5 DIGIT AUTOMATION FLAT | $ 212,039 | Final Discount times Volume |
| 42 | CARRIER ROUTE | $ 32,180,293 | Final Discount times Volume |
| 43 | HIGH DENSITY | $ 1,785,947 | Final Discount times Volume |
| 44 | SATURATION | $ 982,961 | Final Discount times Volume |
| 45 | WKSHARING DISCNTDELIVERY OFFICE ENTRY | $ 2,132,249 | Final Discount times Volume |
| 46 | Total Discount Leakage | $ 40,238,173 | Sum Line 33-45 |
| 47 | Revenue Required from Pieces + Discount Leakages | $ 92,252,251 | Line 46 plus Line 4 from Piece Discounts |
| 48 | TYBR Pieces | 722,431,237 | |
| 49 | Revenue Requirement + Leakage Per Piece {Base Rate} | $ 0.128 | Line 47/Line 48 |

# Appendix D, 4 of 10

**USPS-LR-L-126**
**Within County**
**Worksheet Rate Design Input**

## Inputs to Within County Rates Development

| *Line #* | Item | Amount | Source / Notes |
|---|---|---|---|
| 5 | TY Before Rates Volume | 722,431,237 | USPS-LR-L-63, Witness Thress |
| 6 | TY After Rates Volume | 853,535,270 | USPS-LR-L-63, Witness Thress |
| 7 | TYBR Cost, Without Contingency | 81,056,095 | USPS-LR-L-7, Witness Waterbury |
| 8 | TYAR Cost, Without Contingency | 78,726,200 | USPS-LR-L-7, Witness Waterbury |
| 9 | Contingency Factor | 101% | USPS-T-10, Witness Waterbury |
| 10 | TYBR Cost, (Including Contingency) | $ 81,866,656 | Calculated (Line 7*Line 9) |
| 11 | TYAR Cost, (Including Contingency) | $ 79,513,462 | Calculated (Line 8*Line9) |
| 12 | Desired Cost Coverage | 103.70% | One-Half of Initial Cost Coverage for Outside County |
| 13 | TYBR Fees | $ 1,650,649 | USPS-T-39, Witness Berkeley |
| 14 | TYAR Fees | $ 1,563,000 | USPS-T-39, Witness Berkeley |
| 15 | Proportion of Revenue From Piece Rates | 62.5% | Assumption |
| 16 | MULTIPLIER TO GET ACTUAL REVENUE | 100.035% | Base Year Worksheet |
| 17 | Transportation Cost, Without Contingency | 96,625 | USPS-LR-L-7, Witness Waterbury |
| 18 | Transportation Cost, With Contingency | $ 97,592 | Calculated (Line 17*Line 9) |
| 19 | Proportion of Transportation Cost That is Distance Related | 0.5946 | USPS-LR-L-39, Witness Kelly |
| 20 | Distance Related Transportation Cost | $ 58,028 | Calculated (Line 18*Line 19) |

**USPS-LR-L-126**
**Within County**
**Worksheet TYAR B.D.**

| TYAR BILLING DETERMINANTS - AFTER RATES VOLUME & REVENUES WITHIN COUNTY PERIODICALS | | | |
|---|---|---|---|
| **Pounds** | **TY AR Pounds** | **Proposed Rates** | **Postage (Rate*Pounds)** |
| Delivery Unit - Pound Rate | 105,321,546 | $ 0.109 | $ 11,480,049 |
| General - Pound Rate | 126,766,452 | $ 0.146 | $ 18,507,902 |
| **Presort Rate Pieces** | **TY AR Pieces** | **Proposed Rates** | **Postage (Rate*Pieces)** |
| BASIC NON-AUTOMATION | 15,294,097 | $ 0.128 | $ 1,957,644 |
| BASIC AUTOMATION LETTER | 497,774 | $ 0.068 | $ 33,849 |
| BASIC AUTOMATION FLAT | 902,094 | $ 0.119 | $ 107,349 |
| 3-DIGIT NON-AUTOMATION | 15,339,480 | $ 0.119 | $ 1,825,398 |
| 3-DIGIT AUTOMATION LETTER | 4,004,446 | $ 0.061 | $ 244,271 |
| 3-DIGIT AUTOMATION FLAT | 3,533,813 | $ 0.108 | $ 381,652 |
| 5-DIGIT NON-AUTOMATION | 68,412,119 | $ 0.109 | $ 7,456,921 |
| 5-DIGIT AUTOMATION LETTER | 3,910,481 | $ 0.062 | $ 242,450 |
| 5-DIGIT AUTOMATION FLAT | 41,099,272 | $ 0.104 | $ 4,274,324 |
| CARRIER ROUTE BASIC | 404,946,190 | $ 0.071 | $ 28,751,179 |
| CARRIER ROUTE HIGH DENSITY | 108,177,430 | $ 0.055 | $ 5,949,759 |
| CARRIER ROUTE SATURATION | 34,022,501 | $ 0.043 | $ 1,462,968 |
| WKSHARING DISCNTDELIVERY OFFICE ENTRY | 258,307,013 | $ (0.008) | $ (2,066,456) |
| Total Pieces & Calculated Revenue | 700,139,698 | | $ 80,609,259 |
| Ride-along Pieces | 566,207 | 0.155 | $ 87,762 |
| Adjusted Total Revenue including Ride-along | | | $ 80,725,526 |
| TYAR Fees | | | $ 1,563,000 |
| Calculated Revenue+TYAR Fees | | | $ 82,288,526 |
| TYAR Cost | | | $ 79,513,462 |
| Cost Coverage after calculation of new rates | | | 103.49% |
| Revenue per piece | | | $ 0.118 |

**USPS-LR-L-126**
**Within County**
**Worksheet Piece Discounts 2**

## CALCULATION OF PIECE DISCOUNTS, SHEET 2

| Line # | Presort Level | Unit Cost Savings (From Discounts W/S) | Passthrough |
|---|---|---|---|
| 3 | | | |
| 4 | | | |
| 5 | BASIC NONAUTOMATION | $ - | {Benchmark unit cost} |
| 6 | BASIC AUTOMATION LETTER | $ 0.302 | 20% |
| 7 | BASIC AUTOMATION FLAT | $ 0.013 | 70% |
| 8 | 3 DIGIT NONAUTOMATION | $ 0.073 | 12% |
| 9 | 3 DIGIT AUTOMATION LETTER | $ 0.305 | 19% |
| 10 | 3 DIGIT AUTOMATION FLAT | $ 0.012 | 86% |
| 11 | 5 DIGIT NONAUTOMATION | $ 0.080 | 12% |
| 12 | 5-DIGIT AUTOMATION LETTER | $ 0.316 | 15% |
| 13 | 5 DIGIT AUTOMATION FLAT | $ 0.003 | 166% |
| 14 | CARRIER ROUTE | $ 0.06 | 100% |
| 15 | HIGH DENSITY | $ .025 | 70% |
| 16 | SATURATION | $ .045 | 63% |
| 17 | WKSHARING DISCNTDELIVERY OFFICE ENTRY | $ .0138 | 55% |
| 18 | | **Final Unit Cost Savings** | **Notes** |
| 19 | BASIC NONAUTOMATION | $ - | |
| 20 | BASIC AUTOMATION LETTER | $ 0.060 | Passthroughs Times Unit Cost Savings |
| 21 | BASIC AUTOMATION FLAT | $ 0.009 | Passthroughs Times Unit Cost Savings |
| 22 | 3 DIGIT NONAUTOMATION | $ 0.009 | Passthroughs Times Unit Cost Savings |
| 23 | 3 DIGIT AUTOMATION LETTER | $ 0.058 | Passthroughs Times Unit Cost Savings |
| 24 | 3 DIGIT AUTOMATION FLAT | $ 0.011 | Passthroughs Times Unit Cost Savings |
| 25 | 5 DIGIT NONAUTOMATION | $ 0.010 | Passthroughs Times Unit Cost Savings |
| 26 | 5-DIGIT AUTOMATION LETTER | $ 0.047 | Passthroughs Times Unit Cost Savings |
| 27 | 5 DIGIT AUTOMATION FLAT | $ 0.005 | Passthroughs Times Unit Cost Savings |
| 28 | CARRIER ROUTE | $ 0.066 | Passthroughs Times Unit Cost Savings |
| 29 | HIGH DENSITY | $ 0.018 | Passthroughs Times Unit Cost Savings |
| 30 | SATURATION | $ 0.028 | Passthroughs Times Unit Cost Savings |
| 31 | WKSHARING DISCNTDELIVERY OFFICE ENTRY | $ 0.008 | Passthroughs Times Unit Cost Savings |
| 32 | | **TY BR Leakage** | **Notes** |
| 33 | BASIC NONAUTOMATION | $ - | |
| 34 | BASIC AUTOMATION LETTER | $ 30,817 | Final Discount times Volume |
| 35 | BASIC AUTOMATION FLAT | $ 8,377 | Final Discount times Volume |
| 36 | 3 DIGIT NONAUTOMATION | $ 212,455 | Final Discount times Volume |
| 37 | 3 DIGIT AUTOMATION LETTER | $ 239,653 | Final Discount times Volume |
| 38 | 3 DIGIT AUTOMATION FLAT | $ 40,110 | Final Discount times Volume |
| 39 | 5 DIGIT NONAUTOMATION | $ 2,223,628 | Final Discount times Volume |
| 40 | 5-DIGIT AUTOMATION LETTER | $ 189,644 | Final Discount times Volume |
| 41 | 5 DIGIT AUTOMATION FLAT | $ 212,039 | Final Discount times Volume |
| 42 | CARRIER ROUTE | $ 47,988,156 | Final Discount times Volume |
| 43 | HIGH DENSITY | $ 2,009,190 | Final Discount times Volume |
| 44 | SATURATION | $ 982,961 | Final Discount times Volume |
| 45 | WKSHARING DISCNTDELIVERY OFFICE ENTRY | $ 2,132,249 | Final Discount times Volume |
| 46 | Total Discount Leakage | $ 56,269,280 | Sum Line 33-45 |
| 47 | Revenue Required from Pieces + Discount Leakages | $ 108,283,357 | Line 46 plus Line 4 from Piece Discounts |
| 48 | TYBR Pieces | 722,431,237 | |
| 49 | Revenue Requirement + Leakage Per Piece {Base Rate} | $ 0.150 | Line 47/Line 48 |

# Appendix D, 7 of 10

**USPS-LR-L-126**
**Within County**
**Worksheet TYAR B.D.**

| TYAR BILLING DETERMINANTS - AFTER RATES VOLUME & REVENUES WITHIN COUNTY PERIODICALS | | | |
|---|---|---|---|
| **Pounds** | **TY AR Pounds** | **Proposed Rates** | **Postage (Rate*Pounds)** |
| Delivery Unit - Pound Rate | 105,321,546 | $ 0.140 | $ 14,745,016 |
| General - Pound Rate | 126,766,452 | $ 0.177 | $ 22,437,662 |
| **Presort Rate Pieces** | **TY AR Pieces** | **Proposed Rates** | **Postage (Rate*Pieces)** |
| BASIC NON-AUTOMATION | 15,294,097 | $ 0.140 | $ 2,141,174 |
| BASIC AUTOMATION LETTER | 497,774 | $ 0.080 | $ 39,822 |
| BASIC AUTOMATION FLAT | 902,094 | $ 0.131 | $ 118,174 |
| 3-DIGIT NON-AUTOMATION | 15,339,480 | $ 0.131 | $ 2,009,472 |
| 3-DIGIT AUTOMATION LETTER | 4,004,446 | $ 0.073 | $ 292,325 |
| 3-DIGIT AUTOMATION FLAT | 3,533,813 | $ 0.120 | $ 424,058 |
| 5-DIGIT NON-AUTOMATION | 68,412,119 | $ 0.121 | $ 8,277,866 |
| 5-DIGIT AUTOMATION LETTER | 3,910,481 | $ 0.074 | $ 289,376 |
| 5-DIGIT AUTOMATION FLAT | 41,099,272 | $ 0.116 | $ 4,767,516 |
| CARRIER ROUTE BASIC | 404,946,190 | $ 0.055 | $ 22,272,040 |
| CARRIER ROUTE HIGH DENSITY | 108,177,430 | $ 0.037 | $ 4,002,565 |
| CARRIER ROUTE SATURATION | 34,022,501 | $ 0.027 | $ 918,608 |
| WKSHARING DISCNTDELIVERY OFFICE ENTRY | 258,307,013 | $ (0.008) | $ (2,066,456) |
| Total Pieces & Calculated Revenue | 700,139,698 | | $ 80,669,217 |
| Ride-along Pieces | 566,207 | 0.155 | $ 87,762 |
| Adjusted Total Revenue including Ride-along | | | $ 80,785,505 |
| TYAR Fees | | | $ 1,563,000 |
| Calculated Revenue+TYAR Fees | | | $ 82,348,505 |
| TYAR Cost | | | $ 79,513,462 |
| Cost Coverage after calculation of new rates | | | 103.57% |
| Revenue per piece | | | $ 0.118 |

# Appendix D, 8 of 10

**USPS-LR-L-126**
**Within County**
**Worksheet Rate Design Input**

## Inputs to Within County Rates Development

| Item | Amount | Source / Notes |
|---|---|---|
| TY Before Rates Volume | 722,431,237 | USPS-LR-L-63, Witness Thress |
| TY After Rates Volume | 853,535,270 | USPS-LR-L-63, Witness Thress |
| TYBR Cost, Without Contingency | 81,056,095 | USPS-LR-L-7, Witness Waterbury |
| TYAR Cost, Without Contingency | 78,726,200 | USPS-LR-L-7, Witness Waterbury |
| Contingency Factor | 101% | USPS-T-10, Witness Waterbury |
| TYBR Cost, (Including Contingency) | $ 81,866,656 | Calculated (Line 7*Line 9) |
| TYAR Cost, (Including Contingency) | $ 79,513,462 | Calculated (Line 8*Line9) |
| Desired Cost Coverage | 103.70% | One-Half of Initial Cost Coverage for Outside County |
| TYBR Fees | $ 1,650,649 | USPS-T-39, Witness Berkeley |
| TYAR Fees | $ 1,563,000 | USPS-T-39, Witness Berkeley |
| Proportion of Revenue From Piece Rates | 62.5% | Assumption |
| MULTIPLIER TO GET ACTUAL REVENUE | 100.035% | Base Year Worksheet |
| Transportation Cost, Without Contingency | 96,625 | USPS-LR-L-7, Witness Waterbury |
| Transportation Cost, With Contingency | $ 97,592 | Calculated (Line 17*Line 9) |
| Proportion of Transportation Cost That is Distance Related | 0.5946 | USPS-LR-L-39, Witness Kelly |
| Distance Related Transportation Cost | $ 58,028 | Calculated (Line 18*Line 19) |

**USPS-LR-L-126**
**Within County**
**Worksheet Piece Discounts 2**

## CALCULATION OF PIECE DISCOUNTS, SHEET 2

| Line # | Presort Level | Unit Cost Savings (From Discounts W/S) | Passthrough |
|---|---|---|---|
| 3 | | | |
| 4 | | | |
| 5 | BASIC NONAUTOMATION | $ - | {Benchmark unit cost} |
| 6 | BASIC AUTOMATION LETTER | $ 0.302 | 20% |
| 7 | BASIC AUTOMATION FLAT | $ 0.013 | 70% |
| 8 | 3 DIGIT NONAUTOMATION | $ 0.073 | 12% |
| 9 | 3 DIGIT AUTOMATION LETTER | $ 0.305 | 19% |
| 10 | 3 DIGIT AUTOMATION FLAT | $ 0.012 | 86% |
| 11 | 5 DIGIT NONAUTOMATION | $ 0.080 | 12% |
| 12 | 5-DIGIT AUTOMATION LETTER | $ 0.316 | 15% |
| 13 | 5 DIGIT AUTOMATION FLAT | $ 0.003 | 166% |
| 14 | CARRIER ROUTE | $ 0.066 | 100% |
| 15 | HIGH DENSITY | $ 0.025 | 70% |
| 16 | SATURATION | $ 0.045 | 63% |
| 17 | WKSHARING DISCNTDELIVERY OFFICE ENTRY | $ 0.0138 | 55% |
| 18 | | **Final Unit Cost Savings** | **Notes** |
| 19 | BASIC NONAUTOMATION | $ - | |
| 20 | BASIC AUTOMATION LETTER | $ 0.060 | Passthroughs Times Unit Cost Savings |
| 21 | BASIC AUTOMATION FLAT | $ 0.009 | Passthroughs Times Unit Cost Savings |
| 22 | 3 DIGIT NONAUTOMATION | $ 0.009 | Passthroughs Times Unit Cost Savings |
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| 28 | CARRIER ROUTE | $ 0.066 | Passthroughs Times Unit Cost Savings |
| 29 | HIGH DENSITY | $ 0.018 | Passthroughs Times Unit Cost Savings |
| 30 | SATURATION | $ 0.028 | Passthroughs Times Unit Cost Savings |
| 31 | WKSHARING DISCNTDELIVERY OFFICE ENTRY | $ 0.008 | Passthroughs Times Unit Cost Savings |
| 32 | | **TY BR Leakage** | **Notes** |
| 33 | BASIC NONAUTOMATION | $ - | |
| 34 | BASIC AUTOMATION LETTER | $ 30,817 | Final Discount times Volume |
| 35 | BASIC AUTOMATION FLAT | $ 8,377 | Final Discount times Volume |
| 36 | 3 DIGIT NONAUTOMATION | $ 212,455 | Final Discount times Volume |
| 37 | 3 DIGIT AUTOMATION LETTER | $ 239,653 | Final Discount times Volume |
| 38 | 3 DIGIT AUTOMATION FLAT | $ 40,110 | Final Discount times Volume |
| 39 | 5 DIGIT NONAUTOMATION | $ 2,223,628 | Final Discount times Volume |
| 40 | 5-DIGIT AUTOMATION LETTER | $ 189,644 | Final Discount times Volume |
| 41 | 5 DIGIT AUTOMATION FLAT | $ 212,039 | Final Discount times Volume |
| 42 | CARRIER ROUTE | $ 47,988,156 | Final Discount times Volume |
| 43 | HIGH DENSITY | $ 2,009,190 | Final Discount times Volume |
| 44 | SATURATION | $ 982,961 | Final Discount times Volume |
| 45 | WKSHARING DISCNTDELIVERY OFFICE ENTRY | $ 2,132,249 | Final Discount times Volume |
| 46 | Total Discount Leakage | $ 56,269,280 | Sum Line 33-45 |
| 47 | Revenue Required from Pieces + Discount Leakages | $ 108,283,357 | Line 46 plus Line 4 from Piece Discounts |
| 48 | TYBR Pieces | 722,431,237 | |
| 49 | Revenue Requirement + Leakage Per Piece {Base Rate} | $ 0.150 | Line 47/Line 48 |

# Appendix D, 10 of 10

**USPS-LR-L-126**
**Within County**
**Worksheet TYAR B.D.**

| TYAR BILLING DETERMINANTS - AFTER RATES VOLUME & REVENUES WITHIN COUNTY PERIODICALS | | | |
|---|---|---|---|
| **Pounds** | **TY AR Pounds** | **Proposed Rates** | **Postage (Rate*Pounds)** |
| Delivery Unit - Pound Rate | 105,321,546 | $ 0.110 | $ 11,585,370 |
| General - Pound Rate | 126,766,452 | $ 0.147 | $ 18,634,668 |
| **Presort Rate Pieces** | **TY AR Pieces** | **Proposed Rates** | **Postage (Rate*Pieces)** |
| BASIC NON-AUTOMATION | 15,294,097 | $ 0.150 | $ 2,294,115 |
| BASIC AUTOMATION LETTER | 497,774 | $ 0.090 | $ 44,800 |
| BASIC AUTOMATION FLAT | 902,094 | $ 0.141 | $ 127,195 |
| 3-DIGIT NON-AUTOMATION | 15,339,480 | $ 0.141 | $ 2,162,867 |
| 3-DIGIT AUTOMATION LETTER | 4,004,446 | $ 0.083 | $ 332,369 |
| 3-DIGIT AUTOMATION FLAT | 3,533,813 | $ 0.130 | $ 459,396 |
| 5-DIGIT NON-AUTOMATION | 68,412,119 | $ 0.131 | $ 8,961,988 |
| 5-DIGIT AUTOMATION LETTER | 3,910,481 | $ 0.084 | $ 328,480 |
| 5-DIGIT AUTOMATION FLAT | 41,099,272 | $ 0.126 | $ 5,178,508 |
| CARRIER ROUTE BASIC | 404,946,190 | $ 0.065 | $ 26,321,502 |
| CARRIER ROUTE HIGH DENSITY | 108,177,430 | $ 0.047 | $ 5,084,339 |
| CARRIER ROUTE SATURATION | 34,022,501 | $ 0.037 | $ 1,258,833 |
| WKSHARING DISCNTDELIVERY OFFICE ENTRY | 258,307,013 | $ (0.008) | $ (2,066,456) |
| Total Pieces & Calculated Revenue | 700,139,698 | | $ 80,707,974 |
| Ride-along Pieces | 566,207 | 0.155 | $ 87,762 |
| Adjusted Total Revenue including Ride-along | | | $ 80,824,276 |
| TYAR Fees | | | $ 1,563,000 |
| Calculated Revenue+TYAR Fees | | | $ 82,387,276 |
| TYAR Cost | | | $ 79,513,462 |
| Cost Coverage after calculation of new rates | | | 103.61% |
| Revenue per piece | | | $ 0.118 |