Postal Regulatory Commission
Submitted 7/12/2010 4:16:57 PM
Filing ID: 68947
Accepted 7/12/2010

BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, D.C. 20268B0001

SIX-DAY TO FIVE DAY STREET DELIVERY AND RELATED SERVICE CHANGES, 2010	Docket No. N2010-1

RESPONSES OF THE UNITED STATES POSTAL SERVICE TO QUESTIONS 1-2, 5-6 OF CHAIRMAN'S INFORMATION REQUEST NO. 7 (July 12, 2010)

The United States Postal Service hereby provides its responses to Questions 1-2, 5-6 of Chairman's Information Request No. 7, dated July 2, 2010. Answers were sought no later than today. Each question is stated verbatim and is followed by the response. Responses to Questions 3-4 will be filed when available.

The responses are sponsored by witnesses in this docket as follows:

Questions 1-2, 5.a.-c. -- Granholm (USPS-T-3)
Questions 5.d.-e., 6 – Bradley (USPT-T-6)

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorney:

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July 12, 2010

RESPONSE OF POSTAL SERVICE WITNESS GRANHOLM
TO CHAIRMAN'S INFORMATION REQUEST NO. 7

Question 1

1. Please provide a table (in the format provided as an example following this question) with the number of routes, by district, currently receiving 1, 2, 3, 4, 5, or 6 days of delivery, respectively.

	1 Day	*2 Days*	*3 Days*	*4 Days*	*5 Days*	*6 Days*
District 1						
District 2						
…						
District n						

RESPONSE:

I have been informed that it is not possible to provide data in the requested table format, but the data are relatively straightforward.

All city routes are delivered six days a week.

Out of 74,714 rural routes, all except 16 are delivered six days a week. Those 16 routes are delivered tri-weekly: 2 in the Seattle district, 11 in the Big Sky district, and 3 in the Colorado/Wyoming district.

There are approximately 270 contract delivery routes that are delivered tri-weekly. Information is available for them by state, but not by district:

1 in Alaska, 10 in Alabama, 5 in Arizona, 9 in California,

20 in Colorado, 14 in Florida, 6 in Idaho, 1 in Kansas, 3 in Maine,

1 in Michigan, 1 in Minnesota, 70 in Montana, 35 in North Dakota, 20 in New Mexico, 4 in Nevada, 1 in New York, 1 in Oklahoma,

16 in Oregon, 14 in South Dakota, 5 in Texas, 4 in Utah,

and 29 in Wyoming.

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2. At the Rapid City, South Dakota and Buffalo, New York field hearings, the Commission received testimony about the practice of rural carriers carrying mail between post offices that is destined for home or post office box delivery at the receiving post office. The Commission heard concerns that if the Postal Service implements its five-day plan, this transportation link would be eliminated and post office box recipients in the receiving office would not receive mail on Saturday as they currently do. Please provide:
a. the number of routes on which carriers (rural or city) serve as a means of transporting mail between post offices;
b. the number of post offices and post office boxes that are dependent on such carrier transport;
c. the amount of mail volume involved; and
d. a description of how the elimination of the carrier transporting mail between post offices on Saturday will affect service to post office box patrons dependent on such transport.

RESPONSE:

[a]-[c] These data are not available, but I believe the numbers would be very small.

[d] The elimination of the carrier transporting mail between post offices on Saturday will not affect service to post office box patrons currently dependent on such transport. Other means of transport, such as contract transportation, will be employed.

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5. The Postal Service cites various reasons for basing its estimates of the costs saved by eliminating Saturday delivery on qualitative operational analysis rather than quantitative analysis of economies of density or of excess capacity. *See* Response to Chairman's Information Request (CHIR) No. 3, questions 5 and 8. Its operational analysis concludes that in the context of shifting Saturday volume to Monday delivery, Monday city carrier street costs would be increased by only 10 percent of Saturday city carrier street variable costs (plus added collection costs) and 66 percent of Saturday in-office costs.

a. What specific operational mechanisms or engineering phenomena are expected to bring about the absorption of 90 percent of the variable costs of delivering the added volume on Mondays?

b. Because different areas/districts may have different capacities to absorb displaced Saturday volume on Monday (or Tuesday, in the case of a holiday), please describe and discuss the operational changes required in different areas/districts that will be adopted to most efficiently absorb the displaced Saturday volume.

c. USPS-LR-N2010-1/3, at page 3, states:

> The street time includes transporting mail to and loading the vehicle, driving to and from the route, driving between stops while on the route, reaching for and fingering the mail at the point of delivery, and placing mail in the mailbox—**tasks that are mostly unaffected by volume.** (Emphasis added.)

The major activities referenced in this quote closely resemble the division of street time into functions that were analyzed for volume variability by the Postal Service and the Commission prior to Docket No. R2005-1. *See, e.g.,* Docket No. R87-1, Opinion and Recommended Decision, March 4, 1988, at 218. Specific engineering phenomena called "cost drivers" were identified that were found to cause street time to vary with volume. In the case of "driving between stops while on the route" (labeled "access time" in pre-R2005-1 analysis) the cost driver was stop coverage. In the case of "fingering the mail at the point of delivery" (labeled "load time" in pre-R2005-1 analysis) the cost driver was pieces-per-actual-delivery (ppd). As stop coverage or ppd rose, the

volume variability of these functions fell (their absorption of volume increased). Is the change in these cost drivers the primary source of the 90 percent absorption of street time hours that the Postal Service expects on Mondays after the elimination of Saturday delivery?

d. In the pre-R2005-1 analysis, access time and load time comprised the majority of street time. The rate at which those costs would be absorbed would be a function of changes in those cost drivers. To corroborate the expected street time cost absorption of 90 percent, please provide the percent increase in the stop coverage and pieces-per-delivery cost drivers that would be expected to occur on Mondays (or Tuesdays, in the case of a Monday holiday) under the five-day delivery scenario. Please do this using the most recent fiscal year for which data on stop coverage and ppd are available. If date-specific City Carrier Cost System data is not available and sufficient to perform such an analysis, please explain.

e. The passage from USPS-LR-N2010-1/3 quoted in subpart c., above, asserts that the listed tasks are "mostly unaffected by volume." Of those listed tasks, load time was the largest in terms of its contribution to attributable street time costs under the Postal Service's pre-R2005-1 analysis. In the past, the Postal Service has consistently estimated that load time is more than 95 percent variable with volume. Under pre-R2005-1 analysis, the Postal Service's estimates of load time as a percent of total street time have ranged from 25 percent (based on the Street Time Sampling System) to 38 percent (based on the Engineered Standards study).

   i. If the load time task is nearly 100 percent variable with volume and it accounts for 25 to 38 percent of total street time, can these estimates be reconciled with an expected street time absorption factor of 90 percent under the five-day delivery scenario?

   ii. If load time depends on the volume of mail that is delivered at each individual delivery point, rather than on the number of routes served by a delivery unit, is there any reason to believe that the volume variability characteristics of this task should change under the five-day delivery scenario?

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RESPONSE:

[a] My office and I analyzed a potential operational change. We used our professional experience to identify the implications for how delivery will work in a 5-day environment, and the impact on hours. We did not review Commission volume variability studies. Based on an analysis of past results after Monday holidays, I concluded that 10 percent of the Saturday street delivery hours would need to be added to other days.

[b] The Postal Service has not, to my knowledge, made any determinations as to local measures to most efficiently absorb the "displaced" Saturday volume. The 10 percent figure is a national average figure.

[c] My office and I did not review, much less rely on, any prior studies of volume variability before the Commission.

[d] – [e]. Responses provided by Prof. Bradley.

Response of Postal Service Witness Michael D. Bradley
To Chairman's Information Request No. 7

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Question 5 Response:

I understand that responses to parts a., b. and c. have been provided by witness

Granholm. My responses to parts d and e are below.

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I am not the author of Library Reference USPS-LR-N2010-1/3 cited in the question, nor did I perform the operational analysis of expected Postal Service delivery activities in a five-day delivery environment. On the other hand, witness Granholm has no familiarity with the Commission studies from twenty years ago. Consequently, I am attempting to provide the Commission with the requested data and analysis, but am doing so from a general perspective.

d. To calculate the requested increase in stop coverage on Monday that would arise if the Postal Service were to move to five-day delivery, it would seem that one needs the following information for the year for which the analysis is done.

1. Possible Stops on Monday in the Six-Day Environment
2. Actual Stops on Monday in the Six-Day Environment
3. Volume on Monday in the Six-Day Environment
4. Volume on Saturday in the Six-Day Environment
5. A Mechanism for Predicting the Actual Stops as a Function of Pieces Per Stop in A Five Day Environment

Stops coverage is defined as actual stops (those receiving mail) divided by possible stops, so one can directly calculate this coverage from the data in a six-

day environment.[1] However, in a five-day environment such a direct calculation of actual stops is not available because the number of actual stops on each of the delivery days is unknown. As a result, a forecasting or prediction mechanism is required. Unfortunately, my review of the historical record revealed that there is no approved mechanism for making this prediction. In the Docket R90-1 Remand, and again in Docket No. R94-1, the Commission appears to have rejected all versions of the "coverage model"and determined attributable access costs solely on the basis of single subclass stops.[2] The Postal Service does not have a mechanism for predicting single subclass stops in a five-day environment and thus cannot use this methodology. Moreover, because the Commission left unresolved the appropriate mechanism for identifying the relationship between volume and coverage at multiple subclass stops, the Postal Service has no mechanism for predicting the change in the number of multiple subclass actual stops in a five-day environment. In addition, the existing models, even if they could be identified, were estimated on data collected more than fifteen years ago.

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[1] The Postal Service has determined that the most recent year for which stops data are available is FY2007. Because of the sharp decline in volume between FY2007 and FY2009, it would not be appropriate to directly use these data to calculate stop coverage for the five-day analysis and some adjustment to update the data to FY2009 would be required.

[2] See, Postal Rate Commission, Opinion and Recommended Decision, Docket No. R94-1 at III-33.

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In contrast, the Postal Service can provide some information on the predicted pieces per delivery in a five day environment. That is because the relevant data are currently available from the Carrier Cost System and the requested calculation is more straightforward. The average pieces per delivery by day of week can be calculated for both city and rural carriers by taking the annual volume delivered by day of week and dividing that by the number of deliveries multiplied by the number of delivery days. The relevant information is obtained from the Carrier Cost System and is presented below.

FY2009 CCS Deliveries

Total City	87,670,966
Total Rural	39,704,212

CCCS FY09 Volumes and Delivery Days by Day of Week (volume in thousands)

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
All Mail	19,781,925	16,843,058	16,952,286	16,634,199	17,873,229	15,895,008
Delivery Days	47	52	53	50	52	51

RCCS FY09 Volumes and Delivery Days by Day of Week (volume in thousands)

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
All Mail	9,951,178	8,266,923	8,152,509	7,953,006	8,419,537	7,782,013
Delivery Days	47	52	53	50	52	51

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This information is combined in the above formula to produce the average pieces per delivery point per day by day of week. Note this includes both residential and business delivery points.

City Average Pieces Per Delivery Point Per Day -- Six Day Delivery

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
4.80	3.69	3.65	3.79	3.92	3.55

Rural Average Pieces Per Delivery Point Per Day -- Six Day Delivery

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
5.33	4.00	3.87	4.01	4.08	3.84

To calculate the average pieces per delivery point per day, an assumption must be made about the days to which Saturday's volume will migrate. The actual migration is unknown but solely for the purpose of illustrating the requested calculation, this response makes the hypothetical assumption that that 50 percent of Saturday's volume migrates to Monday, 25 percent migrates to Friday and 12.5 percent migrates to Tuesday and Thursday.

City Average Pieces Per Delivery Point Per Day -- Five Day Delivery

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
6.73	4.13	3.65	4.25	4.79	0.00

Rural Average Pieces Per Delivery Point Per Day -- Five Day Delivery

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
7.42	4.48	3.87	4.50	5.02	0.00

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e.i. The question asserts that the load time task is nearly 100 percent variable with volume. However, my review of the historical record would indicate that this assertion would appear to be inaccurate, based upon the Commission's own work. When the Commission estimated its own load time function, it found the estimated variability to far below 100 percent:[3]

> The overall variability for elemental load time that we calculate from the Commission's unrestricted models is 59 percent.

As it turns out, load time would appear to have a relatively low variability. Such a low variability implies that total load time rises much less proportionately than volume and is evidence of material economies of density in delivery. Load time therefore would appear to provide an excellent example, in general, of how economies of density arise in a nonlinear context. For example, because pieces can be "bundled" for delivery into a mailbox, the additional variable labor time required to deliver an additional piece likely falls as the number of pieces put into the box rises.

[3] See, Postal Rate Commission, Opinion and Recommended Decision, Docket No. R90-1 at III-85.

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e.ii. Yes. There is reason to believe that the cost per piece for loading mail into the receptacle would fall as the number of pieces per delivery increases. This would be a source of productivity increase in the street time function and would be one reason why the additional variable time on other days of the week might not rise as much as the variable time falls on Saturday.

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6. The response to CHIR No. 5, question 12 states that aggregate city carrier delivery cost functions of Cobb-Douglas form and that other more flexible specifications are candidates for future econometric investigation of cost impacts from moving to five-day delivery. The response centers around the construction of aggregate cost models where the frequency of delivery over specified time periods (weekly) enters as a separate explanatory variable. However, the Commission is still left with the present task of evaluating city carrier savings without resort to future data that might provide a more definitive resolution to this issue.

Therefore, as another alternative to other cost impact approaches presented by the Commission in previous questions, please consider the following approach that would use daily cost and volume data in estimating cost savings for an entire year. The data to be used, posed in this alternative, is available in the FY 2009 DOIS database that was filed with the Commission as USPS-LR-2010-1/6 and in response to CHIR No. 3, question 10.

Consider total delivery costs for some week i to be the sum of daily delivery costs for that week. Cost for any day t in week i is specified as a function of delivery volume and possible deliveries for that particular day. Therefore, the delivery cost for that day can be shown as $c(v_{it}, PD_{it})$ and the total cost for week i is $C_i = \sum c(v_{it}, PD_{it})$, where $t = 1,2,\ldots,T_i$. Because of holidays, T_i (the number of delivery days for any week i) is variable. Indexing Saturday as t = 1, Monday as t = 2, and so on, the Saturday cost saving for any week i is $c_{i1} = c(v_{i1}, PD_{i1})$, where c_{i1} is revealed from the data. A first order approximation for the cost increase (the offset) from diverting Saturday volume for delivery on other days can then be shown as $\sum \Delta c_{it} \approx \sum (\partial c(v_{it}, PD_{it})/\partial v_{it})*\Delta v_{it}$, subject to the no volume loss constraint $v_{i1} = \sum \Delta v_{it}$ where $t = 2,\ldots,T_i$. The constraint states that the sum of the new volume increments on each of the non-Saturday delivery days $\sum \Delta v_{it}$ must sum to the original Saturday volume v_{i1}. Therefore, net city carrier delivery savings for week i can be approximated by summing the known Saturday savings less the approximated offset:

$$\Delta C_i \approx c_{i1} - \sum (\partial c(v_{it}, PD_{it})/\partial v_{it})*\Delta v_{it}. \quad (1)$$

From the daily cost function, the volume variability for each delivery day in week i can be specified as: $VV_{it} = (\partial c(v_{it}, PD_{it})/\partial v_{it})v_{it}/c_{it}$.

Therefore substituting in (1) yields $\Delta C_i \approx c_{i1} - \sum VV_{it}*(c_{it}/v_{it})*\Delta v_{it}$ or:

$$\Delta C_i \approx c_{i1} - \sum VV_{it}*c_{it}*(v_{i1}/v_{it})*\Delta v_{it}/v_{i1}, \quad (2)$$

where $1 = \sum \Delta v_{it}/v_{i1}$ from the no volume loss constraint. Now suppose volume variability is a constant value VV. Then (2) can be expressed as:

$$\Delta C_i \approx c_{i1} - VV*[\sum c_{it}*(v_{i1}/v_{it})*\Delta v_{it}/v_{i1}]. \quad (3)$$

It follows that if VV is known, and daily volume and cost values are revealed from the data, then ΔC_i can be approximated given any distribution of Saturday volumes among the remaining delivery days (the individual Δv_{it} values).

To illustrate, if all Saturday volume is assumed to be delivered on a non-holiday Monday, then $\Delta v_{i2} = v_{i1}$ and (3) simplifies to $\Delta C_i \approx c_{i1} - VV*c_{i2}*v_{i1}/v_{i2} = c_{i1}*(1 - VV*(c_{i2}/c_{i1})*v_{i1}/v_{i2})$. If volumes and possible deliveries on the two days are the same, then so are costs and therefore $\Delta C_i \approx c_{i1}*(1 – VV) = c_{i2}*(1 – VV)$. However, with Saturday volume less than Monday volume, $(c_{i2}/c_{i1})*v_{i1}/v_{i2} < 1$ can be expected in general (because of concavity in the cost function), and therefore the cost decrement is greater than if volumes are equal on both days.

Please comment on the usefulness of the above approach, or any extension/modification to the approach that could be added, for estimating cost savings for each week, using system level known daily volumes and costs by week for an entire year using FY 2009 DOIS data. In your comments, please identify the various distributions of Saturday volumes for delivery on other days useful for evaluation to establish a range of possible cost savings.

Question 6 Response:

Initially, I would note that the Commission already has a powerful and flexible tool for evaluating city carrier savings without resort to future data, namely the cost model described in my testimony and submitted in Library Reference USPS-LR-N2010-1/6. That model is not only consistent with Commission-approved methods of attributing costs for both city and rural carries, but is also consistent with a wide range of assumptions about "absorption rates," wage rates, volume variabilities, transfers of

hours from Saturday to other days, and the operational structure in a five-day environment.

As I understand the approach proposed in the question, it would estimate the city carrier cost savings from moving to five-day delivery by calculating the additional cost saved by using a day-specific "driver" variability. That is, it would require estimation of the elasticity of daily hours with respect to daily delivered volume using time series data, and then application of the estimated daily variability to the calculation of daily and ultimately annual cost savings. Moreover, the question seeks guidance on implementing the proposed approach using FY2009 DOIS data.

In this response, I assist the Commission by attempting to implement the proposed approach using FY2009 DOIS data. Before doing so, however, I would reiterate my concerns with such an approach, as expressed in my response to Question 9 of Chairman's Information Request 6. I will also demonstrate the flexibility of the cost model put forth in my testimony, showing how the results of the proposed new "volume variability" approach can be incorporated into that model.

To estimate cost savings using the proposed new "volume variability" approach, one must move away from the purely theoretical and begin making the structure computational. The first step in making it computational is recognizing that the cost

savings from moving to five-day delivery are necessarily the difference between what is saved on Saturday and what additional costs are incurred on other days of the week.[4] To derive a computational formula, one starts with the definition of Saturday costs as the product of Saturday hours (H_S) and the relevant wage (ω):

$Cost_S = \omega H_S$

The cost savings are the difference between this saved cost and any additional cost incurred on other days:

$\text{Cost Saving} = \omega H_S - \sum \Delta C_i. = \omega H_S - \sum \Delta \omega H_i$

The proposed approach suggests approximating the additional costs on the other days by using the derivative of costs with respect to volume. Given that wages are not affected by daily volume changes, this amounts to using the derivative of hours with respect to volume.[5] The proposed approximation is thus:

$$\sum \Delta \omega H_i - \omega \sum \Delta H_i \approx \omega \sum (\partial H_i / \partial v_i) * \Delta v_i.$$

Furthermore, as suggested in the question, this approximation can be transformed by using the formula for the daily "volume variability" or the daily elasticity of cost with respect to volume (ε). Thus if:

[4] The proposed approach is silent on how to handle the remaining delivery of Express Mail on Saturday in the "volume variability" approach so I also ignore this issue in my response. In addition, it does not address how to handle indirect costs, so I also ignore that issue in my response.

[5] I note that this assumption is relaxed in my cost model and the user can employ whatever wage he or she thinks is appropriate.

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$\varepsilon = \partial H_i / \partial v_i \, (v_i / H_i)$

Then:

$\omega \sum \Delta H_i \approx \omega \sum \varepsilon H_i \, \Delta v_i / v_i$.

Or,

Cost Saving $\approx \omega H_S - \omega \sum \varepsilon H_i \, \Delta v_i / v_i$.

The next step is to come up with estimates of ε, one for street time and one for office time based upon FY2009 DOIS data. To do this one can make use of the fact that the current proposal is quite similar to the one put forth by the Commission in ChIR No. 3, Question 9. There, the Commission proposed that:

> The city carrier cost savings from eliminating a delivery day can be approximated as the product of average daily carrier costs and one less the volume variability measured at average daily volume.

This discussion is just a verbal version of the final cost savings equation proposed in this question: $\Delta C_i \approx c_{i1}*(1 - VV) = c_{i2}*(1 - VV)$. Therefore to obtain estimates of the relevant elasticities, one can use the elasticities estimated on FY2009 DOIS data that were supplied in response to that question:

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Elasticity of Daily Hours with Respect to Daily Volume, FY2009

	Quadratic Model	Translog Model
Office	47.4%	48.3%
Street	13.0%	13.6%

The next step is to estimate the percentage changes in daily volumes. The redistribution of Saturday volumes to other days is, of course, unknown, so I follow what is proposed in the question and assume that all Saturday volume is delivered on a non-holiday Monday, although one can employ the above formula for any assumed redistribution of Saturday volume. The relevant average non-holiday daily volumes from the FY2009 DOIS data set are reproduced below:

Mon	422,724,459
Tue	340,862,663
Wed	334,142,559
Thu	328,998,505
Fri	341,366,365
Sat	324,018,050

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Under the assumption that all of Saturday's volume is moving to Monday, the percentage increase in volume on Monday is given by 324,018,050/422,724,459 = 76.65 percent. This means the additional street hours on Monday would be 76.65% * 13% = 9.97 percent and the additional office hours would be 76.65% * 47.4% = 36.3 percent. In other words, this volume variability approach predicts a 9.97 percent increase in Monday's street time and a 36.3 percent increase in Monday's office time.

	Office Hours	Street Hours
Mon	363,489	933,872
Tue	330,014	908,370
Wed	331,313	920,062
Thu	324,000	890,894
Fri	332,426	901,802
Sat	323,431	855,548

Given the average non-holiday Monday office and street hours, one can compute the increase in Monday hours implied by the volume variability approach. That increase in office time is given by the product of the percentage increase in Monday office time and the average office hours on non-holiday Monday, or 36.3% * 363,489 = 132,063. The increase for street time is calculated in a similar way and is 9.97% * 933,872 = 93,056. To identify the total cost savings, one can identify what percentage of Saturday's hours is made up of the increase in Monday's hours. For street time, the percentage of Saturday's hours that will be added to Monday for the office is (132,063/323,431) or 40.8 percent. For the street, the percentage of hours that will be added to Monday is

(93,056/855,548) or 10.9 percent. These percentages can then be plugged in to the cost model submitted with my testimony to calculate the overall direct carrier savings and indirect carrier savings. This is done in the attached spreadsheet entitled, ChIR.7.Q.6.VVApproach.xlsx. That spreadsheet shows that this proposed new volume variability approach yields direct city carrier cost savings of $2.1 billion and this turns out to be close the estimated cost savings using the Postal Service's operations analysis which yields a direct city carrier cost saving of $1.9 billion. Also, when the direct city carrier cost is combined with rural carrier and indirect cost savings, it yields an overall carrier savings of $2.9 billion. Interestingly, this is quite close the overall carrier savings from moving to five day delivery found by applying the Commission's USO methodology (as presented in its Annual Report) to FY2009 costs, which is approximately $2.8 billion.