Postal Rate Commission
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BEFORE THE
POSTAL RATE COMMISSION
WASHINGTON, D.C. 20268–0001

POSTAL RATE AND FEE CHANGES
PURSUANT TO PUBLIC LAW 108-18

Docket No. R2005–1

RESPONSES OF POSTAL SERVICE WITNESS BRADLEY TO INTERROGATORIES OF VALPAK (VP/USPS-T14-1-2.b, 3-7.a, c) (June 2, 2005)

The United States Postal Service hereby provides the responses of witness Bradley to the following interrogatories of ValPak: VP/USPS-T14-1-2.b, 3-7.a, c, filed on May 19, 2005. Question 2.c was redirected to witness Kelley, question 7.b to witness Lewis, and question 8 to witness Harahush.

Each interrogatory is stated verbatim and is followed by the response.

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorneys:

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June 2, 2005

Response of Postal Service Witness Michael D. Bradley
To Interrogatories Posed by Valpak

VP/USPS-T14-1.
Your testimony at page 54 (ll. 7-8) states that the number of Zip Codes used to estimate the regression is 1,545. Your testimony at page 17 (ll. 3-11) identifies types of sections found on a typical city carrier route.

a. For the 1,545 Zip Codes included in your final sample, please indicate the number of each type of section (as defined on p. 17 of your testimony) included in the sample.

b. For all city carrier routes, please provide the total number of each type of section, compare the sections in the sample frame with this universe, and discuss the extent to which the sample frame is representative of the universe of city carrier routes with respect to section coverage.

c. Please discuss why it would or would not be appropriate to treat the sample as a random stratified sample of section types, and to weight the sample results so as to provide a more accurate representation of the universe of section types.

VP/USPS-T14-1 Response:

First, I need to present a slight clarification. The number 1,545 refers to the number of observations in the estimation data set. As explained on page 31 of my testimony, the estimation data set was based upon Zip Code days. Thus, there are 1,545 Zip Code days used to estimate the regression, not 1,545 Zip Codes.

a. My estimation data set includes the time associated with each type of route section over the course of the route day, not number of sections. Thus, I can provide, by type, the number of routes-day observations with at least one route section of that type. This information is provided in the following table.

Type of Route Section	Proportion of Route Days Having At Least One Section of this Type
Loop/Foot	61.8%
Curbline	39.6%
NDCBU	28.2%
VIM	0.9%
Central	32.8%
Dismount	46.7%

Please note that the percentages do not add to 100 percent because an individual route can have route sections of multiple types.

b. This information is not available. The Postal Service does not collect or possess information on the number of route sections. In the CCSTS, route sections were identified by the individual carrier.

c. Because there is no frame for route sections, I believe it would not be possible to calculate accurate weights as discussed in your question.

Response of Postal Service Witness Michael D. Bradley
To Interrogatories Posed by Valpak

VP/USPS-T14-2.

The responses to VP/USPS-T30-1-3 state that in FY 2004 the Postal Service had the following number of city carrier routes:

	Number of Routes	Percent
Foot	11,454	7.0%
Park & Loop	87,793	53.7
Curbline	38,686	23.7
Dismount	25,418	15.6
Subtotal	163,351	100.0%
Other	2,267	
TOTAL	165,618	

a. Please provide the total number of city carrier routes included in the sample of 1,545 Zip Code areas, broken down by the type of route, as shown above.

b. Please compare the distribution of the routes in the sample frame with the universe of city carrier routes, and discuss the extent to which the routes in the sample frame are representative of the universe of city carrier routes.

c. Please discuss why it would or would not be appropriate to treat the sample as a random stratified sample of route types, and to weight the sample results so as to provide a more accurate representation of the universe of route types.

VP/USPS-T14-2. Response

a.

	Number of Routes	Percent
Foot	237	7.1%
P&L	1904	57.3%
Curbline	670	20.2%
Dismount	510	15.4%
Subtotal	3321	100.0%
Other	40	
Total	3361	

b. Given that the sample was selected by Zip Code, and not by route, there would appear to be a strong correspondence between the sample distribution for 2002 and the frame distribution for 2004.

c. Redirected to Witness Kelly.

Response of Postal Service Witness Michael D. Bradley
To Interrogatories Posed by Valpak

VP/USPS-T14-3.
Please refer to your testimony at page 36, where you discuss the Tolerance factor, the Variance Inflation Factors ("VIF") measure, and multicollinearity, as well as Table 4, which shows tolerances and VIF for the full quadratic model. Subsequently, at page 38 (ll. 3-4), you state that if "cross products can be omitted without doing violence to the estimated variabilities, the precision of the estimation can be greatly increased."

a. Please define what you would regard as a "great increase" in precision, as you use that phrase here, as well as in the context of the full quadratic model and the restricted quadratic model that results after elimination of the cross products.

b. Please provide a table, similar to Table 4, showing the tolerance and VIF for the restricted quadratic model, the results of which are shown in Table 5 (p. 38).

VP/USPS-T14-3 Response:

a. In the cited section of my testimony, I was discussing the problem of multicollinearity in estimating the regular delivery equation. Multicollinearity leads to coefficients with inflated standard errors and coefficients with the wrong sign. The increase in precision I was referring to was the characteristic of reducing the standard errors of the estimated coefficients and estimating coefficients with the correct signs. Both of these outcomes occurred from the elimination of the cross product terms.

b. Please notes that the tolerances and VIFs for the restricted quadratic model are provided on pages 24 and 25 of LR-K-81. I reproduce them below for convenience.

Response of Postal Service Witness Michael D. Bradley
To Interrogatories Posed by Valpak

Tolerances and VIF for the Restricted
Quadratic Model

Variable	Tolerance	VIF
Letters	0.0466	21.4
Letters^2	0.0764	13.1
Flats	0.0629	15.9
Flats^2	0.0835	12.0
Sequenced	0.2707	3.7
Sequenced^2	0.2857	3.5
Collection	0.2235	4.5
Collection^2	0.2454	4.1
Small Parcels	0.1256	8.0
Small Parcels^2	0.1656	6.0
Delivery Points	0.0586	17.1
Delivery Points^2	0.0830	12.1
Density	0.1387	7.2
Desiity^2	0.1431	7.0

Response of Postal Service Witness Michael D. Bradley
To Interrogatories Posed by Valpak

VP/USPS-T14-4.

Please refer to Table 6 at page 39 of your testimony. Please explain whether the variabilities shown in each column of that table reflect any of the quadratic or cross product coefficients shown in Table 3 (p. 35) and Table 5 (p. 38).

VP/USPS-T14-4 Response:

Yes, the higher order terms are reflected in the calculated variabilities. The formula for calculating the variability is given on page 39 of my testimony. To see how this formula involves quadratic and cross product terms, let's apply it to a simple two-variable quadratic model:

$$y = \beta_0 + \beta_1 x + \beta_2 x^2 + \beta_3 z + \beta_4 z^2 + \beta_5 xz$$

For this equation, the variability formula is given by:

$$\lambda_{y,x} = \frac{\partial y}{\partial x}\frac{\bar{x}}{y(\bar{x},\bar{z})} = \frac{(\beta_1 + 2\beta_2 \bar{x} + \beta_5 \bar{z})\bar{x}}{y(\bar{x},\bar{z})}.$$

Response of Postal Service Witness Michael D. Bradley
To Interrogatories Posed by Valpak

VP/USPS-T14-5.

Please refer to your testimony from page 40, line 16 through page 41, line 15.

a. Would you agree that the total marginal time for Products A and B is 600 seconds? That is, 400 seconds for Product A, computed as 5 (seconds) times 80, and 200 seconds for Product B, computes as 10 (seconds) times 20? If you do not agree with this computation of total marginal time, please show how you would compute it.

b. Please explain the source of the total time of 800 seconds referred to at page 40, line 17, and explain why the total time of 800 seconds differs from the total marginal time of 600 seconds.

c. Please explain why you use 800 seconds in the equation at line 1 on page 41, instead of the total marginal time of 600 seconds.

VP/USPS-T14-5. Response:

a. Agreed.

b. The 800 seconds is the sum of the total marginal time (or, by its more familiar name, the volume variable time) of 600 seconds and the institutional time of 200 seconds. In general, the total time is equal to volume variable time (600 seconds) plus institutional time (200 seconds).

c. I use 800 seconds because that is the total delivery time associated with delivering the two products in the hypothetical. The total time is the correct value to be entered into the variability formula.

VP/USPS-T14-6.
Please refer to your testimony at page 44 (ll. 14-21), where you state that "[t]he variabilities derived from the fixed estimation are presented in Table 10... The regular delivery variabilities imply that a doubling of all volumes delivered on city routes would cause only [a] 7 percent increase in delivery time." Please explain how, using the estimated variabilities shown in Table 10, a doubling of volume "would cause only [a] 7 percent increase in delivery time," and show the deviation.

VP/USPS-T14-6 Response:

In preparing the reference paragraph, I had the following equation in mind:

$$\%\Delta DT = \sum_{i=1}^{n} \lambda_i \%\Delta V_i$$

in which DT stands for delivery time, the λ_i are the variabilities for the individual product volumes and the V_i are the individual product volumes. To calculate the 7% value, I applied this general formula to the fixed effects regular delivery variabilities presented in Table 10:

$$\%\Delta DT = 0.0539 * (0.5) + .0432 * (0.5) + 0.147 * (0.5) + .0197 * (.5) + 0.076 * (0.5)$$

$$\%\Delta DT = 0.1391 * (0.5)$$

$$\%\Delta DT = 0.07$$

This calculation demonstrates that the 7% value was predicated upon a 50 percent increase in all volumes. Clearly, when I wrote the paragraph I mistakenly typed "a doubling of" when I meant "a 50 percent increase in." I apologize for the typographical error. The last part of your question asks me to show a deviation, but I cannot determine what deviation you are requesting.

Response of Postal Service Witness Michael D. Bradley
To Interrogatories Posed by Valpak

VP/USPS-T14-7.
Section I.A of your testimony, at pages 1-2, criticizes the datedness of the data underlying the established model, and concludes by stating that "more recent data would be preferable" (p. 2, l. 21). Then, at page 59 (ll. 11-14), Step 2 of your procedure for estimating the amount of cased ECR Saturation mail relies on data from a study by witness Shipe presented in Docket No. R90-1.

a. Would you agree that witness Shipe's data upon which you rely are about as dated as other data that underlie the established model? If you do not agree, please explain.

b. Would you agree that carrier casing productivities may have changed with widespread adoption of vertical flats cases by city carriers? If not, please explain why not.

c. Would you agree that more recent data for manual casing productivity by city carriers would be preferable? If not, please explain.

VP/USPS-T14-7 Response

a. Partially agreed. It is my understanding that the part of Witness Shipe's testimony that deals with carrier casing productivities was based upon a controlled test in which individuals cased mail in a specific environment as opposed to data taken from actual operations. Consequently, Witness Shipe's data reflect the environment in which the test was performed as opposed to the operations being used at the time the test was taken.

b. Redirected to Witness Lewis.

c. Agreed, but difficulties associated with the vintage of the data are mitigated by the fact that data used by Witness Shipe were from a controlled test that was designed to replicate an environment that uses vertical flats cases.

Response of Postal Service Witness Michael D. Bradley
To Interrogatories Posed by Valpak

VP/USPS-T14-8.

At pages 58-59 of your testimony, you state that "the Carrier Cost System measures delivery-point sequenced mail separately and an estimate of the amount of ECR Saturation mail that is DPS can be directly obtained" (p. 58, l. 24 through p. 59, l. 2). Please explain how, given some measured or counted volume of delivery point sequenced ("DPS") letters, you can directly obtain the volume of ECR Saturation letters contained in that DPS volume.

VP/USPS-T14-8 Response:

Redirected to Witness Harahush.

CERTIFICATE OF SERVICE

I hereby certify that I have this date served the foregoing document in accordance with Section 12 of the Rules of Practice and Procedure.

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