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 OCA INTERROGATORIES [OCA/USPS-T14-1a.i, a.iii, b.ii, b.iii, 2 - 6] (April 26, 2005)

The United States Postal Service hereby provides its responses to above-listed interrogatories of the Office of the Consumer Advocate, filed on April 12, 2005. Interrogatory 1a.v. was redirected to witness Lewis, and Interrogatories 1a.ii and 1b.i were redirected to witness Stevens.

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

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorneys:

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

OCA/USPS-T14-1. Please refer to the testimony of witness Jeffery W. Lewis (USPS-T-30).

a. At page 3, lines 13-16, witness Lewis states that "adding bundles results in carriers retrieving mail from more sources when delivering mail on the street. For example, carriers must check and withdraw mail from the bundle of DPS letters, from the bundle of cased mail, and from each of the additional bundles taken directly to the street."

   i. Did you examine models of delivery time that included number of bundles (aggregated to ZIP Code level) as an explanatory variable? If so please describe your efforts and results. If not, why not?

   ii. Please confirm that Library Reference K-80 contains a dataset--AL161ZIPS.PRN–with 40,668 Zip-date-route records of volumes for delivery-point-sequenced (DPS) letters, non-DPS (i.e., cased) automation letters, non-DPS (i.e., cased) non-automation (i.e., "other") letters, cased flats, and sequenced mail volumes.

   iii. Did you examine models of delivery time that included volume of DPSed mail and volume of cased mail (aggregated to ZIP Code level) as explanatory variables? If so please describe your efforts and results. If not, why not?

   iv. Did you examine models of delivery time that included number of bundles in excess of three (3) (aggregated to ZIP Code level) as an explanatory variable? If so please describe your efforts and results. If not, why not?

   v. Do you consider "small parcels" to constitute a separate bundle (for operational purposes, not for labor-agreement purposes)? If not, why not?

b. At page 4, lines 2-5, witness Lewis states that there has been "an increase in curbline, cluster box (CBU), and centralized deliveries and virtually [no] growth of door delivery. Over time, as these modes of delivery have grown as a percentage of total deliveries, this change has fueled an increase in carrier street productivity."

   i. Please confirm that DOIS maintains number of possible delivery points by type for each route. (See LR-K-80 at 1.) If you do not confirm, please explain.

ii. Is "type" the same as "mode"—e.g., curbline, NDCBU, etc.? If not, are data on number of possible delivery points by mode available by route for the routes in your datasets? Can such data be generated? If so, please provide it. If not, why not?

iii. Did you examine models of delivery time that included number (aggregated to ZIP Code level) or existence of each delivery mode as explanatory variables? If so please describe your efforts and results. If not, why not?

OCA/USPS-T14-1 Response

a.i. No. To my knowledge no data exists on number of bundles actually carried by individual carriers on a daily basis.

a.ii. Redirected to Witness Stevens

a.iii. Yes. Please see page 47-48 of USPS-T-14 in the section entitled "Alternative Volume Definition." That section presents the results of estimating the delivery time model with cased letters and DPS letters as separate variables.

a.iv. No. To my knowledge no data exists on number of bundles actually carried by individual carriers on a daily basis.

a.v. Redirected to Witness Lewis.

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b.i Redirected to Witness Stevens

b.ii. I'm not sure exactly what you mean by "type," but "type" and "mode" generally refer to the nature of the delivery. Below, the set of definitions of the individual delivery variables are reproduced, for your convenience, from LR-K-81, page 4. The list describes the nature of the deliveries in each instance:

BUD		Business curbline deliveries.
BED	-	Business central deliveries
BND	-	Business NDCBU deliveries
BOD	-	Business other deliveries
RUD		Residential curbline deliveries
RED	-	Residential central deliveries
RND	-	Residential NDCBU deliveries
ROD	-	Residential other deliveries

b.iii. No. There is only a single delivery mode defined for each route in a Zip Code and this does not change. Thus there will be as many delivery modes in a Zip Code as there are routes in a Zip Code. Adding the number of delivery modes to the model would thus be similar to adding the number of routes to the model. A better way to test for the importance of the number of routes is to estimate a weighted regression in which the weight is the number of routes. Please see page 50 of USPS-T-14 for the results of this approach.

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OCA/USPS-T14-2. Please refer to your testimony at page 25, lines 4-8. You state that you are "trying to model the response in the city carrier delivery network in two areas: (1) how does regular delivery time respond to a sustained change in the volume of letters, flats, sequence mail, collection mail and small parcels? and (2) how does parcel/accountable delivery time respond to a sustained change in the volume of large parcels and accountables?"

a. Please define "sustained" as you use the term here.

b. Is it accurate to say that you wish to estimate the elasticity of regular delivery time with respect to a "sustained" change in volume? If not, why not?

c. Please explain how the elasticity you wish to estimate differs from witness Bozzo's short-run elasticity of labor supply with respect to volume.

OCA/USPS-T14-2 Response.

a. To keep in existence, maintain. Alternatively, to lengthen or extend in duration or space.

b. I think an accurate way to state it is as follows: I am modeling the response in delivery time to a sustained change in the volume of letters, flats, sequence mail, collection mail and small parcels. I do so because I wish to estimate variability consistent with the Commission's view of the appropriate variability:[1]

> . Witness Bradley's operational definition given in his response to P.O. Information Request No. 4 is consistent with the Commission's view of the correct time period for postal cost studies. "One should attempt to base prices on the marginal costs that will actually be incurred by the firm to serve a sustained increase in volume over the time period during which the prices will be in effect." Tr. 11/5417-18.

1 See, PRC Op., Docket No. R87-1, Vol. 1, at 79-80.

c. I don't know that it does.

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

OCA/USPS-T14-3. Please refer to your testimony at page 27, lines 5-6, where you state that "a geographical variable will be included as the density of delivery, the number of deliveries per square mile."

a. Would "number of deliveries per route mile" (aggregated to ZIP Code level) constitute a suitable geographical variable (where "route miles" is the total distance traveled during the "regular" delivery function)? If not, why not?

b. Would "number of deliveries per route mile" (aggregated to ZIP Code level) constitute a more natural geographical variable than number of deliveries per square mile? If not, why not?

c. Does "route miles" as defined in a., above, exist for the routes in your datasets? Can such data be generated? If so, please provide it. If not, why not?

d. Does data similar to "route miles" as defined in a., above, (e.g., total length of all block faces on a route) exist for the routes in your datasets? Can such data be generated? If so, please provide it. If not, why not?

e. Did you examine models of delivery time that included possible deliveries per route mile (aggregated to ZIP Code level) as an explanatory variable? If so please describe your efforts and results. If not, why not?

f. In developing your "square miles" measure, did you delete any of the following?
   i. bodies of water,
   ii. roadless areas,
   iii. uninhabited areas,
   iv. areas not served by city delivery carriers (e.g., served by rural carriers).

   If not, why not?

g. Did you examine models of delivery time that included possible deliveries per square mile net of areas listed in f., above, as an explanatory variable? If so please describe your efforts and results. If not, why not?

h. If one used a route-level geographical variable such as number of possible deliveries per route mile (aggregated to ZIP Code level), would that reduce possible problems resulting from including areas listed in f., above? If not, why not?

Response of Postal Service Witness Michael D. Bradley
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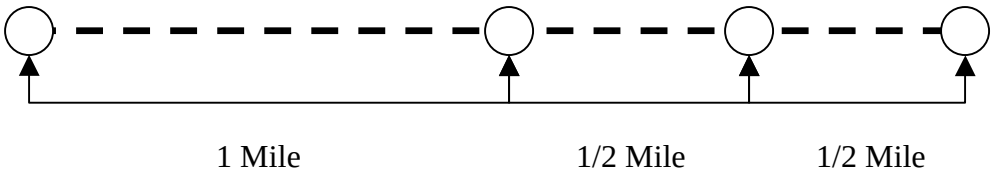
OCA/USPS-T14-3 Response:

a. I think not. There are both measurement and conceptual drawbacks to using number of deliveries per route mile as a density variable. My understanding is the Postal Service delivery network generally assigns delivery responsibilities to delivery units on the basis of Zip Codes. The delivery unit is responsible to delivering the mail to the deliveries within the geographical area defined by the Zip Code. Thus, the measure of density that best reflects the network responsibility would be the geographical area of the Zip Code. In addition, the number of deliveries per route mile might be a function of volume. Consider, for example a Zip Code with only four stops and one route:



The route has 4 stops and 2 miles. It thus has an average of 2 stops per mile. Now suppose that because of volume increases, the four stops must be served by two routes. The first two stops are served by one route and the last two stops are served by the other route. The first route would have 2 deliveries per route mile while the second route would have 2 deliveries per route mile or an average

of 4 deliveries per mile. Despite the fact that the geographic network has not changed, the geographic measure, deliveries per route mile has changed.

This example also illustrates the measurement problem. In the case where there are two routes, there is an open question how the deliveries per route mile should be calculated for the Zip Code. For example, should the average deliveries per mile be the average across routes? (The average of 2 deliveries per mile and 4 deliveries per mile yields 3 deliveries per mile). Or should the deliveries and routes miles be added before the average is taken? (A total of 4 deliveries divided by a total of 1.5 route miles for an average of 2 2/3 deliveries per mile).

b. No. Please see my answer to a.

c. No. "Route miles" as defined in a. above were not collected in the City Carrier Street Time Study so such a variable cannot be constructed.

d. No. Route miles were not collected in the City Carrier Street Time Study so such a variable cannot be constructed.

e. No. Please see my answers to a. – d. above.

f. Yes. I excluded bodies of water. I did not have data on roadless areas, uninhabited areas or areas not served by city delivery carriers

g. Yes. Please see pages 34 to 39 of USPS-T-14 for estimation of an econometric model that excludes bodies of water.

h. I don't know that there are possible problems with the items listed above. However, as explained in answer a. above, there are some potentially serious drawbacks from including deliveries per route mile aggregated to Zip Code level.

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To Interrogatories Posed by OCA

OCA/USPS-T14-4. Please refer to your testimony, page 38, Table 5.

a. Please confirm that your restricted quadratic model includes delivery points and delivery points per square mile (plus their squares) as explanatory variables. If you do not confirm, please explain.

b. Please explain the need and desirability of including four (4) functions of delivery points as explanatory variables in an econometric model.

c. Did you examine models of delivery time that included volume (letters, flats, etc.) per delivery point (plus their squares) as the only explanatory variables? If so please describe your efforts and results. If not, why not?

d. Would you agree that an increase in the distance between delivery points (ceteris paribus) would cause an increase in the time to complete a route? If not, why not?

e. If one could use the mean and variance (or mean squared) of distance between delivery points as explanatory variables, would there be any reason to include delivery points as a variable in a model of delivery time? If so, please explain.

f. Would you agree that if all delivery points on a route were concentrated at a single stop (e.g., at one NDCBU), then adding one delivery point to that route would cause almost no increase in delivery time? If not, why not?

g. Would you agree that if a new delivery point appeared in a ZIP Code that was five (5) miles from any other existing delivery point within that ZIP Code, serving that new delivery point would cause a significant increase in delivery time. If not, why not?

h. Did you examine models of delivery time that included functions of the distance between delivery points as explanatory variables? If so please describe your efforts and results. If not, why not?

OCA/USPS-T14-4. Response:

a. Confirm. Delivery points and density, as measured by delivery points per square

mile are both explanatory variables in the econometric equation. In a quadratic form all explanatory variables are entered into the equation with a first order term and a second order term.

b. The econometric equation is a quadratic functional form. In a quadratic functional form there are both linear and quadratic terms for the included variables. Delivery points and density are each included variables so both are included with linear and quadratic terms. While obviously related, they measure different things. The advantage of a quadratic functional form is that is allows for a nonlinear response in delivery time to the included variables. Previous research has shown that delivery time is likely to have a nonlinear response to the included variables.

c. No. If the explanatory variables are in terms of volumes per delivery then the dependent variable is logically expressed in terms of delivery time per delivery. One of the goals of the analysis is to estimate the system wide response of delivery time to volume changes. Focusing the estimation on the delivery time per delivery would not facilitate a system wide analysis. I would also note that such a specification would include twenty (20) “functions” of delivery points as explanatory variables.

d. In the postal network distance between delivery points is fixed by their location and is not increased or decreased. Moreover it is not possible to increase th distance between delivery points while holding everything else (specifically route length and the number of delivery points) constant. However, suppose one has two otherwise identical routes, (i.e. same volume, same distribution of volume per stop, same number of delivery points, etc) except that the delivery points are further apart on one of the routes and that route is therefore longer. The time to traverse the route would be greater on the route with delivery points farther apart. This would increase the total, but not volume variable, time on that route as compared to the first route.

e. Yes. The number of delivery points is included in the equation for reasons other than the geographic distance to be covered traversing the route. First, for a given volume of mail, the number of delivery points affects coverage. For a given volume of mail, the lower the number the delivery points the higher the coverage (the more stops that are receiving mail). Thus increases in volume are unlikely to create additional time accessing the delivery points. Second, for a given amount of volume the number of delivery points affects the number of pieces of mail received at each delivery. Variations in the amount of volume per

delivery would affect the amount of time required to load mail into the receptacles. Note that the number of deliver points is included in the Commission's MDR and BAM load time regressions.

f. Partially agree. The additional time would depend upon how much additional mail was being delivered to the new delivery. If the new delivery was not receiving any mail then the additional time would be very small indeed.

g. No. In the scenario you describe, the new delivery point would likely be its own route section. Thus there would be a substantial addition of network travel time, but very little additional delivery time.

h. No. I estimated models that included the number of delivery points per square mile rather than the inverse, the square miles per delivery point.

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OCA/USPS-T14-5. Please refer to your testimony at page 40, lines 7-8, where you state that the elasticities in your Table 6 "do not reflect the relative marginal delivery times for each shape." (Original emphasis.) Please provide a table in the form of your Table 6 showing marginal delivery times for each shape. Please show all calculations.

OCA/USPS-T14-5 Response:

Marginal Times for Regular Delivery
All Times are in Seconds

Shape	Full Quadratic Variability	Restricted Quadratic Variability
Letters	1.535	1.393
Flats	2.259	1.359
Sequenced	0.455	0.824
Collection	2.216	3.995
Small Parcels	-12.289	9.557

The calculations are shown in the SAS code below. This code can be easily added to the program Estimating Delivery Equations.SAS which is provided in LR-K-81.

Calculations for the full quadratic model:

```
data mtal1; merge coef1 regmean (drop=_TYPE_);

mtl=(let*mlet +2*let2*mlet*mlet
lf*mlet*mcf+lse*mlet*mseq+lcv*mlet*mcv+lspr*mlet*mspr
+ldp*mlet*mdp+ldns*mlet*mdens)/mlet;
mtf=(cf*mcf +2*cf2*mcf*mcf
+lf*mlet*mcf+fse*mcf*mseq+fcv*mcf*mcv+fspr*mcf*mspr
+fdp*mcf*mdp+fdns*mcf*mdens)/mcf;
mts=(seq*mseq +2*seq2*mseq*mseq
+lse*mlet*mseq+fse*mcf*mseq+scv*mseq*mcv+sspr*mseq*mspr
```

```
+sdp*mseq*mdp+sdns*mseq*mdens)/mseq;
mtc=(cv*mcv +2*cv2*mcv*mcv
+lcv*mlet*mcv+fcv*mcf*mcv+scv*mseq*mcv+cspr*mcv*mspr
+cdp*mcv*mdp+cdns*mcv*mdens)/mcv;
mtp=(spr*mspr +2*spr2*mspr*mspr
+lspr*mlet*mspr+fspr*mcf*mspr+sspr*mseq*mspr+cspr*mcv*mspr
+spdp*mspr*mdp+spdns*mspr*mdens)/mspr;

proc print data=mtal1;
var mtl mtf mts mtc mtp ;
```

Calculations for the restricted quadratic model:

```
data mtal2; merge coef2 regmean (drop=_TYPE_);

mtl=(let*mlet +2*let2*mlet*mlet)/mlet;
mtf=(cf*mcf   +2*cf2*mcf*mcf)/mcf;
mts=(seq*mseq +2*seq2*mseq*mseq)/mseq;
mtc=(cv*mcv   +2*cv2*mcv*mcv)/mcv;
mtp=(spr*mspr +2*spr2*mspr*mspr)/mspr;

proc print data=mtal2;
var  mtl mtf mts mtc mtp ;
```

Response of Postal Service Witness Michael D. Bradley
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OCA/USPS-T14-6. Please refer to your testimony at page 43, Table 9. Please provide a table in the form of your Table 9 showing marginal delivery times for each "shape." Please show all calculations.

Marginal Times for Parcel/Accountable Delivery
All Times are in Seconds

Shape	Variability
Large Parcels	37.796
Accountables	80.564

The calculations are shown in the SAS code below. This code can be easily added to the program Estimating Delivery Equations.SAS which is provided in LR-K-81.

Calculations for the Parcel Accountable Model:

```
data mtpa1; merge coefp1 pregmean (drop=_TYPE_);
mtp=(pcl*mpcl +2*pcl2*mpcl*mpcl+pact*mpcl*mact+padp*mpcl*mdp)/mpcl;
mta=(act*mact +2*act2*mact*mact+pact*mpcl*mact+acdp*mact*mdp)/mact;

proc print data=mtpa1;
var   mtp mta ;
```

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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