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

POSTAL RATE AND FEE CHANGES, 1997 | Docket No. R97–1

RESPONSE OF UNITED STATES POSTAL SERVICE
WITNESS BARON TO INTERROGATORIES OF
THE NEWSPAPER ASSOCIATION OF AMERICA
(NAA/USPS–T17—1–8)

The United States Postal Service hereby provides responses of witness Baron to the following interrogatories of the Newspaper Association of America: NAA/USPS–T17—1–8, filed on August 5, 1997.

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

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorneys:

Daniel J. Foucheaux, Jr.
Chief Counsel, Ratemaking

Richard T. Cooper

475 L'Enfant Plaza West, S.W.
Washington, D.C. 20260–1137
(202) 268–2993; Fax –5402
August 19, 1997

NAA/USPS-T17-1. Please refer to Table 1 at page 12 of your direct testimony concerning the calculation of fixed-time costs related to the "stops effect."

a. Please explain why you chose the lowest 20th percentile as your sample of one-letter stops to estimate "zero-volume" load times for SDR, MDR, and BAM stops.
b. Please provide the average load time for the entire sample of one-letter delivery stops for SDR, MDR and BAM stops.
c. For the estimates of "fixed time at stop" provided in this table, please provide the standard deviations of these estimates for the SDR, MDR, and BAM stop types.

RESPONSE:

a. See page 11, lines 4-16 of my testimony. The purpose of choosing the lowest 20th percentile was to obtain enough observations to produce reliable estimates of the minimum load times at one-letter stops.

b-c. The file FixedTime.XLS included with USPS LR-H-140 provides the data necessary to perform these calculations. I did not calculate the requested average load times as part of my analysis. However, I can report the following standard deviations (in seconds) for the 20th percentile data subsets used to calculate fixed time at a stop:

SDR	0.234
MDR	0.277
BAM	0.251

NAA/USPS-T17-2. Please refer to page 11, lines 15-17. You describe your estimates of fixed time per stop as "upper bound" estimates.

a. Please discuss what you would consider to be a reasonable "lower bound" of the fixed time per stop.
b. To the extent your fixed time per stop estimates represent the "upper bound" of the reasonable fixed time at stop, please confirm that application of these estimates will result in lower estimates of volume variable load-time costs than would the use of a "lower bound" estimate. If you cannot confirm, please explain your response.

RESPONSE:

a. A reasonable lower bound would be the smallest values of any set of estimates that **directly** measure pre-loading preparation time. These estimates would, specifically, measure the time carriers spend immediately prior to the point when they first begin handling mail pieces, bundles, mail containers, or other mail-related equipment at a stop for purposes of loading receptacles. Moreover, it is expected that these pre-loading times would be completely independent of, and hence uncorrelated with the volumes of mail that are eventually handled and loaded. The minimum of the pre-loading values would therefore be quite small, falling within the neighborhood of the 1 second per stop range that is estimated in my testimony for fixed-time per stop, as shown in table 1, page 12 of that testimony.

b. Confirmed. The higher the estimate of fixed-time per stop, the greater will be the cost that is removed from the accrued load time pool and moved into the access cost pool.

NAA/USPS-T17-3. Please refer to Equations (1) and (3) on pages 7 and 8 of your direct evidence. These equations are used to measure the volume variability of load time with respect to volume.

a. Please provide your interpretation of the coefficient α in each of these equations.
b. Does the coefficient α provide an estimate of the average fixed time per stop? If not, please explain why not.
c. Does the average fixed time per stop vary depending upon receptacle or container type? Please explain why or why not.

RESPONSE:

a. This intercept coefficient is added to the load-time equation to improve the fit of the ordinary least squares (OLS) estimation of the entire set of right hand side coefficients. Without the α term, the OLS estimation would be forced to set the intercept at zero. This would produce biased estimates of the slope coefficients.

b. α predicts carrier time at zero volumes and deliveries. However, the 1985 test data sets contain no actual data on carrier time expended when volumes and deliveries equal zero. Therefore the **estimates** of α in the regression equations (used in my testimony), which were derived from the 1985 test data set, are simply artifacts of the estimation procedure. These estimates should not be interpreted as valid measures of fixed-time per stop - the time expended at zero volumes and deliveries. For example, the estimates of α in the MDR and BAM regressions are both negative.

c. No. Receptacle and container types affect the amount of time spent in activities that involve the handling of mail or mail-related equipment. These activities include the three elements of load time defined on page 39 in the 1985 Load Time Variability Test, Industrial Engineer Test Package, which was presented in Docket No. R87-1, USPS LR-E-4. See my response to question 4a. Fixed-time at a stop measures the work performed immediately prior to the initial handling of mail or mail-related equipment.

NAA/USPS-T17-4. Please refer to Equations (1) and (3) on pages 7 and 8 of your direct evidence.

a. Please confirm that the dependent variable, load time, in each of these equations is equal to the total load time at a particular stop, including both fixed time activities (i.e., related to the "stops effect") and the time directly related to loading and collecting mail. If you cannot confirm, please explain what measure of load time was used in each of these equations.
b. Please explain whether the calculations used to derive the elasticities of load time with respect to volume are measured at the mean load time. If not, please explain how the elasticities were calculated and provide a simplified example.
c. If the response to (b) is affirmative. Please explain whether the mean load time used in the calculation of the elasticities includes the fixed time associated with the "stops effect." If not, please explain how the mean load time was derived when measuring the elasticities.
d. Please confirm that the volume-elasticities for load time are applied to the cost pool that remains after the fixed-time costs have been transferred to access cost.
e. If your responses to parts (a) and (d) are affirmative, please explain whether the inclusion of the fixed component of load time in the estimation of the equations is inconsistent with the application of the resulting volume elasticities to load time costs excluding the fixed costs. If, in your opinion, there is no inconsistency, please explain why and demonstrate with a simplified example.

RESPONSE:

a. Partially confirmed. The dependent variable, load time, does equal the total load time at a particular stop. However, the load-time variable defined in the regression equations excludes fixed-time at a stop. This load-time variable equals the sum of three components: "mail preparation time," "load time," and "customer attend time." The definitions of these three components are presented on page 39 of the Load Time Variability Test, Industrial Engineer Test Package (August 1985), which was filed as USPS LR-E-4 in Docket No. R87-1. (These definitions are attached). Note, in particular, the definition of mail preparation time. This activity here is that of **handling** mail pieces, bundles, containers, or other mail-related equipment. As such, the mail preparation time interval is necessarily dependent on the volume of mail being loaded or collected. It will increase or decrease as volume increases or decreases. Thus, it

cannot include the pre-loading prep time encompassed by fixed-time at a stop, since the latter, by definition, is completely **independent** of the total volume to be loaded or collected at a stop.

b. The procedure to derive the elasticities with respect to volumes is explained at pages 2-3 of USPS LR-H-137. The SAS program code and outputs in this library reference implement this procedure, and present the elasticity results. For each stop type (SDR, MDR, and BAM), the procedure substitutes average values for the right hand side variables in the appropriate load-time regression. This produces a predicted value for load time, and a set of predicted partial derivatives of load time with respect to the volume terms. This predicted load time does not equal the mean of the load-time values reported in the 1985 load time test, which are the values used to estimate the load-time regression.

c. The elasticity estimation procedure does not derive a mean load time.

d. Confirmed.

e. The load-time values in the 1985 test data set used to estimate the load-time regressions do not include a fixed-time at stop component. See my response to part a.

Attachment to Response to NAA/USPS-T17-4

LOAD TIME VARIABILITY TEST

INDUSTRIAL ENGINEER
TEST PACKAGE

Foster Associates, Inc.
Washington, D.C. 20036

August 1985

Inter Stop Time (Element 1) - This consists of carrier time spent along the line of travel of the route on the street and in going to and returning from a stop, but excluding any time spent handling mail at the stop. The element begins when the carrier starts away from a stop after completing the mail and customer-related activities required at that stop. The element ends when the carrier reaches the next stop and starts the mail and customer-related activities required at that stop. For example, walking up and back over a front pathway is inter stop time; time spent slowing the vehicle for a stop and resuming speed after the stop for curbline delivery is inter stop time.

Mail Preparation Time (Element 2) - This consists of carrier time spent handling mail at or adjacent to a stop to prepare it for delivery or after collection. The element begins when the carrier starts handling mail or mail-related equipment and ends when the mail or equipment is appropriately ready for delivery or after collection. For example, separating a bundle of letters into batches destined to individual addresses is mail preparation time; combining flats and circulars from separate bundles is mail preparation time.

Load Time (Element 3) - This consists of carrier time spent at a stop to place mail into or onto a delivery receptacle and/or collect mail from a receptacle and/or perform mail- related customer services. The element begins when the carrier's hand starts moving with delivery mail towards the receptacle (after appropriate mail preparation) or reaching towards the receptacle for collection mail. The element ends when the carrier is ready to leave the receptacle. For example, putting a bundle of mail into a customer mail box and collecting a letter from inside the box is load time; inserting letters and newspapers through a door slot is load time; signing for a registered parcel is load time.

Attending Customer (Element 4) - This consists of carrier time spent serving or awaiting a customer with a mail item requiring individual treatment. The element begins when the carrier starts treating the affected piece of mail or customer as an individual item (such as departing from the normal line of travel or waiting for the customer to respond). The element ends when the carrier completes the required individual treatment and resumes routine operations. For example, going from a multiple apartment mail box to and from resident's apartment to deliver a parcel is attending customer time; ringing a doorbell, waiting, obtaining no response, and providing a "Notice of Attempt to Delivery" is attending customer time.

Delay for Study (Element 5) - This consists of any time delay to the carrier's performance or schedule caused by the ongoing load time variability test. For example, a delay after completing a stop because there was a large volume of collected mail for the IE to count is delay for study.

NAA/USPS-T17-5. Please refer to Table 14 at page 39.

a. Please confirm that total accrued load time costs amount to $995,848 thousand under both the new and previous methodology. If you cannot confirm this figure, please explain.

b. Please confirm that $139,504 thousand of these total accrued costs are "fixed" or "coverage-related" load-time costs under the new methodology. If you cannot confirm this characterization of these costs, please explain what these costs represent.

c. Please confirm that $522,577 thousand of the total accrued costs are volume-variable load time costs, If you cannot confirm this figure or this characterization of these costs, please explain.

d. Please explain whether the remaining $333,866 thousand ($995,848 less $139,405 less $522,577) of costs are fixed or variable in nature.

e. Given that these costs are not fixed costs associated with coverage of the stop and that these costs are not variable with volume, please explain what the remaining $333,866 thousand of costs represent.

RESPONSE:

a. Not confirmed. Under the new methodology, this cost is not regarded as the true total accrued load time cost. Instead, total accrued load time cost is defined as the $856,443 thousand that remains after the cost of fixed-time at a stop ($139,405) is deducted and moved into the access cost pool.

b. The $139,405 thousand cost pool is defined as the cost of fixed-time at a stop under the new methodology. This cost does not increase in response to increases in volume at existing stops. In this sense, the cost is fixed at each actual stop (just like traditional access cost). Obviously, however, this cost will go up as actual stops increase in response to volume growth.

c. Confirmed.

d. These costs are residual institutional costs. They are still variable in the sense that they will fall to zero if volume falls to zero.

e. See my response to part d.

NAA/USPS-T17-6. Please refer to page 24, lines 8-15. You state that the '"previous" approach uses equations 1 and 3 to calculate volume effects, and that the "only difference between this procedure and that proposed in Part 1 - Section 1 is the size of the cost pool by which the volume elasticities are multiplied to determine the volume-variable costs."

a. Please compare the elasticities provided in Table 10 at page 29 (previous methodology) to the elasticities provided in Table 6 at page 22 (new methodology). Please explain why the elasticities applied to calculate volume-variable load-time costs for MDR stops are 0.65129 under the "previous" methodology and 0.71026 under the "new" methodology if the only difference is the size of the cost pool to which the elasticities are applied.
b. Please explain any and all differences in the equations or calculations used to estimate the different elasticities described in part (a) above.
c. Please compare the elasticities provided in Table 11 at page 30 (previous methodology) to the elasticities provided in Table 7 at page 23 (new methodology). Please explain why the elasticities applied to calculate volume-variable load-time costs for BAM stops are 0.52107 under the "previous" methodology and 0.52665 under the "new" methodology.
d. Please explain any and all differences in the equations or calculations used to estimate the different elasticities described in part c above.

RESPONSE:

(a)-(d). The elasticity estimation procedures implemented by the new and previous methodologies for both MDR and BAM are the same in the sense that the same computational steps are performed. Specifically, mean values are calculated from FY 1996 CCS data or 1985 test data and substituted for the right hand side variables in the load-time equations. This produces predicted values for load time and for the partial derivatives of load time with respect to the volume and delivery terms. These predicted values are then substituted, along with the averages of the right hand side variables, into the standard formulas to produce elasticity estimates.

As shown in USPS LR-H-137 (see pages 2-3 and the SAS program and output listings), the application of these steps produces different elasticity estimates under the new methodology as compared with the previous methodology. The new methodology substitutes average **actual** deliveries for the deliveries variable on the right hand sides of the MDR and BAM equations, whereas the previous procedure substitutes average **possible** deliveries for the deliveries variables. It is this difference that accounts for the

differences between the MDR variability estimates in tables 10 and 6 of my testimony, and the differences between the BAM estimates shown in tables 11 and 7 of that testimony.

NAA/USPS-T17-7(a). Please explain what work a carrier performs "to prepare for loading receptacles and collecting mail."

RESPONSE:

Please see my response to T17-8(b).

NAA/USPS-T17-8. Please refer to line 15 on page 36 and lines 1-15 on page 37 of your direct evidence.

a. Does evidence exist that the additional block of time resulting from the coverage of a new delivery at an existing actual stop should not be the same as the additional block of time that results from coverage of a whole new MDR or BAM stop? If so, please provide such evidence and explain simply the significance of such evidence.
b. Please explain what work a carrier performs to prepare for loading receptacles and collecting at a new multidelivery actual stop.
c. Please explain what work a carrier performs to prepare for loading receptacles and collecting at a new actual delivery at an existing stop.
d. If the work performed related to T17-8(b) and (c) is different, please explain how that difference supports recognizing the work performed related to T17-8(b) as "simply a component of access time" while recognizing the work performed related to T17-8(c) as "accounted for through the measurement of MDR and BAM elasticities of load time with respect to volume through the positive effect of volume increases on actual deliveries."

RESPONSE:

a. The requested information is derived in a new library reference, USPS LR-H-225. This library reference presents an extended version of the SAS program, LOAD2.ELAST.CNTL, presented in USPS LR-H-137 (which accompanied my testimony). The new program adds a print out of the derivatives of MDR and BAM load time with respect to actual deliveries. These derivatives, computed from the corresponding Postal Rate Commission load-time regressions, are the same as those substituted into the elasticity formulas to produce the elasticity estimates shown in tables 6 and 7 of my testimony. Each derivative measures the "additional block of time resulting from the coverage of a new delivery at an existing stop." The following table compares these derivatives with MDR and BAM fixed-time at stop estimates, obtained from table 1 of my testimony. Each fixed-time estimate measures an "additional block of time that results from coverage of a whole new MDR or BAM stop."

Stop Type	Derivative of Load Time With Respect to Actual Deliveries (Seconds)	Fixed Time at Stop (Seconds)
MDR	3.801	1.110
BAM	10.112	0.919

The implication of this table is that at the mean values of the right hand side regression variables used to estimate elasticities, the time to cover a new delivery at an existing MDR or BAM stop exceeds the fixed-time at stop required for pre-loading work.

b. This work is the activity of preparing to handle mail pieces, mail bundles, or mail-related equipment and to then place the mail into receptacles or collect mail from receptacles. This work occurs immediately after the carrier reaches the stop, and just prior to the initiation of the first loading activity at the stop. Note that the time required to do this work - what the Postal Rate Commission at paragraph 3158 of its R90-1 Decision calls coverage-related load time, and what my testimony calls fixed time per stop - is independent not only of the total volume delivered to the stop. It is also independent of the number of deliveries that get mail at that stop.

c. Pre-loading preparatory work has already been completed at a multi-delivery stop by the time mail has been loaded at one or more deliveries. No further preparatory work is performed by a carrier in proceeding from the last delivery loaded to a new delivery at the same stop. For a more detailed explanation of this difference between the activity of going from one actual stop to a new actual stop, and that of going from one actual delivery to a new actual delivery at the same stop, see Carrier Cost System, Handbook F-55, USPS LR-H-25 at pages 21-24.

d. The increase in time that occurs when a carrier proceeds from one delivery at a stop to a new delivery at the same stop is an increase in load time - properly accounted for through the measurement of elasticities of load time with respect to volume through the effects of volume growth on deliveries. The increase in fixed-time per stop that occurs because a carrier has accessed a new stop is, by definition, an increase in access time. Obviously, an increase in access time should be accounted for not in the load-time analysis, but in the traditional access time analysis - in particular, through measurement

of the elasticities of running time with respect to actual stops, and the elasticities of actual stops with respect to volumes.

DECLARATION

I, Donald M. Baron, declare under penalty of perjury that the foregoing answers are true and correct, to the best of my knowledge, information, and belief.

Donald M. Baron

Dated: 8/18/97

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon all participants of record in this proceeding in accordance with section 12 of the Rules of Practice.

Richard T. Cooper

475 L'Enfant Plaza West, S.W.
Washington, D.C. 20260–1137
August 19, 1997