USPS-ST-49

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

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Nov 12   4 47 PM '97

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

SUPPLEMENTAL TESTIMONY
OF
THOMAS W. HARAHUSH
ON BEHALF OF THE
UNITED STATES POSTAL SERVICE

1   Supplemental Testimony
2   of
3   Thomas W. Harahush

4   <u>AUTOBIOGRAPHICAL SKETCH</u>

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6   The autobiographical sketch filed in conjunction with my direct testimony,

7   USPS-T-3, is hereby incorporated by reference.

1   **I. PURPOSE OF TESTIMONY**

2   The purpose of this testimony is to adopt the portions of Library Reference

3   LR-H-89 that deal with the Postal Service's Carrier Cost Systems (CCS). This

4   material appears at pages 18-25 of the Library Reference. Library Reference H-

5   89 was filed on July 10, 1997; the portions of this Library Reference which I

6   adopt are attached to my testimony and designated as Exhibit USPS-49A. This

7   testimony presents a brief summary of this material.

8   **II. CARRIER COST SYSTEMS**

9   **A. City Carrier System**

10   Pages 18-21 of LR-H-89 describe the statistical documentation for the

11   City Carrier System, including the population and characteristics of interest, the

12   sample design, the manner in which the survey is administered, and the

13   estimation formulas used in the subsystem.   This material also discusses the

14   issue of data recoding.

15   **B. Rural Carrier System**

16   Pages 22-25 of LR-H-89 describe the statistical documentation of the

17   Rural Carrier System, including the population and characteristics of interest, the

18   sample design, the survey administration, and means of estimation used in the

19   subsystem. This material also discusses the issue of data recoding.

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Exhibit USPS-49A

City Carrier System
Statistical Documentation

CITY CARRIER SYSTEM
STATISTICAL DOCUMENTATION

A.   Population and Characteristics of Interest

For the City Carrier System (CCS), the study plan utilized is a probability sample of city carrier routes. The population of interest, or universe under study, is all mail delivered on all eligible city delivery letter routes within the Postal Fiscal Year. Characteristics of interest include mail volume, mail mix, and the number of potential and actual mail stops.

B.   Sample Design

A stratified, three-stage cluster sample design is used for the CCS. Every city letter route is assigned to one of four strata based upon whether the route is a Business Route or a Residential Route, and on the size of the route's post office (CAG A-E or CAG F-K). The sampling frame for the first stage cluster sample is the list of all city letter routes. A selected city route is then systematically sampled 13 times through the year, once each accounting period. The number of route parts or route trips for multi-carrier or multi-trip routes forms the second stage sampling frame. The elementary sampling unit is a mail stop.

First Stage Sample

.   The first stage sample is a cluster of route-delivery days. Routes are stratified into four strata: Business Routes in CAG A-E Offices; Business Routes in CAG F-K Offices; Residential Routes in CAG A-E Offices; and Residential Routes in CAG F-K Offices. A random sample of routes was systematically selected within each stratum. Each Accounting Period (AP), the mail delivered on these selected routes is sampled. Sampling this randomly selected panel of routes repeatedly produces a data set which contains both cross-sectional and time series variation in volume and coverage. A random delivery date is systematically assigned to each selected route for each AP.

Second Stage Sample

The second stage sample unit is the trip, or part of a route when the selected route is a multi-trip or multi-carrier route. One trip or one part of a route is randomly selected. Over 99% of city delivery letter routes are single carrier, single trip routes, and they are completely enumerated at the second stage.

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Third Stage Sample

The third stage sample unit is the mail stop. All possible mail stops on the selected route or route part/trip are identified, regardless of whether there is mail for the stop on the test day. One of the first ten stops is randomly selected, and every tenth stop thereafter is selected.

C.   Survey Administration

1.   Sample Selection Methodology

First Stage Sample

A stratified random sample of routes was selected from a file of eligible letter routes generated from the master file of all city routes. There are 31 business, residential and mixed delivery route types eligible for selection. Ineligible routes included parcel post, relay, collection, and other special purpose routes. VIM and Van Routes are not enumerated. These randomly selected routes are then repeatedly sampled each Accounting Period throughout the year. Table 1 shows the universe sizes, sample sizes and sampling rates by stratum.

TABLE 1: City Carrier System -- Universe Size and Sample Size by Stratum

Postal Quarter	Stratum	No. of Routes in Universe	Delivery Days	Route Delivery Days	Sample Size	Sampling Rate	Effective Sample	Effective Sampling Rate
1	BAE	4158	69	286902	120	0.000418	83	0.000289
	BFK	52	69	3588	3	0.000836	3	0.000836
	RAE	141215	69	9743835	1659	0.000170	1644	0.000169
	RFK	13270	69	915630	162	0.000177	157	0.000171
2	BAE	4158	68	282744	120	0.000424	82	0.000290
	BFK	52	68	3536	3	0.000848	3	0.000848
	RAE	141215	68	9602620	1659	0.000173	1615	0.000168
	RFK	13270	68	902360	162	0.000180	151	0.000167
3	BAE	4158	72	299376	120	0.000401	82	0.000274
	BFK	52	72	3744	3	0.000801	3	0.000801
	RAE	141215	72	10167480	1659	0.000163	1627	0.000160
	RFK	13270	72	955440	162	0.000170	152	0.000159
4	BAE	4158	93	386694	160	0.000414	111	0.000287
	BFK	52	93	4836	4	0.000827	4	0.000827
	RAE	141215	93	13132995	2212	0.000168	2167	0.000165
	RFK	13270	93	1234110	216	0.000175	204	0.000165

A test date was randomly assigned to each route for the Accounting Period (AP) in which the panel of routes was first selected. The method used for randomly assigning test delivery dates to selected routes ensured that a District would not have more than one City Carrier Route Test on any one delivery date. For subsequent Accounting Periods, the route is scheduled for testing on the same day of the AP as it was scheduled in during the first AP. Through the CODES (Computer On-site Data Entry System) administrative system, the District is provided an electronic copy of the list of selected routes and test dates and other information for each selected route delivery day.

Second Stage Sample

The second stage of sample selection is carried out on the day of the test. If the route is a multi-carrier route, the number of parts on the route is determined, and one part of the route is randomly selected. The random selection depends upon the day of the month and the number of parts on the route, and is automatically generated by the CODES software. Information is gathered only for the selected part of the route.

Similarly, if the route is being operated as a two-trip route on the test day, then one trip is randomly selected, and information is gathered for the selected trip only. The random selection of the trip is based on whether the test date is odd-numbered or even-numbered.

If the route is both a single-carrier and single-trip route, the entire route is selected at the second stage.

Third Stage Sample

The third stage of sample selection is carried out at the time of the test. The mail stop is the third stage sampling unit. The last digit of the test ID determines the number of the first stop to be tested. Thereafter, every tenth stop is tested.

2.   Data Collection Methodology

The data for each City Carrier Route Test are recorded using portable microcomputers with CODES software. After recording information which identifies the first and second stage sample units being tested, detailed information is recorded for each of the selected mail stops. Data are recorded after the carrier has cased all of the mail to be delivered that day. This detailed information includes: counts of possible deliveries; counts of deliveries with mail; information about the type of stop; mail counts by class and shape of mail; and,

counts of mail pieces with special services. Detailed instructions for City Carrier Route Test data collection are contained in Library References H-25 and H-71.

3.   Quality Assurance

CCS data pass through a series of control processes to ensure accuracy. The CODES microcomputer software directs the flow of questions and contains on-line edits, ensuring the consistency and completeness of the data. The data are then passed electronically to a desktop microcomputer, where they are "checked in", aggregated, and then transmitted electronically to the national host computer at the ISSC in San Mateo, California. There, additional editing is performed by the mainframe production system, and final adjustments and corrections are made by Headquarters technical staff. Details of the automated processes of data entry, editing, check-in, aggregation, and transmission are contained in Library References H-25, H-66, H-69, H-70, and H-71.

D.   Estimation

Estimation formulas are shown in Docket R94-1 Tr.1/66-67 and 118-119.

E.   Assumptions

The estimation methodology assumes that nonresponse is random, or independent of the quantities being estimated.

F.   Data Recoding

New rate categories from Docket No. MC95-1 were implemented on July 1, 1996, and CODES data collection software was changed to reflect the new categories. When the new software was implemented, counts of third-class single piece mail increased substantially, as did the proportion of single piece relative to the third-class bulk categories. For PQ 4, which spans July 1, some pieces which had been recorded as third-class single piece mail were recoded to third-class bulk rate regular. This was done by randomly assigning pieces to either third-class single piece or third-class bulk rate regular with probabilities such that the third-class single piece estimates for PQ 4 of FY 1996 would be consistent with growth adjusted estimates for PQ 4 of FY 95. The process was carried out separately for each shape category.

In the new CODES data collection software, no distinction was made between postal cards and post cards. Both were recorded as post cards. For PQ 4 of FY 1996, some pieces which had been recorded as single piece post cards were recoded to single piece postal cards, and the same was done for pieces recorded as postage due single piece post cards. This was done using the proportions that were observed in PQ 4 of FY 1995. Pieces recorded as non-automated post cards were recoded to presort or carrier-route presort post cards using proportions from PQ 4 of FY 95.

RURAL CARRIER SYSTEM
STATISTICAL DOCUMENTATION

A.   Population and Characteristics of Interest

For the Rural Carrier System (RCS), the study plan utilized is a probability sample of rural delivery routes. The population of interest, or universe under study, is all mail delivered on all rural routes within the Postal Fiscal Year. Characteristics of interest include mail volumes and mail mix by shape, class and subclass of mail.

B.   Sample Design

A stratified, three-stage sample design is used for the RCS. Every rural route is assigned to one of two strata based upon the number of rural routes in the District associated with the route. The sampling frame for the first stage sample is the list of all rural route delivery days. The number of intermediate offices for routes serving multiple offices forms the second stage sampling frame. The elementary sampling unit is a box.

First Stage Sample

The first stage sampling unit is the route delivery day. Routes are stratified into two strata: routes associated with Districts having more than 20 rural routes; and, routes associated with Districts having not more than 20 rural routes. Each Postal Quarter, a random sample of routes is systematically selected within each stratum, with probabilities proportional to the number of delivery days within the Postal Quarters. A random delivery date within the Postal Quarter is then assigned to each selected route.

Second Stage Sample

The second stage sampling unit is the office, when the selected route serves one or more intermediate offices. In that case, one office served by the route is randomly selected. However, the majority (about 92%) of routes do not serve intermediate offices, and are completely enumerated at the second stage.

Third Stage Sample

The third stage sample unit is the box. All possible boxes on the selected route or intermediate office segment are identified, regardless of whether there is mail for the stop on the test day. One box within the first twenty is randomly selected, and every twentieth box thereafter is selected.

C. . Survey Administration

 1. Sample Selection Methodology

 First Stage Sample

 Each Postal Quarter, a file of all rural routes is generated. Within each stratum, routes are systematically selected from the file of rural routes, with a sampling interval proportional to the number of delivery days within the Postal Quarter. For each selected route, a test date is randomly assigned from the list of delivery dates within the Postal Quarter. The method used for randomly assigning test delivery dates to selected routes ensures that a District does not have more than one Rural Carrier Route test on any one delivery date. Through the CODES administrative system, the District is provided an electronic copy of the list of selected routes and test dates and other information for each selected route delivery day. Table 2 shows the universe size, sample sizes and sampling rates by stratum.

TABLE 2: Rural Carrier System -- Universe Size and Sample Size by Stratum

Postal Quarter	Stratum	No. of Routes in Universe	Delivery Days	Route Delivery Days	Sample Size	Sampling Rate	Effective Sample	Effective Sampling Rate
1	1C	54378	69	3752082	1250	0.000333	1238	0.000330
	2C	35	69	2415	2	0.000828	2	0.000828
2	1C	54444	68	3702192	1252	0.000338	1231	0.000333
	2C	35	68	2380	2	0.000840	2	0.000840
3	1C	54978.	72	3958416	1319	0.000333	1301	0.000329
	2C	35	72	2520	2	0.000794	1	0.000397
4	1C	55891	93	5197863	1732	0.000333	1722	0.000331
	2C	35	93	3255	3	0.000922	3	0.000922

 Second Stage Sample

 The second stage of sample selection is carried out on the day of the test. If the route serves intermediate offices, only one of the offices is selected. The office to be tested is randomly determined by the CODES software. Data are recorded only for the selected office. If the route serves only one office, the entire route is selected at the second stage.

Third Stage Sample

The third stage of sample selection is carried out at the time of the test. The mail box is the third stage sampling unit. Identification of the first box on a route to be sampled is provided to the District with the list of selected routes and test dates. Thereafter, every twentieth box is selected, and detailed information is recorded.

2. Data Collection Methodology

The data for each Rural Carrier Cost Test are recorded using laptop microcomputers and CODES software. After recording information which identifies the first and second stage sampling units being tested, all accountable mail, parcels and postage due mail pieces for delivery on the route on the test day are counted and recorded by mail class or special service category. Then, detailed information is recorded for each of the selected mail boxes. Recording of data occurs after the carrier has cased all of the mail to be delivered that day. This detailed information includes counts of mail by class and shape of mail, and counts of parcels, accountables and postage due mail pieces. Detailed instructions on Rural Carrier Route test data collection are contained in Library References H-25 and H-71.

3. Quality Assurance

Rural Carrier Cost System data pass through a series of control processes to ensure accuracy. The CODES microcomputer software directs the flow of questions which ensures the completeness of the data. The software also contains on-line edits which ensure the consistency and completeness of the data. The data are then passed electronically to a desktop microcomputer, where they are "checked in," aggregated, and then transmitted electronically to the national host computer at the ISSC in San Mateo, California. There, additional editing is performed by the mainframe production system, and final adjustments and corrections are made by Headquarters technical staff. Details of the automated field processes of data entry, editing, check-in, aggregation, and transmission are contained in Library References H-25, H-66, H-69 through H-71.

D. Estimation

The estimation formulas are shown in Docket No. R90-1, Tr.1/533-538.

E. Assumptions

The estimation methodology assumes that nonresponse is random, or independent of the quantities being estimated. The variance estimation methodology used to compute confidence intervals ignores the effect of sampling at the second stage.

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F.   Data Recoding

New rate categories from Docket No. MC95-1 were implemented on July 1, 1996, and data collection software was changed to reflect the new categories. When the new software was implemented, counts of third-class single piece mail increased substantially, as did the proportion of single piece relative to the third-class bulk categories. For PQ 4, which spans July 1, some pieces which had been recorded as third-class single piece mail were recoded to third-class bulk rate regular. This was done by randomly assigning pieces to either third-class single piece or third-class bulk rate regular with probabilities such that the third-class single piece estimates for PQ 4 of FY 1996 would be consistent with growth adjusted estimates for PQ 4 of FY 95. The process was carried out separately for each shape category.

In the new CODES data collection software, no distinction was made between postal cards and post cards. Both were recorded as post cards. For PQ 4 of FY 1996, some pieces which had been recorded as single piece post cards were recoded to single piece postal cards, and the same was done for pieces recorded as postage due single piece post cards. This was done using the proportions that were observed in PQ 4 of FY 1995. Pieces recorded as non-automated post cards were recoded to presort or carrier-route presort post cards using proportions from PQ 4 of FY 95.