

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

RESPONSE OF POSTAL SERVICE WITNESS KELLEY  
TO INTERROGATORIES OF THE OCA (OCA/USPS-T16-1 - 7)  
(June 1, 2005)

The United States Postal Service hereby provides the response of witness Kelley to the following interrogatories of the OCA, filed on May 18, 2005: OCA/USPS-T16-1 -7.

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 1, 2005

**Response of Postal Service Witness John Kelley  
To Interrogatories Posed by the Office of the Consumer Advocate**

**OCA/USPS-T16-1.** Please refer to your testimony at page 8, lines 16-17. You state that your objective was to estimate the vast majority of variables with a coefficient of variation of less than ten percent.

- a. Why was 10 percent, as opposed to some other percentage, chosen?
- b. In lines 23-25 on page 8 you discuss the use of daily volume as a proxy for other variables in performing the computations. Please show the calculations used in conjunction with your testimony in lines 20-27.

**Response**

- a. Deriving estimates from sample surveys usually involves a need for a balance between precision and resources. Ten percent was selected as a target relative error because that level of reliability instilled a high level of confidence that the information collected as part of the CCSTS could be used for costing purposes.
- b. Refer to the attached spreadsheet. The calculations shown there refer to ones done based on the final sample of 167 ZIP Codes, with volume being used as a proxy (from FY2000 CCS tests) for the variables of interest to be collected in the study.

Response to OCA/USPS-T-16-1

Strata	$N_h$	N	$n_h$	$(N_h - n_h)$	Mean Daily Volume <sup>1</sup>	$S_h^2$	$1 - f_h$	Variance <sup>2</sup>
1	5793	11588	29	5764	13,765	100,002,400	0.99499	857,477.93
2	5747	11588	128	5619	64,477	1,522,319,266	0.97773	2,860,085.59
3	48	11588	10	38	165,423	2,214,670,895	0.79167	3,008.27
								3,720,572
Average volume across all strata					39,544			
Standard Deviation					1,929			
CV					4.88%			
<sup>1</sup> Data from CCS tests FY2000								
<sup>2</sup> Cochran, William G. <u>Sampling Techniques</u> 3 <sup>rd</sup> Edition (John Wiley & Sons, 1977) p. 92								

**Response of Postal Service Witness John Kelley  
To Interrogatories Posed by the Office of the Consumer Advocate**

**OCA/USPS-T16-2.** On page 9 of your testimony, line 26 through page 10, line 2 you discuss three possible strata. Please identify, for each encoded ZIP Code in the final sample, the stratum to which it belongs. If this information is already available in a database, please identify the database, appropriate column and, if possible, provide a printout of the first few lines in order that there may be no doubt on how to interpret the data.

**Response**

Please see the table below. Note, also, that of the 167 ZIP Codes in the final sample, two ZIP codes were excluded from the USPS-LR-K-79 and LR-K-81 scan-time files, and from the LR-K-80 and LR-K-81 volume files. These two ZIP codes are therefore also excluded from the table below. A third ZIP was included in the LR-K-79 scan-time file (COSTPOOL2.FINAL.XLS), and was therefore used in the LR-K-79, MDCD.CPSUM.FINAL.XLS calculations of the Segment 7 street-time percentages. However, this ZIP was excluded from the LR-K-81 scan-time file, and from the LR-K-80 and LR-K-81 volume files. For this ZIP, the table below therefore reports only the encoded ZIP (1335.00) from COSTPOOL2.FINAL.XLS.

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<b>Encoded Zip Used on the LR-K-79 and LR-K-80 Scan- Time and Volume Files</b>	<b>Masked Zip Used on the LR-K-81 Scan-Time and Volume Files</b>	<b>STRATUM</b>
1377.00	7761044	1
1122.26	5872302	1
922.50	207119	1
1093.41	8971623	1
989.10	1226213	1
1076.37	2644577	1
1053.01	4088800	1
1348.00	6151787	1
1113.44	3170247	1
1136.84	2946128	1
1040.37	4700671	1
1127.96	4416772	1
1113.12	2381912	1
999.29	206351	1
1366.00	5006634	1
1016.24	6833631	1
1325.00	3333330	1
1240.70	1830982	1
1077.27	2634763	1
871.65	502885	1
1308.00	9231238	1
932.78	4224807	1
1109.25	5561832	1
1217.68	2523329	1
1336.30	5967956	1
1062.08	7064632	1
956.10	1660939	1
900.51	3841890	2
1150.73	2071680	2
1042.38	9719666	2
1047.36	3541130	2
1108.94	1109097	2
1148.45	3637100	2
1134.97	4741966	2
833.30	5813957	2
914.77	1495397	2
1010.21	527528	2
1100.90	4286657	2
972.47	5268704	2
991.12	7408660	2
1096.58	6617639	2
1350.00	1111110	2
1029.59	3610207	2
1151.50	8767371	2
1023.98	7795307	2

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<b>Encoded Zip Used on the LR-K-79 and LR-K-80 Scan- Time and Volume Files</b>	<b>Masked Zip Used on the LR-K-81 Scan-Time and Volume Files</b>	<b>STRATUM</b>
950.67	7131259	2
1147.32	2432303	2
1321.00	2222220	2
1094.10	6915709	2
1283.25	8265880	2
1094.61	2516318	2
958.72	8755088	2
1154.51	3931949	2
1186.18	7211264	2
1098.24	1631973	2
1072.26	8090573	2
1143.87	2490591	2
1211.98	5386728	2
1010.97	3461089	2
946.86	6641989	2
1028.07	680989	2
1118.17	4220169	2
1112.82	4282180	2
1157.32	8573006	2
996.90	9600952	2
978.10	7033018	2
1063.05	4889538	2
975.44	2669128	2
993.57	4033945	2
1066.76	6019538	2
1135.87	3341404	2
1191.69	2409668	2
1032.12	7606474	2
949.71	7366497	2
1125.12	8807513	2
1179.79	4717812	2
1006.64	1618591	2
1133.32	7109598	2
1056.69	9404528	2
1105.56	264816	2
1135.37	9680073	2
1078.42	540658	2
1124.93	8586719	2
1229.85	8939761	2
1014.15	1352856	2
1158.21	5079251	2
1031.94	8885626	2
1017.34	3522403	2
1306.00	6714985	2
1104.59	9900515	2
761.84	6608572	2

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<b>Encoded Zip Used on the LR-K-79 and LR-K-80 Scan- Time and Volume Files</b>	<b>Masked Zip Used on the LR-K-81 Scan-Time and Volume Files</b>	<b>STRATUM</b>
995.59	478581	2
1091.46	3347202	2
1090.85	3711526	2
1038.85	5887042	2
1107.40	5119230	2
1159.84	3275234	2
1134.41	1891225	2
1140.45	6135928	2
1316.00	7944004	2
909.31	3117064	2
948.66	4826943	2
1091.36	1432093	2
985.46	8925917	2
1038.07	3078259	2
1109.45	5050753	2
1122.11	1376260	2
1132.47	1629153	2
916.27	8693266	2
975.43	8935185	2
1103.09	4193105	2
934.50	5161981	2
1124.81	6123091	2
1004.37	7875349	2
1030.27	6146537	2
1067.66	8768579	2
1032.56	7889371	2
1143.11	4017880	2
1016.26	6131949	2
1033.13	5056157	2
1125.39	5656871	2
1024.34	5335517	2
1224.06	4938880	2
944.37	8155849	2
1032.15	3023743	2
1124.53	6395033	2
1123.00	723582	2
1106.88	6980401	2
958.64	3975672	2
1399.00	6222079	2
1302.00	2556848	2
1061.98	8407116	2
1108.48	9216792	2
1243.68	3029022	2
1207.31	3109561	2
1095.13	7595552	2
1102.14	5621617	2

**Response of Postal Service Witness John Kelley  
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<b>Encoded Zip Used on the LR-K-79 and LR-K-80 Scan- Time and Volume Files</b>	<b>Masked Zip Used on the LR-K-81 Scan-Time and Volume Files</b>	<b>STRATUM</b>
1357.00	1635436	2
1114.00	2774051	2
1100.36	2958650	2
1098.31	265172	2
917.83	4228438	2
1096.44	6260501	2
994.01	9272079	2
1045.39	5627955	2
1014.06	7701991	2
1111.87	5875249	2
1055.71	8365476	2
977.69	2418845	2
1155.58	1797270	2
1019.05	9797599	2
1107.59	4690965	2
1208.60	8027588	2
1335.00	#N/A	2
994.64	823126	2
1288.00	6103170	2
968.05	5917898	2
975.17	275455	2
1012.96	8131706	3
1047.80	5692981	3
1106.16	6566657	3
1099.29	2330822	3
1016.15	7253903	3
1063.72	8937811	3
1127.21	9785658	3

**Response of Postal Service Witness John Kelley  
To Interrogatories Posed by the Office of the Consumer Advocate**

**OCA/USPS-T16-3.** Please refer to your testimony at page 10, lines 3-6. You reference the method of Dalenius and Hodges in choosing strata boundaries. Please provide the calculations and a table similar to Table 5A.12 in the book you have referenced, William Cochran, *Sampling Techniques*.

**Response**

My testimony on page 10 lines 3-6 references a table similar to Table 5A.12 in Cochran's 2<sup>nd</sup> Edition (which is Table 5A.11 in the 3<sup>rd</sup> Edition).

City Routes per ZIP Code	Frequency f(y)	Cum $\sqrt{f(y)}$
1-10	5,793	76.1
11-20	2,544	126.6
21-30	1,782	168.8
31-40	918	199.0
41-50	379	218.5
51-60	124	230.0

To determine the strata boundaries from the table, divide the final cum  $\sqrt{f} = 230$  by two (since only one boundary was determined using this method) which equals 115 and that is found in the table between the first and second rows. As a result, the first stratum had ZIP Codes with ten or fewer city letter routes and the second stratum contained ZIP Codes with more than ten and less than sixty-one city letter routes.

**Response of Postal Service Witness John Kelley  
To Interrogatories Posed by the Office of the Consumer Advocate**

**OCA/USPS-T16-4.** Please refer to your testimony at page 11. You indicate in line 11 that the stratified systematic sample design selected 221 ZIP Codes for the CCSTS. Please provide the calculations leading to the selection of 221 ZIP Codes. That is, how was the projected size of the sample determined?

**Response:**

The original sample size was based on the following three factors: 1) resource limitations; 2) precision targets; and 3) desire to sample the third strata with certainty. Originally, a sample size of 221 ZIP Codes with the third stratum sampled with certainty achieved our three objectives. Calculations were done, as shown on the attached sheet, to see the expected reliability from a sample of 221 ZIP Codes. A larger than necessary sample size was drawn to account for the possibility of non-response.

Response to OCA/USPS-T-16-4

Strata	$N_h$	N	$n_h$	$(N_h - n_h)$	Mean Daily Volume <sup>1</sup>	$S_h^2$	$1 - f_h$	Variance <sup>2</sup>
1	5793	11588	33	5764	13,765	100,002,400	0.99430	753,018.28
2	5747	11588	140	5619	64,477	1,522,319,266	0.97564	2,609,350.91
3	48	11588	48	38	165,423	2,214,670,895	-	-
								3,362,369
Average volume across all strata					39,544			
Standard Deviation					1,834			
CV					4.64%			
<sup>1</sup> Data from CCS tests FY2000								
<sup>2</sup> Cochran, William G. <u>Sampling Techniques</u> 3 <sup>rd</sup> Edition (John Wiley & Sons, 1977) p. 92								

**Response of Postal Service Witness John Kelley  
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**OCA/USPS-T16-5.** On page 12 of your testimony starting at line 5 you state that ZIP Codes with more than sixty letter routes incurred a reduction in sample size from forty-eight ZIP Codes to twelve ZIP Codes.

- a. Did you perform an analysis of the impact on statistical accuracy and precision resulting from this reduction? If so, please provide it. If not, please explain.
- b. Do you have any basis for evaluating whether this reduction introduced bias to the data collection procedure? If so, please furnish any analyses. If not, please explain.

**Response**

- a. Yes. Refer to the attached spreadsheet provided as part of my response to OCA/USPS-T-16-1b. It can be seen (column I) that the third stratum contributes very little (as opposed to nothing if it was sampled with certainty) to the overall variance based on volume. The reduction in the sample size in the third stratum had relatively little impact on the expected coefficient of variation and yielded considerable cost savings.
- b. The specific data collection procedures for the CCSTS were not related to the sample size. To further that point, when the sample size was reduced, the data collection procedures did not change. Therefore, a reduction in sample size could not have introduced bias to the data collection procedures since they were not related.

**Response of Postal Service Witness John Kelley  
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**OCA/USPS-T16-6.** On page 13 of your testimony, lines 13-19, you delineate the elimination of additional ZIP Codes. Do you have any basis for evaluating whether this reduction introduced bias to the data collection procedure? If so, please furnish any analyses. If not, please explain.

**Response:**

Please refer to my response to OCA/USPS-T-16-5b.

**Response of Postal Service Witness John Kelley  
To Interrogatories Posed by the Office of the Consumer Advocate**

**OCA/USPS-T16-7.** Please refer to your testimony at page 13, lines 23-25. You indicate that the level of precision for the final sample had a CV of less than six percent. Please provide the calculations underlying this statement.

**Response:**

I do not think you have paraphrased my testimony correctly, but refer to the attached spreadsheet for the standard errors for the estimates of time pool proportions calculated from the CCSTS.

STRATUM	ACTIVITY	$N_h/n_h$	$n_h$	$n_h/N_h$	THE SAMPLE MEAN OF TOTAL TIME ACROSS ALL ACTIVITIES	RATIO OF SUM OF TIME SPENT IN THIS ACTIVITY TO TOTAL TIME ACROSS ALL ACTIVITIES	SAMPLE VARIANCE OF TIME SPENT IN THIS ACTIVITY	SAMPLE VARIANCE OF GRAND TOTAL TIME IN THIS STRATUM	SAMPLE COVARIANCE OF TIME SPENT IN THIS ACTIVITY AND TOTAL TIME ACROSS ALL ACTIVITIES	Variance Component	Standard Error	CV
3	Total Delivery - All Regular Delivery Route Sections	4.8	4,600	0.208	282,122,561	0.723	34,245,497	54,489,928	26,152,357	0.00002		
2	Total Delivery - All Regular Delivery Route Sections	44,208	30,358	0.000	312,466,803	0.723	36,684,389	48,090,957	24,608,515	0.00000		
1	Total Delivery - All Regular Delivery Route Sections	214.556	1,332	0.005	290,823,724	0.723	35,697,814	37,479,852	19,179,366	0.00007		
ENTIRE SAMPLE	Total Delivery - All Regular Delivery Route Sections	1,649,925	36,290	0.022	307,731,684	0.723				0.00009	0.00942	1.3%
3	Network Travel	4.8	4,600	0.208	282,122,561	0.114	5,071,713	54,489,928	3,306,449	0.00000		
2	Network Travel	44,208	30,358	0.000	312,466,803	0.114	8,179,790	48,090,957	3,137,110	0.00000		
1	Network Travel	214.556	1,332	0.005	290,823,724	0.114	10,482,014	37,479,852	3,098,616	0.00003		
ENTIRE SAMPLE	Network Travel	1,649,925	36,290	0.022	307,731,684	0.114				0.00003	0.005503	4.8%
3	Total Delivery Activities Support	4.8	4,600	0.208	282,122,561	0.105	6,833,037	54,489,928	11,492,061	0.00000		
2	Total Delivery Activities Support	44208.000	30,358	0.000	312,466,803	0.105	5,719,935	48,090,957	9,367,648	0.00000		
1	Total Delivery Activities Support	214.556	1,332	0.005	290,823,724	0.105	5,221,700	37,479,852	6,854,019	0.00001		
ENTIRE SAMPLE	Total Delivery Activities Support	1,649,925	36,290	0.022	307,731,684	0.105				0.00001	0.00378	3.6%
3	General Collections	4.8	4,600	0.208	282,122,561	0.002	287,689	54,489,928	27,296	0.00000		
2	General Collections	44208.000	30,358	0.000	312,466,803	0.002	167,644	48,090,957	61,800	0.00000		
1	General Collections	214.556	1,332	0.005	290,823,724	0.002	262,346	37,479,852	-139,749	0.00000		
ENTIRE SAMPLE	General Collections	1,649,925	36,290	0.022	307,731,684	0.002				0.00000	0.00093	38.5%
3	Express Collections	4.8	4,600	0.208	282,122,561	0.0002	7,327	54,489,928	11,800	0.00000		
2	Express Collections	44208.000	30,358	0.000	312,466,803	0.0002	7,084	48,090,957	-523	0.00000		
1	Express Collections	214.556	1,332	0.005	290,823,724	0.0002	1,361	37,479,852	5,352	0.00000		
ENTIRE SAMPLE	Express Collections	1,649,925	36,290	0.022	307,731,684	0.0002				0.00000	0.00009	40.5%
3	Total Parcel/Accountable, Deviation Delivery and Travel Time	4.8	4,600	0.208	282,122,561	0.0564	1,671,451	54,489,928	1,996,059	0.00000		
2	Total Parcel/Accountable, Deviation Delivery and Travel Time	44208.000	30,358	0.000	312,466,803	0.0564	1,491,181	48,090,957	1,547,173	0.00000		
1	Total Parcel/Accountable, Deviation Delivery and Travel Time	214.556	1,332	0.005	290,823,724	0.0564	1,115,397	37,479,852	1,600,091	0.00000		
ENTIRE SAMPLE	Total Parcel/Accountable, Deviation Delivery and Travel Time	1,649,925	36,290	0.022	307,731,684	0.0564				0.00000	0.00196	3.5%

## 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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June 1, 2005