

BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, D.C. 20268B0001

SIX-DAY TO FIVE DAY STREET DELIVERY
AND RELATED SERVICE CHANGES, 2010

Docket No. N2010-1

RESPONSES OF THE UNITED STATES POSTAL SERVICE
TO QUESTIONS 1-4, 6-14 OF CHAIRMAN'S INFORMATION REQUEST NO. 5
(June 25, 2010)

The United States Postal Service hereby provides its responses to Questions 1-4, 6-14 of Chairman's Information Request No. 5, dated June 11, 2010. Answers were sought no later than today. Each question is stated verbatim and is followed by the response, although questions 9 and 12 reflect the errata of June 11, 2010. A response to Question 5 will be filed when available.

The responses are sponsored by witnesses in this docket as follows:

Questions 1 -- Granholm (USPS-T-3)
Questions 2, 14 -- Whiteman (USPS-T-9)
Question 3 -- Pulcrano (USPS-T-1)
Question 4 -- Institutional Postal Service
Questions 6-8 -- Grossmann (USPT-T-5)
Questions 9-12 -- Bradley (USPT-T-6)
Question 13 -- Colvin (USPS-T-13)

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorney:

Michael T. Tidwell

475 L'Enfant Plaza West, S.W.
Washington, D.C. 20260-1137
(202) 268-2998; Fax -5402
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**RESPONSE OF POSTAL SERVICE WITNESS GRANHOLM
TO CHAIRMAN'S INFORMATION REQUEST NO. 5**

Question 1

The Postal Service states that tri-weekly routes will continue to exist under 5-day delivery and that service standards will not change. See Response to CHIR No. 2, Question 1.

- (a) USPS Handbook M-38 "Management of Rural Delivery Services" discusses Tri-Weekly Routes and indicates that Tri-Weekly Routes include a Saturday component on half of the routes. If the Postal Service's proposal to eliminate Saturday delivery is instituted, what would be the effect on the Tri-Weekly routes that incorporate a Saturday Delivery?
- (b) Please identify the number of Tri-Weekly Routes by Three Digit ZIP Code area or by state.
- (c) Please identify the approximate total number of customers currently served by Tri-Weekly Routes, if that information is available.

RESPONSE:

[a] Adjustments would be necessary to have all current Tri-Weekly routes continue to deliver three (3) days within a five (day) week. CDS (Contract Routes) would need to have contracts renegotiated based on changes to current service.

[b] To the best of my knowledge, based on the data and information available, there are 272 Tri-weekly routes. The pdf file (ChIR.5.Q.1.Attach.pdf) attached to this response electronically lists the routes by state.

[c] Based on the available data, the approximate number of customers currently being served by Tri-weekly routes is 40,519.

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Question 2

Please provide the title page and table of contents only for the following reports conducted for the Postal Service:

- a. Reactions to Five-Day Delivery, Opinion Research Corporation, June 1980.
- b. Nonbusiness Users of the Postal Service and Their Attitudes Toward Five-Day Delivery, Opinion Research Corporation, April 1980.
- c. Reactions to Five-Day Delivery, USPS Marketing Services Division, Contract 104230-76-W-2217, Volumes 1 and 2, 1979.
- d. Nonbusiness Users of the Postal System and Their Attitudes Toward Possible Changes the USPS Might Make, Opinion Research Corporation, October 1977.
- e. Reactions to Five-Day Delivery (Revised Version), USPS Marketing Services Division, September 1977.
- f. Reactions to Five-Day Delivery and Changes in Mail Deposit Patterns, Decision Making Information Inc., Volumes 1 to 3, Contract Number 104230-76-W-2217, August 1977.
- g. Five-Day Delivery Task Force Report/Operations, May 19, 1980 [cited on pages 15-16 in the June 9, 2009 Congressional Research Service Report entitled, "U.S. Postal Service and Six Day Delivery: Issues for Congress."].
- h. The study on Five-Day Delivery performed by the Postal Service to support the President's Commission on the United States Postal Service during 2002-2003.
- i. Any other Five-Day Delivery studies or reports prepared for or by the Postal Service between 2003 and the present that have not already been provided in this case.

RESPONSE:

a-f. The Postal Service was not able to find any materials related to the referenced documents. We used a variety of methods including an internal search, online searches, and a search by Opinion Research for items indicated in parts a, b, and d.

g. Included in the attached pdf file (ChIR.5.Q.2.Attach) is the May 19, 1980 report on Five Day Delivery. There is no Table of Contents so we are including the entire report.

h. Included in the attached pdf file (ChIR.5.Q.2.Attach) is a report conducted for the President's Commission, dated June 9, 2003, by Black

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and Veatch and Peter D. Hart/American Viewpoint. There was no Table of Contents so we are including the entire report. Although Five-Day Delivery does not appear to be the focus of the report, we can find no other relating to the President's Commission.

i. The Postal Service did not find any other studies or reports "that have not already been provided in this case."

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Question 14.

The Postal Service sets forth estimated volume, revenue, cost and net income changes from five-day delivery in FY 2009. USPS-T-9 at 15, Chart 1. This chart shows that the Postal Service expects Periodicals Nonprofit volume to increase by 1.43 percent or 23.8 million pieces from implementing five-day delivery. Please provide the rationale that explains why Periodicals Nonprofit volume would increase as a result of eliminating Saturday delivery.

RESPONSE:

The chart represents how customers responded to the quantitative market research conducted by ORC on behalf of the Postal Service. I assume that mailers of Periodicals Nonprofit said they would mail more in a five-day environment because they made a value – price tradeoff. It is my presumption that such mailers will mail more because the loss of the extra day of delivery resulting from five-day delivery would not change their perception of the value of the mail for the price they pay.

With this said, I must provide a cautionary note to any projected change in volume for nonprofit Periodicals, because the sample size for this group was relatively small. I made the judgment that the small sample size was acceptable given the relatively small amount of volume of such mail. Virtually no increase or decrease of such mail would significantly affect the financial stability of the Postal Service or the viability of this proposal to implement five-day delivery.

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Question 3

In a five-day delivery and outgoing processing environment, does the Postal Service plan to make special accommodations for vote by mail in those states (such as Louisiana) that hold Saturday elections? If so, how will the Postal Service accommodate those states? Has the Postal Service gathered information on how many states and localities hold Saturday elections?

RESPONSE:

The Postal Service is working with election officials throughout the United States to ensure that ballots are timely delivered. One of the actions we have taken is to encourage these officials to rent a Post Office Box and use a Post Office Box address, so that delivery can be made to the P.O. Box on Saturday, as well as on every other delivery day. This is particularly important in those States that require receipt of a ballot by COB of Election Day. Should any jurisdiction count ballots postmarked on Election Day (whether Tuesday or Saturday), continuation of the practice of postmarking mail upon request at the retail window also will preserve the value of ballots mailed on Election Day.

The Postal Service is also working with election officials so that they use a P.O. Box and a FIM (Facing Identification Mark) on ballots, thus allowing the ballots to be separated on the first pass processing. This separation enables ballots to be handled like remittances, making them available for pickup after they are processed. This, too, assures timely delivery of ballots.

Election officials have informed the Postal Service that they will work with the Postal Service to inform voters to mail their ballots in sufficient time to assure their vote is counted. This is something that many election officials have said they will do.

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In the qualitative market research focus groups conducted by ORC on behalf of the Postal Service in Seattle, there was a discussion by customers about the need to timely mail ballots to ensure timely receipt by election officials. Customers said it was their responsibility to mail their ballots well in advance of election so that they would be timely received. Based on these discussions, we are confident we are taking the necessary steps to ensure the timely delivery of ballots, even when an election is held on a Saturday.

We understand that the State of Louisiana, New Castle County, DE and Harris County, TX hold non-Federal elections on Saturday. We note that Massachusetts held a special election for the U.S. Senate on Saturday, January 19, 2010. We further understand that other jurisdictions may hold Saturday elections for non-Federal elections or primaries.

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Question 4

Please refer to Tables 1 and 2 below. The employee types shown by row are the same as those appearing in USPS-T-7, Attachment 1.

- a. Please provide estimates for the data in the format indicated for city and rural carriers, annually, beginning in FY 2010 and ending in FY 2015.
- b. Please provide estimates for the data shown in the two tables indicated in USPS-T-7, Attachment 1 for each of the same period.

Table 1 – City Carriers

Type	BOY Personnel Count	Hires		Retirement		Reduction in Force		Movement Among Types		EOY Personnel Count
		Without Elimination of Saturday Delivery	With Elimination of Saturday Delivery	Without Elimination of Saturday Delivery	With Elimination of Saturday Delivery	Without Elimination of Saturday Delivery	With Elimination of Saturday Delivery	Without Elimination of Saturday Delivery	With Elimination of Saturday Delivery	
FTR										
PTR										
PTF										
Subtotal										
TE										
Casual										
Total										

Table 2 – Rural Carriers

Type	BOY Personnel Count	Hires		Retirement		Reduction in Force		Movement Among Types		EOY Personnel Count
		Without Elimination of Saturday Delivery	With Elimination of Saturday Delivery	Without Elimination of Saturday Delivery	With Elimination of Saturday Delivery	Without Elimination of Saturday Delivery	With Elimination of Saturday Delivery	Without Elimination of Saturday Delivery	With Elimination of Saturday Delivery	
Career										
Non-Career										
Bargaining										
Casuals										
Total										

RESPONSE:

[a]-[b] At the beginning of FY 2010, there were, in the city carrier craft: 177,057 full-time regulars, 873 part-time regulars, 20,519 part-time flexibles, 0 casuals, and 13,154 transitional employees.

At the beginning of FY 2010, there were, in the rural carrier craft: 67,119 regular rural carriers, 657 part-time flexible rural carriers, 4,203 temporary relief carriers

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(casuals), and 44,938 rural carrier associates or rural carrier relief employees.

In deciding to pursue the proposed changes in this filing, the Postal Service did not prepare estimates of future hires, retirements, possible reduction-in-force (RIF) actions, and inter-craft transfers

Indeed, the Postal Service does not believe that it can provide useful estimates of the requested detailed labor complements for future fiscal years in response to this question. In the current environment there is too much uncertainty to reliably provide the requested detailed complement forecasts.

In preparing this case, the Postal Service expended considerable resources, using data from a completed fiscal year (FY 2009), to estimate the savings that would have been realized had 5-day delivery been in effect for that year. This approach has the advantage that the analysis is for a completed year and thus obviates the need for forecasting. As a result, it avoids injecting the inevitable error associated with a forecasting exercise. Nevertheless, it provides valuable insight into the size and nature of cost savings from moving to five-day delivery. To reliably forecast complements for the next six years (FY 2010 to FY 2015) would require not only an exorbitant delay in this case, it would, in the end, not lead to helpful data.

An important reason that precludes accurately making the requested forecasts is the difficulty in predicting the future labor environment. The Postal Service's collective bargaining agreements with the American Postal Workers Union, AFL-CIO ("APWU") and National Rural Letter Carriers Association ("NRLCA") expire on November 20, 2010. The collective bargaining agreements

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with the National Association of Letter Carriers, AFL-CIO ("NALC") and National Postal Mail Handlers Union ("NPMHU") expire on November 20, 2011. Should any of these agreements expire without a new agreement in place, negotiations could be followed by interest arbitration, which could extend well into the following year. Until those agreements are finalized, there can be no meaningful estimates for new hires, retirements, reduction-in-force actions, and inter-craft transfers.

The Postal Service has previously provided data regarding attrition for the different crafts in recent years. See Response to PR/USPS-T3-3 (filed May 18, 2010). While some people might assume that this rate will be the same in future years, agreements with unions representing postal employees have, in the past, created incentives for employees to leave the rolls, and resulted in higher attrition rates. On the other hand, the state of the economy could have a great impact on whether employees eligible to retire would choose to exercise that option.

The Postal Service notes that ACR model embodies certain relationships about the ways that costs will respond to small, sustained changes in volume. When the Postal Service uses those relationships, which are often based on empirical analysis, it does not and cannot map out the detailed impact on each complement and its work hours like this question requests. Both the Postal Service and the Postal Regulatory Commission still make use of the results of the aggregate analysis and find it reliable.

In sum, the Postal Service has no basis to accurately provide the detailed long-term estimates sought by this question and suggests that, if made, they

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would seem to be too speculative to be of any use. This does not mean, however, that the extensive analysis of five-day delivery it already submitted is not sufficient for analyzing the impacts of such a service change.

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Question 6.

Witness Grossmann provides estimates of the percentage reduction in Vehicle Service Driver (VSD) transportation and contracted surface transportation that result from eliminating Saturday delivery. "In total, I estimate that the planned changes in processing and delivery will permit the elimination of approximately 20 percent of inter-area HCR transportation on Saturdays and 80 percent on Sundays." USPS-T-5 at 9. Please provide, in the following tabular format, the percentage reductions of transportation under the appropriate units column for each surface transportation type. Please provide the data in two separate tables, one for Saturday and the other for Sunday.

RESPONSE:

The responsive breakdown is provided in the requested tabular format that follows.

Based on operational knowledge, it is assumed that the reduction in cubic feet and miles will be commensurate with the reduction in trips.

Saturday:

Surface Transportation Type	Trips	Cubic Feet	Cubic Feet Miles	Other (Specify)	Explanation	Source
Inter-Area Transportation	-20%	-20%	-20%		See: GCA/USPS-T5-5	SV/TIMES Database, USPS operational judgment
Inter-Cluster and Inter-P&DC Transportation	-30%	-30%	-30%		See: GCA/USPS-T5-5	SV/TIMES Database, USPS operational judgment
Inter-BMC Transportation	0%	0%	0%		See: GCA/USPS-T5-5	SV/TIMES Database, USPS operational judgment
Intra-BMC Transportation	-40%	-40%	-40%		See: GCA/USPS-T5-5	SV/TIMES Database, USPS operational judgment
Intra-CSD Transportation - Box Route	-100%	-100%	-100%		See: GCA/USPS-T5-5	SV/TIMES Database, USPS operational judgment
Intra-CSD Transportation - Combination Route	-60%	-60%	-60%		See: GCA/USPS-T5-5	SV/TIMES Database, USPS operational judgment
Intra-P&DC Transportation	-60%	-60%	-60%		See: GCA/USPS-T5-5	SV/TIMES Database, USPS operational judgment
Vehicle Service Drivers	-42%	-42%	-42%		See: GCA/USPS-T5-5	USPS operational judgment

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Sunday: Surface Transportation Type	Trips	Cubic Feet	Cubic Feet Miles	Other (Specify)	Explanation	Source
Inter-Area Transportation	-80%	-80%	-80%		See: GCA/USPS- T5-5	SV/TIMES Database, USPS operational judgment
Inter-Cluster and Inter-P&DC Transportation	-80%	-80%	-80%		See: GCA/USPS- T5-5	SV/TIMES Database, USPS operational judgment
Inter-BMC Transportation	0%	0%	0%		See: GCA/USPS- T5-5	SV/TIMES Database, USPS operational judgment
Intra-BMC Transportation	-50%	-50%	-50%		See: GCA/USPS- T5-5	SV/TIMES Database, USPS operational judgment
Intra-CSD Transportation - Box Route	-100%	-100%	-100%		See: GCA/USPS- T5-5	SV/TIMES Database, USPS operational judgment
Intra-CSD Transportation - Combination Route	-80%	-80%	-80%		See: GCA/USPS- T5-5	SV/TIMES Database, USPS operational judgment
Intra-P&DC Transportation	-80%	-80%	-80%		See: GCA/USPS- T5-5	SV/TIMES Database, USPS operational judgment
Vehicle Service Drivers	0%	0%	0%		See: GCA/USPS- T5-5	USPS operational judgment

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Question 7

Referring to surface transportation, Witness Grossmann states,

To estimate the reduction in overall capacity needs, I reviewed the amount of each type of surface transportation by time of day. I then identified the number of trips of each type and time of day that are linked to Saturday collection and/or delivery. I also considered mitigating factors, such as continued transportation needs for certain types of mail that will continue to be processed on Saturday. From this review, I was able to determine the approximate percent reductions resulting from the proposed mail processing and delivery network.

USPS-T-5 at 7.

- a. Please provide the “number of trips of each type and time of day that are linked to Saturday collection and/or delivery.”
- b. Please provide all data and supporting analyses used to estimate these results.
- c. Please provide all data and supporting analyses used to determine “the approximate percent reductions resulting from the proposed mail processing and delivery network” by surface transportation mode in the units provided in response to the previous question.

RESPONSE:

- a. Please see witness Grossmann's Response to GCA/USPS-T5-5, filed on June 10, 2010.
- b-c. Please see the Microsoft Excel files “SumSunFreq.xls” and “SumLeaveTimeSat.xls,” filed in connection with the Responses of the United States Postal Service Witness Grossmann to Greeting Card Association Interrogatories (GCA/USPS-T5-1-5), filed on June 10, 2010. Additional data and supporting analyses are being filed in Library Reference USPS-LR-N2010-1/18.

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Question 8

Please provide all supporting data and analyses used to estimate the new distributions of air transportation volume by air carrier when moving the eliminated Sunday transportation to Tuesday, as described on page 6 of USPS-T-5.

RESPONSE:

For the Postal Service's estimate of distribution of air transportation volume in a five-day environment, please see Library Reference USPS-N2010-1/NP1, filed under seal. This distribution was based on the following assumptions:

1. The assumption about FedEx's ability to absorb additional Tuesday volume is informed by FedEx's current ability to carry extraordinary volumes on Tuesdays over the course of the year (excluding peak periods). Supporting data are being filed non-publicly in Library Reference USPS-LR-N2010-1/NP7; a redacted public version, entitled "ChIR.5.Q.8.AirScans REDACT.xls," is being filed publicly as an electronic attachment to these responses.
2. The assumption about UPS is based on the fact that the Postal Service has the opportunity to request additional volume under the current UPS contract, as well as on operational knowledge of the Postal Service's ongoing discussions with UPS.
3. The Postal Service would procure air transportation from commercial carriers to fulfill any remaining needs. The Postal Service continuously evaluates its needs for commercial airline capacity and makes contract adjustments accordingly. In addition, the Postal Service would extend the use of road feeder service to bring more volume to airports where commercial air carriers have

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additional capacity.

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9. The Postal Service states that the system-wide carrier cost model $C = C(V, N, Z) = c(V/N, Z)N$ "will hold if the system-wide cost function is linear, but will generally not hold for nonlinear system-wide cost functions such as quadratic or translog." Response to CHIR No. 3, Question 9. Please consider and comment on the following constant elasticity system-wide cost function $C = N \cdot a(Z) \cdot (V/N)^\epsilon$ where cost per day is equal to $c = a(Z) \cdot (V/N)^\epsilon$ and the shift parameter (a) is shown as a function of Z , the vector of control variables. Note that the system-wide cost function can also be shown as $C = N \cdot a(Z) \cdot V^\epsilon / N^\epsilon$, and therefore:

$$C = a(Z) \cdot N^{(1-\epsilon)} \cdot V^\epsilon.$$

a. Would the Postal Service agree that the value for (ϵ) represents the system-wide volume variability for carrier costs? If not, please explain.

b. Would the Postal Service agree that the value for $1 - \epsilon$ represents the system-wide elasticity of carrier costs with respect to delivery days? If not, please explain

Question 9 Response:

As explained in the response to CHIR No. 3, the analytical derivation of a system-wide cost model from a daily cost model will not generally be available for nonlinear cost functions. Thus, if one wishes to pursue that course, the challenge is to find a special case, a functional form that is both nonlinear and permits moving directly from the daily function. One class of functional forms that provides that avenue is the set of linearly homogeneous forms, of which the Cobb-Douglas function proposed in this question is a member. Linear functional forms, mentioned in the previous response, are also members of this class.

While these types of functions have the commendable property of facilitating aggregation, they have the disadvantage of impose strong *a priori* restrictions on the function to be estimated, and these functions may be at odds with the underlying cost

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generating process that is being modeled. For example, the underlying process may not be linear, so a linear function would not be appropriate. Similarly, the underlying process may not be subject to a constant elasticity restriction, as would seem to be the case in carrier street time, where extensive empirical investigation has supported the existence of a non-constant elasticity. Such a restriction may be appropriate for office time where far less empirical research has been conducted. Finally, the restriction placed upon the function to permit aggregation would seem to have reduced its ability to accurately capture an essential part of any delivery cost function, namely, that costs arise both because of the volume to be delivered and the network being covered.

a. I agree that it is the elasticity of cost with respect to volume for the specification posed in the question.

b I agree that it that is the elasticity of cost with respect to days of delivery for the specification posed in the question.

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10. Please consider and comment on the system-wide cost function $C(V, N, Z)$ as homogenous of degree one with respect to V and N such that $C(V, N, Z)^k = C(V^k, N^k, Z)$. This homogenous cost function, as shown, states that system-level costs vary in proportion to volume and the number of delivery days. So for example, if $C(V, N, Z)$ represent annual costs, then bi-annual costs can be represented as $C(V, N, Z)^2 = C(V^2, N^2, Z)$, keeping all other variables constant (the Z vector). Costs double over a measurement period that is twice as long (two years) because volume and the number of delivery days also double, when measured over the same period (but the annual amounts for these variables remain constant). Now letting $k = 1/N$, and substituting into $C(V, N, Z)^k = C(V^k, N^k, Z)$ yields:

$$C(V, N, Z)/N = C(V/N, 1, Z) = c(V/N, Z),$$

$$\text{so therefore: } C(V, N, Z) = N \cdot c(V/N, Z).$$

a. Would the Postal Service agree that the constant elasticity function represented in the previous section is an example of the above homogenous function? If not, please explain.

b. Please comment on the above homogenous form as the type of function useful for describing the impact on carrier costs from changes in the number of delivery days when volume is held constant or when volume changes.

Question 10 Response:

a. No, the function is not homogenous of degree one. The definition of a homogeneous function is given by: $f(\lambda \underline{x}) = \lambda^k f(\underline{x})$, where \underline{x} is the vector of "input" variables. This can also be written as $f(\lambda \underline{x}) = f(\lambda x_1, \lambda x_2, \lambda x_3, \dots, \lambda x_n) = \lambda^k f(x_1, x_2, \lambda x_3, \dots, x_n)$. For a function to be homogeneous of degree one, $k = 1$, so $f(\lambda \underline{x}) = \lambda f(\underline{x})$. To make this more concrete, suppose that there are three variables, in the \underline{x} vector, x , y and z . Then, the condition for a function to be homogenous of degree one is $f(\lambda x, \lambda y, \lambda z) = \lambda f(x, y, z)$. We can use this condition to check homogeneity for the suggested cost function. To do so, we need

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a specific functional form, so let $a(Z) = Z^\beta$, so that $C = Z^\beta * N^{(1-\epsilon)} * V^\epsilon$. The test for homogeneity for this function is:

$$\lambda C = f(\lambda Z, \lambda N, \lambda V) = (\lambda Z)^\beta * (\lambda N)^{(1-\epsilon)} * (\lambda V)^\epsilon.$$

Expanding terms yields:

$$f(\lambda Z, \lambda N, \lambda V) = \lambda^\beta Z^\beta * \lambda^{(1-\epsilon)} N^{(1-\epsilon)} * \lambda^\epsilon V^\epsilon.$$

This yields:

$$f(\lambda Z, \lambda N, \lambda V) = \lambda^{\beta+(1-\epsilon)+\epsilon} * Z^\beta * N^{(1-\epsilon)} * V^\epsilon.$$

Or:

$$f(\lambda Z, \lambda N, \lambda V) = \lambda^{(1+\beta)} Z^\beta * N^{(1-\epsilon)} * V^\epsilon.$$

b. The fact that the function is not linearly homogenous when a variable incorporating the network is included highlights a challenge associated with applying this type of function to delivery activities. Delivery costs arise both because of network-related costs and volume-related cost, and to the extent there are activities associated with serving the network, and not volume, they will typically occur once a day regardless of the amount of volume delivered. Thus, even if the volume variability of volume-related costs is one, some network-related costs would be saved by movement to five-day delivery. However, the specified constant elasticity function precludes this outcome from occurring. To see this, set $\epsilon = 1$. Then, the cost function is $C = a(Z) V$ and there are no cost savings from reducing the number of delivery days. This is reflected in the fact that the elasticity of cost with respect to the number of days in that function would be zero.

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11. With respect to use of the $C(V, N, Z) = N \cdot c(V/N, Z)$ homogenous function for purposes of estimating carrier cost savings, the Postal Service states, "Third, this approach assumes that there are no changes to the daily cost function, $c(V/N, Z)$ as a result of the elimination of Saturday delivery. This requires assuming that there would be no operational changes that could lead to a shift or movement in the cost surface. If such operational changes did occur, then a revision of the function would also be required." Response to CHIR No. 3, Question 9. The Postal Service also states that operational experts do not anticipate any changes in the number of city and rural carrier routes in response to eliminating Saturday delivery. USPS-T-6 at 12, 24.

a. Because changes in the number of routes are not anticipated, please identify what other operational changes might be pertinent to analyzing cost effects from eliminating Saturday delivery. Please explain how these changes might cause a revision of the cost function.

b. Can these operational factors affecting carrier costs be included in a vector of Z variables for a particular cost function? If not, please explain.

Question 11 Response:

a. Any operational change that causes a shift or movement in the cost curve would be pertinent for analyzing the cost effects from removing Saturday delivery. For example, a reorganization of work or an increase in productivity could cause such a change. The revision in the cost function comes about because of changes in the parameters that relate the relevant delivery cost to the cost drivers, such as volumes or the number of delivery points.

b. It is unlikely. Typically, a shift in the cost surface involves change in the parameters of the cost function, not change in the variables included in the cost function. It is possible however, that a change in an omitted variable could be causing a shift in the cost surface. If that is the case, then identifying and including that variable in the cost function would be an alternative way for accounting for the change.

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12. Assume a week i cost function, homogenous of degree one, and of the form $C_i = N \cdot a(Z_i) \cdot (V_i/N)^\epsilon = a(Z_i) \cdot V_i^\epsilon \cdot N^{(1-\epsilon)}$, where V_i is the week i system volume, N is the weekly delivery frequency and $i = 1, 2, \dots, 52$. Assume the current $N = 6$. Then using this constant elasticity function, cost savings for any week i from reducing delivery frequency by one day can be calculated as:

$$\begin{aligned}\Delta C_i &= \text{Six Day Cost} - \text{Five Day Cost} \\ &= a(Z_i) \cdot V_i^\epsilon \cdot 6^{(1-\epsilon)} - a(Z_i) \cdot V_i^\epsilon \cdot 5^{(1-\epsilon)} \\ &= a(Z_i) \cdot V_i^\epsilon \cdot 6^{(1-\epsilon)} \cdot (1 - (5/6)^{(1-\epsilon)}) \\ &= C_i \cdot (1 - (5/6)^{(1-\epsilon)}).\end{aligned}$$

The weekly cost savings can also be approximated by the following marginal cost with respect to delivery days:

$$\begin{aligned}(\partial C_i / \partial N) \big|_{N=6} &= a(Z_i) \cdot (V_i/6)^{\epsilon \cdot (1-\epsilon)} \\ &= (C_i/6)^{(1-\epsilon)}.\end{aligned}$$

where $(1 - \epsilon)$ is the cost elasticity with respect to delivery days and $C_i/6$ is the average daily cost. Please comment on the use of such a weekly cost function to determine cost savings per week, through either of the two methods presented above, and ultimately cost savings for the entire year when eliminating Saturday delivery service.

Question 12 Response:

Before providing the requested comments I would note that, despite the filing of an erratum (June 11, 2010), there still may be a typographical error in the question. I believe that for the specified function, the derivative of cost with respect to the number of days when the current frequency of delivery is six day is $(1-\epsilon) C_i/6$.

Consideration of the specification and estimation of a weekly, constant elasticity, Cobb-Douglas style delivery cost function would be based upon a number of factors, some of

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which may be considered supportive and others of which call in to question the utility of the approach. In the balance of this response I discuss a number of those factors.

One factor that is important to consider is how well the specified functional form captures the key characteristics of the underlying cost generating process. In delivery, costs arise both because of volume and because of the need to deliver that volume over a network. This means that there are some activities that delivery carriers do once each day that they deliver mail, regardless of the amount of mail that they deliver that day. The costs associated with these types of activities, typically included in institutional costs in the lexicon of postal costing, would be saved when a delivery day was eliminated, regardless of the amount of volume delivered and the elasticity of cost with respect to that volume. This suggests that a daily cost function should at least allow for the possibility that there may be costs not associated with volume and it is important to include a network variable such as the number of delivery points or routes. Note that these costs are incurred in addition to the volume-related costs which have been specified according to the constant elasticity approach.

For example, if these non-volume related costs are associated with the number of delivery points, then a daily cost function could look something like: $C/N = \theta D + a(Z)*(V/N)^\epsilon$, where D is the number of delivery points. This means that the aggregate cost function could be given by: $C = N\theta D + a(Z)*V^\epsilon N^{1-\epsilon}$. This would be an important

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dimension of the model to explore before an empirical implementation could be pursued.

One of the main strengths of the "Cobb-Douglas" functional form and one of the main reasons why it is widely used in economic theory is the fact the function is simple and straightforward and has convenient properties for its derivatives. This means that it often yields tractable theoretical results (as here), when other more sophisticated forms will not. However, the tractability comes at the cost of imposing restrictions on the relationship between the included variables. Consider just the volume-related costs of delivery. When the frequency of delivery is reduced, costs are saved on the eliminated day, but increase on the remaining days. Thus, the overall cost savings depends upon how much cost is saved on the eliminated day versus how much cost is added on the other days. The Cobb-Douglas form, as applied here, imposes a tight restriction on these two changes. It is a very useful restriction, mathematically, because the resulting proportionality facilitates aggregation, but it is a restriction which may or may not be supported by the data, particularly when network characteristics are taken into account. There would seem to be no obvious operational or technological reason for restricting the elasticity of cost savings with respect to the number of days and the elasticity of cost with respect to an increase in volume to be a simplex. It would seem like investigation of the appropriateness of this restriction would be necessary before an empirical implementation were pursued. The challenges associated with such an investigation

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are an important part of why flexible functional forms, like the translog, are widely used in estimating cost functions.

Two other aspects of this approach merit consideration from an empirical perspective. First, as mentioned in response to a previous question, the empirical evidence to date would suggest rejection of a constant elasticity assumption for delivery time on the street. This means that such a restriction would need to be tested in any empirical implementation. In addition, this approach assumes that the day being eliminated (here it is Saturday) is just like any other day in terms of its total hours and hour structure. This assumption may be rejected by the data, which would reduce the accuracy of the approach.

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Question 13.

The Postal Service states that total workhours for city carriers are 394,939,572. This number is derived from the workyear calculation model. See Docket No. ACR2009, Response to CHIR No. 3, Question 20. However, in the FY 2009 Total Factor Productivity tables filed with the Commission on March 2, 2010, specifically at Table 13, total city carrier workhours are 410,017,555. Please explain the apparent discrepancy and provide a reconciliation.

RESPONSE:

I am told that regarding the TFP Table 13, the FY 2009 workhours of 410.0 million is a composite of both city carriers and vehicle drivers. Its components can be found on TFP Table 6 and are as follows for FY 2009 (in millions of workhours):

City Carriers

Full time	326.2
Part time	40.7
TEs & Casuals	<u>27.8</u>
Total City Carrier	394.7

Vehicle Drivers

Full time	13.5
Part time	1.6
TEs & Casuals	<u>0.3</u>
Total Vehicle Drivers	15.4

Total City Carriers/Vehicle Drivers 410.0