

AD-A230 640

TIC
LECTE
DEC 31 1990



**THRESHOLD FOR
TRANSPORTATION CHARGE REVIEW
COST BENEFIT ANALYSIS**

DISTRIBUTION STATEMENT A

Approved for public release
Distribution Unlimited

**Prepared by
DCMDC
Operations Research Office**

September 1990

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE July 1990		3. REPORT TYPE AND DATES COVERED In House Study (Final)	
4. TITLE AND SUBTITLE Threshold for Transportation Charge Review Cost-Benefit Analysis				5. FUNDING NUMBERS	
6. AUTHOR(S) John S. McKinney					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Defense Contract Management District North Central (DCMDC), Operations Research and Economic Analysis Office, Chicago, IL 60666-0926				8. PERFORMING ORGANIZATION REPORT NUMBER DCMR-XX-P00011	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Defense Logistics Agency, Operations Research and Economic Analysis Office, Cameron Station, Alexandria, VA 22304-6100				10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES					
12a. DISTRIBUTION/AVAILABILITY STATEMENT Unlimited				12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) Reviews of transportation charges on Commercial Bills of Lading (CBLs) are done as part of the Prepaid Transportation Program (PTP). The PTP program currently calls for a Transportation Specialist to review each invoiced CBL transportation charge that is more than \$100. When this threshold triggers a review the invoice cannot proceed through the Automatic Payment of Invoice system. Instead, it is paid manually, and a second manual pay is done for the shipping charges after they are reviewed and approved. This cost-benefit analysis found that the transportation charge threshold should be changed to \$190. ←					
14. SUBJECT TERMS				15. NUMBER OF PAGES	
				16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT		

Threshold for Transportation Charge Review
- Cost Benefit Analysis

September 1990

John S. McKinney
Operations Research and Economic Analysis Office
DCMDC
O'Hare International Airport, Chicago, Illinois



Accession For	
NTIS CRAM	
DTIC TAB	
Unannounced	
Justification	
By	
Distribution	
Availability	
Dist	Availability Special
A-1	

CONTENTS

<u>EXECUTIVE SUMMARY</u>	2
I. <u>INTRODUCTION</u>	3
II. <u>METHODOLOGY</u>	3
III. <u>RESULTS</u>	4
A. Savings.....	4
B. Costs.....	4
IV. <u>CONCLUSIONS</u>	5
V. <u>RECOMMENDATION</u>	6
ATTACHMENTS.....	7

EXECUTIVE SUMMARY

Reviews of transportation charges on Commercial Bills of Lading (CBLs) are done as part of the Prepaid Transportation Program (PTP). The PTP program currently calls for a Transportation Specialist to review each invoiced CBL transportation charge that is more than \$100. When this threshold triggers a review the invoice cannot proceed through the Automatic Payment of Invoice system. Instead, it is paid manually, and a second manual pay is done for the shipping charges after they are reviewed and approved. This cost benefit analysis finds that the transportation charge threshold should be changed to \$190.

I. Introduction

The DFC Administrator asked the Operations Research and Economic Analysis Office at DCMR, Chicago to find ways to improve the Automatic Payment of Invoices (API) rate at the Defense Finance Center (DFC). This study of the \$100 Transportation Charge Threshold emerged from the larger API project. This threshold decreases the API rate by causing manual review of commercial bills of lading (CBL) shipping charges over \$100.

The Prepaid Transportation Program (PTP) allows contractors to use their own CBLs to prepay and ship orders and then bill the government for the shipping. Some contractors are given blanket authority to use PTP. Others make single shipments on CBLs. The other option available to contractors is to ship on a Government Bill of Lading (GBL).

It is less expensive for the government when the contractor ships on a CBL. The cost of the CBL is lower because of less government administrative involvement. The government does not need to get involved until after the shipment, by possibly checking the shipping rate used. On the other hand, the GBL by design involves the government before the shipment is made. The GBL ensures contractor compliance because the government can assign the correct shipping rates. The GBL is therefore more expensive to the government because of the extra work the government does.

When an API is stopped due to the \$100 threshold, the Comptroller's office forwards the shipping charge in question to the Transportation office. Any charges other than the questioned shipping amount are then paid by the Comptroller on a Manual Payment of Invoice (MPI). A Traffic Management Specialist will then review the shipping charge for reasonableness. This person returns the request to the Comptroller noting the proper amount the contractor should be reimbursed for shipping. A second transaction then manually pays the correct shipping amount.

II. Methodology

The basic methodology used for this project was the following:

A. Setting the threshold at different levels, find the average dollar savings per review associated with each level of invoiced transportation charges.

B. Estimate average all-inclusive variable cost per review.

C. Compare cost per review with average savings per review at each level.

D. Develop criteria for doing transportation charge reviews based on C above.

There were 1,057 individual transportation reviews analyzed in this study. Data was gathered from DCMR Boston, Chicago, Dallas, Los Angeles, and Philadelphia. Individual reviews of shipping charges were analyzed according to original amount requested by the contractor; amount authorized for payment by Transportation, and any amount denied.

III. Results

A. Savings

Original transportation charges requested by contractors were stratified by \$50 intervals (for example, \$50-\$100, \$100-\$150, etc.). The corresponding average amount saved for the reviews in each interval was also computed. (See Attachment I)

B. Costs The costs to do a review in the PTP program are:

1. Cost of Traffic Management Specialist to review the transportation charge for reasonableness, and to recommend proper amount for payment. (See Attachment II)

2. Cost of Traffic Management Specialist to process prepay and add CBL instructions. (Approximately once every 15 reviews - see Attachment II)

3. Cost of Payment Clerk to deduct transportation charge in question and pay the remaining charges manually. When the authorization is received from the Traffic Management Specialist, the proper amount for transportation is then paid on a second MPI. (See Attachment II)

4. Cost of Disbursing clerk to process MPI payment for mailing plus first class postage. (See Attachment II)

5. A Systems Change Request (SCR) will be implemented which will be an offset to costs. It will allow DFC Payment personnel and Traffic Management Specialists to input and access information in the mainframe about particular shipments. In this way the Traffic Management Specialists could do these transportation reviews at their local offices. It will no longer be necessary to have Transportation Specialist(s) at the DFC, as is now the case.

Details of exactly how these new screens will look are not yet decided.

This change will eliminate the need in many cases for the Traffic Management Specialist to get the contract folder and to locate copies of shipping documents. Normally, they would need to get the contract in order to evaluate the shipping charges. With this change, the DFC Payment personnel would input key shipping data from the contract. When a review of shipping charges is needed the Traffic Management Specialist will access the system. Ideally, the specialist will have all information needed for the review available on the screen.

When this change is implemented, the time needed to do a review will decrease substantially. A preliminary estimate is that one hour will be saved that is normally used to get the contract and locate pertinent shipping documents. This will reduce the average time spent on a review to 1.36 hours. The savings identified here will be phased in as the Defense Finance Center continues to increase its workload.

The all-inclusive cost per PTP review is:

Traffic Management Specialist:

Do review	\$ 49.62
Process prepay & add CBL instructions	1.06

Payment Clerk:

First manual payment (Original invoice)	26.38
Second manual payment (Transp. charge invoice)	37.69

Disbursing Clerk:

Process MPI payment for mailing and postage	1.54
---	------

SCR Offset to Cost:	<u>(21.02)</u>
---------------------	----------------

Total	\$ 95.27
-------	----------

IV. Conclusions

The current cost of the PTP program is approximately \$116.29 per review. When the system change is fully implemented and the DFC is making all contractor payments, the cost of each review will be \$95.27. After the system change, the breakeven point where costs most nearly equal benefits will be approximately at a level of transportation charges of \$175.

Changing the threshold to \$190 (an increment above breakeven) would show net savings of \$51,647 more per year than keeping the \$100 threshold. The increased net savings would come from reducing the number of reviews of smaller transportation charges (that have correspondingly small average reductions in the requested amounts), and concentrating on larger transportation charges with larger average payoff. (See Attachment III.)

Setting the threshold at \$190 would ensure a return of about 10% on funds invested reviewing CBLs. A sampling plan for reviewing CBL transportation charges wouldn't be effective because the number of incorrect transportation charges is so high. About 69% of the invoiced transportation charges are incorrect.

V. Recommendation

The recommendation is to change the threshold to \$190 for invoiced transportation charges. This change would provide the government with at least a 10% return on the \$95.27 cost of reviewing a CBL. By eliminating reviews whose costs exceed the savings the total number of reviews will be cut substantially.

Attachment 1
Table of Transportation Charges Reviewed

INTERVAL \$	ACTUAL- SAMPLE (1)		PROJECTED DOMC-WIDE IN THE INTERVAL				PROJECTED DOMC-WIDE ABOVE THRESHOLD				
	NUMBER OF INVOICES IN SAMPLE	AMOUNT INVOICED \$	AMOUNT PAID \$	AMOUNT SAVED \$	AVERAGE AMOUNT SAVED \$	INVOICES	SAVINGS- REDUCED TO DO CHARGES REVIEWS	COST TO DO NET	INVOICES	SAVINGS- REDUCED TO DO CHARGES REVIEWS	COST TO DO NET
6-50	33	994	758	236	7	(2)					
50-100	175	12,823	9,126	3,496	20	(2)					
100-150	316	37,633	19,841	17,792	56	1,288	72,748	122,691	(49,952)	3,471	897,178 339,682 566,496
150-175	78	12,511	5,774	6,737	86	319	27,643	38,381	(2,838)	2,183	824,438 297,991 616,447
175-190	40	7,243	3,152	4,090	102	164	16,721	15,580	1,141	1,864	796,895 177,610 619,285
190-200	17	3,312	1,538	1,774	104	70	7,253	6,621	631	1,701	788,174 162,030 618,143
200-250	68	15,173	6,490	8,683	128	278	36,499	26,486	9,013	1,631	772,921 155,499 617,512
250-300	50	13,810	6,136	7,673	153	294	31,370	19,475	11,895	1,353	737,422 128,923 608,499
300-350	55	17,981	8,648	9,313	100	225	38,075	21,422	16,652	1,149	786,952 169,448 616,604
350-400	24	9,000	5,000	4,001	107	90	16,357	9,348	7,010	924	667,978 88,026 579,951
400-450	22	9,298	3,328	5,970	271	90	24,487	8,569	15,838	826	651,620 70,678 572,942
450-500	24	11,345	7,658	3,687	154	90	15,074	9,348	5,726	736	627,213 70,109 557,103
500-1000	85	58,715	27,981	30,755	202	348	125,737	33,107	92,630	638	612,139 60,761 551,378
1000-	71	210,911	100,939	110,073	1,070	290	406,402	27,654	458,748	290	486,402 27,654 458,748
Total	1,057	429,558	206,378	223,180		3,471					

Notes:

1. The number of reviews in the sample were:
DOMC BOS 141
DOMC CHI 82
DOMC DAL 131
DOMC LA 374
DOMC PHI 349
Total 1,057
2. No reviews are projected to be done below \$100.

Attachment II

Table of PTP Program Costs

The primary costs of the PTP program are as follows:

A. Cost of Traffic Management Specialist to review the transportation charge for reasonableness, and to recommend proper amount for payment.

	<u>Avail. hrs.</u> <u>per year</u>	times % of time <u>spent on PTP</u>	divided by # of reviews <u>done in 1 yr.</u>	equals hours <u>per review</u>
ATL	1628.64	.50	300	2.71
CHI	1628.64	.18	106	2.76
DAL	1628.64	.30	216	2.26
PHI	1628.64	.80	600	2.17
DFC	1628.64	--	--	1.60 (1)

(1) Note: DFC Traffic Management Specialist does approximately 5 reviews in an 8 hour day which is 1.6 hours per review.

Average time spent on each review = 2.36 hours

GS-11 St.5

Hourly wage X Fringe benefit adj. X Hours per review

\$16.23/hour X 1.2955 X 2.36

= \$ 49.62 per review

B. Cost of Traffic Management Specialist to process prepay and add CBL instructions. (Approximately once every 15 reviews)

GS-11 St.5

Hourly wage X Fringe benefit adj. X Time X Frequency

16.23 X 1.2955 X .75 X .067

= \$ 1.06

C. Cost of Payment Clerk to deduct transportation charge in question and pay remaining charges manually (MPI). When authorization comes from the Traffic Management Specialist, proper amount for transportation is then paid on a second MPI. (Based on 1989 data from DLA report RCS 448.)

FY 1989 Invoices Paid Per Employee:

Total DCMC FY89
Invoices

1,528,725
(274,601) (1)
1,254,124

1,254,124
1,815

Total FY89 DCMC PLFA
CF Employees

2,169
(354) (2)
1,815

= 691 Invoices/Employee

Notes:

1. Total DCMC invoices processed is reduced by DCMR LA and DFC invoices. During the year these invoices were paid by both DCMR LA and the DFC.
2. Total CF employees is reduced by the number of CF employees at DCMR LA and the DFC. At the end of FY89 DCMR payment processing was in transition to the DFC. DCMR LA payment staff was partly transferred to the DFC and new additional personnel were being added to the DFC. In addition, a sizable liaison staff remained at DCMR LA. Including DCMR LA and DFC data would result in understating the number of invoices processed per CF employee and overstating costs.

691 total payments/CF employee/yr. X 50% MPI rate
.70 CF employees working on MPI
= 494 manual invoices per year

494 manual invoices per year

182 workdays/yr. (70% of these emp. time spent on MPI)

= 2.714 manual payments per day per person doing MPI

GS 6 St. 5 fringe ben.

\$9.87/hr. X 1.2955 X 8 hours = \$102.30 per day

\$102.30/day = \$37.69 per invoice

2.714 manual payments per day

(Time used for leave and training is implicitly included in the 2.714 MPI per day average)

As noted earlier, two MPIs are caused when an API is stopped due to the transportation threshold being broken. From a two week sample of MAAPR messages taken from all DCMRs and the DFC, it was found that 0.4% had the "transportation amount exceeded" message. Of those that did have the message, 70% were stopped solely because of this message (they had no other message that would stop an API). Therefore, 70% of the cost of the first manual created is attributed to the transportation threshold being broken.

70% of \$37.69 = \$26.38

D. Cost of Disbursing clerk to process MPI payment for mailing plus first class postage.

GS 4 St. 5 fringe ben. leave train. standard overhead
\$8.86/hr. X 1.2955 X 1.18 X 1.02 X .0847 X 1.1

= \$ 1.29 + .25 (postage) = \$ 1.54 per invoice

Attachment III

Impact of Threshold on Potential Savings

<u>Threshold</u>	<u>Cost of Review</u>	<u>Number of Annual Reviews</u>	<u>Cost of Reviews</u>	<u>Transp Charge Reductions from Reviews</u>	<u>Net Savings</u>
\$100	\$95.27	3,471	\$330,682	\$ 897,178	\$566,496
\$175	\$95.27	1,864	\$177,610	\$ 796,895	\$619,285
\$190	\$95.27	1,701	\$162,030	\$ 780,174	\$618,143

Notes:

1. In the sample, 849 reviews were in the 'over \$100' range. It is estimated that 3,471 reviews will be done annually DCMC-wide in this range. (The rates are ATL: 300, CHI: 106, DAL: 216, PHI: 600 and DFC: 1,025; the remaining activities are estimated at a combined rate of 1,224 for a total of 3,471.)
2. Estimated based on the number of 'over \$175' reviews in the sample.