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TRANSPORTATION COST ANALYSIS OF VENDOR CONSOLIDATION AT THE DALLAS, TEXAS, REGIONAL FREIGHT CONSOLIDATION CENTER

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OPERATIONS RESEARCH AND ECONOMIC ANALYSIS OFFICE

DEPARTMENT OF DEFENSE
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FOREWORD

This report documents the results of a transportation cost analysis of vendor freight consolidation at the Dallas, TX Regional Freight Consolidation Center (RFCC) contractor operated facility for the 6-month period ending 30 June 1991. The study is the result of a request from the Directorate of Supply Operations, Transportation Division, RFCC Program Office (RFCCPO) and is part of the continuing analysis of RFCC implementation and operation.

Our analysis showed that during the 6 months of operation reviewed, vendor consolidation at Dallas, TX saved approximately $148,656 in transportation expenditures. Based on observed trends in the RFCC data for Dallas, TX transportation savings are expected to continue.

ROGER C. ROY
Assistant Director
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BACKGROUND

The Defense Logistics Agency's (DLA) Directorate of Supply Operations, Transportation Division (DLA-OT), Regional Freight Consolidation Center Program Office (RFCCPO) requested a transportation cost analysis of vendor consolidation at the Dallas, TX Regional Freight Consolidation Center (RFCC). The analysis covers vendor shipments destined for the six DLA supply depots between 1 January 1991 and 30 June 1991.

Vendor consolidation is the process of collecting small, less-than-truckload (LTL) shipments from commercial vendors at or near origin and combining these shipments to build larger LTL or truckload (TL) shipments for movement to the DLA supply depots to replenish inventory. Savings are expected to accrue based on the difference in the cost of shipping many small LTL shipments direct to the depots versus the cost of collecting those same LTL shipments at a facility at or near origin and consolidating them into one large LTL or TL shipment for movement to the depots at a lower volume rate.

Studies conducted by the DLA Operations Research and Economic Analysis Management Support Office (DLA-LO(DORO)) have shown that vendor consolidation has the potential to save considerable transportation dollars. Currently, any savings achieved through this program will be indirect since the vendor will ship to the RFCC free-on-board destination. DLA expects these savings will eventually be passed on through lower item prices. The scope of this report covers only the estimated transportation cost differential between direct shipment to a depot versus transshipment through the RFCC system. A determination as to whether DLA has received a reduction in contract prices is beyond the scope of this report.

II. STUDY APPROACH

A. Purpose. The purpose of this study is to determine the cost difference between two alternative shipment methods. The first is vendor direct shipment to the six DLA depots. The other involves consolidation of vendor freight at the Dallas, TX RFCC prior to final movement to the six DLA depots.

B. Objectives. The objectives are as follows:

1. To estimate vendor shipping costs for both direct and RFCC routed shipments. Use the calculated costs to compare the two methods of shipment and determine the dollar cost differentials.

2. Identify any problems with consolidation at the RFCC site and offer recommendations for improvement or change.

III. ANALYSIS

A. Inbound Shipment Characteristics. Vendor shipments are moved to the RFCC by three main methods of transportation; they are commercial motor carrier, private motor carrier, and small parcel carrier. These shipments can be categorized into two shipment types, LTL and small parcel. Small parcels account for approximately 47 percent of the number of shipments (4,442 shipments) and 3 percent of the total shipment weight (70,028 pounds) received at the RFCC. On the other hand, LTL freight amounts to about 53 percent of the number of shipments (4,966 shipments) and 97 percent of the total shipment weight (2,449,034 pounds). Table 1 shows a breakdown of the tonnage for the period 1 January 1991 through 30 June 1991 for Dallas, TX. Included in Table 1 are average weights for both LTL and small parcels. An average inbound LTL shipment weighed 493 pounds while inbound small parcels averaged 15.7 pounds.

Table 1

VENDOR RECEIPTS BY MONTH - DALLAS, TX

Month	Weight	Shipments	Average Weight Parcels	Average Weight LTL
Jan	321,736	1,645	15	485
Feb	247,086	1,217	16	591
Mar	571,316	2,132	16	590
Apr	484,323	1,680	16	501
May	600,289	1,351	17	453
Jun	294,312	1,383	16	386
Total	2,519,062	9,408		

B. Outbound Shipment Characteristics. After vendor shipments arrive at the RFCC they are consolidated into large LTL or TL shipments and forwarded to the DLA depot consignee on a routine basis. Outbound shipment weights should be considerably higher than the weights of shipments received from the vendors. Experience gained since the beginning of the vendor consolidation phase of the RFCC concept has shown that carrier trailers will reach maximum cube utilization between 18,000 and 25,000 pounds depending on the product mix. Table 2 shows the total number of shipments and weight shipped by month and includes the average outbound shipment weight. Table 3 gives the number of shipments received from the Dallas RFCC at each of the DLA depots.

Table 2

RFCC OUTBOUND SHIPMENTS BY MONTH

Month	Weight	Shipments	Average Shipment Weight
Jan	321,378	24	13,390
Feb	365,951	17	21,526
Mar	452,106	24	18,837
Apr	666,894	31	21,512
May	417,474	18	23,193
Jun	296,090	19	15,583
Total	2,519,893	129	

Table 3

DEPOT RECEIPTS - JAN 1991 TO JUN 1991

Depot	Shipments	Weight	Average Weight
Richmond	22	283,978	12,908
Columbus	21	440,877	20,944
Mechanicsburg	21	402,642	19,173
Tracy	21	564,959	26,902
Ogden	22	332,904	15,132
Memphis	22	494,533	22,478
Total	129	2,519,893	

C. Cost Analysis.

Cost comparison of RFCC routed versus non-RFCC shipments necessitates that the data be processed into three files. The first covers shipments from the vendor to the RFCC for consolidation. This file is built by aggregating the RFCC history file for Dallas by RFCC receipt date and contract number. The second file incorporates shipments made from the RFCC to each of the DLA depots. This file is built by aggregating the RFCC history file on outbound government bill of lading (GBL) number. By combining the shipments in both files, movement through the RFCC system is modeled. A third file was built from the RFCC history file which simulated shipment of the same material on a direct basis from vendor origin to the DLA depot consignee. Direct shipments were aggregated by RFCC receipt date, contract number and depot destination. The total number of RFCC routed shipments was 9,408 while the number of direct shipments was estimated at 12,063. The difference of 2,655 in the number of

shipments between RFCC routed and non-RFCC shipments reflects a secondary level of consolidation being accomplished at the vendor origin (for example, more than one depot's freight on the same bill going to the RFCC site).

Once the files were built, they were rated using a program designed to individually rate each shipment with the appropriate rate tables. Direct LTL shipments were rated with commercial class rates[1] at class 50 with a 10 percent discount. LTL shipments from vendor to the RFCC site for consolidation were also rated at class 50 with a 10 percent discount. The rate level and discount are based on samples of inbound vendor shipments taken at the New Jersey RFCC[2] and from a sample of direct vendor shipments into the Defense Depot at Richmond, VA (internal DORO analysis). Small parcels were rated using United Parcel Service surface parcel rates. Consolidated shipments from the RFCC to the DLA depots were rated using the applicable government tenders.

After completing the rating process, the cost data were compiled and the results are shown in Table 4.

Table 4

SAVINGS PROJECTION FOR THE DALLAS, TX RFCC

MONTH	IN	OUT	TOTAL RFCC	TOTAL DIRECT	PROJECTED SAVINGS (LOSS)
Jan	$52,956	$28,618	$81,574	$102,746	$21,172
Feb	36,059	30,756	66,815	71,757	4,942
Mar	82,659	39,677	122,336	161,654	39,318
Apr	77,454	57,719	135,173	150,938	15,765
May	102,356	35,027	137,383	192,671	55,288
Jun	57,402	26,257	83,659	95,830	12,171
Total	$408,886	$218,054	$626,940	$775,596	$148,656

[1] Class rating is a method used by the commercial motor carrier industry to assign rate scales to different types of commodity groups. Rate classes range from Class 50 for high density commodities that take up little space to Class 500 for low density items that require a lot of space. DLA traditionally paid Class rates for freight-all-kinds (FAK) on shipments out of its depots prior to the Guaranteed Traffic Program.

[2] Defense Logistics Agency, "Transportation Cost Analysis of New York EDDS Vendor Consolidation," DLA Project No. DLA-90-P90174, March 1990.

Savings appear to be consistent now that the RFCC concept is becoming the normal operating procedure for the vendors using the RFCC system. Costs both in and out of the RFCC appear to be reasonable and consistent.

IV. CONCLUSIONS

Vendor consolidation at the Dallas, TX RFCC has resulted in an estimated net savings of $148,656 during the the period 1 January 1991 through 30 June 1991. Estimated average monthly savings over the 6-month period is $24,776.

The carrier appears to be doing a good job of trailer utilization with average shipment sizes currently ranging between 12,900 and 26,900 pounds depending on the destination. If this trend continues, estimated savings from vendor consolidation at the Dallas, TX RFCC should continue.

V. RECOMMENDATION. Continue to monitor carrier operations to insure that maximum consolidation is maintained.

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13. ABSTRACT *(Maximum 200 words)*

This report documents the results of a transportation cost analysis of vendor freight consolidation at the Dallas, TX Regional Freight Consolidation Center (RFCC) contractor operated facility for the 6-month period ending 30 June 1991. Costs for shipping vendor freight through the RFCC are compared to the estimated cost of shipping from the vendor direct to the depot. Cost differentials are computed and savings are estimated. Based on the results of the analysis, the Dallas RFCC saved approximately $148,000 for the 6-month period.

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