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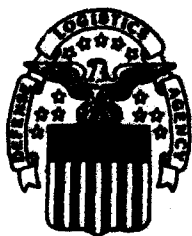
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DLA-91-P00116

**Transportation Cost Analysis
for EDDS Vendor Consolidation -
Jacksonville, FL**

OPERATIONS RESEARCH AND ECONOMIC ANALYSIS OFFICE



DEPARTMENT OF DEFENSE

DEFENSE LOGISTICS AGENCY

1990

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Transportation Cost Analysis for EDDS Vendor Consolidation - Jacksonville, FL

Charles F. Myers II

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CAMERON STATION,

ALEXANDRIA, VIRGINIA 22304-6100

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FOREWORD

This report documents the results of a transportation cost analysis of vendor freight consolidation at the Jacksonville, FL, Enhanced Defense Logistics Agency Distribution System (EDDS) contractor operated facility for the 8-month period ending 31 March 1990. The study is the result of a request from the Directorate of Supply Operations, Transportation Division, EDDS Support Office (EDSSO) and is part of the continuing analysis of the EDDS implementation and operation.

Analysis shows that during August 1989 through March 1990, vendor consolidation at Jacksonville, FL, saved approximately \$45,739 in transportation expenditures. This figure includes losses incurred during the initial start-up period. During the latest 3 months of operation analyzed, inbound tonnage averaged over 400,000 pounds per month while the estimated transportation savings were about \$11,300 monthly. Based on observed trends in the EDDS data for Jacksonville, transportation savings are expected to continue.

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Christine L. Gallo
CHRISTINE L. GALLO
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EXECUTIVE SUMMARY

Vendor consolidation under the Enhanced Defense Logistics Agency Distribution System (EDDS) is the method of collecting small less-than-truckload (LTL) shipments from commercial vendors at or near origin and combining shipments to build larger LTL or truckload (TL) shipments for movement to the DLA supply depots for replenishment of inventory. Savings in transportation dollars are expected to accrue based on the difference in the cost of shipping many small LTL shipments direct to the depots versus collecting those same LTL shipments at a facility and consolidating them into one large LTL or TL shipment for movement to the depots at lower volume prices. The savings should eventually be passed on to DLA in the form of lower item prices. *(Signature)*

Analysis showed that under the current method of operation at the Jacksonville, FL, EDDS facility, an estimated savings of \$45,739 resulted during the latest 8 months of operation. However, during January, February and March 1990 the Jacksonville EDDS site processed over 400,000 pounds monthly with an estimated monthly savings in transportation expenditures of about \$11,300. The EDDS contractor is making weekly shipments to each of the DLA depots except for Ogden, UT, which is averaging a little over two shipments per week. These multiple weekly shipments to Ogden have resulted in higher shipping costs to Ogden from the EDDS site. There appears to be potential for increased consolidation of shipments destined for the depot at Ogden.

We recommend the following:

- o Discuss fluctuation in the number of shipments and weight made from the EDDS facility to the depot at Ogden, UT, with the carrier and attempt to resolve any problems.
- o Continue to monitor carrier operations to ensure that maximum consolidation is maintained.

I. BACKGROUND

The Defense Logistics Agency's (DLA) Directorate of Supply Operations, Transportation Division (DLA-OT), Enhanced DLA Distribution System Support Office (EDSSO) requested a transportation cost analysis of vendor consolidation at the Jacksonville, FL, Enhanced DLA Distribution System (EDDS) facility. The analysis covers vendor shipments destined for the six DLA supply depots between 1 August 1989 and 31 March 1990.

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 (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 EDDS facility 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 EDDS. A determination as to whether DLA has received a reduction in contract prices is beyond the scope of this report.

II. CONCLUSIONS

Vendor consolidation at the Jacksonville, FL EDDS facility has resulted in an estimated net savings of \$45,739 during the the period 1 August 1989 to 31 March 1990. During the most recent 6 months of operation reviewed, the site saved approximately \$46,400 or about \$7,733 per month. During the last 3 months of operation, savings averaged about \$11,300 per month. In addition, analysis shows that the carrier may have reached its consolidation potential to all depots except Ogden, UT.

III. RECOMMENDATIONS

- o Discuss fluctuation in the number of shipments and weight made from the EDDS facility to the depot at Ogden, UT, with the carrier and attempt to resolve any problems.

- o Continue to monitor carrier operations to insure that maximum consolidation is maintained.

IV. STUDY APPROACH

A. Purpose. The purpose of this study is to determine if the vendor consolidation concept under the EDDS at Jacksonville, FL is a cost effective means of shipping vendor freight to the six DLA depots.

B. Objectives. The objectives are as follows:

1. To determine the characteristics of shipments into and out of the EDDS facility (mode and weight).

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

3. Identify any problems with consolidation at the EDDS site and offer recommendations for improvement.

V. ANALYSIS

A. Inbound Shipment Characteristics. Vendor shipments are moved into the EDDS site 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. Figure 1 shows a breakdown of inbound shipments by aggregated weight, number of shipments, and average weight. Small parcels account for approximately 85 percent of the number of shipments (9,204 shipments) and 5 percent of the total shipment weight (163,371 pounds) received at the EDDS site. On the other hand, LTL freight amounts to about 15 percent of the number of shipments (1,614 shipments) and 95 percent of the total shipment weight (3,052,015 pounds).

Inbound tonnage seems to be leveling out beginning in September 1989. Figure 2 shows the information graphically. Table 1 shows a breakdown of the tonnage for the period 1 August 1989 through 31 March 1990 for Jacksonville. Included in Table 1 are average weights for both LTL and small parcels. An average inbound LTL shipment weighed 1890 pounds while inbound small parcels averaged 18 pounds.

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EDDS INBOUND VENDOR SHIPMENTS

Jacksonville EDDS Site - Aug 89 - Mar 90

INBOUND VENDOR TONNAGE

Jacksonville, FL EDDS Site

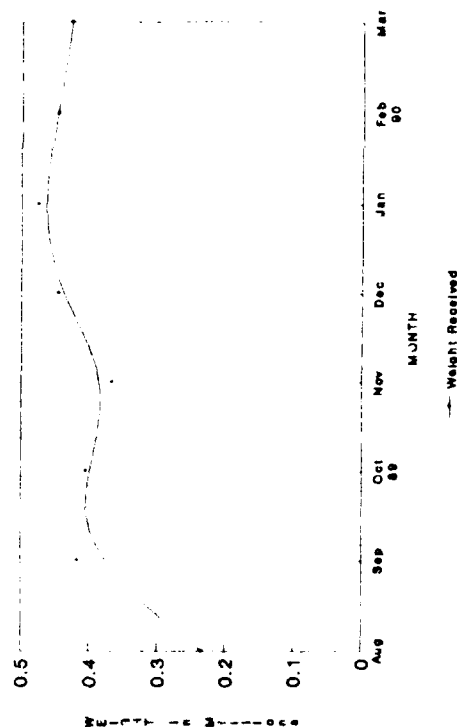
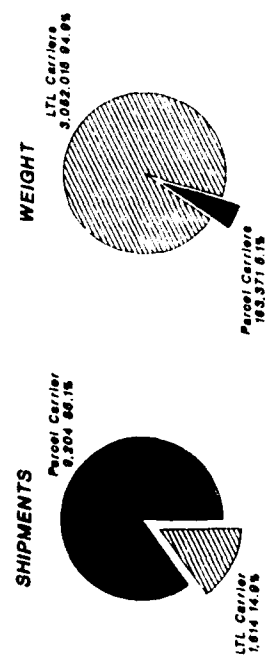


Figure 1

Figure 2

Table 1

VENDOR RECEIPTS BY MONTH - JACKSONVILLE, FL

<u>Month</u>	<u>Weight</u>	<u>Shipments</u>	<u>Average Weight</u>	
			<u>Parcels</u>	<u>LTL</u>
Aug 89	233,452	1,032	18	1,524
Sep	417,067	1,122	18	2,666
Oct	405,066	1,346	18	2,075
Nov	366,056	1,227	18	1,590
Dec	445,427	1,772	16	2,440
Jan 90	475,050	1,299	19	2,577
Feb	447,292	1,365	18	1,735
Mar	425,976	1,657	18	1,245
Total	3,052,015	10,818	18	1,890

B. Outbound Shipment Characteristics. After vendor shipments arrive at the EDDS site 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 EDDS has shown that carrier trailers will reach maximum cube utilization between 18,000 and 25,000 pounds depending on the product mix. Shipment frequencies should be relatively low but do depend on the distance and time needed to deliver the freight to the receiving depot within specified standards. Table 2 shows the average outbound shipment weight by month and receiving depot. Table 3 shows the corresponding monthly outbound shipment frequencies.

Table 2

AVERAGE OUTBOUND SHIPMENT SIZE IN POUNDS BY MONTH

	<u>Richmond</u>	<u>Columbus</u>	<u>Mechburg</u>	<u>Tracy</u>	<u>Ogden</u>	<u>Memphis</u>
Aug 89	2,148	694	4,274	4,562	1,130	3,714
Sep	3,549	2,722	4,785	10,767	2,674	7,555
Oct	4,912	4,499	4,523	7,659	1,958	11,433
Nov	11,509	5,512	12,422	7,754	2,084	8,808
Dec	5,806	6,784	24,977	7,375	4,129	32,000
Jan 90	11,950	20,694	23,231	17,840	8,772	15,853
Feb	25,389	7,333	20,884	24,793	14,260	20,909
Mar	16,026	8,376	16,792	27,194	3,901	22,909

Table 3

MONTHLY OUTBOUND SHIPMENT FREQUENCIES

	<u>Richmond</u>	<u>Columbus</u>	<u>Mechburg</u>	<u>Tracy</u>	<u>Ogden</u>	<u>Memphis</u>	<u>Total</u>
Aug 89	19	14	12	13	18	14	90
Sep	16	12	12	12	16	13	81
Oct	13	6	8	16	16	4	63
Nov	5	4	7	15	15	5	71
Dec	5	5	5	11	11	4	41
Jan 90	4	5	4	4	4	4	25
Feb	4	4	4	3	4	4	23
Mar	4	4	4	5	9	4	30

The average weight per outbound shipment has increased since August 1989 indicating that the carrier is consolidating better as experience is gained and the inbound weight increases. Corresponding outbound shipment frequencies over the same period of time have dropped to around four per month to all of the depots except Ogden indicating that the carrier may have reached its maximum consolidation potential to all depots except Ogden. Shipment frequencies and weights for Ogden still appear to be fluctuating and may require some coordination with the carrier to stabilize.

Table 4 gives a breakdown of weight received by depot. Weights reflect that Tracy and Memphis received the most tonnage during the 8 months of operation reviewed at the Jacksonville EDDS site.

Table 4

DEPOT RECEIPTS - AUG 89 TO MAR 90

<u>DEPOT</u>	<u>SHPTS</u>	<u>WEIGHT</u>
Richmond	70	461,472
Columbus	54	291,651
Mechanicsburg	56	600,355
Tracy	79	790,192
Ogden	93	298,355
Memphis	52	606,675
Total	404	3,048,700

C. Cost Analysis. Cost comparison of EDDS versus non-EDDS shipments necessitates that the data be processed into three files. The first covers shipments from the vendor to the EDDS site for consolidation. This file is built by aggregating the EDDS history file for Jacksonville by inbound bill number. The second file incorporates shipments made from the EDDS site to each of the DLA depots. This file is built by aggregating the EDDS history file on outbound government bill of lading (GBL) number. By combining the shipments in both files, movement through the EDDS system is emulated. A

third file was built from the EDDS 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 inbound bill number, depot destination, and contract number. The total number of EDDS shipments was 10,818 while the number of direct shipments was estimated at 18,512. The difference of 7,694 in the number of shipments between EDDS and non-EDDS reflects a secondary level of consolidation being accomplished at the vendor origin, i.e. - more than one depot's freight on the same bill going to the EDDS 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 at class 50 with a 10 percent discount. LTL shipments from vendor to the EDDS 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 York, NY EDDS site and the Defense Depot located at Richmond, Va. Small parcels were rated using United Parcel Service (UPS) surface parcel rates. Consolidated shipments from the EDDS site to the depots were rated using the applicable government tenders. After completing the rating process, cost data were compiled and are shown in Table 5.

Table 5

SAVINGS PROJECTION FOR THE JACKSONVILLE, FL, EDDS SITE
August 1989 through March 1990

MONTH	EDDS		TOTAL	DIRECT	SAVINGS
	IN	OUT			
Aug 89	\$ 23,806	\$ 29,666	\$ 53,472	\$ 50,543	\$ (2,929)
Sep	32,956	46,549	79,499	81,767	2,628
Oct	36,940	38,387	75,327	80,025	4,698
Nov	36,931	37,570	74,501	77,901	3,400
Dec	38,570	39,153	77,473	82,120	4,647
Jan 90	39,067	33,927	72,994	91,877	18,883
Feb	42,422	35,828	78,250	86,070	7,820
Mar	47,302	40,833	88,135	95,087	6,952
Total	\$297,738	\$301,913	\$599,651	\$645,390	\$ 45,739

During August 1989 approximately \$2,929 was lost due to low tonnage. However, as the inbound weight increased and consolidation at the site improved the site began to save money. During the September 1989 through March 1990 time frame, savings amounted to \$48,668 or about \$6,900 per month. During the last three months of operation, savings averaged about \$11,200 per month. The problems with initial start-up appear to have been overcome and the estimated savings seem to be getting better.

D. Sensitivity Analysis. In June 1990, Roadway proposed increases to vendor rates from the Jacksonville EDDS site averaging about 7.4 percent of

the current lender rates. The new rates were evaluated against the same data used to produce Table 5. Costs out of Jacksonville increased from \$301,916 to \$325,539 or about 7.8 percent. Overall projected savings decreased by 51 percent from \$45,736 to \$22,113. The results of this analysis tend to show that savings are highly sensitive to any increases in the rates out of the EDDS site.

REPORT DOCUMENTATION PAGE

CMB 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 November 1990		3. REPORT TYPE AND DATES COVERED Final	
4. TITLE AND SUBTITLE Transportation Cost Analysis for EDDS Vendor Consolidation- Jacksonville, FL				5. FUNDING NUMBERS	
6. AUTHOR(S) Charles F. Myers II					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) HQ Defense Logistics Agency Operations Research and Economic Analysis Office (DLA-LO) Cameron Station Alexandria, VA 22304-6100				8. PERFORMING ORGANIZATION REPORT NUMBER DLA-91-P00116	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) Defense Logistics Agency Cameron Station Alexandria, VA 22304-6100				10. SPONSORING / MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES					
12a. DISTRIBUTION / AVAILABILITY STATEMENT Public Release; Unlimited Distribution				12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) This is a transportation cost analysis of vendor freight consolidation at the Jacksonville, FL, Enhanced Defense Logistics Agency Distribution System (EDDS) contractor operated facility for the 8-month period ending 31 March 1990. The study is the result of a request from the DLA Directorate of Supply Operations and is part of the continuing analysis of the EDDS implementation and operations. Analysis shows that during August 1989 through March 1990, vendor consolidation at Jacksonville, FL, saved approximately \$45,739 in transportation expenditures. This figure includes losses incurred during the initial start-up period. During the latest 3 months of operation analyzed, inbound tonnage averaged over 400,000 pounds per month while the estimated transportation savings were about \$11,300 monthly. Based on observed trends in the EDDS data for Jacksonville, transportation savings are expected to continue.					
14. SUBJECT TERMS Transportation, freight, consolidation, analysis				15. NUMBER OF PAGES 19	
				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		