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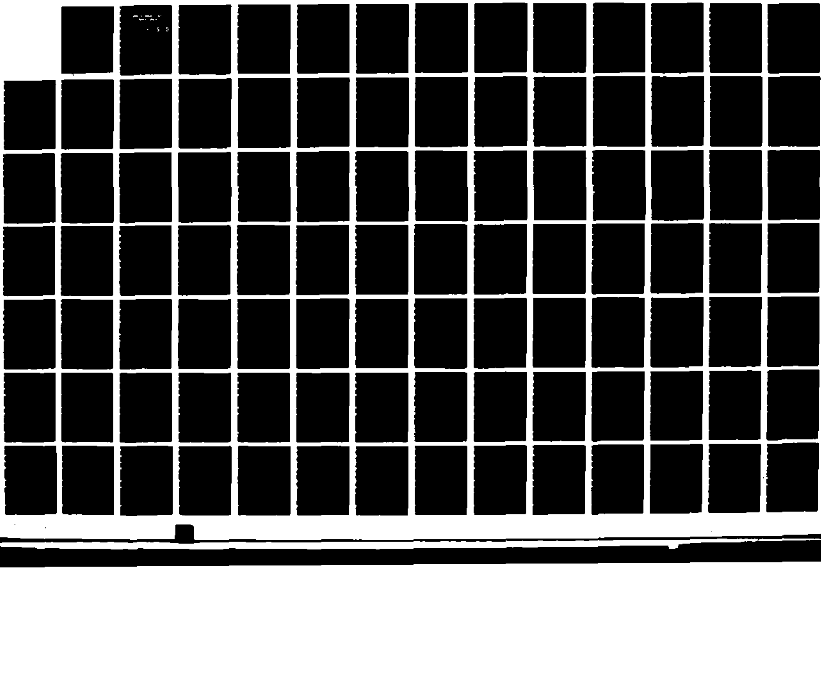

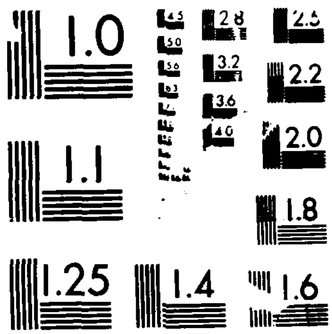

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THE NAVY'S SURFACE OPPORTUNE LIFT PROGRAM

by

Edward Thomas Evard

December 1987

Thesis Advisor: F.C. Horton

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The Navy's Surface Opportune Lift (OPLIFT) program is a Navy Material Transportation Office-managed cost reduction program. The program makes use of deploying and returning U.S. Navy ships to move fleet and shore material. The transportation cost avoided or saved would otherwise be billed to Servicewide Transportation funds.

This thesis is an analysis of the OPLIFT program with an emphasis on the cost savings achieved over the past five years. In order to determine if maximum cost savings are being achieved an examination of top management emphasis on OPLIFT utilization, fleet implementation of the Program and the existing cost savings reporting system is conducted. In addition,

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The Navy's Surface Opportune Lift Program

by

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Submitted in partial fulfillment of the
requirements for the degree of

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ABSTRACT

The Navy's Surface Opportune Lift (OPLIFT) program is a Navy Material Transportation Office-managed cost reduction program. The program makes use of deploying and returning U.S. Navy ships to move fleet and shore material. The transportation cost avoided or saved would otherwise be billed to Servicewide Transportation funds.

This thesis is an analysis of the OPLIFT program with an emphasis on the cost savings achieved over the past five years. In order to determine if maximum cost savings are being achieved an examination of top management emphasis on OPLIFT utilization, fleet implementation of the Program and the existing cost savings reporting system is conducted. In addition, trends and patterns in OPLIFT utilization are identified and a multiple regression model to predict monthly cost savings is developed. An attempt is made to identify measures which can be taken to upgrade and improve the program and enable the Navy to maximize cost savings.

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I. INTRODUCTION

A large share of the Department of Defense logistics budget is devoted to transportation services. In fiscal year (FY) 1986, the Navy's transportation budget, known as Servicewide Transportation (SWT), approached $375 million. Of this amount, over $47.5 million was spent on the ocean transportation of Navy cargo [Ref. 1]. In the current atmosphere of close scrutiny of defense spending at all levels, it is imperative the Navy realize all opportunities to reduce transportation funding requirements.

Surface Opportune Lift (OPLIFT) is a Navy Material Transportation Office (NAVMTO) Norfolk managed cost avoidance program. The program makes use of deploying and returning U.S. Navy ships to move fleet and shore material. The material is diverted from the Defense Transportation System (DTS) to U.S. Navy vessels for movement to fleet units and shore activities. The transportation costs avoided would have otherwise been billed to SWT funds.

A viable OPLIFT program can be an effective means of realizing substantial transportation cost avoidances. Within the Department of the Navy, the Chief of Naval Operations (CNO) has been one of the biggest supporters of the OPLIFT program. In a message to the Fleet Commanders

(CINCS) in 1982, the CNO's commitment to the program was conveyed in the fourth paragraph:

> Through effective communication and liaison between Fleet CINCS, supply activities, ships and OPLIFT points of contact, the Navy can improve performance of the OPLIFT program and further reduce the expenditure of SWT funds. Full support in this effort is solicited and any suggestions which will enhance the OPLIFT of cargo are welcome. [Ref. 2]

A. OBJECTIVES OF THE RESEARCH

The objectives of this research effort are:

1. Determine whether the Navy is currently placing enough emphasis on the use of OPLIFT as a cost avoidance measure;

2. Review OPLIFT implementation at the fleet level to ascertain if viable programs are in place;

3. Examine OPLIFT relative to the frequency of utilization, quantity of tonnage moved, transportation cost savings achieved, types of cargo moved, categories of ships moving the cargo and traffic routes over which the cargo is transported to determine program trends and patterns.

4. Review the current transportation cost avoidance reporting system to determine whether it provides a meaningful picture of Program performance; and

5. Develop a model that can predict monthly OPLIFT cost avoidances.

B. SCOPE, LIMITATIONS AND ASSUMPTIONS

Some of the information presented in this study is pertinent to the OPLIFT of all categories of cargo but due to the limited availability of data on the movement of personal material, this study will focus on examining the cost avoidance implications of transporting Navy sponsored fleet freight and general OPLIFT cargo only. In the context of this study "fleet freight" refers to cargo destined for mobile fleet units that is issued by supply sources in and around port areas. The term "general OPLIFT cargo" refers to non-fleet freight cargo (usually heavy, bulky and low priority shipments with no specific required delivery date) originating outside a port area for shipment to shore activities. The analysis of cost avoidances provided to the Fleet CINCS for moving fleet organic cargo (items in the custody or plant account records of field activities or afloat units) and to service members for the movement of their personal property is beyond the scope of this study.

For the purpose of this study the term "cost avoidance" is defined to mean a realized reduction in funds which were otherwise firmly committed by the Navy for transportation services and is synonymous to the term "cost savings." The terms "cost avoidance" and "cost savings" will be used interchangeably.

In this study cost savings compiled from NAVMTO records will be referred to as "transportation cost savings attributed to OPLIFT" and will include first destination transportation (FDT), second destination transportation (SDT) and other (all cost savings other than FDT and SDT which are distinguished by the Transportation Account Code) cost savings.

It is assumed that the reader of this study has a passing familiarity with the DTS and Navy material transportation procedures.

C. RESEARCH METHODOLOGY

The research methodology utilized in this study included a literature search through the Defense Logistics Studies Information Exchange, the Defense Technical Information Center and a review of various journals and periodicals which revealed that prior research on the subject is nonexistent.

A series of fact finding trips were made to various activities, including Commander, Naval Supply Systems Command, Navy Material Transportation Office Norfolk, Commander in Chief U.S. Atlantic Fleet, and Commander Naval Surface Force, U.S. Atlantic Fleet.

A series of telephone interviews was conducted with management and supervisory personnel assigned to the Office of the Chief of Naval Operations, Commander in Chief U.S. Pacific Fleet, Commander Naval Surface Force, U.S. Pacific Fleet, Commander Military Sealift Command, Naval Supply Center Norfolk and USNS SIRIUS (T-AFS-8).

D. LITERATURE REVIEW

Instructions, point papers, reports, cost savings, tonnage data and correspondence were obtained during the fact finding trips. Historical files containing information pertinent to OPLIFT were reviewed at several activities.

E. ORGANIZATION OF THE STUDY

Chapter II, an "Overview of the Surface Opportune Lift Program," provides the reader with a general perspective of the OPLIFT program, how it operates and what direction it is taking and discusses problems with the current cost savings reporting system. Chapter III focuses on the implementation of OPLIFT in the Atlantic and Pacific Fleets and compares the relative strengths and weaknesses of each program. Chapter IV examines the OPLIFT program and identifies the patterns and trends relative to fleet use, types of cargo moved, categories of ships moving the cargo and traffic routes covered. Chapter V develops a model to predict monthly OPLIFT cost savings. Chapter VI presents the study's principal findings, conclusions and recommendations.

II. OVERVIEW OF THE SURFACE OPPORTUNE LIFT PROGRAM

A. PROGRAM ORIGIN

The U.S. Navy's surface OPLIFT program is believed to have had its beginning during the Vietnam conflict. Military vehicles, primarily jeeps and trucks consigned to the Marine Corps, were becoming increasingly backlogged at West Coast supply centers and water terminals. Due to the low transportation priority assigned, the probability of dissolving the vehicle backlog was small. To counteract the backlog Mobile Logistics Support Force (MLSF) ships (now known as Combat Logistics Support Force (CLSF)), under the operational control of Commander in Chief U.S. Pacific Fleet (CINCPAC), began loading and transporting the vehicles to the Vietnam theater. This continued to occur as long as available deck space allowed. [Ref. 3]

The effort soon expanded to include all categories of spare parts, equipment and supplies. There were, however, three conditions which had to be met before cargo could be moved by OPLIFT:

1. Excess space had to be available on the carrying vessel;
2. The cargo had to be low priority without a specified delivery date; and
3. The movement of cargo could not adversely affect operational commitments of the carrying vessel or require operating schedule changes.

B. OPPORTUNE LIFT AS A COST SAVINGS TOOL

The need to reduce transportation backlogs during a period of conflict had given OPLIFT its initial impetus. The potential cost savings that could be realized through its use was not the driving force behind OPLIFT's origin. With the end of the Vietnam conflict, however, a different view of defense spending began to develop. In FY 1974 approximately 40 million short tons of DOD cargo were moved at an estimated cost of $3.5 billion. This amount paid for only transportation services and did not include DOD's large capital investments in transportation hardware and facilities [Ref. 4:p. 2]. Transportation was obviously a large share of the DOD logistics budget. Vice Admiral Thomas R. Weschler, then director for logistics, Organization of the Joint Chiefs of Staff, expressed the mood of the times when he wrote in 1975 that:

> Only by cutting dollars in our support and logistics area will we have sufficient dollars to procure and support the B-1 or Trident or other such systems that are so very vital to keeping the peace. [Ref. 5:p. 5]

Spiraling inflation and the lingering effects of the 1973 oil embargo resulted in rising transportation costs. In the fall of 1975 a transportation cost analysis conducted by the Navy projected a large probable deficit of $48 to $50 million for the FY 1976 transportation budget account (now known as SWT). Having no prospect for additional funds, the only alternative left to the Navy was to substantially reduce transportation costs through movement and mode restrictions. In January 1976 the CNO issued a Navy-wide directive (NAVOP 012/76) which imposed controls on transportation costs. Twenty transportation cost cutting provisions were implemented. Their implementation resulted in savings that more than offset the deficit. These provisions have remained intact and have continued to reduce transportation costs by an average of $60 million annually. [Ref. 6]

One of the cost cutting provisions called for Fleet CINCS to insure that deploying and returning U.S. Navy ships, including those Military Sealift Command (MSC) vessels under their operational control, offer OPLIFT for use by Navy shipping activities. It was envisioned that increased emphasis on the use of OPLIFT would reduce the transportation costs paid to commercial ocean carriers and thereby generate additional transportation funds for support of other requirements.

In response to the CNO's directive, Fleet CINCS formally implemented OPLIFT programs. Given little implementing guidance, the CINCS tailored OPLIFT toward the needs of their particular fleet. Arranging for and coordinating the movement of cargo via OPLIFT was, however, a collateral duty at every level of the program. This "volunteer" nature of the program, the absence of centralized reporting requirements and the limited implementing guidance resulted in a program that waxed and waned considerably. [Ref. 3]

OPLIFT cost savings data collection procedures were relatively undefined and the little data that was available indicated a decline in the real growth in reported savings attributed to the program for the period 1978 to 1982. [Ref. 2]

C. PROGRAM REVITALIZATION

The implications of declining OPLIFT cost savings were exacerbated by an increased scrutiny of defense spending and a FY 1982 SWT budget approaching $500 million. The CNO responded to these events by requesting the assistance of his Fleet CINCS in ensuring that OPLIFT was aggressively pursued through the chain of command. In September 1982, CNO policy guidance on OPLIFT was promulgated. A definition of OPLIFT and a priority system for allocating OPLIFT space were provided. In addition, an OPLIFT Program Manager, NAVMTO Norfolk, was designated. It was hoped that through more effective communication, liaison, and management greater cost savings could be realized.

1. Opportune Lift Defined

The CNO defined OPLIFT as follows:

> OPLIFT is the movement of cargo aboard U.S. Navy ships between the continental United States [CONUS] and overseas areas or between overseas areas (intratheater). OPLIFT cargo is non-organic to the carrying ships and is cargo whose transportation would, in the absence of OPLIFT space, otherwise be billed to an appropriation charging SWT funds. Only cargo consigned to mobile units having overseas consignment locations in the current NAVMTO Freight Forwarding Guide or cargo consigned to overseas shore stations is eligible for OPLIFT. [Ref. 2]

This definition served to limit the potential cost savings that could be realized by precluding the movement of material between CONUS locations and from overseas locations to CONUS. The Fleets, however, have not followed this guidance and have consistently moved OPLIFT cargo between CONUS locations and from overseas locations to CONUS.

2. Priority of Space Allocation

The following OPLIFT space allocation was recommended by the CNO, consistent with the requirements of the Fleet CINCS:

1. Fleet Freight. Cargo issued by various supply sources in and around port areas and destined for mobile units. The cargo will be coordinated for loading by direct liaison between fleet OPLIFT representatives and water terminal operators and take priority over all other OPLIFT cargo.

2. General Cargo. Non-fleet freight cargo (usually heavy, bulky, and low priority shipments having no specific required delivery date) originating outside a port area for shipment to, from, or between overseas activities. Space for general cargo originating in CONUS will be offered to NAVMTO Eastern and Western Area representatives who will coordinate the movement and loading with fleet representatives and water terminal operators. General cargo originating overseas (for shipment to CONUS or to another overseas area) will be coordinated by Navy Sea Cargo Coordinators (NAVSEACARCOORD) and overseas fleet representatives. Space for general cargo will be offered to NAVMTO and NAVSEACARCOORDS, as applicable, only after all fleet freight space requirements have been satisfied.

3. Other Freight. Other cargo carried on an OPLIFT basis which would not have otherwise entered the defense or commercial transportation system or have been billed to SWT funds may be shipped OPLIFT when all freight and general cargo requirements have been satisfied. [Ref. 2]

The recommended space allocation system places fleet organic cargo as priority three. Fleet organic cargo is material owned by the Fleet CINCS, i.e., items in the custody or plant account records of field activities or material in custody of afloat units. Movement of such material in the DTS is funded from the Fleet CINCS Operations and Maintenance, Navy (O&M,N) appropriation. For this reason it is logical to conclude that the Fleet CINCS might place the highest priority on moving this type of cargo. The Atlantic Fleet, has in fact, given the highest OPLIFT loading priority to fleet organic cargo.

In addressing the priority of space allocation, provisions were discussed by the CNO for moving general cargo to CONUS from overseas areas. The CNO definition of OPLIFT, however, precludes the movement of general cargo by OPLIFT unless it is consigned to overseas shore stations. This is an example of one of the inconsistencies found in OPLIFT implementation guidance. Similar inconsistencies can also be found in the implementation guidance provided by the Fleets.

3. <u>Program Manager</u>

The CNO has designated NAVMTO Norfolk, a field activity of the Naval Supply Systems Command (NAVSUPSYSCOM), as the OPLIFT Program Manager. The following responsibilities have been assigned to NAVMTO:

1. Through its Eastern and Western Area representatives, coordinate the OPLIFT movement of general cargo

(non-fleet freight) from CONUS to overseas areas and maintain direct liaison with fleet and water terminal OPLIFT representatives.

2. Collect, on a monthly basis, tonnage information on diversions of fleet freight and general cargo to OPLIFT from those reporting Commanders designated by the Fleet CINCS.

3. Compute and report all cost avoidance attributable to the OPLIFT of fleet freight and general cargo.

4. Provide technical assistance and guidance on any aspect of the OPLIFT program. [Ref. 2]

D. THE PROGRAM TODAY

For the purpose of this study a review of OPLIFT cost savings data was conducted at NAVMTO Norfolk in June 1987. The review covered the period October 1982 to May 1987. Accurate and complete cost savings data were not available prior to October 1982. Cost savings were grouped by fiscal year. Within each fiscal year the number of lifts reported, the number of measurement tons (MT) moved (one measurement ton is equivalent to 40 cubic feet) and the cost savings attained were examined. The data are summarized in Table 2.1. The findings show that the CNO's revitalization initiative was met initially with overwhelming support. However, after achieving a cost savings of almost $12 million in FY 1984, enthusiasm for the use of OPLIFT began to wane. Annual cost savings have been on the decline since FY 1984. The reported cost savings through May of FY 1987 is only $1.35 million. The projected cost savings for FY 1987 is only $2 million. Also of importance is the

TABLE 2.1

TRANSPORTATION COST SAVINGS ATTRIBUTED
TO THE OPPORTUNE LIFT PROGRAM

Fiscal Year	# of OPLIFTS Reported	Measurement Tons Moved	Cost Savings
1983	112	51,954	$ 5,936,278
1984	198	80,661	$11,782,380
1985	178	66,049	$ 5,260,007
1986	98	37,504	$ 4,398,537
1987 (through May)	30	17,448	$ 1,353,363
TOTAL	616	253,616	$28,730,565
1987 (projected for FY)	45	26,172	$ 2,030,045

Source: Data provided by NAVMTO Norfolk and compiled by the researcher.

decreasing number of reported OPLIFTs over the same period. Only 30 OPLIFTs have been reported through May of FY 1987. The projected number of OPLIFTs for FY 1987 is only 45, a 340 percent decrease from FY 1984.

The data in Table 2.2 reflect measurement tons moved by OPLIFT as a percentage of measurement tons of Navy SWT funded cargo moved by ocean carrier (this includes all Navy cargo less mail, Navy Exchange and Navy Commissary material funded by SWT and charged to the "MSC Cargo" account). The percentage has steadily declined since peaking at 13.9

TABLE 2.2

CARGO MOVED BY OPPORTUNE LIFT AS A PERCENTAGE OF NAVY SWT FUNDED CARGO MOVED BY COMMERCIAL OCEAN TRANSPORTATION (MCS-CARGO)

Fiscal Year	Cargo Moved by OPLIFT (in Measure-Tons)	Navy SWT Funded Cargo Moved by Ocean Transportation (in Measurement Tons)	Cargo Moved by OPLIFT as a Percentage of Navy SWT Funded Cargo Moved by Ocean Transportation
1983	51,954	551,000	9.4%
1984	80,661	581,000	13.9%
1985	66,049	532,000	12.4%
1986	37,504	533,000	7.0%
1987 (through May)	17,448	370,000	4.7%
TOTAL	253,616	2,567,000	9.9%
1987 (projected for FY)	26,172	555,000	4.7%

Source: Data provided by NAVSUPSYSCOM and compiled by the researcher.

percent in FY 1984. The percentage is expected to fall to 4.7 percent for FY 1987.

Table 2.3 reflects OPLIFT cost savings as a percentage of the Navy's SWT expenditures for the movement of cargo by ocean carrier. After peaking at 17 percent in FY 1984, the percentage has also declined steadily. The percentage is expected to fall to 4.1 percent in FY 1987.

TABLE 2.3

OPPORTUNE LIFT COST SAVINGS AS A PERCENTAGE OF NAVY SWT EXPENDITURES FOR THE MOVEMENT OF CARGO BY OCEAN TRANSPORTATION (MSC-CARGO)

Fiscal Year	OPLIFT Cost Savings	Navy SWT Expenditures for the Movement of Cargo by Ocean Transportation	OPLIFT Cost Savings as a Percentage of Navy SWT Expenditures for the Movement of Cargo by Ocean Transportation
1983	$ 5,936,278	$ 65,946,000	9.0%
1984	$11,782,380	$ 69,282,000	17.0%
1985	$ 5,260,007	$ 42,898,000	12.2%
1986	$ 4,398,537	$ 47,588,000	9.2%
1987 (through May)	$ 1,353,363	$ 33,147,000	4.1%
TOTAL	$28,730,565	$258,861,000	11.1%
1987 (projected for FY)	$ 2,030,045	$ 49,721,000	4.1%

Source: Data provided by NAVSUPSYSCOM and compiled by the researcher.

The data in Tables 2.2 and 2.3 provide a comparison with ocean carrier service by which the relative importance of OPLIFT can be shown. Since FY 1983 the tonnage moved by OPLIFT has equated to 9.9 percent of the tonnage of Navy SWT funded cargo moved by ocean carrier. During the same time period the total cost savings attributed to OPLIFT equated to 11.1 percent of the Navy's SWT expenditures for the movement of cargo by ocean carrier. When compared to ocean carrier service, the tonnage moved and cost savings generated by OPLIFT are significant.

Table 2.4 compares the cost savings achieved through OPLIFT with all Navy SWT expenditures, not just "MSC Cargo." From this perspective OPLIFT cost savings are just a small fraction of the Navy's annual SWT expenditure, averaging just 1.5 percent. This, however, should not lead to the conclusion that OPLIFT cost savings are not worth pursuing. A discussion with the Office of the Chief of Naval Operations has indicated that SWT funding deficiencies, similar to those occurring in FY 1976, cannot be ruled out for the future. It is therefore important that OPLIFT be kept functioning as a viable cost avoidance program.

E. PERFORMANCE MEASURES

1. The Cost Savings Reporting System

Though it appears from the data in Tables 2.1 through 2.4 that the OPLIFT program is in a period of decline, it is difficult to properly assess how OPLIFT is actually performing because performance standards have not been established. On a monthly basis, NAVMTO reports the dollar cost savings achieved through OPLIFT utilization to NAVSUPSYSCOM. The significance of these cost savings cannot be properly evaluated, however, because there is no annual cost savings performance standard to compare it against.

Monthly cost savings are reported by NAVMTO strictly in terms of dollars. The cost savings achieved are not

TABLE 2.4

OPPORTUNE LIST COST SAVINGS AS A PERCENTAGE
OF NAVY SWT EXPENDITURES

Fiscal Year	Total OPLIFT Cost Savings	Total Navy SWT Expenditures	Total OPLIFT Cost Savings as a Percentage of the Total Navy SWT Expenditures
1983	$ 5,936,278	$ 442,454,000	1.3%
1984	$11,782,380	$ 442,294,000	2.7%
1985	$ 5,260,007	$ 387,055,000	1.4%
1986	$ 4,398,537	$ 372,818,000	1.2%
1987 (through May)	$ 1,353,363	$ 256,495,000	0.5%
TOTAL	$28,730,565	$1,901,116,000	1.5%
1987 (projected for FY)	$ 2,030,045	$ 394,743,000	0.5%

Source: Data provided by NAVSUPSYSCOM and compiled by the researcher.

compared or measured, by either NAVMTO or NAVSUPSYSCOM, against an established standard nor are emerging trends and patterns identified. For these reasons the existing cost savings reporting system does not go far enough in measuring OPLIFT performance.

Does a decrease in cost savings from one fiscal year to the next really indicate a downturn in the OPLIFT program? This question can be answered using the data in Table 2.3. The $6.5 million decrease in cost savings from FY 1984 to FY

1985 appears to indicate a significant decline in OPLIFT performance. If, however, a FY 1985 cost savings goal of 10 percent of that year's Navy SWT expenditure for the movement of cargo by ocean transportation had been established, a different conclusion could be reached. The $5.26 million achieved in cost savings in FY 1985, 12.2 percent of SWT expenditures on ocean cargo, would have surpassed the established annual performance goal, indicating satisfactory OPLIFT performance as a cost savings tool. If an annual cost savings performance goal of 15 percent of SWT expenditures on ocean cargo had been established, the goal would not have been met in FY 1985, indicating unsatisfactory OPLIFT performance. Only with the establishment of an annual performance goal against which cost savings can be compared can a meaningful picture of the performance of OPLIFT as a cost savings tool and a clear indication of the Program's direction be determined. As currently established the transportation cost savings reporting system, because it focuses solely on dollar cost savings, does not provide a meaningful picture of OPLIFT performance.

2. Measuring the Efficiency of the Utilization of OPLIFT Movement Capacity

A different measure of OPLIFT performance could be obtained by examining underutilized ship movement capacity, assuming that a demand for OPLIFT movement exists. OPLIFT movement capacity can be determined by requiring deploying ships to report OPLIFT "space available" to Fleet OPLIFT

Coordinators 30 days prior to deployment (this is currently a requirement in the Pacific Fleet and SIXTH Fleet). By comparing total OPLIFT tonnage moved with total OPLIFT "space availabile," or capacity, a level or measure of movement capacity utilization efficiency can be established. When tied to an annual movement capacity utilization performance goal, such a performance measure would provide a meaningful picture of whether or not OPLIFT movement capacity is being used efficiently, i.e., is OPLIFT cargo being moved when capacity and demand for movement exists.

A downturn in cost savings can result from a downturn in tonnage moved. The question that must be asked, however, is whether or not the downturn in tonnage moved was a result of insufficient OPLIFT movement capacity. Referring back to Table 2.1, the 14,612 ton decrease in tonnage moved from FY 1984 to FY 1985 appears to indicate a downturn in the Program. If, however, in FY 1985 a 90 percent OPLIFT movement capacity utilization goal was established and the tonnage moved that year was 98 percent of available capacity, we could conclude that in FY 1985 the Program was efficient and performing at a satisfactory level despite a decrease in cost savings and tonnage.

The efficiency with which OPLIFT utilization capacity is utilized is not currently measured at any level of the Program (NAVMTO, Fleet CINC or Fleet OPLIFT Coordinator). If such a measure were established it would be another substantive indicator of OPLIFT performance and, if combined with a meaningful measure of annual OPLIFT cost savings, would paint a definitive picture of OPLIFT performance.

F. SUMMARY

This chapter has provided the reader with an overview of the OPLIFT program and current and proposed system cost savings and performance measurements. The program is believed to have had its origin during the Vietnam conflict and proved to be an effective means of reducing transportation backlogs. When faced with a growing transportation budget deficit in 1976, OPLIFT was looked upon as a means of achieving transportation cost savings. The success of OPLIFT in helping to reduce the transportation budget deficit hastened its formal implementation at the fleet level. A growing transportation budget, close scrutiny of defense spending at all levels, and a decline in the real growth of OPLIFT cost savings during the period 1978 to 1982 resulted in a CNO initiative to revitalize the program. In September 1982 the CNO issued an OPLIFT policy statement and designated NAVMTO Norfolk as Program Manager. As Program Manager, NAVMTO became responsible for collecting, computing and reporting cost savings attributable to OPLIFT.

The renewed emphasis on OPLIFT as a cost savings measure resulted in transportation cost savings in excess of $17.7 million during FYs 1983 and 1984. Cost savings has since declined, with a projected cost savings for FY 1987 of only $2 million.

The existing cost savings reporting system does not provide a truly definitive picture of OPLIFT performance. Cost savings are reported by NAVMTO strictly in terms of dollars. An annual performance goal against which cost savings can be compared has not been established. Such a goal would put the annual transportation cost savings achieved into a clearer perspective and serve as a more meaningful indicator of OPLIFT effectiveness. The establishment of a measure of the efficiency with which OPLIFT movement capacity is utilized would also provide a clearer picture of OPLIFT performance.

Chapter III, "Implementation and Management of the Opportune Lift Program in the Atlantic and Pacific Fleets," will examine the growth of OPLIFT in the fleet. In addition, it will compare the relative strengths and weaknesses of both programs and identify inconsistencies in implementation at the fleet level.

III. IMPLEMENTATION AND MANAGEMENT OF OPPORTUNE LIFT IN THE ATLANTIC AND PACIFIC FLEETS

To stem growing transportation budget fund deficiencies in FY 1976, the CNO directed that Fleet CINCS appoint specific coordinators to insure that deploying and returning ships offer OPLIFT space for use by Navy shipping activities. The primary goal of OPLIFT was to reduce the expenditures of transportation funds held in the Navy's SWT account. In the Pacific Fleet, formal guidelines were quickly issued to encourage and regulate the use of OPLIFT. In the Atlantic Fleet, written guidelines specifically directed toward the establishment, regulation and coordination of the OPLIFT program were not immediately promulgated. Over the ensuing years, different philosophies and priorities pursuant to the use of OPLIFT developed in the two fleets. In the Pacific Fleet, OPLIFT was managed in a decentralized manner, with specific responsibilities and assignments clearly defined. The Atlantic Fleet, in direct contrast, pursued OPLIFT in a highly centralized form and provided little in the way of guidance relevant to responsibilities and reporting requirements.

A. OPPORTUNE LIFT IN THE ATLANTIC FLEET

Up until October 1982 paragraph 2713 of Commander in Chief U.S. Atlantic Fleet Instruction (CINCLANTFLTINST)

5400.2H, the Atlantic Fleet MLSF Manual, was the only source of formal OPLIFT guidance. The guidance provided was very general in nature and failed to set forth any specific reporting requirements for the individual ships other than to state that they were required to report the space available for OPLIFT to Commander Naval Surface Force, U.S. Atlantic Fleet (COMNAVSURFLANT) seven days prior to departure from port. In October 1982, more explicit informal OPLIFT procedures, which were eventually formalized by CINCLANTFLTINST 4600.2 of 11 June, 1984, were put into effect. These procedures specifically addressed OPLIFT and made Atlantic Fleet OPLIFT policy more straightforward. The procedures, however, deleted the OPLIFT "space available" reporting requirements for Atlantic Fleet ships.

1. <u>Atlantic Fleet Opportune Lift Policy</u>

Current Atlantic Fleet policy pertaining to the utilization of fleet surface ships in transporting OPLIFT cargo is contained in CINCLANTFLTINST 4600.2 dated 11 June 1984. It states that:

> Utilization of OPLIFT on fleet ships is strongly encouraged to reduce Servicewide Transportation Costs. OPLIFT will be aggressively pursued, yet scrutinized to ensure operational readiness of the lifting unit is not degraded for either assigned missions or emergent requirements. . . . OPLIFT on Atlantic Fleet ships shall routinely be used when such utilization will not adversely affect operational commitments or require operating schedule changes. [Ref. 7]

The key concept of Atlantic Fleet policy is that OPLIFT is to be carried out on a "not to interfere" basis.

Before OPLIFT cargo is loaded on a deploying vessel, it must be certain that the ship will stop at the intended port of discharge. Discussions with NSC Norfolk water terminal personnel indicate that scheduling uncertainty is a major reason why Atlantic Fleet OPLIFT requests are refused. This primarily impacts OPLIFT cargo destined for the Mediterranean.

Due to limited storage space, the Atlantic Fleet does not authorize the OPLIFT of perishable cargo or material of a pilferable nature, such as small arms, controlled equipage, Navy Exchange merchandise and alcoholic beverages. Hazardous materials and "dirty cargoes," such as cement and asphalt, are closely scrutinized prior to loading to ensure that their movement does not affect the operational readiness of the lifting unit. Data obtained from NAVMTO shows that cargo of a general nature and boats account for over 70 percent of the OPLIFT tonnage moved in the Atlantic Fleet.

2. Priority of Space Allocation

When the request for utilization of OPLIFT space exceeds the lift capacity of the loading vessel, the following general order of loading priority prevails in the Atlantic Fleet:

1. Fleet Organic Cargo. This consists of CINCLANTFLT owned material, such as SEAL Patrol Boats and repair equipment, the movement of which in the DTS is funded by the CINCLANTFLT O&M,N appropriation. The use of SWT is not authorized to fund the movement of Fleet organic cargo.

2. Fleet Freight. This consists of cargo issued by various supply sources in and around port areas that is destined for ships and units operating overseas or for overseas shore activities, such as Guantanamo Bay and Naples. Fleet freight accounts for approximately 15 percent of the OPLIFT cargo moved in the Atlantic Fleet.

3. General OPLIFT Cargo. This consists of non-fleet organic cargo and non-fleet freight, such as construction material and industrial equipment and materials, the movement of which is normally paid for by SWT funds.

4. Other OPLIFT Materials. This includes all other materials carried on an OPLIFT basis which cannot be billed to SWT funds. Privately owned vehicles of service members transferring from or to overseas duty stations make up the majority of this category of cargo. [Ref. 7]

In the Atlantic Fleet, loading priority is given to fleet organic cargo in order to reduce CINCLANTFLT O&M,N expenditures. Though the movement of fleet organic cargo by OPLIFT can improve the financial management position of CINCLANTFLT by "avoiding" O&M,N costs, it does nothing to reduce Navy SWT costs. For this reason, giving loading priority to fleet organic cargo appears to be in direct conflict with the CNO's OPLIFT policy which encourages the use of OPLIFT to reduce SWT costs.

3. Cargo Eligibility

Atlantic Fleet policy relative to cargo eligibility states that:

> Cargo destined to mobile units having an overseas consignment location in the current NAVMTO Freight Forwarding Guide is eligible for OPLIFT. OPLIFT shipments bound for units not listed in the Freight Forwarding Guide require prior shipment approval from NAVMTO. [Ref. 7]

This guidance fails to address the eligibility of general cargo and fleet freight consigned to overseas shore activities, cargo moving from overseas to CONUS and cargo moving between CONUS locations. These eligibility criteria have not, however, been strictly enforced by COMNAVSURFLANT in its role as Atlantic Fleet OPLIFT Coordinator.

4. Atlantic Fleet Opportune Lift Coordinator

COMNAVSURFLANT has been designated by CINCLANTFLT as executive agent for the Atlantic Fleet OPLIFT program. The close proximity to NAVMTO, NSC Norfolk and the Norfolk waterfront, where over 97 percent of the Atlantic Fleet's CLSF and Amphibious Force ships (the two biggest supporters of OPLIFT) are home ported, facilitates COMNAVSURFLANT's OPLIFT coordination role. As executive agent, COMNAVSURFLANT is responsible for:

1. Implementation of the Atlantic Fleet OPLIFT policy, with reporting instructions as necessary. (Discussions with the COMNAVSURFLANT staff revealed that implementing instructions were not forthcoming. All formal Atlantic Fleet OPLIFT guidance is contained in CINCLANTFLTINST 4600.2.)

2. Liaison between CLSF units and shipping activities for the OPLIFT of fleet freight.

3. Coordination of space available inputs with NAVMTO, the coordinator for the potential OPLIFT of non-fleet freight.

4. Providing NAVMTO with monthly reports summarizing the OPLIFT of fleet freight and general cargo by surface vessels. Commander Naval Air Force, U.S. Atlantic Fleet (COMNAVAIRLANT) is responsible for providing monthly reports to NAVMTO when AIRLANT units (aircraft carriers) move material by OPLIFT.

5. Authorizing OPLIFTs of "other OPLIFT material" requested by active duty and retired military personnel based on established loading priorities and the ability of Commanding Officers of ships to lift the specific items. [Ref. 7]

5. Interface with SIXTH Fleet Units

Commander SIXTH Fleet has assigned responsibility for coordinating OPLIFT in the Mediterranean theater of operations to Commander Service Force SIXTH Fleet based in Naples. SIXTH Fleet guidance is limited and very general in nature. The only reporting requirement set forth in the SIXTH Fleet Logistics Manual is that CLSF ships are required to advise SIXTH Fleet logisticians and shore activities of the space available to carry OPLIFT cargo seven days prior to entering the ports of Rota, Naples, Augusta Bay and Souda Bay. [Ref. 8]

B. OPPORTUNE LIFT IN THE PACIFIC FLEET

The earliest written Pacific Fleet OPLIFT guidance identified during the course of this study is Commander in Chief U.S. Pacific Fleet Instruction (CINCPACFLTNST) 4600.3B of 12 May, 1967. OPLIFT reporting requirements for individual ships have been in effect since 1978 when Commander Naval Surface Force, U.S. Pacific Fleet Instruction (COMNAVSURFPACINST) 4600.2B was issued [Ref. 9]. In 1984 the most recent CINCPACFLT general OPLIFT guidance was issued. This was followed in 1985 by detailed guidance from COMNAVSURFPAC, the Pacific Fleet OPLIFT manager.

1. Pacific Fleet Opportune Lift Policy

Current Pacific Fleet policy on the use of fleet surface ships in transporting cargo by OPLIFT is contained in CINCPACFLTINST 4600.3J dated 16 October, 1984. It states that:

> Use of OPLIFT for the movement of selected types of cargo and equipment is encouraged when this movement will result in conservation of shipping funds, support emergency situations, ensure delivery, or serve to enhance unit and personnel morale. OPLIFT is normally not suited for delivery and shipment of time critical cargo, personal mail or items which if carried would reduce fleet readiness. [Ref. 10]

As in the Atlantic Fleet, Pacific Fleet ships are used for OPLIFT only when such use will not adversely affect operational commitments or require operating schedule changes. The OPLIFT of cargo and equipment which requires the installation or removal of tie-down pad eyes, cleats, sheathing or battens or that is "dirty" in nature, such as cement, is not normally authorized. Further restrictions apply to cargoes that may endanger the safety of crew (such as certain types of hazardous material), reduce the ship's security posture, cause instability during the ship's transit, or otherwise hazard the vessel. [Ref. 10]

Pacific Fleet policy holds that OPLIFT can be best used in support of the following:

> Minor unit moves, shipment of replacement material and equipment to deployed Middle Pacific (MIDPAC) and Western Pacific (WESTPAC) units, return of material or equipment from MIDPAC and WESTPAC units, shipment of "Project Handclasp" material (goodwill material donated by charitable organizations), shipment of privately owned material belonging to members of the Armed Forces (active

and retired), shipments of conventional ordnance under specific conditions (the vessel must be sheathed), and shipments which cannot be accomplished by single manager resources. [Ref. 10]

2. Who May Use Opportune Lift

The Pacific Fleet has instituted strict guidelines on who may use OPLIFT. In general, authorization for the use of OPLIFT is extended to the following:

1. All agencies of the U.S. Government for the shipment of government owned property.

2. All members of the Armed Forces of the United States, both active and retired, and unremarried widows or widowers of deceased retired service members.

3. The West Coast Director of Project Handclasp. [Ref. 10]

The CNO's intention in implementing the OPLIFT program was to reduce transportation costs paid to commercial ocean carriers for shipping Navy sponsored cargo. Pacific Fleet interpretation of OPLIFT has expanded the program to include the movement of all U.S. Government sponsored cargo.

3. Priority of Space Allocation

The following general order of priority is used in allocating OPLIFT space in the Pacific Fleet:

1. Cargo and equipment for operationally deployed units (includes fleet freight).

2. Cargo and equipment for use in support of operationally deployed units (includes fleet organic cargo).

3. Conventional ordnance movements required by forces in direct support of operational commitments. (NAVMTO data shows that ordnance accounted for 31 percent of the OPLIFT cargo moved in the Pacific Fleet.)

4. Cargo and equipment for shore-based military installations.

5. Household goods and privately owned vehicles which are eligible for funded transportation.

6. Household goods and privately owned vehicles which are not eligible for funded transportation. (As in the Atlantic Fleet, this is a morale enhancement program mainly utilized by service members reporting to or returning from an overseas assignment.)

7. Project Handclasp material.

8. Other authorized material along with privately owned vehicles belonging to unremarried widows or widowers of deceased retired service members which are not eligible for funded transportation. [Ref. 10]

The Pacific Fleet, in contrast to the Atlantic Fleet, gives the highest loading priority to fleet freight cargo. Special preference does not appear to be given to CINCPACFLT organic cargo for the purpose of saving CINCPACFLT O&M,N funds.

4. Pacific Fleet Opportune Lift Manager

The OPLIFT Manager for the Pacific Fleet is COMNAVSURFPAC. As OPLIFT Manager, COMNAVSURFPAC is responsible for providing detailed instructions for the execution of OPLIFT within the Pacific Fleet. In addition, COMNAVSURFPAC is responsible for collecting data and providing a monthly report to NAVMTO identifying all government sponsored material shipped by OPLIFT. Rather than concern itself with cost savings for just Navy sponsored cargo, the Pacific Fleet reports cost savings for all government agencies and departments. In addition to Navy cargo, discussion with the COMNAVSURFPAC staff has indicated that significant quantities of Marine Corps cargo have been shipped via OPLIFT, particularly from Okinawa to Camp Pendleton, California.

As OPLIFT manager, COMNAVSURPAC is tasked with assigning coordination responsibilities for the Pacific Fleet. In contrast to the Atlantic Fleet, the homeports of the two biggest supporters of Pacific Fleet OPLIFT, the CLSF and Amphibious Force, are spread throughout the Pacific. This necessitates a greater level of coordination. To achieve this, COMNAVSURFPAC has assigned the following coordination responsibilities to the following activities:

1. Commander Amphibious Group THREE (COMPHIBGRU THREE). Offer space to COMSURFPAC for OPLIFTs on Amphibious units departing the Eastern Pacific [EASTPAC] for the Hawaii area (MIDPAC) and WESTPAC 60 days prior to deployment. Coordinate OPLIFT on ships assigned to COMPHIBGRU THREE.

2. Commander Naval Surface Group Western Pacific. (COMNAVSURFGRU WESTPAC) [CTF 73]. Coordinate and approve OPLIFT on ships operating within the SEVENTH Fleet. Establish an internal monitoring system for the OPLIFT program.

3. Commander Service Group ONE (COMSERVGRU ONE). Coordinate OPLIFTs on ships assigned to COMSERVGRU ONE that originate in CONUS. Coordinate with Commander Naval Surface Group Middle Pacific on the OPLIFT of ammunition that originates in MIDPAC.

4. Commander Naval Surface Group Middle Pacific (COMNAVSURFGRU MIDPAC). Act as COMNAVSURFPAC representative for MIDPAC for the approval and assignment of OPLIFT from the MIDPAC area. Coordinate and approve OPLIFT on ships assigned to COMNAVSURFGRU MIDPAC, and those originating and terminating in the MIDPAC area. Coordinate the OPLIFT of ammunition with COMSERVGRU ONE. Establish an internal monitoring program for OPLIFT.

5. Commander Cruiser-Destroyer Group(s) [COMCRUDES-GRU(s)]. Coordinate OPLIFTs on ships assigned to applicable COMCRUDESGRU Commands.

6. Commander Naval Air Force, U.S. Pacific Fleet [COMNAV-AIRPAC]. Coordinate OPLIFT on ships (aircraft carriers) assigned to COMNAVAIRPAC. [Ref. 11]

Figure 3.1 provides a clearer picture of the Pacific Fleet's OPLIFT approval authorities for the different areas of operation.

Origin of OPLIFT	Destination of OPLIFT	Approval Authority
EASTPAC	MIDPAC or WESTPAC	COMNAVSURFPAC
MIDPAC	EASTPAC or WESTPAC	COMNAVSURFGRU MIDPAC
WESTPAC	MIDPAC or EASTPAC	COMNAVSURFGRU WESTPAC

Figure 3.1 Pacific Fleet OPLIFT Approval Authorities

5. Vessel Reporting Requirements

Pacific Fleet ships, excepting Amphibious Force ships, are required to report space available for OPLIFT not later than 30 days prior to departing from an Eastern Pacific or Mid Pacific port to another port. Amphibious ships must report not later than 60 days prior to departure. Such reports make potential OPLIFT users aware of a vessel's lift capacity and planned movement, thus allowing them sufficient time to plan OPLIFT shipments. Space available reports are not required for ships departing from Western Pacific ports. OPLIFT loading and offloading reports are also required of all Pacific Fleet Ships. These reports serve to provide a chain of custody and accountability for the OPLIFT cargo. [Ref. 11]

C. PROGRAM COMPARISON

Different philosophies exist in the Atlantic and Pacific Fleets as to the management of OPLIFT. In the Atlantic Fleet the OPLIFT program is highly centralized in its administration, with COMNAVSURFLANT assigned primary coordination and approval responsibility. In the Pacific Fleet, largely because of geography and fleet dispersion, the OPLIFT program is more decentralized.

CINCPACFLT and COMNAVSURFPAC have detailed specific responsibilities through their formal OPLIFT instructions, thus reducing the potential for misunderstanding and misconception. The Atlantic Fleet has not issued as detailed instructions as the Pacific Fleet and relies more on informal and unwritten procedures.

The reporting procedures in the Pacific Fleet make the OPLIFT program more visible to potential users by providing them with the lift capacities and planned movement of possible OPLIFT candidates. In the Atlantic Fleet, potential users, excepting NSC Norfolk, NAVMTO, and Mediterranean shore activities, are not necessarily aware of this information since detailed OPLIFT "space available" reports are only required in the SIXTH Fleet operating area.

The priority of OPLIFT space allocation in the Atlantic Fleet gives preference to fleet organic cargo. As such the primary emphasis is on reducing CINCLANTFLT O&M,N expenditures. In the Pacific Fleet, the first priority is given to cargo and equipment for operationally deployed units, a priority which facilitates SWT cost avoidance.

D. SUMMARY

This chapter has presented to the reader the OPLIFT management philosophies and practices of the Atlantic and Pacific Fleets. The circumstances leading to the formal implementation of the Program were discussed. The utilization policies, management structures, reporting requirements and critical elements of each Fleet's OPLIFT program were detailed and compared.

Chapter IV will examine OPLIFT relevant to frequency of utilization, quantity of tonnage moved, transportation cost savings achieved, types of cargo moved, categories of ship moving the cargo and traffic routes over which the cargo is transported to determine program trends and patterns.

IV. TRENDS AND PATTERNS IN THE OPPORTUNE LIFT PROGRAM

Monthly OPLIFT reports submitted to NAVMTO by COMNAVSURFLANT and COMNAVSURFPAC contain the background data necessary to substantiate OPLIFT dollar savings. This background data includes the ports of embarkation and debarkation, name of the vessels conducting the OPLIFT, commodity moved, piece/weight/cube and measurement tons transported. An MSC billing rate, the rate that would have been paid if the cargo was shipped by commercial ocean transportation, is determined by NAVMTO based on ports of embarkation, ports of debarkation and commodity. Actual cost savings are determined by NAVMTO by multiplying the MSC billing rate by the measurements tons moved. [Ref. 12]

Since NAVMTO began collecting data on OPLIFT utilization in October 1982, it has concentrated on reporting only transportation cost savings. The background data are used only to substantiate OPLIFT cost savings and are not otherwise analyzed or reported on. That data, however, can be quite useful in the determination of OPLIFT trends and patterns.

For the purpose of this study all NAVMTO background data on OPLIFT were analyzed for the period October 1982 through May 1987. The purpose of the analysis was to examine OPLIFT in terms of the following:

1. Fleet utilization relevant to frequency of use, tonnage moved and cost savings achieved;
2. Categories of cargo shipped;
3. Categories or types of ship utilized;
4. Categories of cargo transported by different ship types; and
5. Traffic routes utilized.

A. FLEET UTILIZATION OF OPPORTUNE LIFT

Table 4.1 summarizes OPLIFT utilization in terms of three factors: volume of use (number of OPLIFTs conducted), measurement tons moved and transportation cost savings achieved at the Atlantic and Pacific Fleet levels. The data in Table 4.1 appears to reflect a sharp decline since FY 1984 for all three utilization factors in both the Atlantic and Pacific Fleet. The apparent downturn has been attributed to a number of different causes, all of which will be discussed in this section.

The relative stability of the Navy's SWT budget in recent years has precluded funding deficiencies, such as occurred in FY 1976, and has led to a diminished sense of urgency at the top management levels (CNO, NAVSUPSYSCOM and Fleet CINCS) concerning OPLIFT use. Discussions with NAVMTO Norfolk and NAVSUPSYSCOM, however, have indicated the need for a renewed emphasis on OPLIFT utilization as a cost avoidance vehicle.

Changes at the fleet level have also affected OPLIFT utilization. Deploying and returning Pacific Fleet amphibious ships previously loaded and unloaded vehicles and equipment in Hawaii. This allowed for the frequent movement of OPLIFT cargo on the relatively empty ships during the transits from California to Hawaii and Hawaii to California. Operational changes in FY 1987, however, have resulted in the amphibious ships now loading prior to leaving California and unloading on their return to California. This has significantly reduced available OPLIFT space. Data obtained from NAVMTO shows that California to Hawaii and Hawaii to California were the two traffic routes accounting for the largest percentage of OPLIFT tonnage moved. The loss of potential OPLIFT space on these routes has had a negative impact on OPLIFT utilization.

Fuel constraints brought on by funding shortfalls have also impacted OPLIFT. Reduced fuel allotments at the fleet level have resulted in reduced "steaming" hours. Training cruises that formerly departed from CONUS for Hawaii, Guantanamo Bay and Puerto Rico have now become "local training" evolutions. Such training cruises served as a means of moving OPLIFT cargo. The reduction in "steaming hours" has played a part in the current OPLIFT downturn.

Ship Commanding Officers have become more reluctant to transport OPLIFT cargo. Transporting OPLIFT cargo means more work for the ship's crew. Cargo must be loaded, manifested, tied down and braced for sea, protected and unloaded. More responsibility is placed on the Commanding

Officer since he becomes accountable for the safety of the OPLIFT cargo. The ship's crew is often against the moving of OPLIFT cargo. The concern of the crew upon returning from a long deployment lies in departing the ship as quickly as possible, therefore unloading OPLIFT cargo is not always the highest priority for the crew. There currently exists no tangible incentive for a ship to carry OPLIFT cargo. Only drawbacks exist and they have influenced the willingness of ship Commanding Officers to carry OPLIFT cargo. If the ship is unwilling to transport the cargo, the cargo will not move. This unwillingness of ships to carry OPLIFT material has impacted the OPLIFT program in both the Atlantic and Pacific Fleets.

Contributing to the downturn of OPLIFT in the Atlantic Fleet was the replacement of NSC Norfolk, by NSC Jacksonville, as the point of entry for transportation priority three (the lowest priority and therefore eligible for movement by OPLIFT) requisitions for Guantanamo Bay, Cuba and Roosevelt Roads, Puerto Rico. There are fewer ships, with smaller cargo capacity, available for OPLIFT in Jacksonville thereby reducing the potential for conducting OPLIFT. [Ref. 13]

The completion of military construction projects in Guantanamo Bay has also resulted in decreased OPLIFT utilization in the Atlantic Fleet. A steady flow of construction material, such as structural steel, forklifts, tractors, mixers and vehicles, was moved to Guantanamo Bay via OPLIFT in FY 1983 and 1984. No major construction has taken place since that time, thereby negating the need for OPLIFT. [Ref. 13]

The data in Table 4.1 also point out some significant differences in the volume of OPLIFT, number of measurement tons moved and cost savings achieved between the Atlantic and Pacific Fleets. Comparatively speaking, the OPLIFT program in the Pacific Fleet has consistently been more productive than that of the Atlantic Fleet. In the aggregate, the Pacific Fleet has utilized more OPLIFTs, moved more tonnage and achieved greater cost savings. Only in FY 1983, when it achieved a higher frequency of OPLIFT use, did the Atlantic Fleet surpass the Pacific Fleet in any utilization factor. The higher degree of utilization in the Pacific Fleet can in part be attributed to the detailed OPLIFT implementing instructions provided by CINCPACFLT and COMNAVSURFPAC. These instructions provide clear-cut responsibilities and assignments, and serve to facilitate OPLIFT coordination and utilization.

Figures 4.1 through 4.3 show graphically the trends in the volume of OPLIFT utilization, tonnage moved and cost savings achieved at the Atlantic, Pacific and Fleet-wide levels since FY 1983.

TABLE 4.1

FLEET UTILIZATION OF OPPORTUNE LIFT, OCTOBER 1982 THROUGH MAY 1987

	Atlantic Fleet			Pacific Fleet		
Fiscal Year	# Lifts	Measurement Tons	Cost Savings	# Lifts	Measurement Tons	Cost Savings
1983	78	26,807	$2,738,166	34	25,147	$3,198,112
1984	82	22,658	$2,726,656	116	58,003	$9,055,724
1985	65	17,322	$1,293,980	113	48,727	$3,966,027
1986	22	4,780	$ 342,453	76	32,724	$4,056,084
1987 (through May)	4	458	$ 26,477	26	16,990	$1,326,886
TOTAL	251	72,025	$7,127,732	365	181,591	$21,602,833
1987 (projected)	6	687	$ 39,716	39	25,485	$1,990,329

Source: Data compiled from NAVMTO Norfolk by the researcher.

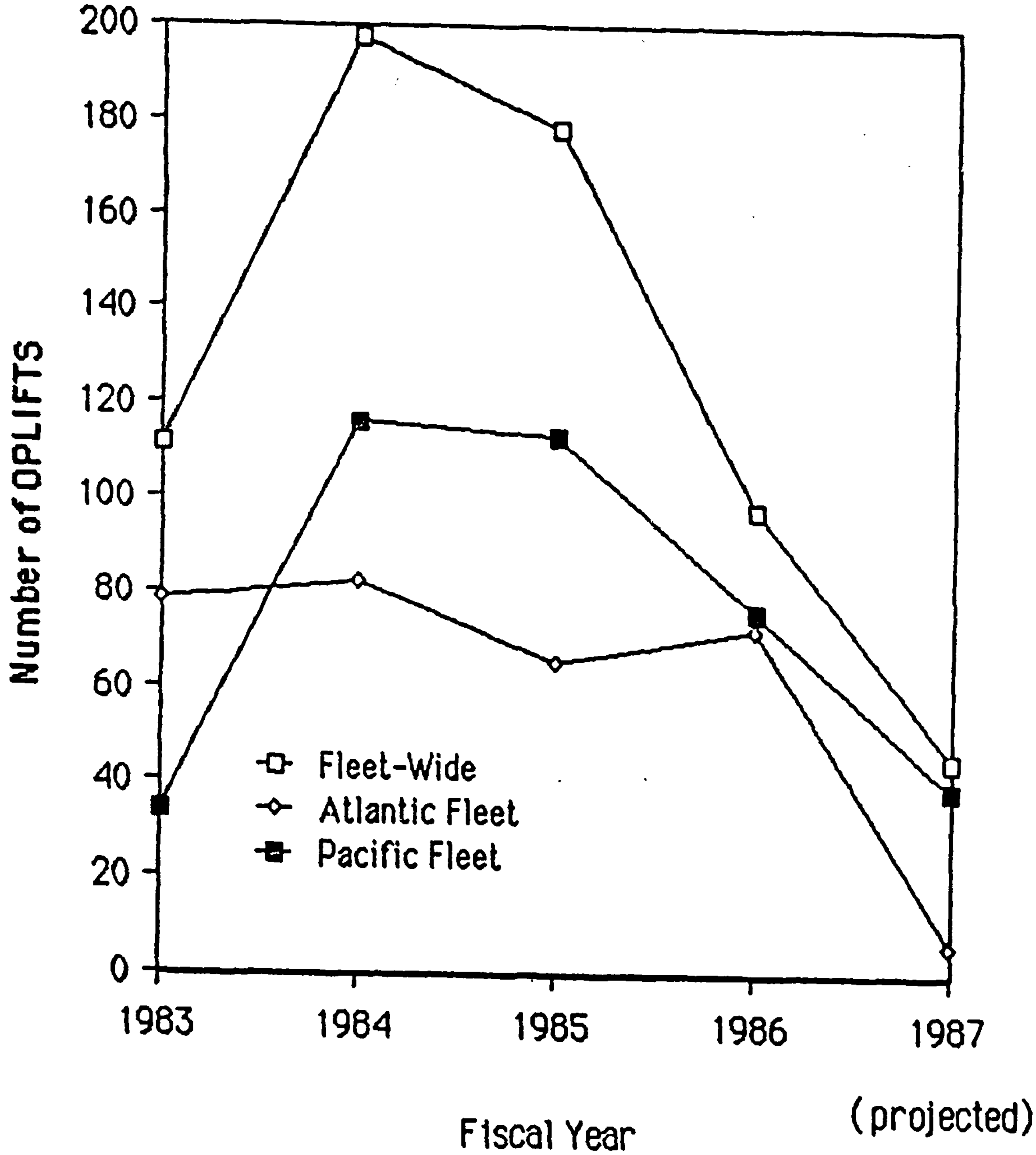

Figure 4.1 Trend in Volume of OPLIFT Use, FYs 1983-1987

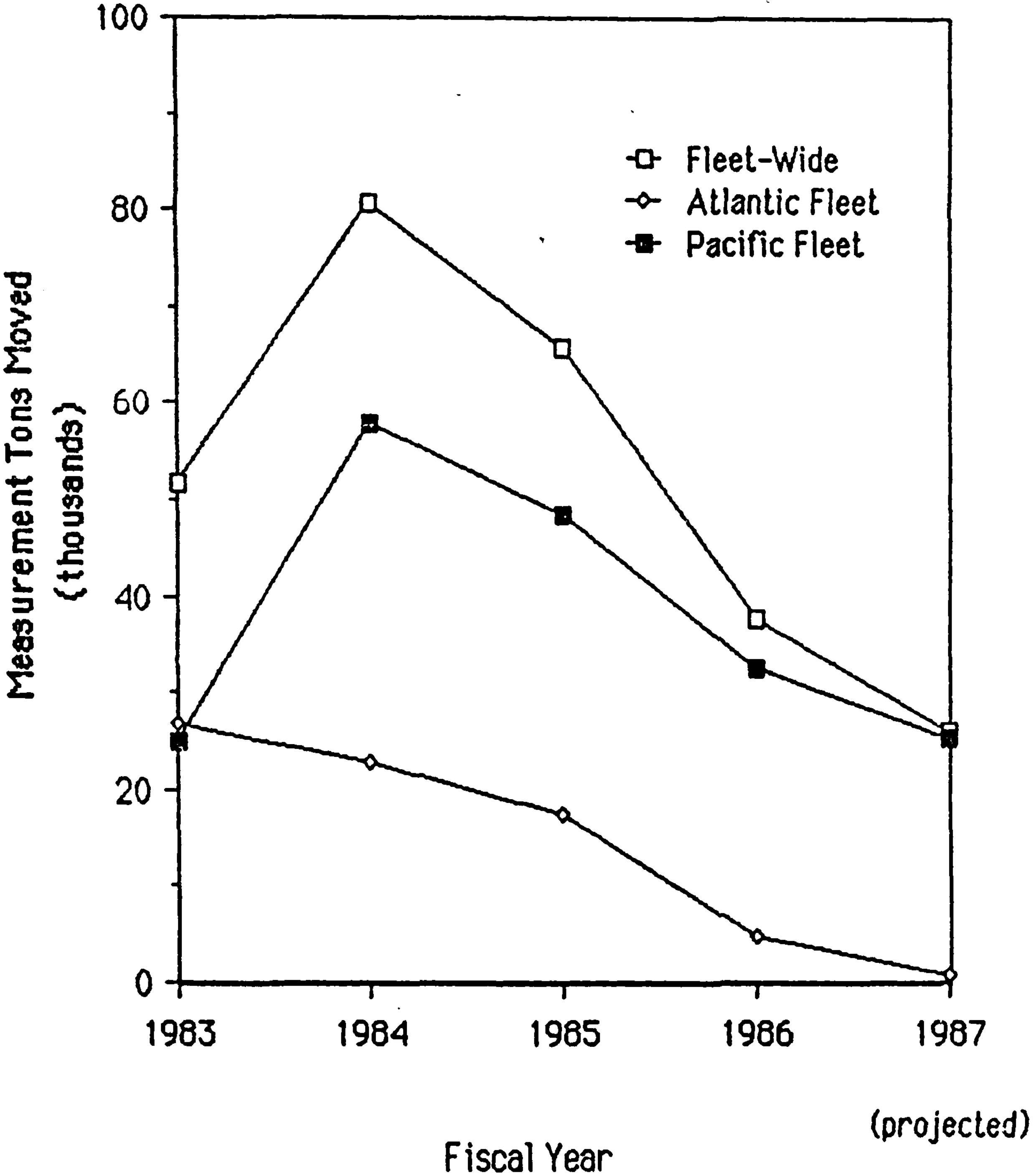

Figure 4.2 Trend in OPLIFT Tonnage Moved, FYs 1983-1987

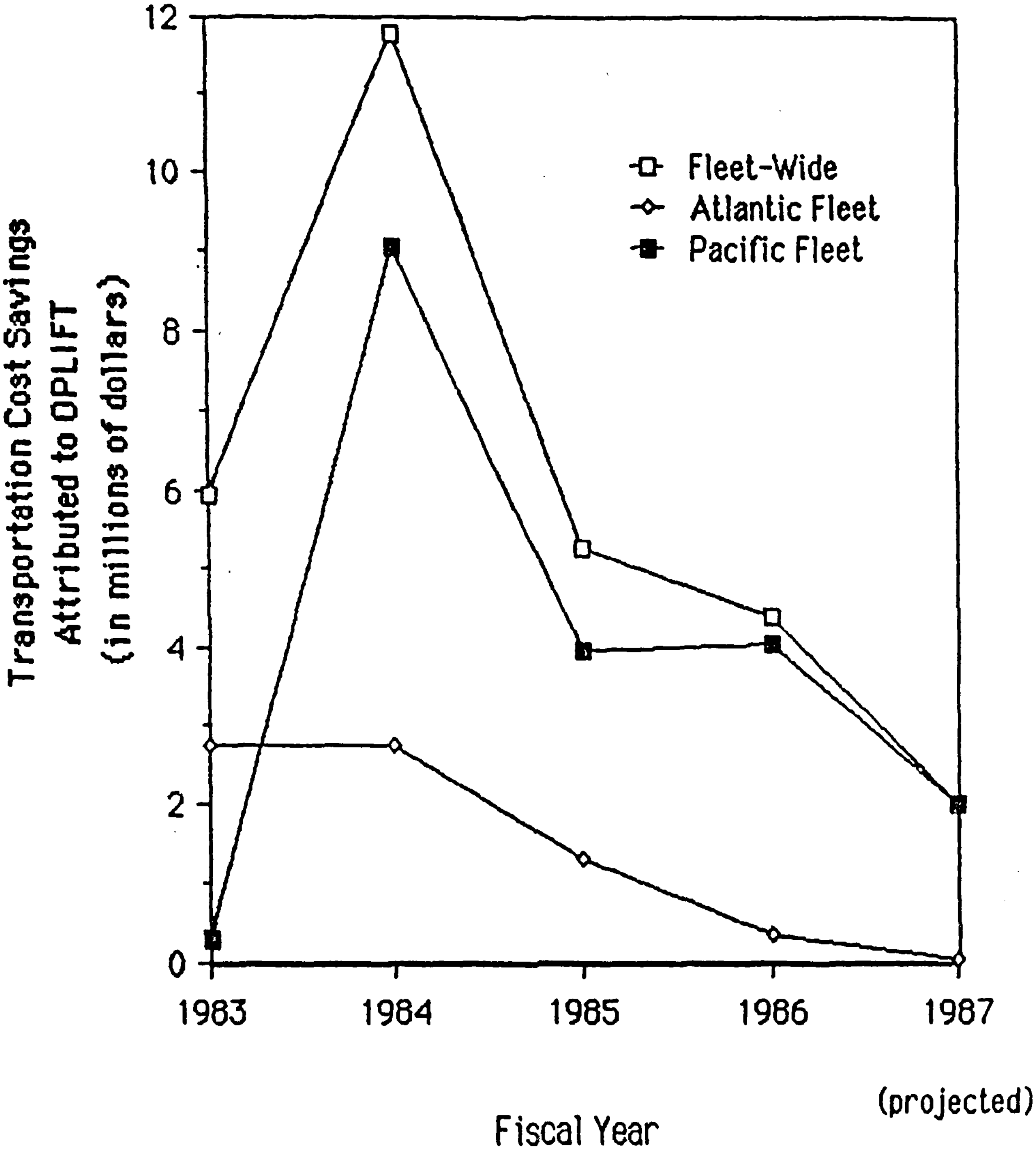

Figure 4.3 Trend in OPLIFT Cost Savings, FYs 1983-1987

B. CATEGORIES OF CARGO MOVED BY OPPORTUNE LIFT

Appendix A contains detailed data on the categories of cargo moved by OPLIFT for the period FY 1983 through May FY 1987. These data will be summarized in this section.

To support its monthly transportation cost savings analysis, NAVMTO prepares a worksheet which analyzes each OPLIFT reported. The worksheet uses the background information on commodities moved to classify the cargo into different categories. For the purpose of this study the commodities moved were broken down into six broad categories: aircraft, boats, ordnance, general cargo (includes fleet freight), vehicles (includes military, wheeled and tracked vehicles) and "other" cargo. Table 4.2 summarizes the six categories of cargo moved.

The data in Table 4.2 and Appendix A show that in the Atlantic Fleet general cargo was the primary cargo moved by OPLIFT, accounting for 52 percent of the tonnage and 47 percent of the cost savings. Ordnance, accounting for 31 percent of the tonnage and 38 percent of the cost savings, was the primary cargo moved in the Pacific Fleet. In contrast to the Atlantic Fleet, general cargo accounted for only 18 percent of the tonnage moved and 12 percent of the cost savings in the Pacific Fleet. At the Fleet-wide level, general cargo was the primary cargo in terms of tonnage moved while ordnance accounted for the greatest cost savings.

TABLE 4.2

SUMMARY OF OPPORTUNE LIFT BY CARGO CATEGORY, OCTOBER 1982 THROUGH MAY 1987

Cargo Category	Atlantic Fleet Measurement Tons	Atlantic Fleet Cost Savings	Pacific Fleet Measurement Tons	Pacific Fleet Cost Savings	Fleet Total Measurement Tons	Fleet Total Cost Savings
Aircraft	3,736	$ 440,528	46,342	$4,797,371	50,078	$5,237,899
Ordnance	6,445	$1,009,129	56,104	$8,308,331	62,549	$9,317,460
Boats	13,743	$1,496,526	29,228	$4,394,777	42,971	$5,891,303
General Cargo	37,111	$3,350,236	34,031	$2,473,069	71,142	$5,823,305
Vehicles	5,659	$ 476,700	8,505	$ 964,101	14,164	$1,440,801
Other	5,331	$ 354,613	7,381	$ 665,184	12,712	$1,019,797
TOTAL	72,025	$7,127,732	181,591	$21,602,833	253,616	$28,730,565

Source: Data compiled from NAVMTO Norfolk by the researcher.

The dominance of general cargo movements in the Atlantic Fleet is attributed to the large quantities of fleet freight and general cargo moved from CONUS to the Mediterranean and back in support of deployed units and overseas shore activities. Unlike the Middle and Western Pacific, there are no supply depots in the Mediterranean and the degree of dependence on CONUS resupply is much higher. Fleet freight and general supplies are frequently moved from CONUS to the Mediterranean as OPLIFT cargo on deploying CLSF ships.

The higher percentage of ordnance movements in the Pacific Fleet is attributed to the location of Naval Magazines in Guam and the Philippines. There are no Naval Magazines outside of CONUS in the Atlantic, thus diminishing the Atlantic Fleet's need to move ordnance.

Table 4.3 shows the average transportation cost savings per measurement ton moved for the different categories of cargo. In the Atlantic Fleet the greatest cost savings per ton was in the OPLIFT of ordnance. In the Pacific Fleet the greatest cost savings occurred in the OPLIFT of boats and ordnance. Fleet-wide, ordnance provided the greatest cost savings. The data in Table 4.3 are a rough indicator of the categories of cargo providing the greatest transportation cost savings per ton and are, therefore, useful for prioritizing categories of cargo to be loaded under conditions of limited space availability in order to maximize transportation cost savings.

TABLE 4.3

AVERAGE COST SAVINGS PER MEASUREMENT TON MOVED, BY CARGO CATEGORY, OCTOBER 1982 THROUGH MAY 1987

Cargo Category	Atlantic Fleet	Pacific Fleet	Fleet Total
Aircraft	$118	$104	$105
Ordnance	$157	$148	$149
Boats	$108	$150	$137
General Cargo	$ 90	$ 73	$ 82
Vehicles	$ 84	$113	$102
Other	$ 66	$ 90	$ 80

Source: Data compiled from NAVMTO Norfolk by the researcher.

C. CATEGORIES OF SHIP UTILIZED FOR OPPORTUNE LIFT

The names of the vessels conducting OPLIFT are reported to NAVMTO on a monthly basis as a part of the OPLIFT substantiating data. Given the ship's name, its classification or type (CGN, AOR, AFS, etc.) can be easily determined. For the purpose of this study the ship types utilized for OPLIFT were grouped into six categories:

1. Combat Logistic Support Force (CLSF): AE, AOE, AO, AOR, AFS and all ships of the MSC's Naval Fleet Auxiliary Force;
2. Amphibious Force: LCU, LST, LSD, LPD, LCC, LKA, LPH and LHA;
3. Combatant: DD, DDG, FF, FFG, CG, CGN and BB;
4. Tender: AR, AD and AS;

5. Aircraft Carrier: CV and CVN; and

6. Other: includes all other ship types.

Appendix B contains detailed data on the categories of ship utilized for OPLIFT for the period October 1982 through May 1987. These data will be summarized in this section.

In the Atlantic Fleet CLSF ships accounted for 60 percent of the OPLIFTs conducted, 57 percent of the tonnage moved and 60 percent of the cost savings achieved. Amphibious ships, in contrast, accounted for 29 percent of the OPLIFTs conducted, 39 percent of the tonnage moved and 36 percent of the cost savings. In the Pacific Fleet the pattern was somewhat reversed with amphibious ships accounting for 37 percent of the OPLIFTs, 57 percent of the tonnage moved and 52 percent of the cost savings while CLSF ships accounted for 56 percent of the OPLIFTs, 40 percent of the tonnage moved and 45 percent of the cost savings. Fleet-wide CLSF ships accounted for the greatest percentage of OPLIFTs while amphibious ships moved the largest percentage of tonnage and achieved the greatest percentage of cost savings. Table 4.4 is a summarization of the data contained in Appendix B.

The utilization of Combatants, Tenders, Aircraft Carriers and "Other" ships for OPLIFT purposes was very limited. Aircraft Carriers, despite their large size and holding capacity, were rarely utilized to carry OPLIFT cargo and accounted for only four OPLIFTs in almost five years.

TABLE 4.4

SUMMARY OF OPPORTUNE LIFT BY SHIP CATEGORIES, OCTOBER 1982 THROUGH MAY 1987

Ship Category	Atlantic Fleet # Lifts	Atlantic Fleet MT	Pacific Fleet # Lifts	Pacific Fleet MT	Fleet Total # Lifts	Fleet Total MT
CLSF	151	41,494	203	72,781	354	114,275
Amphibious	73	28,534	136	103,381	209	131,921
Combatant	13	417	10	581	23	998
Tender	7	612	12	2,527	19	3,139
Carrier	1	503	3	2,294	4	2,797
Other	6	465	1	21	7	486
Total	251	72,025	365	181,591	616	253,616

Cost Savings

Ship Category	Atlantic Fleet	Pacific Fleet	Fleet Total
CLSF	$4,287,704	$ 9,639,807	$13,927,511
Amphibious	$2,624,859	$11,339,803	$13,964,662
Combatant	$ 51,085	$ 61,714	$ 112,799
Tender	$ 81,667	$ 244,596	$ 326,263
Carrier	$ 44,113	$ 315,647	$ 359,760
Other	$ 38,304	$ 1,266	$ 39,570
Total	$7,127,732	$21,602,833	$28,730,565

Notes: MT = Measurement Tons

Source: Data compiled from NAVMTO Norfolk by the researcher.

Their infrequent use can be attributed to their unique function which requires the utilization of all available deck space for aircraft storage.

D. CATEGORIES OF OPPORTUNE LIFT CARGO MOVED BY DIFFERENT SHIP TYPES

Appendix C provides detailed data on the categories of OPLIFT cargo moved by the different ship types. These data are summarized in Table 4.5. In the Atlantic Fleet CLSF ships were primarily utilized to move general cargo while amphibious ships were used to move general cargo and boats. In the Pacific Fleet CLSF ships were used primarily to move ordnance. Very little general cargo was moved by CLSF ships in the Pacific Fleet. Amphibious ships assigned to the Pacific Fleet were used primarily to move aircraft, general cargo and boats.

The loading patterns reflected in Table 4.5 are consistent with the lift capabilities of the different categories of ships. The extra deck space normally available on amphibious ships facilitates the movement of large and bulky items. Seventy-three percent of aircraft, 81 percent of boats and 77 percent of vehicles, all items considered to be large and bulky in nature, were moved by amphibious ships. CLSF ships, many of which are designed to carry explosives and ordnance, moved 99 percent of the ordnance. The only inconsistency rests in the fact that CLSF ships moved only 40 percent of the general cargo

TABLE 4.5

CATEGORIES OF OPPORTUNE LIFT CARGO MOVED, BY SHIP TYPE,
OCTOBER 1982 THROUGH MAY 1987

	CLSF		Amphibious		All Other		Fleet Totals	
Cargo Category	MT LANT	MT PAC	MT LANT	MT PAC	MT LANT	MT PAC	MT LANT	MT PAC
Aircraft	1,408	6,590	1,332	35,132	996	4,620	3,736	46,342
Ordnance	6,274	55,718	166	386	5	0	6,445	56,104
Boats	3,840	3,858	9,474	25,285	429	85	13,743	29,228
General Cargo	25,914	2,488	10,925	30,907	272	636	37,111	34,031
Vehicles	2,708	218	2,730	8,205	221	82	5,659	8,505
Other	1,350	3,909	3,907	3,472	74	0	5,331	7,381
TOTAL	41,494	72,718	28,534	103,387	1,997	5,423	72,025	181,591

Notes: MT = Measurement Tons

LANT = Atlantic Fleet

PAC = Pacific Fleet

Source: Data compiled from NAVMTO Norfolk by the researcher.

fleet-wide. The CLSF normally brings to mind terms such as "underway replenishment" and "resupply." These are terms that are associated with the transfer of fleet freight and general cargo. While CLSF ships were utilized for that purpose in the Atlantic Fleet, amphibious ships moved the majority of general cargo in the Pacific Fleet and fleet-wide.

E. OPPORTUNE LIFT MAJOR TRAFFIC ROUTES

For the purpose of this study the OPLIFT ports of embarkation and debarkation were grouped by geographic traffic area. Appendix D provides a geographical description of the different OPLIFT traffic areas utilized.

A regular line of travel from one traffic area to another traffic area is called a traffic route. From October 1982 through May 1987, a total of 77 different traffic routes were utilized for OPLIFT purposes. Detailed data on the traffic routes utilized are provided in Appendix E. In analyzing the traffic routes utilized, it was found that 13 routes, eight in the Pacific and five in the Atlantic, accounted for 79 percent of both the tonnage moved and the cost savings achieved. Table 4.6 reflects these 13 major traffic routes utilized. Fleet-wide, the California Coast to Hawaiian Islands and Hawaiian Islands to California Coast routes accounted for the most tonnage moved. The greatest fleet-wide cost savings occurred on the Marianas to California Coast and Philippines to California Coast routes.

TABLE 4.6

THIRTEEN MAJOR OPPORTUNE LIFT TRAFFIC ROUTES, OCTOBER 1982 THROUGH MAY 1987

Traffic Route and Ranking (in terms of tonnage)	Measurement Tons	% of Fleet Total	Cost Savings	% of Fleet Total	Average Cost Savings per Ton
1. California Coast-Hawaiian Islands	30,260	12	$3,223,994	11	$106
2. Hawaiian Islands-California Coast	29,566	12	$2,564,580	9	$ 86
3. West Mediter. Atlantic Coast	19,440	8	$2,441,805	8	$125
4. Ryukyu Islands-California Coast	19,214	8	$1,836,960	6	$ 95
5. Marianas-California Coast	18,913	7	$3,743,963	13	$198
6. Philippines-California Coast	16,200	6	$3,359,783	12	$207
7. Atlantic Coast-West Mediter.	14,024	6	$1,361,488	5	$ 97
8. Philippines-Japan	11,663	5	$1,050,813	4	$ 91
9. Atlantic Coast-Guantanamo Bay	11,152	4	$ 673,473	2	$ 60
10. Atlantic Coast-Puerto Rico	9,570	4	$1,179,703	4	$123
11. Guantanamo Bay-Atlantic Coast	8,685	3	$ 528,657	2	$ 61

TABLE 4.6 (CONTINUED)

Traffic Route and Ranking (in terms of tonnage)	Measurement Tons	% of Fleet Total	Cost Savings	% of Fleet Total	Average Cost Savings per Ton
12. California Coast-California Coast	5,487	2	$ 185,832	1	$ 34
13. Japan-Philippines	5,281	2	$ 567,789	2	$107
TOTAL	199,455	79	$22,718,840	79	
Fleet Total	253,616		$28,730,565		

Source: Data provided by NAVMTO Norfolk and compiled by the researcher.

In the Atlantic Fleet, 25 different traffic routes were utilized for the purpose of OPLIFT with the five major routes accounting for 86 percent of both the tonnage moved and the cost savings achieved. In the Pacific Fleet, 52 different traffic routes were utilized for OPLIFT with the eight major routes accounting for 75 percent of the tonnage moved and 78 percent of the cost savings.

The three traffic areas accounting for the most tonnage embarked were the California Coast, Atlantic Coast and Philippines, accounting for 18, 16 and 14 percent, respectively, of all OPLIFT tonnage loaded (Table E.7). The three traffic areas accounting for the most OPLIFT tonnage disembarked were the California Coast, Hawaiian Islands and Atlantic Coast, accounting for 37, 15 and 13 percent, respectively, of all tonnage offloaded (Table E.8).

The flow of OPLIFT cargo between the major traffic areas appears to be consistent with the levels of concentration of Naval forces and shore-based activities in those areas. Appendix F provides detailed data for the 13 major traffic routes relative to the categories of cargo moved and the ship types moving them. The data shows that each of the major traffic routes can be categorized by the movement of one or two specific cargoes on primarily one ship type, as though a system of cargo specialization has developed for each route.

F. SUMMARY

This chapter has examined OPLIFT in terms of volume of use, tonnage moved, cost savings achieved, category of cargo moved, ship type utilized and traffic routes travelled. The OPLIFT program appears to have been in a state of decline since FY 1985. A number of factors have contributed to the apparent downturn; among them are decreased high level interest in OPLIFT, changes in fleet operating procedures, fuel constraints and a growing unwillingness of ship Commanding Officers to transport OPLIFT cargo. Different patterns in terms of categories of cargo moved and ship type utilized have also developed in the Atlantic and Pacific Fleets.

In the Atlantic Fleet, the primary category of cargo moved is general cargo. CLSF ships have accounted for the majority of Atlantic Fleet tonnage moved. Five major traffic routes in the Atlantic Fleet accounted for 86 percent of both the cost savings achieved and the tonnage moved. The West Mediterranean to Atlantic Coast and Atlantic Coast to West Mediterranean traffic routes accounted for the most tonnage moved in the Atlantic Fleet.

The major categories of cargo moved in the Pacific Fleet are ordnance and aircraft. Amphibious ships have accounted for the majority of cargo moved in the Pacific Fleet while CLSF ships transported 99 percent of the ordnance. Eight major traffic routes accounted for 75 percent of the tonnage and 78 percent of the cost savings in the Pacific Fleet. The California Coast to Hawaiian Islands and Hawaiian Islands to California Coast traffic routes accounted for the most tonnage moved.

Chapter V will develop a multiple linear regression model to predict total monthly OPLIFT cost savings.

V. A MULTIPLE LINEAR REGRESSION MODEL TO PREDICT TOTAL MONTHLY OPPORTUNE LIFT COST SAVINGS

A. DEVELOPING THE MODEL

1. Multiple Linear Regression Analysis

Fleet-wide or total monthly cost savings attributed to OPLIFT have fluctuated widely. Total monthly OPLIFT cost savings is a function of both the monthly OPLIFT tonnage moved and the number of monthly OPLIFTs conducted by the Atlantic and Pacific Fleets. Appendix G reflects the total monthly cost savings attributed to OPLIFT, the monthly OPLIFT tonnage moved by the Atlantic and Pacific Fleets and the number of monthly OPLIFTs conducted by the Atlantic and Pacific Fleets for the 56 month period October 1982 through May 1987. From Appendix G it can be observed that total monthly cost savings have been as high as $2,693,518 for March 1984 and as low as $1,002 for April 1987. A model which can predict total monthly OPLIFT cost savings can be a useful management tool for the purposes of planning and controlling the OPLIFT program.

Regression analysis is a statistical technique often used for the purpose of predicting. The objective of regression analysis is the development of a statistical model which uses information about a set of independent or explanatory variables in order to estimate the expected value of some variable believed to be dependent or responsive. [Ref. 14:p. 203]. In multiple linear regression analysis several explanatory variables are used to predict the value of a dependent variable.

In developing a multiple linear regression model to predict the dependent variable total monthly OPLIFT cost savings, four explanatory variables were evaluated--monthly tonnage moved by OPLIFT in the Atlantic Fleet, the number of monthly OPLIFTs conducted in the Atlantic Fleet, monthly tonnage moved by OPLIFT in the Pacific Fleet and the number of monthly OPLIFTs conducted in the Pacific Fleet.

The widespread availability of various computer packages has led to a great expansion in the application of regression models. For the purpose of this study, Minitab, a general purpose data analysis system, was used to develop the multiple linear regression model for the prediction of total monthly OPLIFT cost savings.

2. <u>The Regression Equation</u>

The regression equation for the multiple linear regression model for total monthly OPLIFT cost savings is as follows:

$$\hat{y}_i = b_o + + b_1x_{1i} + b_2x_{2i} + b_3x_{3i} + b_4x_{4i}$$

where:

$\hat{y}_i$ = predicted total monthly OPLIFT cost savings for observation i

b_o = Y intercept

b_1 = slope of Y with variable x_1 holding variables x_2, x_3 and x_4 constant

b_2 = slope of Y with variable x_2 holding variables x_1, x_3 and x_4 constant

b_3 = slope of Y with variable x_3 holding variables x_1, x_2 and x_4 constant

b_4 = slope of Y with variable x_4 holding variables x_1, x_2 and x_3 constant

x_{1i} = monthly OPLIFT tonnage moved in the Atlantic Fleet for observation i

x_{2i} = number of monthly OPLIFTs conducted in the Atlantic Fleet for observation i

x_{3i} = monthly OPLIFT tonnage moved in the Pacific Fleet for observation i

x_{4i} = number of monthly OPLIFTs conducted in the Pacific Fleet for observation i

The value of the regression coefficients (b_o, b_1, b_2, b_3 and b_4) were obtained through the use of Minitab. The computed values of the regression coefficients are:

$$b_o = -136{,}507, \quad b_1 = 107, \quad b_2 = 12{,}775, \quad b_3 = 130, \quad b_4 = 5{,}256$$

The multiple regression equation can therefore be expressed as follows:

$$\hat{y}_i = -136{,}507 + 107x_{1i} + 12{,}775x_{2i} + 130x_{3i} + 5{,}256x_{4i}$$

The Y intercept (b_0, computed as -136,507), represents the constant used in the model. The slope of monthly OPLIFT tonnage moved in the Atlantic Fleet (b_1, computed as 107) can be interpreted to mean that for a month with a given number of OPLIFTs conducted in the Atlantic and Pacific Fleets and a given amount of tonnage moved in the Pacific Fleet, total monthly OPLIFT cost savings will increase by 107 dollars for every one ton increase in OPLIFT tonnage moved. The slope of the number of monthly OPLIFTs conducted in the Atlantic Fleet (b_2, computed as 12,775) can be interpreted to mean that for a month with a given quantity of tonnage moved in the Atlantic and Pacific Fleets and a given number of OPLIFTs conducted in the Pacific Fleet, total monthly OPLIFT cost savings will increase by 12,775 dollars for each additional OPLIFT conducted. The slope of monthly tonnage moved in the Pacific Fleet (b_3, computed as 130) can be interpreted to mean that for a month with a given number of OPLIFTs conducted in the Atlantic and Pacific Fleets and a given amount of OPLIFT tonnage moved in the Atlantic Fleet, total monthly OPLIFT cost savings will increase by 130 dollars for each one ton increase in OPLIFT tonnage moved. Lastly, the slope of the number of monthly OPLIFTs conducted in the Pacific Fleet (b_4, computed at 5,256) can be interpreted to mean that for a given amount of tonnage moved in the Atlantic and Pacific Fleets and a given number of OPLIFTs conducted in the Atlantic Fleet, total monthly OPLIFT cost savings will increase by 5,256 dollars for each additional OPLIFT conducted.

B. ANALYZING THE MODEL

1. Multicollinearity

Multicollinearity is the term applied to the condition of strong correlations or interrelationships between the explanatory variables. When this condition exists it is difficult to isolate the effects individual explanatory variables have upon the response variable. In such instances, highly unstable regression coefficients can result for the correlated variables. [Ref. 14:p. 414]

One method for measuring collinearity uses the variance inflationary factor (VIF) for each explanatory variable. VIF is defined as

$$VIF_j = \frac{1}{1 - R_j^2}$$

where R_j^2 represents the coefficient of multiple determination of explanatory variable X_{ij} with all the other variables. [Ref. 15:p. 694]

Figure 5.1 represent partial Minitab output for the multiple linear regression model in which total monthly OPLIFT cost savings (Totsav) is predicted from monthly Atlantic Fleet OPLIFT tonnage moved (Lantons), the number of monthly OPLIFTs conducted in the Atlantic Fleet (Lanlifts), monthly Pacific Fleet OPLIFT tonnage moved (Pactons) and the

The Regression Equation is

$$\text{Totsav} = -136{,}507 + 107 \text{ Lantons} + 12{,}775 \text{ Lanlifts} + 130 \text{ Pactons} + 5{,}256 \text{ Paclifts}$$

Predictor	Coefficient	Standard Deviation	T-Ratio	VIF
Constant	-136,507	56,530	-2.41	
Lantons	107.25	29.01	3.70	2.2
Lanlifts	12,775	12,780	1.00	2.3
Pactons	129.55	10.76	12.04	1.7
Paclifts	5,256	7,388	0.72	1.8

Standard Deviation about the Regression Line(S) = 215,635

Multiple Correlation Determination (r^2) = 85.7%

r^2 (adjusted) = 84.67

Figure 5.1 Partial Minitab Multiple Linear Regression Output for the Total Monthly OPLIFT Cost Savings Data in Appendix G.

number of monthly OPLIFTs conducted in the Pacific Fleet (Paclifts). The VIF values in Figure 5.1 are all relatively small, ranging from a high of 2.3 to a low of 1.7. If VIF is greater than 10, there is too much correlation between variable x_j and the other explanatory variables [Ref. 15:p. 694]. Based on this criterion, there is little evidence of multicollinearity among the set of explanatory variables.

2. Measuring Association in the Regression Model

Once a multiple regression model has been developed, the coefficient of multiple determination (r^2) can be computed to determine the proportion of variation that is explained by the set of explanatory variables selected. Referring back to Figure 5.1, the coefficient of multiple determination, computed as 85.7 percent, can be interpreted to mean that 85.7 percent of the variation in total monthly OPLIFT cost savings can be explained by the variation in the monthly OPLIFT tonnage moved in the Atlantic and Pacific Fleets and the variation in the number of monthly OPLIFTs conducted in the Atlantic and Pacific Fleets. The adjusted r^2 reflects both the number of explanatory variables in the model and the sample size. Thus, 84.6 percent of the variation in total monthly OPLIFT cost savings can be explained by the multiple linear regression model adjusted for number of predictors and sample size. [Ref. 15:p. 660]

In order to study the relationships among the variables it is useful to examine the correlation between each pair of variables included in the model. Such a correlation "matrix," obtained from Minitab, is displayed in Figure 5.2.

From Figure 5.2, it can be observed that the correlation between the amount of monthly OPLIFT tonnage moved in the Pacific Fleet and total monthly OPLIFT cost savings is .856, indicating a strong positive association

	Totsav	Lantons	Lanlifts	Pactons
Lantons	0.281			
Lanlifts	0.426	0.698		
Pactons	0.856	-0.073	0.160	
Paclifts	0.563	-0.121	0.183	0.640

Figure 5.2 Minitab Correlation Output for the Total Monthly OPLIFT Cost Savings Data in Appendix G.

between the two variables. It can also be observed that the correlation between the amount of monthly OPLIFT tonnage moved in the Atlantic Fleet and the number of monthly OPLIFTs conducted in the Atlantic Fleet is .698, indicating a moderately strong positive association between the variables. The correlation between tonnage moved and OPLIFTs conducted in the Pacific Fleet is .64, also indicating a moderately strong positive association. Moderate positive correlation exists between total monthly OPLIFT cost savings and the number of monthly OPLIFTs conducted in the Atlantic Fleet and monthly OPLIFT costs savings and the number of OPLIFTs conducted in the Pacific Fleet. The correlation between monthly OPLIFT cost savings and monthly tonnage moved in the Atlantic Fleet is .281, indicating a weak positive correlation between the variables. There is virtually no correlation between the explanatory variables monthly tonnage moved in the Pacific Fleet and monthly tonnage moved in the Atlantic Fleet, monthly tonnage moved in the Pacific Fleet and the number of monthly OPLIFTs conducted in the Atlantic Fleet, monthly tonnage moved in the Atlantic Fleet and the number of monthly OPLIFTs conducted in the Pacific Fleet and the number of monthly OPLIFTs conducted in the Atlantic and the Pacific Fleets.

3. Stepwise Regression

A widely used criterion of model building is "parsimony" or the development of a regression model that includes the least number of explanatory variables that permits an adequate interpretation of the dependent variables of interest. Regression models with fewer explanatory variables are by nature easier to interpret. [Ref. 15:p. 702]

A search procedure called stepwise regression is widely used to determine variables that might be deleted from the complete model. In developing a multiple linear regression model, the goal is to use only those explanatory variables that are useful in predicting the value of the dependent variable. If an explanatory variable does not aid in making the prediction, then it should be deleted and a model with fewer explanatory variables utilized in its place. One method for determining the contribution of an explanatory variable is the "partial F-test criterion." It involves determining the contribution made by each explanatory variable after all other explanatory variables have been included in a model. The new explanatory variable would only be included if it improved the multiple linear regression model significantly. [Ref. 15:pp. 661-668]

Figure 5.3 represents Minitab output for a stepwise regression of the total monthly OPLIFT cost savings data in Appendix G. The new multiple linear regression equation for the model becomes:

$$\hat{y}_i = -95{,}061 + 127x_{1i} + 137x_{3i}$$

Minitab has determined that x_2 (the number of monthly OPLIFTs conducted in the Atlantic Fleet) and x_4 (the number of monthly OPLIFTs conducted in the Pacific Fleet) do not contribute significantly to the model and they have therefore been deleted.

Stepwise Regression of Totsav on 4 Predictors, with n = 56

Step	1	2
Constant	806.38	-95,061
Pactons	133.3	137.3
T-Ratio	12.17	16.61
Lantons		127
T-Ratio		6.51
S	286,613	215,650
r^2	73.29	85.16

Figure 5.3 Minitab Stepwise Regression Output for the Total Monthly OPLIFT Cost Savings Data in Appendix G.

4. Residual Analysis

Once the explanatory variables to be included in the model have been selected, a graphical approach known as residual analysis can be undertaken to evaluate the aptness of the fitted multiple linear regression model. The residuals or error values are defined as the difference between the observed (y_i) and predicted ($\hat{y}_i$) value of the dependent variable for given values of x_i. The aptness of the fitted regression model can be evaluated by plotting the residuals on the vertical axis against the corresponding x_i values of the independent variable on the horizontal axis. If the fitted model is appropriate for the data, there will be no apparent pattern in the plot of the residuals versus x_i. If, however, the fitted model is not appropriate, there will be a relationship between the x_i values and the residuals. [Ref. 15:p. 613]

When examining the multiple linear regression model for predicting total monthly OPLIFT cost savings, the following residual plots are of interest:

1. Standardized residuals versus $\hat{y}_i$ (YHAT)
2. Standardized residuals versus x_{1i} (LANTONS)
3. Standardized residuals versus x_{3i} (PACTONS)

The first residual plot examines the pattern of residuals for the predicted values of Y. If the standardized residuals appear to vary for different levels of the predicted Y value, it provides evidence of a potential curvilinear effect in at least one explanatory variable and the need to transform the dependent variable. The second and third residual plots concern the explanatory variables. Patterns in the plot of the standardized residuals versus an explanatory variable can also indicate the existence of a curvilinear effect and lead to the possible transformation of that explanatory variable. [Ref. 14:p. 285]

The residual plots for the multiple linear regression model for predicting total monthly OPLIFT cost savings, obtained from Minitab, are displayed in Figures 5.4 through 5.6. There appears to be very little pattern in the relationship between the standardized residuals and either the predicted value of y_i, the value of x_{1i} or the value of x_{3i}. It can therefore be concluded that the multiple regression model is appropriate for predicting total monthly OPLIFT cost savings.

5. <u>Influence Measures</u>

Regression diagnostics deals with both the evaluation cf the aptness of a fitted model and the potential effect or "influence" of each particular point on that model. Three methods that measure the influence of particular data points are the hat matrix elements, Studentized deleted residuals and Cook's distance statistic. The hat matrix elements reflect the influence of each x_i on the fitted regression model. The Studentized deleted residuals measures the difference between each observed

```
MTB >
NEWPAGE
MTB >
PLOT 'STRES' 'YHAT'

CONTINUE?
Y
STRES   -
        -                                                   *
        -                               *
     2.5+
        -                            *            *
        -
        -                *      *
        -     3*3         *  **    **      *
     0.0+        *422222   *   *  *         *
        -             *   222*
        -              **2          *
        -                    *   *
        -                            * *
    -2.5+
        -
        -                                                   *
        -
        -
         --------+---------+---------+---------+---------+-------YHAT
                 0   500000    1000000   1500000   2000000
```

Figure 5.4 Minitab Residual Plot for Standardized Residuals (STRES) Versus Predicted y (YHAT)

```
MTB >
PLOT 'STRES' 'LANTONS'

CONTINUE?
Y
STRES    -
         -             *
         -  *
    2.5+
         -      **
         -
         -           *                      *
         - 5    *  * *      2*   *                            *
    0.0+ 54 * 3*2 * *        *
         - 2   *    * *              2    *
         -  *   **   *   *
         -            *   *
         -   *        *
   -2.5+
         -
         -      *
         -
         -
          +---------+---------+---------+---------+---------+------LANTONS
          0       1500      3000      4500      6000      7500
```

Figure 5.5 Minitab Residual Plot for Standardized Residuals (STRES) Versus x_{1i} (LANTONS)

```
MTB >
PLOT 'STRES' 'PACTONS'

CONTINUE?
Y
STRES   -
        -                                                *
        -                              *
     2.5+
        -                      *              *
        -
        -       **
        - 6**  * *  *         *     *
     0.0+ 33 2 **2** **    **          *
        -   * 3   *  *    **
        -     *    3         *
        -             *  *
        -                      *       *
    -2.5+
        -
        -                                                       *
        -
        -
          +---------+---------+---------+---------+---------+---------+------PACTONS
          0      3000      6000      9000     12000     15000
```

Figure 5.6 Minitab Residual Plot for Standardized Residuals (STRES) Versus x_{3i} (PACTONS) value of y_i and predicted value $\hat{y}_i$ obtained from a model that includes all observations other than i. The utilization of the hat matrix elements and Studentized deleted residuals in the search for potential troublesome data points, however, is complementary, with neither criterion being sufficient by itself. To decide whether a point flagged by either the hat matrix elements or Studentized deleted residuals is unduly affecting the model, Cook's distance statistic is used. [Ref. 15:pp. 697-699]

The observations cited as unusual by Minitab, after performing the three measures of influence, are displayed in Figure 5.7.

Since the unusual observations displayed in Figure 5.7 were determined to have exerted undue influence on the fitted model, it is not unreasonable to explore alternative models with those five observations deleted. Figure 5.8 represents partial Minitab output for such a model. The model includes the two explanatory variables of monthly OPLIFT tonnage moved in the Atlantic Fleet and monthly OPLIFT tonnage moved in the Pacific Fleet. From Figure 5.8 it is observed that the VIF values are 1.0, indicating no evidence of multicollinearity. The r^2 is 89.4% and the r^2 (adjusted) is 88.9%, indicating that the two explanatory variables explain a significant amount of the variation in total monthly OPLIFT cost savings. The fitted model can be expressed as:

The Regression Equation is:

$$\text{Totsav} = -95{,}061 + 127\ \text{Lantons} + 137\ \text{Pactons}$$

Unusual Observations:

Observations	Lantons	Totsav	Fit	Standard Deviation of Fit	Residual	Standardized Residual
13	961	1,978,230	1,526,405	65,595	451,825	2.21
18	2,161	2,693,518	2,107,986	96,566	585,532	3.04
23	817	1,372,747	863,326	38,597	569,421	2.40
27	757	1,419,898	2,207,139	109,641	-715,241	-3.85
39	133	1,723,333	1,134,724	57,628	588,609	2.83

Figure 5.7 Minitab Partial Output for Unusual Observations for the Total Monthly OPLIFT Cost Savings Data in Appendix G.

The Regression Equation is:

Totsav = -62,916 + 126 Lantons + 113 Pactons

Predictor	Coefficient	Standard Deviation	T-Ratio	VIF
Constant	- 62,916	27,181	- 2.31	
Lantons	126.14	10.23	12.33	1.0
Pactons	113.201	6.805	16.63	1.0

Standard Deviation about the Regression Line(S) = 112,107

Multiple Correlation of Determination (r^2) = 89.4%

r^2 (adjusted) = 88.9%

Figure 5.8 Partial Minitab Output for the Total Monthly OPLIFT Cost Savings Data in Appendix G with Five Observations Deleted

$$\hat{y}_i = -62{,}916 + 126x_{1i} + 113x_{3i}$$

From the model we can conclude that for each additional ton of OPLIFT cargo moved in the Atlantic Fleet, total monthly OPLIFT cost savings increases by 126 dollars holding constant the effect of monthly tonnage moved in the Pacific Fleet. Furthermore, for each additional ton of OPLIFT cargo moved monthly in the Pacific Fleet, total monthly OPLIFT cost savings increases by 113 dollars, holding constant the effect of monthly tonnage moved in the Atlantic Fleet.

6. Disadvantage in Using the Model

The regression model developed requires monthly forecasts of OPLIFT tonnage moved by both fleets. This forecast is required to determine the independent, or explanatory, variables to be used in the total monthly cost savings model. Erroneous tonnage forecasts will result in a faulty cost savings prediction. To protect against this a quantitative predictive model is required. The development of such a model to predict the monthly quantity of OPLIFT tonnage moved is beyond the scope of this study. Such a model is required, however, to facilitate accurate monthly cost savings predictions.

C. SUMMARY

In this chapter a multiple linear regression model was developed through the use of Minitab to predict total monthly OPLIFT cost savings. In arriving at the model, association and multicollinearity were measured, stepwise regression was performed, and residual and influence analysis were accomplished. A fitted multiple linear regression model expressed as follows was developed:

$$\hat{y}_i = -62{,}916 + 126x_{1i} + 113x_{3i}$$

where:

x_{1i} = monthly OPLIFT tonnage moved in the Atlantic fleet for observation i

x_{3i} = monthly OPLIFT tonnage moved in the Pacific Fleet for observation i

Chapter VI will present the principal findings, recommendations and conclusions of this study.

VI. PRINCIPAL FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

A. PRINCIPAL FINDINGS AND CONCLUSIONS

The objectives of this study were fivefold:

1. Determine whether the Navy is currently placing enough emphasis on the use of OPLIFT as a cost avoidance measure;

2. Review OPLIFT implementation at the fleet level to ascertain if viable programs are in place;

3. Examine OPLIFT relative to frequency of use, tonnage moved, cost savings achieved, types of cargo moved, categories of ship moving the cargo and traffic routes over which the cargo is transported to determine trends and patterns;

4. Review the current transportation cost savings reporting system to determine whether it provides a meaningful picture of program performance; and

5. Develop a model that can predict total monthly OPLIFT cost savings.

The principal findings and conclusions are derived from a review of existing instructions, point papers, cost savings data, tonnage data and correspondence and through personal and telephone interviews.

1. Top Management Emphasis

The OPLIFT program, in terms of cost savings, has waxed and waned considerably since its implementation. The Program has thrived only when high level attention (CNO, NAVSUPSYSCOM and Fleet CINC) has been placed on it. In FY 1976, a time of fiscal "belt tightening," the Program received a great deal of attention at the CNO level and proved an effective cost avoidance tool. From FYs 1978 to 1982, a period during which little high level attention was given to OPLIFT, the real growth in OPLIFT cost savings declined. In FYs 1983 and 1984, when fiscal constraints once again dictated a high level of CNO, NAVSUPSYSCOM and Fleet CINC interest in OPLIFT, the cost savings attributed to the Program increased significantly. From FY 1985 through May of FY 1987 OPLIFT cost savings declined dramatically. During this same period there was little top management attention focused on OPLIFT. The performance of OPLIFT appears to be closely related to the level of top management interest focused on the program, which in turn is closely tied to the financial "health" of the SWT account. The OPLIFT program appears to achieve the maximum cost savings only when under the close scrutiny of top management. At other times the Program does achieve cost savings, but not nearly at the level to which it has shown itself to be capable.

2. <u>Implementation at the Fleet Level</u>

The OPLIFT program in the Pacific Fleet has consistently been utilized more than that of the Atlantic Fleet. In the Pacific Fleet OPLIFT tasks, assignments and responsibilities are clearly defined and specified at a number of different operating levels. Superior organization, administration and coordination appear to be a major contributing factor to the greater utilization demonstrated by the Pacific Fleet. Though OPLIFT seems to have functioned at a satisfactory level in the Atlantic Fleet, the Program implemented in the Pacific Fleet appears to function more effectively. Inconsistencies relative to OPLIFT policy exist in both fleets, particularly in regards to priority of space allocation, cargo eligibility and reporting of OPLIFT "space available" by individual ships. The lack of a clearly defined OPLIFT policy at the CNO level has led to the inconsistencies existing in the program.

3. <u>Trends and Patterns</u>

Differing OPLIFT utilization patterns have emerged in the Atlantic and Pacific Fleets. General cargo has emerged as the primary category of OPLIFT cargo moved in the Atlantic Fleet. In the Pacific Fleet, general cargo ranks third behind ordnance and aircraft. The primary transporters of OPLIFT cargo in the Atlantic Fleet are CLSF ships. Amphibious Force ships account for the largest percentage of OPLIFT tonnage moved in the Pacific Fleet. The types of cargo moved by the different ship categories also differs by fleet. In the Atlantic Fleet CLSF ships are used primarily to transport general cargo while boats accounted for the largest percentage of the tonnage moved by amphibious ships. The pattern is different in the Pacific Fleet where CLSF ships are used mainly to move ordnance and amphibious ships are utilized primarily to move aircraft.

Combatants, Tenders, Aircraft Carriers and "Other" ship types have had little impact on OPLIFT in either fleet.

Patterns have also developed with regard to the traffic routes utilized for OPLIFT. Of the 77 different traffic routes utilized to move OPLIFT cargo, 13 (17 percent) have accounted for almost 80 percent of the OPLIFT tonnage moved. In the Atlantic Fleet, 25 different traffic routes were used, with five routes (20 percent) accounting for 86 percent of the tonnage moved. In the Pacific Fleet, 52 different routes were used, with eight traffic routes (15 percent) accounting for 75 percent of the tonnage. This appears to show that the movement of OPLIFT cargo between traffic areas is highly concentrated and strongly tied to the level of Naval presence in those areas.

4. Performance Goals

OPLIFT cost savings are calculated monthly by NAVMTO, the Program Manager. NAVMTO only reports the cost savings, it does not compare or measure the cost savings against any standard nor does it advise other activities of the Program's trends. Monthly cost savings are taken at their face value, with no performance goal or standard against which they are measured. This makes it difficult to fully comprehend the significance of monthly and annual changes in cost savings over time. Does a decrease in cost savings from one year to the next really mean the Program is in a downturn, or are there other factors to be considered?

There is currently no system in effect whereby the cost savings performance of OPLIFT can be accurately measured. Until some form of annual performance standard is established against which actual cost savings can be compared, it will be difficult to accurately gauge the performance of OPLIFT as a cost avoidance tool.

There is also no established performance measure and goal to gauge efficient utilization of ship OPLIFT movement capacity. Such a performance measure and goal would facilitate the determination of allowable levels of movement capacity utilization efficiency, i.e., is cargo being moved by OPLIFT when the demand and capacity for movement exists.

The collection of the necessary cost savings and tonnage data, the reporting and monitoring of OPLIFT performance measures and the establishment of OPLIFT performance goals may require more time and manpower resources than the current "collateral duty" nature of the OPLIFT program allows. Without such data, measures and goals, however, it is difficult to determine OPLIFT performance. NAVSUPSYSCOM, NAVMTO, the Fleet CINCS and Fleet OPLIFT Coordinators must, therefore, weigh the costs of providing additional manpower to manage and monitor OPLIFT against the potential for millions of dollars in cost savings foregone due to ineffective Program management and control.

5. <u>Cost Savings Prediction Model</u>

A model that can predict total monthly OPLIFT cost savings could be a useful management tool for program planning and control. Cost savings, however, is dependent on the number of tons moved by OPLIFT. To facilitate accurate cost savings forecasts, a means of accurately forecasting tonnage shipped by OPLIFT must also be developed.

B. RECOMMENDATIONS

Based on the data presented, it is the opinion of this writer that the Navy's Surface OPLIFT program is a very valuable and viable program. The Program has achieved over $28 million in reported cost savings since October 1982. The results of the research conducted, however, indicate that the Program has not performed up to its full potential. This is more a result of lack of concern by management than mismanagement. With proper top management emphasis, the establishment of annual performance goals and the development of predictive models to forecast tonnage and cost savings the Program can achieve even greater cost savings.

1. <u>Top Level Management Emphasis</u>

It is recommended that an OPNAV instruction delineating the Navy's policy on all aspects of OPLIFT be issued for the purpose of erradicating the policy inconsistencies that now exist. It is also recommended that

CNO, NAVSUPSYSCOM, the Fleet CINCS and the Fleet OPLIFT Coordinators place greater emphasis on the use of OPLIFT and that NAVMTO, as Program Manager, play a more active role in monitoring the performance of OPLIFT and reporting on program trends. Furthermore, it is recommended that Fleet OPLIFT Coordinators and shipping activities pursue the use of OPLIFT as an alternative to commercial ocean transportation more aggressively. Though there are some circumstances that partially explain the downturn in OPLIFT utilization and cost savings, the fact remains that because of decreased high level scrutiny and concern, OPLIFT is not being pursued to the degree that it was in FYs 1983 and 1984. Lastly, it is recommended that NAVSUPSYSCOM, NAVMTO, the Fleet CINCS and the Fleet OPLIFT Coordinators review the personnel resources they have allocated to OPLIFT. The potential for millions of dollars in OPLIFT cost savings lost due to ineffective Program management and control, resulting from insufficient OPLIFT manning, must be weighed against the costs of providing more people to manage and monitor OPLIFT.

2. Establishment of an Annual Performance Goal

It is recommended that an annual OPLIFT cost savings goal be established by NAVSUPSYSCOM so that a true picture of program performance can be determined. One possible goal is an annual cost savings equivalent to a specified percentage of that fiscal year's SWT expenditure on MSC cargo. Another is an annual cost savings equal to a specified percentage of that fiscal year's total SWT expenditure. The determination of the specific performance measures to be applied are beyond the scope of this thesis. However, some form of goal or measure must be established. Only then can the significance of the reported cost savings be fully understood.

It is also recommended that a measure of OPLIFT movement capacity utilization efficiency and a corresponding performance goal be established by NAVSUPSYSCOM. OPLIFT movement capacity utilization efficiency can be measured by examining the utilization of available OPLIFT space, data that can be provided to the Fleet OPLIFT Coordinators by the individual ships (this information is currently provided in the Pacific Fleet and SIXTH Fleet). By comparing OPLIFT tonnage moved with total "space available" for OPLIFT, a level of efficiency can be determined. Performance can then be determined by comparing the annual level of efficiency with the annual efficiency goal. The determination of the specific efficiency goal to be applied is beyond the scope of this thesis.

3. <u>OPLIFT Implementation in the Atlantic Fleet</u>

It is recommended that COMNAVSURFLANT, as Atlantic Fleet OPLIFT coordinator, issue a formal instruction that clearly outlines policy and defines the specific responsibilities, tasks and reporting requirements for the conduct of OPLIFT in the Atlantic. At this point in time the Atlantic Fleet appears to lack the necessary written guidance to ensure the effective implementation and utilization of OPLIFT at all levels of operation.

It is also recommended that the Atlantic Fleet require deploying ships to provide to COMNAVSURFLANT an OPLIFT "space available" report, similar to that required in the Pacific Fleet.

4. Predictive Models

It is recommended that NAVMTO develop a predictive model to forecast the number of OPLIFT tons to be moved by the Atlantic and Pacific Fleet on a monthly basis. Since cost savings are a function of tonnage moved, a model that can accurately predict monthly tonnage moved will facilitate the accuracy of the cost savings model developed in this study. Such models can be of value to NAVMTO in its role as Program Manager. When used in conjunction with an annual cost savings goal, the models can help provide timely data on OPLIFT performance status, i.e., is the Program on track to meet the goal and if not, how much of an increase in tonnage moved and cost savings must occur in order to get back on track.

The above recommendations have been made with the intent to upgrade and improve the Navy's Surface OPLIFT program. In view of the millions of dollars spent annually by the Department of the Navy for the commercial ocean transportation of cargo, and the growing fiscal uncertainty, continued emphasis should be placed on OPLIFT in achieving maximum cost savings. It is imperative that Navy "defense" dollars be spent only where absolutely needed and that the best value be obtained for that "defense" dollar. Prudent use of OPLIFT is a means to this end.

APPENDIX A

SUMMARY OF OPPORTUNE LIFT BY CARGO CATEGORY

TABLE A.1

FISCAL YEAR 1983 CARGO SUMMARY

Cargo Category	Atlantic Fleet M.T.	Atlantic Fleet C.S.	Pacific Fleet M.T.	Pacific Fleet C.S.	Fleet Total M.T.	Fleet Total C.S.
Aircraft	1,387	155,469	9,997	913,377	11,384	1,068,846
Ordnance	2,117	398,536	7,360	1,084,418	9,477	1,482,954
Boats	8,036	1,035,392	2,827	479,682	10,863	1,515,674
General Cargo	10,388	777,088	1,200	50,102	11,588	827,190
Vehicles	3,016	222,354	3,268	519,242	6,284	741,596
Other	1,863	149,327	495	151,291	2,358	300,618
TOTAL	26,807	2,738,166	25,147	3,198,112	51,954	5,936,278

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE A.2

FISCAL YEAR 1984 CARGO SUMMARY

Cargo Category	Atlantic Fleet		Pacific Fleet		Fleet Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
Aircraft	1,783	234,998	16,986	2,044,158	18,769	2,280,156
Ordnance	1,668	315,710	12,425	2,645,290	14,093	2,960,000
Boats	2,623	299,000	19,151	3,479,231	21,774	3,778,231
General Cargo	14,503	1,675,445	6,688	596,481	21,191	2,271,926
Vehicles	1,698	168,792	1,010	141,517	2,708	310,309
Other	383	31,711	1,743	149,047	2,126	180,758
TOTAL	22,658	2,726,656	58,003	9,055,724	80,661	11,782,380

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

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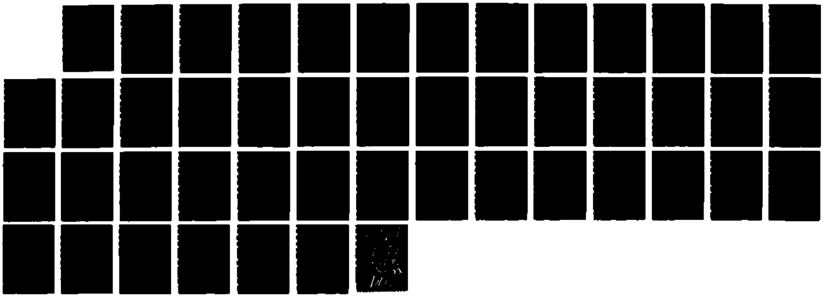

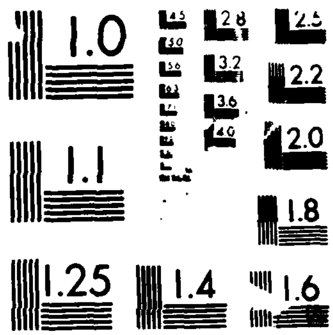

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TABLE A.3

FISCAL YEAR 1985 CARGO SUMMARY

Cargo Category	Atlantic Fleet M.T.	Atlantic Fleet C.S.	Pacific Fleet M.T.	Pacific Fleet C.S.	Fleet Total M.T.	Fleet Total C.S.
Aircraft	503	44,113	4,385	372,601	4,888	416,714
Ordnance	1,376	185,419	9,822	1,235,950	11,198	1,421,369
Boats	2,000	121,166	5,305	310,106	7,305	431,272
General Cargo	9,942	732,424	22,940	1,585,444	32,882	2,317,868
Vehicles	738	64,275	2,736	219,583	3,474	283,858
Other	2,763	146,583	3,539	242,343	6,302	388,926
TOTAL	17,322	1,293,980	48,727	3,966,027	66,049	5,260,007

Notes: M.T. = Measurement Tons
C.S. = Cost Savings (S)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE A.4

FISCAL YEAR 1986 CARGO SUMMARY

Cargo Category	Atlantic Fleet M.T.	Atlantic Fleet C.S.	Pacific Fleet M.T.	Pacific Fleet C.S.	Fleet Total M.T.	Fleet Total C.S.
Aircraft	63	4,948	4,470	618,733	4,533	623,681
Ordnance	919	87,345	23,315	3,067,976	24,234	3,155,321
Boats	1,084	40,968	1,495	102,986	2,579	143,954
General Cargo	2,185	160,921	1,764	126,879	3,949	287,800
Vehicles	207	21,279	403	37,904	610	59,183
Other	322	26,992	1,277	101,606	1,599	128,598
TOTAL	4,780	342,453	32,724	4,056,084	37,504	4,398,537

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Date compiled from NAVMTO Norfolk by the researcher.

TABLE A.5

FISCAL YEAR 1987 (THROUGH MAY) CARGO SUMMARY

Cargo Category	Atlantic Fleet M.T.	Atlantic Fleet C.S.	Pacific Fleet M.T.	Pacific Fleet C.S.	Fleet Total M.T.	Fleet Total C.S.
Aircraft	0	0	10,504	848,502	10,504	848,502
Ordnance	365	22,119	3,182	274,697	3,547	296,816
Boats	0	0	450	22,772	450	22,772
General Cargo	93	4,358	1,439	114,163	1,532	118,521
Vehicles	0	0	1,088	45,855	1,088	45,855
Other	0	0	327	20,897	327	20,897
TOTAL	458	26,477	16,990	1,326,886	17,448	1,353,363

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

APPENDIX B

SUMMARY OF OPLIFT BY SHIP CATEGORY

TABLE B.1

OPPORTUNE LIFT BY SHIP CATEGORY,
FISCAL YEAR 1983

Ship Category	Atlantic Fleet M.T.	Atlantic Fleet C.S.	Pacific Fleet M.T.	Pacific Fleet C.S.	Fleet Total M.T.	Fleet Total C.S.
CLSF	13,949	1,377,807	10,508	1,359,051	24,457	2,736,858
Amphibi-ous	12,704	1,345,879	13,737	1,756,193	26,441	3,102,072
Comba-tant	81	7,203	11	695	92	7,898
Tender	6	321	891	82,173	897	82,494
Aircraft Carrier	0	0	0	0	0	0
Other	67	6,956	0	0	67	6,956
TOTAL	26,807	2,738,166	25,147	3,198,112	51,954	5,936,278

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE B.2

OPPORTUNE LIFT BY SHIP CATEGORY,
FISCAL YEAR 1984

Ship Category	Atlantic Fleet		Pacific Fleet		Fleet Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
CLSF	13,299	1,782,076	15,188	2,851,503	28,487	4,633,579
Amphibi-ous	8,472	821,171	40,667	5,923,307	49,139	6,744,478
Comba-tant	250	37,074	316	44,068	566	81,142
Tender	601	80,954	1,249	130,093	1,850	211,047
Aircraft Carrier	0	0	562	105,487	562	105,487
Other	36	5,381	21	1,266	57	6,647
TOTAL	22,658	2,726,656	58,003	9,055,724	80,661	11,782,380

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE B.3

OPPORTUNE LIFT BY SHIP CATEGORY, FISCAL YEAR 1985

Ship Category	Atlantic Coast M.T.	Atlantic Coast C.S.	Pacific Coast M.T.	Pacific Coast C.S.	Fleet Total M.T.	Fleet Total C.S.
CLSF	10,819	833,501	15,543	1,578,541	26,362	2,412,042
Amphibious	5,593	384,624	31,514	2,219,455	37,107	2,604,079
Combatant	45	5,775	184	11,407	229	17,182
Tender	0	0	353	30,294	353	30,294
Aircraft Carrier	503	44,113	1,133	126,330	1,636	170,443
Other	362	25,967	0	0	362	25,967
TOTAL	17,322	1,293,980	48,727	3,966,027	66,049	5,260,007

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE B.4

OPPORTUNE LIFT BY SHIP CATEGORY,
FISCAL YEAR 1986

Ship Category	Atlantic Fleet M.T.	Atlantic Fleet C.S.	Pacific Fleet M.T.	Pacific Fleet C.S.	Fleet Total M.T.	Fleet Total C.S.
CLSF	3,010	268,876	26,388	3,460,181	29,398	3,729,057
Amphibi- ous	1,765	73,185	5,667	506,529	7,432	579,714
Comba- tant	0	0	70	5,544	70	5,544
Tender	5	392	0	0	5	392
Aircraft Carrier	0	0	599	83,830	599	83,830
Other	0	453	0	0	0	0
TOTAL	4,780	342,453	32,724	4,056,084	37,504	4,398,537

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE B.5

OPPORTUNE LIFT BY SHIP CATEGORY,
FISCAL YEAR 1987 (THROUGH MAY)

Ship Category	Atlantic Fleet		Pacific Fleet		Fleet Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
CLSF	417	25,444	5,154	390,531	5,571	415,975
Amphibious	0	0	11,802	934,319	11,802	934,319
Combatant	41	1,033	0	0	41	1,033
Tender	0	0	34	2,036	34	2,036
Aircraft Carrier	0	0	0	0	0	0
Other	0	0	0	0	0	0
TOTAL	458	26,477	16,990	1,326,886	17,448	1,353,363

Notes: M.T. = Measurement Tons
C.S. = Cost Savings

Source: Data compiled from NAVMTO Norfolk by the researcher.

APPENDIX C

SUMMARY OF CATEGORIES OF OPPORTUNE LIFT CARGO MOVED BY SHIP TYPE

TABLE C.1

CATEGORIES OF CARGO MOVED BY SHIP TYPE, FISCAL YEAR 1983

Cargo Category	CLSF MT LANT	CLSF MT PAC	Amphibious MT LANT	Amphibious MT PAC	All Others MT LANT	All Others MT PAC	Fleet-wide MT LANT	Fleet-wide MT PAC	MT Total
Aircraft	1,022	1,248	365	7,888	0	861	1,387	917	11,384
Ordnance	2,117	7,360	0	0	0	0	2,117	7,360	9,477
Boats	1,059	238	6,971	2,559	6	30	8,036	2,827	10,863
General Cargo	8,441	1,146	1,889	43	58	11	10,388	1,200	11,588
Vehicles	786	43	2,189	3,225	41	41	3,016	3,268	6,284
Other	524	473	1,290	22	49	49	1,863	495	2,358
TOTAL	13,949	10,508	12,704	13,737	154	902	26,807	25,147	51,954

Notes: MT = Measured Tons
LANT = Atlantic Fleet
PAC = Pacific Fleet

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE C.2

CATEGORIES OF CARGO MOVED BY SHIP TYPE, FISCAL YEAR 1984

	CLSF		Amphibious		All Others		Fleet-wide		
Cargo Category	MT LANT	MT PAC	MT LANT	MT PAC	MT LANT	MT PAC	MT LANT	MT PAC	MT Total
Aircraft	386	1,532	904	13,579	493	1,875	1,783	16,986	18,769
Ordnance	1,497	12,148	166	277	5	0	1,668	12,425	14,093
Boats	1,246	891	1,237	18,260	140	0	2,623	19,151	21,774
General Cargo	8,578	523	5,836	5,941	89	334	14,503	6,688	21,191
Vehicles	1,215	36	323	925	160	49	1,698	1,010	2,708
Other	377	58	6	1,685	0	0	383	1,743	2,126
TOTAL	13,299	15,188	8,472	40,667	887	2,148	22,658	58,003	80,661

Notes: MT = Measurement Tons
LANT = Atlantic Fleet
PAC = Pacific Fleet

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE C.3

CATEGORIES OF CARGO MOVED BY SHIP TYPE, FISCAL YEAR 1985

Cargo Category	CLSF		Amphibious		All Others		Fleet-wide		
	MT LANT	MT PAC	MT LANT	MT PAC	MT LANT	MT PAC	MT LANT	MT PAC	MT Total
Aircraft	0	281	0	2,819	503	1,285	503	4,385	4,888
Ordnance	1,376	9,822	0	0	0	0	1,376	9,822	11,198
Boats	1,535	2,042	182	3,263	283	0	2,000	5,305	7,305
General Cargo	6,984	719	2,879	21,865	79	366	9,942	22,940	32,882
Vehicles	560	64	158	2,653	20	19	738	2,736	3,474
Other	364	2,615	2,374	924	25	0	2,763	3,539	6,302
TOTAL	10,819	15,543	5,593	31,514	910	1,670	17,322	48,727	66,049

Notes: MT = Measurement Tons
LANT = Atlantic Fleet
PAC = Pacific Fleet

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE C.4

CATEGORIES OF CARGO MOVED BY SHIP TYPE, FISCAL YEAR 1986

Cargo Category	CLSF MT LANT	CLSF MT PAC	Amphibious MT LANT	Amphibious MT PAC	All Others MT LANT	All Others MT PAC	Fleet-wide MT LANT	Fleet-wide MT PAC	Fleet-wide MT Total
Aircraft	0	2,316	63	1,555	0	599	63	4,470	4,533
Ordnance	919	23,206	0	109	0	0	919	23,315	24,234
Boats	0	256	1,084	1,184	0	55	1,084	1,495	2,579
General Cargo	1,859	97	321	1,666	5	1	2,185	1,764	3,949
Vehicles	147	75	60	314	0	14	207	403	610
Other	85	438	237	839	0	0	322	1,277	1,599
TOTAL	3,010	26,388	1,765	5,667	5	669	4,780	32,724	37,504

Notes: MT = Measurement Tons
LANT = Atlantic Fleet
PAC = Pacific Fleet

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE C.5

CATEGORIES OF CARGO MOVED BY SHIP TYPE, FISCAL YEAR 1987 (THROUGH MAY)

Cargo Category	CLSF MT LANT	CLSF MT PAC	Amphibious MT LANT	Amphibious MT PAC	All Others MT LANT	All Others MT PAC	Fleet-wide MT LANT	Fleet-wide MT PAC	MT Total
Aircraft	0	1,213	0	9,291	0	0	0	10,504	10,504
Ordnance	365	3,182	0	0	0	0	365	3,182	3,547
Boats	0	431	0	19	0	0	0	450	450
General Cargo	52	3	0	1,402	41	34	93	1,439	1,532
Vehicles	0	0	0	1,088	0	0	0	1,088	1,088
Other	0	325	0	2	0	0	0	327	327
TOTAL	417	5,154	0	11,802	41	34	458	16,990	17,448

Notes: MT = Measurement Tons
LANT = Atlantic Fleet
PAC = Pacific Fleet

Source: Data compiled from NAVMTO Norfolk by the researcher.

APPENDIX D

GEOGRAPHICAL DESCRIPTION OF OPPORTUNE LIFT TRAFFIC AREAS

Traffic Area	Geographical Description
Atlantic Coast	Includes all ocean ports on the Atlantic Coast of the United States. Primary OPLIFT ports are Norfolk, Virginia; Mayport, Florida; Newport, Rhode Island; and Earle, New Jersey.
Gulf Coast	Includes all ocean ports of the West Coast of Florida (excluding Key West), Alabama, Mississippi, Louisiana and Texas. Primary OPLIFT port is Pensacola, Florida.
California Coast	Includes all ocean ports of California. Primary OPLIFT ports are Concord, San Francisco, Alameda, Oakland, Long Beach, San Diego and Coronado.
Northwest Coast	Includes all ocean ports of Oregon and Washington. Primary OPLIFT ports were Bremerton and Seattle, Washington.
Panama (LANT)	Includes all ocean ports of the Republic of Panama on the Atlantic Coast.
Bermuda	Includes all ocean ports of Bermuda.
Lesser Antilles	Virgin Islands, Leeward Islands, Windward Islands, Tobago, Trinidad, and the ocean ports of Venezuela, British Guiana, Surinam and French Guiana.
Puerto Rico	Includes all ocean ports of Puerto Rico. Primary OPLIFT port is Roosevelt Roads.
Caribbean	Includes all ocean ports on the east coast of Mexico and Central America, Cuba, Haiti, Jamaica, northern coast ports of Columbia, Bahamas, Turk and Caico Islands and the Dominican Republic.

Guantanamo Bay	Includes the ports of Guantanamo, Santiago, Puerto Manati, and Nuevita, Cuba. Primary OPLIFT port is Guantanamo.
Europe	Includes all ocean ports of West Germany, Netherlands, Belgium, Atlantic Ocean ports of France and of Spain north of northern Portuguese border; all ports of Norway, Sweden, Denmark and Finland.
British Isles	Includes all ocean or English Channel ports of Great Britain and Ireland.
West Mediterranean	Includes all ocean ports of Portugal and Spain south of the northern Portuguese border, Mediterranean ports of Spain and France, Canary Islands, French and Spanish Morocco, Algeria, Tunisia, Baleric Islands, Corsica, Sardinia, Malta, Sicily, and the west coast ports of Italy. Primary OPLIFT ports are Rota, Spain, Naples, Italy, Augusta Bay, Sicily, and La Madalena, Sardinia.
East Mediterranean	Includes all Mediterranean, Adriatic, Ionian, Aegean, Libya, Egypt, Israel, Lebanon, Syria, Cyprus, Turkey, Greece, Albania and Yugoslavia ports and all east coast ports of Italy; includes Istanbul. Primary OPLIFT port is Souda Bay, Crete.
West Africa	Includes all ocean ports on west coast of Africa from the northern boundary of Rio de Oro to the southern boundary of Angola including the Cape Verde Islands, Ascension Island, and St. Helena.
Arabian Gulf	Includes all Red Sea ports; all ports in the Gulf of Aden to Cape Guardafui, all Gulf of Oman ports to the West Pakistan-Iran border and all Arabian Gulf ports. Primary OPLIFT port is Bahrain.
Hawaiian Islands	Includes all ocean ports of Hawaiian Islands (excluding Johnston and Midway Islands). Primary OPLIFT port is Pearl Harbor.

Marianas	Includes all ocean ports of the Marianas Islands. Primary OPLIFT port is Agana, Guam.
Taiwan	Includes all ocean ports of Taiwan and including Hong Kong. Primary OPLIFT port is Hong Kong.
Philippines	Includes all ocean ports of the Philippine Islands. Primary OPLIFT port is Subic Bay.
East Coast South America	Includes all ocean ports on the eastern coast of South America from, but excluding, French Guiana to Cape Horn.
Other Southeast Asia	Includes all ocean ports of Sumatra, Java, Timor, Celebes, Borneo, and the Malay States but excluding New Guinea, Palau, Vietnam, Philippines, Thailand, and Cambodia. Primary OPLIFT port is Singapore.
Ryukyu Islands	Includes all ocean ports of Ryukyu Islands. Primary OPLIFT area is Okinawa.
Korea	Includes all ocean ports of South Korea.
Japan	Includes all ocean ports of Japan. Primary OPLIFT ports are Iwakuni, Sasebo, Yokosuka, and Atsugi.
Indian Ocean	Includes all islands in the Indian Ocean. Primary OPLIFT port is Diego Garcia.

Source: Appendix B to OPNAVINST 4600.17C

APPENDIX E

SUMMARY OF OPPORTUNE LIFT BY TRAFFIC ROUTES

TABLE E.1

TRAFFIC ROUTES UTILIZED FISCAL YEAR 1983

Traffic Route	Measurement Tons	Cost Savings
Atlantic Coast-Atlantic Coast	28	$1,064
Atlantic Coast-Gulf Coast	9	939
Atlantic Coast-Bermuda	203	11,201
Atlantic Coast-Puerto Rico	5,992	797,401
Atlantic Coast-Caribbean	1,757	183,343
Atlantic Coast-Guantanamo Bay	5,539	341,802
Atlantic Coast-Europe	23	1,503
Atlantic Coast-British Isles	160	20,620
Atlantic Coast-West Mediterranean	5,233	477,209
Atlantic Coast-Arabian Gulf	71	9,264
Lesser Antilles-Atlantic Coast	18	1,690
Puerto Rico-Atlantic Coast	766	71,888
Guantanamo Bay-Atlantic Coast	1,666	100,835
Guantanamo Bay-Puerto Rico	6	215
West Mediterranean-Atlantic Coast	5,336	719,192
California Coast-California Coast	996	33,616
California Coast-Northwest Coast	658	44,974
California Coast-Hawaiian Islands	12,313	1,531,194
California Coast-Philippines	341	58,287
Northwest Coast-California Coast	NA	98,700
Hawaiian Islands-California Coast	2,176	218,359
Hawaiian Islands-Philippines	473	51,202
Hawaiian Islands-Japan	249	28,647
Marianas-California Coast	158	14,307
Marianas-Philippines	664	19,056
Philippines-California Coast	3,457	566,144
Philippines-Japan	212	9,103
Ryukyu Islands-California Coast	3,103	502,610
Ryukyu Islands-Philippines	347	21,913
TOTAL	51,954	5,936,278

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE E.2

TRAFFIC ROUTES UTILIZED FISCAL YEAR 1984

Traffic Route	Measurement Tons	Cost Savings
Atlantic Coast-Atlantic Coast	562	$30,503
Atlantic Coast-Lesser Antilles	308	24,190
Atlantic Coast-Puerto Rico	633	97,927
Atlantic Coast-Guantanamo Bay	3,434	239,712
Atlantic Coast-West Mediterranean	3,771	495,023
Atlantic Coast-West Africa	1,063	182,942
Puerto Rico-Atlantic Coast	1,412	213,376
Puerto Rico-Guantanamo Bay	19	1,182
Puerto Rico-Panama (LANT)	106	9,715
Guantanamo Bay-Atlantic Coast	2,758	199,810
Europe-Atlantic Coast	3	282
West Mediterranean-Atlantic Coast	8,498	1,207,453
East Mediterranean-Atlantic Coast	91	24,531
California Coast-California Coast	1,381	61,406
California Coast-Northwest Coast	12	1,147
California Coast-Hawaiian Islands	9,176	1,183,960
California Coast-Marianas	56	15,050
California Coast-Philippines	1,666	316,867
California Coast-Japan	1,162	196,234
Hawaiian Islands-California Coast	8,185	886,428
Hawaiian Islands-Japan	33	7,351
Hawaiian Islands-Korea	46	10,911
Marianas-California Coast	17,947	3,591,145
Marianas-Hawaiian Islands	145	19,996
Marianas-Philippines	78	6,585
Marianas-Japan	306	27,662
Philippines-California Coast	4,880	1,276,758
Philippines-Hawaiian Islands	573	148,292
Philippines-Marianas	312	23,272
Philippines-Japan	2,329	213,956
Philippines-Ryukyu Islands	143	22,952
Philippines-Korea	183	13,487
Philippines-Other Southeast Asia	3	216
Japan-California Coast	210	39,298
Japan-Hawaiian Islands	519	73,361
Japan-Marianas	780	65,320
Japan-Philippines	2,230	297,111
Japan-Ryukyu Islands	560	57,477
Japan-Japan	1	80
Ryukyu Islands-California Coast	1,134	136,817
Ryukyu Islands-Marianas	75	7,463
Ryukyu Islands-Philippines	2,760	266,644

TABLE E.2 (CONTINUED)

Traffic Route	Measurement Tons	Cost Savings
Ryukyu Islands-Japan	796	57,826
Taiwan-Philippines	234	16,392
Other Southeast Asia-California Coast	88	14,260
TOTAL	80,661	11,782,380

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE E.3

TRAFFIC ROUTES UTILIZED FISCAL YEAR 1985

Traffic Route	Measurement Tons	Cost Savings
Atlantic Coast-Atlantic Coast	520	$16,963
Atlantic Coast-Puerto Rico	2,696	271,627
Atlantic Coast-Guantanamo Bay	1,105	46,844
Atlantic Coast-Lesser Antilles	597	56,912
Atlantic Coast-Panama (LANT)	283	19,470
Atlantic Coast-East Coast South America	78	7,436
Atlantic Coast-West Mediterranean	3,340	241,212
Atlantic Coast-Arabian Gulf	18	2,093
Puerto Rico-Atlantic Coast	75	10,227
Guantanamo Bay-Atlantic Coast	2,962	143,143
East Coast South America-Atlantic Coast	22	1,843
West Mediterranean-Atlantic Coast	5,036	453,840
West Mediterranean-West Mediterranean	590	22,370
California Coast-California Coast	1,919	50,054
California Coast-Atlantic Coast	13	1,015
California Coast-Northwest Coast	29	1,151
CAlifornia Coast-Caribbean	13	214
California Coast-Panama (PAC)	70	4,396
California Coast-Hawaiian Islands	4,814	243,339
California Coast-Marianas	4	639
California Coast-Philippines	237	21,140
California Coast-Japan	978	102,602
California Coast-Ryukyu Islands	286	29,844
Northwest Coast-California Coast	50	1,985
Hawaiian Islands-California Coast	10,058	774,661
Hawaiian Islands-Marianas	19	1,780
Hawaiian Islands-Philippines	39	3,044
Marianas-California Coast	493	78,708
Marianas-Hawaiian Islands	59	7,617
Marianas-Philippines	57	4,869
Marianas-Japan	281	15,286
Philippines-California Coast	2,620	379,941
Philippines-Northwest Coast	526	92,418
Philippines-Hawaiian Islands	762	65,985
Philippines-Marianas	2,033	124,235
Philippines-Japan	430	38,937
Philippines-Ryukyu Islands	272	23,834
Philippines-Korea	92	7,935
Japan-Japan	300	14,765
Japan-California Coast	1,715	256,944
Japan-Hawaiian Islands	1,198	102,608
Japan-Marianas	13	1,114

TABLE E.3 (CONTINUED)

Traffic Route	Measurement Tons	Cost Savings
Japan-Philippines	930	78,528
Japan-Taiwan	16	1,058
Japan-Other Southeast Asia	734	48,517
Ryukyu Islands-California Coast	14,931	1,192,121
Ryukyu Islands-Hawaiian Islands	1,324	136,968
Ryukyu Islands-Marianas	3	257
Ryukyu Islands-Philippines	10	718
Ryukyu Islands-Japan	275	13,190
Korea-Philippines	6	345
Korea-Ryukyu Islands	1,118	43,265
TOTAL	66,049	5,260,007

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE E.4

TRAFFIC ROUTES UTILIZED FISCAL YEAR 1986

Traffic Route	Measurement Tons	Cost Savings
Atlantic Coast-Atlantic Coast	219	$5,826
Atlantic Coast-Puerto Rico	249	12,748
Atlantic Coast-Guantanamo Bay	1,073	45,074
Atlantic Coast-Panama (LANT)	2	199
Atlantic Coast-West Mediterranean	1,628	144,719
Puerto Rico-Atlantic Coast	70	9,572
Guantanamo Bay-Atlantic Coast	934	62,750
West Mediterranean-Atlantic Coast	570	61,320
West Mediterranean-West Mediterranean	35	245
California Coast-California Coast	437	15,536
California Coast-Gulf Coast	47	3,250
California Coast-Hawaiian Islands	1,999	155,250
California Coast-Philippines	754	104,967
California Coast-Japan	401	36,009
California Coast-Ryukyu Islands	1,758	191,610
Northwest Coast-Hawaiian Islands	13	14,183
Hawaiian Islands-California Coast	1,411	106,047
Hawaiian Islands-Philippines	376	41,896
Hawaiian Islands-Marianas	14	12,888
Marianas-California Coast	315	59,803
Marianas-Philippines	2,208	271,603
Marianas-Ryukyu Islands	0.1	9
Philippines-Atlantic Coast	656	144,484
Philippines-Gulf Coast	754	166,534
Philippines-California Coast	5,146	1,124,685
Philippines-Northwest Coast	863	186,684
Philippines-Hawaiian Islands	4	713
Philippines-Marianas	147	21,746
Philippines-Japan	8,692	788,817
Philippines-Ryukyu Islands	18	1,744
Philippines-Korea	54	4,852
Japan-California Coast	1,505	266,158
Japan-Marianas	588	39,108
Japan-Philippines	2,021	192,150
Japan-Japan	1,306	60,758
Japan-Ryukyu Islands	4	614
Ryukyu Islands-California Coast	5	989
Ryukyu Islands-Japan	1,028	54,597
TOTAL	37,504	4,398,537

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE E.5

TRAFFIC ROUTES UTILIZED FISCAL YEAR 1987 (THROUGH MAY)

Traffic Route	Measurement Tons	Cost Savings
Atlantic Coast-Atlantic Coast	40	$1,002
Atlantic Coast-Guantanamo Bay	1	31
Atlantic Coast-West Mediterranean	52	3,325
Guantanamo Bay-Atlantic Coast	365	22,119
California Coast-California Coast	754	25,220
California Coast-Hawaiian Islands	1,958	110,251
California Coast-Philippines	487	40,250
California Coast-Ryukyu Islands	818	59,509
Northwest Coast-California Coast	108	5,594
Hawaiian Islands-California Coast	7,736	579,085
Hawaiian Islands-Ryukyu Islands	1,662	123,487
Marianas-Philippines	210	15,613
Philippines-California Coast	97	12,255
Philippines-Marianas	686	40,131
Philippines-Ryukyu Islands	72	2,891
Philippines-Indian Ocean	34	2,036
Ryukyu Islands-California Coast	42	4,423
Ryukyu Islands-Hawaiian Islands	2,326	306,141
TOTAL	17,448	1,353,363

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE E.6

SUMMARY OF TRAFFIC ROUTES UTILIZED
OCTOBER 1982 THROUGH MAY 1987

Traffic Route	Measurement Tons	Cost Savings
Atlantic Coast-Atlantic Coast	1,369	55,358
Atlantic Coast-Gulf Coast	9	939
Atlantic Coast-Bermuda	203	11,201
Atlantic Coast-Lesser Antilles	905	81,102
Atlantic Coast-Puerto Rico	9,570	1,179,703
Atlantic Coast-Guantanamo Bay	11,152	673,473
Atlantic Coast-Panama (LANT)	285	19,669
Atlantic Coast-Caribbean	1,757	183,343
Atlantic Coast-East Coast South America	78	7,436
Atlantic Coast-West Africa	1,063	182,942
Atlantic Coast-British Isles	160	20,620
Atlantic Coast-Europe	23	1,503
Atlantic Coast-West Mediterranean	14,024	1,361,488
Atlantic Coast-Arabian Gulf	89	11,357
Lesser Antilles-Atlantic Coast	18	1,690
Puerto Rico-Atlantic Coast	2,323	305,063
Puerto Rico-Guantanamo Bay	19	1,182
Puerto Rico-Panama (LANT)	106	9,715
Guantanamo Bay-Atlantic Coast	8,685	528,657
Guantanamo Bay-Puerto Rico	6	215
East Coast South America-Atlantic Coast	22	1,843
Europe-Atlantic Coast	3	282
West Mediterranean-Atlantic Coast	19,440	2,441,805
West Mediterranean-West Mediterranean	625	22,615
East Mediterranean-Atlantic Coast	91	24,531
California Coast-Atlantic Coast	13	1,015
California Coast-Gulf Coast	47	3,250
California Coast-Caribbean	13	214
California Coast-Panama (PAC)	70	4,396
California Coast-California Coast	5,487	185,832
California Coast-Northwest Coast	699	47,272
California Coast-Hawaiian Islands	30,260	3,223,994
California Coast-Marianas	60	15,689
California Coast-Philippines	3,485	541,511
California Coast-Japan	2,541	334,845
California Coast-Ryukyu Islands	2,862	280,963
Northwest Coast-California Coast	158	106,279
Northwest Coast-Hawaiian Islands	13	14,183
Hawaiian Islands-California Coast	29,566	2,564,580
Hawaiian Islands-Marianas	34	3,068
Hawaiian Islands-Philippines	888	96,142
Hawaiian Islands-Japan	282	35,998

TABLE E.6 (CONTINUED)

Traffic Route	Measurement Tons	Cost Savings
Hawaiian Islands-Ryukyu Islands	1,662	123,487
Hawaiian Islands-Korea	46	10,911
Marianas-California Coast	18,913	3,743,963
Marianas-Hawaiian Islands	204	27,613
Marianas-Philippines	3,217	317,726
Marianas-Japan	587	42,948
Marianas-Ryukyu Islands	0.1	9
Philippines-Atlantic Coast	656	144,484
Philippines-Gulf Coast	754	166,534
Philippines-California Coast	16,200	3,359,783
Philippines-Northwest Coast	1,389	279,102
Philippines-Hawaiian Islands	1,339	214,990
Philippines-Marianas	3,178	209,384
Philippines-Japan	11,663	1,050,813
Philippines-Ryukyu Islands	505	51,421
Philippines-Korea	329	26,274
Philippines-Other Southeast Asia	3	216
Philippines-Indian Ocean	34	2,036
Japan-California Coast	3,430	562,400
Japan-Hawaiian Islands	1,717	175,969
Japan-Marianas	1,381	105,542
Japan-Philippines	5,281	567,789
Japan-Japan	1,607	75,603
Japan-Ryukyu Islands	564	58,091
Japan-Taiwan	16	1,058
Japan-Other Southeast Asia	734	48,517
Ryukyu Islands-California Coast	19,214	1,836,960
Ryukyu Islands-Hawaiian Islands	3,650	443,109
Ryukyu Islands-Marianas	78	7,720
Ryukyu Islands-Philippines	3,117	289,275
Ryukyu Islands-Japan	2,199	125,613
Taiwan-Philippines	234	16,392
Korea-Philippines	6	345
Korea-Ryukyu Islands	1,118	43,265
Other Southeast Asia-California Coast	88	14,260
TOTAL	253,616	28,730,565

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE E.7

SUMMARY OF TRAFFIC AREAS FROM WHICH CARGO EMBARKED, OCTOBER 1982 THROUGH MAY 1987

Traffic Area	Measurement Tons	Cost Savings
Atlantic Coast	40,687	$3,790,134
Lesser Antilles	18	1,690
Puerto Rico	2,448	315,960
Guantanamo Bay	8,691	528,872
East Coast South America	22	1,843
Europe	3	282
West Mediterranean	20,065	2,464,420
East Mediterranean	91	24,531
California Coast	45,537	4,638,981
Northwest Coast	171	120,462
Hawaiian Islands	32,478	2,834,186
Marianas	22,921	4,132,259
Philippines	36,050	5,505,037
Japan	14,730	1,594,969
Ryukyu Islands	28,258	2,702,677
Taiwan	234	16,392
Korea	1,124	43,610
Other Southeast Asia	88	14,260
TOTAL	253,616	28,730,565

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE E.8

SUMMARY OF TRAFFIC AREAS FROM WHICH CARGO DISEMBARKED, OCTOBER 1982 THROUGH MAY 1987

Traffic Area	Measurement Tons	Cost Savings
Atlantic Coast	32,620	$3,504,728
Gulf Coast	810	170,723
Bermuda	203	11,201
Lesser Antilles	905	81,102
Puerto Rico	9,576	1,179,918
Guantanamo Bay	11,171	674,655
Panama	461	33,780
Caribbean	1,770	183,557
East Coast South America	78	7,436
West Africa	1,063	182,942
British Isles	160	20,620
Europe	23	1,503
West Mediterranean	14,649	1,384,103
Arabian Gulf	89	11,357
California Coast	93,056	12,374,057
Northwest Coast	2,088	326,374
Hawaiian Islands	37,183	4,099,858
Marianas	4,731	341,403
Philippines	16,228	1,829,180
Japan	18,879	1,665,829
Ryukyu Islands	6,711	557,227
Korea	375	37,185
Taiwan	16	1,058
Other Southeast Asia	737	48,733
Indian Ocean	34	2,036
TOTAL	253,616	28,730,565

Source: Data compiled from NAVMTO Norfolk by the researcher.

APPENDIX F

SUMMARY OF THE 13 MAJOR TRAFFIC ROUTES UTILIZED FOR OPPORTUNE LIFE, OCTOBER 1982 THROUGH MAY 1987

TABLE F.1

CALIFORNIA COAST-HAWAIIAN ISLANDS TRAFFIC ROUTE

Cargo Category	CLSF		Amphibious		Other		Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
Aircraft	189	14,477	9,687	894,489	1,164	107,145	11,040	1,016,111
Ordnance	10,062	1,541,225	386	60,698	0	0	10,448	1,601,923
Boats	18	953	1,929	184,203	100	7,773	2,047	192,929
General Cargo	2,731	117,092	294	16,758	14	845	3,039	134,695
Vehicles	103	11,422	571	49,911	0	0	673	61,333
Other	1,277	70,510	1,739	146,493	0	0	3,012	217,003
TOTAL	14,380	1,755,679	14,602	1,352,552	1,278	115,763	30,260	3,223,994

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE F.2

HAWAIIAN ISLANDS-CALIFORNIA COAST TRAFFIC ROUTE

Cargo Category	CLSF		Amphibious		Other		Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
Aircraft	1,136	70,948	9,272	853,072	0	0	10,408	924,020
Ordnance	7,707	849,656	0	0	0	0	7,707	824,656
Boats	0	0	69	3,819	0	0	69	3,819
General Cargo	179	12,034	8,228	561,239	21	1,307	8,428	574,580
Vehicles	16	886	1,912	130,273	0	0	1,928	131,159
Other	60	3,321	966	78,025	0	0	1,026	81,346
TOTAL	9,098	936,845	20,447	1,626,428	21	1,307	29,566	2,564,580

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE F.3

WEST MEDITERRNEAN-ATLANTIC COAST TRAFFIC ROUTE

Cargo Category	CLSF M.T.	CLSF C.S.	Amphibious M.T.	Amphibious C.S.	Other M.T.	Other C.S.	Total M.T.	Total C.S.
Aircraft	926	113,548	466	67,454	969	111,567	2,361	292,569
Ordnance	4,110	756,445	136	31,028	0	0	4,246	787,473
Boats	562	64,757	59	8,145	0	0	621	72,902
General Cargo	7,108	714,416	3,939	454,808	0	0	11,047	1,169,224
Vehicles	443	51,438	0	0	0	0	443	51,438
Other	598	58,773	124	9,426	0	0	722	68,199
TOTAL	13,747	1,759,377	4,724	570,861	969	111,567	19,440	2,441,805

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE F.4

RYUKYU ISLANDS-CALIFORNIA COAST TRAFFIC ROUTE

Cargo Category	CLSF		Amphibious		Other		Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
Aircraft	0	0	0	0	0	0	0	0
Ordnance	37	6,251	0	0	0	0	37	6,251
Boats	0	0	0	0	0	0	0	0
General Cargo	0	0	16,032	1,323,676	0	0	16,032	1,323,676
Vehicles	0	0	3,143	506,822	0	0	3,143	506,822
Other	0	0	2	211	0	0	2	211
TOTAL	37	6,251	19,177	1,830,709	0	0	19,214	1,836,960

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE F.5

MARIANAS-CALIFORNIA COAST TRAFFIC ROUTE

Cargo Category	CLSF		Amphibious		Other		Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
Aircraft	0	0	0	0	0	0	0	0
Ordnance	2,046	471,224	0	0	0	0	2,046	471,224
Boats	0	0	16,694	3,256,999	0	0	16,994	3,256,999
General Cargo	173	15,740	0	0	0	0	173	15,740
Vehicles	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0
TOTAL	2,219	486,964	16,694	3,256,999	0	0	18,913	3,743,963

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE F.6

PHILIPPINES-CALIFORNIA COAST TRAFFIC ROUTE

Cargo Category	CLSF		Amphibious		Other		Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
Aircraft	0	0	2,289	346,007	1,695	231,817	3,984	577,824
Ordnance	9,294	2,213,869	0	0	0	0	9,294	2,213,869
Boats	376	111,221	2,034	393,972	0	0	2,410	505,193
General Cargo	15	1,948	127	15,475	11	695	153	18,118
Vehicles	0	0	63	4,587	0	0	63	4,587
Other	7	938	289	39,254	0	0	296	40,192
TOTAL	9,692	2,327,976	4,802	799,295	1,706	232,512	16,200	3,359,783

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE F.7

ATLANTIC COAST-WEST MEDITERRANEAN TRAFFIC ROUTE

Cargo Category	CLSF		Amphibious		Other		Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
Aircraft	0	0	365	44,056	0	0	365	44,056
Ordnance	257	39,520	0	0	0	0	357	39,520
Boats	175	17,553	1,291	164,897	0	0	1,466	182,450
General Cargo	11,112	1,011,314	622	46,495	5	392	11,739	1,058,201
Vehicles	174	33,452	0	0	0	0	174	33,452
Other	23	3,809	0	0	0	0	23	3,809
TOTAL	11,741	1,105,648	2,278	255,448	5	392	14,024	1,361,488

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE F.8

PHILIPPINES-JAPAN TRAFFIC ROUTE

Cargo Category	CLSF M.T.	CLSF C.S.	Amphibious M.T.	Amphibious C.S.	Other M.T.	Other C.S.	Total M.T.	Total C.S.
Aircraft	583	59,378	963	98,082	0	0	1,546	157,460
Ordnance	9,893	883,328	0	0	0	0	9,893	883,328
Boats	0	0	0	0	0	0	0	0
General Cargo	158	4,856	2	138	0	0	160	4,994
Vehicles	22	2,112	42	2,919	0	0	64	[illegible]
Other	0	0	0	0	0	0	0	[illegible]
TOTAL	10,656	949,674	1,007	101,139	0	0	[illegible]	[illegible]

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE F.9

ATLANTIC COAST-GUANTANAMO BAY TRAFFIC ROUTE

Cargo Category	CLSF		Amphibious		Other		Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
Aircraft	0	0	286	21,983	27	1,762	313	23,745
Ordnance	3	106	301	30,184	0	0	304	30,290
Boats	58	4,148	1,161	46,284	0	0	1,219	50,432
General Cargo	1,630	84,970	3,040	156,272	53	3,806	4,723	245,048
Vehicles	1,447	102,095	2,008	144,244	0	0	3,455	246,339
Other	282	18,740	856	58,879	0	0	1,138	77,619
TOTAL	3,420	210,059	7,652	457,846	80	5,568	11,152	673,473

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE F.10

ATLANTIC COAST-PUERTO RICO TRAFFIC ROUTE

Cargo Category	CLSF		Amphibious		Other		Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
Aircraft	0	0	0	0	8	453	8	453
Ordnance	88	16,647	0	0	0	0	88	16,647
Boats	357	55,013	5,621	754,900	140	22,169	6,118	832,082
General Cargo	65	6,028	2,429	229,391	99	9,831	2,593	245,250
Vehicles	107	14,832	121	15,253	160	24,999	388	55,084
Other	0	0	367	29,593	8	594	375	30,187
TOTAL	617	92,520	8,538	1,029,137	415	58,046	9,570	1,179,703

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE F.11

GUANTANAMO BAY-ATLANTIC COAST TRAFFIC ROUTE

Cargo Category	CLSF		Amphibious		Other		Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
Aircraft	0	0	15	720	22	1,485	37	2,205
Ordnance	1,291	98,551	0	0	0	0	1,291	98,551
Boats	59	2,959	783	58,412	0	0	842	61,371
General Cargo	1,449	82,473	1,166	70,427	0	0	2,615	152,900
Vehicles	575	36,034	551	37,063	0	0	1,126	73,097
Other	323	21,077	2,411	117,450	40	2,006	2,774	140,533
TOTAL	3,697	241,094	4,926	284,072	62	3,491	8,685	528,657

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE F.12

CALIFORNIA COAST-CALIFORNIA COAST TRAFFIC ROUTE

Cargo Category	CLSF		Amphibious		Other		Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
Aircraft	667	22,564	969	34,416	0	0	1,636	56,980
Ordnance	153	4,148	0	0	0	0	153	4,148
Boats	902	38,542	1,934	64,903	244	6,637	3,080	110,082
General Cargo	358	7,313	117	3,452	0	0	475	10,765
Vehicles	0	0	0	0	101	2,747	101	2,747
Other	42	1,110	0	0	0	0	42	1,110
TOTAL	2,122	73,677	3,020	102,771	345	9,384	5,487	185,832

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE F.13

JAPAN-PHILIPPINES TRAFFIC ROUTE

Cargo Category	CLSF		Amphibious		Other		Total	
	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.	M.T.	C.S.
Aircraft	0	0	0	0	1,000	101,850	1,000	101,850
Ordnance	4,105	454,415	0	0	0	0	4,105	454,415
Boats	0	0	0	0	0	0	0	0
General Cargo	27	1,220	0	0	0	0	27	1,220
Vehicles	0	0	0	0	49	5,709	49	5,709
Other	100	4,595	0	0	0	0	100	4,595
TOTAL	4,232	460,230	0	0	1,049	107,559	5,281	567,789

Notes: M.T. = Measurement Tons
C.S. = Cost Savings ($)

Source: Data compiled from NAVMTO Norfolk by the researcher.

TABLE F.14

PRIMARY CARGO AND SHIP CATEGORIES FOR
THIRTEEN MAJOR OPPORTUNE LIFT TRAFFIC ROUTES

Traffic Route	Primary Cargo (% Tons Moved)	Primary Ship Type (% Tons Moved)
California Coast-Hawaiian Islands	Aircraft (36%), Ordnance (35%)	CLSF (48%), Amphibious (48%)
Hawaiian Islands-California Coast	Aircraft (35%), General Cargo (29%)	Amphibious (69%)
West Mediterranean-Atlantic Coast	General Cargo (57%)	CLSF (72%)
Ryukyu Islands-California Coast	General Cargo (83%)	Amphibious (99%)
Marianas-California Coast	Boats (88%)	Amphibious (88%)
Philippines-California Coast	Ordnance (57%)	CLSF (60%)
Atlantic Coast-West Mediterranean	General Cargo (84%)	CLSF (91%)
Philippines-Japan	Ordnance (85%)	CLSF (84%)
Atlantic Coast-Guantanamo Bay	General Cargo (42%), Vehicles (31%)	Amphibious (69%)
Atlantic Coast-Puerto Rico	Boats (64%)	Amphibious (89%)
Guantanamo Bay-Atlantic Coast	Ordnance (32%), General Cargo (30%)	Amphibious (57%)
California Coast-African Coast	Boats (56%), Aircraft (30%)	Amphibious (55%), CLSF (39%)
Japan-Philippines	Ordnance (78%)	CLSF (80%)

Source: Data compiled from NAVMTO Norfolk by the researcher.

APPENDIX G

TOTAL MONTHLY COST SAVINGS DATA

Observation	FY/ Month	Total Monthly OPLIFT Cost Savings	Atlantic Fleet Tonnage	Atlantic Fleet # Lifts	Pacific Fleet Tonnage	Pacific Fleet # Lifts
1	FY 83 Oct	$ 82,004	1,140	2	0	0
2	Nov	56,144	776	4	0	0
3	Dec	1,309,192	1,717	6	8,714	5
4	Jan	278,772	2,555	8	332	1
5	Feb	1,392,913	2,597	9	7,824	10
6	Mar	18,849	126	5	259	2
7	Apr	56,103	1,108	5	0	0
8	May	697,403	2,394	10	2,873	3
9	Jun	190,283	1,292	6	1,238	2
10	Jul	876,904	5,351	3	1,911	3
11	Aug	495,105	4,132	13	698	3
12	Sep	482,606	3,619	7	1,298	5
13	FY 84 Oct	1,978,230	961	9	10,926	16
14	Nov	794,173	844	8	5,058	15
15	Dec	557,820	2,343	6	1,564	11
16	Jan	672,117	103	3	5,519	8
17	Feb	1,023,048	1,462	6	6,049	12
18	Mar	2,693,518	2,161	10	14,055	9
19	Apr	929,811	7,837	14	0	0
20	May	154,225	753	4	1,013	4
21	Jun	675,239	3,101	7	2,181	3
22	Jul	360,042	582	6	3,260	9
23	Aug	1,372,747	817	6	6,228	22
24	Sep	571,410	1,694	3	2,150	7
25	FY 85 Oct	648,232	1,858	9	6,177	9
26	Nov	191,479	767	5	2,818	6
27	Dec	1,491,898	757	3	16,074	15
28	Jan	136,464	195	4	2,686	6
29	Feb	401,421	3,551	7	1,160	7
30	Mar	110,183	816	6	379	9
31	Apr	599,514	1,775	8	4,597	22
32	May	202,883	879	5	2,595	6
33	Jun	162,923	1,566	9	1,088	8
34	Jul	377,824	2,346	2	3,626	5
35	Aug	722,546	2,133	5	5,617	12

Observation	FY/ Month		Total Monthly OPLIFT Cost Savings	Atlantic Fleet Tonnage	Atlantic Fleet # Lifts	Pacific Fleet Tonnage	Pacific Fleet # Lifts
36		Sep	$ 214,640	679	2	1,910	8
37	FY 86	Oct	740,477	315	4	8,615	12
38		Nov	421,682	76	3	3,619	9
39		Dec	1,723,333	133	1	8,837	16
40		Jan	44,359	5	1	286	3
41		Feb	97,328	1	1	693	3
42		Mar	82,852	1,073	3	70	1
43		Apr	356,269	1,678	4	2,432	4
44		May	169,170	35	1	2,173	11
45		Jun	79,383	1,373	3	0	0
46		Jul	315,252	91	1	2,491	12
47		Aug	3,259	0	0	77	2
48		Sep	365,173	0	0	3,431	3
49	FY 87	Oct	102,505	0	0	1,455	5
50		Nov	73,733	418	3	765	4
51		Dec	12,255	0	0	97	1
52		Jan	108,069	0	0	2,021	4
53		Feb	372,431	0	0	4,735	4
54		Mar	242,176	0	0	2,738	1
55		Apr	1,002	40	1	0	0
56		May	441,192	0	0	5,179	7

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