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REPORT BY THE U.S.

General Accounting Office

Cost And Savings Estimates The Air Force Used To Decide Against Relocating The Electromagnetic Compatibility Analysis Center From Annapolis, Maryland, To Duluth, Minnesota

The Air Force decided not to relocate the Electromagnetic Compatibility Analysis Center from Annapolis to the Duluth International Airport. The decision was based on agency studies estimating that costs would be higher between October 1979 and October 1989 if the Center were relocated.

GAO found that the decision to not relocate was, from a cost standpoint, appropriate.

This report was requested by Senators Rudy Boschwitz and David L. Durenberger and Congressman James L. Oberstar.



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UNITED STATES GENERAL ACCOUNTING OFFICE

WASHINGTON, D.C. 20548

PROCUREMENT, LOGISTICS,
AND READINESS DIVISION

B-210384

The Honorable Rudy Boschwitz
United States Senate

The Honorable David Durenberger
United States Senate

The Honorable James L. Oberstar
House of Representatives

In response to your request, we reviewed the Air Force's cost and savings estimates which it used to decide against relocating the Electromagnetic Compatibility Analysis Center from Government owned and leased space in Annapolis, Maryland, to Government-owned space at the Duluth International Airport, Minnesota.

We examined Air Force studies and records and interviewed representatives of the Duluth municipal government, Air Force officials, other Federal Government officials, and representatives of the contractor that prepared Air Force studies on the costs of the potential relocation. Although the Air Force studies considered several options (e.g., partial relocation, complete relocation), we limited our review to the options--either relocating the Center to Duluth or leaving it in Annapolis--for which you provided us analytical information developed by the city of Duluth.

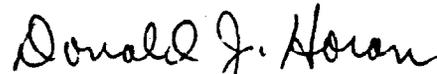
The Air Force estimated in September 1980 that relocation would, over a 10-year period, cost \$11 million more than leaving the Center in Annapolis. In September 1981, the Air Force revised this estimate to \$5 million over a 10-year period. We estimate that relocation would increase costs to the Government, over the next 15 years, between \$4.3 million and \$7 million, depending on the number of personnel that would relocate. Our estimate of relocation costs and the Air Force's estimates differ because:

- We used 1982 cost data whereas the Air Force used 1979 cost data.
- We projected costs over 15 years whereas the Air Force projected costs over 10 years.
- We used a 13.26-percent discount factor to compute the present value of total costs whereas the Air Force used a 10-percent factor.
- We computed higher or lower estimates for some cost items.

In summary, the decision not to relocate was, from a cost standpoint, appropriate. The Air Force's estimates and ours are discussed in detail in appendix I.

As your Offices agreed, we obtained Department of Defense comments on a draft of this report. The Assistant Secretary of Defense (Manpower, Reserve Affairs, and Logistics) responded that no factual discrepancies were found between the draft report and previous Air Force analyses.

As also agreed with your Offices, we are providing copies of this report to the Chairmen of the Senate and House Committees on Appropriations and on Armed Services; the Chairmen, Senate Committee on Governmental Affairs and House Committee on Government Operations; the Director, Office of Management and Budget; and the Secretaries of Defense and the Air Force. We will also provide copies to others upon request.


Donald J. Horan
Director

AIR FORCE AND GAO ANALYSES OF THE COSTS AND SAVINGSASSOCIATED WITH RELOCATING THE CENTERFROM ANNAPOLIS TO DULUTH

In a September 1980 study, the Air Force estimated that relocation would increase costs by more than \$11 million over the period October 1979 to October 1989. ^{1/} In this study, the Air Force assumed that 27 percent of the Center's contractor professional employees would relocate from Annapolis to Duluth. Costs were computed based on October 1979 dollars with a present value computation using a 10-percent discount factor.

In a September 1981 study (responding to information developed by the city of Duluth), the Air Force estimated that the relocation would increase costs by more than \$5 million over the same period. In this study, the Air Force assumed that 60 percent of the contractor's professional employees would relocate. Costs were computed based on October 1979 dollars with a present value computation using a 10-percent discount factor.

We computed the relocation costs by a method similar to the Air Force's, except that we started with costs in fiscal year 1983, the year the move was to begin, and costs were estimated to be different in Annapolis and Duluth. We projected costs over a 15-year period because we estimated that the remaining economic useful life of the buildings that the Center would occupy if it were relocated was 15 years. We computed a present value based on 1982 dollars using a 13.26-percent discount factor which was, as of July 31, 1982, the average yield of Treasury obligations with more than 10 years' remaining maturity. While we used a different discount rate, we tested to determine how using the 10-percent rate would affect our conclusion. Using the Air Force rate would not affect it. We made computations for both a 27-percent and a 60-percent relocation rate for contractor professional employees. If 27 percent of these relocated, we estimate that over the period 1983-97, costs would increase by about \$7 million. If 60 percent relocated, we estimate that over this period, costs would increase by about \$4.3 million. We also computed the cumulative costs for 20 years for both relocation rate assumptions, and in all years the present value of the cumulative costs to establish and operate the Center in Duluth were higher.

^{1/}While the Air Force study covers the period October 1979 to October 1989, the Air Force assumed the Center, if relocated, would not be relocated until October 1983 (beginning of fiscal year 1984). Thus, the Air Force assumed that the differences in the costs of relocating to Duluth and of remaining in Annapolis would not appear until October 1983 and would continue to October 1989.

OBJECTIVE, SCOPE, AND METHODOLOGY

The Air Force based its decision not to relocate on several studies, including the

- "Relocation of ECAC: Operational and Resources Study," September 1980, and
- Air Force analysis of information developed by the city of Duluth, "Analysis of the Fiscal Impact on the Federal Government Involved With Operation of the Electromagnetic Compatibility Analysis Center in Annapolis, Maryland, or Duluth, Minnesota," September 1981.

Our objective was to evaluate the cost and savings estimates used by the Air Force in deciding not to relocate the Center. Although the Air Force considered several options, we limited our review to the options in the Air Force study for which the requestors provided us analytical information developed by the city of Duluth. These options proposed ultimate transfer of all of the Center's current and future workload. The information provided was used in evaluating the Air Force's cost estimates and studies and in preparing our estimates.

Our review was made primarily at the Center's Annapolis offices and at Air Force and other organizations, mainly in the Duluth and Washington, D.C., areas. It involved:

- Reviewing the support for the Air Force's estimates of recurring and nonrecurring costs and cost avoidances.
- Reviewing documentation and interviewing Air Force and IIT Research Institute officials at the Center in Annapolis and Air Force officials in Duluth and in Air Force headquarters in Washington, D.C.
- Interviewing and obtaining information from representatives of the Duluth municipal government and other interested parties in Duluth.
- Interviewing and obtaining information on lease costs from the General Services Administration, Washington, D.C.
- Interviewing and obtaining information on secure voice and data communications costs from the Defense Commercial Communications Office, Scott Air Force Base, Illinois.
- Interviewing and obtaining rate information for commercial telephone service from Northwestern Bell, Duluth.
- Interviewing and obtaining information on recruiting and relocation costs contained in their studies from Control Data Business Advisors, Inc., Minneapolis, Minnesota.

--Interviewing and obtaining information from Analytic Services, Inc., Arlington, Virginia, the Air Force contractor that prepared the cost comparison studies.

Our review was made according to generally accepted government auditing standards.

BACKGROUND

On March 29, 1979, the Air Force announced decisions to implement numerous base realignments. The realignments were part of the Air Force's continuing effort to enhance readiness. The Air Force estimated that the realignments would result in a cost avoidance of about \$140.3 million annually.

The announcement included a decision to inactivate the Semi-Automatic Ground Environment Regional Control Center at Duluth International Airport by mid-1982. In addition, the Air Force said it would study a proposal to withdraw other units from the airport in conjunction with the planned closing down of the Regional Control Center and would report the vacated facilities to the General Services Administration for disposal.

The Air Force concluded in August 1979 that it would benefit substantially if the proposed action to withdraw the other units were implemented. However, in February 1980, the Air Force added the alternative of transferring the Electromagnetic Compatibility Analysis Center from Annapolis to Duluth. On October 15, 1981, the Air Force announced that it would not relocate the Center and would phase out the other active units at the Duluth International Airport.

Mission of the Center

The Center was organized in 1960 to give the Department of Defense (DOD) advice and technical assistance on electromagnetic interference issues. The Air Force administers the Center for DOD. Engineering support is provided the Center under contract by the IIT Research Institute.

The Center's mission includes:

- Establishing and maintaining data bases needed to analyze electromagnetic compatibility problems and maintaining the Frequency Record Resource System.
- Developing analysis techniques for investigating military electromagnetic compatibility problems.
- Providing support to the Joint Chiefs of Staff and the Office of the Secretary of Defense in crises and in contingency planning.

- Developing and promoting design features in communications-electronics equipment that maximize electromagnetic compatibility potential.
- Providing direct assistance on a reimbursable basis to DOD and other Government agencies on electromagnetic compatibility matters.

Facilities at Annapolis, Maryland

The Center is housed in two locations in the Annapolis area. One is leased space on Admiral Cochrane Drive, and the other is Government-owned Building 120 at the David Taylor Naval Research and Development Center. The leased facility contains 125,000 square feet of space, and Building 120 contains 54,049 square feet. The Research and Development Center is across the Severn River from the U.S. Naval Academy in Annapolis.

Facilities at Duluth International Airport

The Air Force facilities at the airport consist of 1,214 acres about 7 miles from downtown Duluth. They include 98 buildings containing 552,858 square feet of space and 345 Government-owned family housing units. Duluth is at the western edge of Lake Superior in St. Louis County.

AIR FORCE STUDY METHODOLOGY

Ten-year costs as computed by the Air Force for each location of the Center are shown in the table below in constant October 1979 dollars. These costs show undiscounted and discounted costs (the result of the Air Force's present value computation as of Oct. 1979) for each location.

Air Force Estimate of Costs
in October 1979 Dollars
for the Period
October 1979 to October 1989

| <u>Center location</u> | <u>Air Force study dated</u> | | | |
|------------------------|------------------------------|--------------------------------------|-----------------------|--------------------------------------|
| | <u>September 1980</u> | | <u>September 1981</u> | |
| | <u>Undiscounted</u> | <u>Discounted</u> <u>(note a)</u> | <u>Undiscounted</u> | <u>Discounted</u> <u>(note a)</u> |
| | ------(millions)----- | | | |
| Annapolis | \$172.585 | \$102.223 | \$172.585 | \$102.223 |
| Duluth | <u>191.602</u> | <u>113.591</u> | <u>183.968</u> | <u>107.509</u> |
| Increase to relocate | <u>\$ 19.017</u> | <u>\$ 11.368</u> | <u>\$ 11.383</u> | <u>\$ 5.286</u> |

a/Present value as of October 1979.

The Air Force arrived at these estimates by first computing the constant dollar costs that would be incurred for each location in each year for the period 1979-89. These costs were classified as either "recurring" or "nonrecurring." The 10-year costs contained in the Air Force's September 1980 study are shown below. These are in constant October 1979 dollars, without a present value computation, and they show how various categories of cost would be affected by a relocation to Duluth.

Air Force's Cost Estimates
for the Period
October 1979 to October 1989
as Contained in the Air Force's
September 1980 Study

| | <u>Annapolis</u> | <u>Duluth</u> | <u>Increase or decrease (-)</u> |
|------------------------------------|----------------------|----------------------|-------------------------------------|
| Recurring operating costs: | | | |
| Facility rental | \$ 7,467,149 | \$ 3,162,383 | -\$ 4,304,766 |
| Other operating | 1,052,540 | 588,879 | -463,661 |
| Personnel | 136,878,000 | 126,577,000 | -10,301,000 |
| Recruiting | 2,653,200 | 4,877,184 | 2,223,984 |
| Travel | 3,664,055 | 4,530,276 | 866,221 |
| Communications | 710,614 | 1,663,026 | 952,412 |
| Utilities, taxes, and insurance | 3,994,584 | 4,198,340 | 203,756 |
| Computer operations | 16,164,680 | 16,972,914 | 808,234 |
| Workload contracted out | - | <u>23,622,000</u> | <u>23,622,000</u> |
| Total recurring costs | <u>172,584,822</u> | <u>186,192,002</u> | <u>13,607,180</u> |
| Nonrecurring costs: | | | |
| Investment | | 3,283,772 | 3,283,772 |
| Operating | - | <u>2,126,067</u> | <u>2,126,067</u> |
| Total nonrecurring costs | - | <u>5,409,839</u> | <u>5,409,839</u> |
| Total costs | <u>\$172,584,822</u> | <u>\$191,601,841</u> | <u>\$19,017,019</u> |

The Air Force made a similar computation in its September 1981 study. Costs for the Center remaining in Annapolis did not change in the 1981 study. A comparison of the costs for each location is shown below.

Air Force's Cost Estimates
for the Period
October 1979 to October 1989
as Contained in the Air Force's
September 1981 Study

| | <u>Annapolis</u> | <u>Duluth</u> | <u>Increase or decrease (-)</u> |
|------------------------------------|----------------------|----------------------|-------------------------------------|
| Recurring operating costs: | | | |
| Facility rental | \$ 7,467,149 | \$ 3,162,383 | -\$ 4,304,766 |
| Other operating | 1,052,540 | 588,879 | -463,661 |
| Personnel | 136,878,000 | 137,703,000 | 825,000 |
| Recruiting | 2,653,200 | 3,013,000 | 359,800 |
| Travel | 3,664,055 | 4,990,399 | 1,326,344 |
| Communications | 710,614 | 1,725,699 | 1,015,085 |
| Utilities, taxes, and insurance | 3,994,584 | 3,103,758 | -890,826 |
| Computer operations | 16,164,680 | 16,972,914 | 808,234 |
| Workload contracted out | - | 4,093,000 | 4,093,000 |
| Total recurring costs | <u>172,584,822</u> | <u>175,353,032</u> | <u>2,768,210</u> |
| Nonrecurring costs: | | | |
| Investment | - | 2,000,772 | 2,000,772 |
| Operating | - | 6,614,339 | 6,614,339 |
| Total nonrecurring costs | - | <u>8,615,111</u> | <u>8,615,111</u> |
| Total costs | <u>\$172,584,822</u> | <u>\$183,968,143</u> | <u>\$11,383,321</u> |

The Air Force used these annual recurring and nonrecurring cost estimates in constant 1979 dollars to compute a present value (as of Oct. 1979) for each location. A table ^{1/} extracted from the 1980 study of the present value of the estimated costs for retaining the Center in Annapolis is shown below.

Costs for Center in Annapolis
in October 1979 Dollars

| <u>Fiscal year</u> | <u>Nonrecurring investment</u> | <u>Nonrecurring operations</u> | <u>Recurring operations</u> | <u>Present value of total (note a)</u> | |
|--------------------|--------------------------------|--------------------------------|-----------------------------|--|------------------|
| | | | | ----- (millions) ----- | |
| 1980 | - | - | \$13.308 | \$13.308 | \$ 12.098 |
| 1981 | - | - | 14.254 | 14.254 | 11.780 |
| 1982 | - | - | 15.203 | 15.203 | 11.417 |
| 1983 | - | - | 16.248 | 16.248 | 11.097 |
| 1984 | - | - | 17.381 | 17.381 | 10.792 |
| 1985 | - | - | 18.226 | 18.226 | 10.279 |
| 1986 | - | - | 18.707 | 18.707 | 9.597 |
| 1987 | - | - | 19.214 | 19.214 | 8.964 |
| 1988 | - | - | 19.744 | 19.744 | 8.374 |
| 1989 | - | - | <u>20.296</u> | <u>20.296</u> | <u>7.825</u> |
| Total | | | | | <u>\$102.223</u> |

^{a/}The Air Force used a 10-percent discount rate and discount factors from table A3.2 of appendix 3 of the 1980 report.

^{1/}Table 5.1, page 51, of the 1980 report.

A similar table 1/ extracted from the 1980 study for moving the Center to Duluth is shown below.

Costs for the Center
in Duluth in
October 1979 Dollars

| <u>Fiscal year</u> | <u>Nonrecurring investment</u> | <u>Nonrecurring operations</u> | <u>Recurring operations</u> | <u>Total</u> | <u>Present value of total (note a)</u> |
|--------------------|--------------------------------|--------------------------------|-----------------------------|--------------|--|
| | | | | | ----- (millions) ----- |
| 1980 | \$ - | \$ - | \$13.308 | \$13.308 | \$ 12.098 |
| 1981 | - | - | 14.254 | 14.254 | 11.780 |
| 1982 | - | - | 15.203 | 15.203 | 11.422 |
| 1983 | 1.989 | 0.084 | 17.057 | 19.130 | 13.066 |
| 1984 | 1.283 | 2.042 | 23.395 | 26.720 | 16.591 |
| 1985 | - | - | 21.951 | 21.951 | 12.391 |
| 1986 | .012 | - | 20.576 | 20.588 | 10.565 |
| 1987 | - | - | 19.758 | 19.758 | 9.217 |
| 1988 | - | - | 20.063 | 20.063 | 8.509 |
| 1989 | - | - | 20.626 | 20.626 | 7.952 |
| Total | | | | | <u><u>\$113.591</u></u> |

a/The Air Force used a 10-percent discount rate and discount factors from table A3.2 of appendix 3 of the 1980 report.

1/Table 5.9, page 72, of the 1980 study.

In the 1981 study, the Air Force assumed that costs for retaining the Center in Annapolis would not change. Therefore the present value computation in the 1980 study would still apply. The revised present value computation from the 1981 study 1/ if the Center were relocated to Duluth is shown below.

Costs for the Center in Duluth
in October 1979 Dollars

| <u>Fiscal year</u> | <u>Nonrecurring investment</u> | <u>Nonrecurring operations</u> | <u>Recurring operations</u> | <u>Total</u> | <u>Present value of total (note a)</u> |
|------------------------|--------------------------------|--------------------------------|-----------------------------|--------------|--|
| ----- (millions) ----- | | | | | |
| 1980 | \$ - | \$ - | \$13.307 | \$13.307 | \$ 12.097 |
| 1981 | - | - | 14.253 | 14.253 | 11.779 |
| 1982 | - | -0.395 | 15.203 | 14.808 | 11.125 |
| 1983 | 1.989 | .084 | 16.897 | 18.970 | 12.957 |
| 1984 | - | 5.949 | 19.552 | 25.501 | 15.834 |
| 1985 | - | .499 | 17.491 | 17.990 | 10.155 |
| 1986 | .012 | .465 | 17.871 | 18.348 | 9.415 |
| 1987 | - | - | 18.422 | 18.422 | 8.594 |
| 1988 | - | - | 18.956 | 18.956 | 8.039 |
| 1989 | - | - | 19.489 | 19.489 | 7.514 |
| Total | | | | | <u>\$107.509</u> |

a/The Air Force used a 10-percent discount rate and discount factors from table A3.2 of appendix 3 of the 1980 report.

1/Table A5.9 in the 1981 study.

GAO ANALYSIS OF THE AIR FORCE ESTIMATES

We analyzed each cost category in the Air Force's 1980 and 1981 studies. Where we disagreed with the Air Force, we developed our own estimates.

A key factor in the proposal to move the Center to Duluth was an opportunity to use Government-owned space in lieu of continuing to incur the cost of leased space in Annapolis. Accordingly, we projected costs over 15 years based on the estimated remaining economic useful life of the buildings at Duluth.

Our estimates and the Air Force's are shown in the schedule below.

The Air Force figures are the same as those shown on pages 6 and 7. Our increase or decrease amounts are the results of comparing the 15-year cumulative costs for Annapolis and Duluth for the 27-percent and the 60-percent personnel relocation assumptions.

| | Air Force 1980 estimate of increase or decrease (-) based on 27-percent personnel relocation (note a) | GAO estimate of increase or decrease (-) based on 27-percent personnel relocation (note b) | Air Force 1981 estimate of increase or decrease (-) based on 27-percent personnel relocation (note a) | GAO estimate of increase or decrease (-) based on 60-percent personnel relocation (note b) |
|--|---|--|---|--|
| <u>Estimated Change in Costs of Moving the Center From Annapolis to Duluth</u> | | | | |
| Recurring operating costs: | | | | |
| Facility rental | -\$ 4,304,766 | -\$12,288,157 | -\$ 4,304,766 | -\$12,288,157 |
| Other operating | -463,661 | -1,446,956 | -463,661 | -1,446,956 |
| Personnel | -10,301,000 | -4,962,849 | 825,000 | 2,395,772 |
| Recruiting | 2,223,984 | 623,000 | 359,800 | 127,000 |
| Travel | 866,221 | 4,719,477 | 1,326,344 | 5,268,067 |
| Communications | 952,412 | 3,237,192 | 1,015,085 | 3,265,408 |
| Utilities, taxes, and insurance | 203,756 | -1,719,704 | -890,826 | -1,719,704 |
| Computer operations | 808,234 | 452,740 | 808,234 | 452,740 |
| Workload contracted out | <u>23,622,000</u> | <u>14,775,206</u> | <u>4,093,000</u> | <u>609,286</u> |
| Total recurring costs | <u>13,607,180</u> | <u>3,389,949</u> | <u>2,768,210</u> | <u>-3,336,544</u> |
| Nonrecurring costs: | | | | |
| Investment | 3,283,772 | -1,327,758 | 2,000,772 | -1,327,758 |
| Operating | <u>2,126,067</u> | <u>3,692,496</u> | <u>6,614,339</u> | <u>6,924,654</u> |
| Total nonrecurring costs | <u>5,409,839</u> | <u>2,364,738</u> | <u>8,615,111</u> | <u>5,596,896</u> |
| Total costs | <u>\$19,017,019</u> | <u>\$ 5,754,687</u> | <u>\$11,383,321</u> | <u>\$ 2,260,352</u> |

a/Based on the period October 1979 to October 1989 expressed in October 1979 dollars but without a present value computation.

b/Based on the period October 1982 to October 1997 expressed in October 1982 dollars but without a present value computation.

Analysis of the Air Force's
September 1980 study estimates

The sections below compare the Air Force's September 1980 estimates and our estimates of changes in recurring and non-recurring costs if the Center were relocated from Annapolis to Duluth.

Recurring costs

Facility rental cost reduction--The Air Force estimated savings of over \$4 million from reduced facility rental by determining facility leasing costs which could be avoided by relocation. The Air Force computed this by first identifying its current facility leasing costs at the Annapolis IIT Research Institute Building. Then, to this cost the Air Force added an estimate of the annual cost it would incur for leasing additional space in Annapolis to meet the Center's future workload and personnel growth. The resulting total is the estimated rental cost that could be saved if the Center were moved to Duluth. From this the Air Force deducted its estimate of the cost to provide a Washington area liaison office that it believed necessary if the Center were moved to Duluth. There would be no facility rental cost for 15 years in Duluth because the space to be used there is Government owned and the buildings are expected to last at least 15 years.

The Air Force estimated that for fiscal years 1984-89, ^{1/} the cost to lease space in Annapolis at the IIT Research Institute Building and space in other buildings to meet future Center personnel growth would be about \$4,642,470. If the Center were moved to Duluth, these costs could be avoided although the Air Force estimated that the cost to lease space for a Washington liaison office would be about \$337,704. Thus, facility rental cost would be \$4,304,766 less in Duluth in constant fiscal year 1979 dollars between fiscal years 1984 and 1989.

We calculated our estimate in a similar manner, except that as noted on page 1, we used a 15-year period (the minimum expected useful life of the Duluth building) and we used constant 1982 costs. We estimate that over the period of our analysis, facility rental costs could be \$12,288,157 lower if the Center

^{1/}The Air Force's cost comparison schedules show costs in Annapolis and Duluth for fiscal years 1980-89. Since the move to Duluth was not expected to begin until fiscal year 1983, the Air Force used identical costs for facility rental costs (and for several other cost categories) for each location for fiscal years 1980-83. We excluded costs for years when they were identical.

were relocated. When the impact of including costs in our analysis beyond fiscal year 1989 is excluded from our estimate above, we estimate that facility rental costs could be about \$5,353,197 lower in Duluth over fiscal years 1984-89.

Our estimate differs from the Air Force's over the fiscal year 1984-89 period because:

- The Air Force's estimate of the cost to lease space for a Washington area liaison office was understated by about \$235,320 based on updated lease cost information supplied by the General Services Administration.
- The Air Force's estimate of additional lease cost to provide space in Annapolis to meet future Center growth is overstated by \$370,980 based on updated information, which shows an 18-percent decline in the staffing level used by the Air Force in calculating its estimate.

The remainder of the difference occurred because the Air Force used fiscal year 1979 cost information while we used fiscal year 1982 cost information.

Decrease in other operating costs--Other operating costs include courier, interfacility shuttle, guard, and snow removal service costs. The Air Force estimated these costs at about \$671,684 for fiscal years 1984-89 if the Center remained in Annapolis and about \$208,023 if the Center were relocated, or an estimated cost reduction of \$463,661.

We estimate other operating costs of about \$1,783,860 in Annapolis and about \$336,904 in Duluth over the 15-year period of our analysis, or reduced costs of about \$1,446,956 if the Center were relocated. Excluding costs beyond fiscal year 1989 from our comparison, we estimate costs in Annapolis at \$713,544 and costs in Duluth at \$93,420, or \$620,124 lower in Duluth.

We estimate more savings than the Air Force because we used updated staffing information showing that the Center's planned staffing level would be about 18 percent lower than the level the Air Force used. Less office space would be needed to accommodate the Center's planned staff, and one less building would be required. Space in only two buildings--Number 240 and Number 128--appears to be needed to house the Center in Duluth. Thus, guard service and interfacility shuttle service to Building 211 could be eliminated. These reduced requirements translate into an increase in estimated savings of about \$129,333. In addition, as a result of using the updated staffing level, the space needed to accommodate the Center in Annapolis is less than estimated by the Air Force. Thus, guard

service costs would be \$100,400 lower than estimated by the Air Force. The remaining difference between the Air Force estimate and ours resulted from our using more recent cost information.

Personnel cost decrease--The Air Force estimated that personnel costs would be \$10,301,000 lower in Duluth. The Air Force estimated that personnel costs associated with analysis project workload and administrative and support staff would decrease by about \$12,871,820 as a result of personnel losses that would occur if the Center were relocated. The Air Force assumed that no more than 27 percent of the professional employees would move to Duluth and that for fiscal years 1984-86, the military services would have to contract for services until new employees were recruited. The Air Force also estimated that incremental personnel costs of about \$2,570,820 would be incurred to staff a Washington area office that it believed necessary to maintain analysis project workload at its planned level and to provide liaison with the services and the Office of the Secretary of Defense.

We estimate that over the 15-year period of our analysis, using the same methodology as the Air Force, except that we used constant 1982 dollars, personnel costs associated with analysis project workload and administrative support staff would decrease by about \$7,712,575. We estimate also that incremental personnel costs associated with a Washington area office would be about \$2,749,726. Thus, overall personnel costs would be about \$4,962,849 lower in Duluth.

Adjusting our estimate above to exclude the impact of our projecting costs beyond fiscal year 1989 so that it would be comparable with the Air Force estimate, we estimate that personnel costs associated with analysis projects workload and administrative and support staff could decrease \$7,712,575 and personnel costs for a Washington area office could increase \$1,178,454 for a net decrease in personnel costs of \$6,534,121.

The following tables show Air Force estimates and our estimates of personnel costs for analysis project workload and administrative and support staff by location.

Air Force Estimates

| <u>Analysis projects</u> | | | | <u>Administrative and support staff</u> | | |
|--------------------------|----------------------------|---------------|----------------------------|---|--------------|----------|
| <u>Fiscal year</u> | <u>Number of personnel</u> | <u>Cost</u> | <u>Number of personnel</u> | <u>Cost</u> | <u>Total</u> | |
| | | (000 omitted) | | (000 omitted) | | |
| Annapolis | 1984 | 435 | \$10,205 | 196 | \$3,832 | \$14,037 |
| | 1985 | 450 | 10,549 | 203 | 3,961 | 14,510 |
| | 1986 | 465 | 10,904 | 209 | 4,094 | 14,998 |
| | 1987 | 480 | 11,271 | 216 | 4,232 | 15,503 |
| Duluth | 1984 | 200 | 4,692 | 118 | 2,307 | 6,999 |
| | 1985 | 313 | 7,343 | 155 | 3,030 | 10,373 |
| | 1986 | 410 | 9,619 | 189 | 3,695 | 13,314 |
| | 1987 | 480 | 11,271 | 216 | 4,232 | 15,503 |

GAO Estimates

| <u>Analysis projects</u> | | | | <u>Administrative and support staff</u> | | |
|--------------------------|----------------------------|---------------|----------------------------|---|--------------|----------|
| <u>Fiscal year</u> | <u>Number of personnel</u> | <u>Cost</u> | <u>Number of personnel</u> | <u>Cost</u> | <u>Total</u> | |
| | | (000 omitted) | | (000 omitted) | | |
| Annapolis | 1984 | 334 | \$10,385 | 188 | \$4,433 | \$14,818 |
| | 1985 | 341 | 10,593 | 189 | 4,457 | 15,050 |
| | 1986 | 348 | 10,805 | 190 | 4,481 | 15,286 |
| | 1987 | 355 | 11,021 | 190 | 4,481 | 15,502 |
| Duluth | 1984 | 164 | 5,094 | 125 | 2,948 | 8,042 |
| | 1985 | 317 | 9,846 | 181 | 4,268 | 14,114 |
| | 1986 | 348 | 10,805 | 190 | 4,481 | 15,286 |
| | 1987 | 355 | 11,021 | 190 | 4,481 | 15,502 |

Generally, both the Air Force's and our estimates of personnel availability for Duluth were based on the relocation of 27 percent of the Analysis Center's professional employees and 13.5 percent of its preprofessional and support staff employees (derived from Air Force experience and a survey of employees) and the recruitment of up to 134 professional employees annually and support staff in proportion to the level of professional employees on board.

The Air Force estimate differs from ours primarily because we used more recent information to calculate our estimates. The Air Force used fiscal year 1979 analysis project and administration support staff workload, staffing level, and cost information, while we used fiscal year 1982 information. The updated information shows that while workload and staffing levels have decreased, personnel costs have increased due to inflation.

The Air Force believed that in order to maintain future analysis project workload at the planned level, a Washington area liaison office should be established if the Analysis Center were moved to Duluth. The Air Force estimated that personnel costs would be about \$428,470 annually for fiscal years 1984-89 for the additional positions that would be created for this office.

The office would consist of 36 positions, of which 17 would be new. Included in the 17 new positions are 12 duplicative technical liaison positions that would be staffed by engineers. Incumbents would perform duties such as (1) meeting with electronics contractors to provide expertise in systems electromagnetic compatibility and (2) explaining preliminary results of electromagnetic compatibility analysis projects to DOD activities sponsoring the projects. The determination that 12 technical liaison positions were needed was based on the Air Force's best judgment, without any additional detailed justification, considering analysis project workload in the Washington area.

We could not verify that the liaison positions were needed, so without taking exception to the Air Force's decision to establish a liaison office, we used a more conservative methodology to develop an alternative estimate of incremental personnel costs. We based it on the estimated annual travel costs of \$291,913 that could be avoided by establishing the liaison office, less the rental cost for the office of \$95,504, for a total of \$196,409. At that level, the cost of establishing the liaison office approximates the cost that could be incurred if it were not established. Consequently, our estimate is about \$232,061 lower annually than the Air Force estimate.

Recruiting cost increase--The Air Force estimated that recruiting costs after relocation would be about \$1,806,948 higher during fiscal years 1984-87. It further estimated that, in fiscal years 1988 and 1989, annual recruiting costs would be \$205,740

and \$211,296 higher in Duluth. Thus, over the period of the Air Force analysis, recruiting costs would be \$2,223,984 higher in Duluth.

The Air Force estimated that recruiting costs would be higher in Duluth annually on the basis that, while the average cost to recruit and relocate inexperienced professional personnel who are recent college graduates would decrease from \$3,300 to about \$2,500, the average cost to recruit and relocate experienced professional personnel from east coast recruiting areas would increase from \$3,300 to about \$9,656. The Air Force's \$2,500 estimate reflects the experience of the Minnesota Power and Light Company in recruiting similar personnel. The \$9,656 estimate was based on the estimated cost to relocate a current Center employee from Annapolis to Duluth. The Center hires about 50 percent experienced personnel annually. The Air Force estimated that its turnover rate would be about 12 percent regardless of location.

We estimate that recruiting costs to restaff after relocation could be about \$853,000 during fiscal years 1984-86. We estimate that in fiscal years 1987, 1988, and 1989, costs in Duluth could be \$10,000, \$22,000, and \$22,000 lower, respectively, than in Annapolis. Thus, during fiscal years 1984-89, recruiting costs for Duluth could be \$799,000 higher. The estimated lower annual recruiting costs in Duluth beyond fiscal year 1989 to fiscal year 1997 reduce the higher cost estimate for Duluth to \$623,000.

We estimate the average cost to recruit and relocate professional personnel who are recent college graduates at \$2,500--the same figure used by the Air Force. However, we estimate the average cost of recruiting and relocating experienced professional personnel at about \$5,500, or \$4,156 less than the Air Force estimate. Our estimate was based on information in the Air Force's September 1981 study in which the Air Force believed that recruiting costs could be potentially lower as a result of its review of information submitted to it by the city of Duluth. The September 1981 study used the \$5,500 estimated cost for experienced personnel and the \$2,500 estimate for recent college graduates, which results in an overall average cost of about \$4,000 per recruit.

Our estimates are lower because to determine the number of professional engineers that would need to be replaced, we used

--a current workload projection which showed that the planned staffing level had decreased by about 20 percent from the level used by the Air Force at the time of its study,

--a 9-percent turnover rate for Duluth based on a reestimate by the Air Force (a more conservative estimate derived from data provided by the city of Duluth) in the study, and

--the lower costs discussed above.

Travel cost increases--The Air Force estimated that travel costs would be about \$360,022 higher in Duluth during fiscal years 1984-87, the period that it would be restaffing after relocation. The Air Force estimated that during fiscal years 1988 and 1989, travel costs would be \$248,908 and \$257,291 higher, respectively, in Duluth. Thus, over the period of the Air Force analysis, travel costs for Duluth would be \$866,221 higher.

The Air Force calculated its estimate by using fiscal year 1980 travel records to estimate the number, purposes, destinations, and costs of trips being made by Center personnel in Annapolis. To compute travel costs from Duluth, the Air Force estimated the number of trips that would be made and their cost if the Center were located in Duluth during fiscal year 1980. By comparing the estimated travel costs which would be incurred in Duluth with those incurred in Annapolis, a factor showing the relationship between the two locations was calculated.

According to Air Force calculations, annual travel costs in Duluth would be 58.9 percent higher. Most of the increase would be for analysis-project-related travel from Duluth to the Washington area. The Air Force also determined that there would be a net increase in air fares and per diem costs for travel out of Duluth rather than out of Annapolis. The Air Force adjusted the fiscal years 1984-87 estimates that would result from applying the factor to reflect the availability of personnel to perform analysis-project-related travel.

We used the same approach in analyzing fiscal year 1982 travel records. Our analysis indicated that travel costs would be about 59.2 percent higher in Duluth. Also, we found that estimated travel costs in Annapolis had increased from \$322,508 to \$574,875, increasing the baseline used to estimate travel costs if the Center were relocated. This reflects a 17-percent increase in out-of-town trips and an increase in the cost per trip due to higher air fares and per diem rates. Applying the factor we computed against the higher baseline cost provides higher costs for Duluth than were shown in the Air Force analysis.

We estimated that over the 15-year period of our analysis, travel costs would be \$4,719,477 higher in Duluth. Adjusting this estimate to exclude the effect of projecting costs beyond fiscal year 1989, we estimate that travel costs during fiscal years 1984-87 could be about \$886,847 higher in Duluth.

We estimate that travel costs during fiscal years 1988 and 1989 could be \$383,263 higher in each year in Duluth.

Communications--The Air Force estimated that communications costs for secure voice, data, and commercial telephone services would increase by about \$268,488, \$348,912, and \$115,272, respectively, if the Center were relocated. The Air Force also estimated that postage costs would increase by about \$219,740, because more classified documents would be transmitted by mail instead of courier service, for a total communications cost increase of \$952,412.

The Air Force's estimates for secure voice and data services were based on rate information provided by the Defense Commercial Communications Office, Scott Air Force Base, Illinois. The Air Force estimate for commercial telephone service was based on rate information provided by Northwestern Bell. The Air Force estimated that without courier service, the number of classified documents that would be transmitted by mail would double. Thus, without courier service, costs would be about twice as great in Duluth.

We estimate that over the 15-year period of our analysis, communications costs for secure voice, data, and commercial telephone services could increase by \$2,046,940, \$83,496, and \$621,936, respectively, if the Center were relocated. We also estimate that over the period of our analysis, postage costs would increase by \$484,820 because more classified documents would be transmitted by mail instead of courier service.

Adjusting our estimates above to exclude costs beyond fiscal year 1989 so our estimates would be comparable with the Air Force's, we estimate that costs for secure voice, data, and commercial telephone services could increase by \$877,260, \$35,784, and \$266,544, respectively, if the Center were relocated. We also estimate that postage costs for transmitting classified documents could increase by \$190,292, for a total communications cost increase through 1989 of \$1,369,880.

Our estimates for secure voice and data services were based on updated rate information provided by the Defense Commercial Communications Office. Our estimate for commercial telephone service was based on updated rate information provided by Northwestern Bell. Thus, the Air Force estimate differs from ours because we used updated cost information. Our estimate of increased mailing costs is lower than the Air Force's because we used updated workload information which indicated a decrease from the level used by the Air Force. As a result of the decrease, the estimated number of classified documents generated would also decrease and this would lower mailing costs for both Annapolis and Duluth and the resulting difference between the two locations.

Utilities, taxes, and insurance--In its September 1980 study, the Air Force estimated that utility costs for heating, electricity, water, and sewerage would increase by \$861,196 in Duluth. Costs for taxes and insurance would decrease by \$657,440, resulting in a net increase of \$203,756.

The Air Force's estimate of utility costs in Annapolis--\$1,792,964--was based on using cost information provided by the David Taylor Naval Ship Research and Development Center and the Center contractor, IIT Research Institute. Generally, the Air Force's estimate for Duluth--\$2,654,160--was calculated by using basewide cost factors which allocated costs to buildings on the basis of their size in gross square feet. However, heating costs were allocated to facilities based on whether the facility was heated by the air base's central heating system or an individual facility heating system. The heating system's boilers were fired by fuel oil.

The Air Force's estimate of tax and insurance cost decreases in Duluth was based on estimates supplied by the IIT Research Institute.

In its September 1981 study, the Air Force adjusted its estimate of utility costs based on its analysis of information provided by the city of Duluth's Office of Business Development. Instead of an estimated increase in utility costs, the adjusted Air Force estimate indicated that utilities costs would decrease by \$233,386 if the Center were relocated. The Air Force estimate for decreased taxes and insurance remained unchanged. Thus, the Air Force estimated that costs for this category would decrease by \$890,826.

In calculating the adjusted estimate, the Air Force did not change its estimate of utility costs for Annapolis. However, the Air Force revised its estimate of utility costs in Duluth from \$2,654,160 to \$1,559,578. The Air Force estimate for Duluth decreased because the Air Force substituted natural gas for fuel oil as a more economical means of heating the Duluth facilities and used cubic feet rather than gross square feet in buildings to calculate estimated heating costs. The Air Force also adjusted the estimate to reflect how using a 60-percent relocation rate factor for professional employees would affect facility usage in Duluth. Below is a reconciliation of the Air Force's September 1980 and 1981 estimates.

| | | |
|--|----------------|------------------------------|
| September 1980 estimate-- increased costs | | \$ 203,756 |
| Less: Substitution of natural gas for fuel oil | \$647,075 | |
| Calculating heating costs using cubic feet rather than square feet | <u>492,444</u> | <u>1,139,519</u> -935,763 |
| Plus: Using facilities in Duluth earlier as a result of higher relocation rate estimate | | <u>44,937</u> |
| September 1981 estimate--decreased costs | | <u>- \$ 890,826</u> |

We estimate that, over the 15-year period of our analysis, utilities costs for heating, electricity, water, and sewerage could decrease by about \$970,564 if the Center were relocated. We also estimate that taxes and insurance costs could decrease by \$749,140. Thus, costs would decrease by a total of \$1,719,704.

Adjusting our estimate above to exclude costs beyond fiscal year 1989, we estimate that utilities costs could decrease by \$415,956 and taxes and insurance costs could decrease by \$321,060. Thus, over fiscal years 1984-89, estimated costs could be \$737,016 lower if the Center were relocated.

Our estimate of decreased utility, taxes, and insurance costs is lower than the Air Force estimate over fiscal years 1984-89 because we believe decreased costs would be

--\$81,866 less because updated budget information indicated that planned workload and staffing levels had decreased from the levels used by the Air Force and thus reduced its estimated space requirement in Annapolis;

--\$43,422 less because updated information indicated higher electricity costs in Duluth than used by the Air Force;

--\$336,380 less because updated cost information indicated taxes and insurance costs in Annapolis were lower than estimated by the Air Force;

--\$196,074 more because we used individual facility heating information for Buildings 240 and 128 in lieu of basewide facility heating data, which overstated heating in Duluth for these buildings;

--\$77,884 more because updated budget information indicated that planned workload and staffing levels had decreased from the levels used by the Air Force and thus reduced estimated space requirements in Duluth to accommodate a relocated Center; and

--\$33,900 more because updated information indicated utility costs were higher in Annapolis.

Duplicate computer operation costs increase--Duplicate computer operations costs include costs for those tasks that would be necessary to transfer the data base from the existing computer activity in Annapolis to a new activity that would be organized in Duluth. To facilitate the transfer, the Air Force estimates the need for a 3-month period of duplicate computer operations. The Air Force estimated these costs at \$808,234. We estimate them at \$452,740.

Our estimate is lower primarily because

--the Air Force erroneously included computer rental costs for a 6-month period rather than the proposed 3-month period and thus overstated its estimate by \$404,117 and

--the Air Force estimate did not provide for personnel costs during the period of dual operation and thus understated its estimate by about \$125,000.

The remainder of the difference between the Air Force estimate and ours resulted because we used more recent cost information.

Cost increase that resulted from contracting out analysis projects--The Air Force study proposed that analysis project workload that could not be done by the Center during the transition period after relocation due to personnel losses be contracted out to private for-profit engineering firms. This would continue until the Center's staff returned to a level where it could handle all the work.

The Air Force estimated that the cost would be about \$70,000 per staff-year of effort, or about 1.553 times greater than the Center's staff-year cost to do the work at the time of the study. This estimate was based on the Air Force's judgment concerning cost to do analysis project work by for-profit engineering firms. The Air Force estimated that contracting costs would be \$23,622,000 during fiscal years 1984-86.

We estimate contracting costs per staff-year by adjusting the Air Force's \$70,000 estimate for inflation using Air Force

cost indexes. The resulting total at \$85,574 was 1.324 times greater than the Center's fiscal year 1982 estimated cost per staff-year of \$64,614. Our estimate of staff-years to be contracted was calculated by deducting from total staff-years planned in each year an estimate of the number of staff-years that the Center could deliver which was based on personnel availability in Duluth due to relocation of existing employees and recruitment of new personnel. The resulting difference was an estimate of the number of staff-years that could not be delivered by the Center during the transition period. To this we applied the estimated cost per staff-year at \$85,574.

We estimated contracting costs for analysis projects at \$14,775,206 during fiscal years 1984 and 1985. The Air Force estimate differed from ours primarily because we used updated budget information, which showed that planned analysis project workload had decreased since the Air Force prepared its study and that the relationship of estimated Center staff-year cost to the for-profit private firm staff-year cost had decreased from 1.553 to 1.324.

Nonrecurring costs

The Air Force based its estimates of nonrecurring costs on the assumption that the move to Duluth would occur in fiscal years 1984-87. During this period, there would be costs to transfer personnel, renovate facilities, and establish equipment capabilities. The Air Force's 1980 estimate assumed that 27 percent of the Center's professional staff would relocate. The Air Force's 1981 estimate assumed that 60 percent would relocate.

Air Force 1980 Estimate
of Nonrecurring Costs
and GAO Estimates

| | <u>Air Force</u> | <u>GAO</u> | <u>GAO over or under (-)</u> |
|--|--------------------|--------------------|--------------------------------------|
| Investment: | | | |
| Facility construction and renovation | \$3,283,772 | \$3,057,854 | -\$ 225,918 |
| Facility construction avoided | <u> -</u> | <u>-4,385,612</u> | <u>-4,385,612</u> |
| Total investment costs | <u>3,283,772</u> | <u>-1,327,758</u> | <u>-4,611,530</u> |
| Operating: | | | |
| Relocation of military, civilian, and contractor personnel | 1,950,633 | 2,626,181 | 675,548 |
| Communications equipment acquisition, relocation, and installation | 175,434 | 114,157 | -61,277 |
| Severance pay | <u> -</u> | <u>952,158</u> | <u>952,158</u> |
| Total operating | <u>2,126,067</u> | <u>3,692,496</u> | <u>1,566,429</u> |
| Total costs | <u>\$5,409,839</u> | <u>\$2,364,738</u> | <u>-\$3,045,101</u> |

Investment--facility construction and renovation costs--The Air Force estimated that if Buildings 240, 128, and 211 at Duluth International Airport were used to provide space for the Center, facility renovation costs of about \$2,000,772 would be required. The Air Force also estimated that Building 120 at the David Taylor Naval Ship Research and Development Center in Annapolis would be renovated to meet naval needs at a cost of about \$1,283,000. The Navy planned to renovate Building 120 to provide laboratory space it needed.

Our estimate is \$225,918 lower than the Air Force estimate because:

- Updated staffing information showed that the Center's planned staffing level was about 18 percent lower than the level at the time the Air Force prepared its estimate. Consequently, Building 211 would not be needed to meet the Center's space requirements and renovation costs of about \$11,572 should be excluded.
- We excluded \$1,283,000, the costs to renovate Building 120 from our one-time cost estimates. We treated Building 120 renovation costs as an offset in calculating estimated construction cost avoidances. (See p. 26.)
- We increased costs to renovate Building 240 by about \$1,068,654 by using a more detailed project description.

One-time cost avoidances--The Air Force identified proposed construction work at the David Taylor Ship Research and Development Center that might not be required if the Center vacated the space it occupies in Building 120. The work is incorporated into two military construction projects.

| <u>Title</u> | <u>Number</u> | <u>Scope</u> | <u>Cost</u> |
|--|---------------|----------------|-------------|
| Integrated Ship Machinery Systems Laboratory | P-143 | 50,600 sq. ft. | \$6,225,800 |
| Materials Laboratory | P-124 | 29,574 sq. ft. | 2,857,000 |

The Air Force concluded that these projects could be avoided by renovating space vacated in Building 120 as proposed by the Navy at an estimated cost of about \$1.2 million. Since the above projects were not approved or funded by the Department of

the Navy, the Air Force did not claim that a one-time construction cost avoidance would result if the Center was relocated. However, the Air Force showed how claiming these projects as a one-time cost avoidance would affect its cost analysis, assuming that the projects would ultimately be approved and funded by the Navy.

Generally, the manner in which the Air Force dealt with the issue of whether the construction work should be claimed as a cost avoidance is appropriate because it showed how claiming the projects as a cost avoidance would affect the cost comparison it prepared. However, we believe a cost avoidance could be claimed because the potential cost to the Government to meet a deficiency could be reduced by altering an existing facility in lieu of new construction to meet a portion of the requirement and the projects are included in the Chief of Naval Material Corporate Plan for Research and Development Centers, Fiscal Years 1982-1986, dated October 1981.

The Air Force estimate of the potential savings of \$9,082,800 that could accrue to the Government is overstated because altering existing space in Building 120 could meet only up to 54,409 square feet of the 80,174-square-foot total requirement. Thus, new construction of about 26,125 square feet would be needed to satisfy the total requirement. When this factor is considered along with the estimated cost to alter Building 120, the potential construction cost avoidance estimate is decreased to about \$4,385,612 using the most recent cost data. 1/

In addition, the Air Force estimate did not reflect the fact that if the facilities in Duluth were used to provide space for the relocated Center, the Government would be denied the proceeds that might have resulted from disposing of the facilities. Thus, the estimate is overstated by the amount of proceeds that might have been realized. An estimate of the fair market value of the facilities was not available; therefore, we could not adjust the estimate for this factor.

Costs to relocate military, civilian, and contractor personnel--The Air Force estimated that personnel relocation costs of \$1,950,633 would be incurred if the Center were relocated to Duluth. The Air Force estimated that 14 military and 12 civilian personnel would relocate. The Air Force also

1/In September 1981, the Air Force lowered its estimate to \$5 million to recognize that Building 120 could meet only a portion of Navy requirements for laboratory space. The Air Force did not claim the \$5 million as a cost avoidance.

estimated that 27 percent, or 151, of the contractor professional and 13.5 percent, or 33, of the preprofessional and clerical personnel would relocate. The Air Force estimated that the average cost to relocate a military person was \$3,893 and the cost to relocate a civilian or contractor employee was about \$9,656. These estimates were based on the joint travel regulations and past Air Force experience.

Using the updated staffing projection, we estimated that 125 contractor professionals and 32 preprofessional and clerical personnel would relocate.

We used updated cost information reflecting higher household goods moving and storing costs and househunting expenses. We also used information contained in an employee survey regarding sales value of employee homes. For example, we found that the weighted average value of Center employees' homes was about \$86,400. Using this value, we estimated that reimbursable real estate expenses would average about \$6,458 rather than \$4,260 included in the Air Force estimate.

When the updated cost information is considered, the estimated cost to relocate a civilian or contractor employee increases to about \$15,196.

Thus, our higher cost estimate results from the estimated increase in the cost to relocate a Center civilian or contractor employee, although we estimated that fewer people would relocate.

Communications equipment acquisition, relocation, and installation costs--The Air Force estimated these costs at \$175,434. We estimate them at \$114,157. Our estimate is lower primarily because:

- The Center acquired a secure voice KY-3 unit capability after the Air Force calculated its estimate; this eliminated the need to acquire the unit at an estimated cost of about \$4,436, as originally proposed.
- According to Northwestern Bell, the estimated cost to install telephone service in Duluth decreased by \$20,401 since the Air Force estimate was prepared.
- The cost to acquire a secure facsimile capability is about \$39,000, or \$36,000 less than the Air Force estimated.

Severance pay costs--The Air Force did not include severance pay in its estimate of one-time costs. Severance pay is compensation provided to personnel who would be involuntarily separated

from employment if they did not transfer to Duluth. Severance pay is calculated based on weekly salary costs and years of service with the Center. Under the Defense Acquisition Regulation, these costs could be passed on to the Air Force for the operation of the Center by the IIT Research Institute.

Contractor policy provides 1 week's salary for each year of service with a minimum of 4 weeks and a maximum of 26 weeks' salary for a professional employee and one-half week's salary with a minimum of 2 weeks and a maximum of 12 weeks' salary for a preprofessional or clerical employee. Our estimate is based on 334 professional employees who would not relocate receiving the minimum severance pay estimated at \$2,392 and 199 preprofessional and clerical employees receiving the minimum severance payment estimated at \$770. We estimate that severance pay would cost about \$952,158 if the Center were relocated.

Analysis of Air Force's September 1981 study estimates

The sections below compare the Air Force's September 1981 estimates and our estimates of changes in recurring and nonrecurring costs. The 1980 study assumed that 27 percent of the contractor's professional employees would relocate; the 1981 study assumed that 60 percent would relocate. The Air Force's estimates of costs for facility rental, other operating, and data equipment in the 1981 study are the same as those in the 1980 study. Our estimates and the reasons for the difference between the Air Force's estimates and ours are the same as discussed earlier in this report.

Recurring costs

Personnel, travel, communications, and contracted projects costs--The Air Force adjusted its September 1980 estimates for personnel, travel, communications, and contracted projects costs to reflect how the assumption that 60 percent of the Center's professional staff would relocate to Duluth would affect costs. The Air Force estimate differs from ours primarily because we used updated budget workload, staffing, and cost information to calculate our estimates and considered costs beyond fiscal year 1989 in our cost comparison study.

Utilities--The difference between the Air Force's September 1980 and September 1981 estimates and our estimate for utilities costs is discussed on pages 20 to 22.

Recruiting--The Air Force calculated its September 1981 recruiting cost estimate using a 9-percent turnover rate for Duluth rather than the 12-percent rate used in its September 1980 study, costing the recruiting and relocation of experienced professional personnel at \$5,500 per recruit rather than \$9,656

used in the September 1980 study and using an assumed 60-percent relocation rate rather than 27-percent rate of current Center professional personnel. We used updated staffing information to calculate our estimate and included costs in our analysis beyond fiscal year 1989.

Nonrecurring costs

The following sections compare Air Force estimates of non-recurring costs with ours.

| | <u>Air Force's 1981 Estimate of Nonrecurring Costs</u> | | |
|--|--|--------------------|--------------------------------------|
| | <u>Air Force</u> | <u>GAO</u> | <u>GAO over or under (-)</u> |
| Investment: | | | |
| Facility construction and renovation | \$2,000,772 | \$3,057,854 | \$1,057,082 |
| Facility construction avoided | <u>-</u> | <u>-4,385,612</u> | <u>a/-4,385,612</u> |
| Total investment costs | <u>2,000,772</u> | <u>-1,327,758</u> | <u>-3,328,530</u> |
| Operating: | | | |
| Relocation of military civilian, and contractor personnel | 6,833,905 | 6,219,531 | -614,374 |
| Communications equipment acquisition, relocation, and installation | 175,434 | 114,157 | <u>a/-61,277</u> |
| Severance pay | <u>-395,000</u> | <u>590,966</u> | <u>985,966</u> |
| Total operating | <u>6,614,339</u> | <u>6,924,654</u> | <u>310,315</u> |
| Total costs | <u>\$8,615,111</u> | <u>\$5,596,896</u> | <u>-\$3,018,215</u> |

a/The Air Force's 1981 estimate assumed that 60 percent of the professional employees would relocate. Costs did not change as a result of increasing the relocation rate from 27 to 60 percent. Therefore, the earlier report sections discuss the differences between the Air Force's estimates for these categories and ours.

Investment-facility construction and renovation costs--The Air Force estimated that facility renovation costs of \$2,000,772 could result if the Center were relocated and provided space in Buildings 128, 211, and 240. We estimate that the relocation could result in facility renovation costs of about \$3,057,854. Our estimate is higher primarily because we based it on a more detailed project description; the cost to alter and renovate Building 240 could be about \$3,057,854 rather than the \$1,989,200 estimated by the Air Force. However, as a result of a reduction in estimated future workload and staffing, Building 211 would not be needed for Center use. Thus, we excluded Building 211 renovation costs of about \$11,572 from our estimate. When these two factors are considered, a difference of \$1,057,082 results.

Costs to relocate military, civilian, and contractor personnel--The Air Force estimate of average relocation cost per contractor professional employee was increased from \$9,656 in the 1980 estimate to \$18,873. Except for this change, the Air Force calculated its estimate in the same manner as the September 1980 estimate. The higher level of estimated reimbursement was assumed to be necessary to encourage the relocation of more professional employees and increase their estimated relocation rate from 27 percent to 60 percent. The increase assumes a higher level of reimbursement for real estate sales and purchase expenses and the partial reimbursement of increased mortgage interest costs between employees' current mortgages and the mortgages on real estate that would be acquired in Duluth.

We calculated our estimate in a manner similar to the Air Force's, subject to the joint travel and Defense Acquisition Regulations. We estimated average professional contractor employee relocation expenses at about \$19,974. Our estimate is higher because we used more recent information reflecting higher household goods shipping and storage costs and higher house-hunting trip expenses offset by lower real estate expense reimbursements.

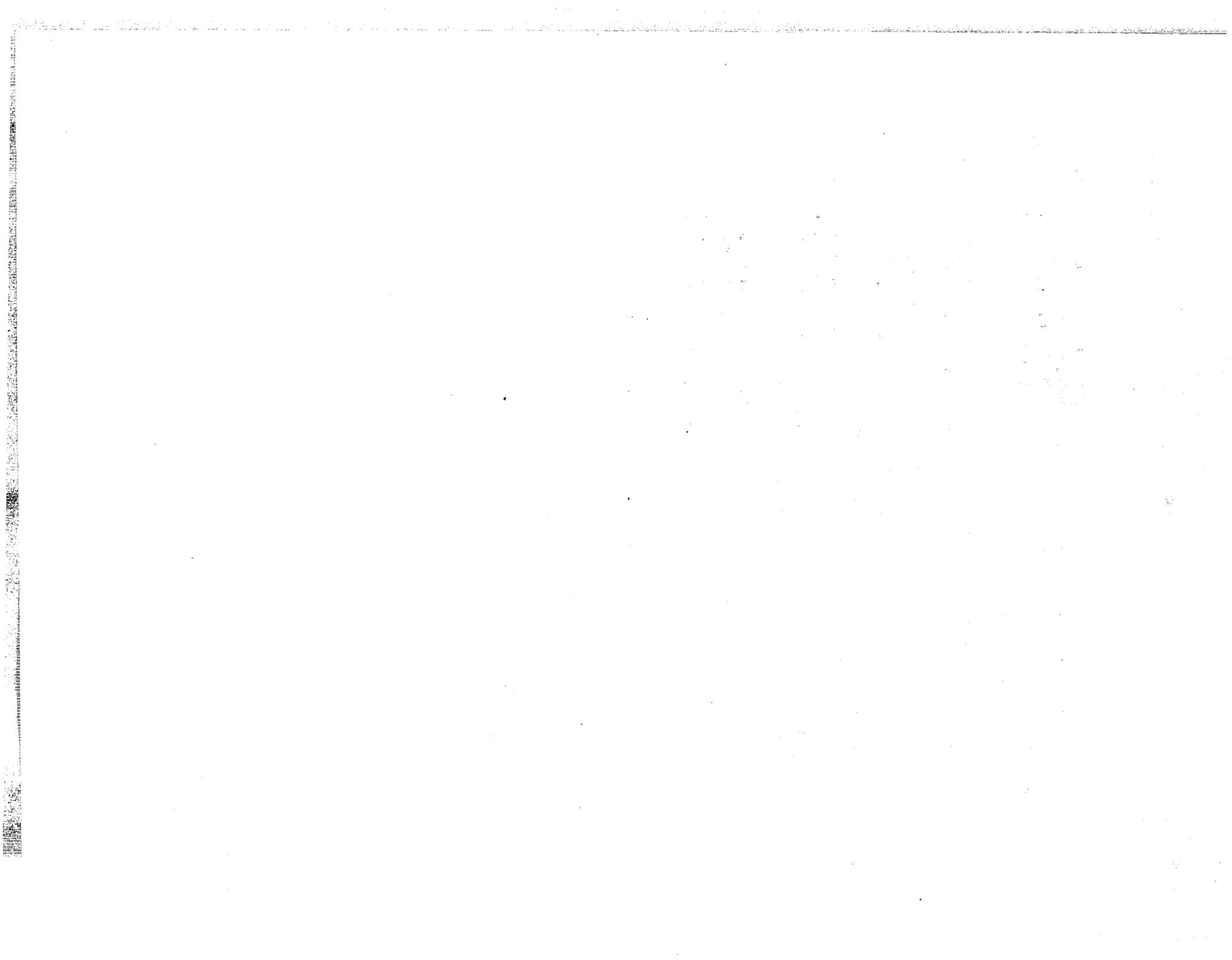
Our total estimate is lower because based on current workload data, about 18 percent fewer contractor personnel would be employed when the relocation could begin.

Severance pay costs--The Air Force estimated that severance pay costs of about \$395,000 could be avoided if the Analysis Center hired unemployed Regional Control Center or Duluth International Airport base operating support personnel to replace Analysis Center employees who declined to transfer to Duluth. The Air Force determined that severance costs of about \$874,000 might be avoided if the Analysis Center hired Federal employees

who formerly were employed at Duluth; however, as an offset, the Air Force deducted the estimated cost, \$479,000, of terminating Analysis Center employees who declined to relocate. This calculation resulted in its estimate of a potential cost avoidance of about \$395,000.

We estimated severance pay costs at about \$590,966. Our estimate differs from the Air Force estimate because:

- Due to the time, estimated at 12 to 19 months, between the involuntary separation of Control Center and base support personnel in Duluth between March and October 1982 and the proposed relocation of the Analysis Center to Duluth beginning in October 1983, we do not believe that severance costs for these employees could be avoided if they were subsequently hired by the Analysis Center.
- Our estimate is based on cost and termination pay policy information applicable to Analysis Center personnel rather than cost data for Control Center and base operating support personnel that the Air Force used.
- We used more recent staffing information.





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