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A PLAN FOR THE EFFICIENT USE OF WASHINGTON'S AREA AIRPORTS

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I. INTRODUCTION

MANY MAJOR commercial United States airports suffer from overcrowded, inadequate facilities due to the recent rapid growth of commercial and general aviation. From 1955 to 1965, the total operations at Federal Aviation Administration operated airport traffic control towers increased from about 19 million to 38 million.¹ Scheduled air carrier domestic intercity passenger miles during the same period increased from approximately 19½ billion to 51½ billion,² and general aviation hours flown from 9½ million to 16½ million.³

The Federal Aviation Administration's latest aviation projections from 1965 to 1980⁴ indicate a future growth level far above that of the past. For example, it is projected that general aircraft operations will increase 309 per cent and scheduled air carrier operations by 143 per cent, total enplaned passengers 433 per cent, and the scheduled air carrier cargo tonnage by 1,377 per cent. Since Washington, D.C.'s airports are expected to share in this increase,⁵ the problem is, how to best accommodate it.

Friendship International Airport (FIA) was eliminated from the study for several reasons. First, the present existing major highway between Washington, D.C. and Friendship International Airport (Baltimore-Washington Parkway) is congested, whereas the limited access highway to Dulles International Airport (DIA) is under utilized. Second, in terms of physical location Friendship International Airport is closely tied to the Baltimore Area and Washington National Airport (WNA) and Dulles International Airport to the Washington Area. Finally, as the Baltimore Area grows, it will need the capacity of a commercial airport. In addition, most of the overflow of Washington National Airport is already going to Dulles. Therefore, the commercial airports of the "Washington Area" are

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¹ FEDERAL AVIATION AGENCY, FAA STATISTICAL HANDBOOK OF AVIATION [hereinafter cited as FAA STATISTICAL HANDBOOK] 2,234 (August 1966).

² *Id.* at 202.

³ *Id.* at 97.

⁴ AIRPORTS SERVICE, U.S. DEP'T OF TRANSPORTATION, AVIATION DEMAND AND AIRPORT FACILITY REQUIREMENT FORECAST FOR LARGE AIR TRANSPORTATION HUBS THROUGH 1980 3 (August 1967).

⁵ FAA STATISTICAL HANDBOOK, *supra* note 1, at 5.

defined as Washington National Airport and Dulles International Airport.

This article presents an analysis of the present existing projections of passengers, aircraft operations and net revenue trends for the Washington Area airports, in light of an examination of the existing facilities and limitations of the present Washington Area airports. A prediction of the best plan to maximize total revenue from the Washington airports given existing airport facilities and limitations is made herein.

This study is primarily based on data collected by personal interviews with the airport administrators and chief controllers at the Washington Area airports and on secondary data obtained from an Operations Research, Inc. Study⁶ (ORIS) that has been updated for this article with 1966 data.

II. PHYSICAL LIMITATIONS OF WASHINGTON'S METROPOLITAN AIRPORTS⁷

A. *Washington National Airport*

WNA consists of 680½ acres with three runways (6870 ft., 5212 ft., and 4724 ft.), a terminal building, twelve hangars, a small number of other buildings and a parking lot. There is one Instrumental Landing System (ILS) installed on its longest runway, and it lies in a north-south direction. The airport is considered to be a one runway airport (north-south) for all but the lighter traffic except when there are strong winds, then the other runways can be used.

With the existing runway facilities, it is believed that WNA under ideal Visual Flight Rules (VFR) conditions could handle between 90 and 116 operations per hour and between 50 and 65 under Instrument Flight Rules (IFR) conditions. These operations figures assume the present mixture of aircraft at WNA which is 45 per cent jet, 18 per cent piston and 37 per cent turboprop. This aircraft mixture consists of 72 per cent air carrier operations, 23 per cent general aviation and 5 per cent FAA and military operations. If a homogeneous aircraft mixture of 727's, 737's and DC-9's were exclusively used, it is believed that the airport could maintain 35 inbound and 35 outbound flights per hour.

Today there are several major restrictions on aircraft flights in and out of WNA. They are:

- (1) An agreement between the air carriers and general aviation representatives has set limits of 40 scheduled air carriers and 20 general aviation flights per hour.
- (2) Inbound flights must be balanced by outbound flights as a result of the shortage of ramp space.
- (3) A noise restriction requires all inbound and outbound flights to

⁶ OPERATIONS RESEARCH, INC., ECONOMIC FEASIBILITY OF ALTERNATIVE PROGRAMS FOR WASHINGTON NATIONAL AIRPORT pt. 1&2 (January 1966). This was a report prepared for the Federal Aviation Agency.

⁷ Many of the figures used in this chapter were obtained when interviewing at Washington National Airport and Dulles International Airport. The figures should be taken as close approximations but by no means as exact.

follow a set pattern over the Anacostia and Potomac Rivers.⁸ Moreover, jet aircraft cannot land or take-off at National before 7 a.m., or after 11 p.m.

- (4) There is an airspace restriction over areas of downtown Washington that would normally be used in approaching the north-south instrument runway. This area includes the White House, Lincoln Memorial, Washington Mounment, the United States Capitol, and an additional area near the United States Naval Observatory.
- (5) WNA is closed to all four engine jet aircraft.⁹
- (6) The airport is limited to minimum weather conditions of 200 vertical feet of visibility and a minimum horizontal distance of one-half mile.

As a result of the above restrictions, there is really no one peak hour of operations at WNA but rather a relatively constant load during the daytime operating hours. Under normal weather conditions, there are not usually any ATC (Air Traffic Control) delays except for delays caused by flow control (airways delays) which are being experienced by many of the major hub areas.

Of all the restrictions at WNA, the most limiting is that of land. Little or no room is available for expansion without incurring an extremely large investment. The existing aircraft facilities are inadequate for large jets. Runways, approaches, taxiways, and turnoffs need improvement, and more space is needed for ramp, parking, and holding areas as well as maintenance and service. However, the main limitation of WNA is the extreme shortage of passenger handling facilities. Passenger loading and unloading areas, waiting rooms, baggage handling, parking capacities and all the other accommodations needed to serve a large number of people are inadequate.

B. Dulles International Airport

In a report to the 85th Congress in 1958, the site of the present Dulles International Airport was recommended after an intensive search of likely jet airport locations near the Washington Area.¹⁰ DIA is presently a 10,000 acre jet airport astride the Fairfax-Loudoun county line north of Chantilly, Virginia. It has two parallel 11,500-foot runways that are north-south and 6500 feet apart, and a third 10,500-foot runway that lies east-west. All of the runways are capable of simultaneous take-offs and landings given no weather or flow control restrictions, and one runway is equipped with an Instrument Landing System. The existing runways at DIA can handle all existing aircraft as well as those being planned for the near future (both jumbo jets and supersonic aircraft).

⁸ WASHINGTON NATIONAL AIRPORT NOISE ABATEMENT PROCEDURES (effective 1 Oct. 1967), is obtainable from the airport administrator at WNA.

⁹ Some people may argue that this is not really a restriction because the short runways would restrict large jet loads anyway; others would disagree and say the air carriers would find other ways to restrict weight or increase power so they could utilize their larger jets.

¹⁰ GREINER-MATTEN ASSOCIATES, ENGINEER-ARCHITECTS, ADDITIONAL AIRPORT FOR WASHINGTON, D.C. (December 1957). This site selection study was prepared especially for the White House.

It has been estimated by airport officials that the existing facilities at DIA under ideal VFR conditions could handle about 225 operations per hour, with the present aircraft mixture of large and small planes, and about 80 to 95 IFR landings flights per hour plus 75 additional take-offs (wind conditions permitting). The exact present aircraft mix was not available, but 30 per cent of the daily operations are by scheduled air carriers, 35 per cent by general aviation and the remaining 35 per cent by others, mainly military.

DIA could handle at least 135 flights per hour if it had dual ILS runways and was operating strictly under IFR conditions. In order to insure passenger safety, airport administrators believe that it will be essential to maintain a complete IFR operation during all weather conditions as the airport becomes more crowded.

There is only one present operating restriction at DIA and that is weather. The airport is, however, under only a class two ILS restriction; that is, it can operate as long as there is a 100-foot vertical and 1600-foot horizontal visibility. The only other major Air Traffic Control delays at DIA are caused by flow control restrictions. It should also be noted that sometimes the longer turnoff times of light aircraft on the long runways causes short delays.

Although the 600-foot air terminal building and its present facilities were built to accommodate 4 million people per year, peak rush hours of passenger traffic between 4:30 and 7:00 p.m., and at 12 noon have caused minor congestion problems, due to the use of the mobile passenger lounge cars, designed to take passengers to and from the aircraft, as holding areas. Baggage facilities are also overloaded. These problems could be largely eliminated, however, by adding lounge holding and baggage areas to the present terminal.

The long-range DIA plans propose expansion in three stages: The first stage, scheduled for 1969, will include the addition of 10 more mobile lounges to the existing 30 and an additional 200 feet to the present terminal with holding rooms and enlarged baggage facilities. These improvements should increase passenger capacity to between 8 and 12 million people annually. The intermediate stage will add 20 more gates and mobile lounges to the then existing 40 and an additional 400 feet on to the main terminal making it 1,200 feet long. These improvements should increase passenger handling capacity to between 16 and 20 million people per year. The final stage calls for two terminals, each 1,200 feet long with lounges, a total of 90 aircraft gates (the new gates will be designed for jumbo aircraft and each will hold more people than those now existing), and parking for 5000 cars. These changes should bring the total passenger handling capacity to a range of 45 to 60 million people per year.

III. ANALYSES

A. *Updating Projections*

The projections of the Operations Research, Inc. report for passenger volume aircraft operations and revenues have been updated by using 1966

figures obtained from the FAA Statistical Handbook of Aviation. In each case, the 1966 projected figure was compared with the actual 1966 figure and a percentage change (increase or decrease) was calculated and then incorporated into the projections.

Specifically, the Operations Research, Inc. Study (ORIS) projections for 1966 were subtracted from the actual 1966 figures. The difference was then divided by the original ORIS projections and multiplied by 100 to get a percentage change. The percentage change was multiplied by each original ORIS projection, and the result was added to or subtracted from the original projection to obtain the updated version. (The basic assumption made is that the same percentage change in 1966 will affect each of the individual ORIS projected values by the 1966 rate of change.) Finally, total net revenue increases or decreases per airport and then for the combined DIA and WNA operation were calculated by using Operations Research's projected net operational revenue formulas multiplied by the newly updated passenger projections.

B. *Defining Plans*

All of the above projections for passengers, operations and revenues were calculated under three different operational alternatives for WNA, DIA and their combined total. Plans I and II were defined as alternatives for WNA in the ORIS, while Plan III was added by the authors.

Plan I: Operation of WNA under regulations which exclude air carrier jet aircraft. (No data available for updating.)

Plan II: Operation of WNA to allow its use by two and three engine, short and medium range air carrier jet aircraft, in addition to piston and turbo-prop aircraft, assuming that any modernization and expansion required for such operation at WNA will be made. (This plan has been updated using 1966 data.)

Plan III: Close WNA to all air carriers and for projection purposes assume all present and future projected carriers' business from WNA will go to DIA, and close DIA to all but air carrier operations and assume all other business will go WNA (except large jet aircraft).

The above three plans are by no means the only conceivable solutions to handling the Washington Area's projected air traffic needs. These plans were selected because they utilized the present facilities in their airport capacity projections thereby minimizing outlays for new facilities. Furthermore, the projected data was available and could reasonably be updated within the cost and time constraints of this study.

C. *Passenger Projections*

The most striking feature under any of the alternative plans is that the total projected passenger volume at WNA and DIA is expected to triple by 1980 (See Table 1). The total passenger growth pattern for the Washington area will be roughly the same under any of the plans; that is,

a moderate growth through 1970 followed by a greater growth rate through 1975 and a still more rapid growth rate through 1980. The three plans then account for variations in the growth at the individual airports but do not affect the overall projections for the Washington Metropolitan Area.

D. Aircraft Operation Projections

Total projected annual aircraft operations under all three plans show a similar pattern when projected from 1966 to 1980 (See Tables 2 and 3). A slight decline in the number of aircraft operations is forecasted for the next few years until 1968 or 1969 followed by a gradual increase to 1975, and then a slightly greater increase up to 1980. The overall increase is expected to be in the area of 20 per cent, or from about 500,000 operations in 1966 to 600,000 operations by 1980. The most striking fact about aircraft operations since the Operations Research, Inc. 1966 projections is that actual data show the total area's operations have greatly increased over their projections. WNA has increased about 5 per cent and DIA almost 39 per cent more than expected.

TABLE 1
PROJECTED ANNUAL GROWTH OF TOTAL PASSENGERS (1000)

Airport	1966	1967	1968	1969	1970	1975	1980
O.R. ¹ Plan I							
WNA	6596	3156	1852	1765	1682	1328	1058
DIA	1761	5639	7219	7848	8572	13306	22978
Total	8357	8795	9071	9613	10254	14634	24036
O.R. Plan II							
WNA	7390	7685	7995	8313	8655	11615	16680
DIA	1456	1608	1777	1964	2167	4247	7933
Total	8846	9273	9772	10277	10822	15862	24613
O.R. Updated Plan II							
WNA	7920	8236	8568	8909	9275	12486	17875
DIA	1175	1298	1435	1585	1749	3428	6402
Total	9095	9534	10003	10494	11024	15914	24277

PROJECTED ANNUAL GROWTH OF TOTAL AIRLINE PASSENGERS (1000)

O.R. Updated Data							
WNA	7666	7972	8295	8625	8974	12086	17302
DIA	1106	1222	1351	1492	1646	3227	6026
Total	8772	9194	9646	10117	10620	15313	23328
PLAN III							
WNA	323	340	357	377	404	601	949
DIA	8772	9194	9646	10117	10620	15313	23328
Total	9095	9534	10003	10494	11024	15914	24277

¹ O.R.—Means Operational Research, Inc. Study Figures.

TABLE 2
PROJECTED ANNUAL TOTAL AIRCRAFT OPERATIONS (1000)

Airport	1966	1967	1968	1969	1970	1975	1980
O.R. Plan I							
WNA	291	218	191	189	189	181	177
DIA	135	181	203	209	216	260	343
Total	426	399	394	398	405	441	520
O.R. Plan II							
WNA	297	290	283	277	275	296	345
DIA	131	132	133	134	135	154	177
Total	428	422	416	411	410	450	522
Updated Plan II							
WNA	313	306	298	292	290	312	364
DIA	182	183	185	186	188	214	246
Total	495	489	483	478	478	526	610

PROJECTED ANNUAL TOTAL COMMERCIAL AIR CARRIER OPERATIONS
(1000)

O.R. Plan II							
WNA	221				190	220	293
DIA	27				33	61	95
Total	248				223	281	388
Updated Plan II							
WNA	217				185	216	287
DIA	37				45	83	131
Total	254				230	299	418
Plan III							
WNA	241				248	227	192
DIA	254				230	299	418
Total	495				478	526	610

TABLE 3
PROJECTED ANNUAL GENERAL AVIATION OPERATIONS (1000)

Airport	1966	1967	1968	1969	1970	1975	1980
O.R. Plan I							
WNA	72.3	105.4	117.0	118.2	118.5	121.7	123.7
DIA	44.1	40.9	38.0	35.3	32.9	22.7	15.8
Total	116.4	146.3	155.4	153.5	151.4	144.4	139.5
O.R. Plan II							
WNA	69.8	72.0	74.3	76.7	79.5	70.0	48.4
DIA	46.1	45.6	45.2	44.8	44.3	35.7	24.0
Total	115.9	117.6	119.5	121.5	123.8	105.7	72.4
Updated Plan II							
WNA	90.5	93.3	96.3	99.4	103.1	90.8	62.8
DIA	69.4	68.6	68.0	67.4	66.7	53.7	36.1
Total	159.9	161.9	164.3	166.8	169.8	144.5	98.9

In summary, under updated Plan I total aircraft operations would increase markedly at DIA and be considerably reduced at WNA. Meanwhile,

the percentage of general aviation operations would show a large increase at WNA and a steady decline at DIA. Updated Plan II, DIA operations projections show that they will remain about 100,000 per year less than at WNA and general aviation operations at DIA will steadily decline. General Aviation operations at WNA under this present plan will increase until early 1970's and then decline. If the Plan III were used there would be a large initial increase at DIA followed by a slight decline and then a continued increasing trend. WNA on the other hand would initially increase and then be followed by a steady decline.

E. Projected Annual Net Airport Revenue

The projected annual net airport revenue as expressed in the following section is dependent directly on passenger volume. The formulas and justification for predicting revenue in this fashion are explained in the Operations Research, Inc. Report. Unlike the overall trends under the various plans for total aircraft operations, the total net revenue under the different plans varies considerably, both in growth pattern over the years and in amount.

DIA revenue would represent most of the net airport revenues under Plan I and WNA revenue would be small. The present plan of operation shows DIA income to be negative until early in the 1970's while WNA net revenue is enough to give a positive net balance. Under Plan III, as under the first plan, DIA would dominate joint revenues and WNA revenue would be negative. In short, under Plan I or III total revenue in every year (except at the start of Plan I) will be greater than under the present plan of operation.

TABLE 4
PROJECTED ANNUAL NET REVENUE FROM JOINT AIRPORT OPERATIONS
(1000)

Airport	1966	1967	1968	1969	1970	1975	1980
O.R. Plan I							
WNA	2238	862	341	306	273	131	23
DIA	1187	3467	5367	6118	6986	12667	24274
Total	1051	4329	5704	6424	7259	12798	24297
O.R. Plan II							
WNA	2556	2674	2798	2925	3062	4246	6272
DIA	-1553	-1370	-1168	-943	-700	1796	6220
Total	1003	1304	1630	1982	2362	6042	12492
Updated Plan II							
WNA	2768	2894	3027	3164	3310	4594	6750
DIA	-1890	-1742	-1578	-1398	-1201	814	4382
Total	878	1152	1449	1766	2109	5408	11132
Plan III							
WNA	-271	-264	-257	-249	-238	-160	-20
DIA	7226	7733	8275	8840	9444	15076	24694
Total	6955	7469	8018	8591	9206	14916	24674

IV. TREND PROJECTIONS AND AIRPORT REVENUE IMPLICATIONS

The purpose of this section is to draw conclusions about revenue implications for the individual airports under the three previously analyzed plans.

A. General Area Trends

The future of aviation with its related businesses in the Washington Area has never looked brighter. All projections for total passengers traveling by air show continuing large advances over the next decade. Even though our passenger figures show increases over many of the original projections, both of these forecasts are low when compared with those made by the FAA in August, 1967. At present, with the rapid population growth and increases in per capita income in the Washington Area, it is likely that the present air passenger projections are low. There is also a good possibility that many international air carriers will rely more on DIA in the future since the JFK airport in the New York Area is experiencing longer and longer delays, thereby creating the need for rescheduling international flights through Washington, D.C.

The general belief is that the area's total operations of aircraft will be constant or slightly lower for the next few years as the majority of the commercial air carriers continue to make the transition to aircraft with larger seating capacity.¹¹ The constant or slightly downward trend, however, may not materialize because of the rapid growth of general aviation.

Airports are not dependent largely upon the number of operations for revenue. Since revenue trends for airports in the past have been shown to be directly proportional to passenger volume, it is reasonable to assume that the relationship will continue in the future. Under all of our suggested plans, the total passengers are expected to increase through 1980. Therefore, total net revenue can also be expected to show increases.

Although this report does not deal directly with air cargo, and although at present the air cargo operation is a very small part of the total aviation revenue, all projections for air cargo are extremely optimistic. As air cargo movements increase, airports and total area revenue will increase proportionally.

B. Plan I Trends

By eliminating all jet aircraft from WNA Plan I would effectively cause a greater utilization of DIA. WNA would lose commercial carrier flights and gain more general aircraft. The DIA aircraft pattern meanwhile would be the exact opposite of WNA. National would slowly be converted into a general aviation airport, and its number of flights could be increased due to better utilization of its runways and fewer passenger congestion problems. Under this plan, there would be no restrictions of overall aircraft operations at either WNA or DIA.

Before Plan I could be implemented, DIA would have to be expanded

¹¹ This opinion was given by all airport administrators interviewed.

to at least the first phase of its long-range plans in order to handle the additional passengers from WNA. Yet, given time for passenger facility expansion, the plan would not be restrictive, and net revenues would be greater than under the present system because the net revenue per passenger is larger at DIA than at WNA.

It should also be noted that the commuter time from airport to downtown Washington would be greater from Dulles, but with a continuation of the present limited access highway from DIA directly into the city, the total travel time would only be about 20 minutes. In effect, Plan I could increase both commercial and general aviation in the Washington Area, increase joint airports' net revenues and provide the needed room for future passenger expansion. However, time must be provided for expanding the needed facilities at Dulles and for continuing the limited access highway from the beltway into the center of Washington.

C. Plan II Trends

The facts introduced previously show that the updated projected passenger trends for WNA cannot possibly be realized. The severe limitations of space have already caused many air carriers to shift flights to DIA. The latest figures will show that in 1969 WNA will handle close to 10 million passengers and that the existing facilities are extremely overloaded. Given new three-engine jets with larger seating capacities, the modernization of present passenger handling facilities and the possibility that the air carriers might be able to obtain more than 40 operations per hour, it still seems unlikely that total passengers could increase much above 12½ million passengers per year at WNA.

Using the 1975 projected figure of 12½ million passengers as the cut-off point, revenue would be affected as shown on the dotted portions of Graph 1 in the analysis section. It is important to note that under Plan II, total net airport revenue, even when adjusted, is much less than under either of the other plans due to the large unutilized capacity of DIA.¹²

Another problem with the present projected Plan II is that it is unlikely that WNA could increase its total operations to 345,000 as projected for 1980 due to the limited field space. It is true that at present there are nearly 300,000 operations per year, but this partially results from the 28 percent of the operations which are not scheduled air carriers. Many small aircraft which can use the shorter runways intermittently as air carriers use the main runway. Further, several air carriers are still flying relatively small piston and turbo-prop aircraft in and out of WNA which can also use shorter runways under certain weather conditions.

DIA under the present plan (Plan II) will remain under-utilized until at least the early 1970's. Its projected operations under Plan II may not be realized since as commercial flights are increased, many of the present

¹² Although it may be argued that the marginal revenue value used at DIA is too high, this still would not change the economic fact that even if net marginal revenue was only a few cents higher at DIA, the total net jointed revenues for the airports could be increased by moving passengers to DIA.

military and training flights will disappear (they presently account for 35 percent of DIA's operations).

D. Plan III Trends

Plan III will effectively have the same results as Plan I except it will make the transition of commercial carriers and passengers to DIA happen much faster. Again, as in Plan I, the same expansion of facilities would be needed. A large initial shift to DIA would have the advantage of greatly increasing total net airport revenues, and therefore would make more revenue available at an earlier date. This plan is entirely feasible and well within the future expansion limitations of DIA.

V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

A. Summary

Before drawing conclusions and making recommendations, several points should be emphasized.

(1) All projections from this report and others show that overall travel in the United States and in the Washington Area can be expected to more than double in the next decade.

(2) The present Washington Airport facilities are inadequate to handle the expected increases in passengers.

(3) Because of limited space and no reasonable large scale expansion possibilities, Washington National Airport will be inadequate to handle future Washington Area needs.

(4) With a large unutilized capacity Dulles International Airport seems to offer the best solution for the future air travel needs in the Washington Area.

(5) Every passenger that transfers from Washington National Airport to Dulles International Airport adds to the total net airports' revenue because the net marginal revenue is greater at DIA than WNA. (See Operations Research, Inc. Report, Footnote 6.)

(6) The total utility of air carriers should be increased as more use is made of DIA since there are fewer airport restrictions at Dulles International Airport than Washington National Airport.

(7) In the near future, V/STOL aircraft may provide an acceptable solution to some of the congestion and travel time problems in the Washington Area.

(8) There is a great need now to provide some practical means for transporting travelers between the city center and Dulles International Airport in less time than at present.

B. Conclusions

If air travel in the Washington Area is to grow, it must grow through Dulles International Airport. In order to accommodate this expansion, it would be advantageous to extend the existing highway from Dulles into the center of Washington. Since total cost of the addition to the highway

would be less now than later (due to the present inflationary trend), and since the metropolitan area net airport revenue could be increased by more rapidly expanding Dulles, every effort should be made to obtain the needed improvements as soon as possible. (The highway will eventually be needed under any of the Plans examined here.)

As more use is made of DIA, the air carrier's revenues should be increased because of the economies of scale that Dulles can offer in terms of facilities. A secondary benefit to the air carriers should include greater savings as a result of less delay time (on the ground and in the air) and fewer take-off and landing restrictions than at National. The above conclusion does not imply that WNA should be closed. WNA can serve as a valuable link in the present transition of the air carriers to DIA, and thereafter as a general aviation airport until a new general aviation airport is needed or can be built. WNA may also serve as an excellent STOL facility for air buses with a 300 to 400 mile range in the future, while Dulles is devoted to international and long-range flights.

C. Recommendations

(1) Every effort should be made to expand the present facilities at Dulles International Airport and to complete its limited access highway into the city.

(2) Air carriers should be persuaded by every means possible to use Dulles International Airport and to eliminate flights at Washington National Airport in order to maximize net area airport revenues.

(3) In order to make the above switch to Dulles International Airport acceptable to the traveling public, efforts to improve its public image must be made. Its facilities, its safety and closeness in terms of time to the downtown D.C. area could be specifically stressed.

(4) The possible alternative uses of Washington National Airport should be examined to determine its niche in the air transport needs of the Washington Area.