

September 1999

# REAGAN NATIONAL AIRPORT

## Capacity to Handle Additional Flights and Impact on Other Area Airports



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**Resources, Community, and  
Economic Development Division**

B-282375

September 17, 1999

The Honorable Rodney Slater  
Secretary of Transportation

Dear Mr. Secretary:

Over two decades ago, the Congress deregulated the airline industry, phasing out the federal government's control over fares and service and allowing market forces to determine the price, quantity, and quality of domestic air service. As we have reported,<sup>1</sup> fares have declined and service has improved overall since deregulation, but deregulation's benefits have not been evenly distributed throughout the United States. Furthermore, the federal high-density rule, which controls the number of takeoffs and landings that may occur each day within hourly time periods, and perimeter rules, which limit the distance of nonstop flights that can serve an airport, have created barriers to entry for new airlines wishing to begin service and for established airlines seeking to serve new markets, and can influence competition. Ronald Reagan Washington National Airport (Reagan National) is subject to both types of rules. To take off or land during any given hour at Reagan National, an airline must first obtain a "slot," which is an authorization from the federal government to do so. In addition, under current restrictions, no airline may operate a nonstop flight that exceeds 1,250 miles to or from the airport.

Several legislative proposals currently before the Congress address these slot and perimeter restrictions by allowing additional flights at Reagan National. However, questions have been raised about the impact of adding flights and extending the perimeter at Reagan National on the operations at the other two airports in the Washington, D.C., metropolitan area—Washington Dulles International (Dulles) and Baltimore/Washington International (BWI).

To examine the potential impact of these proposals on Dulles and BWI, we (1) described the most prominent proposals that would allow an increased number of takeoffs and landings at Reagan National and create exemptions to the perimeter rule, (2) examined the extent to which Reagan National could safely accommodate more takeoffs and landings, and (3) analyzed whether adding flights at Reagan National to and from destinations beyond the current perimeter would cause passengers to shift their travel from Dulles or BWI.

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<sup>1</sup>See list of related GAO products at the end of this report.

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This study did not evaluate the potential congestion and noise that could result from an increase in operations at Reagan National.<sup>2</sup> Ultimately, as it has done previously in changing the rules governing operations at Reagan National, the Congress must balance the benefits that additional flights may bring to the traveling public against the local community's concerns about the effect of those flights on noise, the environment, and the area's other two major airports.

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## Results in Brief

To improve the access that various communities have to Washington, D.C., and to increase competition in some of those markets, three major legislative proposals introduced during 1999 would provide exemptions to the number of commercial jet flights allowed at Reagan National. Current law permits 37 jet flights per hour. The proposals would add between 6 and 36 jet flights per day. In addition, two of the proposals would permit flights to destinations beyond the existing 1,250-mile perimeter. These two bills also contain provisions that would require reviews of whether the additional flights affect noise, safety, and the environment around Reagan National.

According to an analysis by the Department of Transportation (DOT), Reagan National could accommodate up to seven additional flights per hour without compromising safety. Above that number, Reagan National's infrastructure—such as its gates and runways—begins to limit the number of takeoffs and landings, increasing flight delays. Airport officials acknowledge that Reagan National could handle additional hourly flights without incurring significant delays, but they believe the number of flights to be less than seven per hour. Thus, DOT and airport officials agree that Reagan National could accommodate 36 new jet flights per day, as proposed in one bill. Moreover, DOT has some flexibility to allow airlines to operate flights in slots that are currently available but unused by effectively moving the slots to times that are more compatible with commercial interests and consumer demand.

According to our analysis of the impact of four new airlines on competition among the area's airports, adding nonstop flights from Reagan National to destinations beyond the existing 1,250-mile perimeter, as proposed in the Congress, would likely cause only a limited number of passengers to switch from BWI or Dulles to Reagan National. While we did

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<sup>2</sup>GAO has separate reviews under way examining noise and environmental issues related to airport operations. These include broad reviews of the Federal Aviation Administration's noise mitigation programs and responsibilities, the effect of airport operations on the environment, and the monitoring and enforcement of noise abatement procedures at Reagan National.

not directly estimate the demand for nonstop travel between Reagan National and destinations outside the perimeter, our analysis indicates that many travelers currently using BWI or Dulles for travel beyond the perimeter are likely to continue to prefer them because of price or convenience and would not switch to Reagan National. That is, business travelers who prefer BWI or Dulles because these airports are closer to their homes or businesses are likely to continue to use them. However, other business travelers are likely to switch if longer-distance nonstop flights become available at Reagan National because that is their preferred airport. With respect to leisure travelers, the fares at Reagan National for nonstop flights beyond the perimeter may be higher than for similar flights at the other airports because low-fare airlines may have difficulty gaining access to Reagan National's facilities. Consequently, leisure travelers are generally unlikely to switch in large numbers. Finally, even if all of the 12 to 24 nonstop flights per day to and from destinations beyond the perimeter suggested by the proposed legislation moved from BWI or Dulles to Reagan National, they would represent between 1 and 2 percent of the total flights at those airports (11 and 21 percent of the nonstop flights from BWI and Dulles to destinations beyond the perimeter).

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## Background

Reagan National Airport,<sup>3</sup> built by the federal government, opened on June 16, 1941, on the western bank of the Potomac River, across from Washington, D.C. The airport has three runways and 42 air carrier gates.<sup>4</sup> The airline with the largest number of operations at Reagan National is US Airways, which in 1998 had over 40 percent of all large air carrier operations, expressed in terms of aircraft departures.<sup>5</sup> The next largest operators at Reagan National are Delta Air Lines and American Airlines, with 16 percent and 15 percent of departures, respectively. During 1998,

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<sup>3</sup>The airport's official name was changed from Washington National Airport to Ronald Reagan Washington National Airport under P.L. 105-154, 112 Stat. 3 (1998).

<sup>4</sup>Air carrier (that is, jet) gates are those that are designed to accommodate large air carriers, generally defined as jet aircraft seating 56 passengers or more. In contrast, gates designed for use by smaller commuter aircraft are referred to as commuter gates. Commuter aircraft are generally turboprop aircraft seating fewer than 56 passengers. Within the past few years, several commuter airlines have begun using small jet aircraft ("regional jets") in their fleets. To avoid confusion throughout the remainder of this report, we will refer to all commuter aircraft, regardless of whether they are regional jets or turboprops, as commuter aircraft.

<sup>5</sup>Smaller commuter carriers, which often serve as regional affiliates for major airlines, are not required to report these data and are not included. For example, Atlantic Coast Airlines, which flies as United Express and serves as a regional commuter carrier for United Airlines, is not required to report these data. Thus, figures for the number of departures for United Airlines do not include those made by United Express.

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these three airlines together accounted for 68 percent of total passenger enplanements<sup>6</sup> at the airport.

Since May 1966, a perimeter rule has been in place at Reagan National restricting airlines from operating nonstop flights between it and airports of a particular distance. At first, the Federal Aviation Administration (FAA) had concerns that allowing jets to fly into Reagan National would create a noise problem and would conflict with further development at newly built Dulles Airport. As a result, with the airlines agreeing, the Civil Aeronautics Board approved a 650-mile perimeter, with exceptions for seven cities between 650 and 1,000 miles away that enjoyed grandfather status as of December 1, 1965.<sup>7</sup> In 1981, FAA formalized the perimeter rule, setting the perimeter at 1,000 miles.

Similarly, since 1969, the federal government has restricted the number of commercial takeoffs and landings at Reagan National to 48 per hour: 37 for jets and 11 for commuter aircraft. FAA authorizes general aviation users—primarily operators of small corporate aircraft—to make an additional 12 takeoffs or landings during each hour.<sup>8</sup> In 1986, the Congress elevated the slot and perimeter rules from FAA regulation to federal statute as part of the Metropolitan Washington Airports Act of 1986.<sup>9</sup> The act also led to the transfer of authority over Reagan National and Dulles from the federal government to the Metropolitan Washington Airports Authority (MWAA) and set the perimeter at 1,250 miles, which allowed nonstop flights to Houston and Dallas. Notwithstanding the regulatory limits on operations, FAA used other authority granted it to permit an exemption to enable Braniff Airlines to resume operations at Reagan National with four

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<sup>6</sup>“Passenger enplanements” represent the total number of passengers boarding an aircraft. A passenger who must make a single connection between his or her origin and destination counts as two enplaned passengers because he or she boarded two separate flights. To estimate the total number of passengers using an airport, the number of passenger enplanements is doubled to account for those passengers disembarking at the airport as well.

<sup>7</sup>Civil Aeronautics Board Order E-23743, May 25, 1966. The seven cities included hubs for major airlines during that period, such as Miami, Minneapolis-St. Paul, and St. Louis.

<sup>8</sup>In 1969, facing increasing delays and congestion, FAA applied special air traffic rules to certain airports that it designated as high-density airports: Chicago’s O’Hare; New York’s LaGuardia and Kennedy; Newark, New Jersey; and Reagan National. (DOT dropped Newark International Airport’s designation as a high-density airport in October 1970.) Because of the restricted number of allowable operations, these airports are generally known as “slot-controlled,” and the special air traffic rules governing the allowable number of operations are referred to as “slot rules,” or “high-density rules.” The total number of slots allowed at Reagan National has remained unchanged since the slot rule was put in place in 1969, although the original limit on the number of jet slots was 40 per hour. FAA reduced it to 37 in 1981.

<sup>9</sup>P. L. No. 99-591, 100 Stat. 3341-376, title VI.

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slots, even though all air carrier slots were already allocated.<sup>10</sup> These four slots were later allocated to America West Airlines.<sup>11</sup>

Dulles opened on November 19, 1962. The federal government built Dulles in part to provide a facility for nonstop “long-haul” air carrier traffic (that is, flights bound to or from locations beyond Reagan National’s perimeter) in the Washington, D.C. area. Among major carriers, United Airlines has the largest number of jet operations at Dulles (over 36 percent of large carrier departures in 1998), and its regional affiliate, Atlantic Coast Airlines, has the largest number of commuter operations. The other major carriers with significant numbers of operations at Dulles in 1998 were Delta (13 percent of departures), US Airways (12 percent of departures), and American (10 percent of departures). Until the mid-1980s, Dulles was relatively underutilized. More recently, however, the number of air carrier operations at Dulles has greatly expanded. During the early 1990s, “new entrant” airlines, such as ValuJet and Western Pacific, initiated service there. Since early 1999, United has increased by more than one-third the number of its departures at Dulles to 118 per day. US Airways’ low-cost subsidiary, MetroJet, began operations in December 1998 and by June 1999 offered 39 daily flights from Dulles.

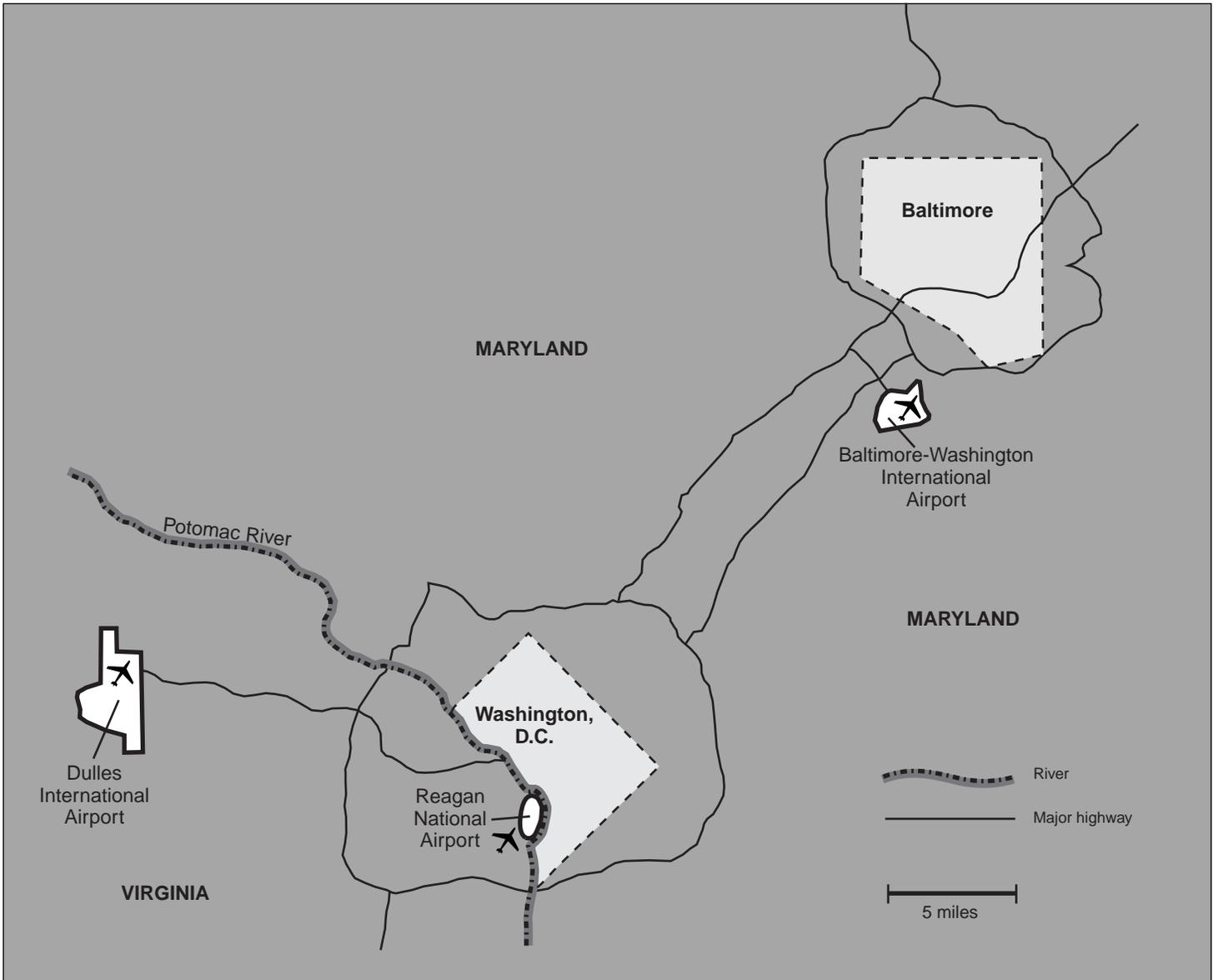
BWI, built by the city of Baltimore and originally named Friendship International Airport, was opened on June 24, 1950. BWI is located 10 miles southwest of Baltimore and approximately 30 miles northeast of Washington, D.C. US Airways and Southwest Airlines were the airport’s dominant airlines in 1998, with 36 percent of departures and 28 percent of departures, respectively. Figure 1 shows the location of each of the three airports in the metropolitan Washington, D.C., area. Appendix I shows the configurations of Reagan National, Dulles, and BWI, illustrating the number of runways, the size of terminals, and the restrictions on expansion at Reagan National.

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<sup>10</sup>FAA Exemption No. 2927, Feb. 24, 1984. FAA used its statutory authority, since amended, under 49 U.S.C. section 40109 to grant this exemption from its high-density rules on the basis of a public interest finding.

<sup>11</sup>FAA Exemption No. 5133, Jan. 12, 1990.

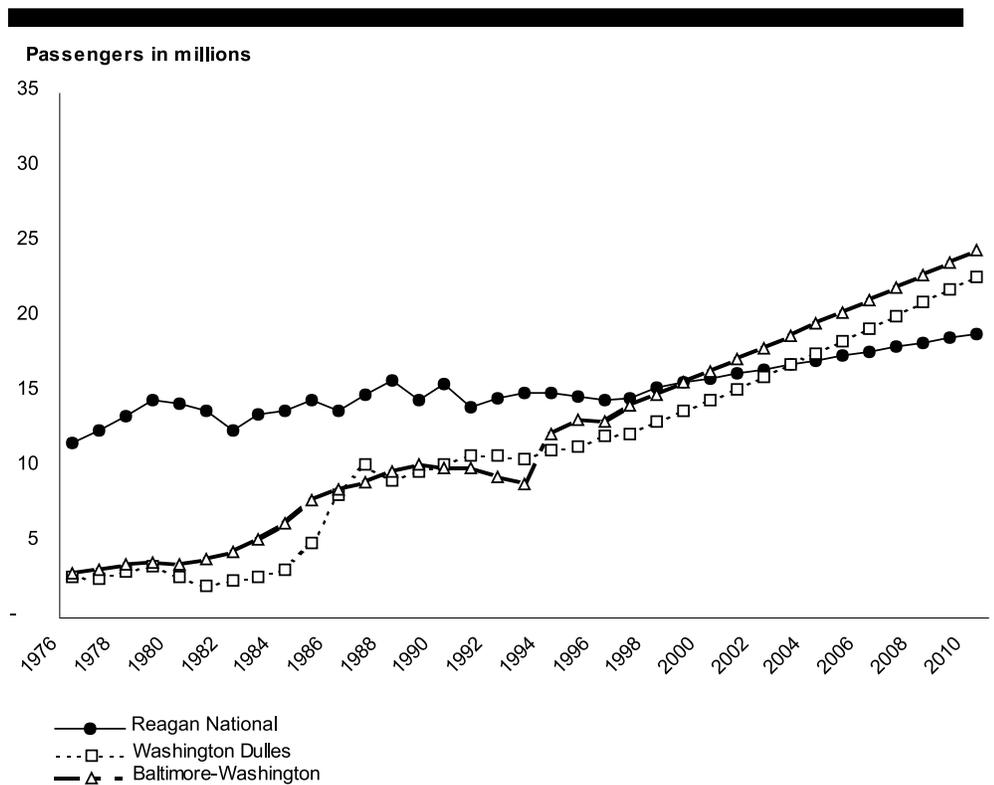
Figure 1: Location of Reagan National, Dulles, and BWI Airports Around the Washington, D.C., Metropolitan Area



Until recently, more of the region's passengers used Reagan National than the other two airports. Reagan National has handled about 15 million

passengers per year since the late 1970s. Using its latest available statistics on passenger enplanements, FAA estimated that BWI would surpass Reagan National in total passengers in 1999 and that Dulles would surpass Reagan National in 2004 (see fig. 2). However, by 1998, other data indicated that BWI already was handling more passengers than either Reagan National or Dulles.

**Figure 2: Number of Actual and Projected Passengers at Reagan National, Dulles, and BWI Airports, 1976 Through 2010**



Source: FAA.

## Recent Legislative Proposals Would Add Flights at Reagan National

During this Congress, several bills have been introduced that would provide exemptions to Reagan National’s slot and perimeter rules. The bills vary in the total number of jet flights (takeoffs and landings) that they would add at Reagan National, ranging from 6 to 36.<sup>12</sup> They also differ on whether and how many flights would be permitted to and from destinations beyond the existing 1,250-mile perimeter. No pending bill

<sup>12</sup>Two of these bills would also allow an additional 12 daily commuter flights.

proposes eliminating the slot and perimeter rules at Reagan National.<sup>13</sup> Table 1 summarizes the key provisions of the major bills pending as of August 31, 1999, including their provisions on maintaining air service to communities inside the perimeter and assessing the Washington, D.C., area's concerns about possible environmental impacts, including noise.

**Table 1: Summary of Major Pending Legislation That Would Modify Reagan National's Slot or Perimeter Rules**

Pending legislation	Sponsor	Proposed modifications to slot and perimeter	Other key provisions	Status as of August 31, 1999
S. 82	Senator John McCain, Chairman, Senate Committee on Commerce, Science, and Transportation	Permits 36 new jet flights daily (18 takeoffs and 18 landings). Two-thirds of all new jet flights could serve destinations beyond the perimeter.	New service must not reduce travel options to communities within the perimeter; DOT must assess the impact on noise, safety, and the environment.	Passed the Senate Committee on Commerce, Science, and Transportation; pending with full Senate.
H.R. 1000	Representative Bud Shuster, Chairman, House Committee on Transportation and Infrastructure	Permits 6 new jet flights daily (3 takeoffs and 3 landings). No new flight could serve a destination beyond the perimeter.	Requires DOT to grant slots only for service to airports where service is insufficient and fares are high.	Passed the House of Representatives; referred to the Senate Committee on Commerce, Science, and Transportation.
S. 536	Senator John Warner	Permits 12 new jet flights daily (6 takeoffs and 6 landings). All new jet flights could serve destinations beyond the perimeter.	New service must not reduce travel options to communities within the perimeter; DOT must assess the impact on noise, safety, and the environment.	Pending with the Senate Committee on Commerce, Science, and Transportation.

Source: GAO's analysis of legislative proposals.

In our 1996 report and in testimony this past January,<sup>14</sup> we suggested that the Congress consider granting DOT the authority to modify the perimeter rule at Reagan National when proposed new service would substantially increase competition. We did not recommend that the rule be eliminated because doing so could have unintended consequences, such as reducing the amount of service to smaller communities in the Northeast and Southeast. This could happen if the airlines serving Reagan National were

<sup>13</sup>In addition, S. 545, introduced for the Clinton administration by Senator Ernest Hollings, has proposed revisions to increase competition at the nation's three other slot-controlled airports—Chicago O'Hare, New York Kennedy, and New York LaGuardia—by phasing out slot controls. This bill does not suggest similar revisions to the rules governing Reagan National. H.R. 1000 also calls for a phaseout of slot controls at O'Hare, LaGuardia, and Kennedy. Slot controls are to be completely phased out at O'Hare by 2002 and at LaGuardia and Kennedy by 2007.

<sup>14</sup>Airline Deregulation: Barriers to Entry Continue to Limit Competition in Several Key Domestic Markets (GAO/RCED-97-4, Oct. 18, 1996) and Federal Aviation Administration: Issues Concerning the Reauthorization of Aviation Programs (GAO/T-RCED-99-68, Jan. 20, 1999).

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to shift their service from these communities to take advantage of more profitable, longer-distance routes. In addition, in our January testimony, we recognized that the communities in which the airports are located will be concerned with any proposals to accommodate additional service because of potential noise, safety, and congestion problems. Provisions in some of the pending legislation seek to mitigate these concerns.

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## Reagan National Has the Capacity to Absorb a Limited Number of Additional Flights

If the slot and perimeter rules were revised, the constraints of Reagan National's infrastructure, such as its relatively short runways and limited number of gates, would prevent it from accommodating a significantly larger number of flights. According to a 1995 DOT study, the airport could absorb seven more flights per hour (for a total of 126 per day) above the current number allowed by law, but flights above that number could result in significant airport congestion and delay.<sup>15</sup> MWAA officials believe that the airport could accommodate fewer flights before delays become significant. However, some flights could be added at Reagan National without increasing the total number of currently available slots because not all slots at the airport are allocated and because some slots that are allocated are not fully used.

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## Reagan National's Infrastructure Limits Its Capacity to Handle Much Additional Air Traffic

Even if the slot and perimeter rules were revised, Reagan National's ability to support an increased number of flights is limited by the ability of its runways and gates to accommodate a significantly larger number of jet aircraft.<sup>16</sup> A 1995 DOT study on the slot rule found that, because of improvements to air traffic management, Reagan National's infrastructure could support more flights per hour without affecting air safety. The DOT report indicated that while removal of the slot rule would result in an increase in operations, air safety would not be affected because FAA's air traffic control staff would continue to apply programs and procedures that ensure safety.

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<sup>15</sup>U.S. DOT, *Report to the Congress: A Study of the High Density Rule*, May 1995. This report contained no recommendations but provided a factual basis for making decisions pertaining to slot-controlled airports.

<sup>16</sup>Reagan National's geographic boundaries also combine to limit the airport's ability to accommodate a significant number of additional flights. Reagan National is bordered on the east by the Potomac River and on the west by National Park Service land. The existence of these features makes adding or lengthening the airport's runways virtually impossible.

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The study estimated that the airport's "balanced capacity"<sup>17</sup> was 67 flights per hour, or 7 flights per hour more than the 60 currently permitted. (This would result in an additional 126 flights per day.) It did not specify how these flights could be divided among jets, commuter aircraft, or general aviation aircraft. The study projected that if the number of slots were increased by 7, delays of 15 minutes or more as a percent of total operations could increase from about 0.5 percent to 3 percent and cause the airlines to experience a decreased profit. (The average delay for the other slot-controlled airports in fiscal years 1997 and 1998 was about 3.6 percent.) At the same time, however, the costs associated with the increase in delays would be partially offset by consumer benefits. Should the slot rule be eliminated, the demand for air service could exceed the airport's balanced capacity for 10 hours each day, and delays would be much greater. An FAA official told us that the report's key findings are generally still applicable.

MWAA officials thought that Reagan National could accommodate a few more flights per hour but perhaps not as many as seven. They said that the number of flights the airport could handle per hour was in the "low- to mid-60s" (for a total of about 70 additional flights per day) before delays became significant. They emphasized that they remained concerned about any possible noise-related impact that additional flights might have on the area. However, MWAA has not conducted its own analysis to determine how many additional flights per hour could be safely accommodated without an undue increase in delays.

The length of Reagan National's runways is a key factor restricting the number of takeoffs and landings. Only one of its three runways is long enough to routinely accommodate most jet aircraft. FAA and MWAA officials observed that the use of this longest runway is increasing because commuter airlines are replacing traditional propeller aircraft, which can use the shorter runways, with regional jets, which must use the longest runway.

Furthermore, should the perimeter be expanded, airlines would find that Reagan National has a limited capacity to accommodate large aircraft. To date, only narrow-body aircraft, such as the Boeing 737 and MD-80, have been used at the airport. Should flights beyond the perimeter be allowed,

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<sup>17</sup>"Balanced capacity" refers to the average ability of an airport's runways to support a certain number of operations per hour under varying weather and wind conditions.

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airlines could use wide-body aircraft no larger than the Boeing 767-300.<sup>18</sup> Reagan National's renovation allowed airlines to use wide-body aircraft as large as the Boeing 767-300, but only in limited numbers.<sup>19</sup> Because of the size of their wingspans (156 feet each), two Boeing 767s could not pass each other on adjacent taxiways or use adjacent gates. Furthermore, Reagan National has only five gates that could accommodate a Boeing 767, and the use of these gates would require that aircraft using adjacent gates be smaller in size than could otherwise be used. In addition, even some newer narrow-body aircraft, such as the Boeing 757-300, could have difficulty using some of the airport's gates because their length would hamper aircraft movements.

The limited availability of gates and other facilities at Reagan National provides incumbent airlines with little opportunity to add service or shift flights from Dulles or BWI, as some industry observers have suggested could happen if the perimeter rule were changed. For instance, if United were allowed to begin operating nonstop service to destinations beyond the perimeter, it would find that shifting a significant number of its transcontinental flights from Dulles to Reagan National would be difficult. This is because the airline is already using its three gates at Reagan National on a frequent basis throughout the day and because the number of slots to be offered under proposed legislation is limited. In addition, United has no slots and gates at Reagan National for its regional commuter affiliate to bring passengers in from other eastern markets that would connect with those transcontinental flights.

Moreover, if any of the proposed legislation is enacted and airlines that do not already serve Reagan National are awarded slots, they may have difficulty obtaining the gates, ticket counters, baggage handling areas, and other facilities necessary to initiate new service, especially at key periods during each business day. Reagan National currently has 42 gates available for jet operations. According to MWAA, all of these gates are leased to the incumbent "tenant" airlines until 2014.<sup>20</sup> MWAA may make a gate available to another airline when it is not needed to support the tenant airline's scheduled operations. While a tenant airline cannot prevent another airline from using the gate when it does not need it, the only effective opportunity

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<sup>18</sup>We found no standard definition of a wide-body aircraft. According to an MWAA official, a wide-body aircraft is generally considered to be an aircraft with two aisles, such as a Boeing 747. For scale comparisons of this aircraft and other aircraft used at Reagan National, Dulles, or BWI, see app. II.

<sup>19</sup>Reagan National now has five gates that can accommodate wide-body aircraft, but it will have an additional gate when its renovation is complete. In comparison, Dulles has more than 60 gates that can serve wide-body aircraft.

<sup>20</sup>Under certain conditions, MWAA may terminate leases in 2004.

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for a new entrant to initiate service at key business times of the day—or for an incumbent to expand service—is through a contractual arrangement with the tenant airline. To date, this is how new entrants have gained access to the airport. Until 1996, for instance, Midwest Express had gate-use agreements, initially with United and later with Northwest Airlines, to support its daily nonstop service to Milwaukee and Omaha. In August 1996, Midwest Express began leasing its own gate directly from MAAA. Today, similar opportunities exist for new entrants to share daytime gate space with incumbents whose “turn rates” are relatively low.<sup>21</sup> Opportunities may exist, for example, to sublease from Trans World Airlines, Northwest, and Continental Airlines, none of which makes more than six daily turns per gate.

Several incumbent airlines are unlikely to sublease their gates to new competitors because they use them frequently each day to support their own operations. Collectively, the major airlines use Reagan National’s 42 jet gates at a high rate relative to the industry average. Airline analysts consider Southwest to be the most efficient major U.S. airline because it averages 10 turns per gate per day at airports where it operates. At Reagan National, US Airways makes nearly 200 daily flights from its 12 jet gates, for an average of eight turns per gate per day.<sup>22</sup> Several of Reagan National’s other major airlines also use their gates frequently throughout the day; Delta and United, for example, make an average of eight turns and six turns per gate per day, respectively.<sup>23</sup> Measured against the typical industry rate of seven aircraft turns per gate per day, these three airlines have little or no ability to sublease these gates to new entrants, especially during peak business hours.

Although MAAA has no plans to increase the number of gates at Reagan National, MAAA officials emphasized that they will work with incumbent airlines to ensure that any new entrant wishing to serve Reagan National can do so. MAAA officials stated that they address gate access whenever necessary. Since 1986, for instance, MAAA has helped two airlines—Midway and Midwest Express—to gain access to gates and other facilities at the airport. In addition, every 3 years, MAAA undertakes a broad, formal assessment of the airlines’ use of gates and associated facilities at Reagan

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<sup>21</sup>A “turn” is an informal industry term referring to one aircraft’s combined inbound and outbound flight operations at a given gate.

<sup>22</sup>This excludes US Airways’ shuttle flights to New York City, which operate out of two separate gates. Each day, the airline operates 15 shuttle flights from each of these gates (approximately eight turns per gate).

<sup>23</sup>By comparison, at Dulles, United operates approximately 118 flights from 36 gates, thus averaging fewer than four turns per gate per day.

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National. Reagan National's next formal reassessment is scheduled for the summer of 2000.

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### Some Existing Slots at Reagan National Have Not Been Allocated to Airlines, While Others Are Not Efficiently Used

FAA controls the allocation of available jet and commuter slots at Reagan National during an 18-hour period every day, from 6:00 a.m. until midnight. Specifically, FAA makes 868 slots available per day to jet and commuter airlines—37 jet slots available each hour during the 18-hour period, for a total of 670 daily available jet slots, and 11 commuter slots per hour during the 18-hour period, for a total of 198 daily available commuter slots.<sup>24</sup>

Of the 670 available jet slots, 86 have not been requested for allocation. Each of these 86 jet slots falls either in the early morning (between 6:00 and 7:00) or in the late evening (between 9:00 and midnight). According to MWAAs officials, these jet slots remain unallocated because there is less demand for passenger service during these hours and because the airlines do not use aircraft that comply with MWAAs's stricter noise requirements in effect after 10:00 p.m. To date, the airlines also have not requested that FAA allocate 35 commuter slots for their use.<sup>25</sup>

In addition, not all allocated slots are being used in the most efficient manner. Each day, small commuter aircraft use 36 slots designated for jet traffic during busy times of the day. US Airways Express, a commuter airline, uses 20 of these 36 jet slots to serve a variety of nearby cities with small propeller aircraft during the mid-day hours. An FAA official acknowledged that commuters often operate flights in jet slots but emphasized that this practice is permissible under federal regulation.

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<sup>24</sup>In addition to the 37 hourly jet slots, FAA makes available 4 jet slots to America West under a special slot exemption authority. America West uses these jet slots to operate flights to its Phoenix hub via Columbus, Ohio, at 8:00 a.m., 3:00 p.m., 4:00 p.m., and 9:00 p.m. FAA includes these four additional jet slots in its count of available daily jet slots. The total number of jet slots available each day equals 670.

<sup>25</sup>Current law defines the peak-hour period as between 7:00 a.m. and 9:59 p.m. In certain circumstances, DOT has the authority to "re-time" (i.e., change the assigned hour) up to two slots per hour. 49 U.S.C. section 41714(d) permits the Secretary of Transportation to allow air carriers holding or operating slots to re-time them, but only under specified conditions and upon a finding that exceptional circumstances exist. The most important of these conditions are that the total number of slots during peak hours are not increased and that the number of operations in any 1-hour period not be increased by more than two. The law does not allow DOT to "re-time" off-peak slots to peak hours. For example, in September 1994, DOT allowed Midwest Express to obtain two jet slots that were available at 9:00 p.m., and then re-time them for use at 7:00 p.m. DOT took this action primarily to allow Midwest Express to accommodate passengers demanding convenient nonstop service to and from Omaha, Nebraska. DOT's decision to provide this exemption to Midwest Express means that the total number of slots currently allocated to all airlines at 7:00 p.m. exceeds the limit of 37 jet operations per hour at Reagan National by 2, as is permitted under 49 U.S.C. section 41714(d)(1)(C). In addition, Midwest Express has applied for Reagan National's two remaining unallocated 9:00 p.m. slots.

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Finally, some weekday peak-hour slots at Reagan National are not being fully used, resulting in fewer flights at certain times than are permitted under the current slot limits. FAA regulations require that an airline use each slot a minimum of 80 percent of the time over a 2-month reporting period, or the agency will withdraw it. According to FAA's May 1999 analysis of slot-use data recently submitted by the major airlines, some airlines report operating flights in a staggered manner among allocated slots during the standard 2-month reporting periods to ensure compliance with the minimum-use regulations for each slot. For example, because the regulations allow a slot to go unused for up to 20 percent of the time, a carrier with five slots in 1 hour must operate only four flights in that hour on any day to obtain 80-percent use for each of its five slots. The carrier is allowed to "rotate" its four flights across the five slots over the 2-month period to prevent FAA from withdrawing the slot. The practice of a carrier's rotating actual flights among its allocated slots is commonly referred to as "babysitting." FAA officials emphasized that babysitting is not prohibited by existing regulation, provided that a slot meets the minimum-use requirements.

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### **Only a Limited Number of Passengers Are Likely to Switch to Reagan National for Service Beyond the Perimeter**

Only a limited number of passengers might switch from using BWI or Dulles to Reagan National to take advantage of nonstop service to destinations beyond the perimeter should the Congress provide the opportunity. Previous experiences in the Washington, D.C., metropolitan area with airlines introducing new or low-fare service suggest that relatively few passengers are likely to switch from using BWI or Dulles to Reagan National. Furthermore, the amount and type of service provided by additional flights at Reagan National as a result of the proposals before the Congress would affect the number and mix of passengers most likely to switch.

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### **Previous Washington Area Airport Experiences Provide Insight Into the Extent to Which Passengers Might Switch to Reagan National**

To gain insight into whether passengers who currently use BWI or Dulles might switch to using Reagan National, we determined the extent to which passengers switched from one area airport to another when provided with an incentive. Typically, passengers prefer to fly from the airport that is most convenient for them. For the purpose of our analysis, we used the introduction of "low-fare" service at BWI and Dulles as an incentive that could attract passengers from one area airport to another. (During the 1990s, no airline introduced "low-fare" service to or from Reagan National.) We did this because the effect of price changes at one airport on the passenger traffic and fares at another airport is frequently used as a

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measure of the extent to which passengers view airports as substitutes for one another.<sup>26</sup>

In our analysis, we distinguished between the reactions of passengers traveling for leisure and for business purposes.<sup>27</sup> As a general rule, individuals traveling for leisure purposes tend to be more sensitive to price differences than those traveling for business. That is, leisure passengers are more likely than business passengers to change their travel plans (that is, switch—or substitute—airports) in response to differences in airfares. However, various other factors, such as the availability of low fares or nonstop service at one airport that is not provided at another, may persuade travelers to switch from the airport that they might otherwise use.<sup>28</sup>

To evaluate the impact of low-fare service on passenger choice, we identified three cases in which an airline new to an airport (a “new entrant”) introduced low-fare service at an area airport and one case in which an airline introduced new service without offering low-fare service. We then determined how these “entry events” affected passenger traffic and fares for both leisure and business travelers at all three area airports. The four entry events we examined were (1) ValuJet’s entry into the Dulles–Atlanta market during 1994, (2) Southwest’s entry into the BWI–St. Louis market during 1994, (3) Western Pacific’s entry into the Dulles–Denver market during 1997, and (4) Midway Airlines’ entry into the Reagan National–Raleigh/Durham market during 1995. Appendix III contains a more complete description of our methodology.

Our analysis indicated that, for a number of reasons, relatively few passengers switched airports in response to the service offered by the new

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<sup>26</sup>This general approach is widely accepted by the economics profession and used by the Department of Justice and the Federal Trade Commission to determine whether two similar products compete with each other or whether they are in distinct markets.

<sup>27</sup>Airline ticket data do not indicate whether passengers are traveling for business or leisure purposes. To simplify our analysis, we assumed that travelers purchasing cheaper tickets, which normally require advance purchase and a Saturday-night stayover, were leisure travelers and those who purchased more expensive tickets, often fares available at the last minute, were business travelers.

<sup>28</sup>Passenger preference surveys also provide valuable insight into this issue. About every 5 years, the Metropolitan Washington Council of Governments surveys passengers at each of the three major airports. This survey includes questions on which airport passengers prefer to use. The 1992 survey reported that 43 percent of locally originating passengers preferred to use Reagan National, 22 percent preferred Dulles, and 23 percent preferred BWI, with 12 percent expressing no opinion. The Council of Governments conducted its most recent passenger survey in 1998 but has not had the funding needed to analyze the data and publish the results. We believe the more recent survey might reflect changes in passenger preferences that could have taken place since 1992, especially those that reflect the notable increase in employment and population in the vicinity of Dulles Airport, along with the introduction of low-fare service discussed in this section and the renovation of all three area airports.

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entrant. Although the entry of a new carrier substantially lowered the fares between the two airports served by the new entrant, the low fares at one airport had, at most, only a small effect on the number of passengers paying high fares (generally, business travelers) at the other area airports. This indicates that passengers who pay high fares have a strong preference for the airport that is most convenient for them. For those passengers, the airports are poor substitutes for one another. In contrast, passengers who traveled at low fares (generally, leisure travelers) showed some willingness to switch among the area's three airports. Yet even this group, which is more sensitive to price changes than business travelers, demonstrated some preference for one airport. This indicates that for leisure travelers, these airports may be modest substitutes for each other. In addition, the lower fares increased the total number of passengers flying. The results of our analyses are summarized in table 2 and described in more detail in appendix IV.

**Table 2: Summary of the Effects on Passengers and Fares of New Entry at the Three Washington-Area Airports**

<b>Entrant airline/Airport-pair market entered</b>	<b>Airport/Previous Provider</b>	<b>Effect of entry</b>
ValuJet/Dulles-Atlanta	Dulles/Delta	Low fares substantially increase the total traffic between Dulles and Atlanta. Little change in number of high-fare passengers.
	Reagan National/Delta and TWA	Increase in the number of low-fare passengers. Little change in the number of high-fare passengers. TWA exited market.
	BWI/ Delta, US Airways, and TWA	Large decrease in the number of low-fare passengers, who probably switched to other airports. Little effect on high-fare passengers.
Southwest/BWI—St. Louis	Dulles/TWA	Slight decline in the number of low-fare passengers who possibly switched to BWI. Small increase in the number of high-fare passengers.
	Reagan National/TWA	Large decline in the number of low-fare passengers, who probably switched to BWI. Little effect on high-fare passengers.
	BWI/TWA and US Airways	Large increase in the total number of passengers, most at low fares. Decline in the number of high-fare passengers. US Airways exited market.
Western Pacific/Dulles—Denver	Dulles/United	Low fares increased the number of travelers. Large decline in the number of high-fare passengers.
	Reagan National/none	No nonstop service; Denver is outside the current perimeter. Little change in connecting service.
	BWI/United	Lower fares increase both the number of low-fare and total passengers; no apparent switch of passengers. Modest decline in the number of high-fare passengers.
Midway/Reagan National—Raleigh-Durham	Dulles	No nonstop service at the time of Midway's entry.
	Reagan National/US Airways	Low fares increased the number of travelers. Decline in the number of high-fare passengers, who then traveled at lower fares.
	BWI/US Airways	Modest decrease in the number of low-fare passengers. Large increase in the number of high-fare passengers, probably because of American Airlines' exit.

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We believe there is an unmet demand for nonstop travel between Reagan National and destinations outside the perimeter. However, we were unable to directly estimate the size of this unmet demand. Precise estimates of the number of travelers who might switch from using Dulles or BWI to Reagan National would depend on a number of major assumptions about airline behavior and the markets that would be served. For example, United officials noted that an airline's reaction to changes in the slot and perimeter rules would depend on a variety of conditions, such as the way the perimeter rule was changed, the availability of sufficient facilities at Reagan National, and other competitive pressures. If some version of the legislative proposals under consideration were enacted, the effect on Reagan National air travelers would depend on which airlines received exemptions to the perimeter rule (along with the necessary slots and facilities at Reagan National), the amount and type of service they provided, and the markets they served.

If exemptions allowed the major airlines already serving Reagan National to operate to and from large western cities, those airlines could capitalize on the scarcity of their new nonstop service and charge a premium fare. This would tend to restrict the benefits from such service to travelers doing business in downtown Washington, D.C., rather than to the more price-sensitive leisure travelers, who would be unlikely to switch because lower fares might still be available at BWI or Dulles. Nevertheless, our analysis of the market entries by these four airlines indicates that if new nonstop service to locations outside the perimeter is allowed, not all business passengers are likely to switch to Reagan National from BWI or Dulles. Business travelers who prefer BWI or Dulles because these airports are closer to their home or business are likely to continue to use these airports. Other business travelers are likely to switch if longer-distance flights become available because they would prefer to use Reagan National. Leisure travelers are generally unlikely to switch in large numbers because, under this scenario, the fares at Reagan National for nonstop flights beyond the perimeter may be higher than for similar flights at the other airports.

If exemptions were awarded to low-cost airlines, more leisure travelers would be likely to benefit. Often lacking national networks and alliance agreements with the major airlines, low-cost carriers tend not to attract as many business travelers and thus depend more on leisure passengers. As we pointed out earlier, however, the lack of available facilities at Reagan National may inhibit the ability of new entrants to initiate service at commercially viable times. MCAA officials told us that they have always

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been able to accommodate airlines that wanted to initiate new service at Reagan National. Nonetheless, the experience of Midwest Express indicates that gaining reasonable access to its own facilities at Reagan National can take some time.

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### Limited Shift in Airline Operations and Passenger Traffic Unlikely to Affect Dulles or BWI Significantly

Airline industry experts with whom we spoke said that the impact on Dulles or BWI of modifying the perimeter rule would depend on how the rule was changed and how many additional flights would be added at Reagan National. Nevertheless, they generally dismissed the notion that moderate changes in the slot and perimeter rules at Reagan National would adversely affect BWI or Dulles because they do not view the Washington, D.C., metropolitan area as a single market for the three airports. Rather, they believe that the market for each of the area's three commercial airports is largely different. Furthermore, some of the experts did not believe that the number of passengers switching would be detrimental to Dulles because of the sizable growth of business in the vicinity of Dulles. They said that unlike years ago, when Dulles needed the protection afforded by the slot and perimeter rules at Reagan National, Dulles is now an established airport with a natural customer base in its geographic area.

The airline experts we spoke with speculated that Dulles would lose some business travelers if nonstop long-haul flights to cities beyond the perimeter were offered at Reagan National. However, even if all of the 6 to 12 roundtrip nonstop flights per day to destinations beyond the perimeter suggested by the proposed legislation moved from BWI or Dulles to Reagan National, they would represent between 1 and 2 percent of the total flights at those airports (11 to 21 percent of the nonstop flights to destinations beyond the perimeter). We believe it is unlikely that the 6 to 12 flights would move to Reagan National because the existing long-haul service at Dulles relies in part on connecting traffic. In addition, such a scenario would be unlikely because some of the passengers flying on new nonstop flights from Reagan National would be the same passengers who are currently using one-stop service from the airport. Only US Airways—which does not have major long-haul service at Dulles—has a significant commuter operation at Reagan National. United operates more transcontinental flights than any other airline at Dulles but has no commuter flights into Reagan National to bring connecting passengers in from other East Coast locations. In addition, because of the constraints on the size of Reagan National's runways, taxiways, and gates, the airport could accommodate only some of the aircraft that airlines now use at

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Dulles or BWI for transcontinental service. Thus, we believe that changes to the slot and perimeter rules at Reagan National would not result in a significant shift of passenger traffic or service among the three area airports and that neither BWI nor Dulles would experience significant adverse effects.

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## Agency Comments

We provided copies of our draft report to DOT, FAA, MWAA, and the Maryland Aviation Administration. We met with officials from DOT and FAA, including DOT's Deputy Assistant General Counsel and FAA's Assistant Manager, Air Traffic Operations. These agencies generally agreed with our findings and provided several comments to clarify technical issues concerning slot allocation and use. We spoke with the Director, Policy Development, Maryland Aviation Administration, who also agreed with the report's findings and provided us with technical comments. We incorporated the comments on clarity and technical issues as appropriate.

MWAA agrees that Reagan National Airport could support a modest number of additional flights and asserts that its reasons for wishing to retain existing limits stem primarily from policies that it deems important to the operation of the airports in the Washington, D.C., region. MWAA commented that we did not clearly place Reagan National's slot and perimeter rules in the context of these policies. In addition, MWAA suggested that our use of "balanced capacity" to measure the number of flight operations that Reagan National should be able to accommodate overstates the airport's capacity. We believe, as does DOT, that balanced capacity is a superior method for determining what the airport's capacity ought to be because it accounts for the operation of aircraft during all weather conditions. MWAA had several other technical comments, which we addressed in the report, as appropriate. MWAA's comments, along with our responses to them, appear in appendix V.

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We conducted our work from March 1999 through August 1999 in accordance with generally accepted government auditing standards.

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If you or your staff have any questions about this report, please call me or Steve Martin at (202) 512-2834. Staff contacts and others who made key contributions to this report are listed in appendix VI.

Sincerely yours,

A handwritten signature in black ink that reads "John H. Anderson, Jr." The signature is written in a cursive style with a large initial 'J' and a distinct 'A'.

John H. Anderson, Jr.  
Director, Transportation Issues

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**Abbreviations**

BWI	Baltimore/Washington International Airport
DOT	Department of Transportation
FAA	Federal Aviation Administration
GAO	U.S. General Accounting Office
IFR	Instrument Flight Rules
MWAA	Metropolitan Washington Airports Authority

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# Configuration of the Three Airports in the Washington, D.C., Metropolitan Area

Figure I.1: Ronald Reagan Washington National Airport



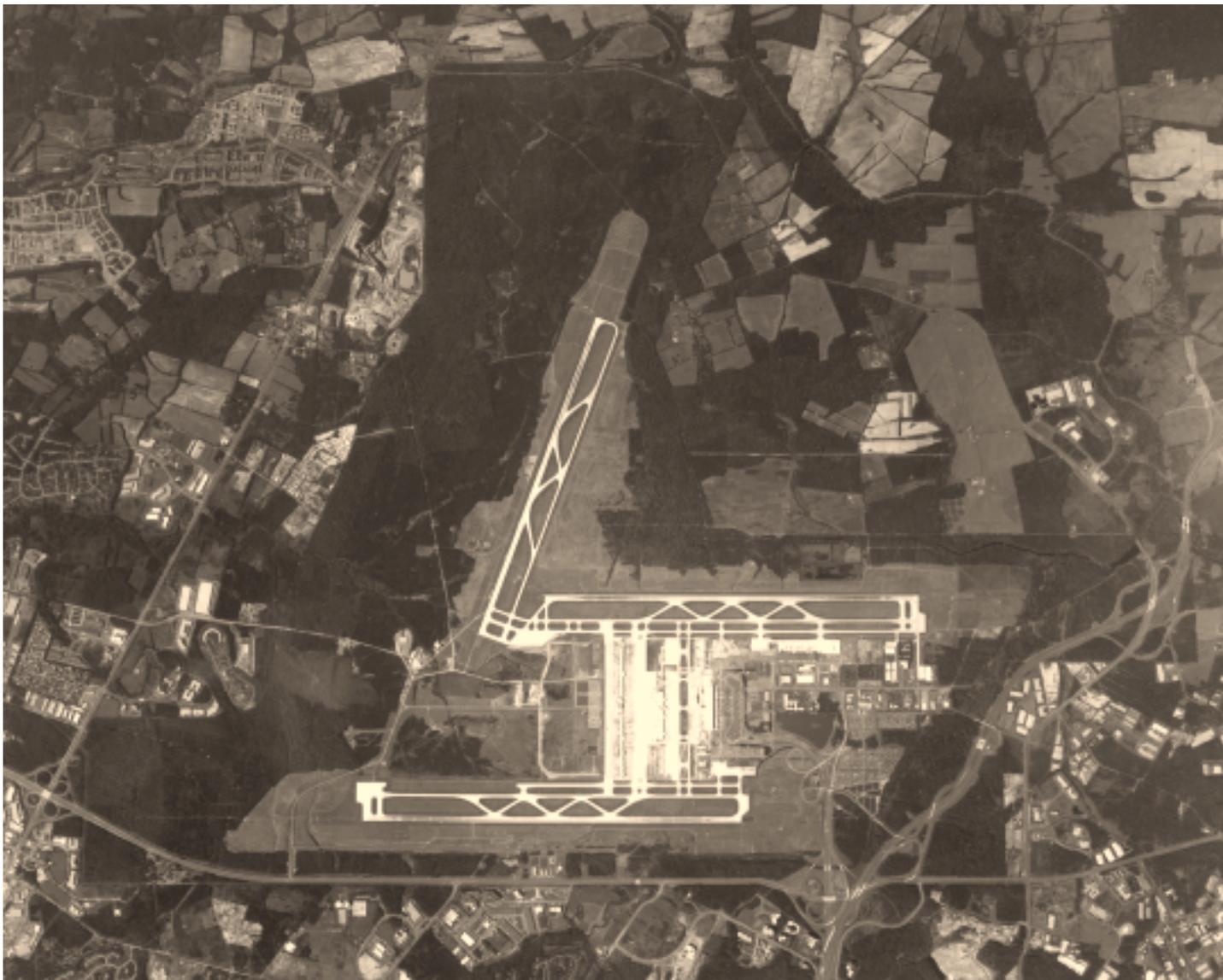
Source: Metropolitan Washington Airports Authority.

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**Appendix I**  
**Configuration of the Three Airports in the**  
**Washington, D.C., Metropolitan Area**

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**Figure I.2: Dulles International Airport**



Source: Metropolitan Washington Airports Authority.

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**Appendix I**  
**Configuration of the Three Airports in the**  
**Washington, D.C., Metropolitan Area**

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**Figure I.3: Baltimore/Washington International Airport**



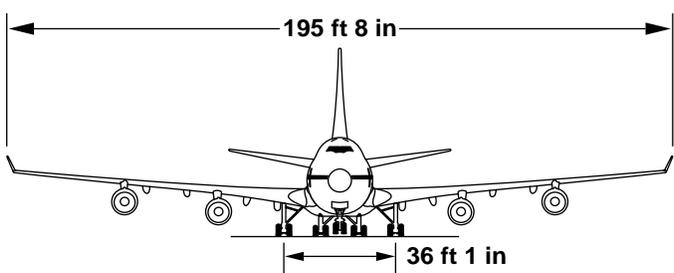
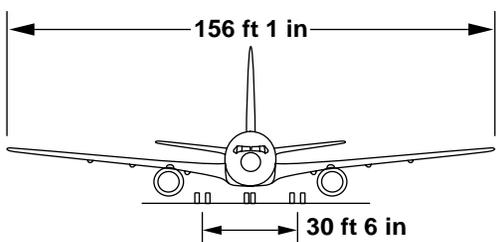
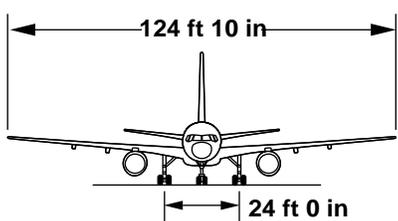
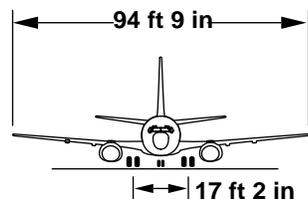
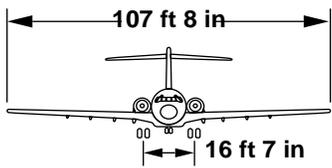
Source: Maryland Aviation Administration.

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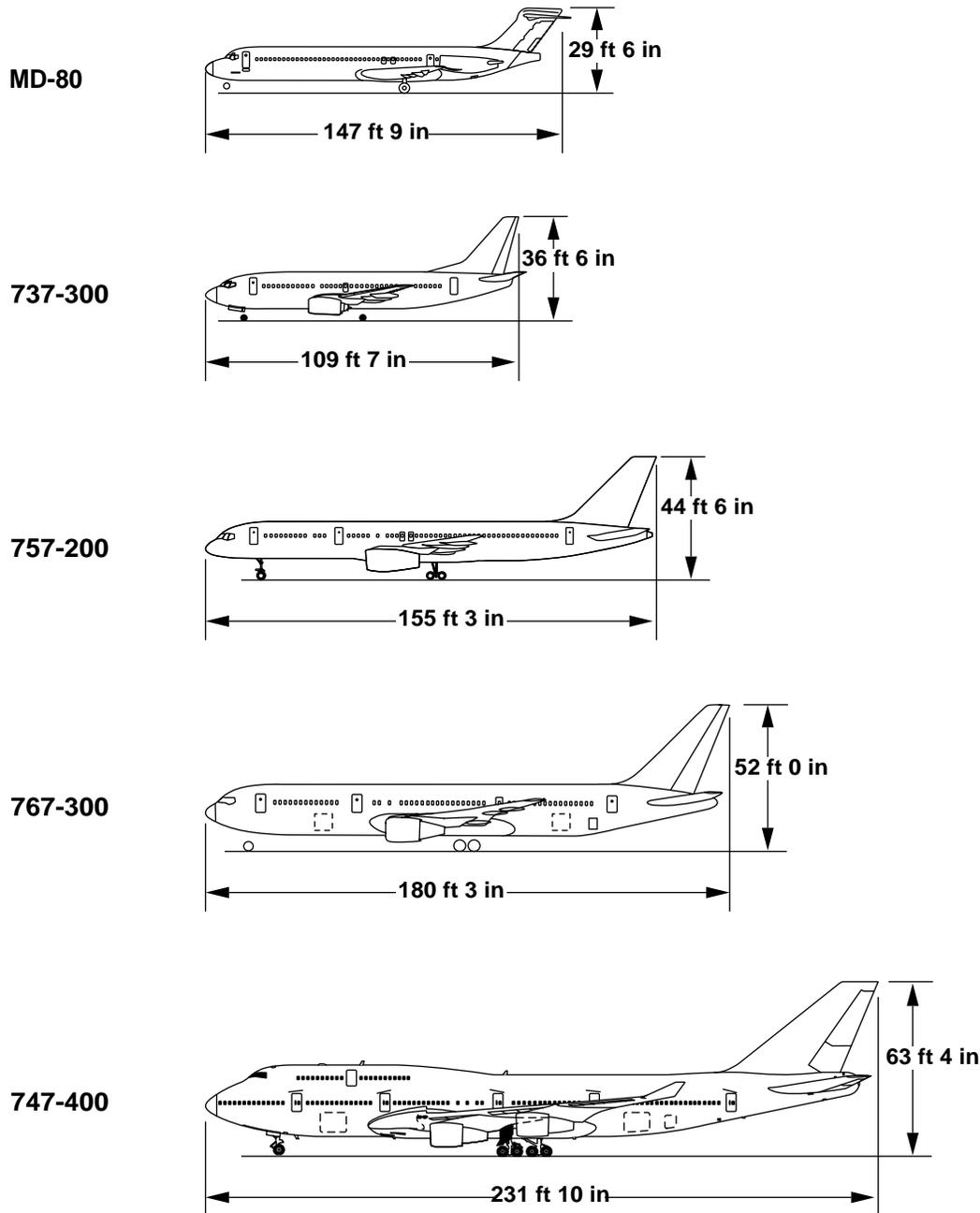
**Appendix I**  
**Configuration of the Three Airports in the**  
**Washington, D.C., Metropolitan Area**

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# Comparison of the Sizes of Various Aircraft That Use Reagan National, Dulles, and BWI Airports



**Appendix II  
Comparison of the Sizes of Various Aircraft  
That Use Reagan National, Dulles, and BWI  
Airports**



Source: The Boeing Corporation

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# Scope and Methodology

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To examine the potential impact of several legislative proposals currently before the Congress that would address restrictions on flights at Ronald Reagan Washington National Airport (Reagan National), we (1) described the most prominent proposals that would allow an increased number of takeoffs and landings at Reagan National and create exemptions to the perimeter rule, (2) examined the extent to which Reagan National could safely accommodate more takeoffs and landings, and (3) analyzed whether adding flights at Reagan National to and from destinations beyond the current perimeter would cause passengers to shift their travel from Dulles or BWI.

To address the first objective, we reviewed the three leading legislative proposals that have been introduced in the 106<sup>th</sup> Congress and compared their similarities and differences. We also examined the legislative history of the federal government's involvement with the Washington, D.C., area airports. This review included various laws and regulations, such as the Metropolitan Washington Airports Act of 1986, in which the federal government ceded control of Reagan National and Dulles to the newly created Metropolitan Washington Airports Authority (MWAA). Finally, we reviewed exemptions to the slot and perimeter rules that have been permitted over time.

For the second objective, we determined how airlines are using existing slots. We did this to gain insight into the extent to which Reagan National may be able to absorb additional air traffic and passengers if the slot and perimeter rules change and if airlines operating at Dulles and BWI decide either to initiate service at Reagan National or move service from those airports to Reagan National. We analyzed data from the Federal Aviation Administration (FAA) on the actual use of allocated air carrier (jet) and commuter slots in terms of the existing slot limitations to determine if slots are being used in an economically efficient manner.<sup>29</sup> This analysis included reviewing data on which airlines operated commuter aircraft in jet slots and how airlines met the federal regulatory requirements that slots be used 80 percent of the time during 2-month periods.

We also examined Reagan National's capacity in terms of the maximum number of flights allowed by the slot rule. We determined the limitations presented by the airport's runways, taxiways, gates, and terminal areas to accommodate not only more flights (with more passengers) but also flights by aircraft larger than those normally operating there now—aircraft

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<sup>29</sup>We define an "economically efficient manner" to mean the extent to which the scarce slot resources are used to serve the greatest number of passengers. We recognize that holders of slots may have different perspectives on what they consider to be the best use of those slot resources.

capable of flying long-range or transcontinental routes. We reviewed the data contained in a 1995 study by the Department of Transportation (DOT) on the high-density rule,<sup>30</sup> as well as data provided by FAA on the runway lengths needed to accommodate different aircraft capable of flying long-range routes. We also determined from MWAAs the number and location of gates at Reagan National that had been constructed to accommodate larger, heavier aircraft than are now used at the airport. We interviewed FAA and MWAAs officials about the effect on Reagan National's operations of the introduction of long-range aircraft, along with the substitution by commuter carriers of regional jets for turboprop aircraft.

Finally, for the third objective, we analyzed the extent to which passengers would shift their travel from any one of the area's three airports to another in response to new travel options. To do so, we analyzed cases in which airlines that previously did not fly to and from one airport (defined here as "new entrants") introduced service to destinations already served by other airlines (defined here as incumbent airlines). Using data originally provided to DOT by the airlines, we identified all new entrants that began operations at one of the three airports during the 1990s. Because individuals traveling for leisure are known to be more sensitive to changes in prices than individuals traveling for business, we separately analyzed the distribution of passengers and the fares they paid for each airport.

We restricted our analyses to cases in which the new entrants initiated service at a significant level. We eliminated those new entrants that served only as commuter affiliates to a major airline, along with those that failed to carry the equivalent of at least two planeloads daily (approximately 20,000 passengers per quarter). We further limited our analysis of those cases to destinations that the new entrant served on a nonstop basis. Thus, we examined the effects on passenger traffic and fares that may have been produced by four new entrants during the 1990s: Southwest Airlines' 1993 introduction of service at BWI; ValuJet's 1994 introduction of service at Washington Dulles; Western Pacific's 1994 introduction of service at Washington Dulles; and Midway's 1994 introduction of service at Reagan National. Between the time that they began service in the Washington area and the time of our review (through the fourth quarter of 1998), according to the most recent available data, Southwest and ValuJet (now operating as AirTran Airlines) began nonstop service to a number of destinations. We selected only one market for each carrier. In general, we excluded destination cities that are served by more than one airport. We did this because we would not be able to determine whether changes in air traffic

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<sup>30</sup>U.S. DOT, Report to the Congress: A Study of the High Density Rule, May 1995.

and fares between the Washington, D.C., area airports and the destination city were due to the new competition in the Washington, D.C., area, or to competitive effects from the second airport in the destination city (for example, we excluded an analysis of the effect of Southwest's entry into the BWI-to-Chicago Midway Airport market because we would not be able to separately identify any effect that Chicago's O'Hare International Airport may exert on traffic and fares in the market).<sup>31</sup>

In measuring the number of passengers traveling in a market and the fares they paid, we also excluded itineraries involving (1) flights making an intermediate stop between their origin and destination, except in the case of travel between Denver and the three area airports; (2) flights making any stop outside the continental United States; (3) nonrevenue flights taken by airline employees or passengers using frequent flyer awards; (4) flights for which the fare was unknown (for example, charters); and (5) flights with certain missing data, such as those on fares, segments, date, or operating airline. We also excluded itineraries involving more than one airline. We reported fares on a one-way basis.

To determine whether the entry by these airlines produced an effect on (1) the number of passengers carried by incumbent airlines at the airport where the entry took place; (2) the number of passengers carried at either of the other two area airports in the same airport-pair market; or (3) fares paid by those passengers, we analyzed traffic and fare data for those particular routes, beginning 2 quarters prior to the new entrants' service and 2 quarters afterward. For example, if an entrant began service in the second quarter of 1995, we examined changes in competitors' fares at each of the three area airports between the fourth quarter of 1994 and the fourth quarter of 1995. We selected this 4-quarter interval to minimize any effects that seasonal air travel might introduce into the analysis (during the winter, fewer passengers fly on most routes, and fares are generally lower; the situation is reversed during the peak summer travel months).

We obtained these data from DOT's Bureau of Transportation Statistics, Office of Airline Information. These data are reported originally by the operating airlines and constitute a 10-percent sample of all tickets. Because they are drawn from a sample, they are subject to sampling error (that is, the likelihood that the result produced from analyzing the sample is different from the "true" value). We did not calculate the sampling

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<sup>31</sup>These airlines may have provided nonstop service to other cities as well, but we excluded those routes from our analyses because, for example, they did not meet our criterion for the minimum passenger load.

errors during this review. In the past, however, when we have used these data, we have found the sampling errors to be very small.<sup>32</sup>

Finally, we examined whether the entry events exerted different effects on leisure and business travelers, who generally represent separate passenger markets. Leisure travelers tend to be more sensitive to price changes than are business travelers. Moreover, airlines pay special attention to business travelers because these travelers are responsible for generating a disproportionate amount of airline revenue. We examined changes in the overall distribution of passenger traffic by analyzing for each airline pre-entry and post-entry changes in the number of passengers paying fares in different fare categories, defined in \$50 increments. Because airline ticket data do not indicate the purpose for which individuals traveled, we assumed that passengers paying higher fares were generally those traveling for business and those paying lower fares were generally traveling for leisure.

We conducted our work from March 1999 through August 1999 in accordance with generally accepted government auditing standards.

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<sup>32</sup>See, for example, Airline Deregulation: Changes in Airfares, Service, and Safety at Small, Medium-Sized, and Large Communities (GAO/RCED-96-79, Apr. 19, 1996).

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# Additional Information on Substitutability of Airports

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Since 1993, several new airlines have begun service to the Washington, D.C., area. This appendix describes the impact of four of those new airlines on competition among the area's airports. Specifically, it describes the effect that (1) ValuJet's new service between Washington Dulles and Atlanta's Hartsfield International Airport (Atlanta) had on the number of passengers and the fares they paid for travel between Atlanta and Reagan National and BWI; (2) Southwest Airlines' (Southwest) new service between BWI and St. Louis Lambert Field (St. Louis) had on the number of passengers and the fares they paid for travel between St. Louis and Dulles and Reagan National; (3) Western Pacific's new service between Dulles and Denver International Airport (Denver) had on the number of passengers and the fares they paid for travel between Denver and BWI and Reagan National; and (4) Midway's new service between Reagan National and Raleigh-Durham International Airport (Raleigh-Durham) had on the number of passengers and the fares they paid for travel between Raleigh-Durham and Dulles and BWI. As discussed in the report and appendix III, we assessed the substitutability of Washington's three airports by determining the extent to which passengers switched from one Washington area airport to another when new service became available. The more the airports are substitutable, the more likely passengers are to switch airports in response to new service options.

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## ValuJet's Entry at Dulles During 1994 Suggests That Reagan National and Dulles May Be Substitutes for Leisure Passengers but That Business Passengers Regard Each Airport as Separate

ValuJet's entry at Dulles significantly increased the number of passengers who flew on low-fare tickets for travel between Dulles and Atlanta. The number of passengers paying between \$50 and \$99 for one-way tickets between Atlanta and Dulles increased almost fivefold, from about 1,000 to almost 5,000 passengers between the end of 1993 and the end of 1994. Similarly, but to a lesser extent, ValuJet had the same effect on low fares and passenger traffic at Reagan National. Over the same period, the number of low-fare passengers served by Delta Air Lines (Delta) increased modestly, from 7,640 to 9,850, suggesting that Delta viewed the two airports as substitutes. However, the number of low-fare passengers on this route decreased overall because Trans World Airlines (TWA) stopped serving this route after ValuJet's entry at Dulles. In contrast, ValuJet's entry at Dulles did not exert a downward pressure on the higher fares paid by business passengers at any of the three area airports, and the number of passengers paying these fares remained about the same. Since the airlines did not need to reduce fares charged to business passengers to keep them from switching, we conclude that business travelers did not perceive the three airports to be substitutes. On the other hand, because some leisure

passengers may have switched from BWI to Dulles to obtain lower fares, we conclude that they regard the airports as moderate substitutes.

When ValuJet began service at Dulles in 1994, Delta was the principal carrier of passengers between Dulles and Atlanta, an airport that also serves as Delta's operations hub. Delta, and to a much lesser extent, TWA and US Airways, provided nonstop service to each of the three Washington, D.C., area airports at a wide variety of fares. When ValuJet began offering low-fare service between Dulles and its base of operations, Atlanta, during the second quarter of 1994, most of ValuJet's passengers flew on tickets that cost between \$50 and \$99 each way, usually for a round-trip ticket.<sup>33</sup> In comparison, fares charged by the other air carriers for travel between Washington's three airports and Atlanta ranged between \$50 and \$549.

At Dulles, ValuJet's entry into the market for travel between Dulles and Atlanta had a significant impact on the fares charged by Delta, which appeared to have lowered the fares it charged between those airports. As shown in figure IV.1, the distribution of fares on Delta for travel between Dulles and Atlanta shifted substantially in favor of lower fares after ValuJet began its operations.<sup>34</sup> Because Delta offered more seats at prices matching some of ValuJet's lower fares, the fares generally charged to leisure passengers, Delta's passenger levels at lower fare levels dramatically increased from approximately 11,700 to 29,000 passengers per quarter (or about 130 to 320 per day) for fares between \$50 and \$199. In contrast, the impact of ValuJet's entry on the number of passengers traveling at the more expensive fares, those between \$300 and \$399 each way, did not change substantially. These lower fares also resulted in a greater number of passengers traveling between Dulles and Atlanta, an increase from 54,220 (about 593 passengers per day) to 94,950 passengers (about 1,038 per day).

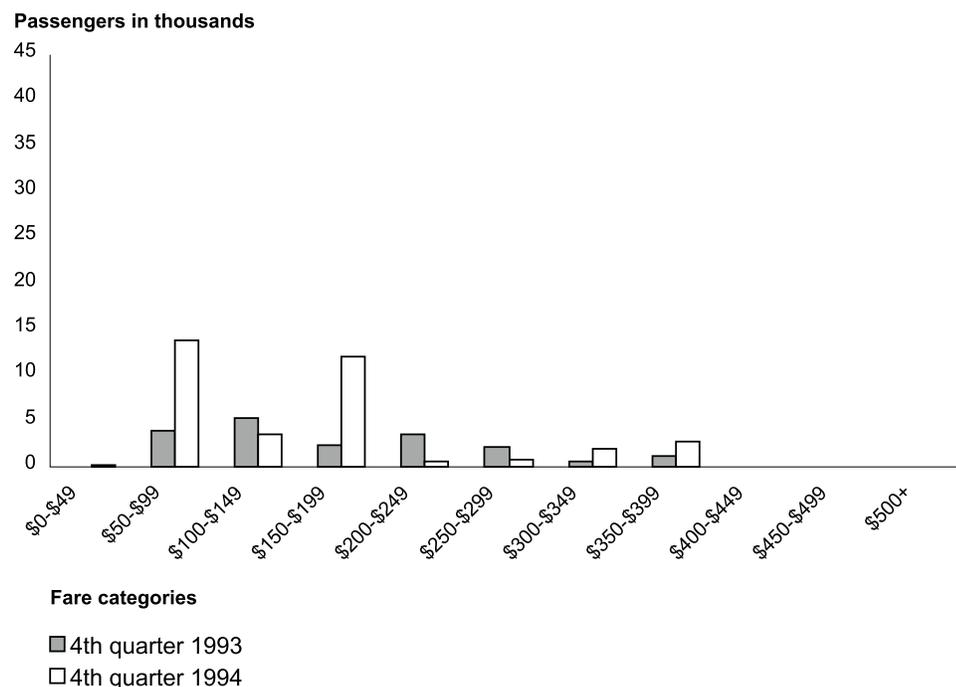
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<sup>33</sup>These fares are based on round-trip and one-way itineraries and are expressed on a one-way basis.

<sup>34</sup>We examined changes in airfares for the period covering 2 quarters before the new carrier's entry through 2 quarters after. In this case, we examined changes in Delta's fares in the fourth quarters of 1993 and 1994. Looking at changes across the same seasonal quarter also helps minimize any changes in airfares associated with seasonality (i.e., comparing traffic and fares during peak summer travel with those during the winter off-season).

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**Figure IV.1: Change in the Distribution of Fares and the Number of Passengers Flying on Delta Between Dulles and Atlanta, Before and After, ValuJet's Entry Into the Dulles-Atlanta Market**



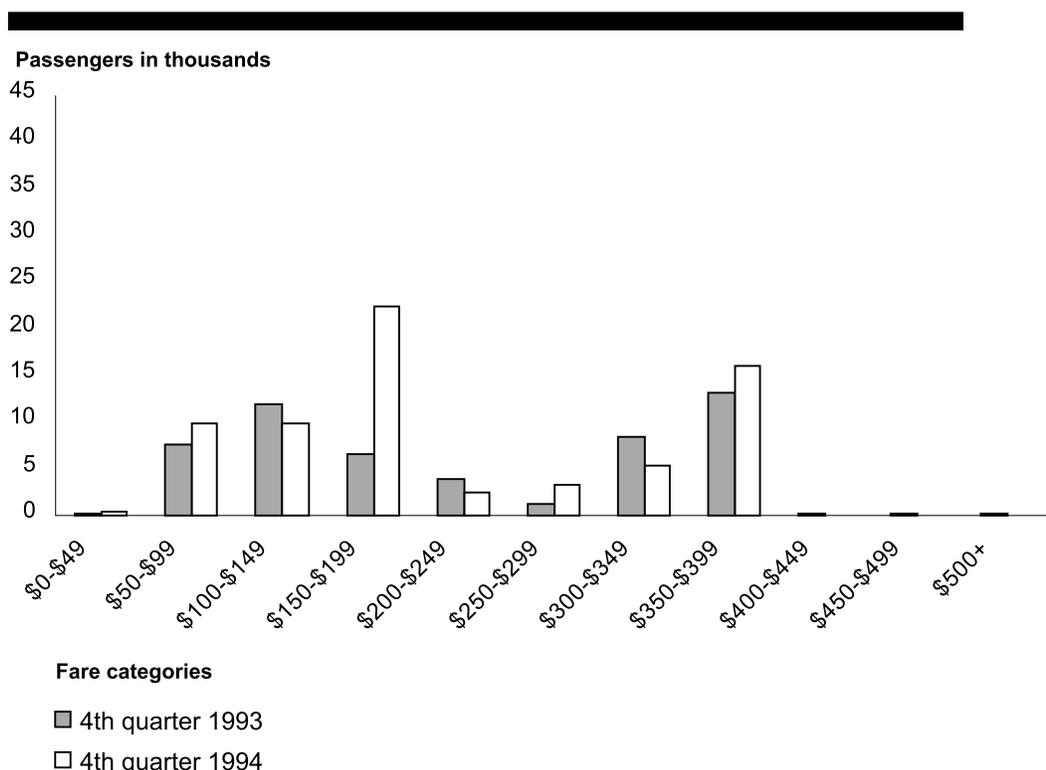
Note: To ease comparisons on the total number of passengers among the three airports, we used the same scale showing the number of passengers for each airport.

Source: GAO's analysis of DOT's data.

ValuJet's offering low fares in the market between Dulles and Atlanta had a similar, but more modest effect on fares and passenger traffic between Reagan National and Atlanta. The distribution of fares that Delta charged for travel between Reagan National and Atlanta changed only slightly in response to ValuJet's entry at Dulles. As figure IV.2 shows, the only substantial change was an increase in the number of passengers, from 6,600 passengers per quarter to nearly 22,500 per quarter, paying between \$150 and \$199 to travel between Dulles and Atlanta. This increase took place in a fare category whose prices exceeded the \$50 to \$99 charged by ValuJet for the same route. For the \$50 to \$99 fare category at Reagan National, the increase in the number of passengers was quite moderate—an increase of 7,600 to 9,900 passengers. In contrast, over the same time period, the number of the more expensive business tickets sold

changed only slightly. Part of Delta's increased passenger loads may be attributable to TWA's dropping service between Reagan National and Atlanta during 1994.

**Figure IV.2: Change in the Distribution of Fares and Number of Passengers Flying on Delta Between Reagan National and Atlanta, Before and After ValuJet's Entry Into the Dulles-Atlanta Market**

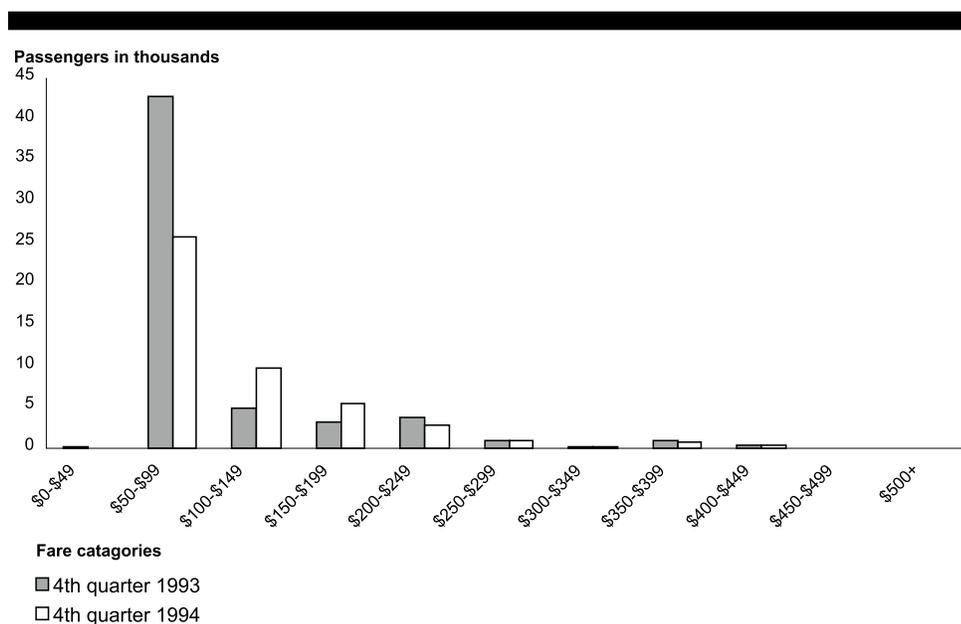


Source: GAO's analysis of DOT's data.

After ValuJet's entry at Dulles, the number of BWI passengers traveling in the lower fare category—\$50 to \$99—fell significantly, even though Delta did not reduce its total capacity in the market. As seen in figure IV.3, the number of low-fare passengers in this category decreased from about 43,000 to about 26,000. Thus, it appears that passengers who had been traveling on low fares between BWI and Atlanta switched to Dulles. However, the distribution of fares generally paid by business passengers remained largely unchanged by ValuJet's entry at Dulles. US Airways (then USAir) also served the route between BWI and Atlanta. After ValuJet began

service at Dulles, the distribution of fares paid by passengers on US Airways remained largely unchanged.

**Figure IV.3: Change in the Distribution of Fares and Number of Passengers Flying on Delta Between BWI and Atlanta, Before and After ValuJet's Entry Into the Dulles-Atlanta Market**



Source: GAO's analysis of DOT's data.

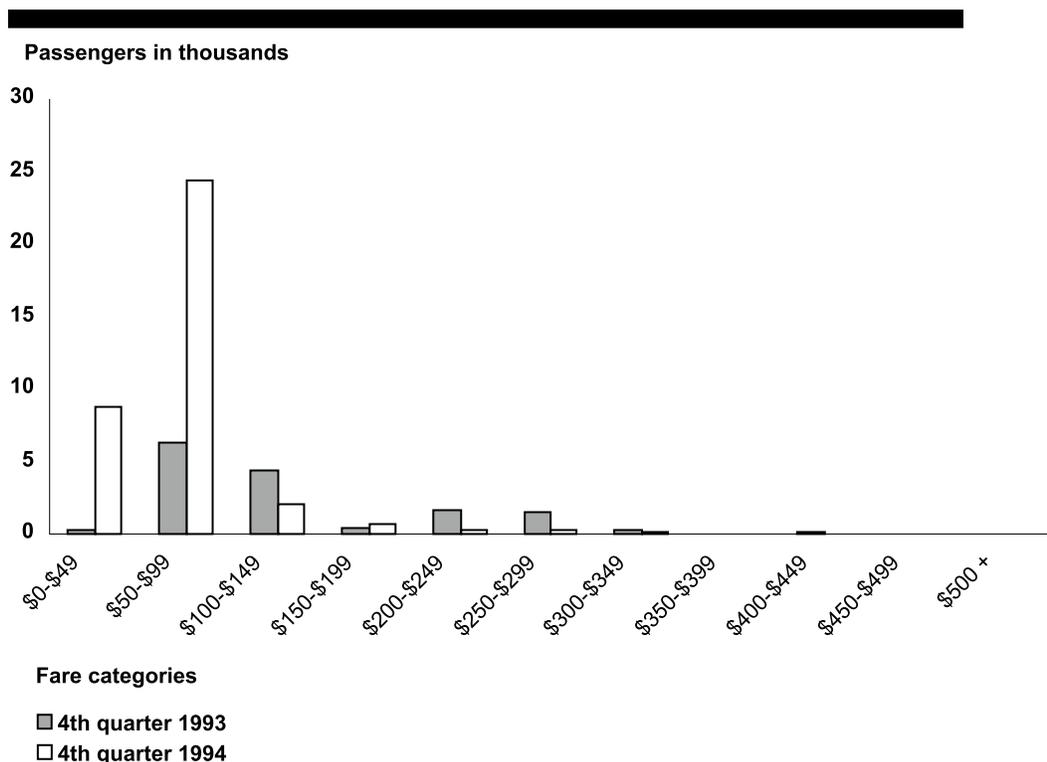
## Southwest's Service Between BWI and St. Louis Suggests That Reagan National, Dulles, and BWI Are Substitutes for Leisure Passengers but Not for Business Passengers

Southwest's entry into the market between BWI and St. Louis demonstrated that many leisure passengers apparently were willing to go to BWI to obtain the low fares available there rather than continuing to use Reagan National. Southwest began service between BWI and St. Louis during the second quarter of 1994. Before Southwest began service between BWI and St. Louis, TWA and US Airways served that route. Between the fourth quarter of 1993 and the fourth quarter of 1994, the total number of passengers flying between Baltimore and St. Louis grew from under 30,000 to over 80,000 (an increase of over 174 percent).<sup>35</sup> By the fourth quarter of 1994, Southwest carried nearly 31,000 passengers between BWI and St. Louis (almost 340 per day, each way), each of whom paid between \$50 and \$99 each way.

<sup>35</sup>A year before Southwest's entry on this route, the BWI-St. Louis market ranked as the 624<sup>th</sup> largest U.S. domestic city pair, with approximately 25,000 passengers per quarter (nearly 280 passengers per day). One year after Southwest entered the market, it was the 147<sup>th</sup> largest market, with about 106,000 passengers flying that quarter (nearly 1,200 per day).

As shown in figure IV.4, the new service by Southwest changed both the competition in the BWI—St. Louis market and the distribution of fares. US Airways, which carried about 4,900 passengers (or about 54 per day) on that route in the third quarter of 1993, dropped its service. TWA, which carried more than three times as many passengers than US Airways during the same quarter, matched some of Southwest's fares and the number of passengers traveling at low fares increased dramatically. Prior to Southwest's entry, TWA carried about 6,500 passengers per quarter (slightly more than 70 per day) at fares of less than \$100 each way during the fourth quarter of 1993. One year later, during the fourth quarter of 1994, the number of passengers traveling on TWA at fares of less than \$100 increased to over 33,000 per quarter (about 365 per day). Some of that increase is likely attributable to TWA's increasing its capacity (measured by the amount of available seats, reflecting either an increase in flight frequency or the use of larger aircraft) between BWI and St. Louis by almost 50 percent over the period. On the other hand, the number of passengers paying high fares declined. The number of passengers paying between \$200 and \$299 declined from more than 3,100 per quarter (about 34 per day) to about 500 per quarter (about 6 per day).

**Figure IV.4: Change in the Distribution of Fares and Number of Passengers Flying on TWA Between BWI and St. Louis, Before and After Southwest's Entry Into the BWI-St. Louis Market**

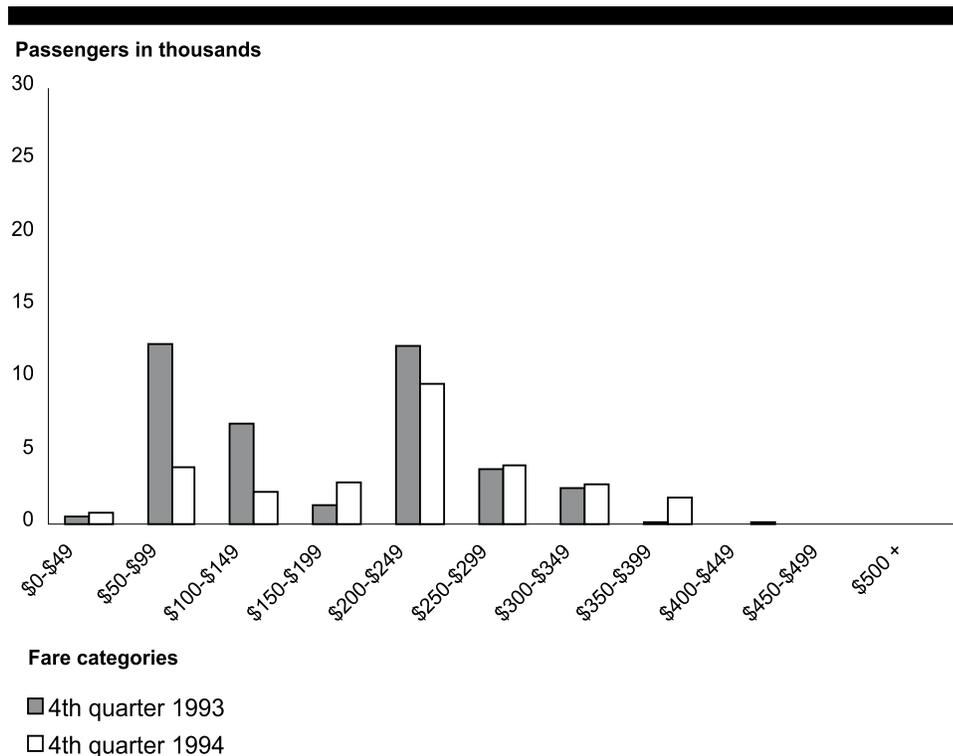


Source: GAO's analysis of DOT's data.

Southwest's service between BWI and St. Louis affected the distribution of fares paid for nonstop service offered by TWA between Reagan National and St. Louis, especially for lower fares typically paid by leisure travelers. As shown in figure IV.5, the number of passengers paying between \$50 and \$149 at Reagan National declined from about 19,000 per quarter (about 211 per day) to about 6,000 per quarter (about 66 per day), despite TWA's adding more than 20 percent in capacity in the market. These passengers likely switched to the low-fare service being offered between BWI and St. Louis—as described earlier, the number of passengers flying at fares less than \$100 each way increased dramatically after Southwest began its service. Thus, many of the passengers who paid low fares—generally leisure passengers—were willing to go to BWI for the lower available fares rather than continuing with TWA's somewhat higher fares at Reagan National. In contrast, the number of higher-fare passengers traveling

between Reagan National and St. Louis (those traveling for fares between \$200 and \$299 each way) declined only marginally during the period. As a result, we conclude that these passengers—who are likely to be business passengers—were not willing to substitute BWI for Reagan National.

**Figure IV.5: Change in the Distribution of Fares and Number of Passengers Flying on TWA Between Reagan National and St. Louis, Before and After Southwest's Entry Into the BWI-St. Louis Market**

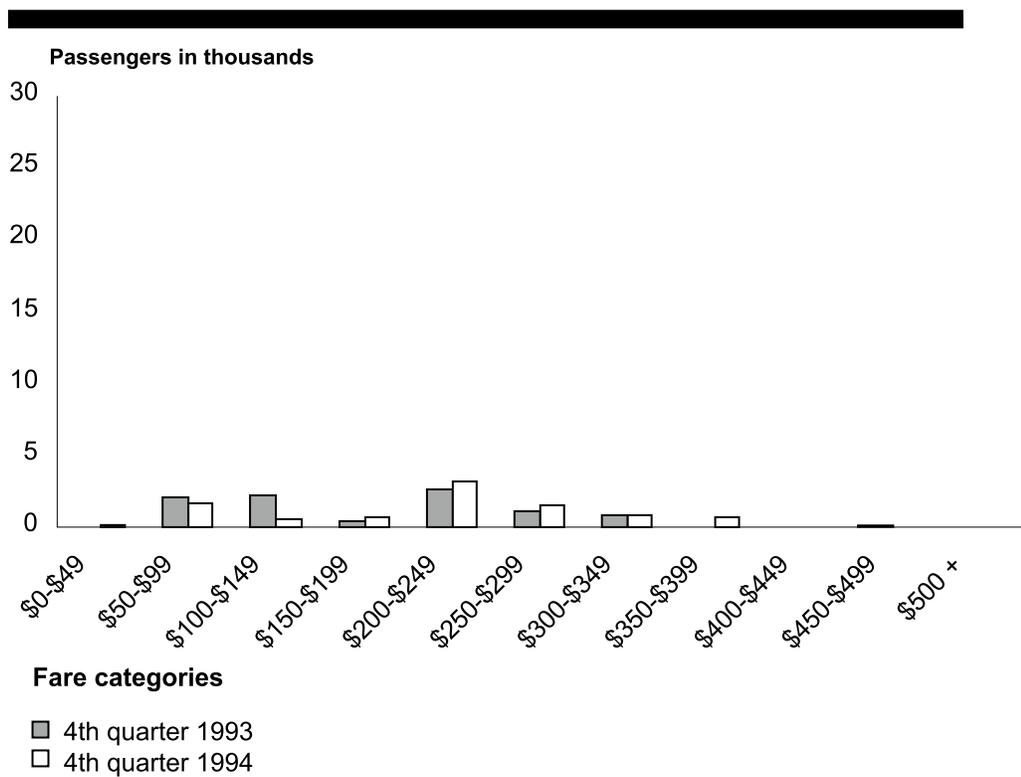


Source: GAO's analysis of DOT's data.

The change in the distribution of passengers and fares paid for service between Dulles and St. Louis is similar to the change observed on service between Reagan National and St. Louis, although the number of passengers traveling between Dulles and St. Louis is much smaller. As shown in figure IV.6, the number of passengers paying low fares declined modestly. The number of passengers paying between \$50 and \$149 each way declined from roughly 4,100 during the fourth quarter of 1993 (under 50 per day) to about 2,200 during the same quarter of 1994 (less than 25

per day). Over the same period, TWA also increased its capacity between these two airports by roughly 16 percent. This shows some willingness on the part of low-fare passengers to switch from Dulles to BWI. In contrast, there is little evidence that high-fare passengers are willing to switch. In fact, the number of passengers paying more than \$150 each way increased.

**Figure IV.6: Change in the Distribution of Fares and Number of Passengers Flying on TWA Between Dulles and St. Louis, Before and After Southwest's Entry Into the BWI-St. Louis Market**



Source: GAO's analysis of DOT's data.

An academic study of Southwest's service from BWI to Cleveland and Chicago Midway airports is consistent with our analysis.<sup>36</sup> That analysis of the effect that Southwest's entry into those markets had on passenger traffic and fares from Reagan National and Dulles showed that Southwest's entry stimulated significant new passenger traffic and lowered fares at BWI and had smaller, less uniform effects at Reagan National and Dulles.

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## **Western Pacific's Service Between Dulles and Denver Suggests That New Long-Haul Service at Dulles Had Little Effect on Passengers' Preferences for Reagan National or BWI**

Western Pacific Airlines was a small, low-cost carrier offering service between Dulles and Colorado Springs, which was initially its main base of operations. In 1997, Western Pacific moved its base of operations to Denver, which is also a hub for United Airlines (United). Because Western Pacific moved its operations to Denver, its nonstop service between Dulles and Denver competed directly with United Airlines' nonstop service between those two airports and potentially competed with nonstop service between BWI and Denver. There is no nonstop service between Reagan National and Denver because Denver is outside Reagan National's perimeter. Western Pacific has since ceased its operations.

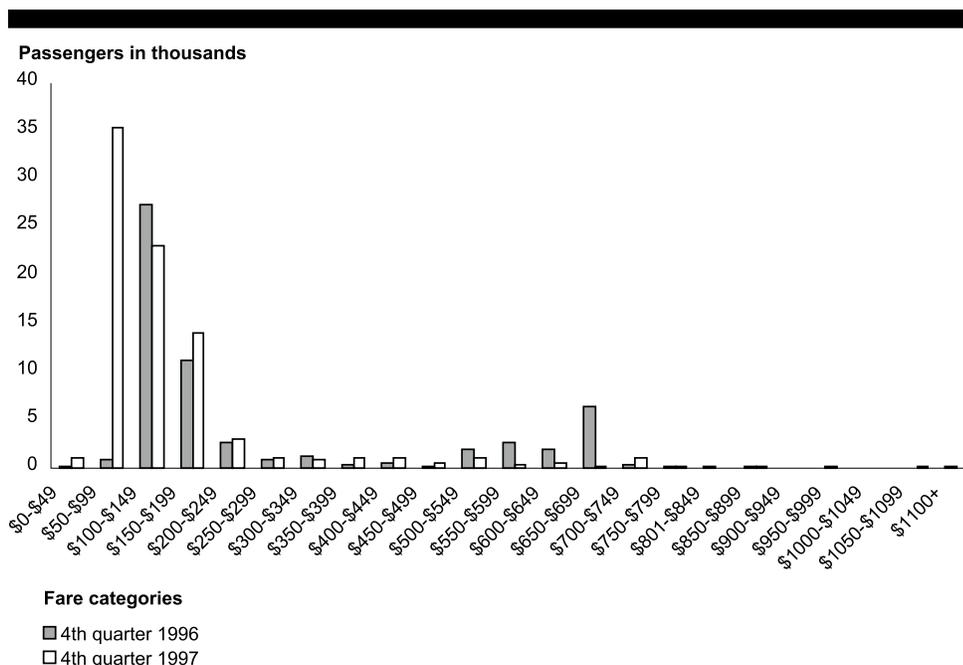
The new service offered by Western Pacific between Dulles and Denver changed the fares charged by United. United carried substantially more passengers at low fares after Western Pacific moved its operations to Denver than it had carried before. As shown in figure IV.7, during the fourth quarter of 1996, United carried approximately 41,000 passengers (about 450 per day) at fares between \$100 and \$249 each way. After Western Pacific's move, United carried about 73,000 passengers (about 800 per day) in the same price range. United made this change in fares with only a minor (about 2 percent) increase in its total capacity on this route. The presence of Western Pacific also substantially reduced the number of passengers paying high fares of between \$500 and \$699 each way. Prior to Western Pacific's service to Denver, United carried about 13,000 passengers per quarter (about 140 per day) at those higher fares, but that figure dropped to about 2,400 (less than 30 per day) after Western Pacific's move.

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<sup>36</sup>Dresner, Martin, Jiun-Sheng Chris Lin, and Robert Windle, "The Impact of Low-Cost Carriers on Airport and Route Competition," *Journal of Transport Economics and Policy*, Sept. 1996, pp. 309-328. The study concluded that Southwest's entry into the Cleveland market had no apparent effect on passenger traffic between Reagan National or Dulles and Ohio, but that its entry into Chicago's Midway Airport may have had some effect on prices between Reagan National and Illinois. While the methodology of this study was somewhat different than our methodology, the basic conclusion is the same—the introduction of new service did not substantially change the traffic at other area airports. The authors noted that the decline in fares between Reagan National and Illinois followed the decline at BWI by 9 months, and may have been triggered by an unusually steep decline in passenger traffic at the airport during the end of 1993 and beginning of 1994.

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**Figure IV.7: Change in the Distribution of Fares and Number of Passengers Flying on United Between Dulles and Denver, Before and After Western Pacific's Entry Into the Dulles-Denver Market**

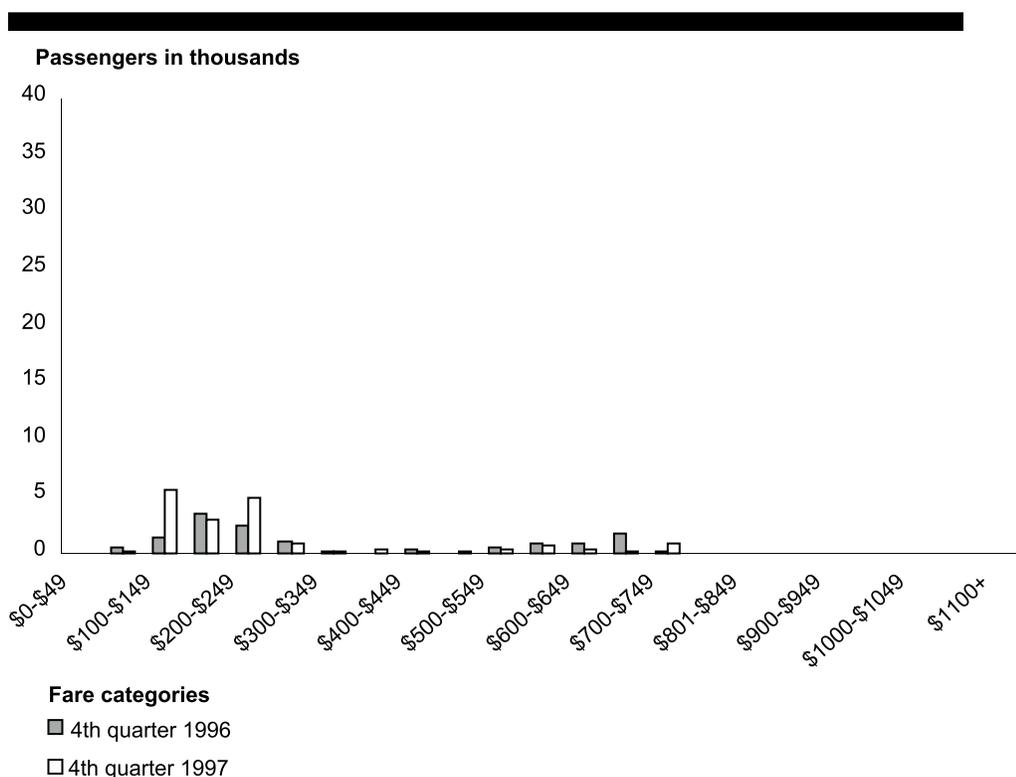


Source: GAO's analysis of DOT's data.

Western Pacific's service between Dulles and Denver had an effect on some leisure and business fares for travel between BWI and Denver. In addition, the total number of passengers traveling between Dulles and Denver increased substantially. As shown in figure IV.8, after Western Pacific began its service, United carried more passengers between BWI and Denver. The number of passengers paying fares between \$100 and \$249 each way increased from about 7,200 (about 80 per day) to about 13,500 (nearly 150 per day) from the fourth quarter of 1996 to the same period in 1997. This may be because United increased the number of available low-fare seats between BWI and Denver to be more comparable with the number available between Dulles and Denver. As at Dulles, United added very little capacity to the route, increasing its number of available seats by less than 3 percent. As such, it is evident that BWI and Dulles are partial substitutes for leisure traffic. Because of the lower fares between BWI and Denver, there was a decrease in the number of passengers paying relatively high fares. The number of travelers paying fares between \$600 and \$749 declined from about 2,700 (about 30 per day) to about 1,610 (less

than 18 per day) per quarter. However, because the number of passengers paying high fares for flights between Dulles and Denver also fell during this period, we conclude that the decline in the number of high-fare passengers occurred because those passengers were able to take advantage of the additional competition to pay lower fares at their preferred airport rather than switching from one airport to another.

**Figure IV.8: Change in the Distribution of Fares and Number of Passengers Flying on United Between BWI and Denver, Before and After Western Pacific's Entry Into the Dulles-Denver Market**



Source: GAO's analysis of DOT's data.

In addition to assessing the impact of Western Pacific's new nonstop service at Dulles on other nonstop service from the Washington, D.C., area, we assessed the effect that this new service had on the number of passengers and fares that used connecting service. We did so because the perimeter rule precludes any nonstop service between Reagan National and Denver. We found that, prior to Western Pacific's entry, relatively few

passengers took connecting flights from the Washington, D.C., area to Denver. Approximately 25 percent of all Washington-Denver traffic took connecting flights, while the vast majority flew nonstop between Dulles or BWI and Denver. Most of those who took connecting flights did so from Reagan National, and most of them flew at relatively low fares. After Western Pacific began its service, the number of passengers on connecting flights at relatively low fares for travel between Reagan National and Denver increased by about one-third, while the number of passengers on connecting flights at relatively low fares for travel between BWI or Dulles and Denver decreased by similar percentages. We did not find that Western Pacific's low-fare service caused any shift in the airports used by travelers making connections.

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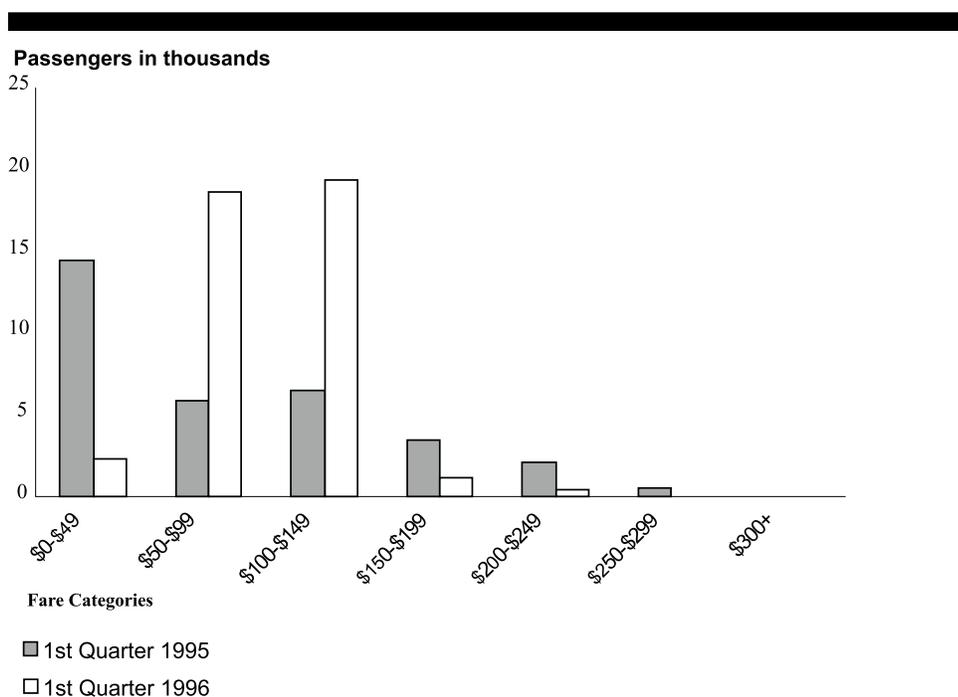
## **Midway's Service Between Reagan National and Raleigh-Durham Suggests That Passengers Do Not Treat Reagan National, Dulles, and BWI as Substitutes**

Our analysis of the effect that Midway had on fares for travel between the three Washington, D.C., area airports and Raleigh-Durham, North Carolina, did not suggest that passengers are willing to change airports to obtain different service or fares. Midway began operations in November 1993 at Midway Airport in Chicago. In March 1995, it moved its hub to Raleigh-Durham. It began serving several routes, mainly in the eastern United States, that were being dropped by American Airlines (American). One of these routes was between Reagan National and Raleigh-Durham. (American dropped its service between Raleigh-Durham and BWI at the end of 1994 and its service between Raleigh-Durham and Reagan National in the second quarter of 1995.) Although Midway is not considered to be a low-fare airline like the other new entrant airlines whose experience we examined, we included it in our analysis because its initiating service at Reagan National was the only such event during the 1990s.

Unlike the other entry events that we examined, Midway did not enter the market with substantially lower fares than American had been charging. Midway carried about the same number of passengers at each fare level as American had carried before eliminating its service between Reagan National and Raleigh-Durham, although Midway carried a somewhat higher number of passengers at lower fares. For example, in the first quarter of 1995, American carried 43 percent of its Reagan National-Raleigh-Durham passengers at fares of between \$100 and \$149 each way. In the first quarter of 1996, Midway carried 47 percent of its passengers for the same amount. As shown in figure IV.9, US Airways carried more passengers between Reagan National and Raleigh-Durham at fares of between \$50 and \$149 than it had before the service provided by Midway replaced the service provided by American. US Airways had not

significantly increased its capacity on that route between the first quarters of 1995 and 1996. It appears instead that US Airways made more seats available at those fares. We do not believe that the increase US Airways experienced is related to Midway's replacing American on that route. Rather, we believe that Midway generally gained its passenger traffic from former American passengers.<sup>37</sup>

**Figure IV.9: Change in the Distribution of Fares and Number of Passengers Flying on US Airways Between Reagan National and Raleigh-Durham, Before and After Midway's Entry Into the Reagan National-Raleigh-Durham Market**



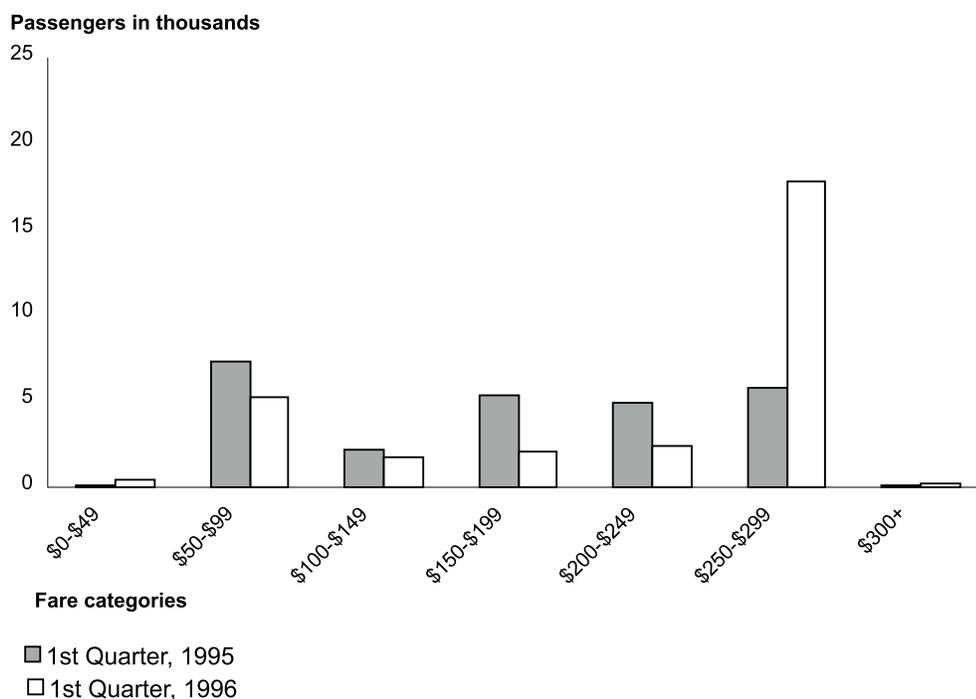
Source: GAO's analysis of DOT's data.

The service offered by Midway between Reagan National and Raleigh-Durham had little impact on the number of passengers or the fares that they paid for travel between BWI and Raleigh-Durham, suggesting that travelers did not treat Reagan National and BWI as substitutes. Figure IV.10 shows the number of passengers and the fares that they paid for travel between BWI and Raleigh-Durham before and after Midway began its service at Reagan National. The greatest difference is the large increase in the number of passengers paying between \$250 and \$299 each way, which

<sup>37</sup>Midway also has a frequent flyer program relationship with American.

was most likely caused by the exit of American Airlines. This increase is largely offset by a decrease in the number of passengers paying lower fares. However, the modest decrease in passengers paying low fares does not indicate that Midway's new service caused any shift of traffic from BWI to Reagan National. Although this change in passenger traffic suggests that passengers did not treat these airports as substitutes, the change in the number of passengers and the fares they paid could also be explained by the fact that Midway's entry did not substantially lower the fares that other airlines charged for service between Reagan National and Raleigh-Durham.

**Figure IV.10: Change in the Distribution of Fares and Number of Passengers Flying on US Airways Between BWI and Raleigh-Durham, Before and After Midway's Entry Into the Reagan National-Raleigh-Durham Market**



Source: GAO's analysis of DOT's data.

Because there was no nonstop service from Dulles to Raleigh-Durham, we could not measure whether passengers would view those airports as substitutes.

# Comments From the Metropolitan Washington Airports Authority and Our Evaluation

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



## METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

44 Canal Center Plaza → Alexandria, Virginia 22314-1562

August 16, 1999

Mr. John Anderson  
Director, Transportation Issues  
United States General Accounting Office  
Washington, D.C. 20548

Dear Mr. Anderson:

Thank you for providing the Metropolitan Washington Airports Authority (Airports Authority) with a draft of the Report entitled, "Reagan National Airport: Airport Has Capacity to Handle Some Additional Flights."

We have reviewed the Report and have the following comments:

- The report addresses what it seems to regard as an inconsistency of the High Density Rule and the Perimeter Rule with airline deregulation. As a purely legal matter, neither the slot rule nor the perimeter rule is inconsistent with the Airline Deregulation Act. The courts have upheld National's and LaGuardia's perimeter as legitimate exercises of airport proprietor's rights in the face of deregulation act challenges. Further, aspects of the High Density Rule and the Perimeter Rule for National are also federal statutes. The Report, while emphasizing the benefits of deregulation, does not address the policies underlying the federal laws that established the restrictions on National and the balancing of interests struck by those previous legislative efforts. We believe that the Report should more clearly emphasize that the GAO approached this report as a technical airport capacity analysis, and that it did not attempt to analyze the environmental concerns which are of such interest to many and which form the counterbalance to the issues which GAO did probe.

See comment 1.

- The Report continues to rely on "balanced capacity" (a technique that blends IFR and VFR capacity to develop a theoretical airport capacity number) and then compares that to the High Density Rule. The limits in the High Density Rule are purely an expression of IFR capacity, not a blend. The Rule, of course, includes mechanisms that relax the limits when VFR conditions exist, a mechanism primarily useful to General Aviation. If you use a blend of each (i.e., an average of IFR and higher VFR capacity) the result will, of course, be a higher number than the IFR capacity alone. But it is not correct to conclude, or cause the readers of this Report to conclude, that the IFR capacity of National is higher than the capacity in the High Density Rule or to conclude that the

See comment 2.

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IFR capacity can be increased because the VFR capacity or a blend of VFR and IFR capacity is higher.

- On page 10, the Report acknowledges the Airport's limitations, but the first draft we reviewed contained the sentence, "...if Reagan National's slot rule were eliminated, the Airport's infrastructure would allow a relatively modest increase in total hourly operations before encountering major delays or disruptions." The revised draft does not contain that sentence, instead it states, "...Should the slot rule be eliminated, the demand for air service could exceed the Airport's balanced capacity for 10 hours each day and delays would be much greater." The revised draft is stating that delays would be "much greater" when the balanced capacity of 67 is exceeded. While the Report acknowledges that there will be demand that exceeds balanced capacity, it understates the delay. Delay will occur at or below balanced capacity not just when it is exceeded. As stated above, this entire approach fails to acknowledge that the High Density Rule deals with IFR capacity, not balanced capacity, and that the rule promotes air traffic efficiency and minimizes delays in instrument conditions. Delays will occur in IFR conditions well below the 67 balanced capacity number, and increasing slots to the balanced capacity will assuredly lead to delays and cancellations in IFR conditions at National.

See comment 3.

- If balanced capacity is to be used, the Report should present FAA's conclusions about the impacts of adding slots in its 1995 Study of the High Density Rule (FAA Report to Congress, May 1995). In this study, FAA analyzed "Dollar Benefits and Costs" and "Operational Delays," and they concluded that adding slots up to balanced capacity at National would produce net losses in terms of dollar benefits to consumers, airlines, and the Airport because the cost of operational delays offset the benefits of new air service. Indeed the Airport benefitted most, more than consumers or the airlines, from the revenue from new slots. (FAA Study, Exhibit 6.9). The FAA Study also concluded that operational delays at National, in terms of average minutes of delay per operation, would nearly triple from 4 - 6 to 12 minutes per operation, on average. In addition, the FAA balanced capacity analysis was performed before the advent of the regional jet in significant numbers. The greater use of National's main runway by regional jets, removing them from the cross wind runways, should reduce the balanced capacity if that analysis was done today. In any event, the delays from increasing slots to balanced capacity are significant.

See comment 4.

- As you noted, we have not performed our own technical capacity analysis, but have expressed generally our sense that a small number of operations an hour could be added to National, in a pure aviation capacity sense. The Report should clearly note that the Airports Authority has not supported an increase because of the policy concerns and

See comment 5.

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has not agreed that such increases would be without operational delay impacts, which, consistent with the earlier "balanced capacity" discussion, would occur in IFR conditions at anything approaching the 36 additional flight level.

See comment 6.

- The Report states that "...current law permits 37 jet flights per hour." It would be more correct to say that the current law limits the scheduling of large air carrier aircraft to 37 an hour. The law also allows "jet flights" to be flown in commuter slots. The Report addresses this in Footnote 3, but the use of "large aircraft" slots may be more accurate.

Now footnote 4.

- On page 5, although stating that Congress elevated the slot and perimeter rules from regulation to federal statute is accurate, the Report does not state that this was an important part of the legislative scheme that allowed the transfer of the airports to occur. The statement that the 1986 Act transferred the airports is not correct; it authorized the transfer to Virginia and the District of Columbia if conditions were met. Actually, a lease agreement transferred the airports in June 1987, and, it should be noted, one of the conditions in the lease is a covenant by the Authority that it will not change the High Density Rule. This was part of the overall agreement by all parties to the lease that there would not be an increase in the large aircraft operations at National.

See comment 7.

- On page 7, the passenger data is incorrect. For the 12 months ending June 30, 1999 the numbers of actual passengers are:

See comment 8.

National	<b>15,646,452</b>
Dulles	<b>17,846,518</b>
BWI	<b>16,258,412</b>

Any projection of passengers, working from current data, would clearly show Dulles with greater numbers than in Figure 2 of the Report. Additionally, we can't imagine anyone, starting from where we are, projecting BWI with more passengers than Dulles, at least not in the near term. Such an approach completely misses what has occurred throughout the year at Dulles.

See comment 9.

- Page 12, Footnote 19 is misleading. Under the preferential lease, the leaseholder airline has preference over other users for its schedule. It is not an exclusive lease or a "use or lose" lease to which the concept of "full use" applies. The reference to subleases in the text is also misleading as it implies that the tenant airline can control access to gates by subleases. The text should note that the tenant airline cannot refuse to allow another airline to use the gate space when the tenant is not using it. The sublease may be the usual vehicle, but unless the sub-lessee is also acquiring services from the tenant carrier the tenant airline cannot pose an obstacle to the use of the gate. The text on the

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bottom of page 12 to 13 seems to imply fault with the fact that the gates are being heavily used by the tenants and therefore not available to new entrants. The Report correctly notes that Airport officials will work with incumbents to ensure that a new entrant wishing to serve the Airport (who has obtained the necessary slots) can do so. Also, in the Report, GAO cites the 3-year reallocation provision of the Use Agreement. The Report should not leave the impression that the Airport deals with this every 3 years. Access is addressed whenever the issue arises, and the reallocation opportunity is only one of several provisions available to bring about access to new airlines that have acquired slots at National.

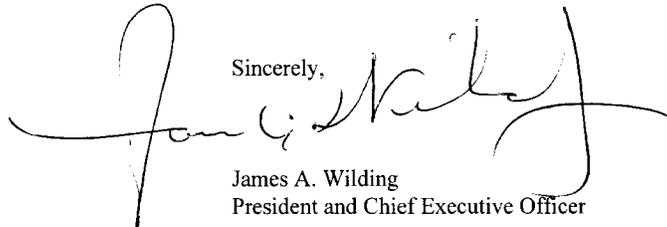
- New Footnote 26: The revised language more accurately addresses the retiming of slots. The law, 49 U.S.C. 41714 (d), allows for a limited retiming of no more than 2 slots an hour. The total number of slots between 7 a.m. and 10 p.m. must remain the same even if there are retimed slots. Therefore, the statement that Midwest Express has retimed two slots from the 9 p.m. hour and will, in December 1999, receive the 2 remaining slots in the 9 p.m. hour would be correct if that does not have the effect of increasing the total number of slots between 7 a.m. and 10 p.m.

- Page 19. It is correct that the Authority has been able to accommodate airlines at National provided, of course, that they obtained the slots.

In summary, to the extent that the overall thrust of this Report is that National Airport can physically support a modest number of additional flights, we would not disagree. We are, however, on the low side of the number in the Report, and reiterate that our reasons for wanting to continue limits on the growth of National do not directly stem from the Airport's technical capacity to handle more flights, but rather from policies important to the operation of the region's airports. The Report should also acknowledge that it has not evaluated the policies underlying these longstanding limitations. Finally, we are pleased that the Report accepts that National Airport does have its limitations, but the use of "balanced capacity" to reach a conclusion about IFR capacity at National is, in our view, a flawed approach. An increase in slots even approaching 67 will cause operational delays that are not beneficial and are avoided today.

Thank you for sharing the draft Report with us. I hope that these comments are helpful.

Sincerely,



James A. Wilding  
President and Chief Executive Officer

The following are GAO's responses to the Metropolitan Washington Airports Authority's (MWAA) August 16, 1999, letter.

1. As we have reported in the past, operational barriers such as slot and perimeter rules impede airline competition—the goal of the industry's 1978 deregulation. In this report, we clearly state that the report was done to examine the impact of various legislative proposals on the operations of the Washington, D.C., area airports and not to assess any underlying policies. We agree that the draft report could have more clearly stated that it is not intended to analyze the potential effect of changes in operations at Reagan National on noise, congestion, and other environmental concerns, and we made appropriate changes.

2. We believe, as does DOT, that “balanced capacity” is a more appropriate method for determining an airport's capacity than the method suggested by MWAA. While MWAA contends that Instrument Flight Rules (IFR) should be used to measure capacity, DOT's Technical Supplement No. 3 to its 1995 report<sup>38</sup> points out that IFR airfield capacity is indicative of the lowest level of available capacity, and thus virtually ensures constant availability of an airfield.<sup>39</sup> In practice, this approach would leave large amounts of airfield capacity unused because a significantly higher capacity could be achieved during the better weather conditions under which Visual Flight Rules apply.<sup>40</sup> According to data from FAA, less than 0.5 percent of all air traffic operations at Reagan National in 1998 were delayed because of weather conditions. Because setting the number of slots on the basis of balanced capacity reflects both bad and good weather conditions, we did not revise our report.

3. By limiting its comments to how delays would change in IFR conditions, MWAA suggests that the prevailing weather conditions at Reagan National require IFR operations every day. However, as noted earlier, FAA data show that less than 0.5 percent of all air traffic operations at Reagan National in 1998 were delayed because of weather conditions. We do not agree that we understated the potential delay caused by weather, having noted in the report that delays of 15 minutes or more could increase. Furthermore, we

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<sup>38</sup>U.S. DOT, *Report to the Congress: A Study of the High Density Rule*, May 1995.

<sup>39</sup>Instrument Flight Rules govern procedures for conducting aircraft operations during weather conditions when the cloud ceiling is less than 1,000 feet and/or visibility is less than 3 miles, requiring certain aircraft separations and other operating standards.

<sup>40</sup>Visual Flight Rules govern procedures for conducting aircraft operations when the cloud ceiling is more than 1,000 feet and visibility is 3 miles or more. Airport capacity under these conditions is generally significantly higher than under conditions under Instrument Flight Rules.

clearly indicate how delays would increase if the slot rule were eliminated. Thus, we did not revise our report.

4. MWAA correctly notes that the DOT study estimated that adding seven additional slots per hour would result in an overall net loss and an increase in delays. The DOT study points out, however, that consumers would benefit from additional flight services and that the airport would benefit from an increase in landing fees, even as the airlines would experience a net loss because of delays. MWAA also correctly notes airlines' increasing use of regional jets. However, FAA and DOT do not believe that this change alters their calculations of Reagan National's balanced capacity. Thus, we did not revise the report.

5. We do not believe our report implies that MWAA supports an increase in operations. Rather, the report acknowledges MWAA's recognition that the airport could accommodate additional flights.

6. MWAA correctly notes that federal law permits airlines to operate small jet aircraft (that is, "regional jets") in commuter slots. However, we do not believe that clarification is necessary in response to this comment. A footnote in our report explains that we considered both regional jets and turboprop aircraft seating fewer than 56 passengers to be commuter aircraft, and that we considered aircraft seating 56 passengers or more (that is, "large aircraft"), most of which are not turboprops, to be jets. Large aircraft are not permitted to use commuter slots.

7. MWAA correctly notes that the transfer of Reagan National and Dulles airports from federal to local authority did not take place immediately upon the passage of the Metropolitan Washington Airports Act of 1986. Rather, that act led to the transfer of authority in June 1987. We modified our report in response to this comment.

8. We used actual and projected data that were the most currently available from FAA at the time of our work. In addition, data submitted by the airlines to DOT indicate that, in 1998, BWI handled more passengers than Dulles, and nearly as many as Reagan National. Thus, we continue to believe that these data are valid and made no change to the report.

9. MWAA notes that preferential gate use at Reagan National is not a "use-or-lose" concept. In response, we clarified the narrative. Also in response to MWAA, we revised the report to clarify that a tenant airline may not prevent a new entrant from gaining access to a gate when the gate is

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**Appendix V  
Comments From the Metropolitan  
Washington Airports Authority and Our  
Evaluation**

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not being used and that MWAA could reallocate gates at any time, not just during the formal reassessment periods that take place every 3 years.

# GAO Contacts and Staff Acknowledgments

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## GAO Contacts

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## Acknowledgments

In addition to those named above, Sonja Bensen, Stephen Brown, Aaron Casey, David Hooper, Joseph Kile, and Lewison Lem made key contributions to this report.

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# Related GAO Products

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Airline Deregulation: Changes in Airfares, Service Quality, and Barriers to Entry (GAO/RCED-99-92, Mar. 4, 1999).

Aviation Competition: Effects on Consumers From Domestic Airline Alliances Vary (GAO/RCED-99-37, Jan. 15, 1999).

Aviation Competition: Proposed Domestic Airline Alliances Raise Serious Issues (GAO/T-RCED-98-215, June 4, 1998).

Domestic Aviation: Service Problems and Limited Competition Continue in Some Markets (GAO/T-RCED-98-176, Apr. 23, 1998).

Aviation Competition: International Aviation Alliances and the Influence of Airline Marketing Practices (GAO/T-RCED-98-131, Mar. 19, 1998).

Airline Competition: Barriers to Entry Continue in Some Domestic Markets (GAO/T-RCED-98-112, Mar. 5, 1998).

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**Airline Takeoff and Landing Slots: Department of Transportation's Slot Allocation Rule** (GAO/RCED-86-92, Jan. 31, 1986).

**Deregulation: Increased Competition Is Making Airlines More Efficient and Responsive to Consumers** (GAO/RCED-86-26, Nov. 6, 1985).

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