



November 2020

REAGAN NATIONAL AIRPORT

Information on Effects of Federal Statute Limiting Long- Distance Flights

GAO Highlights

Highlights of [GAO-21-176](#), a report to congressional requesters

Why GAO Did This Study

Reagan National's perimeter and slot control rules were designed in part, respectively, to help increase use of Dulles and manage congestion at Reagan National by limiting the number of flights. On three occasions—2000, 2003, and 2012—federal statutes have provided exemptions to the perimeter rule, collectively allowing 40 daily beyond-perimeter flights (20 round trips) at Reagan National. Of these exemptions, 32 were new beyond-perimeter flights and eight allowed airlines to convert existing slots to beyond-perimeter flights. The Metropolitan Washington Airports Authority (MWAA) operates Reagan National and Dulles, and DOT and the Federal Aviation Administration (FAA) oversee these rules.

GAO was asked to update its past work on the perimeter rule. This report describes (1) the effects of beyond-perimeter flights at Reagan National, and (2) key considerations if additional beyond-perimeter flights are allowed. GAO analyzed DOT data for the most recent 10-year period (2010 through 2019) on passengers and flights at Reagan National and Dulles, and MWAA data on airport capacity at Reagan National in 2019. GAO also reviewed relevant statutes and regulations, and interviewed DOT and FAA officials, and a non-generalizable sample of 32 stakeholders: 9 airlines, 4 airport authorities, 7 academics, 5 associations, 5 community groups, and 2 consumer advocates. Selected airlines included those that operate out of Reagan National or Dulles; other stakeholders were recommended or selected, in part, from prior GAO work and their expertise on the topic.

View [GAO-21-176](#). For more information, contact Heather Krause at (202) 512-2834 or krauseh@gao.gov.

November 2020

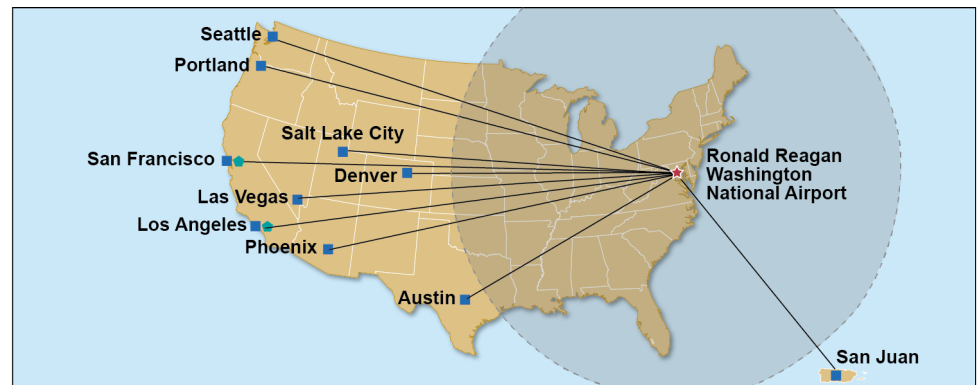
REAGAN NATIONAL AIRPORT

Information on Effects of Federal Statute Limiting Long-Distance Flights

What GAO Found

Airlines serving Ronald Reagan Washington National Airport (Reagan National) are subject to, among other federal operational requirements, (1) a “perimeter rule,” limiting nonstop flights to a distance of 1,250 miles unless there is an exemption, and (2) a “slot” or operating authorization requirement for each takeoff and landing. GAO found that while the 40 daily beyond-perimeter flights to or from Reagan National accounted for about 6 percent of flights and 10 percent of passengers at the airport in 2019, the additional flights may have had some limited effects, including further reducing the airport's landside capacity (e.g., ticketing and gates). GAO's analysis of the Department of Transportation's (DOT) data from 2010 through 2019 showed that airlines used larger aircraft on beyond-perimeter flights carrying, on average, about 75 more passengers than within-perimeter flights. While these larger aircraft may use more capacity, they did not contribute to a substantial increase in flight delays at Reagan National. The beyond-perimeter flights may have also had other effects, such as drawing a few flights and passengers from Washington Dulles International Airport (Dulles).

2020 Beyond-Perimeter Flight Exemptions at Ronald Reagan Washington National Airport



Sources: GAO analysis of Department of Transportation data and Map Resources. | [GAO-21-176](#)

Several factors—existing slot control rules; capacity at Reagan National; and potential effects on noise, other area airports, passengers, and airline competition—should be considered in any decision to modify Reagan National's perimeter rule, according to GAO's prior work and stakeholder interviews. GAO examined these factors under three scenarios: (1) no changes to the current perimeter rule or beyond-perimeter flights, (2) adding a small number of beyond-perimeter flights, and (3) completely lifting the perimeter rule. Many stakeholders who provided a perspective did not support changes to the perimeter rule, citing concerns about increased congestion at Reagan National or drawing passengers from other airports, primarily Dulles. Some stakeholders supported adding a small number of beyond-perimeter flights, citing increased competition if airlines added service to existing routes. No stakeholders supported lifting the perimeter rule, saying it would disadvantage airlines with a small number of flights at Reagan National. Regardless of their position on the rule, many stakeholders said airlines would add beyond-perimeter flights if allowed.

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Abbreviations

ASQP	Airline Service Quality Performance System
BWI	Baltimore/Washington International Thurgood Marshall Airport
COVID-19	Coronavirus Disease 2019
DOT	Department of Transportation
Dulles	Washington Dulles International Airport
FAA	Federal Aviation Administration
MWAA	Metropolitan Washington Airports Authority
Reagan National	Ronald Reagan Washington National Airport
TSA	Transportation Security Administration

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November 24, 2020

The Honorable Ted Cruz
Chairman
Subcommittee on Aviation and Space
Committee on Commerce, Science, and Transportation
United States Senate

The Honorable John Thune
United States Senate

The proximity of Ronald Reagan Washington National Airport (Reagan National) to the Nation’s capital makes it a popular airport for airlines and passengers.¹ As a result, starting in the 1960’s, the federal government placed restrictions on flights at Reagan National to, among other things, help manage congestion and delays at the airport and direct longer flights to Washington Dulles International Airport (Dulles) to spur growth. For example, a federal law—known as the “perimeter rule”—limits non-stop flights serving Reagan National to a distance of 1,250 miles.² Since 2000, three federal statutes have collectively allowed a limited number of exemptions at Reagan National for non-stop flights—40 flights daily, or 20 round-trip flights—to airports more than 1,250 miles from Reagan National. The Department of Transportation (DOT) is responsible for awarding these beyond-perimeter flights to airlines based on criteria established in federal statute. Federal law has directed DOT to consider beyond-perimeter flight exemptions for airlines whose service would, among other things, provide beneficial connecting flights beyond the perimeter; increase competition in multiple markets; not reduce travel options for communities served by small- or medium-hub airports within the perimeter; and not increase travel delays at Reagan National.³

¹Though in law and regulation airlines are generally referred to as “air carriers” and “foreign air carriers,” we generally refer to them as “airlines” in this report.

²49 U.S.C. § 49109.

³49 U.S.C. § 41718. The term “hub” is defined in federal law to identify commercial service airports as measured by passenger boardings. Federal law defines medium-hub airports as those that handle at least 0.25 percent, but less than 1 percent of passenger boardings (49 U.S.C. § 40102(a)(31)) and small-hub airports as those that handle at least 0.05 percent, but less than 0.25 percent of passenger boardings (49 U.S.C. § 40102(a)(42)).

We were asked to update our past work related to the perimeter rule at Reagan National.⁴ This report examines: (1) what is known about the effects of the existing beyond-perimeter flights at Reagan National; and (2) key considerations if additional beyond-perimeter flights are allowed.

To address these objectives, we reviewed federal laws; DOT's and the Federal Aviation Administration's (FAA) regulations; and reports from the Metropolitan Washington Airports Authority (MWAA), which oversees Reagan National and Dulles. We analyzed data collected by airlines and reported to DOT, specifically (1) T-100 data on flights and passengers, and (2) Airline Service Quality Performance System (ASQP) flight delay data from calendar years 2010 through 2019, the most recent 10-year period available at the time of our review.⁵ To assess the reliability of the T-100 and ASQP data, we took several steps, including reviewing relevant quality control procedures, comparing our results to DOT published data, and interviewing DOT officials about how the data were collected and used. We determined that both data sources were sufficiently reliable to describe information on passengers and flights from 2010 through 2019, among other uses.

We also interviewed DOT and FAA officials, as well as a non-generalizable sample of representatives from nine U.S. airlines and 23 stakeholder groups (four airport authorities, seven aviation academics and researchers, five airport or industry associations, five community groups concerned with noise, and two consumer advocates). We selected a range of network and low-cost airlines to include those that operate beyond-perimeter flights to or from Reagan National and have varied market shares at Reagan National, Dulles, or Baltimore/Washington

⁴GAO, *Slot-Controlled Airports: FAA's Rules Could Be Improved to Enhance Competition and Use of Available Capacity*, [GAO-12-902](#) (Washington, D.C., Sept. 13, 2012); GAO, *Reagan National: Update on Capacity to Handle Additional Flights and Impact on Other Area Airports*, [GAO-07-352](#) (Washington, D.C., Feb. 28, 2007); GAO, *Reagan National: Capacity to Handle Additional Flights and Impact on Other Area Airports*, [GAO/RCED-99-234](#) (Washington, D.C., Sept. 17, 1999); and GAO, *Airline Deregulation: Barriers to Entry Continue to Limit Competition in Several Key Domestic Markets*, [GAO/RCED-97-4](#), (Washington, D.C., Oct. 18, 1996).

⁵T-100 data represents a "census" of 100-percent of traffic and passengers for U.S. airlines traveling to, from, or within the U.S. ASQP data includes airlines that meet DOT's annual reporting requirement, based on domestic scheduled-passenger revenue. See appendix I for more information.

International Thurgood Marshall Airport (BWI), among other things.⁶ We selected other stakeholders to include those with oversight responsibilities for Reagan National, Dulles, or BWI, those identified in our background literature search, and those recommended by stakeholders.⁷ In this report, we refer to a “few” stakeholders if representatives from two to three entities expressed the view, “some” if representatives from four to six entities expressed the view, and “many” if representatives from seven or more entities expressed the view. Given stakeholders’ varied expertise, not every stakeholder provided an opinion on every topic.

To understand if Reagan National could accommodate additional beyond-perimeter flights and passengers, we compared FAA’s reports—which reflect the number of operating authorizations (“slots”) held by commercial airline operators—for the summer of 2019 with regulations and statutes on the maximum number of slots allowed per hour at the airport.⁸ We also reviewed calendar year 2019 usage data from MWAA on roadway access and parking; gates and seating areas; and other terminal areas (e.g., baggage facilities). To assess the reliability of usage data, we solicited written responses from MWAA on how the data were collected and used, as well as the agency’s procedures for ensuring the accuracy of the data. In reviewing the information, we determined that MWAA’s usage data for Reagan National were sufficiently reliable to describe the airport’s current capacity. More details about our scope and methodology are presented in appendix I.

We conducted this performance audit from October 2019 to November 2020 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe

⁶In 2019, these airlines accounted for more than 90 percent of flights and passengers at the three airports. Network airlines support large, complex hub-and-spoke operations, which provide service at various fare levels to many destinations. Low-cost airlines generally operate less costly point-to-point service using fewer types of aircraft.

⁷See appendix I for additional information on our literature search, how we selected stakeholders, and a list of stakeholders we interviewed.

⁸49 U.S.C. § 41718 and 14 C.F.R. § 93.123.

that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Three large-hub commercial airports serve the Washington D.C. region.⁹ Reagan National opened in 1941 on the western bank of the Potomac River in Arlington, Virginia. The airport, owned by the federal government, is located about three miles south of downtown D.C. and is accessible by Metrorail. The airport has three runways—including the main runway that is primarily used for commercial aircraft—and two terminals with a total of 44 gates. Dulles is located about 30 miles west of D.C. and accessible via Metro bus, with planned Metrorail access beginning in 2021. Like Reagan National, Dulles is owned by the federal government and operated by MWAAs under a lease agreement, currently running through 2067.¹⁰ Under this lease, MWAAs are responsible for operating, maintaining, and improving both airports. BWI is located about 30 miles northeast of D.C. and 10 miles southwest of Baltimore, and is accessible by rail from both cities. BWI is owned and operated by the State of Maryland through the Maryland Aviation Administration.

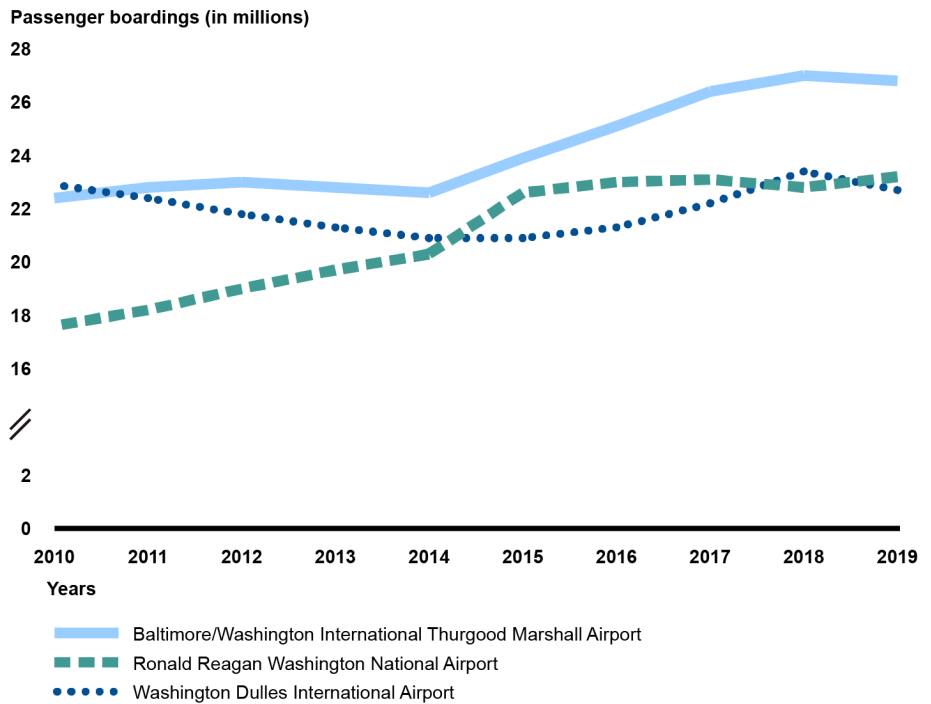
While passenger boardings at Reagan National and BWI have increased over the past decade, they have remained relatively flat at Dulles (see fig. 1). From 2010 through 2019, passenger boardings at Reagan National and BWI increased about 32 percent and 20 percent, respectively. Over that same period, passenger boardings at Dulles declined less than 1 percent. In early 2020, passenger boardings at all three airports declined sharply in response to the Coronavirus Disease 2019 (COVID-19).¹¹

⁹Federal law defines large-hub airports as those with at least 1 percent of total annual passenger boardings. See 49 U.S.C. § 40102(a)(29).

¹⁰The Metropolitan Washington Airports Act of 1986 authorized the transfer of operational authority over Reagan National and Dulles to MWAAs. Pub. L. No. 99-500, title VI, 100 Stat. 1783- 373 (codified as amended at 49 U.S.C. §§ 49101- 49112.)

¹¹Passenger boardings decreased at all three airports in the second quarter of 2020, compared to the same period in 2019. According to T-100 data, passenger boardings decreased by 85 percent at BWI, 92 percent at Reagan National, and 93 percent at Dulles.

Figure 1: Annual Passenger Boardings at Airports Serving the Washington D.C. Area, 2010-2019



Source: GAO analysis of T-100 data. | GAO-21-176

Despite similar numbers of passengers served in 2019, all three airports varied with respect to the number of airlines at the airport, average numbers of daily flights, and destinations served (see table 1). For example, while Reagan National and BWI primarily provide domestic service, more than one-third of passengers at Dulles in 2019 travelled internationally.

Table 1: Profile of Three Airports Serving the Washington D.C. Area, 2019

	Ronald Reagan Washington National Airport	Washington Dulles International Airport	Baltimore/Washington International Thurgood Marshall Airport
Total passenger boardings	23.2 million	22.7 million	26.8 million
Average number of daily flights	786	637	613
Number of airlines operating at airport	20	51	16
Number of non-stop routes	97	144	95
Percentage of passenger boardings to domestic airports	98	65	96

Source: GAO analysis of T-100 data and airport documents. | GAO-21-176

Note: One airline at Ronald Reagan Washington National Airport sells tickets for flights but has other airlines operate those flights on its behalf.

Reagan National is subject to a federal perimeter rule, which since 1986 has limited non-stop flights to a distance of 1,250 miles, unless an exemption is provided in statute.¹² The objectives and distance of the perimeter rule have expanded over time.

- Initially set at 650 miles in 1966 through an agreement between the airlines and the federal government, the perimeter rule was designed to, among other things, provide the “optimum utilization” of Reagan National for airline passengers and general aviation; emphasize Reagan National’s role as a short haul commuter and local service airport; and reduce congestion of passengers, parking and ground facilities to maintain efficient runway operations and improve service to passengers.
- In 1981, the perimeter rule was expanded via FAA rulemakings to 1,000 miles.¹³ At that time, FAA adopted a number of objectives for the perimeter rule, including to provide the D.C. area with safe and efficient airport facilities, reduce aircraft noise and congestion associated with Reagan National, and promote better utilization of Dulles Airport.

¹²The rule was codified in statute in 1986, when the perimeter was set at 1,250 miles. 49 U.S.C. § 49109.

¹³Metropolitan Airports Policy, 46 Fed. Reg. 58036 (Nov. 27, 1981).

Reagan National is also a capacity-controlled airport, meaning that airlines must obtain slots from FAA for every takeoff and every landing.¹⁴ Slot controls have been in place since 1969 to help manage congestion and delay at the airport.¹⁵ FAA allocates slots at Reagan National on a recurring basis for a specific day of the week and hour of the day, and each airline must use its hourly slots collectively at least 80 percent of the time in a fixed, 2-month reporting period (e.g., January-February).¹⁶ Reagan National is limited to a maximum of 67 slots an hour per a combination of regulations and statutes (see table 2). While FAA regulations have established 60 slots per hour for allocation—for air carrier, commuter, and general aviation and unscheduled flights—statutes have established an additional maximum of seven slot exemptions and slot slides per hour.¹⁷ Not all 67 slots can be used for every hour at Reagan National. For example, slot slides allow airlines to allocate up to two slots per hour to be reassigned and used in different hours. However, slot slides cannot increase the total number of slots per day at Reagan National, as an increase in slots for one hour must be offset by a decrease in slots for another hour.

¹⁴See 14 C.F.R. § 93.123. In the U.S., John F. Kennedy International and LaGuardia Airports are also subject to slot controls, which are administered pursuant to FAA orders.

¹⁵High Density Traffic Airports, 34 Fed. Reg. 2603 (Feb. 26, 1969).

¹⁶14 C.F.R. Part 93, subparts K and S. After airlines have been allocated slots or slot exemptions, as long as they comply with the rules, they tend to keep them indefinitely or transfer them to another airline. Airlines consider their slots and slot exemptions to be valuable assets, and FAA has always reserved the right to reclaim slots from airlines.

¹⁷“Slot exemptions,” are slots authorized in statute. Slot exemptions have allowed for additional slots above the 60 hourly limit set forth in regulation for Reagan National under 14 C.F.R. § 93.123 and have allowed airlines to operate beyond the 1,250-mile limit set forth in the statutory perimeter rule. Of the 60 slot exemptions provided in statute, 20 were for new within-perimeter flights; 32 were for new beyond-perimeter flights; and eight were for conversions of air carrier slots in regulation for within-perimeter flights to slots for beyond-perimeter flights (discussed more later). Unless stated otherwise, when we refer to air carrier slots, we are including flights allowed through slot exemptions. Moreover, throughout this report, we also refer to the slot exemptions for flights beyond 1,250 miles as beyond-perimeter flights. Federal statute also permits “slot slides,” which allow airlines to move their scheduled slots to different hourly time slots, subject to DOT approval.

Table 2: Hourly Slots (Takeoffs and Landings) Allowed at Ronald Reagan Washington National Airport, as of 2020

Type of aircraft operations	Maximum number of slots allowed per hour
Air carrier ^a	37
Commuter aircraft operations ^b	11
General aviation and unscheduled flights	12
Slot exemptions ^c	5
Slides (allowing slots to be used in different hours) ^d	2
Total	67

Source: 49 U.S.C. § 41714(d)(1), 49 U.S.C. § 41718(c)(2)(A)(ii), and 14 C.F.R. § 93.123. | GAO-21-176

^a"Air carrier slots" are intended for operations with turboprop and reciprocating engine aircraft with 75 or more seats or turbojet aircraft with 56 or more seats. However, air carrier slots may be used for operations using aircraft of any size. 14 C.F.R. § 93.123(c)(1).

^b"Commuter slots" may be used only for operations with turboprop and reciprocating engine aircraft with a maximum of 76 seats. 14 C.F.R. § 93.123(c)(2).

^c"Slot exemptions" are exemptions, codified in statute and issued by the Office of the Secretary of Transportation, above the 60 hourly slots set in regulation. Statutory exemptions are currently limited to 60 per day, for a maximum of five per hour across 15 hours (7:00 a.m. to 9:59 p.m.). 49 U.S.C. § 41718 (a), (b), (c), and (g).

^d"Slot "slides," issued by the Office of the Secretary of Transportation, allow slots allocated for certain hours to be reassigned and used in different slot periods. However, an increase in slots for one hour must be offset by a decrease in slots for another hour. 49 U.S.C. § 41714(d).

Nine airlines hold air carrier or commuter slots at Reagan National.¹⁸ As of August 2020, American Airlines holds the largest share—about 50 percent—of air carrier and commuter slots. The airlines that hold the next largest shares are Southwest Airlines, Delta Air Lines, and United Airlines which each hold about 12 percent of air carrier and commuter slots. The remaining five airlines each hold less than 10 percent of these slots.

Federal statutes enacted on three occasions—2000, 2003, and 2012—collectively allow 40 beyond-perimeter flights daily (20 round trips).

- In 2000, a federal statute authorized 12 new beyond-perimeter flights.¹⁹

¹⁸An additional 11 regional airlines operate on behalf of these airlines that hold slots at Reagan National. Regional airlines typically operate small aircraft—turboprops or regional jets with up to 100 seats—and generally provide service to smaller communities on behalf of network airlines.

¹⁹Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L. No. 106-181, § 231(e), 114 Stat. 61, 112-14 (2000).

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- In 2003, a federal statute authorized 12 new beyond-perimeter flights.²⁰
 - In 2012, a federal statute authorized 16 new beyond-perimeter flights; eight were made available through new slots and eight were the result of slot conversions.²¹ The eight flights using new slots were designated for new entrant or limited incumbent airlines that held fewer than 40 daily slots and applied for a specific route.²² The eight flights using existing slots were awarded to the four incumbent airlines at Reagan National that each held 40 or more daily slots; these four airlines were each authorized to convert two air carrier slots used for flights to large hubs within the perimeter to two slot exemptions for non-stop flights beyond the perimeter. Unlike exemptions awarded with new slots, airlines that were allowed to convert slots can change the destination of the beyond-perimeter flight after informing DOT. Since 2012, two airlines have changed the destinations of their beyond-perimeter flights.

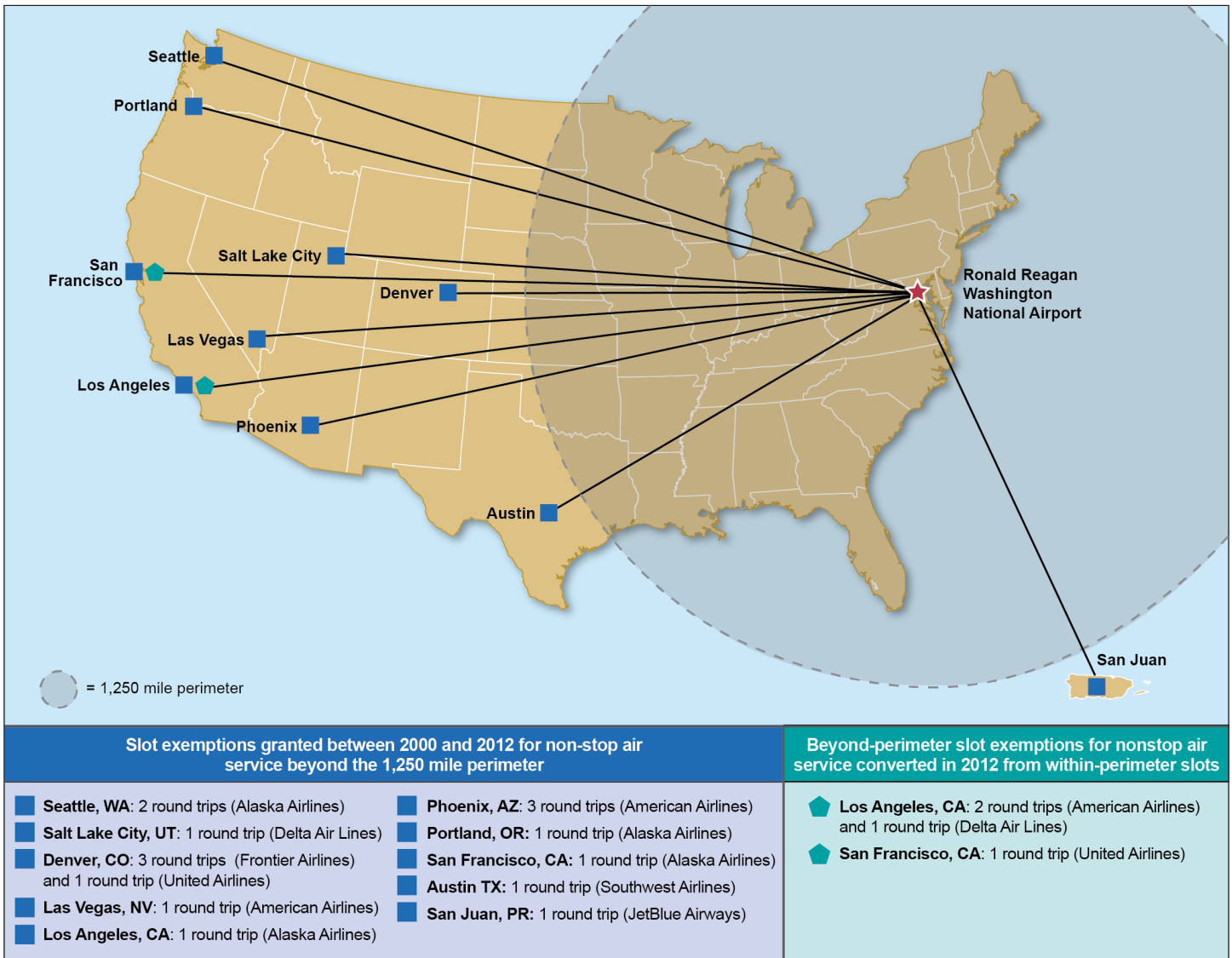
In 2020, airlines used their beyond-perimeter flights to serve 10 airports (see fig. 2).

²⁰Vision 100-Century of Aviation Reauthorization Act, Pub. L. 108-176, § 425, 426(a), 117 Stat. 2490, 2555 (2003).

²¹FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 414, 126 Stat. 11, 90 (2012).

²²Seven airlines applied for the four new beyond-perimeter slot pair exemptions. DOT awarded the exemptions to Alaska Airlines for Portland, OR, JetBlue Airways for San Juan, PR, Southwest Airlines for Austin, TX, and Virgin America (now Alaska Airlines) for San Francisco, CA. See [GAO-12-902](#).

Figure 2: 2020 Beyond-Perimeter Flight Exemptions at Ronald Reagan Washington National Airport



Sources: GAO analysis of Department of Transportation data and Map Resources. | GAO-21-176

In 2012, we were asked to review the potential effects of adding the 16 beyond-perimeter flights at Reagan National that were authorized in the 2012 FAA Modernization and Reform Act.²³ At that time, we found that the beyond-perimeter flights would likely have a limited effect on Reagan

²³GAO-12-902.

National, other area airports, and nearby communities. For example, we reported that while Reagan National would have sufficient runway capacity to accommodate the beyond-perimeter flights, the airport's terminal facilities would be more constrained. Moreover, we found that any effects on changes in passenger boardings at Dulles and BWI or aircraft noise in communities near Reagan National would be limited.

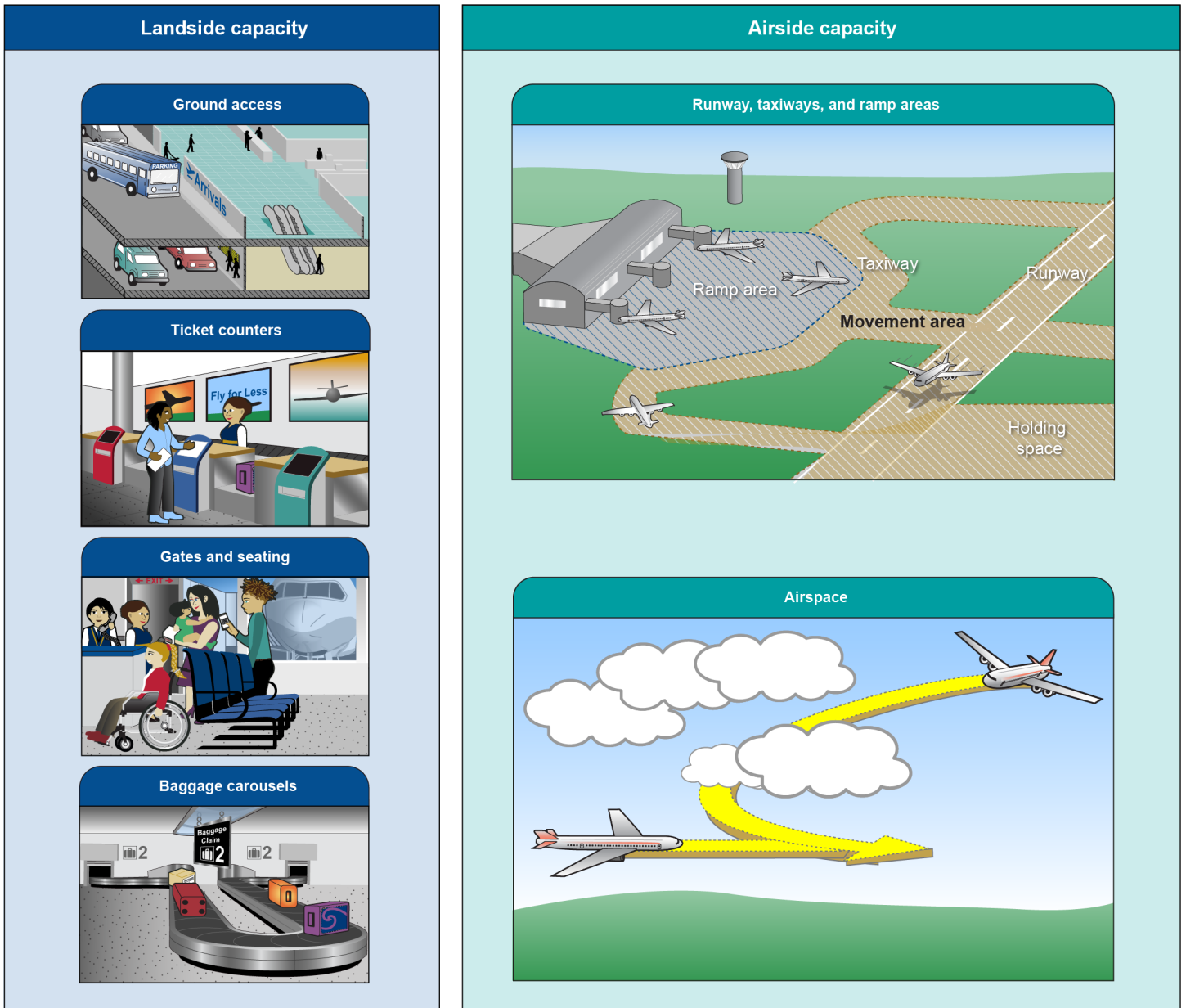
DOT and FAA share responsibility for administering the perimeter and slot-control rules at Reagan National. DOT is responsible for monitoring competitive aspects of the airlines' slot holdings and awarding slot slides and slot exemptions for within-perimeter and beyond-perimeter flights at Reagan National based on criteria identified in statute. For each new exemption, DOT issues a request for applications through regulations.gov and develops any supplemental guidance. Upon receiving airlines' applications, DOT evaluates them against the statutorily defined criteria. According to DOT officials, the primary goal of DOT's evaluation is to determine which exemptions would provide the greatest public benefit. Once the exemption is awarded, FAA is responsible for monitoring airlines' compliance with various slot control rules. For example, FAA reviews airlines' compliance with the 80-percent slot usage requirement, among other rules.²⁴

While Other Effects Are Less Certain, Beyond-Perimeter Flights Increased Passenger Traffic at Reagan National Likely Reducing Available Capacity

Although the 40 beyond-perimeter flights at Reagan National account for only about 6 percent of all air carrier slots at Reagan National in 2019, we found that the addition of these flights may have had some limited effects, including reducing the airport's available capacity. These flights also accounted for about 10 percent of passengers in 2019. Specifically, we found that the beyond-perimeter flights awarded to airlines likely reduced some existing available airside and landside capacity at Reagan National because aircraft used on these flights were, on average, larger and carried more passengers. Airside capacity includes runways, taxiways, and aircraft holding spaces, while landside capacity includes resources passengers use prior to boarding or after deplaning an aircraft, such as parking, roadways, ticket counters, gates, and baggage facilities (see fig. 3). We also found that the beyond-perimeter flights at Reagan National may have drawn a limited number of flights and passengers from Dulles and contributed to an increase in noise for some nearby communities.

²⁴14 C.F.R. § 93.227.

Figure 3: Examples of Airport Landside Capacity and Airside Capacity



Source: GAO. | GAO-21-176

Airside Capacity

The 32 new beyond-perimeter exemptions awarded from 2000 through 2012 increased the total number of commercial flights at Reagan National during certain hours, which may have reduced available airside capacity.²⁵ Our review of FAA data found that the new beyond-perimeter flights caused the largest increase in the number of hourly slots from 4:00 p.m. to 6:59 p.m., when the number of air carrier slots increased by about four per hour. Nevertheless, it is unlikely that these flights would have had a considerable impact on Reagan National's airside capacity because they accounted for less than 5 percent—32 out of 696—of daily weekday air carrier slots at the airport in 2019 and are spread out throughout the day.²⁶

Further, airlines' use of larger aircraft for their beyond-perimeter flights places some additional burdens on airside capacity. Our analysis of T-100 data from 2010 through 2019 found that aircraft used for the 40 beyond-perimeter flights averaged 70 more seats (165 seats) than aircraft used for within-perimeter flights (95 seats). Looking at flights to airports of similar sizes, beyond-perimeter flights still use larger aircraft. Specifically, aircraft used for beyond-perimeter flights had, on average, 48 more seats compared to aircraft used for flights to within-perimeter, large-hub airports.²⁷ While beyond-perimeter flights use larger aircraft, any effects from these larger flights on airside capacity would likely be limited because stakeholders said that Reagan National's shorter runway limits the size of aircraft that airlines can use.²⁸ Our review of T-100 data from 2010 through 2019 found that the Boeing 737-800 and the Airbus A320, which hold up to 189 and 180 seats respectively, were the most

²⁵Airside capacity can change if an airport undertakes improvements to expand or enhance the capacity of the airport. Expanding capacity includes the addition of new runways, taxiways, and other infrastructure improvements. Enhancing capacity includes improvements in air traffic control procedures or technologies that increase the efficiency of existing capacity. See GAO, *National Airspace System: Setting On-Time Performance Targets at Congested Airports Could Help Focus FAA's Actions*, [GAO-10-542](#), (Washington, D.C.: May 26, 2010).

²⁶We omitted the 183 commuter air carrier slots from this analysis.

²⁷Of the 10 beyond-perimeter airports served in 2019, 8 are large-hub airports and 2 are medium-hub airports.

²⁸According to MWA officials, the largest aircraft an airline can operate at Reagan National is a Boeing 757, which carries 200 to 228 passengers. However, not all airlines operate this aircraft in their fleet, and according to FAA officials, the size of the 757 aircraft can create challenges accessing certain gates at Reagan National.

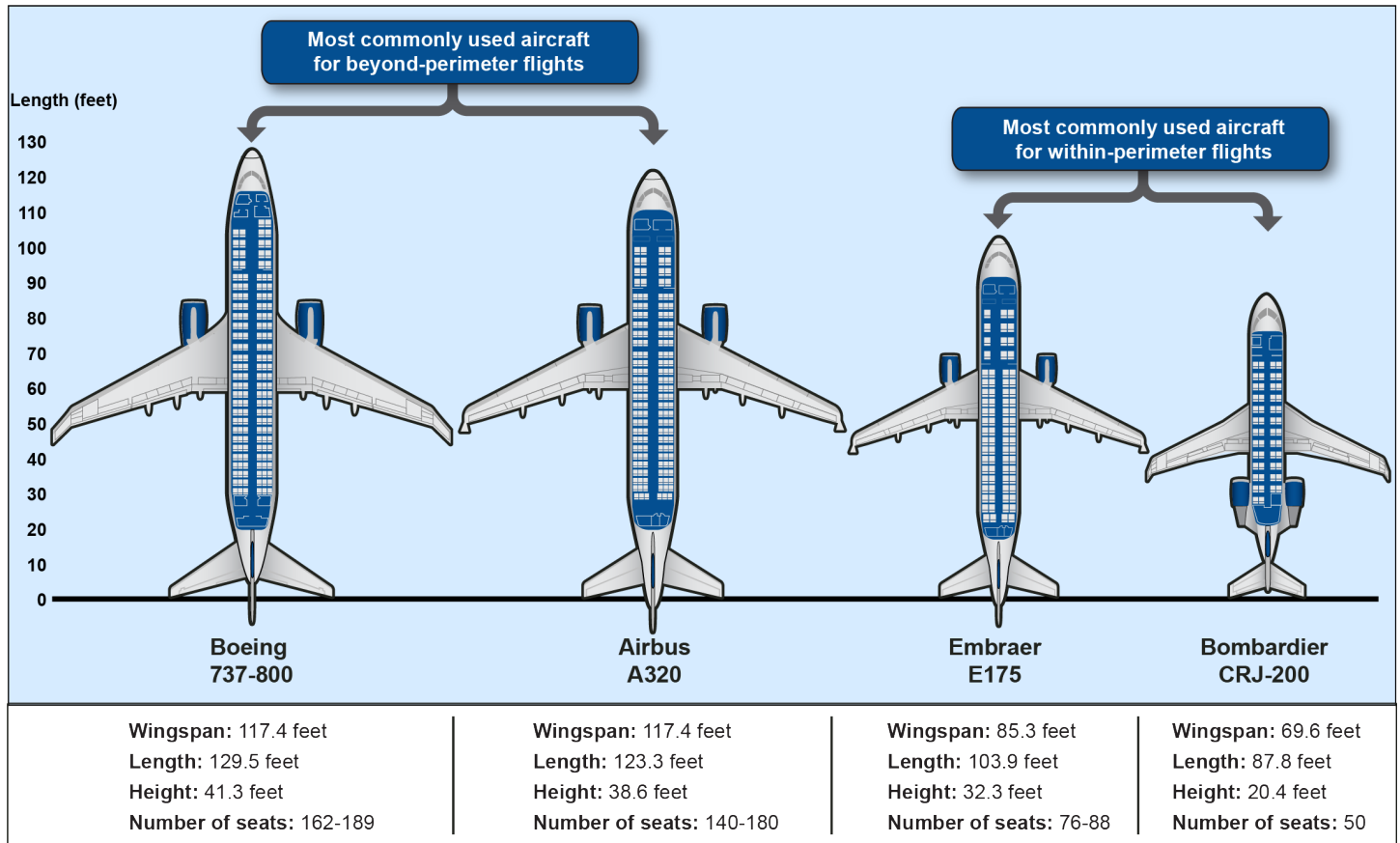
commonly used aircraft for beyond-perimeter flights (see fig. 4).²⁹ These aircraft are larger than the most commonly used aircraft for within-perimeter flights—i.e., the Bombardier CRJ-200 and Embraer E175—which hold 50 seats and up to 88 seats, respectively.³⁰ Past research has also shown that, on average, airlines generally use larger aircraft for longer flights.³¹

²⁹The smallest aircraft used for beyond-perimeter flights at Reagan National is the Airbus A319, which has a minimum of 110 seats and was used on 3 percent of these flights in 2019.

³⁰According to T-100 data from 2010 through 2019, the most commonly used aircraft for within-perimeter flights to large-hub airports were the Airbus A319 (holding up to 160 seats), Boeing 737-800 (holding up to 189 seats), and Embraer E190 (holding up to 114 seats).

³¹M. Givoni and R. Piet, "Airline's choice of aircraft size—Explanations and implications," *Transportation Research Part A*, vol. 43 (2009) 500-510.

Figure 4: Most Commonly Used Aircraft for Beyond- and Within-Perimeter Flights at Ronald Reagan Washington National Airport, 2010-2019



Source: GAO review of T-100 data and aircraft documents. | GAO-21-176

Many stakeholders we spoke to—including airlines, MWAA and FAA—said larger aircraft flown to beyond-perimeter airports place additional burdens on Reagan National’s airside capacity for the following reasons.

- **Larger holding spaces.** Holding spaces store aircraft that arrive at the airport before their gate is ready, stay at the airport overnight, or are parked in poor weather conditions. While each holding space can accommodate three to four smaller aircraft, FAA officials said they can only accommodate two of the larger aircraft typically used for beyond-perimeter flights.
- **Increased separation standards.** MWAA and FAA officials said that larger aircraft require additional separation during takeoff and landing

when they are interspersed with smaller aircraft (such as turboprop aircraft) because of differences in airspeed as well as wake turbulence—the movement of air created behind an aircraft in motion.³² However, according to FAA officials, in recent years airlines have operated fewer smaller turboprop aircraft out of Reagan National, limiting the need for increased separation between aircraft.

- **Longer landing times.** MWA officials said larger aircraft take longer to land and move off the active runway, reducing the number of flights the airport can accommodate.

The introduction of the new beyond-perimeter flights in 2012 may have contributed to a small increase in the percentage of flights delayed and average delay times at Reagan National, though a number of factors can affect these data. Our analysis of DOT flight delay data found that from June 2011 through May 2012, the year before any of the new beyond-perimeter flights went into effect, 17 percent of arrivals at Reagan National were delayed, compared to 20 percent from September 2012 through August 2013, the year after the new beyond-perimeter service was fully established.³³ We also identified a small increase in the average delay per delayed arrival of about 5 minutes—from about 51 minutes to almost 57 minutes—for the year after the beyond-perimeter flights went into effect. We have previously found that insufficient capacity—such as airspace or runways—to accommodate existing flights is one of a number of reasons an airport may see an increase in flight delays. However, other factors outside the airport—such as weather conditions, congestion at other airports, airlines’ scheduling practices, and airspace congestion—can also cause delays.

Landside Capacity

Similar to airside capacity, we found that beyond-perimeter flights use more available landside resources than within-perimeter flights, on average, primarily because airlines generally carry more passengers and operate fuller aircraft on beyond-perimeter flights. Using T-100 data from 2010 through 2019, we found that, on average, airlines carried more than twice as many passengers on flights beyond the perimeter, compared to

³²We reported in 2007 that increased separation can reduce the number of arrivals and departures an airport can accommodate, but the magnitude of this effect depends on the timing and volume of flights using aircraft of appreciably different sizes. GAO, *Commercial Aviation: Potential Safety and Capacity Issues Associated with the Introduction of the New A380 Aircraft*, [GAO-07-483](#) (Washington, D.C.: Apr. 20, 2007).

³³A flight is considered delayed by DOT if it departed or arrived 15 minutes or more after its scheduled flight time or flight plan. See [GAO-10-542](#).

flights within the perimeter. Even among large airports with service to or from Reagan National, beyond-perimeter flights still carried almost 60 more passengers per flight (see table 3). Beyond-perimeter flights also generally had a higher percentage of seats filled.³⁴ According to 2019 T-100 data, flights to beyond-perimeter airports were about 6 percentage points fuller, on average, than flights to large within-perimeter airports. These beyond-perimeter flights accounted for about 10 percent of total passengers at Reagan National in 2019.

Table 3: Average Numbers of Passengers and Percentage of Seats Filled per Flight at Ronald Reagan Washington National Airport

Flight type	Destination hub size ^a	Average number of passengers per flight, 2010-2019	Average percentage of seats that are filled, 2019
Within-Perimeter	All	71	80
Within-Perimeter	Large	90	82
Beyond-Perimeter	All	146	88

Source: GAO analysis of T-100 data. | GAO-21-176

^aThe term “hub” is defined in federal law to identify commercial service airports as measured by passenger boardings. Federal law defines large-hub airports as those with at least 1 percent of total annual passenger boardings. Of the 10 beyond-perimeter airports in 2019, 8 are large-hub airports and 2 are medium-hub airports. Medium-hub airports handle at least 0.25 percent, but less than 1 percent of total passenger boardings. (49 U.S.C. § 40102(a)(29), (31)).

MWAA officials pointed to beyond-perimeter flights as one of the factors contributing to increased passenger boardings at Reagan National over the past decade. According to T-100 data from 2010 through 2019, annual passenger boardings at Reagan National increased by more than 5-million, from about 18 million to more than 23 million (32 percent). Despite beyond-perimeter passengers making up only about 7 percent of Reagan National’s passenger boardings in 2010, they accounted for 18 percent of growth over the past decade, increasing from about 1.2 million passengers in 2010 to 2.2 million in 2019. In addition to increases in passengers from new beyond-perimeter flights, MWAA officials also cited the merger between American Airlines and US Airways as a key driver in passenger growth during this time. As a condition of this merger, American Airlines was required to divest slots at Reagan National and LaGuardia Airport to address concerns about airline competition resulting from the merger. Of the divested slots at Reagan National, Southwest Airlines and JetBlue Airways were awarded 56 and 40 of these slots, respectively. Because Southwest Airlines and JetBlue Airways operate a

³⁴This metric is referred to as the load factor.

more uniform fleet of larger aircraft than American Airlines at Reagan National, it is likely that the slot swap resulted in airlines using larger aircraft for some of these slots, increasing passenger boardings at Reagan National.

More generally, in discussing differences in flight characteristics, representatives from some airlines told us beyond-perimeter flights carry more passengers—and use larger aircraft—because airlines cannot operate these routes with the same frequency of similar within-perimeter routes. For example, our analysis of T-100 data for 2019 found that airlines provided an average of four daily non-stop flights for airports beyond the perimeter, compared to about 21 daily non-stop flights for similar large-hub airports within the perimeter. While these differences in flight frequencies are likely driven by the perimeter rule, other factors could contribute to this. For example, representatives from some airlines said Reagan National handles a large number of business travelers, who tend to prefer convenient schedules. Therefore, where possible—particularly on within-perimeter routes with high numbers of business travelers—airlines may look to provide more frequent service on certain routes, potentially using smaller aircraft. While business traveler preferences may contribute to more frequent service using smaller aircraft, our prior work has found that commercial flights at slot-controlled airports, such as Reagan National, were more likely to use smaller aircraft than commercial flights at airports that are not slot controlled, resulting in a more inefficient use of available capacity.³⁵

Effects on Dulles and BWI

We found limited evidence that the existing beyond-perimeter flights to or from Reagan National have affected flights at the surrounding airports, despite a number of stakeholders' perspectives that said otherwise. Specifically, many stakeholders said the addition of the beyond-perimeter flights to or from Reagan National likely adversely affected Dulles and to a lesser extent BWI by shifting some beyond-perimeter flights or passengers to Reagan National. However, our analysis of T-100 data for the year before and after airlines were either (1) awarded 2012 exemptions at Reagan National or (2) changed the destination of a slot conversion found that airlines reduced their service on two (of nine) routes from Dulles to airports that are also served by Reagan National's beyond-perimeter flights. We did not find that airlines decreased their

³⁵For a discussion on why airlines may use smaller aircraft at slot-controlled airports, as well as the potential effects of such action, see [GAO-12-902](#).

flights at BWI.³⁶ We found similar results in 2012, identifying only one instance where an airline discontinued service in 2005 between Dulles and an airport beyond Reagan National's perimeter after receiving an exemption at Reagan National and no decrease in flights at BWI.³⁷ Representatives from more than half of the airlines with beyond-perimeter exemptions at Reagan National also told us that the exemptions have not affected their operations at Dulles or BWI.

While we found some evidence that new beyond-perimeter flights to or from Reagan National may have drawn a couple of flights from Dulles, data on passengers following the addition of the 2012 exemptions at Reagan National suggest that both Reagan National and BWI increased their market share of passengers to or from Reagan National's 10 beyond-perimeter airports, while Dulles saw a decline.³⁸ Our analysis of T-100 data from 2010 through 2019 found that Reagan National's share of non-stop passengers to or from beyond-perimeter airports increased from 14 percent to 21 percent and BWI increased its share of these passengers from 29 percent to 36 percent, while Dulles' share of these passengers decreased from 57 percent to 43 percent.³⁹ The decline in passengers at Dulles represented about a 5 percent (260,000) decrease in passengers traveling to or from those 10 airports, or about 1 percent of Dulles' total passenger boardings in 2019. In addition to the effects of the beyond-perimeter exemptions, any changes in passenger boardings could also be the result of airlines' business decisions, such as airlines drawing down service at Dulles or moving their connecting traffic through different airports.

Any shift of passengers from Dulles to Reagan National likely indicates a preference of some passengers to travel to or from Reagan National over Dulles, among other things. Many stakeholders we spoke with said that with few exceptions, a majority of passengers traveling to Washington,

³⁶We also found that one airline drew down service after it acquired a beyond-perimeter exemption from a merger with another airline.

³⁷[GAO-12-902](#).

³⁸We limited our analysis to non-stop passengers and did not quantify any changes in passengers who may have been connecting through one of the D.C. area airports.

³⁹In 2019, Reagan National, Dulles, and BWI each had non-stop service to all 10 beyond-perimeter airports. In 2010, Dulles had non-stop service to all 10 beyond-perimeter airports while BWI did not have non-stop service to Portland and Reagan National did not have non-stop service to Austin, Portland, San Francisco, or San Juan.

D.C. prefer Reagan National to Dulles, due to the proximity of Reagan National to downtown D.C. and the lack of rail service at Dulles. Therefore, according to some of these stakeholders, when new beyond-perimeter flights were made available, some passengers who previously flew out of Dulles may have chosen Reagan National instead. Stakeholders' perspectives aligned with a 2019 survey of air passengers conducted at the three D.C. area airports, which estimated that a larger percentage of passengers (44 percent) preferred Reagan National, compared to BWI (34 percent), and Dulles (22 percent).⁴⁰ The majority of passengers cited airport proximity (i.e., "closest airport") as the most important factor in their choice, including an estimated 69 percent of passengers who preferred Reagan National.⁴¹

While evidence is limited, we have previously reported that any shifts in passengers to Reagan National from Dulles could increase the per-passenger airline costs of using Dulles, which, if substantial, could cause the airlines to reduce service at that airport. From 2010 through 2012, airlines' cost per enplaned passenger (airport charges for an airline divided by that airline's enplaned passengers) at Dulles rose from \$16.40 to \$25.01, as a result of a major capital development project.⁴² The increase in airlines' costs lead to concern by MWA that some airlines might reduce or discontinue service at Dulles.⁴³ Beginning in fiscal year 2015, MWA added a provision in its Use and Lease Agreement to allow revenue sharing between Reagan National and Dulles through fiscal year 2024. Under this provision, MWA can transfer up to \$310 million in revenue over a 10-year period from Reagan National to help offset

⁴⁰National Capital Region Transportation Planning Board, *2019 Washington-Baltimore Regional Air Passenger Survey*, (Washington, D.C.: April 2020).

⁴¹These passengers' preferences may be reflected in higher average airfares at Reagan National. Our prior work has found that average airfares at the slot-controlled airports, including Reagan National, are some of the highest among domestic large-hub airports. See [GAO-12-902](#).

⁴²Cost per enplaned passenger is defined as all landing fees, airside usage charges, fuel flowage fees, terminal rents, and other terminal payments to an airport, divided by the number of enplaned passengers. Since most of these costs are fixed, any reduction in passengers would likely increase the cost per enplaned passenger. [GAO-12-902](#).

⁴³In 2012, we asked MWA to estimate the cost per enplaned passenger at Dulles assuming the new beyond-perimeter flights shifted passengers from Dulles to Reagan National. This analysis found that the cost per enplanement at Dulles would rise about 4 percent as a result. For additional information, see [GAO-12-902](#).

operating costs at Dulles.⁴⁴ According to MWWA officials, this provision has helped decrease average costs per enplaned passenger at Dulles from about \$25 in 2012 to \$15 in 2019.

Effects on Airport Noise

Stakeholders we spoke with had varying views on whether the beyond-perimeter flights increased noise for some communities near Reagan National, though it is likely that any effects would be limited. For example, representatives from three of the five community groups concerned with noise that we spoke with said any increases in the number of flights, such as those from the 32 beyond-perimeter flights or increases from flights within the perimeter, would contribute to increases in noise, having a negative effect for some residents living near the airport. However, beyond-perimeter flights from new slot allocations make up less than 5 percent of Reagan National's total daily air carrier and commuter slots, which limits their overall effect on noise. Stakeholders including some community groups concerned with noise, MWWA, and a few airlines also said that on average, aircraft used for beyond-perimeter flights contribute more noise to surrounding communities than aircraft used for within-perimeter flights. They attributed this to larger aircraft that generate more noise during takeoff and landing compared to smaller aircraft. In contrast, representatives from other community groups concerned with noise, many airlines, and an academic studying noise said beyond-perimeter flights do not contribute more noise than within-perimeter flights. While one of the purposes of the perimeter rule was to limit noise at Reagan National, these stakeholders said that because of advances in aircraft technology, larger aircraft are no longer louder than smaller aircraft. This observation generally aligns with our past work, which has found that newer aircraft—including large commercial aircraft—tend to meet more stringent noise requirements.⁴⁵

FAA officials did not take a position on whether beyond-perimeter flights contributed more noise to surrounding communities, compared to within-perimeter flights. These officials told us that aircraft noise is the result of a confluence of factors—including type of aircraft, flight path, time of day, weight of aircraft, and total number of flights—and it is difficult to assess

⁴⁴MWWA's Use and Lease Agreement included annual maximum amounts of revenue that could be shared between Reagan National and Dulles. For example, from fiscal years 2020 through 2024, MWWA cannot transfer more than \$25 million per year to Dulles.

⁴⁵GAO, *Aircraft Noise: Information on a Potential Mandated Transition to Quieter Airplanes*, [GAO-20-661](#) (Washington, D.C.: Aug. 20, 2020).

the effect of any flight without modeling scenarios with assumptions for these factors.

Instead, FAA officials and a study of airport noise cited the increased concentration of flight paths as the primary driver of noise concerns for some communities near Reagan National. Flight paths are increasingly concentrated because of performance-based navigation, which uses satellites to provide aircraft with more efficient flight paths. We reported in 2017 that performance-based navigation can allow aircraft to fly a more direct and predictable path into or out of an airport, but this path can increase the prevalence of aircraft noise in some communities.⁴⁶ A study of aircraft noise at Reagan National similarly found that areas of D.C. bordering the Potomac River, where flight paths are concentrated, experienced increases in aircraft noise following implementation of performance-based navigation, while other communities saw decreases.⁴⁷ According to MWAA reports, the new flight paths using performance-based navigation have contributed to an increase in noise complaints at Reagan National over the last few years. For example, our review of MWAA noise complaint data found that, from 2015—when the new flight paths were implemented—through 2018, noise complaints at Reagan National increased more than eight-fold.

Slot Rules, Airport Congestion, and Other Factors Should Be Considered Before Additional Beyond-Perimeter Flights Are Allowed

Our prior work and interviews with stakeholders found that any changes to the perimeter rule at Reagan National should consider existing slot control rules; factors that could increase congestion and noise at that airport and draw traffic from Dulles and BWI; travel options for passengers to or from Reagan National; and airline competition. While stakeholders we interviewed varied in their assessment of whether changes should be made to Reagan National's perimeter rule, many agreed that airlines would add additional beyond-perimeter flights if allowed. Because the effects can vary depending on whether and how the rule is changed, we examined the potential effects using three scenarios: (1) no changes to the perimeter rule and keeping the current 40 daily beyond-perimeter exemptions; (2) adding a small number of additional beyond-perimeter flights while retaining the perimeter rule; and (3) completely lifting the perimeter rule.

⁴⁶GAO, *Air Traffic Control Modernization: Progress and Challenges in Implementing NextGen*, [GAO-17-450](#) (Washington, D.C.: Aug. 31, 2017).

⁴⁷CSDA Design Group, *Ronald Reagan Washington National Airport (DCA) Noise Assessment Final Report* (San Francisco, CA: September 2018).

Existing Slot Control Rules Should Be Reviewed If Additional Beyond-Perimeter Flights Are Allowed to or from Reagan National

Stakeholders who provided a perspective on potential changes to the perimeter rule varied in their assessment of whether additional beyond-perimeter flights should be permitted to or from Reagan National, but many agreed that any changes should be informed by a review of the airport's slot control rules.

- **No changes to the perimeter rule.** Many of the stakeholders did not support adding additional beyond-perimeter flights to or from Reagan National. These stakeholders—including MWAA, airport industry associations, community groups concerned with noise, and selected airlines—asserted that additional beyond-perimeter flights could pose challenges for Reagan National, other area airports, or communities near Reagan National. Some stakeholders, including MWAA and selected airline representatives, expressed concerns that additional beyond-perimeter flights could increase congestion at Reagan National, have financial consequences for Dulles, or change the competitive landscape at the three D.C. area airports. A few community groups concerned with noise also cited concerns over increases in noise in communities near Reagan National from new beyond-perimeter flights.
- **Adding a small number of beyond-perimeter flights.**⁴⁸ Some stakeholders supported providing a small number of additional beyond-perimeter flights to some airlines through new slot exemptions at Reagan National, similar to what has been done in the previous three statutes where additional beyond-perimeter flights were allowed. These stakeholders said that this scenario could, for example, (1) allow airlines to expand service to beyond-perimeter airports without any reductions in service to airports within the perimeter, and (2) increase competition at Reagan National by providing opportunities to expand service to airlines with a limited number of slots. Moreover, a few of these stakeholders also noted that Reagan National has the capacity to accommodate additional beyond-perimeter flights.
- **Lifting the perimeter rule.**⁴⁹ None of the stakeholders supported completely lifting the perimeter rule without changing the number or allocation of air carrier slots at Reagan National. Many stakeholders opposed this scenario primarily because, among other things, it would provide a significant competitive advantage to airlines with larger air

⁴⁸In this scenario, we assumed that the number of within-perimeter flights stayed the same.

⁴⁹In this scenario, we assumed that airlines only used air carrier slots allocated for larger aircraft for new beyond-perimeter flights.

carrier slot holdings at Reagan National because they would have more flexibility to make changes to their network and expand service beyond the perimeter, compared to airlines with smaller air carrier slot holdings.

Many stakeholders we spoke with—regardless of their position on whether changes should be made to the perimeter rule—said airlines would likely add additional beyond-perimeter flights or modify existing service if additional beyond-perimeter flights were allowed. More specifically, based on consumer demand, and if a change in law would allow it, airlines would likely use some slots that are currently used for flights to airports within the perimeter for service to beyond-perimeter airports. Representatives from airlines generally expressed an interest in expanding service to cities beyond the perimeter, including Denver, Las Vegas, Los Angeles, San Diego, and Seattle. These perspectives generally aligned with an unpublished analysis conducted by an airport industry association that found that airlines would add service to large- or medium-hub airports beyond the perimeter if the perimeter rule were lifted. Representatives from a few airlines also expressed an interest in making changes to their existing beyond-perimeter flights, such as changing the location or time of their flights.

Additional Beyond-Perimeter Flights Could Contribute to Congestion at Reagan National and Draw Passengers from Other Nearby Airports

Both scenarios that expand the number of beyond-perimeter flights—lifting the perimeter rule or adding additional beyond-perimeter flights—would use more airport capacity and could contribute to airside or landside congestion at Reagan National during certain times of the day. For example, if airlines were allocated a small number of additional beyond-perimeter flights, the number of flights and passengers at Reagan National would increase relative to the status quo under existing statutes and regulations. Alternatively, if the rule were completely lifted with no additional slots, there would be no increase in the number of flights. However, because some slots would likely be converted from within- to beyond-perimeter flights, Reagan National could experience an increase in the size of some aircraft, thereby likely increasing passenger traffic and causing additional airside and landside congestion. Our analysis shows that Reagan National may have some available airside capacity but more limited landside capacity. In addition to using more capacity, beyond-perimeter flights could also increase noise for communities near the airport, particularly if new flights are added.⁵⁰ Nevertheless, predicting the

⁵⁰We have ongoing work examining airport noise, including at Reagan National, which we plan to issue in 2021. Among other things, this work will discuss factors that contribute to aviation noise and FAA's process for evaluating and mitigating noise.

Airside Capacity at Reagan National

specific implications of either scenario would be difficult without a policy proposal.

Our analysis of FAA data for the summer of 2019 found that Reagan National may have some airside capacity available at certain times of the day and on weekends. Specifically, of the maximum of 55 hourly air carrier and commuter slots (takeoffs and landings) authorized by regulation and statute during weekdays, airlines held an average of 53 slots during peak hours (7:00 to 10:00 a.m. and 4:00 p.m. to 7:00 p.m.) and almost 47 slots during nonpeak hours.⁵¹ In addition, airlines held even fewer slots on weekends, averaging less than 50 slots per hour during peak hours. According to FAA officials, as of August 2020, there are currently 39 total daily unallocated slots available for commercial airlines at Reagan National. However, these unallocated slots are generally available during hours that are less attractive to airlines, such as on weekends or weekdays during early morning or late evening. FAA officials also told us that they have the authority to hold a small number of slots for new entrants to operate at Reagan National; at this time, they are using this authority to hold some slots at 6:00 a.m. and 10:00 p.m. while allowing incumbent airlines to use the slots only on a temporary basis.

Reagan National is also operating well below the 12 maximum authorized hourly reservations for general aviation aircraft. Our review of FAA data for July through August of 2019 found that, on average, fewer than one general aviation reservation was used each hour (or almost 13 per day). Much of the difference between the maximum number of hourly aircraft operations authorized and used at Reagan National can be attributed to security restrictions that the Transportation Security Administration (TSA) imposed on general aviation flights following the September 11, 2001, terrorist attacks that were still in effect as of October 2020. These restrictions require, among other things, that all general aviation aircraft have an armed security officer on board and be screened at, and depart from, a gateway airport prior to arriving at Reagan National.⁵²

Representatives from two industry associations who represent general aviation operators said they are actively working with federal agencies, including TSA, to loosen these restrictions. If such action occurs, these

⁵¹As mentioned previously, of these 55 hourly slots, five are slot exemptions that are only available during certain hours of the day and two are slot slides, which, if used, reduce the number of available slots in other hours.

⁵²49 C.F.R. Parts 1540 and 1562.

stakeholders said general aviation traffic would return to pre-9/11 levels at Reagan National, which we reported in 2012 was about 210 daily general aviation flights.⁵³

FAA officials' analysis of 2019 data also suggests that Reagan National has some available airside capacity. According to FAA officials, while data suggest that Reagan National's capacity is between 66 and 67 hourly operations, the airport is currently operating about 60 flights per hour. Specifically, FAA officials said they compare peak flight activity (i.e., the number of hourly flights handled at the 90th percentile) against available runway capacity (i.e., the number of flights air traffic control says it can handle) at airports, including Reagan National, to assess capacity, particularly for infrastructure decisions.

Many stakeholders—including FAA, MWA, and some airlines—we spoke with said that Reagan National is operating at or near its airside capacity and a few cautioned that additional flights could increase congestion at the airport. Specifically, they cited airspace, runway, taxiway, and aircraft holding spaces as the primary bottlenecks. According to these stakeholders, if additional takeoffs and landings were allowed—either through the addition of new beyond-perimeter flights or by airlines operating closer to the maximum number of hourly slots—congestion would occur, especially during poor weather. Moreover, airports can benefit from a small amount of available or excess capacity. For example, according to FAA air traffic-control officials, during poor weather, the airport's capacity diminishes and Reagan National can slip into gridlock if this occurs during busy times. Therefore, having some excess capacity can help the airport recover faster when weather conditions deteriorate. Our review of DOT's flight delay data for 2019 found that the percentage of on-time departures and arrivals at Reagan National is slightly above the average across all large-hub airports.

In contrast, representatives from some airlines said Reagan National has additional airside capacity and could handle more flights. These stakeholders cited the fact that Reagan National is consistently operating below the 60 hourly slots authorized by FAA for air carrier, commuter, and general aviation aircraft. Specifically, representatives from a few airlines suggested that Reagan National could convert some of its underutilized general aviation or air carrier slots to allow for additional beyond-perimeter flights. However, in 2012, we reported that large commercial

⁵³[GAO-12-902](#).

Landside Capacity at Reagan National

aircraft cannot necessarily use the slots reserved for smaller general aviation aircraft because these general aviation aircraft do not generally use the same infrastructure, including the airport's longer runway, gates, and terminal infrastructure.⁵⁴

While Reagan National may have some airside capacity to accommodate new beyond-perimeter flights, our review of MWAA data showed that Reagan National has limited landside capacity to add additional flights, whether those flights are within or beyond the perimeter, without additional infrastructure or operational changes. Our review of MWAA data identified capacity constraints related to roadways and gates, among other things.

- **Roadways.** Reagan National is using about 85 percent or more of its available roadway capacity during peak hours, according to MWAA data. According to MWAA officials, when the percentage of used roadway capacity is greater than 85 percent, traffic is backed up or at “stop-and-go.” MWAA officials attributed increases in congestion at curbside pickup and drop off areas to passengers increasingly using rideshare services, such as Uber or Lyft, to get to the airport. These perspectives generally aligned with a 2019 survey of air passengers conducted at the three D.C. area airports. The survey found that ridesharing services were the most popular mode of access at Reagan National in 2019 and that the number of passengers using ridesharing services increased almost 85 percent from 2017 through 2019.⁵⁵ While the airport faced some challenges with roadway congestion, Reagan National had sufficient parking for passengers in 2019, as there were no instances in 2019 when Reagan National's 9,053 parking spaces were filled to capacity.
- **Gates.** Based on 2019 gate usage rates at Reagan National, on average, gates are fully used. MWAA data for 2019 indicated that airlines operating at Reagan National averaged about 8.5 turns per day for each gate.⁵⁶ According to a report from the Airport

⁵⁴See [GAO-12-902](#).

⁵⁵In 2017, an estimated 2,057,000 passengers used ride sharing services, compared to 3,802,000 passengers in 2019. See National Capital Region Transportation Planning Board, *Washington-Baltimore Regional Air Passenger Survey - 2019* (Washington, D.C.: 2020).

⁵⁶Airlines' gate utilization ranged from an average of three turns per gate to almost 10, according to MWAA data.

Cooperative Research Program, airlines rarely exceed 8 to 10 daily turns per gate.⁵⁷ We have previously reported that exceeding full gate utilization could lead to flight delays.⁵⁸

- **Other terminal capacity areas.** MWAA data suggests that other terminal areas—including security, baggage, and passenger check-in—had varying levels of available capacity. For example, airlines are currently using about 75 percent of the airport’s capacity for passenger check-ins and baggage facilities. In 2019, Reagan National used about 93 percent of its total available capacity for TSA screening.

Similar to what we found in our analysis of available data, many stakeholders—including MWAA, FAA, and some selected airlines—we spoke with agreed that Reagan National is near or at its landside capacity and showing strains in some areas. While these stakeholders most commonly cited congestion issues with roadways and gates, they also highlighted challenges with available terminal space. These perspectives align with our work in 2012, which found that Reagan National would face some challenges accommodating the 2012 beyond-perimeter exemptions without its planned enhancements.⁵⁹ Yet, since we reported in 2012, annual passenger boardings at Reagan National increased 22 percent, from almost 19 million to more than 23 million, according to T-100 data.

Representatives from a few airlines said Reagan National has additional landside capacity. For example, representatives from one airline acknowledged that while there are potential challenges with the availability of security checkpoints and gates during heavy travel periods, they believe that Reagan National has the landside capacity to add additional flights. Representatives from another airline said they could schedule their flights to shorten their turnaround times at Reagan National, which would allow them to operate more flights per day.

MWAA’s planned updates for Reagan National—which are to be completed in 2021—will provide limited increases in some landside capacity. Reagan National is currently undergoing a \$1 billion, multi-year capital improvement project that will add new security checkpoints and a

⁵⁷National Academies of Sciences, Engineering, and Medicine 2016, *Guidebook for Preparing and Using Airport Design Day Flight Schedules*, (Washington, D.C.: 2016).

⁵⁸[GAO-12-902](#).

⁵⁹At that time, we reported that Reagan National could handle those new flights only with planned improvements and adjustments. [GAO-12-902](#).

14-gate concourse (see fig. 5). Upon completion, TSA's screening capacity will increase from 20 to 28 security lanes and allow passengers to travel between terminals B and C without leaving a secure area. MWA will also add a new concourse, replacing the 14 outdoor aircraft-boarding positions previously accessed through one gate (35X) via a bus. The new concourse will also provide 850 new seats, 14,000 square feet of concessions, and a new baggage handling system for the concourse. According to MWA representatives, the project was not designed to increase capacity, but rather allow passengers to transfer between concourses and improve passengers' experiences for those who previously used the exterior gates.

Figure 5: Renderings of Ronald Reagan Washington National Airport's New Concourse and Updated Airport Layout



Source: Metropolitan Washington Airports Authority. | GAO-21-176

Effects of COVID-19 on Reagan National

While our analysis focused on Reagan National's available capacity as of the end of 2019, current and future available capacity is uncertain, given the decrease in air traffic across U.S. airports from COVID-19. Beginning in March 2020, FAA waived the 80-percent minimum slot usage requirement at Reagan National. After an extension, the usage requirement was waived through March 27, 2021.⁶⁰ Our analysis of T-100 data found that in the second quarter of 2020, the number of flights and passengers at Reagan National decreased almost 78 and 92 percent, respectively, compared to the second quarter of 2019. When isolating the effects to beyond-perimeter airports, we found that the number of flights and passengers at Reagan National decreased almost 58 and 85

⁶⁰FAA, COVID-19 Related Relief Concerning Operations at Chicago O'Hare International Airport, John F. Kennedy International Airport, Los Angeles International Airport, Newark Liberty International Airport, New York LaGuardia Airport, Ronald Reagan Washington National Airport, and San Francisco International Airport for the Winter 2020/2021 Scheduling Season, 85 Fed. Reg. 63335 (Oct. 7, 2020).

percent, respectively. While COVID-19 has decreased traffic at Reagan National in the near-term, longer effects are unknown. Some organizations estimate that passenger traffic in the U.S. may not recover to 2019 traffic levels before 2024.

At the same time, airports—including Reagan National—may need additional terminal capacity to implement new social distancing practices in response to COVID-19. For example, the International Civil Aviation Organization recommended that to the extent possible, airports should target a physical distance of at least one meter between all individuals; use physical separators between selected staff and passengers in high traffic areas; and encourage the use of self-service tools, such as boarding pass and baggage tag kiosks and baggage drops.⁶¹ According to the organization, because high levels of physical contact can increase the probability of transmission, airports should maximize opportunities to distance people. It is likely that these social-distancing measures, if implemented, could reduce capacity at the airport. For example, MWWA officials estimate that they could handle only 30 to 40 percent of their pre COVID-19 traffic while still complying with social distancing guidelines, such as keeping people six feet apart. Moving forward, COVID-19's long-term effects on airport facilities, including Reagan National, are uncertain.

Passenger Traffic at Dulles and BWI

Results from our data analysis and stakeholder interviews of existing beyond-perimeter flights suggest that additional changes to the perimeter rule could result in some passengers choosing to fly out of Reagan National, as opposed to Dulles or BWI. Some stakeholders we spoke with agreed that these effects would be more significant at Dulles than BWI. They attributed this to the fact that BWI has less overlap with Reagan National in where it draws passengers from and that BWI has built a market niche having a substantial presence of low cost airlines serving the airport. Our analysis of existing beyond-perimeter flights also found that BWI would likely be less affected than would Dulles. Of the two scenarios for adding additional beyond-perimeter flights, completely lifting the perimeter rule would likely draw more passengers from other airports,

⁶¹International Civil Aviation Organization, *Take-off: Guidance for Air Travel through the COVID-19 Public Health Crisis* (Montréal, Canada, May 27, 2020).

compared to adding a small number of additional beyond-perimeter flights, according to a few stakeholders.⁶²

MWAA has long objected to any additional changes to the perimeter rule, citing concerns over its longer-term planning. According to MWAA representatives, the perimeter rule supports longstanding policy whereby Reagan National is a short and medium-haul facility and Dulles can serve all types of operations.⁶³ MWAA officials also said they have made investment decisions about capital projects at Dulles, assuming that Dulles would handle longer-haul flights.

According to MWAA officials, Dulles' financial status has been negatively affected by the existing exemptions at Reagan National and a number of factors could cause challenges for MWAA and Dulles moving forward. First, MWAA's current Use and Lease agreement with airlines allowed for revenue sharing between the two airports, which helped decrease Dulles' costs assessed to airlines serving Dulles, making the airport more competitive. However, the agreement is set to expire at the end of 2024, and MWAA representatives do not intend to include a similar provision in future agreements. According to representatives, the cost-sharing provision was intended to be a one-time solution when Dulles airport was having more substantial financial difficulties. The expiration of the provision could result in higher costs for airlines at Dulles, making the airport less attractive for them, particularly if additional beyond-perimeter flights are allowed at Reagan National and these flights draw passengers from Dulles. Moreover, as a result of COVID-19, passenger boardings are not expected to return to 2019 levels for a number of years, causing additional financial uncertainty for both Dulles and Reagan National.

⁶²Representatives from one airline said that while adding a small number of additional beyond-perimeter flights will likely draw fewer passengers from Dulles or BWI, the effects of any additional beyond-perimeter flights should be looked at cumulatively with the existing 40 exemptions.

⁶³Metropolitan Washington Airports, 46 Fed. Reg. 58036 (Nov. 27, 1981).

Changes to the Perimeter Rule Could Have Varied Effects on Travel Options for Passengers and Airline Competition

Travel Options for Passengers to or from Reagan National

Lifting the perimeter rule at Reagan National would likely be a detriment to passengers in certain communities. Many selected stakeholders agreed that if the perimeter rule were lifted, airlines would reduce or discontinue service for some passengers traveling to or from smaller communities within the perimeter. According to some stakeholders, flights to smaller communities generally generate less revenue because they use smaller aircraft and carry fewer passengers. Instead, airlines tend to focus their schedules on their highest value flights. Therefore, if the rule is lifted and airlines are able to choose between using their slots for flights to smaller communities within the perimeter or for service to larger beyond-perimeter airports, they will likely choose to expand some service on beyond-perimeter routes.⁶⁴ With these changes, some passengers in larger communities beyond the perimeter would likely benefit through new or enhanced non-stop service to Reagan National.

While stakeholders agreed that airlines would shift some within-perimeter slots for use on beyond-perimeter routes if the perimeter rule were lifted, it is difficult to predict the extent of these changes. First, according to a few stakeholders, airlines' networks and flight patterns are complex, and forecasting changes can be difficult. Second, airlines have incentives—aside from profitability—to operate certain routes, according to an aviation academic, such as operating flights to an airport where maintenance can be conducted or to get a flight crew to a certain airport. Moreover, while airlines may look to shift some slots to beyond-perimeter flights, some protections would still exist for smaller communities within the perimeter. For example, about 20 percent of slots at Reagan National are reserved for commuter aircraft operations, and airlines cannot operate aircraft with more than 76 seats on these routes. A few stakeholders said that the types of aircraft used for commuter slots are not designed to fly long distances beyond the perimeter and often are not preferred by

⁶⁴Representatives from one airline said if they reduced service to some airports within the perimeter, they would look to increase the size of the aircraft for the remaining flights on those routes. Thus, although they would be reducing service frequency, the number of available seats on the route might not be reduced much, if at all.

passengers for longer-haul routes. Therefore, these slots may provide some protections to smaller communities within the perimeter.

If, instead, a small number of additional beyond-perimeter flights were added, airlines could increase service for some passengers beyond the perimeter, potentially without reducing service to communities within the perimeter, according to some stakeholders. As has generally been the case with previous statutes, when exemptions were made for new beyond-perimeter flights, airlines have added flights without reducing the number of within-perimeter flights to small communities.

Airline Competition on Beyond-Perimeter Routes and at D.C. Area Airports

Given airlines' disparate slot holdings at Reagan National, lifting the perimeter rule could provide an advantage to airlines with large air carrier slot holdings. Our review of FAA data for the summer of 2019 found that slot holdings for the nine airlines ranged from 1 to 357 daily air carrier slots (see table 4). As a result, many stakeholders we spoke with agreed that airlines with the largest holdings at Reagan National would have a substantial competitive advantage if the rule were lifted because they would have more opportunities to add beyond-perimeter flights. A few stakeholders also said airlines that operate much of their network on the West Coast could also benefit, as it would be a natural move for them to add beyond-perimeter flights to these airports, if airlines were allowed to operate additional beyond-perimeter flights.

Table 4: Airlines' Weekday Slot Holdings at Ronald Reagan Washington National Airport, as of 2019

Airline	Number of daily air carrier slots held	Percentage of total daily air carrier slots
Air Canada	1	0.1
Alaska Airlines	18	2.6
American Airlines	357	51.3
Delta Air Lines	86	12.4
Frontier Airlines	6	0.9
JetBlue Airways	60	8.6
Republic Airline	4	0.6
Southwest Airlines	82	11.8
United Airlines	82	11.8

Source: GAO analysis of Federal Aviation Administration data. | GAO-21-176

Notes:
 Percentages may not add to 100 due to rounding.
 Data are for weekdays.
 Air carrier slots also include flights allowed through slot exemptions.

Stakeholders' perspectives generally align with economic literature and our past work, which has found that competition is strongest when there are many firms in a market and no firm has a substantial share of that market.⁶⁵ For example, some studies have found that greater market concentration is associated with higher prices.⁶⁶

While lifting the rule could provide advantages to airlines with larger air carrier slot holdings at Reagan National, it could also benefit some passengers by lowering airfares on some routes. Of the 10 beyond-perimeter routes, only three have more than one airline providing non-stop service to or from Reagan National (see table 5). Our previous work and past economic literature has demonstrated that the extent of competition on individual routes is the most relevant factor in how prices are set in the airline industry.⁶⁷ Further, according to DOT officials who are responsible for monitoring the competitive effects of airlines' slot holdings, the key factors that drive competition on a route or at an airport are: (1) number of competitors on a route, (2) each airline's overall market share at the airport, and (3) whether any of the airlines on a route are low-cost competitors. Therefore, if the rule were lifted and airlines added flights to existing beyond-perimeter routes, competition on those routes could increase, resulting in lower average airfares for passengers. In contrast, some within-perimeter routes could see reductions in the number of competitors on routes or the frequency of service. Nevertheless, it would be challenging to predict or quantify such effects.

Table 5: Number of Airline Competitors on Beyond-Perimeter Routes at Ronald Reagan Washington National Airport, as of 2019

Airport	Airlines on route (number of daily round-trip flights)
Austin, Texas	<ul style="list-style-type: none"> • Southwest Airlines (1)
Denver, Colorado	<ul style="list-style-type: none"> • Frontier Airlines (3) • United Airlines (1)
Las Vegas, Nevada	<ul style="list-style-type: none"> • American Airlines (1)
Los Angeles, California	<ul style="list-style-type: none"> • Alaska Airlines (1) • American Airlines (2) • Delta Air Lines (1)

⁶⁵GAO, *Airline Competition: The Average Number of Competitors in Markets Serving the Majority of Passengers Has Changed Little in Recent Years, but Stakeholders Voice Concerns about Competition*, [GAO-14-515](#) (Washington, D.C.: June 11, 2014).

⁶⁶For these studies, see [GAO-14-515](#).

⁶⁷[GAO-14-515](#).

Airport	Airlines on route (number of daily round-trip flights)
Phoenix, Arizona	<ul style="list-style-type: none"> • American Airlines (3)
Portland, Oregon	<ul style="list-style-type: none"> • Alaska Airlines (1)
Salt Lake City, Utah	<ul style="list-style-type: none"> • Delta Airlines (1)
San Francisco, California	<ul style="list-style-type: none"> • Alaska Airlines (1) • United Airlines (1)
San Juan, Puerto Rico	<ul style="list-style-type: none"> • JetBlue Airways (1)
Seattle, Washington	<ul style="list-style-type: none"> • Alaska Airlines (2)

Source: GAO analysis of Department of Transportation data. | GAO-21-176

Depending on the DOT allocation process and the beyond-perimeter routes airlines seek to serve, the addition of a small number of beyond-perimeter flights could create the potential for limited enhancements to competition on specific routes. In each of the three previous authorizations, a key criterion DOT has used to award exemptions for beyond-perimeter flights has been that the new service would increase competition by a new entrant airline or increase competition in a market. Some stakeholders also said that allocating new beyond-perimeter flights to low-cost airlines, airlines with smaller slot holdings, or airlines that do not have slots at Reagan National could be particularly pro-competitive. We have previously reported that because half of the new beyond-perimeter flights in previous statutes were awarded to low-cost airlines, thereby increasing competition, these new flights could have a positive effect on fares on routes where new flights were added.⁶⁸ Moreover, representatives from two low-cost airlines told us they entered the Reagan National market only after receiving the exemptions. However, the complexities of the aviation market and consumer demand make it difficult to determine the efficacy of any consumer or aviation benefits outside of a specific policy proposal and detailed DOT allocation plan.

Both scenarios could also have implications on airline competition among the three D.C. area airports. Some stakeholders—including representatives from a few airlines—said that when setting prices and schedules for flights to or from Reagan National, they consider, among other things, prices and schedules for non-stop flights at Dulles and BWI. Our past work has also found that when there is more than one airport in a metropolitan area for a consumer to choose from, some passengers will consider multiple airports when looking for a flight.⁶⁹ That said, other

⁶⁸GAO-12-902.

⁶⁹GAO-14-515.

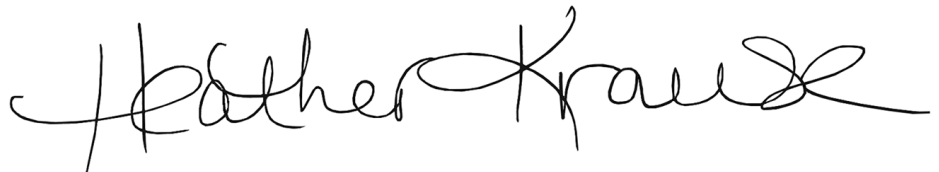
travelers (mostly business travelers) may be unwilling to consider alternative airports.

Agency Comments

We provided a draft of this report to DOT and MWA for review and comment. DOT and MWA both provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees, the Secretary of the Department of Transportation, the FAA Administrator, and other interested parties. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have questions about this report, please contact me at (202) 512-2834 or KrauseH@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix II.



Heather Krause
Director, Physical Infrastructure Issues

Appendix I: Objectives, Scope, and Methodology

In this report, we were asked to update our past work on the perimeter rule at Ronald Reagan Washington National Airport (Reagan National).¹ This report examines: (1) what is known about the effects of the existing beyond-perimeter flights at Reagan National and (2) key considerations if additional beyond-perimeter flights are allowed.

To address these objectives, we reviewed laws, regulations, and Department of Transportation's (DOT) and Federal Aviation Administration's (FAA) documents on air traffic control rules at Reagan National, including on the perimeter and slot control rules. We interviewed officials at DOT and FAA to determine each agency's role with respect to these rules and to capture their perspectives on our objectives. We conducted a literature search for peer-reviewed studies, government reports, and trade and industry articles about perimeter rules at U.S. airports that were published from 2010 through 2019 to obtain background information, identify potential stakeholders to interview, and determine whether any peer-reviewed studies had examined the perimeter rule at Reagan National.²

We analyzed T-100 data on flights and passengers collected by airlines and reported to DOT from calendar years 2010 through 2019, the most recent 10-year period available at the time of our review.³ For beyond-perimeter flights, we analyzed data on the type of aircraft, number of available seats, numbers of passenger boardings, and numbers of flights and destinations.⁴ We then compared these data to (1) all within-perimeter flights, and (2) within-perimeter flights to large-hub airports to

¹GAO, *Slot-Controlled Airports: FAA's Rules Could Be Improved to Enhance Competition and Use of Available Capacity*, [GAO-12-902](#) (Washington, D.C., Sept. 13, 2012); GAO, *Reagan National: Update on Capacity to Handle Additional Flights and Impact on Other Area Airports*, [GAO-07-352](#) (Washington, D.C., Feb. 28, 2007); GAO, *Reagan National: Capacity to Handle Additional Flights and Impact on Other Area Airports*, [GAO/RCED-99-234](#) (Washington, D.C., Sept. 17, 1999); and GAO, *Airline Deregulation: Barriers to Entry Continue to Limit Competition in Several Key Domestic Markets*, [GAO/RCED-97-4](#) (Washington, D.C., Oct. 18, 1996).

²We did not identify any peer-reviewed studies about Reagan National's perimeter rule. Our search used the following databases: ProQuest, ProQuest Dialog, Scopus, EBSCO, Westlaw, and Harvard Think Tank. Two other U.S. airports have been subject to perimeter rules—New York's LaGuardia Airport and Dallas Love Field.

³We also reviewed T-100 data for quarter two of 2020 on the numbers of passenger boardings and flights to describe how COVID-19 affected Reagan National.

⁴For 2019, we also looked at the percentage of seats on beyond-perimeter flights that were filled; this metric is commonly referred to as a load factor.

identify any differences and better understand the marginal effects of adding the beyond-perimeter flights, relative to not allowing any exemptions for beyond-perimeter flights.⁵

To understand the potential effects of these beyond-perimeter flights on Washington Dulles International Airport (Dulles) and Baltimore/Washington International Thurgood Marshall Airport (BWI), we also analyzed T-100 data from those two airports on numbers of flights and passengers from 2010 through 2019 to Reagan National's beyond-perimeter airports. We then compared these data to the same beyond-perimeter flights at Reagan National from 2010 through 2019 to see if the exemptions authorized in 2012 corresponded to changes at Dulles and BWI. We also relied on our past work in 2012 and 2007 to discuss any effects prior to 2010.⁶ T-100 includes traffic data on passengers, as well as flights for U.S. airlines traveling to, from, or within the U.S. These data represent a 100-percent census of all traffic. We obtained these data from Diio, a private contractor that provides online access to U.S. airline financial, operational, and passenger data with a query-based interface.⁷ To assess the reliability of the T-100 data, we reviewed the quality control procedures used by Diio and DOT, conducted electronic testing of the data to identify any outliers, verified the accuracy of T-100 data on passenger boardings and number of flights with relevant airlines and airport authorities, compared our results to DOT's published data, and interviewed DOT officials about how the data were collected and used. We determined the data were sufficiently reliable to describe the effects of the beyond-perimeter flights at Reagan National.

We also interviewed a non-generalizable sample of nine U.S. airlines and 23 stakeholders (four airport authorities, seven aviation academics and researchers, five airport or industry associations, five community groups

⁵The term "hub" is defined in federal law to identify commercial service airports as measured by passenger boardings. Federal law defines large-hub airports as those with at least 1 percent of total annual passenger boardings. 49 U.S.C. § 40102(a)(29).

⁶[GAO-12-902](#) and [GAO-07-352](#).

⁷Diio's default parameter for T-100 data is to limit results to airlines and routes that had at least 3 departures per month at the airport. Taking this action helps filter out charter flights and irregular operations, such as a flight diversion (i.e., a flight that left from the scheduled airport but flew to an arrival airport other than the scheduled destination point).

concerned about noise, and two consumer advocates) listed in table 6.⁸ We selected a range of network and low-cost airlines to include those that operate beyond-perimeter flights at Reagan National; that have varied market shares at Reagan National, Dulles, or BWI; and that were required to report operational data to DOT in 2019.⁹ These airlines accounted for more than 90 percent of flights and passengers at Reagan National, Dulles, and BWI in 2019.¹⁰ We selected airport authorities to include those that oversee the major commercial airports in the Washington D.C. or New York-area airports, as well as one airport authority that expressed interest in obtaining a beyond-perimeter flight to Reagan National. Aviation academics and researchers, airport and industry associations, community groups concerned with noise, and consumer advocates were selected based on prior work, stakeholder recommendations, or our literature search.

Table 6: List of Aviation Industry Stakeholders GAO Interviewed

Category	Stakeholder
Airlines	Alaska Airlines
	Allegiant Air
	American Airlines
	Delta Air Lines
	Frontier Airlines
	JetBlue Airways
	Southwest Airlines
	Spirit Airlines
	United Airlines
Airport Authorities	City of San Antonio
	Maryland Aviation Administration
	Metropolitan Washington Airports Authority
	Port Authority of New York and New Jersey

⁸We also received a letter from the Reagan National Airport Community Noise Working Group in which they expressed their strong opposition to adding exemptions for additional beyond-perimeter flights.

⁹DOT requires airlines that handle a certain percentage of domestic scheduled-passenger revenue in the most recently reported 12-month period to report data for reportable flights. In 2019, the reporting threshold was .5 percent; 17 airlines met this reporting threshold.

¹⁰Of these nine airlines, as of December 2019, six operated flights at all three airports, two only operated flights at BWI, and one operated flights at Reagan National and BWI.

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Category	Stakeholder
Airport or Industry Associations	Aircraft Owners and Pilots Association
	Airports Council International-North America
	Metropolitan Washington Council of Governments
	National Business Aviation Association
	Washington Airports Taskforce
Aviation Academics and Researchers	Dr. Peter Belobaba, Massachusetts Institute of Technology
	Dr. Jan Brueckner, University of California at Irvine
	Dr. Kenneth Button, George Mason University
	Dr. R. John Hansman, Massachusetts Institute of Technology
	Dr. Lance Sherry, George Mason University
	Randy Waldeck, Principal, CSDA Design Group
Community Groups Concerned with Noise	Dr. Bud Weinstein, Southern Methodist University
	Arlington County Board
	Arlington Ridge Civic Association
	Aurora Highlands Civic Association
	Crystal City Civic Association
Consumer Advocates	Montgomery County Quiet Skies Coalition
	National Consumers League
	Travelers United

Source: GAO. | GAO-21-176

Because the effects can vary depending on whether and how the rule is changed, we examined the potential effects of changes to the perimeter rule using three scenarios: (1) no changes to the perimeter rule and keeping the 40 daily beyond-perimeter exemptions, (2) adding a small number of additional beyond-perimeter flights while retaining the perimeter rule, and (3) completely lifting the rule.¹¹ We also developed a list of factors to consider if additional changes are made to the perimeter rule based on our prior work and asked stakeholders for their perspectives on these factors during interviews.¹² Stakeholders, including DOT and FAA officials, generally agreed that we identified the correct key factors.

¹¹In the first scenario where the rule is completely lifted, we assumed that airlines only convert slots allocated for larger aircraft. The smaller aircraft used for commuter slots are not designed to fly long distances beyond the perimeter. For the second scenario, we assumed that the number of slots allocated for within-perimeter flights stays the same.

¹²See [GAO-14-515](#), [GAO-12-902](#), and [GAO-07-352](#).

In this report, we refer to a “few” stakeholders if representatives from two to three entities expressed the view, “some” if representatives from four to six entities expressed the view, and “many” if representatives from seven or more entities expressed the view. Because stakeholders’ expertise varied, not every stakeholder provided an opinion on every topic. Although the views of these stakeholders we spoke with are not necessarily representative of all stakeholders, they still represent the views of relevant stakeholders and provide valuable insights. That said, many of the stakeholders may have views that align to their self-interests, such as operating additional beyond-perimeter flights or ensuring that no new slots are allocated at Reagan National. Therefore, where possible we have attempted to corroborate stakeholders’ perspectives with available data and other analyses.

We also examined other federal data and reviewed relevant reports. Specifically:

- We reviewed data on flight delays at Reagan National from calendar years 2010 through 2019—the most recent 10-year period available—and at all large-hub airports in 2019 from DOT’s Airline Service Quality Performance System to understand information on flight delays.¹³ These data are based on information filed by airlines each month with DOT’s Bureau of Transportation Statistics.¹⁴ To assess the reliability of the data, we compared our results to DOT’s published data, and interviewed DOT officials about how the data were collected and used. After reviewing this information, we determined the data were sufficiently reliable to present information on changes in flight delays over time.
- To determine if Reagan National could accommodate additional beyond-perimeter flights, we compared FAA’s slot holder reports—which reflect the number of slots held by commercial airline operators—for the summer of 2019 against regulations and statutes

¹³Since the ASQP data are only available since June 2003, we did not look at changes in flight delays before or after the 2000 or 2003 beyond-perimeter, exemptions were allowed in statute. Instead, we focused our review of delay data on the 12 months before (June 2011 and May 2012) and after (September 2012 and August 2013) the 2012 exemptions were awarded and put into operation.

¹⁴DOT’s reporting threshold changed over the course of our review. From 2010 through 2017, the reporting threshold was at least 1 percent of passenger-scheduled revenue; this threshold was expanded to 0.5 percent in 2018. Because the reporting threshold is determined on an annual basis, the number of reporting airlines has varied from 12 airlines to 18 airlines.

on the maximum number of air carrier, commuter, and slot exemptions allowed per hour during weekdays.¹⁵ We also obtained data from FAA on the number of general aviation flights at Reagan National from July through August of 2019 and compared that number against FAA’s regulations on general aviation reservations allowed per hour. To assess the reliability of the data, we interviewed DOT officials and reviewed FAA’s user manuals and definitions, as well as other documentation describing how data are collected and stored. We determined that the data were sufficiently reliable to report information on the average number of hourly general aviation flights at Reagan National for the summer of 2019.

- To determine if Reagan National could accommodate additional passengers from beyond-perimeter flights, we reviewed usage data from the Metropolitan Washington Airports Authority (MWAA)—which oversees Reagan National and Dulles—on roadway access and parking, gates and seating areas, terminal capacity, and other terminal areas (e.g., check-in, security, and baggage facilities) for calendar year 2019. To assess the reliability of the usage data, we solicited written responses from MWAA on how the data were collected, as well as the agency’s procedures for ensuring the accuracy of the data. In their written responses, MWAA officials stated that where possible they use industry standards—such as those developed by the Airport Cooperative Research Program and International Air Transport Association—to calculate these measures and determine capacity. Officials said they consider the quality of the data to be reliable and accurate. Therefore, we determined that MWAA’s usage data for Reagan National was sufficiently reliable to describe the airport’s current capacity.
- We also summarized financial information (i.e., cost per enplaned passenger) on Dulles from MWAA’s publicly available reports for calendar years 2010 through 2019, the most recent 10-year period available, to discuss the airport’s financial state.¹⁶
- We also reviewed a 2019 regional air passenger survey conducted at Reagan National, Dulles, and BWI by the National Capital Region

¹⁵49 U.S.C. § 41718 and 14 C.F.R. § 93.123.

¹⁶Cost per enplaned passenger is defined as all landing fees, airside usage charges, fuel flowage fees, terminal rents, and other terminal payments to an airport, divided by the number of enplaned passengers. See Metropolitan Washington Airports Authority, *2020 Budget: January 1-December 31 2020*, (Washington, D.C.: Dec. 11, 2019.) We did not independently assess this data.

Transportation Planning Board to help describe passengers' preferences for the airports, as well as the modes of transportation they used to get to the airport.¹⁷ Although the data for the 2019 survey were collected over a 2-week period in October, the survey results have been annualized to observed annual passengers for the 12-month period from January to December 2019.¹⁸

- We summarized our prior work on topics related to the perimeter rule, slot control rule, flight delays, and airline competition and presented those findings.¹⁹

We also reviewed information on perimeter rules at Dallas Love-Field and New York LaGuardia Airports identified from our literature search and stakeholder interviews to identify their applicability to Reagan National. We found the purposes of the perimeter rules, as well as other characteristics of these airports to be substantially different from Reagan National. Therefore, we did not attempt to analyze the effects of the perimeter rules at LaGuardia Airport or Dallas Love-Field and apply them to the perimeter rule at Reagan National. For example, unlike Reagan National, LaGuardia Airport's perimeter rule is imposed by the airport operator and Dallas Love-Field is not subject to slot control rules. Moreover, stakeholders we interviewed generally agreed that it would be difficult to apply any lessons learned from the perimeter rules at LaGuardia Airport and Dallas Love-Field and apply them to Reagan National.

We conducted this performance audit from October 2019 to November 2020 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe

¹⁷To conduct the survey, field staff collected completed surveys from 23,858 out of a total of 83,424 enplaning passengers on 673 randomly selected flights (589 domestic and 84 international) at the three airports, for an overall response rate of 28.6 percent. See National Capital Region Transportation Planning Board, *Washington-Baltimore Regional Air Passenger Survey - 2019* (Washington, D.C.: April 2020).

¹⁸Percentages across all three airports are subject to a sampling error of approximately plus or minus 3 percentage points at the 90 percent confidence level. Percentages at individual airports (i.e., Reagan National) are subject to a sampling error of twice that amount.

¹⁹See [GAO-14-515](#), [GAO-12-902](#), GAO, *National Airspace System: Setting On-Time Performance Targets at Congested Airports Could Help Focus FAA's Actions*, [GAO-10-542](#), (Washington, D.C.: May. 26, 2010), [GAO-07-352](#), [GAO/RCED-99-234](#), and [GAO/RCED-97-4](#).

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that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: GAO Contact and Staff Acknowledgments

GAO Contact

Heather Krause at (202) 512-2834 or krauseh@gao.gov.

Staff Acknowledgements

In addition to the individual named above, Sara Vermillion (Assistant Director); Melissa Swearingen (Analyst-In-Charge); Amy Abramowitz; Eli Albagli; Paul Aussendorf; Melissa Bodeau; Jieun Chang; David Hooper; Gina Hoover; Malika Rice; and Travis Schwartz made key contributions to this report.

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