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House Committee on Transportation and
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AVIATION INFRASTRUCTURE

Challenges Related to Building Runways and Actions to Address Them





Highlights of [GAO-03-164](#), a report to the Aviation Subcommittee, House Committee on Transportation and Infrastructure

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Challenges Related to Building Runways and Actions to Address Them

Why GAO Did This Study

Aviation experts believe that building runways is one key way to address airport capacity issues and prevent delays that can affect the entire U.S. economy, but runway projects are often controversial and time-consuming. GAO was asked to examine how much time airports spend completing runways, what challenges airports and other stakeholders experience during this process, and what airports and other stakeholders have done to address challenges related to runway projects.

GAO analyzed the results of surveys from 30 airports on 32 runway projects and visited 5 airports in order to interview numerous runway project stakeholders.

The Department of Transportation agreed with GAO's characterization of the challenges associated with building runways and some of the initiatives taken to address these challenges. They did express some concerns related to GAO's analysis of the time airports spent or estimated spending in developing runways, and suggested that GAO acknowledge additional FAA efforts to improve the runway process. We believe that our approach was a reasonable assessment of the amount of time taken to build runways; however, we clarified our discussion about the length of time. We also added information regarding initiatives undertaken by FAA.

www.gao.gov/cgi-bin/getrpt?GAO-03-164

To view the full report, including the scope and methodology, click on the link above. For more information, contact Gerald Dillingham, Ph.D., at (202) 512-3650 or via E-mail at dillingham@gao.gov.

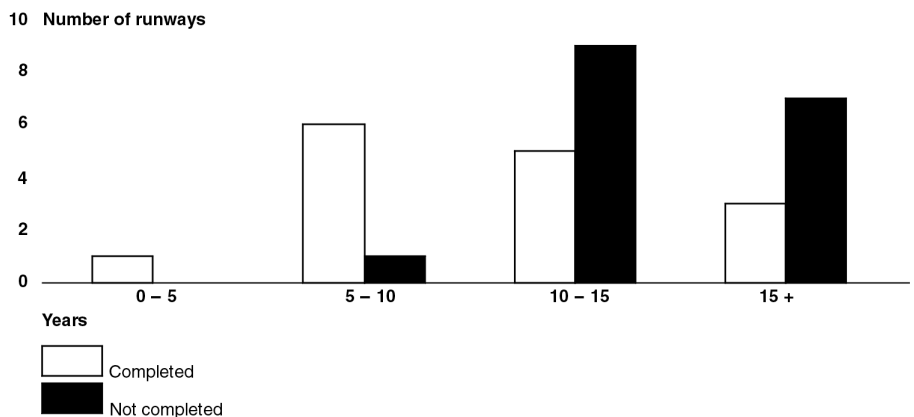
What GAO Found

The amount of time airports spend planning and building their runways can vary because of numerous factors. In light of this variation, for the 32 runway projects we analyzed, we used median rather than average time. The median time was about 10 years for runways that had been completed and was estimated to be about 14 years for those not completed. Most airports and stakeholders we visited and surveyed said they faced a variety of challenges that had delayed their runway projects. While the level of challenges that airports faced varied in part depending on the proximity of the airport to a major city and the amount of community opposition to the runway, some common themes emerged, including challenges related to the following:

- Reaching stakeholder agreement on purpose and need for the runway;
- Completing the environmental review process;
- Reaching agreement on noise mitigation and other issues; and
- Designing and constructing the runway.

Although there may be no single solution to the challenges involved in developing runways, the federal government and airport authorities have undertaken a number of initiatives in this area. Recently, the President issued an Executive Order that is directed at streamlining the environmental review of transportation infrastructure projects, including runways. In addition, two federal legislative initiatives designed to streamline the runway process were considered in the 107th Congress. In addition, FAA has undertaken a number of initiatives directed at streamlining parts of the process. Airports have also undertaken initiatives in this area, including involving stakeholders such as community groups early in the process, and reaching early agreement on how best to mitigate noise and other runway impacts. These initiatives may be a step in the right direction, but it is too early to assess their impact on the runway process.

Amount of Time Airports Spent or Estimated Spending to Complete Runways Varied



Source: Airport survey data.

Contents

Letter	1
Results in Brief	2
Background	4
Some Airports Have Spent Many Years Building Runways and Have Faced a Variety of Challenges	10
A Number of Initiatives Are Underway to Address Challenges Related to Building Runways	16
Agency Comments	22

Appendixes

Appendix I: Scope and Methodology	24
Appendix II: Airport Site Visits	26
General Edward Lawrence Logan International Airport – East Boston, MA	27
Current Status of the Runway Project	30
Stakeholders Cite Community Opposition as a Major Challenge and Say Efforts to Address This Issue Were Unsuccessful	30
Stakeholders Say Meeting Extensive Environmental Requirements Has Been Challenging Because of Community Opposition	31
Litigation Added Time to Process	34
Appendix III: Dallas-Fort Worth International Airport – DFW, TX	36
Current Status of the Two Runway Projects	38
Airport Officials Described Extensive Environmental Review Process as Challenging	38
The Dallas-Fort Worth International Airport Used Some Unique Approaches to Mitigate Runway Impacts	38
Stakeholder Experiences, from Start to Finish, Were Many and Varied	39
Litigation Delayed Process	40
Appendix IV: Memphis International Airport	43
Status of the Runway project	45
Airport Officials Stated That They Faced Challenges Reaching Consensus among Stakeholders on Project Funding Issues and Decisionmaking	45
Extensive Requirements Raised Challenges Regarding Wetlands Mitigation and Land Acquisition during Construction of Runway	46
Site-Specific Challenges Involved Relocating Other Infrastructure	47

Appendix V: Minneapolis-St. Paul International Airport	49
Current Status of the Runway Project	51
Stakeholders Agree That Comprehensive Mitigation Plans Are Essential but Difficult to Develop	51
Stakeholders Believe That Mitigation Funding Should Be More Flexible to Include More Communities	52
A Nationwide Low Frequency Noise Policy Is Not in Place	52
Some Communities Question Justification of State Zoning Laws	53
Appendix VI: Seattle-Tacoma International Airport	56
Status of the Runway project	58
Simplifying Purpose and Need May Help Reduce the Circuitous Nature of the Review Process	58
A Compatible Land Use Program May Help to Reduce Opposition	59
New Mitigation Approaches and Increased Community Interaction Could Help Foster Community Support	60
Extensive Regulatory and Legal Requirements Posed Resource Challenges	62
Site-Specific Issues Involve Safety and Environmental Challenges	63
Appendix VII: Lester B. Pearson International Airport, Toronto, Canada	65
Status of Runway Projects	67
Airport Development Process in Canada Differs from U.S. Process	67
Canadian Airports Face Many of the Same Challenges as U.S. Airports	68
Appendix VIII: Survey of Airports	70
Appendix IX: Survey of Airports with Recent or Planned Runway Projects	72

Tables

Table 1: Summary of Provisions in H.R. 4481 and S. 633, and the Challenges Each Seeks to Address	18
Table 2: Airports Selected for Site Visit and their Runway Projects	27
Table 3: History of the Boston Logan Runway Project	35
Table 4: History of Dallas-Fort Worth Runway Project	41
Table 5: History of Memphis Runway Project	48
Table 6: History of Minneapolis-St. Paul International Airport Runway Project	54
Table 7: History of Sea-Tac Runway Project	64

Table 8: Airports Surveyed	71
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Figures

Figure 1: Runway Development Process	8
Figure 2: Amount of Time Airports Have Spent or Planned to Spend on Runway Projects Varied	11
Figure 3: Median Time Spent on Runway Projects Overall and on Each Phase	12
Figure 4: Airport Diagram—Boston’s Logan International Airport	29
Figure 5: Airport Diagram—Dallas-Fort Worth International Airport	37
Figure 6: Airport Diagram—Memphis International Airport	44
Figure 7: Airport Diagram—Sea-Tac International Airport	57
Figure 8: Airport Diagram—Lester B. Pearson International Airport	66



United States General Accounting Office
Washington, D.C. 20548

January 30, 2003

The Honorable John L. Mica
Chairman
The Honorable William O. Lipinski
Ranking Democratic Member
Subcommittee on Aviation
Committee on Transportation and Infrastructure
House of Representatives

Although the events of September 11, 2001, diverted the aviation industry's attention from airport flight capacity to security issues, aviation experts believe that addressing capacity issues must be brought back to the forefront to prevent costly flight delays and their negative effect on the U.S. economy. According to a recent report on the impact on civil aviation,¹ the flight congestion and delay problems that were experienced in 2000 had a significant effect on the entire U.S. economy and were felt not only in the commercial aviation industry but also in the tourism and related supplier industries. The report found that in 2000, commercial aviation delays resulted in over \$9 billion in negative economic effects on the entire U.S. economy and cost commercial airlines over \$3 billion. In addition, the report stated that if there were no new investments in airport construction (including new runways) or in the air traffic system beyond 2000, delays could potentially cost the U.S. economy \$13.5 billion in 2007 and \$17.2 billion in 2012.

Building runways can involve years of planning, an extensive environmental review phase, and the design and construction of the actual runway. Airport authorities who want to build a runway must also coordinate with numerous stakeholders, including airlines, federal and state officials, and community groups. In addition, they may face legal challenges from opponents of the runway that can take years to resolve. Nonetheless, according to FAA, despite these challenges, building new runways is widely regarded as the most effective way to increase capacity

¹*The National Economic Impact of Civil Aviation*, DRI-WEFA, Inc., July 2002.

in the national airspace system and is critical to the entire U.S. economy.² This report provides information on the process for building runways, taking into consideration the needs of the system and the concerns of the various stakeholders. Specifically, as agreed with your offices, we address the following questions:

1. How much time do airports spend building their runway projects, and what challenges do airports and other stakeholders experience during this process?
2. What have airports and other stakeholders done or proposed to do to address the challenges they experienced in building runways?

To determine the amount of time that airports spent to complete runway projects, along with challenges that airports and other stakeholders faced during this process and initiatives to address these challenges, we surveyed 30 airports that had built or planned to build a total of 32 runways between 1991 and 2010. Based on survey responses, we selected 5 airports that were diverse in size, location, and challenges at which we conducted in-depth site visits in order to understand the perspectives of numerous stakeholders. At these locations, we interviewed airport, airline, federal and state, and community officials about their experiences. We also visited the Lester B. Pearson International Airport in Toronto, Canada, to gain a perspective on the Canadian runway development process. A more detailed explanation of the scope and methodology can be found in appendix I.

Results in Brief

The amount of time that airports spend planning and building their runways can vary because of a number of factors. For example, although it is relatively straightforward to determine the beginning and ending of the environmental and the design and construction phases of the runway development process, there is no consensus among stakeholders about what constitutes the beginning of the planning phase of the process. Consequently, the length of time and the number of activities considered by some airports to be part of the planning phase vary. In light of these circumstances, we decided to use a median time rather than the average time because it would minimize the impact of outlying airports that may have taken a very long or very short time. For the airports we surveyed, the

²Some in the aviation industry believe that demand management and peak pricing are also feasible alternatives to reducing congestion and delays.

median time spent from planning to completion of their runway projects was about 10 years, and the median time that airports estimated they would spend on projects not yet completed was about 14 years. Several of the airports with unfinished runway projects stated that significant challenges had delayed their projects' completion. Although the level of challenges faced by airports varied depending on such factors as proximity of the airport to a major city, amount of community opposition to the runway, and specific environmental issues, some common themes emerged. For example, several airports described challenges related to reaching stakeholder agreement on the purpose and need for the new runway. Another theme was the challenge of completing required environmental reviews; specifically, airports described challenges related to complying with extensive and duplicative federal and state requirements and obtaining the necessary permits. Some airports also described challenges related to reaching agreement on how to mitigate the impact of noise and other issues. Several airports commented that they faced challenges during the design and construction of their runways such as dealing with weather and site preparation issues.

Although there may be no single solution that addresses all the issues involved in planning and building runways, the federal government and airport authorities have undertaken a number of initiatives in this area. Most recently, the President issued an Executive Order that is directed at streamlining the environmental review of transportation infrastructure projects by requiring federal agencies that conduct environmental reviews to develop procedures that will allow the reviews to be completed in a timely and responsible manner. In addition, to address challenges associated with the many regulatory requirements of the runway development process, two legislative initiatives designed to streamline the runway development process have been under consideration at the federal level. FAA has also undertaken several initiatives directed at increasing communication and coordination, and at streamlining the planning and environmental review of runway projects. FAA officials expect these initiatives to produce measurable improvements in the runway development process. Although some airports stated that the federal initiatives held promise for helping airports to resolve challenges more quickly, it is too early to assess their impact on the runway development process. Airports have also undertaken initiatives to address challenges related to building runways, including getting local stakeholders such as community groups involved at the very beginning of the process and reaching early agreement on how to mitigate the impacts of the runway. Airports described these initiatives as helpful to facilitating the completion

of their runway projects, and their efforts may be useful for other airports involved in runway projects to consider, but the variety of situations that airports described and the different levels of challenges they faced make it difficult to generalize from one airport's experience to another.

We provided the Department of Transportation with a draft of this report for their review and comment. FAA officials agreed with our characterization of the challenges associated with building runways and our identification of some of the initiatives to address these challenges. However, they did express some concerns related to our analysis of the time that airports spent developing their runways, and suggested that GAO include more acknowledgment of FAA's efforts to improve the process. In response to FAA's comments, we believe our approach was a reasonable assessment of the amount of time it takes airports to build runways; however, we clarified our discussion about the length of time. We also added information regarding several initiatives that FAA has undertaken to streamline the runway development process, and we made technical changes where appropriate.

Background

The decision to build runways has traditionally elicited strong and often emotional reactions among stakeholders, both negative and positive. Generally, these reactions are directed at the decision to build a runway—usually in response to the perceived environmental or economic impacts that the proposed project will have on the surrounding communities. Often, opponents to a runway project base their opposition on the belief that the negative impact of the runway on their quality of life will outweigh the projected benefits of the project. At other times, opponents contend that alternatives such as high-speed rail, regional airports, or demand management are better alternatives to resolving delay issues than building new runways. In contrast, proponents of new runway projects generally contend that building new runways can increase the level of service and reduce delay at the airport, can result in a positive economic impact to the region served by the airport, and in some cases can reduce noise pollution by distributing flights over a larger geographical area.

Airports that plan to build runways must comply with what can become a complex process involving three general phases that often overlap: planning, environmental review, and design and construction. In addition, airports can be involved in legal actions that can occur in any or all of the three phases.

The first phase in the runway development process is planning. According to FAA guidance, airports should begin planning for a new runway when the airport has reached 60 to 75 percent of total annual flight capacity. During the planning phase, airport authorities and local officials begin by identifying the type of development needed at a specific airport and the proposed project's estimated cost and benefits, in both political and economic terms. Some of the planning tasks include establishing the purpose and need for the runway (for example, assessing the capability of current facilities, reviewing and refining aviation demand forecasts, and evaluating options to accommodate forecast demands), coordinating land use issues with community planning boards, and preparing capacity enhancement plans, master plans, airspace reviews, cost benefit analyses, and airport layout plans.³ Further, most airports consider numerous alternatives for increasing capacity or reducing delay before deciding on a project to pursue. During this phase, airports will begin addressing how to fund the proposed project.

The environmental review phase, which often overlaps with planning, is the second phase in the runway development process. This phase typically begins with a determination by FAA of the extent to which a proposed project will affect the quality of the environment.⁴ To make this determination, FAA examines the proposed project and its possible environmental impacts on air and water quality, on noise, and on historical lands. FAA will make one of three determinations. If the agency determines that the scope of the project is such that it will not directly affect the environment, it will issue a categorical exclusion.⁵ If FAA determines that a project will have a measurable effect on the environment, but that its impact will not exceed guidelines established in the agency's Environmental Handbook, it will issue a Finding of No Significant Impact (FONSI). After issuance of a FONSI, runway projects can begin applying for necessary permits, such as those that may be required under the Clean

³Airports and other stakeholders develop these plans to help them identify potential ways to increase airfield capacity at major airports and to coordinate major infrastructure projects at the airports.

⁴Some states have environmental review requirements in addition to federal requirements.

⁵Under the National Environmental Policy Act of 1969, a categorical exclusion exempts the project from the requirements of the federal environmental review process. However, according to FAA, categorical exclusions are not an option for a new runway or major runway extension. A categorical exclusion does not necessarily relieve the project from state and local environmental review requirements.

Air Act or the Clean Water Act. Where potentially significant impacts are obvious, FAA will proceed directly to the preparation of an environmental impact statement (EIS) rather than start with the airport sponsors' environmental assessment.⁶

If FAA determines that a proposed project will have significant environmental effects, it will issue a notice of intent to prepare an EIS. An EIS includes an analysis of the potential environmental effects of a proposed project and how to mitigate significant impacts. Council on Environmental Quality (CEQ) regulations do not require that all impacts be mitigated; agencies are required to disclose impacts that will not be mitigated, and the reason. After the draft EIS is completed, FAA provides it to the Environmental Protection Agency (EPA), which publishes a notice of its availability in the *Federal Register*, where it is made available for review and comment to federal, state, and local agencies and the public for at least 45 days. Public hearings, if necessary, usually occur during the review and comment period. At the end of the public comment period, FAA responds to comments received on the draft and prepares the final EIS. Once FAA approves the final EIS, the document is printed, distributed, and once again filed with EPA. EPA subsequently publishes notice of the availability of the final EIS in the *Federal Register*. According to CEQ regulations, FAA can not issue a Record of Decision (ROD) for at least 30 days after the publication of the final EIS. Once the final EIS has been issued, it takes FAA an average of about 3 months to issue a ROD. The ROD, which is the final step of the environmental review process, summarizes the administrative record of the agency's proposals, alternatives, analysis, findings/determinations, decisions, actions, and mitigation measures that were made a condition of approval of the EIS. If, however, FAA finds that the revised draft differs significantly from the initial draft, the agency may issue a supplemental draft EIS and release this document for further review and comment. In addition, other factors that may lead to a supplemental EIS include a change in the proposed action, a change in the agency's

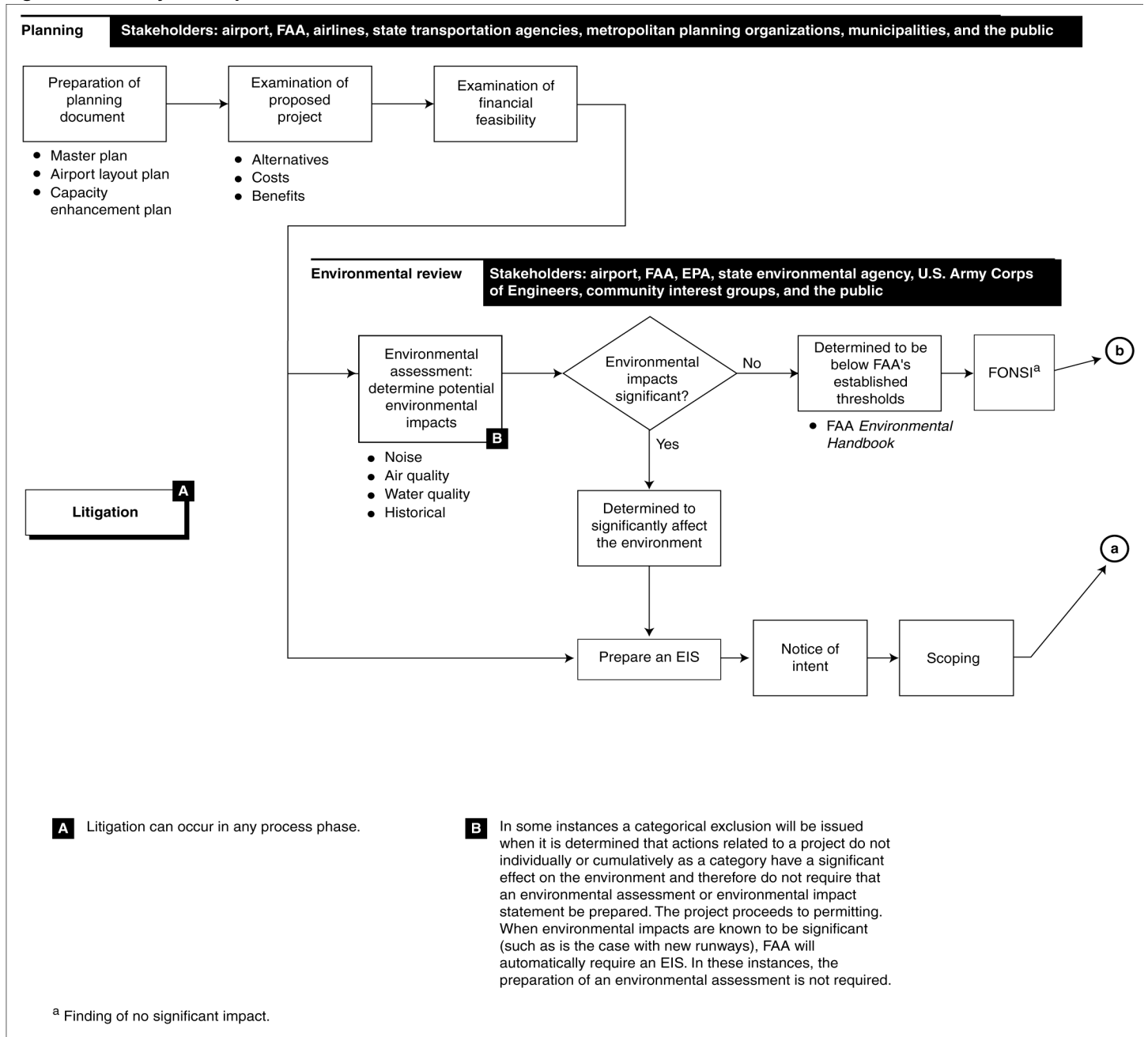
⁶An EIS is a document required of federal agencies by the National Environmental Policy Act of 1969 and its implementing regulations as formulated by the Council on Environmental Quality for major projects or legislative proposals that significantly affect the environment. It describes the environmental effects of the undertaking and lists alternative actions. In principle, it is a basis for deciding whether to approve the project. FAA is responsible for preparing an EIS for a major airport project or selecting a contractor (that is, consultant) to assist FAA in preparing the EIS. Typically, FAA coordinates with the airport authority when it selects an EIS consultant.

decision, or new reasonable alternatives not previously evaluated. A supplemental draft EIS can occur anywhere in the environmental process.

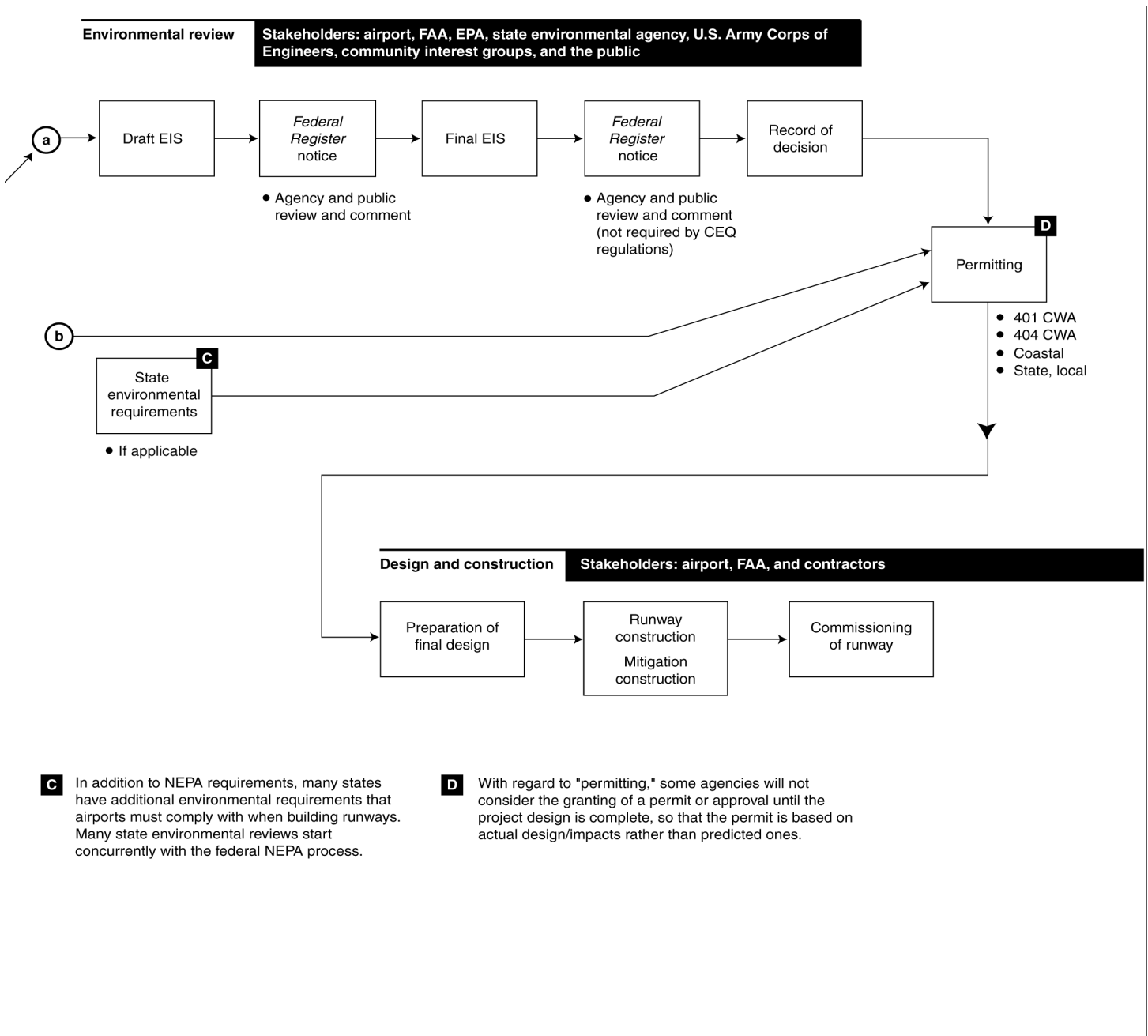
In addition to the requirements above, airport sponsors may be required to obtain environmental permits/approvals from other state, local, and federal agencies before they can begin construction of the proposed project. These permits/approvals cover various federal and state requirements related to wetlands, water and air quality, coastal zone management, and endangered species, among others. These requirements arise from various regulations, including the federal Clean Water Act and Clean Air Act. For example, the Army Corp of Engineers requires permits when proposed projects have an impact on wetlands under the Clean Water Act. State and local agencies may also be responsible for requiring permits dealing with air and water quality. Similar to the National Environmental Policy Act (NEPA) process, the permitting process may include a public review and comment period. Project opponents may initiate litigation once the final EIS has been approved and the FAA has issued a favorable ROD. However, a lawsuit can be filed at any time during the planning, environmental, and design and construction phases.

Following the completion of the permit process, project sponsors generally begin the final phase of the runway development process—the design and construction phase. This phase includes a myriad of tasks, such as project engineering, financing, contracting, land acquisition, site preparation, and actual project construction. This phase also includes construction tasks related to mitigating noise, wetland, and other environmental impacts. According to FAA, it is common for airport sponsors to begin runway design while the environmental process is underway in the interest of saving time by undertaking these actions concurrently. Once construction of the runway has been completed, FAA certifies the runway for operation and commissions it for service. Figure 1 illustrates the main steps involved in the runway development process.

Figure 1: Runway Development Process



Source: FAA and other federal sources.



Note: GAO analysis of FAA and other documents.

Some Airports Have Spent Many Years Building Runways and Have Faced a Variety of Challenges

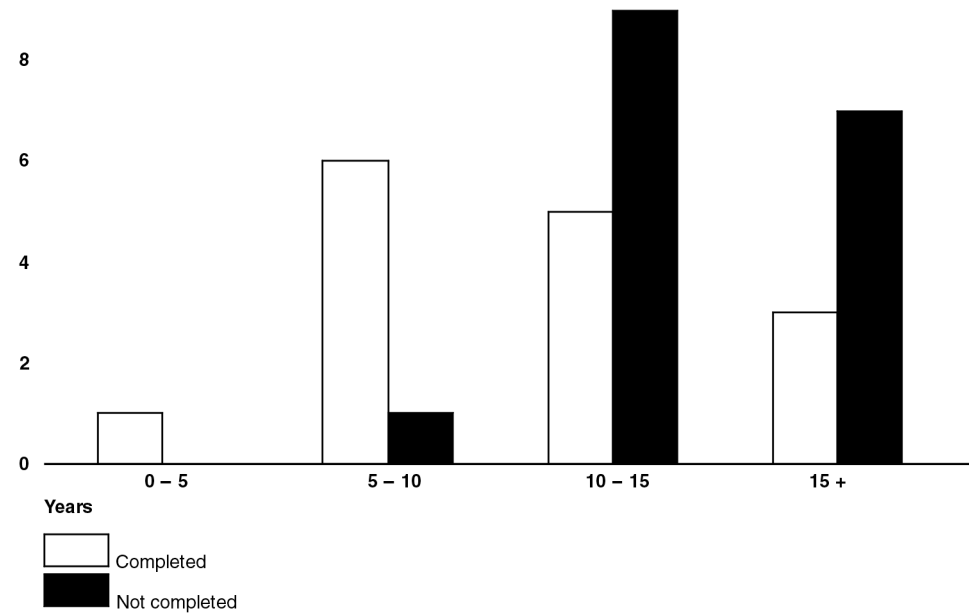
The amount of time that airports spend planning and building their runways can vary because of a number of factors. For example, although it is relatively straightforward to determine the beginning and ending of the environmental and the design and construction phases of the process, there is no consensus about what constitutes the beginning of the planning phase. Consequently, the length of time and the number of activities considered by some airports to be part of the planning phase vary. Airports also described a variety of challenges that they said delayed their projects. Many of these challenges related to reaching stakeholder agreement, completing the environmental review phase, mitigating the impact of noise, or designing and constructing the actual runway.

Completed Runways Took a Median of 10 Years to Build, and Unfinished Runways May Take Even Longer

As shown in figure 2, airports we surveyed reported spending a wide range of time in completing runway projects. In general, airports reported spending less time on completed projects than they estimate they will spend on those projects not yet completed; for example, airports reported that about half of the completed runways took 10 years or less but estimated that almost all the projects that were not yet completed (16 out of 17) would take 10 years or more. According to the airports with uncompleted projects, a number of factors contributed to the time spent, such as community opposition and difficulties in dealing with environmental requirements.

Figure 2: Amount of Time Airports Have Spent or Planned to Spend on Runway Projects Varied

10 Number of runways

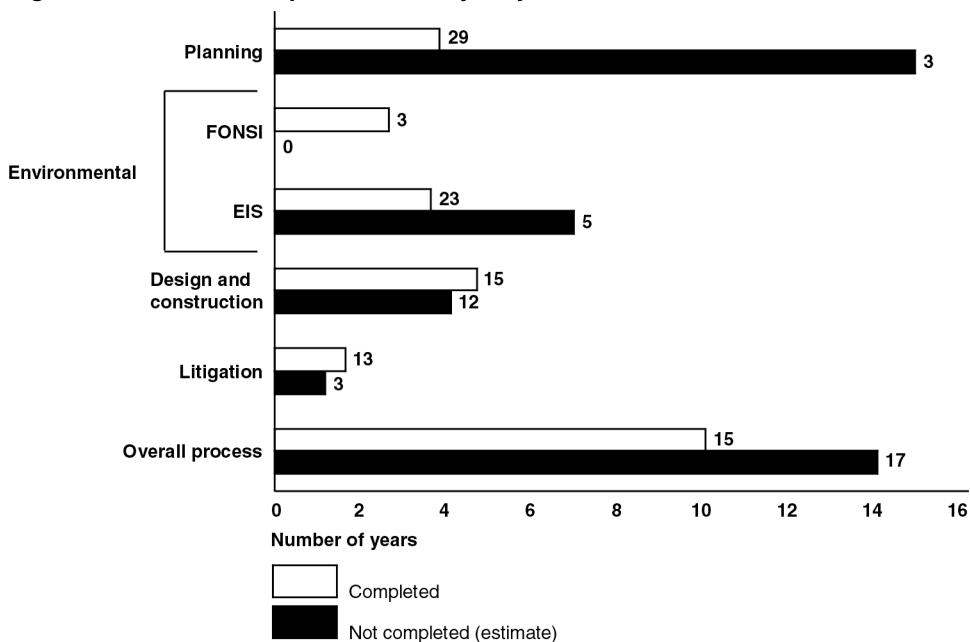


Source: Airport survey data.

Note: GAO analysis of airport survey data.

Figure 3 shows that the median time spent on completed runway projects was about 10 years, while the median time airports estimated they would spend on runway projects not yet completed was about 14 years. Similarly, the median time spent on the planning and environmental phases for airports that had completed these phases was significantly shorter than the median time airports estimated would be spent on those phases for projects that they had not yet completed. This may have been because the three projects in the planning phase and the five projects in the environmental phase were experiencing challenges that the airports believed would delay the completion of the respective phases. Moreover, the median time spent on the environmental phase of projects that had completed their environmental requirements under a FONSI was about 2.7 years, while the median time spent on the environmental phase of projects that had completed their environmental requirements with an EIS was about 3.7 years. This difference is likely attributable to the greater number of requirements that accompany an EIS as compared with a FONSI.

Figure 3: Median Time Spent on Runway Projects Overall and on Each Phase Varied



Source: Airport survey data.

Note 1: GAO analysis of airport survey data.

Note 2: Airports used different milestones to indicate the start and end dates for each phase. Given this difference, we used median time rather than average time.

Note 3: Although we received 32 responses regarding the amount of time taken or estimated to complete the overall process, the number of responses regarding the amount of time taken or estimated to complete each phase varied.

In May 2001, the Department of Transportation issued a report to the Congress on an environmental review of airport improvement projects that reported results similar to our analysis.⁷ As a part of its analysis, FAA measured the average time that elapsed between the start of planning and the start of construction for 10 airports that received approval for a new runway between 1996 and 2000. FAA found that the average time from

⁷Report to the U. S. Congress on Environmental Review of Airport Improvement Projects, U.S. Department of Transportation, May 2001.

the start of planning until the start of construction was about 10 years.⁸ The report also stated that the average time to complete an EIS for a new runway was 3.25 years from the beginning of the EIS process to the issuance of the Record of Decision—or about one-third of the 10-year time. According to FAA, there can be a considerable lag from the inception of the runway process until the runway is completed and in operation. FAA added that these delays occur as part of the process that airports sometimes go through in seeking to achieve consensus and the political will to move forward while contending with local public and political opposition to runway development. According to FAA, numerous examples can be found where runway development has been delayed 5, 10, or more years while plans are revised, discarded, or shelved until political and/or economic factors can be satisfied. FAA stated that these actions make it difficult to determine how long it takes to build a runway.

Several Themes Emerged among the Challenges That Airports Described

Most airports that we surveyed and visited described significant factors that delayed their runway projects. In many cases, the challenges they described were interrelated. For example, several airports said they faced significant community opposition, which affected their ability to reach stakeholder agreement and to complete the environmental review phase. Although many of the airports we surveyed experienced similar types of challenges, some airports, such as those in Boston, Atlanta, and Seattle, faced a heightened level of challenges because of their locations in urban areas with a large number of residences very close by. Some of the specific challenges identified by airports and other stakeholders we visited include the following:

Reaching stakeholder agreement. Reaching consensus on the purpose and need for a runway was described by several airports as being particularly challenging. In order to reach this consensus, airports generally must meet numerous times with stakeholders who may have differing opinions about the runway project or uses of land surrounding the airport. For example, airport officials in Los Angeles and Boston described challenges related to working with community interest groups and local metropolitan planning organizations that opposed the runway projects and advocated using means other than building a new runway to address

⁸FAA officials said that if they added 3 to 5 years for design and construction, then FAA's determination of average time to complete a runway would become about the same as that reported by GAO for projects not yet completed.

capacity issues, such as developing regional airports, building new airports, or pursuing alternative transportation modes like high-speed rail.

Some airports described challenges related to reaching agreement with stakeholders other than community groups. For example, stakeholders in Seattle said that reaching agreement was challenging on issues such as where the runway should be located or the coordination of sometimes inconsistent land use plans among various planning groups. Officials at Boston's Logan Airport said they could not reach agreement with FAA, a key stakeholder on all runway projects, regarding what was needed to satisfy the environmental review process. Specifically, Logan Airport officials disagreed with FAA's decision to extend its environmental process by requiring a supplemental EIS because they believed that environmental issues had been settled during the initial analysis. They believed that FAA's decision to require the supplemental draft stemmed from significant public and political pressure from those opposed to the project.

Completing the environmental review phase. Of the 30 airports we surveyed, 13 stated that one of their most significant challenges in planning and building their runways was complying with environmental requirements. Under the current process, airports must comply with over 40 federal laws, executive orders, and regulations that often overlap with the environmental requirements mandated by some states. For example, federal law requires the governor of each state to certify that federally funded runways conform to local air quality standards, a requirement known as the Governor's certification. In addition, the Clean Air Act requires FAA to determine whether emissions from each airport project conform to its state's plan for implementing national air quality standards. According to officials from the American Association of Airport Executives and Airports Council International, many state air quality plans contain unrealistically low airport emissions budgets, and few realistically anticipate reasonable airport growth. They believe that coordinating airport development activity with the state air quality plans causes a major source of delay and risk to airport projects. The officials also noted that the Governor's Certificate requirement duplicates requirements found in the Clean Air Act and Clean Water Act.

Moreover, several airports, including those in Boston, Atlanta, Houston, and Minneapolis-St. Paul, commented that obtaining the permits necessary to complete the environmental review was a challenge that delayed their projects, because permitting agencies often took much longer than expected. Boston Logan officials stated that they experienced delays

because the permitting agencies did not agree on the order in which the permits should be issued. For example, the coastal zone management agency was unwilling to issue its permit until FAA issued the ROD; however, FAA was unwilling to issue the ROD until the coastal permit was issued. According to FAA officials, the agency was able to obtain a satisfactory assurance from the state permitting agency that allowed FAA to move forward with the issuance of the ROD. As a result, according to FAA officials, they were able to avoid a significant delay.

Mitigating the impact of noise and other issues. As we reported in October 2000,⁹ mitigating the potential impact of aircraft noise on the surrounding community continues to be a significant challenge for airports that are building new runways. One of the reasons is that community concerns with aircraft noise are generally already high around many airports, and adding new runways adds to the already heightened concern. Another reason, according to some stakeholders, why mitigating noise is particularly challenging for several of the airports is because they do not participate in FAA's voluntary Part 150 Noise Compatibility Program, which provides funding to airports to help mitigate the impact of noise on the communities. Several other airports also told us that their noise problems are the result of incompatible land uses (existing or planned) around the airports.

In addition to mitigating the impact of noise on the surrounding community, officials at Sea-Tac Airport said that they were equally challenged to mitigate the impact of the project on wetlands, particularly because two key stakeholders had conflicting views on how this should be done. According to Sea-Tac officials, the state of Washington has a strong preference that mitigation measures for wetland and stream impacts be located in the same water basin where the impacts occur. However, because of concerns about attracting wildlife, and the danger to aircraft of bird strikes, FAA strongly advises that airports avoid locating wetlands within 10,000 feet of runways.

Design and construction of the runway. Several airports commented that they also faced some challenges during the design and construction phase of their runways. For example, Dallas-Fort Worth officials stated that adverse weather conditions created construction problems for them, as the

⁹U.S. General Accounting Office, *Aviation Infrastructure: Challenges Associated with Building and Maintaining Runways*, GAO-01-90T (Washington, D.C., Oct. 5, 2000).

region's high temperatures made it difficult to ensure that concrete poured for the runway would cure properly. Airport officials at Sea-Tac also described challenges related to the design and construction phase. For example, before Sea-Tac can build its runway it has to import 17 million cubic yards of dirt to the airport to extend a plateau for a foundation. Thus, the airport authority has to find suitable, nonpolluted fill dirt to use for the foundation. Once the dirt is located, it must be transported to the airport over an indirect route using trucks that the airport is required to clean before they leave the airport. Finally, the airport authority is to use extensive mitigation measures to ensure that moving the dirt will not adversely affect the surrounding communities and wetlands.

Appendixes II through VI provide a detailed description of how various challenges have affected runway projects at the Boston, Dallas, Memphis, Minneapolis-St. Paul, and Seattle airports, according to airport authorities and other stakeholders.

A Number of Initiatives Are Underway to Address Challenges Related to Building Runways

While there may be no single solution to all the challenges associated with planning and building runways, the federal government and airports have undertaken a number of initiatives to address the challenges related to such issues as duplicative environmental requirements, stakeholder differences, and noise mitigation. Primarily, these initiatives focused on streamlining the environmental review process and improving cooperation, communication, and coordination among major stakeholders.

Federal Initiatives Focus on Streamlining the Environmental Review Process to Reduce Duplication

One initiative designed to address a significant issue identified by airports and other stakeholders—the extensive and often duplicative environmental review requirements—is Executive Order 13274, entitled Environmental Stewardship and Transportation Infrastructure Project Reviews, which was signed by the President on September 18, 2002.¹⁰ The order directs agencies that conduct required environmental reviews with respect to transportation infrastructure projects, including runways, to formulate and implement administrative, policy, and procedural mechanisms that enable the agencies to ensure completion of such reviews in a timely and

¹⁰The order does not supersede the requirements of the National Environmental Policy Act or other environmental laws.

environmentally responsible manner. The order also states that the Secretary of Transportation shall

- designate a list of high-priority transportation infrastructure projects to receive expedited agency reviews;¹¹
- chair an inter-agency task force to monitor and expedite environmental reviews of high-priority transportation infrastructure projects, and identify and promote policies that can effectively streamline the environmental review process; and
- prepare an annual report to the President describing the results of the expedited reviews, and provide recommendations.

Executive departments and agencies shall take appropriate actions, to the extent consistent with applicable law and available resources, to promote environmental stewardship in the nation's transportation system and to expedite environmental reviews of high-priority transportation infrastructure projects. The Secretary has stated that the Department of Transportation will work with federal and state agencies to reduce duplicative and overlapping requirements and promote effective strategies for enhancing the timeliness of the decisionmaking process.

Proposed legislation was introduced in the 107th Congress to address several of the concerns raised by a number of airports and other stakeholders we surveyed and visited—H. R. 4481, the Airport Streamlining Approval Process Act of 2002, and S. 633, the Aviation Delay Prevention Act. H.R. 4481, the House bill, focused on capacity-enhancement projects and was generally directed at streamlining the runway development process, while the Senate bill was directed at reducing aviation delays. Table 1 summarizes some of the key provisions in H.R. 4481 and S. 633 that sought to address the challenges the airports identified.

¹¹On October 31, 2002, the Secretary of Transportation selected seven high-priority transportation projects. One airport project was selected—a runway construction project at the Philadelphia International Airport. The Secretary is currently considering additional transportation projects, including airport projects, to add to the initial list.

Table 1: Summary of Provisions in H.R. 4481 and S. 633, and the Challenges Each Seeks to Address

H.R. 4481, Airport Streamlining Approval Process Act of 2002	S. 633, Aviation Delay Prevention Act	Challenge addressed
Directs FAA to take action to encourage the construction of airport capacity-enhancement projects at congested airports.	Requires DOT to designate certain airport projects as national capacity projects. The airports where these national capacity projects are designated would be required to complete the planning and environmental review process within 5 years, or else lose access to certain federal funds.	Reaching stakeholder agreement.
Authorizes DOT to develop interagency cooperative agreements with other federal and state stakeholders in the environmental review process.	Requires DOT to implement an expedited coordinated environmental review process for national capacity projects that provides for better coordination among federal, regional, state, and local agencies.	Completing the environmental review phase.
Allows airports to reimburse FAA for the additional staff necessary to review and approve project construction requests.	Authorizes DOT to develop a 5-year pilot program funded by airport sponsors to hire additional FAA environmental specialists and attorneys.	Completing the environmental review phase.
Makes DOT the lead agency for all capacity-enhancement project environmental reviews, with responsibility for setting time frames for all relevant agency reviews. All federal agency reviews would be required to occur concurrently.	Requires DOT to implement an expedited environmental review process that provides a “date certain” process deadline for environmental reviews.	Completing the environmental review phase.
Allows DOT to define the purpose and need for any airport capacity-enhancement project for any federal or state review that requires the establishment of a purpose and need.	Not addressed.	Reaching stakeholder agreement.
Eliminates the required Governor's certification, which states that an airport will meet state and local environmental standards.	Eliminates the required Governor's certification, which states that an airport will meet state and local environmental standards.	Completing the environmental review phase.

Source: U.S. General Accounting Office.

In responding to our survey, seven airports stated that eliminating the governor’s certificate requirement would reduce duplicative environmental requirements. In an August 2000 report to the Congress on aviation and the environment, we suggested that Congress may wish to consider eliminating the state air quality certification requirements in airport legislation because it is duplicative of protections offered under the Clean Air Act.¹² FAA officials stated that they agreed with our suggestion and believed that a parallel situation exists with respect to state water quality certification,

¹²U.S. General Accounting Office, *Aviation and the Environment: Airport Operations and Future Growth Present Environmental Challenges*, GAO/RCED-00-153 (Washington, D.C.: Aug. 30, 2000).

which is largely duplicative of protections under the Clean Water Act. Both the House and the Senate bills would have eliminated the Governor's Certificate requirement.

FAA Initiatives Focus on Streamlining the Planning and Environmental Review Processes

FAA has identified and undertaken several initiatives directed at streamlining the planning and environmental review processes and improving cooperation, communication, and coordination among major stakeholders. Some of the initiatives have been implemented, and others are currently underway. FAA officials believe that the initiatives, if successful, will provide measurable improvements in the amount of time and resources spent in the planning and environmental review phases of the process.

FAA has undertaken several initiatives to improve the planning and environmental processes that the agency believes will help ensure that runway projects are completed in a timely manner. With respect to planning, FAA prepared an internal Memorandum of Agreement in September 2002 to standardize the procedures for establishing multidisciplinary teams to participate in major airport planning studies. The agency has plans to update its guidance on airport master plans and to upgrade an airspace and ground capacity simulation model in fiscal year 2003, and to update its guidance on airport terminal planning and design by the end of fiscal year 2004. With respect to streamlining the environmental review process, FAA began implementing several initiatives in January 2001 that are designed to produce measurable improvements. FAA began establishing multidisciplinary EIS teams for new EISs at large hub primary airports, reallocating staff resources and seeking airport reimbursable agreements to support environmental work, and increasing the use of consultants to assist FAA with coordination and administration of EISs.

To increase coordination and assign accountability for runway development tasks to key stakeholders, FAA began another initiative in August 2001 as a part of its Operational Evolution Plan—a 10-year plan to expand and modernize the nation's airport system. FAA developed detailed plans called Runway Template Action Plans to provide a standard set of tasks that must be considered when developing new runways. FAA has completed Runway Template Action Plans for 12 airports that are expected to complete new runways by 2008. According to FAA officials, the agency has met the deadlines for its commitments at all of the airports, and no runway completion date has changed as a result of FAA actions since the program began.

While the Executive Order and the proposed legislation were designed to address challenges some of the airports experienced, it is too early to assess their impact; the Executive Order was only recently signed, and the legislation did not pass in the 107th session of Congress. Nonetheless, several stakeholders, including airports we surveyed and visited, supported efforts consistent with these initiatives. Further, FAA officials believe that the initiatives FAA has taken and proposed will yield measurable improvements in the runway development process—particularly with respect to the planning and environmental review phases of the process.

Airports Have Undertaken Some Initiatives to Address Challenges

Airports we visited and surveyed described a number of actions they have taken to address the challenges they faced in building their runways. These actions included proactive approaches to working with stakeholders to plan for and mitigate various impacts of the runway projects on neighboring communities. For example, the Louisville airport used an unusual approach to deal with the needs of neighboring homeowners who would be required to move in order to be outside the noise parameter levels posed by the new runway. After reaching agreement on the market value that the airport would pay for each home, the airport offered these residents a choice: residents either could move to a new home of equal value in a new community development being built by the airport, or they could participate in the traditional relocation program, where the airport purchases the home and the family relocates to a home and location of its choosing. Airport officials stated that this approach worked well for both the airport and the displaced residents. According to airport officials, the residents benefited because those who wished to stay together as a community (which was the preference of many) were able to do so, and the airport saved approximately \$17,000 per home on those homes built in the new community development.

A Washington State Department of Transportation official stated that minimizing controversy over the uses of land needed for expanding runway capacity could be important in avoiding lengthy project delays. The department developed an Airport Land Use Compatibility Program, implementing a 1996 amendment of the Washington State Growth Management Act—the state’s land-use planning law. The law requires cities and counties to identify, site, and protect essential public facilities (including airports) from incompatible land use, such as encroaching development. In other words, when developing local land-use plans, cities and counties must ensure that their plans do not adversely affect these facilities. As part of the land-use compatibility program, certain state

transportation officials provide consultations, including mediation, between airport sponsors and community representatives (often municipal or county planning staff) to balance the state's dual interest of promoting aviation and ensuring the health, safety, and welfare of its residents. The approach to facilitating airports' future expansion includes several steps, including the development of planning-based solutions and the integration of those solutions into a legally enforceable document, such as a comprehensive development plan—rather than the Airport Master Plan, which is not binding on land-use authority—in order to increase the probability that the solutions will succeed.

In Minneapolis, the airport attempted to build consensus throughout the project by considering mitigation agreements that were more liberal than those required by FAA. For example, the airport has been pursuing a liberal noise-mitigation strategy in order to better address community concerns about noise impacts. The airport chose to keep residential blocks together for noise-mitigation measures, whether or not the entire block fell within the same noise contour. In other words, if one residence in a block lay within the 65-decibel Day Night Average Sound Level (DNL) noise contour, every residence on the block received similar mediation measures.¹³ Another challenge for which the airport had to develop a solution was mitigating the noise impacts on a National Wildlife Refuge located within the flight path of the new runway. The refuge contains an educational center and is a popular location for bird watching. The refuge contended that the usefulness of the center and bird watching activities would be severely impacted by noise from the runway. The airport and the refuge were ultimately able to negotiate an agreement whereby the airport authority would pay the organization \$26 million for the right to conduct flight operations over the refuge.

In Dallas-Fort Worth, the airport chose to implement a four-stage approach to mitigating the noise impacts of the runway project: 1) direct land acquisition for properties located in the runway protection zone, 2) direct land acquisition of certain properties for noise mitigation, 3) sound proofing structures for noise mitigation, and 4) acquisition of aviation easements. Airport officials noted that the first three stages of the mitigation plan are standard among most runway projects and, in the case of acquiring properties in the runway protection zone, required of all

¹³The Day Night Average Sound Level is a measurement of the average noise impacts of the airport on the surrounding community.

airports. However, with respect to aviation easements, the airport undertook an approach that it considered to be extraordinary at the time. The airport offered residents 25 percent of the fair market value of their property to acquire easements for noise impacts. The easements are attached to the property deed, affecting the current property owner and all future owners of that property.

Overall, the airports that described these initiatives believed they had a positive impact on their runway projects. Other airports described similar initiatives that they believed were helpful in facilitating the completion of the various phases of their projects. It may be helpful for other airports to consider these initiatives when faced with similar challenges; however, the wide variety of situations faced by airports and the differing levels of community opposition or environmental issues each airport faces make it difficult to determine whether an effort undertaken successfully by one airport will have the same positive results at another airport.

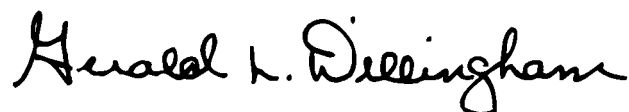
Agency Comments

We provided the Secretary of Transportation with a copy of a draft of this report. FAA officials agreed with our characterization of the challenges associated with building runways and our identification of some of the initiatives to address these challenges. However, they did express some concerns related to our analysis of the amount of time airports spent or estimated spending in developing their runways, as compared with the results of FAA's 2001 study. They also suggested that GAO include more acknowledgment of their efforts in trying to improve the runway development process. Regarding FAA's concerns, we believe our approach was a reasonable assessment of the amount of time it takes airports to build runways. However, we clarified our discussion on the length of time by focusing on the median time rather than the average time because this approach minimizes the impact of outlying airports that may have taken a very long or a very short time to build their runways. We also compared our analysis of the time taken by airports to build runways with FAA's study. See appendix I for a more detailed discussion of the comparative analysis. Finally, we included information regarding several initiatives that FAA has undertaken to streamline and improve the planning and environmental processes. We also made technical changes throughout the report as appropriate.

We performed our work from April 2001 through December 2002 in accordance with generally accepted government auditing standards.

As agreed with your office, unless you release its contents earlier, we plan no further distribution of this report until 10 days after the date of its issuance. At that time, we will send copies of this report to congressional committees with responsibilities for the activities discussed in this report; to the Secretary of Transportation; and to the Administrator of the Federal Aviation Administration. We will make copies available to others upon request. This report is also available at no charge on GAO's Web site at <http://www.gao.gov>.

If you or your staff have any questions regarding the contents of this report, please call me or Tammy Conquest at (202) 512-2834. Other key contributors to this report were Ruthann Balciunas, William Chatlos, David Hooper, Gary Lawson, David Lehrer, and Alwynne Wilbur.

A handwritten signature in black ink that reads "Gerald L. Dillingham". The signature is written in a cursive style with a large initial "G".

Gerald L. Dillingham, Ph.D
Director, Physical Infrastructure Issues

Scope and Methodology

Our primary methods for addressing our two research questions—first, how much time do airports spend building their runway projects and what challenges do airports and other stakeholders experience during this process, and second, what have airports and other stakeholders done or proposed to do to address the challenges they experienced in building runways—were to conduct a nationwide survey of airports that built new runways between 1991 and 2000 or planned to build new runways by 2010, and to perform site visits at five airports. The survey population included 30 airports, 16 of which had built their airports between 1991 and 2000, and 14 of which had planned to build new runways by 2010. The survey, conducted in February 2002, provided data on the amount of time that 30 airports spent in planning and building 32 runway projects; on key factors that accelerated or delayed the projects; and on initiatives that airports have taken to address the challenges they faced during the process.¹⁴

Based on our analysis of the survey responses, we judgmentally selected five airports at which to conduct site visits, to develop a more in-depth understanding of the experiences and challenges they faced. We subsequently visited Boston Logan, Dallas-Fort Worth, Memphis Shelby County, Minneapolis-St. Paul, and Seattle-Tacoma Airports, where we interviewed the airport authority, FAA, hub airlines, state agencies, metropolitan planning organizations, and local community and environmental groups about their experiences with the runway projects. In addition, we also interviewed officials from Lester B. Pearson International Airport in Toronto, Canada, and Transport Canada to gain an understanding of the Canadian runway development process.

We also compared our analysis with FAA's May 2001 report. While the results of the two studies are similar, there are some methodological differences between the two studies. First, our measurement begins at the start of planning and ends with the completion of the runway. In contrast, FAA's measurement begins with planning but ends with the beginning of the design and construction phase. Second, GAO's analysis is based on the median time, which minimizes the impact of runways that take a very long or a very short time to complete; FAA's estimate, however, is based on the average time, which does not account for the impact of outliers. Based on our survey responses, when considering the average time, we found that airports that had completed their projects took 12.25 years and airports

¹⁴Information on the time airports spent in various parts of the process is based, in part, on estimates provided by some airports that have not yet completed their projects.

that had not yet completed their projects estimated that their projects would take about 16 years. Third, our survey allowed the airports to determine the beginning and end of each of the process phases, whereas FAA selected specific events for analysis. For example, FAA's analysis based the end of the environmental review phase on the issuance of the ROD. Certain airports responding to GAO's survey included federal and state permits as part of the environmental process. FAA's May 2001 report found that federal and state permits can take 6 to 12 months or more to complete after the ROD. Finally, each of the two analyses examined a different universe of airports. FAA analyzed data on 10 airports that had projects approved between 1996 and 2000. GAO analyzed data on over 30 runway projects that were completed, or expected to be completed, between 1991 and 2010. GAO's analysis included 6 of the 10 airports that FAA analyzed.

We also interviewed officials from FAA, Airports Council International, the Airline Transport Association, and the National Association of State Aviation Officials to obtain information on the process for building runways and to identify what actions have been taken to address challenges related to planning and building runways.

We conducted our work from April 2001 through December 2002 in accordance with generally accepted government auditing standards.

Airport Site Visits

To gain additional perspective on the runway development process, we visited five airports that had significant positive or negative experiences in going through the runway development process; some of the airports identified initiatives to overcome these challenges.¹⁵ We also included airports that were in various stages of completing their runway projects, and in various parts of the country. We asked the airports to share their experiences in the process of building new runways, as well as those events that either significantly delayed or accelerated the completion of the runway projects. We identified several key factors—the amount of time that transpired, how this time compared with the airports’ expectations of the process timeline, how key stakeholders’ timeliness compared with the airports’ expectations, and the significant events that either delayed or accelerated the completion of the runways. In addition, we considered the airports’ responses to other questions, as warranted. We also visited the Lester B. Pearson International Airport in Toronto, Canada, to gain an understanding of the Canadian runway development process and of the airport’s experiences in building runways. The overarching factor leading to selection was the airports’ experiences that appeared appropriate for other airports to draw upon. These experiences, both positive and negative, are intended to yield lessons that other airports can emulate or avoid. Table 2 shows the airports we selected and the phase of each project as of December 2002.

¹⁵See appendix I for the methodology we used to select the airports we visited.

Table 2: Airports Selected for Site Visit and their Runway Projects

Airport	Location	Size	Phase ^a
Gen. Edward Lawrence Logan International	East Boston, MA	Large	Environmental
Dallas-Fort Worth International	DFW, TX	Large	Completed
Dallas-Fort Worth International	DFW, TX	Large	Suspended ^b
Memphis International	Memphis, TN	Medium	Completed
Minneapolis-St. Paul International	Minneapolis, MN	Large	Construction
Seattle-Tacoma International	Seattle, WA	Large	Environmental
Lester B. Pearson International	Toronto, Ontario	Large	Completed
Lester B. Pearson International	Toronto, Ontario	Large	Completed
Lester B. Pearson International	Toronto, Ontario	Large	Planning

Source: U. S. General Accounting Office.

^aRunway development phases often overlap. The phase shown is the phase with the predominant activity as of December 2002.

^bThe airport suspended development of this runway to explore implications of recent economic and industry events.

Appendixes II through VII contain a summary of the results of our visit to each airport, including background information and status of the runway project. The summaries also highlight significant events and experiences for each specific location, based on our discussions with the airport authorities and key stakeholders. While each of the airports we visited experienced challenges within several broad themes noted earlier (resolving stakeholder differences, completing extensive environmental requirements, and addressing issues related to runway design and construction), those broad themes were not necessarily the most important at that specific site. Consequently, we highlight different experiences at each site. For example, the Boston airport’s legal challenges were much more extensive than were those at the Minneapolis-St. Paul airport. We discuss Boston’s legal challenges at length, while we mention those at Minneapolis-St. Paul as they applied to other experiences.

General Edward Lawrence Logan International Airport – East Boston, MA

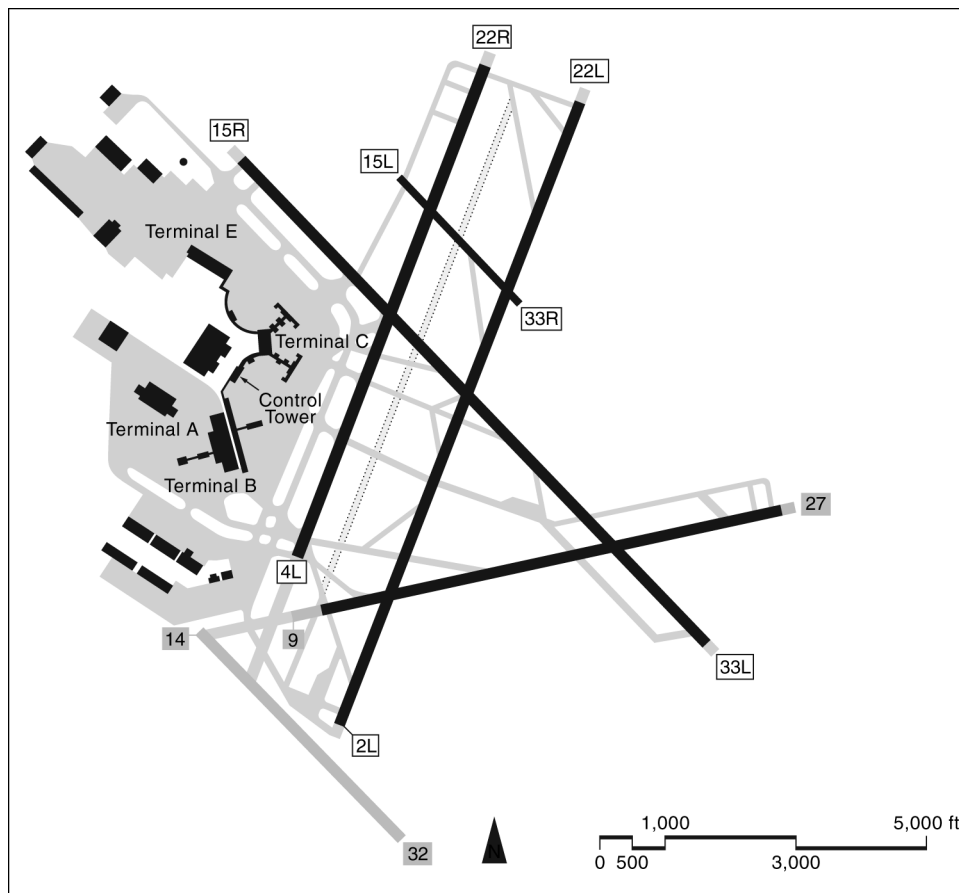
Boston’s Logan International Airport is operated by the Massachusetts Port Authority (Massport). According to FAA, airport, state, and airline officials, Logan plays a critical role in the New England economy, and it serves as the region’s long-haul and international gateway airport. According to Massport officials, in 2000, the airport handled 27.4 million passengers and

contributed about \$6.6 billion to the regional economy, supporting about 100,000 jobs. It was North America's nineteenth-busiest in terms of passenger traffic. Logan is consistently ranked as one of the nation's most delayed airports. In 2000, Logan was the sixth-most delayed airport overall and second-most delayed for arrivals. Logan is served by all the major U.S. carriers. The top carriers are U.S. Airways, American, and Delta, with roughly equal shares of passenger traffic. The airport is primarily an origin and destination point, with about 90 percent of the passengers beginning or ending their trips at Logan.

In good weather, Logan generally operates on a north-south, three-runway configuration with a capacity of about 120 flight operations per hour. However, during adverse weather conditions (such as northwest or southeast winds in excess of 10 knots per hour, which occur about one-third of the year), the airport can be reduced to as few as 60 to 90 operations per hour on an east-west, one- or two-runway operation. Massport believes that its proposed 5,000-foot, unidirectional runway will avoid the significant reduction in efficiency during adverse weather conditions and help mitigate weather-related delays.¹⁶ Massport views the runway as a capacity-neutral airfield enhancement, which means that the proposed runway will decrease delays without increasing the airport's top capacity of about 120 flights per hour. The Massachusetts Executive Office of Environmental Affairs administers the Massachusetts Environmental Policy Act, the state's environmental protection act. In its Final Environmental Impact Report certificate, the Secretary, Massachusetts Executive Office of Environmental Affairs, stated that the central environmental question is not whether the project is accommodating or generating demand per se, but rather whether Massport is operating the airport in a manner that avoids, minimizes, or mitigates environmental impacts in light of its obligations under MEPA. An official from the environmental office stated that the project might increase airfield capacity, but that an airport capacity determination was beyond the scope of its review. Figure 4 shows the existing Logan runway configuration, including the proposed runway project.

¹⁶All flights using this runway would arrive from the southeast or depart from the northwest, over Boston Harbor.

Figure 4: Airport Diagram—Boston’s Logan International Airport



Source: FAA.

We selected Logan Airport as a site-visit location, in part, because its runway project has been in the planning phase since 1969.¹⁷ Further, a state court injunction against building new runways at the airport has been in place since the mid-1970s (FAA approved an EIS for a runway in the same general location on the airfield in the late 1960s). Further, because of the injunction, Massport decided not to actively pursue the project until the project was reinstated in 1995, based on an FAA Capacity Enhancement

¹⁷Logan Airport was not the only airport that spent a long time in the planning phase. Of the 30 airports we surveyed, two others—Phoenix and Indianapolis—also reported spending a long time (about 20 years or more) in the planning phase.

Study. Logan is an example of an airport that has spent a long time in the process, and it has gone through several iterations of the EIS review process.

We interviewed officials at Massport, who were the main sponsors of the new, sixth runway at Logan. We also interviewed officials at FAA's New England Region, American Eagle Airlines, Massachusetts Executive Office of Environmental Affairs, and the Massachusetts High Technology Council. We also gathered information from Communities Against Runway Expansion, the primary community interest group.¹⁸

Current Status of the Runway Project

FAA issued its ROD indicating that the project had satisfied all federal environmental requirements on August 2, 2002. However, the airport can not yet begin constructing the runway because of an existing state court injunction. Moreover, opposition groups appealed the ROD in August 2002 in the U.S. Court of Appeals in Washington, D.C., arguing, among other things, that FAA did not adequately analyze the noise and air quality impacts on neighboring communities.

Stakeholders Cite Community Opposition as a Major Challenge and Say Efforts to Address This Issue Were Unsuccessful

Massport and other stakeholders we interviewed (American Eagle Airlines, Massachusetts Executive Office of Environmental Affairs, FAA, and the High Technology Council) said that the lack of agreement among stakeholders—particularly with regard to responding to the strong ongoing community opposition to the runway project—has presented a major challenge. Communities Against Runway Expansion and other local community groups surrounding the airport opposed the project because of a number of issues, including the impact of the runway on noise, emissions, economic growth, and endangered species. Opponents to the project also question the intended use of the runway (for example, delay reduction versus capacity enhancement). According to FAA, Massachusetts Executive Office of Environmental Affairs, American Eagle Airlines, the High Technology Council, and Massport officials themselves, the public appears to distrust Massport. These stakeholders added that much of the opposition stems from the fact that the airport is located in downtown Boston rather than from plans for a new runway, and that community

¹⁸The Communities Against Runway Expansion Vice President is also the Chair of the Community Advisory Council, a group representing various communities around Logan.

groups opposed to the project are not likely to change their position. According to an American Eagle Airlines official, FAA should help community groups understand the economic benefits of the project on their communities.

Massport said it has attempted to address this challenge through extensive public participation and review efforts, but that these have not been successful. FAA, Massachusetts Executive Office of Environmental Affairs, and the airlines have agreed that Massport involved the public throughout most of the lengthy process, and that the public was able to express its concerns to Massport through the public meetings and the required public comment periods on FAA's decisions. According to Massport, in response to public pressure, FAA created a special review panel and required Massport to undertake a supplemental Draft EIS as a means to further expand public participation. As part of the public outreach process, Massport provided \$350,000 for technical assistance to the Community Advisory Council. Communities Against Runway Expansion, on the other hand, stated that Massport's efforts toward communication were for appearance only—that the airport authority spoke to them but did not listen to their concerns. All agreed that extensive communication did not lead to cooperation and consensus.

Stakeholders Say Meeting Extensive Environmental Requirements Has Been Challenging Because of Community Opposition

Massport and FAA prepared a joint Draft Environmental Impact Report and Draft EIS to meet state and federal requirements. According to Massport, this joint effort is a common approach for streamlining the environmental review process. The joint state and federal permit process lasted over 7 years. Stakeholders said this is partly attributable to community opposition and to the effect of this opposition on the process.

In 1995, in what it described as an effort to conduct the environmental analysis with input from all concerned parties, Massport established the Airside Review Committee, which included representatives from the 24 communities surrounding the airport and from 11 business and industry organizations. However, according to both FAA and Massport, this effort was suspended for about 18 months between 1996 and 1998, when the entire runway project stalled because of a change in Massport leadership and priorities. In 1998, according to Massport officials, the airport attempted to pick up the environmental review process where it had been suspended. Community groups complained that they had not been part of the recent process and appealed to FAA that the Draft EIS was no longer

accurate, complete, or up-to-date. Massport believes it did try numerous times to meet with the Airside Review Committee, but to no avail.

The state approved the Draft Environmental Impact Review in May 1999 and the final Environmental Impact Review in June 2001. However, FAA requested a Supplemental Draft EIS rather than approving the Draft EIS. FAA officials stated that the agency did so because it needed to address several issues, including changing technology and the high level of concerns expressed by project opponents in public comments to the Draft EIS. Massport, the Massachusetts High Technology Council, and American Eagle Airlines all believe that FAA's decision was unreasonable. Massport officials contended that the project had already undergone 5 years of public process, that continuation was unlikely to help achieve local consensus, and that they believed it had not. FAA officials, however, believe that it did result in a better, more informative EIS document.

Individuals, communities, action groups, and business groups submitted comments during public information meetings and hearings and in response to the Draft EIS and Final EIR documents that were extensive. For example, about 800 people attended the two April 2001 public hearings for the Supplemental Draft EIS document and about 850 comment letters were received during the 75-day comment period.

The Supplemental Draft EIS took about 1 year to complete, and it delayed the filing of the Final EIS by about 1.5 years, according to Massport. During this time, in another attempt to develop agreement among stakeholders, FAA chaired a city and commonwealth Task Force to request further comments to the Draft EIS for incorporation into the Supplemental Draft EIS. Although this group met, analyzed, and discussed many runway issues, not all stakeholders were pleased with its outcome. For example, Communities Against Runway Expansion stated that the products of the panel's work, the Supplemental Draft EIS and the Final Environmental Impact Review, were inaccurate and inconclusive, and they justified the runway without proposing a viable alternative.

In late June 2002, FAA issued the Final EIS for public comment, as required by the NEPA process. FAA received approximately 100 comment letters raising 42 main issues, ranging from general opposition to a concern about the adequacy of technical analyses. FAA said that it responded to the comments as required and issued its final approval, the ROD, in August 2002. In both the Final EIS and the ROD, FAA included a restriction (which Massport officials said was unprecedented) that the proposed runway be

used only when winds create conditions in which the usefulness of other current runways is limited.¹⁹ FAA considers this wind restriction a mitigation measure, as it would ensure that the runway was not used to increase capacity during good weather. Many stakeholders—including proponents and opponents—view this restriction as a compromise designed to achieve consensus, but others, such as community groups, maintain that the wind restriction does not go far enough to mitigate the environmental effects of this project. Communities Against Runway Expansion continued to contest FAA's approval in the press and in federal court and, through an urgent message on its Web page, urged others to respond to the Final EIS. Moreover, Massport and Massachusetts Executive Office of Environmental Affairs officials said that, by issuing the ROD with wind restrictions, FAA could reactivate the state environmental review process because the approved project differs significantly from what Massachusetts Executive Office of Environmental Affairs approved in 2001. Subsequently, the Executive Office of Environmental Affairs chose not to reexamine the environmental document because it did not believe that the wind restriction significantly changed the environmental impacts of the runway.

FAA, Massport, and American Eagle Airlines said that, during the length of time spent attempting to get all of the environmental approvals needed, some assumptions made early on in the process have been called into question. For example, concerns have been raised that traffic forecasts may not materialize, that the increasing use of Regional Jets may change the equipment mix more than planned, and that the 5,000 foot runway may not be long enough to be as useful as hoped. They believe that these issues played a part in triggering FAA's Supplemental Draft EIS process. However, a Massachusetts Executive Office of Environmental Affairs official stated that it is not possible to “freeze” the process to figure out all the answers before making a decision. According to many stakeholders, the environmental review process is a continuous cycle in which comments require additional study, which leads to revisions, which lead to more comments, which lead to additional study. They contend that the circuitous nature of the process is the primary source of delay. The Massachusetts environmental permit process has important time triggers that allow for the

¹⁹The ROD limits the use of the proposed 14/32 runway to those times when wind conditions equal or exceed 10 knots, either northwest or southeast. FAA Air Traffic Control is responsible for runway assignments and will base its use of 14/32 on forecasted wind conditions. The Record of Decision also includes a 2-hour window to adjust to changing conditions.

process to come to an end. Massport believes that if similar triggers were in place at the federal level, many of the delays encountered during the EIS process could have been avoided.

Litigation Added Time to Process

Massport first suggested, and actually began construction on, a new 3,830 foot runway in the same general location on the airfield almost 30 years ago (May 1974). Massport took the position that the 1974 runway project did not require a state environmental review because 1) both the Massport Board and the Commonwealth Office of Transportation and Construction determined it had no environmental impact and 2) the project commenced before July 1, 1973, the effective date of the Massachusetts Environmental Policy Act. The City of Boston and the Massachusetts Secretary of Environmental Affairs both disagreed and sued Massport. The Suffolk Superior Court enjoined Massport from proceeding with the 1974 Runways Project, pending the preparation, filing, and review of a final EIR as directed by the Secretary of Environmental Affairs.

On June 15, 2001, the Secretary of Environmental Affairs determined that Massport's Final EIR submitted in March 2001 adequately and properly complied with the Massachusetts Executive Office of Environmental Affairs. Massport went to court to get the injunction lifted. The court began considering this injunction in late January 2003. Groups opposing the project declared victory because the motion to lift the injunction went to trial. A second lawsuit, regarding runway development in Plymouth County, located southeast of the airport, resulted in a summary judgment in favor of Massport. This matter is now under appeal. Plymouth County includes the cities of Hull, Hingham, and Cohasset, all in the flight path of the over-the-water operations. These local municipalities alleged that the state environmental permit was invalid because Massport misled the Massachusetts Executive Office of Environmental Affairs about the project's impact by providing incomplete and inaccurate technical data. Table 3 summarizes the history of the Boston Logan runway project.

Table 3: History of the Boston Logan Runway Project

Date	Event
Late 1960s	FAA approves new runway.
August 1974	State court injunction against building new runways at airport.
June 1976	State court injunction against building new runways at airport amended.
November 1995	Massachusetts Secretary of Environmental Affairs defines Draft EIR scope.
November 1995	Massport establishes Airside Review Committee.
January 1996	FAA defines Draft EIS scope.
February 1999	Massport files Draft EIS/Draft EIR with state and FAA.
April 1999	FAA and Massport hold public meetings on Draft EIS/Draft EIR.
May 1999	State approves Draft EIR.
January 2000	FAA orders supplemental Draft EIS.
March 2001	Massport submits supplemental Draft EIS/Final EIR to state and FAA.
April 2001	FAA and Massport hold public hearings on supplemental Draft EIS/Final EIR.
June 2001	State approves Final EIR.
June 2002	FAA publishes Final EIS for public comment.
August 2002	FAA issues ROD.
August 2002	FAA approves Airport Layout Plan.
August 2002	Community groups appeal ROD in U.S. Court of Appeals.
September 2002	Massachusetts MEPA decides not to reopen state process.
October 2002	Community challenge of state environmental approval trial dismissed.
January 2003	Massport challenge of injunction trial date (Suffolk Superior Court).
Spring 2006	Projected completion date.

Source: U.S. General Accounting Office.

Dallas-Fort Worth International Airport – DFW, TX

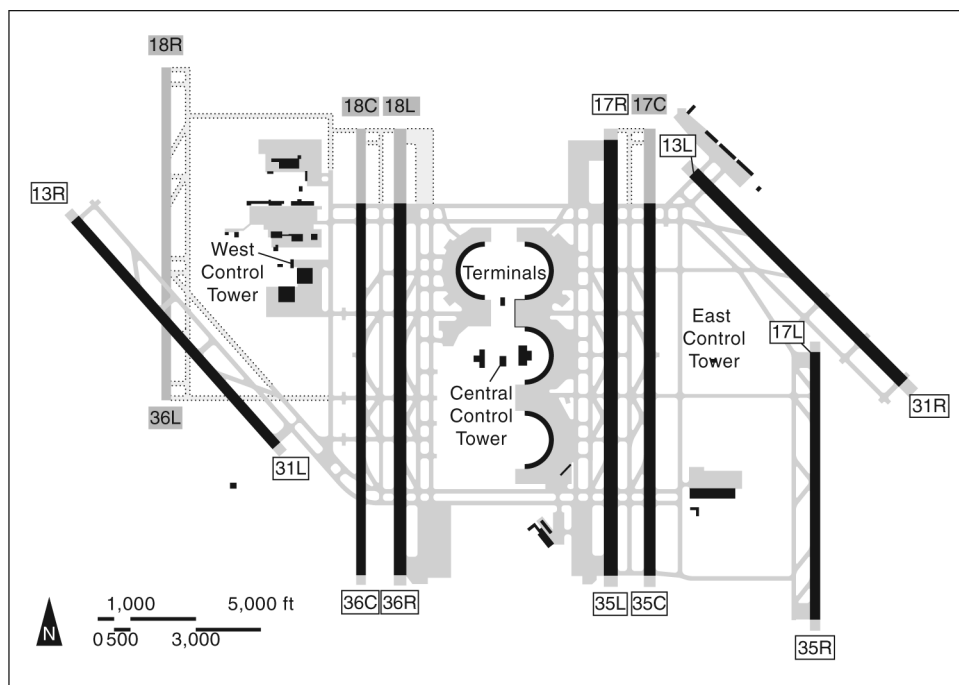
In 2001, the Dallas-Fort Worth International Airport was the fourth-busiest North American airport in terms of passengers. Both American Airlines and Delta Airlines run hub operations at the airport, with about 70 percent and 19 percent of the airport's annual operations, respectively. According to the airport's Chief Executive Officer, the airport provides \$12 billion in annual economic activity for North Texas.

The Dallas-Fort Worth Airport Board (the Board) governs the airport. The Board is composed of 12 members, 11 of whom are appointed by the councils of the airport's owner cities in accordance with each city's ownership interest in the airport; 7 represent the city of Dallas, and 4 represent the city of Fort Worth. The 12th member is a nonvoting member representing the neighboring host cities of Coppell, Euless, Grapevine, and Irving on a rotating annual basis (the member is from a particular city every fourth year). The Board may enter into contracts without approval of the City Councils, but its annual operating budget requires City Council approval of the owner cities.

The airport lies within the city limits of the four host cities. It obtained the freedom to pursue independent development through state legislation known as the Texas Municipal Airports Act. It covers over 29 square miles, and its real property consists of over 18,000 acres. The current configuration is seven runways—five north-south parallel, two diagonal. Four of these runways are over 11,000 feet in length. This configuration allows the airport to land four planes simultaneously. In good weather, the airport generally operates with a capacity of about 260 to 270 operations per hour. Airport revenue is shared with the surrounding cities based upon the location of the enterprise. For example, the rental car franchises are located in Euless, so that city receives a portion of the car rental tax revenues.

The seventh runway was designed to reduce delays as well as to increase overall aircraft operations capacity. Airport officials developed the 1991 DFW Airport Development Plan, which included two new runways in response to market demand, to maintain the highest level of service for their customers. Figure 5 shows the existing Dallas-Fort Worth International Airport configuration, including the proposed eighth runway and several proposed extensions.

Figure 5: Airport Diagram—Dallas-Fort Worth International Airport



Source: FAA.

We selected the Dallas-Fort Worth International Airport for a site visit because the airport, which was completed in February 1974, is one of the most recently constructed airports in the United States (only Denver is a more recently constructed large hub airport). The airport completed its seventh runway in 1996, and had planned to complete an additional eighth runway before more sophisticated demand-delay studies were completed. Furthermore, the airport reported in our survey that many elements of the runway development process took less time than expected.

We interviewed officials at the following: Dallas-Fort Worth International Airport, the sponsor of the new runway projects; the four host cities surrounding the airport—Coppell, Euless, Grapevine, and Irving; FAA Southwest Regional Office and Airports District Office; North Central Texas Council of Governments; and the Texas Commission on Environmental Quality. We attempted to contact American Airlines, but airline officials said that too much time had passed since the early phases of the project for its response to be meaningful.

Current Status of the Two Runway Projects

The seventh runway was commissioned in October 1996. All activities for the proposed eighth runway have been temporarily suspended while airport officials explore the implications that recent economic and industry events will have for runway need.

Airport Officials Described Extensive Environmental Review Process as Challenging

According to the airport Chief Executive Officer, the environmental review process for the seventh runway required the airport to coordinate the activities of 19 federal agencies and 15 state agencies, and this process was further complicated by the lack of prime contacts and personnel changes at reviewing agencies. Public controversy and public demands for information exceeded the airport's expectations and necessitated a highly detailed environmental review. According to airport officials, this review included an analysis of 12 project alternatives, although many were not equally viable or would not survive the review process. According to these officials, the airport will probably include two alternatives in future reviews—build/no build—and then add specific alternatives for study if reviewers request that additional alternatives be examined. Officials felt that preparing an analysis of alternatives in this way will likely be less costly and time-consuming than would preparing alternatives that, in their opinion, clearly have no relevance.

The Dallas-Fort Worth International Airport Used Some Unique Approaches to Mitigate Runway Impacts

The Dallas-Fort Worth International Airport chose to implement a four-stage approach to mitigating the off-airport noise impacts of the runway project: 1) direct land acquisition for properties located in the runway safety area; 2) direct land acquisition of certain properties for noise mitigation; 3) sound-proofing structures for noise mitigation; and 4) acquisition of aviation easements.²⁰ The airport offered 25 percent of the fair market value of the property to acquire aviation easements. According to airport officials, the easements were written so that residents who accepted them still have legal standing to take the airport to court over noise impacts. Airport officials estimated that final mitigation costs would be about \$176 million. The last of the real estate settlements were paid out in 2002. The final cost of the mitigation program exceeded the runway cost by a wide margin.

²⁰Aviation Easements (also referred to as Avigation Easements) are rights given to the airport to fly aircraft over property; they indicate that property owners acknowledge and accept the noise impacts of the aircraft.

The airport created an independent agency, the Action Desk, before beginning the mitigation plan implementation. The Action Desk was the main point of contact for property owners to provide and obtain information and to file concerns and complaints. This office developed a database of property-owner information and disseminated a newsletter. According to airport officials, this approach was highly effective in providing property-specific information to property owners that countered misinformation about the project and allayed fears. The airport also hired a consultant to manage the mitigation process, and it established an appeals process by which property owners could contest the acquisition process. The appeals council was composed of airline employees, local residents, a local clergy member, and airport board members. The airport Chief Executive Officer had final approval of any appeals.

Stakeholder Experiences, from Start to Finish, Were Many and Varied

The Dallas-Fort Worth International Airport still maintains its Capacity Enhancement Team, first established in the 1970s, composed of officials from FAA, the airport, and the airlines. The airport refers to the team as a “three-legged stool.” Each of the groups is equally important to supporting this stool. If one of the “legs” doesn’t provide support, the stool falls over. Airport officials, FAA, and even local governments made reference to this team during our visit. The team’s responsibility is to recommend how the airport should address increases in airfield efficiency, safety, and capacity.

According to airport officials, one of the biggest factors contributing to the successful completion of the seventh runway project was the staff dedicated to the project from FAA, the Department of Justice, and various consultant teams. These stakeholders were assigned to the project. The dedicated team provided the airport with single points of contact and reduced the potential for misinterpretation or ambiguity, as well as continually reeducated the participants. This experience was in contrast to the difficulties the airport experienced in coordinating the input from over 30 agencies in the environmental review process. Airport officials wished that they had kept the Environmental Protection Agency involved throughout the process, rather than only at the beginning and at the end. They also suggested that FAA limit the time frame for agency comments, and thereby eliminate lengthy comment periods. The Environmental Protection Agency took 260 days to review the EIS, which is considerably longer than the 60 to 90 days that the airport expected.

FAA officials thought that holding many more public information meetings than required also contributed to the success of the project, especially

during the environmental review process. This way, FAA and others answered questions or comments and addressed concerns before the official comment period began. FAA also repeated the airport's suggestion that FAA should adhere to the comment deadlines.

The four communities surrounding the airport had both positive and negative experiences while working with the airport. Three cities challenged the ROD on the basis that its noise analysis and mitigation plan were insufficient. (The ROD was upheld 23 months later.) Grapevine felt that the airport broke long-standing promises. According to Grapevine representatives, the plan that the airport originally presented would have placed the area subsequently developed by Grapevine outside projected flight patterns. Currently, if the airport continues with its plan for the eighth runway, flights will go directly over the city of Grapevine. Irving realized that asking for no airport expansion was probably unreasonable, and “you really have to cut the best deal you can.” The best possible runway development process should make the city whole. Euless will be more affected by the eighth runway. While Euless initially joined forces with two cities to contest the ROD, it withdrew its challenge. The Euless City Manager stated that he appreciated the positive economic impact of the airport on the North Central Texas economy and believed the airport needs additional capacity to support that economic impact. If the eighth runway does become a reality, the City Manager expects the same mitigation plan that Irving received for the seventh runway, which he considered fair. The fourth community, Coppell, did not challenge the ROD. According to the Coppell City Manager, Coppell realized that it had to do its part to approve the runway somehow, because the airport is seen as vital to the economies of Coppell as well as to the region. The manager felt that airport staff were professional, knowledgeable, and helpful and never held things out to be different from reality. For example, the airport put together a task force to work with the communities affected by overflights.

Litigation Delayed Process

The surrounding communities of Irving, Grapevine, Euless, and Coppell challenged the airport, asserting that the cities had the rights to control zoning on the airport property that fell within their municipal boundaries. The municipalities wanted to zone the land for “government use.” Such zoning would require that the airport obtain the approval of the city boards prior to doing any construction on airport property. The airport objected, and took the cities to court. The cities won the case, and also won the subsequent appeal. The Texas State Legislature ultimately passed the Texas Municipal Airports Act, which stated that the airport sponsors and not the

municipalities control zoning on airport property. According to the Chief Executive Officer, while the act can apply to any Texas municipal airport, the wording of the act leaves little doubt that it applies specifically to the Dallas-Fort Worth International Airport. The Chief Executive Officer also felt that the support of the local business community was crucial in the development and implementation of the project. For example, the business community provided support to the airport in the state legislature. This case resulted in nearly 7 years of litigation in state courts and ended when the Texas Supreme Court denied hearing the complaint.

In addition to the zoning suit, the surrounding municipalities filed suit contending that the FAA ROD was based on an inadequate environmental impact study. According to the airport's General Counsel, the cities surrounding the airport alleged that FAA and airport officials did not properly follow the environmental review process, primarily because the airport did not use a proper methodology in determining single-event noise impacts. The U.S. Court of Appeals of the District of Columbia upheld the ROD after 23 months of argument, and the U.S. Supreme Court denied hearing the case. The runway construction was delayed 23 months pending the resolution of the case.

Table 4: History of Dallas–Fort Worth Runway Project

Date	Event
February 1974	Airport opens.
September 1986	FAA Task Force forms to explore means of expanding air space capacity.
January 1987	FAA Task Force initiates Metroplex Air Traffic System Plan Studies.
September 1987	DFW begins runway planning.
February 1989	DFW begins EIS Scoping.
April 1990	Neighboring cities challenge DFW on zoning issues.
August 1990	FAA releases Draft EIS.
March 1991	DFW completes runway planning, publishes Airport Development Plan.
December 1991	FAA issues Final EIS.
April 1992	FAA issues ROD.
April 1992	Three cities challenge ROD.
1993	DFW seeks legislative solution to zoning issues from the 73rd Texas Legislature.
May 1993	Texas Municipal Airports Act, reaffirming DFW as exempt from local zoning ordinances, takes effect.
March 1994	U.S. Court of Appeals for D.C. Circuit upholds ROD.
April 1996	Texas Supreme Court denies hearing appeal on zoning case from Fort Worth Court of Appeals.
October 1996	DFW completes construction of 7th runway.
February 1998	Texas Supreme Court denies appeal on zoning case from Dallas Court of Appeals.
May 1998	DFW publishes 1997 Airport Development Plan Update.
October 2001	DFW suspends activities for 8th runway, while DFW Capacity Design Team explores implications of recent economic and industry events for runway need.
Spring 2002	DFW pays final real estate settlements.

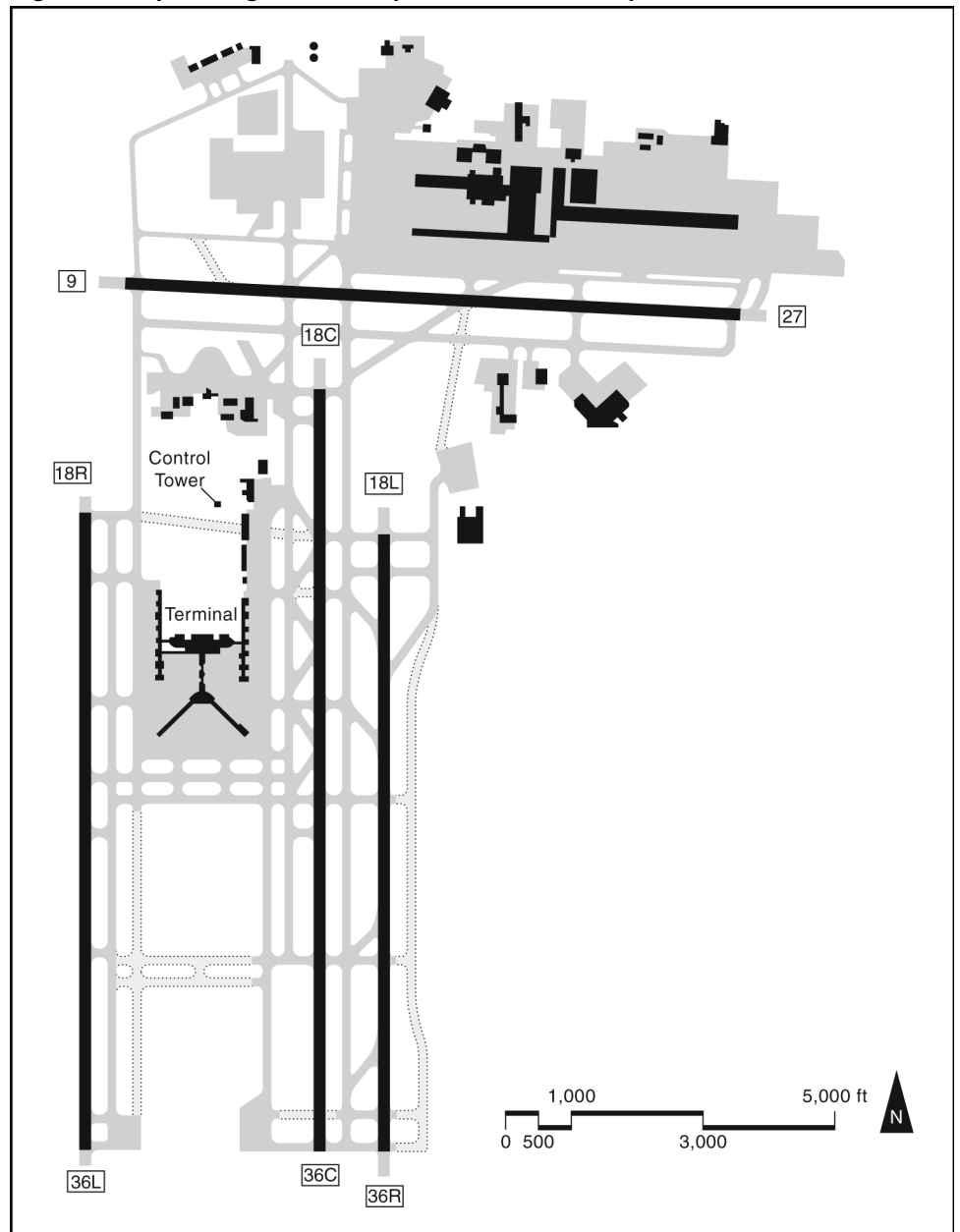
Source: U.S. General Accounting Office.

Memphis International Airport

The Memphis International Airport is a medium-size hub airport that has significant levels of both commercial passenger traffic and cargo traffic. According to FAA data, this airport was among the 31 busiest U.S. airports in 2001. Memphis is one of three major hubs operated by Northwest Airlines. Federal Express is based in Memphis, and along with other cargo airlines operating there, Memphis has served as the busiest cargo airport in the world for the past several years. Additionally, Memphis has claimed the distinction of being the number one hub airport in the United States for on-time flights. The Memphis-Shelby County Airport Authority operates the Memphis and two general aviation airports. The authority is managed by a seven-member county board composed of commissioners who must be qualified community leaders in the fields of aviation, engineering, or finance. Of the airlines operating at Memphis, three account for about 60 percent of the operations. Northwest and Federal Express each accounts for slightly more than 20 percent of the operations, while Northwest AirlinK—a commuter airline—accounts for slightly less than 20 percent.

Memphis currently has four runways, three of which are parallel and run north and south, including the new runway on the east side of the airport, developed between 1984 and 1997, which was the focus of our study. The fourth runway runs east and west and is located north of the other runways. The addition in 1997 of the new 9,000 foot runway (18L/36R) raised the airport's maximum capacity in good weather from 131 to 145 operations per hour (about 11 percent) and in bad weather from 84 to 99 operations per hour (about 18 percent). However, the runway was constructed mainly to counteract the capacity reduction incurred by the reconstruction and extension of an existing runway, and to help the combination of commercial and cargo air service work at the airport. Figure 6 shows the existing Memphis airport configuration.

Figure 6: Airport Diagram — Memphis International Airport



Source: FAA.

Note: According to Memphis airport officials, the center runway has been completed, and changes to the remaining runways are no longer planned.

We selected the Memphis Airport for study because it had quite recently experienced all phases of the runway development process—planning, environmental, and design and construction. In addition, unlike most other airports in our study, it had a significant proportion of its operations devoted to cargo, and it was the only medium-size hub airport we visited.

We interviewed airport officials from the Memphis-Shelby County Airport Authority who were the sponsors of the runway project. We also interviewed officials at FAA Memphis Airport District Office; Federal Express Airlines, which accounted for about 20 percent of the airport’s operation but about 50 percent of its landed weight; Northwest Airlines, Memphis’s leading commercial airline; neighboring business community and residential representatives; Tennessee Department of Transportation, Aeronautics Division and Highway Division; and Tennessee Department of Environment and Conservation.

Status of the Runway Project

FAA commissioned the runway in 1997.

Airport Officials Stated That They Faced Challenges Reaching Consensus among Stakeholders on Project Funding Issues and Decisionmaking

A Memphis Shelby County Airport Authority official stated that the airport faced challenges reaching agreement among airlines regarding project funding during the development of their runway project. Specifically, during the planning phase, a funding disagreement arose between the two airlines that were the biggest airport users—one a passenger airline and one a cargo airline. The passenger airline objected to the airport’s initial proposal to fund a major portion of the project using passenger facility charges, which are collected only by commercial passenger airlines and not by cargo airlines, as it believed that this approach would disproportionately benefit the cargo airlines. Ultimately, the airport authority was able to negotiate an agreement with the airlines in which project funding was based on landing fees, which are proportionate to the gross landed weight at the airport and therefore apply to both passenger and cargo aircraft.

The disagreement among airlines regarding project funding highlighted a broader issue regarding the establishment of the overall decisionmaking process at the airport, according to an airport official. The Memphis airport uses a Majority-in-Interest Agreement that stipulates how the airlines (and other airport tenants) are involved in the airport’s decisionmaking process.

As some airline fees are based on landed weight, some airports' agreements base each airline's vote on its proportion of landed weight, giving more power to those airlines with the greatest landed weight and highest fees. However, the Memphis airport chose to structure its voting process to prevent any one airline from dominating the decisionmaking process. According to its Majority-in-Interest Agreement, a vote to approve or reject a proposal, such as any that addressed the runway completed in 1997, must have represented more than 51 percent of signatory airlines' landed weight and more than 51 percent of the number of signatory airlines serving the airport. This approach allowed all airlines to participate in runway project decisions affecting them. Additionally, after 1996, the airport started using an "inverted" Majority-in-Interest Agreement, whereby the airport may proceed with projects unless an airline requests a formal vote and the majority of airlines vote to disapprove the project. This approach—supported by the two hub airlines at the airport—gives the airport more flexibility in project development than would an approach requiring airlines to affirmatively approve every significant project step.

Extensive Requirements Raised Challenges Regarding Wetlands Mitigation and Land Acquisition during Construction of Runway

Airport officials said that extensive environmental and land acquisition requirements presented challenges during the construction of the runway project. The airport was required to mitigate a wetland area called Hurricane Creek and a series of small, adjacent marshy areas on its property that needed to be relocated because of impacts associated with the construction of the runway and adjacent developable land.²¹ Airport officials said wetlands attract birds that must be "harvested" through periodic hunting because of the danger that birds represent to jet airplanes, and that airport workers do not like being exposed to the poisonous snakes in the creek as they work to maintain the relocated wetlands. According to airport officials, it was necessary to relocate a portion of the existing creek to construct the new runway, and to straighten the remainder of the creek to maximize the use of remaining developable airport property. The airport proposed a concrete-lined channel for the relocated creek based on a City of Memphis standard. However, state governmental authorities required the airport to obtain an aquatic alteration permit from the state and requested that it relocate the creek in its natural state so that animals such as frogs and poisonous snakes in the creek bed would still have their

²¹According to FAA officials, the EIS addressed all major development in the Memphis Airport Master Plan, including the new runway. FAA officials contend that if the EIS had included only the new runway, no appreciable wetland impacts would have occurred.

habitat. According to an official from the Tennessee Department of Environment and Conservation, this type of requirement is fairly typical for airports that are expanding into areas containing water. Another state environmental official said that the airport's concrete lined-channel approach had no habitat for living species and would be a direct conduit for pollutants. Ultimately, large wire baskets filled with medium-sized rocks were used along the new stream alignment, and four artificially constructed habitat structures were added in the channel bottom to support fish that had been in the stream before it was altered.

Airport officials stated that acquiring land for the runway project took longer than they expected because of litigation and requirements associated with acquiring the land. According to airport officials, for the new runway, the airport acquired a road and adjacent property next to the airport that previously contained gas stations and industrial property. Some of the acquired properties contained underground tanks that had previously leaked chemicals into the ground. The state environmental agency required the airport to clean up the polluted properties prior to constructing the project, although the airport did not cause the residue problems.

Site-Specific Challenges Involved Relocating Other Infrastructure

During the construction phase, the Memphis airport faced a challenge in attempting to relocate a road that lay adjacent to the airport and in the path of the new runway. According to airport officials, the City of Memphis preferred that the airport be responsible for relocating the road to ensure that the work was done in a timely manner. After the new runway project was completed in 1997, the airport had a subsequent project to reconstruct and extend an existing runway by 2,700 feet to permit use by larger planes used for international flights. An airport boundary road had to be lowered to allow for the proper clearance of the flight path for the extended runway over the boundary road. According to airport officials, the City of Memphis owned the road and had widened it about 15 years earlier; the road could have been lowered for an additional \$250,000. However, the city refused to fund the additional project cost at that time. When the airport asked for funding from the Federal Highway Administration to assist in lowering the highway, the agency determined that no funds were available to meet the airport's required time schedule, and it could not fulfill the request. Ultimately, the airport accomplished the project with FAA and bond funds.

On another roadway project through the center of the airfield, the airport worked with the Tennessee Department of Transportation to widen and

lower a portion of an existing road passing under an existing taxiway, the original center runway, and two additional taxiways. The state transportation agency chose to be responsible for the design and construction of a new roadway to match the city's current road plan. The airport notified the city that the taxiway and runway would be closed to air traffic because of airport reconstruction, and it offered the opportunity to accomplish the needed street improvements at the least cost. The airport funded and constructed two taxiway crossings over the existing road in the same general time period, and it contributed funds toward the cost of a replacement tunnel and a portion of the lowered and widened roadway needed to accommodate the eastern taxiway. According to airport officials, the airport was responsible for these improvements at a cost of \$17 million. They said that the airport complied with state requests at a cost and time greater than was planned for by the airport because of the state transportation agency's jurisdiction and power over factors that can slow down or stop an airport's project.

Table 5: History of Memphis Runway Project

Date	Event
June 1984	Airport initiates Master Plan for new runway.
March 1987	Airport initiated Environmental Assessment and noise study.
June 1989	Airport's noise study report issued. Litigation began.
June 1991	First Majority in Interest Agreement between airport and airlines to build a new runway is reached.
December 1991	Airport completes Environmental Assessment.
December 1991	FAA begins EIS process.
April 1992	Airport initiates first of eight runway design projects.
May 1992	FAA publishes Draft EIS.
November 1992	FAA issues Supplemental Draft EIS to address EPA noise comments.
April 1993	FAA issues Final EIS.
May 1993	FAA issues ROD.
July 1996	Airlines' disagreement about prorated funding for runway project resolved.
September 1997	Airport opens runway.
October 2000	Litigation ended.

Source: U.S. General Accounting Office.

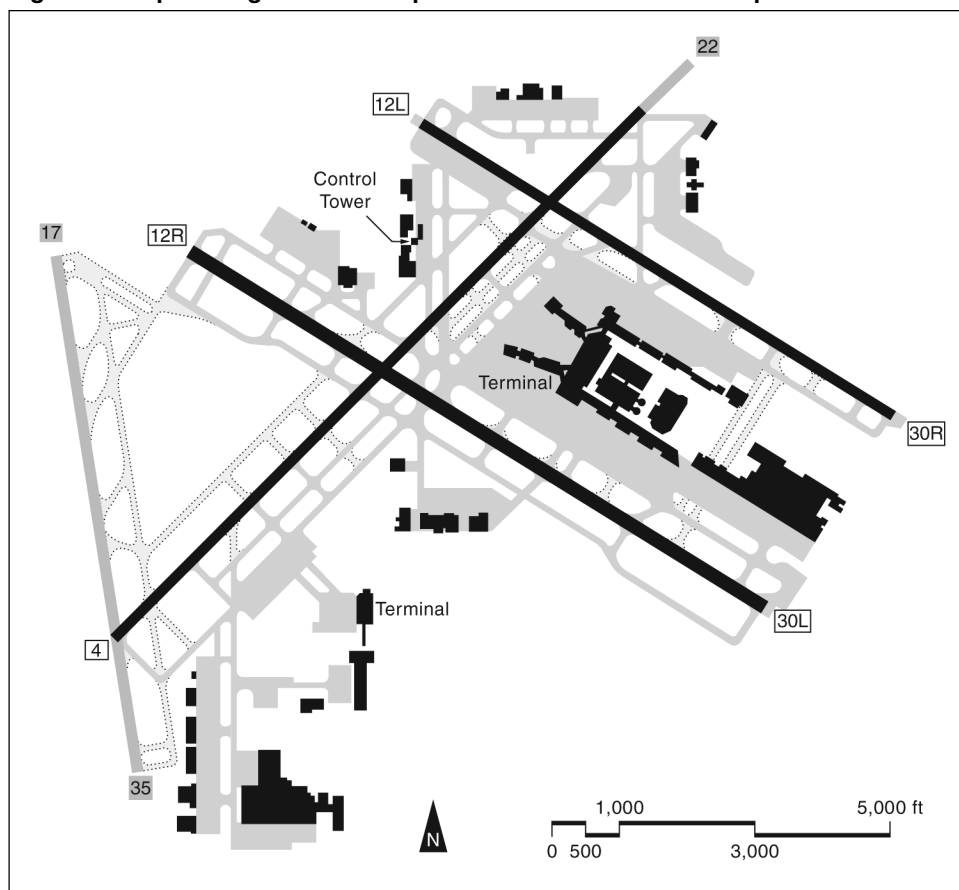
Minneapolis-St. Paul International Airport

The Minneapolis-St. Paul International Airport (Minneapolis-St. Paul) ranked as North America's tenth-busiest airport in terms of passenger traffic during 2001. The Metropolitan Airports Commission (Commission) broke ground in May 1999 for the new north-south runway. This runway, the airport's fourth, is expected to add about 25 percent additional capacity. According to the Commission Chairman at the groundbreaking, the new runway is vital to the economic growth of Minnesota and the region.

The Commission owns and operates the Minneapolis-St. Paul International Airport and six reliever airports. The Commission reports directly to the Minnesota legislature and governor. Northwest Airlines, the major hub carrier serving Minneapolis, accounts for nearly 80 percent of annual operations. Several other airlines account for the remaining traffic. Northwest is headquartered in the neighboring community of Eagan, Minn.

The configuration is two parallel northwest-southeast runways, one crosswind runway, and the new north-south runway. In good weather, the airport operates with a capacity of 115 to 120 operations per hour. The runway was originally scheduled for completion in December 2003, but the terrorist events of September 11, 2001, forced the airport to delay completion until November 2004—an 11 month delay. Airport officials cited reduced cash flow as the primary reason for this delay. They also said that the new runway would accommodate future demand, increase runway capacity, relieve congestion, and reduce delays. Figure 7 shows the existing airport configuration, including the new runway.

Figure 7: Airport Diagram—Minneapolis-St. Paul International Airport



Source: FAA.

We selected Minneapolis-St. Paul International Airport as a site-visit location because it is one of the nation’s busiest airports with an active runway project; its project was in the construction phase; it had detailed and comprehensive planning and environmental phases; and its Executive Director has been a prominent speaker regarding airport issues.

We interviewed Commission officials who were the main sponsors of a new fourth runway at the airport. We also interviewed officials at FAA’s Minneapolis Airport District Office; Northwest Airlines, which had a majority of the air operations at the airport; Minnesota Department of Transportation Office of Aeronautics, which is responsible for promoting safety zones around the airport; and the Metropolitan Council, which had a

key role in the planning process. Additionally, we interviewed representatives of the cities of Eagan, Richfield, and Bloomington, which surround the airport and are impacted by the runway project.

Current Status of the Runway Project

The Minneapolis-St. Paul International Airport is in the construction phase for its fourth runway (Runway 17/35).

Stakeholders Agree That Comprehensive Mitigation Plans Are Essential but Difficult to Develop

According to both FAA District Office and airport officials, the Commission worked hard at building consensus throughout the project and entered into numerous mitigation agreements to resolve issues. The prevailing philosophy was to do whatever was necessary to make the project successful. Commission officials, communities, airlines, and other stakeholders worked together to achieve this. For example, when developing noise contour maps, the Commission chose to include an entire city block if the noise contour intersected any part of the block. If one residence received sound insulation measures because it lay within the Day Night Noise Level (DNL) 65 contour, every house on the block received identical remediation measures. According to Minneapolis–St. Paul airport officials, the effort represented good comprehensive community involvement. The Commission spent considerable resources trying to keep all stakeholders satisfied. According to airport officials, the Commission and FAA also tried to avoid having the project go into litigation, viewed as an unproductive use of time and resources and the worst scenario in the process. In the long run, the FAA District Office, the state Department of Transportation, and Commission officials agreed that consensus building, while taking longer than expected in the project’s early stages, saved time in the long run.

However, often what was good for one community was bad for another community. At least one community accused the Commission of buying communities off, neighborhood by neighborhood. For example, Minneapolis was “made happy” by eliminating the north parallel runway from consideration. A National Wildlife Refuge located near the airport was “made whole” through the payment of over \$26 million;²² however, the

²²According to an airport official, the amount was determined by an independent professional appraiser and includes costs to relocate significant educational activities.

noise will continue over the refuge. According to FAA officials, this cost was required to mitigate the impact on refuge property protected under 49 U.S.C. 303(c), formerly known as section 4(F) of the DOT Act. The opposition viewed the process as achieving “traveling” consensus—just moving the problem around. Opposition groups described the process as one seeking cooperation for appearances only—a “divide and conquer” approach.

Stakeholders Believe That Mitigation Funding Should Be More Flexible to Include More Communities

Stakeholders impacted by the runway said that they would be more supportive of the project if the airport authority would increase the level of noise mitigation on the surrounding community. The FAA concluded, as indicated in its Minneapolis-St. Paul ROD, that federal-funds eligibility for future residential sound insulation measures is generally limited to the DNL 65+ contour. However, it said that FAA might extend federal-funds eligibility for the residential insulation program to include the area out to the DNL 60 contour if there are applicable local standards. For the Minneapolis airport, FAA plans to evaluate this extension through a future Commission-initiated Federal Aviation Regulations Part 150 Noise Compatibility Plan. The Commission submitted an updated noise compatibility plan to FAA in November 2001 and withdrew it in May 2002, prior to an FAA decision. Mitigation efforts continue in the DNL 65+ contour area; time frames released to the public called for the extended (DNL 60-64) program to be completed in phases between 2005 and 2012. A major factor in Northwest Airlines’ objection to paying for the additional mitigation measures was that the future had changed significantly enough since September 11, 2001, to reevaluate these additional measures.²³

A Nationwide Low Frequency Noise Policy Is Not in Place

The impact of low frequency noise on the surrounding community is an issue for the Minneapolis-St. Paul airport, which is close to neighborhoods, according to the Federal Interagency Committee on Aviation Noise

²³MAC intends to update the noise contours to reflect a 2002 base year and the 2007 forecast, incorporating the 2007 fleet mix plans. As a result, noise contours could shrink because of quieter aircraft. MAC adopted a noise-mitigation plan for single-family homes in the DNL 60–64 contours in April 2002. Implementation of this plan is contingent upon resubmission of the Part 150 Update and its FAA approval.

(FICAN).²⁴ According to the City of Richfield official, the Commission received \$10 million in FAA Airport Improvement Program funds for noise mitigation activities for the west side of the new runway (the City of Richfield lies west of the new runway), pending FAA's review of the noise impacts of the project. The \$10 million was earmarked in the 2001 Department of Transportation Appropriations Act conference report.²⁵

In December 1998, the City of Richfield and the Commission agreed to undertake a detailed study of existing and potential impacts of low frequency aircraft noise in communities around the airport. In order to develop a consistent low frequency noise policy, FAA turned to FICAN for input on the review of this study and technical aspects of the issue—particularly for an assessment of the problem and metrics to evaluate it. Low frequency noise was discussed at the committee meeting held in June 2001. Commission and Richfield experts attended. The Committee released its findings in August 2002 and basically said that additional data are needed to determine whether any relationship exists between low frequency noise and human annoyance.²⁶ According to FAA officials, FAA is reluctant to fund low frequency noise mitigation until the alleged adverse impacts are conclusively validated and national standards established.

Some Communities Question Justification of State Zoning Laws

According to the Minnesota Department of Transportation, FAA, the Commission, and community officials, Minnesota has state safety zones that go beyond the federal Runway Protection Zone limits.²⁷ Within these safety zones, certain types of development are prohibited. The establishment of safety zones involves issues of safety, land use, and encroachment that can impact not only the development of an airport

²⁴Low frequency noise is aircraft-generated noise that is likely to induce audible rattles in residences, most likely below 100 hertz.

²⁵House Conference Report 106-940, October 5, 2000.

²⁶Federal Interagency Committee on Aviation Noise on the Findings of the Minneapolis-St. Paul International Airport Low Frequency Expert Panel, August 2002.

²⁷FAA requirements cover both the primary runway surface and runway protection zone limits. The length and width of the zones depend upon the aircraft operating on the particular runway and the visibility minimums. Minnesota state requirements include 1) Zone A—begins 200 feet from the runway end and extends for a distance two-thirds the runway length; 2) Zone B—begins at the end of Zone A and extends for a distance of one-third the runway length; and 3) Zone C—the required horizontal clearance.

runway but also the development of land surrounding the airport. Some communities around the airport question whether the safety zones are beneficial for them. Although not all stakeholders oppose Minnesota’s strict zoning, The Commission authorized and funded a consultant study to research the need for the state safety zones as well as the approaches that the other 49 states have taken. The consultant’s April 2002 report, sent to the Joint Zoning Board, found no justification for the strict zoning.

The application of a grandfather clause in the use of state-created safety zones presents an additional challenge to the communities surrounding the airport. Under the terms of the grandfather clause, if a residential area existed in the state zones in 1978 or earlier, it was allowed to remain in place and not be removed by the airport. However, business expansion in the general area around the airport is subjected to state safety zone restrictions. Communities are unhappy because it makes no sense to the community leaders to leave residences closer to the runway itself but not permit businesses to expand in an area further away from the airport. Businesses feel that, although their property was not acquired, the impact is the same, since expansion is forbidden.

Table 6: History of Minneapolis-St. Paul International Airport Runway Project

Date	Event
October 1988	Metropolitan Airports Commission (Commission) and Metropolitan Council issue Airport Adequacy Study.
May 1989	Minnesota legislature establishes Dual Track Airport Planning Process.
April 1992	Scoping meetings held. FAA, in cooperation with Commission, publishes Notice of Intent to prepare EIS. FAA and Commission issue First Phase Scoping Report.
March 1993	FAA and MAC publish responses to First Phase Scoping Report.
December 1993	Airport Capacity Team completes Capacity Enhancement Plan.
December 1994	State Department of Transportation completes Terminal Airspace Study for relocated airport.
May 1995	FAA issues Second Phase Scoping report, holds public meetings.
July 1995	FAA issues EIS Scoping Decision.
December 1995	FAA and Commission publish Draft EIS.
March 1996	Commission and Metropolitan Council issue Dual Track Planning Study.
April 1996	Minnesota legislature decides to expand existing airport.
August 1996	FAA issues Airport Capacity Enhancement Terminal Airspace Study.

Appendix V
Minneapolis-St. Paul International Airport

(Continued From Previous Page)

Date	Event
May 1998	FAA issues Final EIS.
September 1998	FAA issues ROD.
December 1998	Richfield individual files suit against Commission and state Environmental Quality Board.
May 1999	Commission commences runway construction.
June 2000	State Court of Appeals upholds Summary judgment regarding Richfield individual's lawsuit.
October 2000	\$10 million earmarked for noise mitigation activities for the west side of the new runway.
June 2001	Federal Interagency Committee on Aviation Noise begins discussing low frequency noise standards.
November 2001	Commission submits Part 150 Noise Compatibility Plan.
March 2002	FAA clarifies airport zoning standards.
April 2002	Study authorized by Commission results in consultant report that finds no need for state safety zones.
May 2002	Commission withdraws Part 150 Noise Compatibility Plan.
November 2004	Planned runway completion.

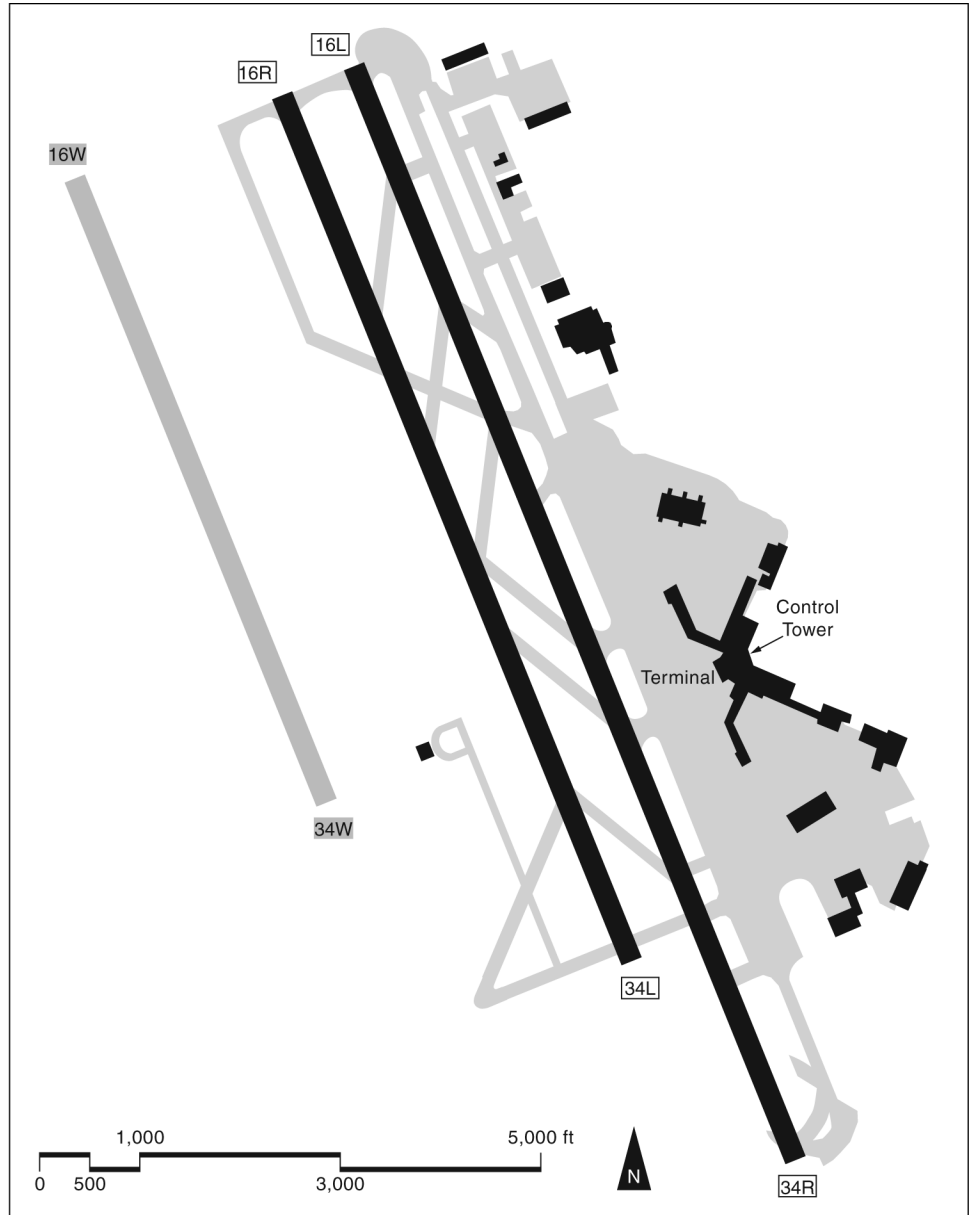
Source: U.S. General Accounting Office.

Seattle-Tacoma International Airport

The Seattle-Tacoma International Airport (Sea-Tac) is the primary air transportation hub of Washington State and the northwestern United States. It is the 17th-busiest passenger airport, the 20th-busiest cargo airport, and among the 31 busiest hub airports in the United States. Located 12 miles south of downtown Seattle and 20 miles north of Tacoma, it is the primary provider of international and domestic air carrier service in the region surrounding the Seattle/Tacoma area. Its primary service market is the Puget Sound region, composed of four counties and approximately 3.5 million people. About three-fourths of the air travelers using Sea-Tac Airport are origin and destination passengers who begin or end their trip at the airport. The remaining flights are connecting flights. The airport is a significant employer in the region, with 20,000 airport employees.

Sea-Tac currently has two parallel runways. Our primary focus was on a runway development project for a new third parallel runway first considered in Sea-Tac's plans in 1989, and which the Port of Seattle approved in 1992. The project has proceeded through several steps of the environmental review process, and it is currently scheduled for completion in 2006. Sea-Tac's sole purpose for adding this 8,500 foot parallel runway, which would be separated by 2,500 feet from the furthest parallel runway, is to address constraints attributable to Seattle's poor weather, and although the new runway would increase capacity, airport officials do not consider the runway project to be a capacity-enhancing project. During periods of reduced weather conditions, which occur about 44 percent of the time, Sea-Tac can use only one of the two existing runways for arrivals because of the narrow spacing between them, thereby causing delays. The number of flights that can be accommodated drops from about 60 arrivals per hour in good weather to 48 or fewer in poor weather. The new runway, which is planned to have much greater separation from other runways, would allow independent landings on two runways at the same time, which reduces delays. Figure 8 shows the existing Sea-Tac airport configuration, including the proposed runway.

Figure 7: Airport Diagram—Sea-Tac International Airport



Source: FAA.

We selected Sea-Tac Airport for study because it was an airport with a significant amount of both passenger and cargo operations and it had

experienced significant planning and environmental issues during the development of its runway project. Additionally, in constructing the planned runway, Sea-Tac is expanding the plateau where the airport is located—undertaking one of the most significant landfill and embankment projects in the United States (about 17 million cubic yards). According to Sea-Tac officials, this earth-moving project is producing several accompanying environmental considerations.

We interviewed officials from Sea-Tac, who were the sponsors of the runway project. We also interviewed officials at the FAA Seattle Airports District Office; Alaska Airlines; Puget Sound Regional Council; Airport Community Coalition; Regional Commission on Airport Affairs; Washington State Department of Transportation Aviation Division; Washington State Department of Ecology; the U.S. Army Corps of Engineers; and the U.S. Environmental Protection Agency.

Status of the Runway Project

As indicated above, the runway project for the new third parallel runway at Sea-Tac has completed environmental review and has received state and Corps wetland fill permits. However, according to Sea-Tac officials, both permits are currently in litigation and under appeal. Sea-Tac has begun constructing the foundation that will be required to support the third runway.

Simplifying Purpose and Need May Help Reduce the Circuitous Nature of the Review Process

Sea-Tac officials stated that continual review of the purpose of and need for their runway project, as well as alternatives to it, presented a significant challenge to moving forward in the process. They stated that reducing the number of reviews could reduce the amount of potential delay in the process. The purpose and need was established and reviewed by the airport, FAA, consultants, and the local Metropolitan Planning Organization during the planning and environmental process; it was then re-reviewed by the Corps of Engineers (Corps) during the permitting process under Section 404 of the Clean Water Act.²⁸ FAA officials questioned the usefulness of the Corps' review of the project's purpose and need, stating that the extra review created frustrations for other stakeholders and added time to the process when the purpose and need had already been

²⁸According to Sea-Tac and FAA, the Corps was involved as a cooperating agency during Master Plan updates and participated in an early EIS draft.

established. Additionally, FAA officials said that aviation expertise is needed to analyze the alternatives, and the Corps has no such expertise. According to Corps officials, the Corps is required to ensure that alternatives have been adequately considered.²⁹ Corps officials said that their review of the alternatives was justified because it had been a considerable time since the EIS had been developed, and it wanted to determine if the events of September 11, 2001, had changed the relative benefits of the alternatives. Officials from the Puget Sound Regional Council, the metropolitan planning organization in the Seattle area, suggested that the Corps could have been included more in the early consideration of alternatives, but acknowledged that the Corps' limited resources made early participation difficult. FAA officials, however, believe that the Corps did participate in the development of alternatives in its role as a cooperating agency during the development of the EIS.

Sea-Tac Airport, while not specifically citing purpose and need, said that a clear federal policy of encouraging runway development and moving projects through the regulatory process would help ensure that adequate airport capacity is in place to reduce growing air traffic delays. It suggested that such a commitment could be similar to the one the federal government took in developing the interstate highway system and national railroads. A task force could be created to identify runway projects that are critical to the national air transportation system. Such an approach could help expedite implementation of decisions already made at the local level. Additionally, they suggested that Congress could adopt a policy of directing all organizations to achieve a balance between environmental, economic, and social goals, coupled with statutory deadlines for decisionmaking. They contend that such an approach, now used by other countries, would help agencies make difficult decisions and get needed runways built.

A Compatible Land Use Program May Help to Reduce Opposition

A Washington State Department of Transportation official stated that minimizing controversy over the uses of land needed for expanding runway capacity could be important in avoiding lengthy project delays. The department developed an Airport Land Use Compatibility Program, implementing a 1996 amendment of the Washington State Growth Management Act—the state's land use planning law. The law requires cities and counties to identify, site, and protect essential public facilities

²⁹33 CFR part 323.

(including airports) from incompatible land use, such as encroaching development. In other words, when developing local land use plans, cities and counties must ensure that their plans do not adversely affect these facilities.

As part of the land use compatibility program, certain state transportation officials provide consultations, including mediation, between airport sponsors and community representatives (often municipal or county planning staff) to balance the state's dual interest of promoting aviation and ensuring the health, safety, and welfare of its residents. The approach to facilitating airports' future expansion includes several steps, including the development of planning-based solutions and the integration of those solutions into a legally enforceable document such as a comprehensive development plan (rather than the Airport Master Plan, which is not binding on a land use authority).

New Mitigation Approaches and Increased Community Interaction Could Help Foster Community Support

In Seattle, the Airport Communities Coalition, representing several communities near Sea-Tac Airport but not the city of SeaTac, said that expanding the scope of mitigation beyond direct environmental applications would go far in building community support for runway projects. They said that the airport's use of heavy trucks over local roads to haul dirt for its landfill project for the runway caused significant deterioration of the community's roads, for which it has not been reimbursed.³⁰ Similarly, when the airport acquires residence and business locations in order to mitigate noise or wetland impacts, these buyouts deplete the tax base in the community where the properties are based, resulting in negative economic impacts for which the community is not reimbursed. Therefore, the community has no reason to support the runway project. However, they said that the community would have reasons to support the project if some funding were provided to mitigate the economic damage to the community. An organization official said that the Department of Defense reimburses communities for economic loss when it acquires property within the community to build military bases. Officials at the Regional Commission on Airport Affairs, a citizens' group in the greater Seattle metropolitan area, stated that that the airport could do more to mitigate economic impacts. However, they also said that

³⁰An airport official stated that most of the impacts have been to roads in the city of SeaTac, and that mitigation costs pertaining to the impacts have been addressed.

expanding the scope of mitigation would not diminish their opposition to the runway project.

According to the Airport Communities Coalition, communities seek to contribute meaningful input into the airport expansion process; however, when they are not allowed to do so, they are forced to file lawsuits against airports and other stakeholders over decisions that have been made. Officials at both the Coalition and the Regional Commission believed that the planning process used by the airport and the Puget Sound Regional Council needed to include meaningful input from the communities near the airport. An official at the Regional Commission stated that there should be a citizen's advisory committee with genuine input into the airport's expansion projects early in the planning process. The official suggested that the federal government should provide the incentive for the establishment of such a committee by providing federal funds only when such a committee was established. In the official's view, the success of such an approach would be contingent on the airport's taking the committee's views into account and substantively addressing them. These community organizations have filed several lawsuits against the airport, the Puget Sound Regional Council, and FAA, based on objections to their approach for addressing environmental issues. An Airport Communities Coalition official said that the community filed lawsuits in part, to get the airport to listen to the needs of the community and to negotiate solutions. The official noted that communities near other airports had successfully used such an approach. Sea-Tac and FAA officials stated that there was extensive community involvement beyond that required by law.

An official at the Airport Communities Coalition said that the public hearing process on environmental matters gives stakeholders the ability to voice concerns but, because of the limited time allocated to each person, does not give those convening the hearing an ability to understand the concerns or allow citizens to have an impact on the project. The thrust of FAA's 2001 best practices guide seems to agree with the coalition official; the guide states that periodic informal workshops during the planning and environmental processes tend to provide better forums for community consultation than do formal public hearings. Understandable information on the project and its environmental impacts should be made available at the workshop, and knowledgeable stakeholders such as the airport, FAA, and EIS consultants should be present to answer questions. In the guide, FAA notes that strong local opposition tends to slow down the environmental process and that a citizens' advisory committee in some locations has been useful in improving working relationships and

communication between the airport and the community. FAA said that such a committee may be established on either a permanent basis or for the duration of a specific project's planning and environmental review. FAA added that factors that help build local consensus and address opposition include, among others: 1) open and frank dialogue on the aviation need and the airport proprietor's initial planning, including possible alternatives; 2) an effective forum for constructive exchanges on expected benefits, impacts, alternatives, and mitigation prospects; and 3) serious consideration of community concerns and views, including project adjustments that have merit and are possible, as well as responses to community proposals that cannot be accommodated, and the reasons why. A SeaTac official emphasized that the airport did include public outreach beyond that required by environmental regulations. For example, such efforts included public information sessions and community open houses, among others.

Extensive Regulatory and Legal Requirements Posed Resource Challenges

Stakeholders may have limited staff and resources to address the extensive regulatory and legal requirements of the process, leading to delays. For example, officials from FAA's Seattle office said that when an endangered species of fish was identified at Sea-Tac Airport, 20 months elapsed before officials from the federal Fish and Wildlife Service and the state Department of Marine Fisheries approved actions to address the conditions of endangered species. Both agencies had limited staff to review and analyze the discovery and the approach for addressing it. FAA officials said that they understood that the Corps had only six staff members to review about 1,000 water quality permits, and according to state aviation department officials, the Corps had a significant backlog in processing permit applications.

Additionally, an official from the state Department of Ecology said that the Sea-Tac runway project had been a significant drain on resources at the agency. The agency has had difficulty finding sufficient resources to complete environmental reviews and must redirect personnel from other functions. The official said that, because of the shortage of state funds, applicants wanting reviews to proceed quickly will have to bear the burden of funding water quality reviews. Sea-Tac officials noted that additional staff resources are needed in regulatory agencies in order to process environmental permits in a timely manner and, aside from adding federal funding, funding could be provided by project proponents. The airport acknowledged that agencies were reluctant to accept funding because of a concern with potential conflicts of interest. The airport suggested that

Congress could make guidelines under which the agencies could remain impartial. The purpose of allowing such funding would not be to curry favor but to work efficiently with the federal government to get runways built. They asserted that these staff would work exclusively under FAA's supervision and would be under no obligation to the airport. They contended that this proposal would provide a mechanism for airports to bear the financial cost of accelerated project reviews.

Site-Specific Issues Involve Safety and Environmental Challenges

A major site-specific challenge involves the construction of a large plateau to enable the airport to construct the new runway. According to Sea-Tac officials, in order to bring the new runway site up to the elevation of its other two runways, a 17-million cubic yard landfill and embankment is being built. The embankment will require three retaining walls to reduce impacts on a nearby creek and wetlands and to accommodate safety areas at the ends of the runway. The walls are mechanically stabilized, using concrete panels and layers of galvanized reinforced strips that bind to and reinforce the embankment material in a coherent way. According to the Port, this type of wall is highly earthquake resistant, and it has been used successfully elsewhere in the United States. In April 2002, Sea-Tac Airport officials said that the communities surrounding the airport were concerned that the wall will collapse or will be unable to withstand an earthquake. However, according to airport officials, the airport used the services of consulting engineers, geotechnical consultants, and earthquake engineers from companies and the University of Washington, and sought advice from a technical review board in developing the wall design to ensure that it is safe. The airport has also held public hearings in an attempt to enlighten the public about the durability and safety of the wall project.

Table 7: History of Sea-Tac Runway Project

Date	Event
June 1992	Puget Sound Regional Council completes 2.5 year study of air capacity needs that included possible third runway at SeaTac.
April 1993	Metropolitan Planning Organization approves Regional Airport System Plan.
November 1993	Initial design contracts awarded.
October 1994	Metropolitan Planning Organization concludes no sites suitable for new airport.
February 1996	Final EIS completed.
July 1996	Metropolitan Planning Organization amends metropolitan transportation plan to include new runway.
August 1996	Airport authority adopts revised Master Plan that includes new runway.
December 1996	Supplemental EIS begun.
May 1997	Final Supplemental EIS issued.
July 1997	ROD issued.
August 1997	ROD challenged.
December 1997	Airport submits permit applications to state and Corps of Engineers.
March 1998	Construction begins on the first phase of the landfill project.
September 1998	New wetlands discovered in project area.
January 1999	Circuit court affirms ROD.
September 1999	Airport submits revised permit applications.
November 1999	Public comment hearings held on permit applications.
September 2000	Airport withdraws permit application before expiration deadline to address remaining issues and provide agency additional time to process application.
October 2000	Airport resubmits permit applications.
January 2001	Public comment hearings held on permit applications.
August 2001	State issues water quality certification.
December 2001	State water quality certification suspended pending community appeal to Pollution Control Hearings Board.
July 2002	FAA approves Part 150 noise study.
August 2002	Pollution Control Hearings Board upholds water quality certification, subject to additional conditions.
September 2002	Airport appeals Pollution Control Hearings Board's conditional approval of water quality certification.
December 2002	Corps issues wetland permits; permits challenged.
2006	Planned completion of runway construction.

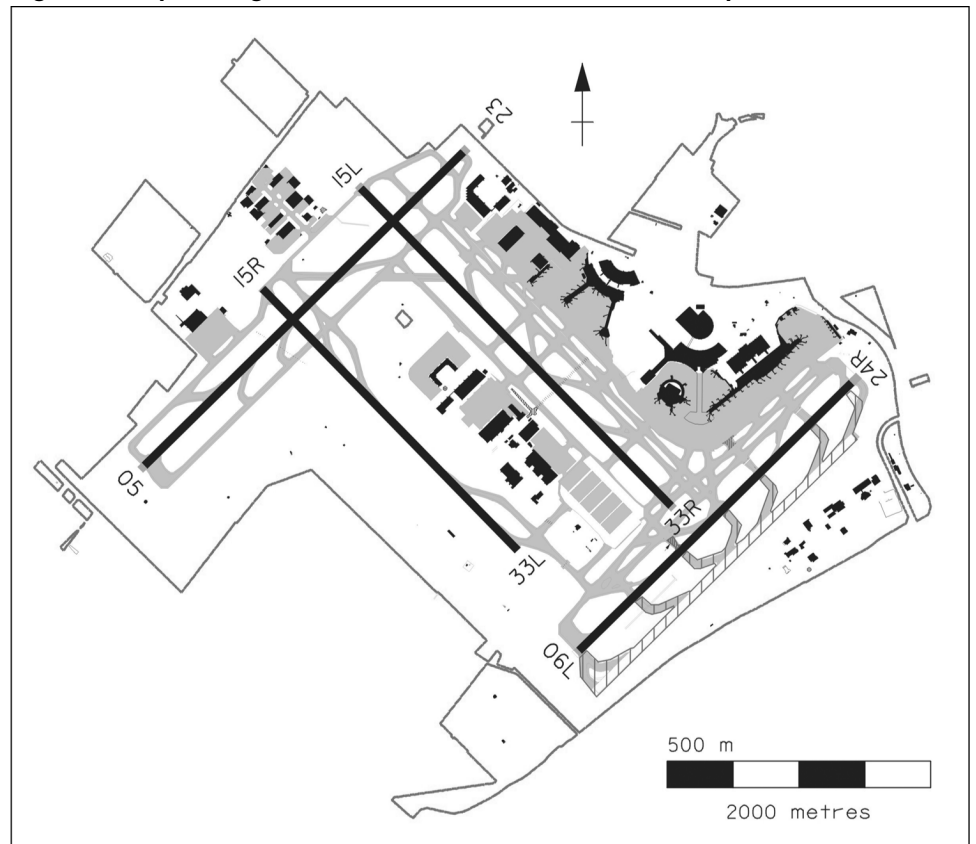
Source: U.S. General Accounting Office.

Lester B. Pearson International Airport, Toronto, Canada

The Lester B. Pearson International Airport (Pearson) is the primary commercial airport serving the Toronto area. The Greater Toronto Airports Authority manages the day-to-day operations of the Pearson airport, as well as managing its capital infrastructure projects. The Greater Toronto Airports Authority was established in March 1993 as a community initiative, was reconstituted in accordance with Canadian Airport Authority guidelines, and was recognized by the Minister of Transport in November 1994 as the airport authority responsible for Pearson airport. The airport authority is a private, not-for-profit corporation. Its 15-member Board of Directors is composed of nominees from the City of Toronto, the Province of Ontario, the Government of Canada, and four regional municipalities. The airport authority assumed control of the management, operation, and maintenance of Pearson on December 2, 1996.

Pearson Airport is the busiest airport in Canada and the 16th-busiest in North America, having served 28 million passengers in 2001. With regard to international passengers, Pearson was ranked as the 2nd-busiest in North America and 17th-busiest in the world in 2001. To handle the projected demand for air travel through the airport, the airport authority developed a \$4.4 billion (Canadian) development plan for the improvement of the airport's infrastructure—the Airport Development Program (ADP), which includes new runway projects, among other infrastructure projects. Figure 9 shows the existing Pearson airport configuration.

Figure 8: Airport Diagram—Lester B. Pearson International Airport



Source: Greater Toronto Airports Authority.

We chose Pearson Airport as a site visit to learn about the runway development process used in Canada, and because the airport had three runway projects that met the criteria we used to select airports in the United States—one runway completed in 1997, one completed in October 2002, and one planned for future implementation.³¹ The three additional runways were approved for development as warranted by demand in 1993 by Transport Canada after a lengthy Environmental Assessment Review process in 1990–1992.

³¹When we visited the airport, the runway project completed in October 2002 was still under construction.

Status of Runway Projects

As noted above, Pearson Airport completed the construction of a new runway in 1997, completed the construction of a second new runway in 2002, and has a third runway in the planning stages, to be constructed when capacity demands warrant another runway.

Airport Development Process in Canada Differs from U.S. Process

The airport development process in Canada differs from the U.S. process in several distinct ways. Pearson Airport was one of the first airports in Canada to attempt to build additional runways since the airports were first constructed to serve the Canadian military during World War II. As a result, there was no established runway development process in place—Transport Canada officials had to learn about the process as they progressed through it. In the broadest sense, there are three pieces of legislation that affect the process—the Aeronautics Act, the Fisheries Act, and the Environmental Act.

The environmental phase differs greatly from that employed in the United States. Prior to the development of the EIS, the airport authority begins the process with scoping. The scoping process is a public process. According to airport officials, every project goes through environmental screening (equivalent to an Environmental Assessment) as a part of the planning process. When the Pearson project went through the screening process, the airport authority was responsible for conducting environmental screening. However, current legislation requires that the screening results be available to the public.

The Minister of Transport and the Minister of the Environment cooperatively choose an Environmental Review Panel consisting of government officials and knowledgeable local residents (that is, academics.) The panel begins by developing a list of issues that it believes the EIS must identify. The issues and, therefore, the requirements of the EIS will vary from airport to airport. Airport officials referred to the process as “organic”—changing from airport to airport, project to project. The airport authority is responsible for preparing the EIS documents, and it submits them to the panel for review. The panel reviews the environmental impact documents and convenes hearings to hear testimony in order to formulate its opinions regarding the environmental impacts of the project and accompanying mitigation measures. The hearings are judicial in nature, and attendees have never resorted to shouting or histrionics. According to airport officials, the hearings were well balanced between opponents and proponents of the projects. With respect to the EIS, the focus of the

environmental hearings was medium-term capacity enhancement projects—the three runways at Pearson. The issues that the panel considered depended greatly on their perception of the issues raised during the hearings. The members of the panel did not work on the EIS full-time, and did not have the requisite expertise to conduct their reviews—the panel either hires knowledgeable consultants or develops the necessary knowledge. This process takes a long time.

Once the EIS is completed, the panel reviews the document, develops a series of recommendations, and submits them to the Minister of Environment. The Minister of Environment then makes a final determination and submits recommendations to the Minister of Transport. The Minister of Transport has sole discretion as to whether to implement the recommendations of the Minister of Environment. The Minister of Transport makes the final determination, and it is incumbent upon the airport authority to respond to the final recommendations.

The design and construction process in Canada does not differ substantially from that in the United States. The airport must prepare preliminary engineering and final design, and then construct the runway infrastructure. Finally, in summary, airport officials believed that the process went very well and did not believe that they would proceed dramatically differently if they were to go through the process again. However, both airport and Transport Canada officials noted that the recently passed Canadian Environmental Assessment Act will result in changes to the existing process.

Canadian Airports Face Many of the Same Challenges as U.S. Airports

Airports in Canada seeking to add capacity by constructing new runways face many of the same challenges that airports in the United States face, including environmental issues, wetlands mitigation issues, and the impacts of noise on the surrounding communities. These impacts generally lead to some community opposition to the proposed project. Canadian airports are also subject to site-specific constraints attributable primarily to the northern climate.

Because of the northern climate, airport operations in Toronto require extensive ice removal in the winter months, resulting in the use of a large quantity of Glycol that can cause an environmental impact on surrounding wetlands. The airport straddles both the Etobicoke and Mimico Creek watersheds, covering 1,640 hectares of land. Most of the airport, including runways, cargo areas, Terminal Three, Terminal One aprons, and infield

areas, drains to Etobicoke Creek. According to the Toronto and Region Conservation Authority, although runoff contamination from these sources is a concern, significant progress has recently been made to mitigate the airport's impact on water quality through the expanded use of wastewater and storm water recovery and containment systems. Airport officials cited their wastewater treatment facility as contributing greatly to allaying the concerns of residents over ground and surface water contamination, and they stated that the airport has never exceeded contaminant limits.

The Council of Concerned Residents, a coalition of three residents' associations near the airport, opposed the expansion of the airport fundamentally on the premise that the projects would increase the noise impacts on their communities. In 1993, the group filed a lawsuit against the airport claiming that the proposed project was illegal for three reasons: 1) a 1973 order precluded the Toronto airport from expanding beyond its borders; 2) a federally approved airport master plan and the local municipality's land use plan stipulated that they were based on the assumption that the airport would have no more than three runways; and 3) the Environmental Review Panel stated that the project should not be pursued because the adverse social impacts of the project outweighed the capacity gains at the airport. According to Transport Canada officials, Canada's noise mitigation standards are very similar to FAA's Federal Aviation Regulations Part 150 programs in the United States. According to airport officials, neither Transport Canada nor the airport authorities are required to acquire noise-sensitive properties surrounding the airport.

According to airport authority officials, airports in Canada face a shortened construction season because of the sometimes severe winter weather associated with the northern climate. Therefore, airports seeking to construct runways must take the climate into account when entering into the construction phase of the runway development process. Airports must schedule construction tasks such that weather-dependent tasks such as concrete construction are scheduled during the warmer months, and reserve climate-independent tasks for the winter months.

Survey of Airports

The following section provides a copy of the survey that we sent to airports that have built a runway between 1991 and 2000 or planned to do so by 2010. Where appropriate, we have summarized their responses to each question. In instances where summarized answers are not possible—such as dates—we have listed the number of airports that answered the question.

In total, we sent 39 surveys to 34 airports—Dallas-Fort Worth, Detroit, Indianapolis, Louisville, and Washington Dulles received more than one survey, because each had more than one runway that met our criteria. We excluded five surveys because the airports reported that their projects did not meet our selection criteria. For our statistical analysis, we excluded responses from five airports—Kailua-Kona, Little Rock, Reno, Sacramento, and one of the two surveys sent to Washington Dulles—because their responses indicated that their projects did not meet our criteria. The primary reason why their responses were dropped from our statistical analysis was that they planned only runway extensions or no new runways during our time frame. We did, however, rely on their responses during the remainder of our review. In total, we received 32 out of a potential 34 responses from 30 airports—a response rate of 94 percent. Table 8 lists the airports we surveyed.

Table 8: Airports Surveyed

1. Atlanta Hartsfield
 2. Baltimore
 3. Boston Logan
 4. Charlotte
 5. Cincinnati
 6. Colorado Springs
 7. Dallas-Fort Worth (2)
 8. Denver
 9. Detroit Wayne County (2)
 10. Grand Rapids
 11. Houston
 12. Indianapolis (2)
 13. Kansas City
 14. Las Vegas
 15. Los Angeles
 16. Louisville (2)
 17. Madison
 18. Memphis Shelby County
 19. Miami
 20. Minneapolis
 21. Nashville
 22. Orlando
 23. Philadelphia
 24. Phoenix
 25. Salt Lake City
 26. San Francisco
 27. Seattle
 28. St. Louis Lambert
 29. Tampa
 30. Washington-Dulles
-

Source: U.S. General Accounting Office.

Survey of Airports with Recent or Planned Runway Projects



United States General Accounting Office Survey of Airports With Recent or Planned Runway Projects

Introduction

Survey ID _____

The U.S. General Accounting Office (GAO) is an agency of the legislative branch that reviews federal programs for the U.S. Congress. We have been asked by the Chairman and Ranking Member of the Subcommittee on Aviation, House Committee on Transportation and Infrastructure, to review what long-term improvements can be made to enhance capacity in the National Airport System, particularly as it relates to building runways.

As part of our study, we are asking a select group of 34 airports for information on their experiences with building runways and how the process could be improved. Your airport was selected because you built a runway between 1991 and 2000 or plan to build a runway before 2010. If you have more than one runway that meets these criteria, you have received one survey for each runway. Your responses will help us better understand the various phases of runway construction and the challenges you had or foresee in the future. We will present the results of this survey in our report.

We have made every effort to minimize the amount of information we are requesting by using other data sources when available. Your participation is important and will enable us to report to the Congress on what works well and what can be improved to expedite the building of runways. Please have appropriate staff respond to these questions including consultants that may have assisted in this project. Please return your completed survey, within the next 15 working days or by January 11, 2002, in the enclosed pre-addressed, postage-paid envelope, or fax your response to David Lehrer at (312) 220-7726. In the event that the envelope is misplaced, the return address is:

Mr. David Lehrer
U.S. General Accounting Office
200 W. Adams Street, Suite 700
Chicago, IL 60606-5219
EMAIL: lehrerd@gao.gov

Your responses to this survey should pertain to the airport and runway stated below, unless the questions ask you to do otherwise. If you have any questions, please call either David Lehrer (312) 220-7667 or Gary Lawson at (202) 512-3649.

Thank you very much for taking time to complete the survey.

1. Airport Name: _____
2. Runway of interest is: _____
3. Name and phone number of person(s) completing this survey:
 - a. Name: _____ Telephone: (____) ____ - _____
 - b. Name: _____ Telephone: (____) ____ - _____
4. Name of a person we may call if we have questions:
 - a. Name: _____ Telephone: (____) ____ - _____
 - b. Best times of day to call: _____

**Appendix IX
Survey of Airports with Recent or Planned
Runway Projects**

EXPERIENCES WITH PLANNING AND BUILDING RUNWAYS

5. Please provide the start and completion dates for each of the following phases of your runway project and describe the event or task related to each date. *(Note: The time frames associated with each of the phases listed below can overlap.)*

<u>Phase</u>	<u>Date started</u>	<u>Date completed</u>
a. Planning N=32	<u>[a]</u> (month/year)	<u>[a]</u> (month/year)
	<u>Begin Master Plan</u> (event/task)	<u>Complete Master Plan</u> (event/task)
b. Environmental process N=31	<u>[a]</u> (month/year)	<u>[a]</u> (month/year)
	<u>Begin EIS</u> (event/task)	<u>Record of Decision</u> (event/task)
c. Litigation N=16	<u>[a]</u> (month/year)	<u>[a]</u> (month/year)
	<u>First Lawsuit Begun</u> (event/task)	<u>Last Lawsuit Settled</u> (event/task)
d. Design and construction N=27	<u>[a]</u> (month/year)	<u>[a]</u> (month/year)
	<u>Begin Design</u> (event/task)	<u>Commission Runway</u> (event/task)

[a] Due to the differences in reporting, summarized responses are not possible. Event/task listed is the most common response provided for each phase.

If necessary, provide clarifying information for your response:

N=18

**Appendix IX
Survey of Airports with Recent or Planned
Runway Projects**

6. For each of the tasks listed below, please indicate to what extent it took **more or less time** than expected (i.e., as compared to your timeline and schedule at the beginning of the project). Please indicate 'not applicable' for those tasks that have not yet taken place.

A. Planning N=32	Much longer than expected (25% longer or greater)	Longer than expected (up to 25% longer)	Time expected	Less than expected (up to 25% less)	Much less than expected (25% less or greater)	Not applicable
Preparing future forecast	9%	25%	59%	0%	0%	6%
Demand/capacity analysis	9%	16%	66%	3%	0%	6%
Alternatives analysis	16%	16%	56%	0%	0%	13%
Justification of future development	19%	22%	50%	0%	3%	6%
Development of Airport Layout Plan	3%	19%	69%	3%	0%	6%
Confirmation of financial feasibility	6%	13%	63%	3%	0%	16%
Other (Please specify)	22%	0%	0%	0%	0%	78%
Other (Please specify)	9%	0%	0%	0%	0%	91%

B. Environmental process N=32	Much longer than expected (25% longer or greater)	Longer than expected (up to 25% longer)	Time expected	Less than expected (up to 25% less)	Much less than expected (25% less or greater)	Not applicable
National Environmental Policy Act (NEPA) requirements	22%	19%	44%	0%	0%	16%
Environmental Assessment	6%	0%	38%	0%	0%	56%
Finding of No Significant Impact—FONSI	3%	0%	16%	0%	0%	81%
Noise study	9%	9%	50%	0%	0%	31%
Noise compatibility program --Part 150	6%	9%	28%	0%	0%	56%
Noise and access restrictions --Part 161	0%	0%	3%	0%	0%	97%
Draft Environmental Impact Statement—EIS	22%	19%	28%	0%	0%	31%
Public comment on draft EIS	13%	13%	41%	0%	0%	34%
General conformity	9%	16%	34%	0%	0%	41%
Environmental Justice	9%	6%	19%	0%	0%	66%
Governor's certificate issuance	6%	9%	38%	6%	0%	41%
Scope definition	6%	9%	50%	0%	0%	34%
Final EIS	25%	19%	22%	0%	0%	34%
Record of decision	16%	9%	38%	3%	0%	34%
Other federal requirements	16%	6%	31%	0%	0%	47%
State and local requirements	19%	13%	25%	0%	0%	44%
Other (Please specify)	19%	6%	0%	0%	0%	75%
Other (Please specify)	3%	0%	3%	0%	0%	94%
Other (Please specify)	3%	3%	0%	0%	0%	94%
Other (Please specify)	3%	0%	0%	0%	0%	97%
Other (Please specify)	0%	0%	0%	0%	0%	100%

**Appendix IX
Survey of Airports with Recent or Planned
Runway Projects**

Question 6 (con't.)

C. Litigation N=32	Much longer than expected <i>(25% longer or greater)</i>	Longer than expected <i>(up to 25% longer)</i>	Time expected	Less than expected <i>(up to 25% less)</i>	Much less than expected <i>(25% less or greater)</i>	Not applicable
Noise	6%	0%	3%	0%	0%	91%
NEPA litigation	3%	0%	6%	3%	0%	88%
Air quality	3%	0%	6%	0%	0%	91%
Land acquisition	6%	9%	22%	0%	0%	63%
General conformity	3%	0%	3%	0%	0%	94%
Environmental justice	0%	0%	0%	0%	0%	100%
Wetlands	3%	9%	0%	0%	0%	88%
Endangered species	0%	0%	6%	0%	0%	94%
Historical site	0%	3%	6%	0%	0%	91%
State legislation	6%	0%	3%	0%	0%	91%
Other (Please specify.)	6%	3%	3%	0%	0%	88%
Other (Please specify.)	6%	0%	0%	0%	0%	94%

D. Design and construction N=32	Much longer than expected <i>(25% longer or greater)</i>	Longer than expected <i>(up to 25% longer)</i>	Time expected	Less than expected <i>(up to 25% less)</i>	Much less than expected <i>(25% less or greater)</i>	Not applicable
Project engineering	6%	6%	47%	9%	0%	31%
Contracting	3%	6%	56%	3%	0%	31%
Mobilization (facility relocation)	0%	6%	47%	6%	0%	41%
Land acquisition	0%	19%	47%	0%	0%	34%
Site preparation	0%	6%	47%	9%	0%	38%
Noise mitigation construction	0%	0%	25%	0%	0%	75%
Project construction	6%	13%	34%	6%	3%	38%
Other (Please specify)	6%	0%	0%	0%	0%	94%
Other (Please specify)	3%	0%	0%	0%	0%	97%

If necessary, provide clarifying information for your response:

N=18

**Appendix IX
Survey of Airports with Recent or Planned
Runway Projects**

7. The following table lists stakeholders that may have been involved in your runway project. Please indicate the extent to which each stakeholder's involvement took more or less time than you expected during each phase of your runway project. Please indicate 'not applicable' for those stakeholders with which you have not yet interacted.

Using the following scale (without regard to set percentages as used in question 6), select the one that best describes the impact of this stakeholder in each phase of the project. Please clearly indicate plus or minus, as appropriate, next to the number you select.

- 2= Much longer than expected
- 1= Longer than expected
- 0= Took the time expected
- +1= Less than expected
- +2= Much less than expected
- NA= Not Applicable

Stakeholder	Planning	Environmental process	Litigation	Design & construction
FAA Headquarters	-0.12	-0.48	0.00	-0.43
FAA Region	-0.18	-0.52	0.29	-0.20
FAA District Office	-0.04	0.00	0.00	0.16
FAA Air Traffic Control	0.00	-0.14	0.00	-0.10
U.S. Environmental Protection Agency	-0.50	-0.80	-0.67	-0.45
U.S. Army Corps of Engineers	-0.25	-0.57	0.00	-0.58
Department of Justice	0.00	-0.17	0.00	0.00
Airlines	-0.38	0.05	-0.25	-0.09
State Department of Transportation	-0.27	-0.20	0.00	-0.25
State Environmental Agency	-0.35	-0.52	-1.00	-0.46
Local agencies	-0.19	-0.42	0.00	-0.32
Community Interest Groups	-0.32	-0.50	-0.43	-0.31
Metropolitan planning Organization (MPO)	-0.04	-0.15	0.00	0.00
Financial institutions	0.00	0.00	0.00	-0.11
Contractors	-0.22	-0.10	-0.25	0.13
Other (Please specify.)	[a]	[a]	[a]	[a]
Other (Please specify.)	[a]	[a]	[a]	[a]

[a] Insufficient number of similar answers to summarize.

If necessary, provide clarifying information to your responses:

N=12

**Appendix IX
Survey of Airports with Recent or Planned
Runway Projects**

8. Which of the following geographic characteristics surrounding your airport had/will have an impact on the runway project? (Check one column for each row.)

Characteristic	None	Some Impact	Moderate Impact	Great Impact
a. Lack of open space within airport boundary N=31	42%	19%	13%	26%
b. Community proximity N=32	13%	25%	19%	44%
c. Hills, mountains, or other obstructions near airport N=32	50%	28%	6%	16%
d. Highways or railroads nearby N=32	16%	44%	9%	31%
e. Water surrounding area N=32	56%	25%	12%	6%
f. Wetlands considerations N=32	25%	34%	9%	31%
g. Other (Please describe) N=6	17%	17%	17%	50%

If necessary, provide clarifying information for your response:

Responding airports provided additional information to this question. The airports cited factors not explicitly listed in the question, including endangered species, landfills, valleys and airspace conflicts and/or described how the geographic characteristic affected their projects. (N=14)

**Appendix IX
Survey of Airports with Recent or Planned
Runway Projects**

9. Please describe the **most critical** or significant events or factors that either delayed or accelerated the completion of your runway project and briefly describe why or how each one affected it.

Events or factors that **delayed** the project:

Responding airports generally stated that events or factors that delayed their projects identified challenges in three major areas—resolving differences among the stakeholders involved in the runway development process, completing extensive federal and state regulatory and legal environmental requirements, and handling site specific challenges related to the airport’s location. (N=29)

Events or factors that **accelerated** the project:

Responding airports generally stated that events or factors that accelerated their projects focused primarily on improving communication and coordination with major stakeholders and streamlining the environmental process. Some stakeholders also identified innovative construction techniques that they believed accelerated the completion of their projects. (N=20)

**Appendix IX
Survey of Airports with Recent or Planned
Runway Projects**

COSTS TO BUILD THE RUNWAY

10. What were your original cost estimates and actual costs incurred during each phase of your runway construction project? *(Please state dollars in millions.)*¹

Project Phase or step	Original estimate	Actual costs
Planning	N=32	N=32
Environmental	N=32	N=32
Environmental mitigation	N=32	N=32
Litigation	N=32	N=32
Land acquisition	N=32	N=32
Design and construction	N=32	N=32
Total	N=32	N=32

11. What percentage of the funding for your runway project came from or will come from the following sources?

Sources	Percent	Not applicable
Airport Improvement Program—entitlement	19%	N=4
Airport Improvement Program—discretionary	25%	N=7
Passenger Facility Charges	18%	N=12
Airport bonds	22%	N=9
State grants	2%	N=25
Landing fee revenue	1%	N=28
Other airport revenue	0%	N=27
Other: (Please specify)	0%	N=32

[a] Figures represent the average of the responses given, and therefore, do not total 100 percent.

12. For each of the funding sources listed below, please indicate the extent to which your project was delayed because of delays in receiving the funds.

Source	Delayed greatly	Delayed somewhat	No delay	Not applicable
Airport Improvement Program—entitlement N=32	6%	9%	59%	25%
Airport Improvement Program—discretionary N=32	12%	12%	47%	28%
Passenger Facility Charges N=32	0%	0%	50%	50%
Airport bonds N=32	0%	3%	69%	28%
State grants N=32	0%	3%	28%	69%
Airport revenue N=32	0%	3%	41%	57%
Other: (Please specify)	[a]	[a]	[a]	[a]

[a] Insufficient number of similar answers to summarize.

13. Did you consider constructing this runway project without the use of federal AIP funds?

Yes [9%] NA=6%
No [84%] N=32

Please explain.

¹ Due to the various methods used to account for project costs, summarization is not possible.

**Appendix IX
Survey of Airports with Recent or Planned
Runway Projects**

Responding airports generally stated that they were either required to use AIP funds, that non-use would present significant financial burden upon the airport, or that federal funds were necessary to establish the financial feasibility of the project. (N=17)

**Appendix IX
Survey of Airports with Recent or Planned
Runway Projects**

IMPACT OF RUNWAY PROJECT

14. What impact do/did you expect this runway to have on the *maximum* number of operations per hour at your airport?

Type of weather	Maximum number of hourly operations before runway completion	Estimated maximum number of hourly operations after runway completion
a. VFR conditions	Range: 75 - 270	Range: 90 - 278
b. IFR conditions	Range: 50 - 185	Range: 59 - 216

15. How did you estimate the *maximum* number of additional operations per hour that could be accommodated from building your new runway? *(Please include such information as the model used, which contractor was used to prepare the estimates, based on what study.)*

Responding airports briefly described the models used to construct the estimates: 25 used SIMMOD primarily or exclusively, and 7 did not expect capacity to change as a result of the project or did not specify the model used. Other models cited included TAAM, DELAYSIM, and ADSIM/RDSIM. (N=30)

16. In 2000, what percentage of annual operations was attributed to the three largest carriers (passenger or cargo) at your airport?

Name of carrier	Percentage of total annual operations
a. N=32	Range: 8% - 78%
b. N=32	Range: 4% - 32%
c. N=32	Range: 3% - 22%

**Appendix IX
Survey of Airports with Recent or Planned
Runway Projects**

IMPROVING THE RUNWAY PROCESS

17. What changes, if any, would you recommend to expedite the overall process (from planning through construction) for building runways and which federal, state or local entity would be the most appropriate one to address each of the changes?

Responding airports provided a number of potential initiatives directed at expediting the overall process for building runways directed primarily at improving communication and coordination between stakeholders and streamlining the environmental process. (N=31)

18. Other than building new runways, what can be done to increase the capacity of the National Airport System?

Responding airports provided a number of potential initiatives directed at increasing the capacity of the National Airport System including changes to airspace utilization, technology improvements and ATC modernization and the continuing construction of new infrastructure. (N=29)

**Appendix IX
Survey of Airports with Recent or Planned
Runway Projects**

RUNWAY EXTENSION PROJECTS

*Answer questions 19 – 21 in this section **only if** your airport completed one or more runway **extensions** from 1991 through 2000 or has one or more runway extensions planned from 2001 through 2010. (If you have received more than one survey, please respond to questions 19 - 21 **once**.)*

19. Describe the runway extensions you have completed or planned to complete by 2010.

Runway number	Year extension completed	Extension completion time--years/months	Length of original runway	Length of extension
N=16	Range: 1991 - 2010	Range: 00/04 – 05/00	Range: 3,000 ft. - 12,636 ft.	Range: 489 ft. - 5,500 ft.
N=6	Range: 1992 - 2004	Range: 00/07 – 05/09	Range: 8,900 ft. - 11,388 ft.	Range: 1,000 ft. - 2,012 ft.
N=3	Range: 1998 - 2005	Range: 02/00 – 06/07	Range: 5,001 ft. - 11,388 ft.	Range: 2,000 ft. - 4,769 ft.
N=0	Range: N/A	Range: N/A	Range: N/A	Range: N/A

20. What were you seeking to accomplish by building this extension (e.g., changed runway from commuter runway to one for only large airplanes)? What impact did/will the extension(s) have on the capacity of this airport?

Responding airports provided information regarding the purpose of their runway extensions. The primary purpose for the extensions was to accommodate longer-range aircraft, heavier aircraft (i.e., cargo), increase safety, and/or reduce noise impacts. (N=19)

21. How is the process for planning and building an extended runway different from building a new runway at your airport? (Please explain.)

Responding airports stated that the process for building an extended runway is virtually the same as that for building a new runway, with minor exceptions. Exceptions included such things as, reduced environmental impacts, less controversy, fewer legal challenges, and shorter construction time. (N=19)

**Appendix IX
Survey of Airports with Recent or Planned
Runway Projects**

IMPACT OF THE SEPTEMBER 11, 2001, ATTACKS ON THE NATIONAL AIRPORT SYSTEM

22. How important is it to add capacity to a) your specific airport, and b) the National Airport System after the terrorist attacks on America on September 11, 2001? Have your airport's priorities changed as a result of the terrorist attacks? If yes, please explain.

Responding airports stated that their short-term focus would shift to safety and security, however, long-term plans remained largely unchanged. They also noted that capacity remains important to the nation's airport system. (N=32)

23. What impact, if any, have or will the terrorist attacks on September 11, 2001, have on the completion of any runway or runway extension planned at your airport?

Baltimore Washington International, Charlotte, Dallas, Minneapolis, and Phoenix experienced delays or deferred airside projects. Several airports noted that their projects were demand driven and that the extent to which demand returns to the airport would determine when the project would be started. (N=29)

24. Given the current financial condition of the major airlines at your airport, what is the likelihood that these airlines will be able to contribute financially to funding your runway project or repayment of existing debt?

Responding airports stated that in the short-term, airlines may have some difficulty in providing financial contributions to the airport. The airports anticipate that the long-term financial commitment of the airlines will not be impacted. (N=32)

Please feel free to include any additional documentation that you believe will help us better understand your runway project and your experiences with it.

Thank you for taking the time to complete this survey.

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