

## NextGen for Airports, Volume 2: Engaging Airport Stakeholders: Guidebook

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## Engaging Airport Stakeholders Guidebook



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AIRPORT COOPERATIVE RESEARCH PROGRAM

ACRP REPORT 150

# NextGEN for Airports Volume 2

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## Engaging Airport Stakeholders Guidebook

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The need for ACRP was identified in TRB Special Report 272: Airport Research Needs: Cooperative Solutions in 2003, based on a study sponsored by the Federal Aviation Administration (FAA). ACRP carries out applied research on problems that are shared by airport operating agencies and not being adequately addressed by existing federal research programs. ACRP is modeled after the successful National Cooperative Highway Research Program (NCHRP) and Transit Cooperative Research Program (TCRP). ACRP undertakes research and other technical activities in various airport subject areas, including design, construction, legal, maintenance, operations, safety, policy, planning, human resources, and administration. ACRP provides a forum where airport operators can cooperatively address common operational problems.

ACRP was authorized in December 2003 as part of the Vision 100—Century of Aviation Reauthorization Act. The primary participants in the ACRP are (1) an independent governing board, the ACRP Oversight Committee (AOC), appointed by the Secretary of the U.S. Department of Transportation with representation from airport operating agencies, other stakeholders, and relevant industry organizations such as the Airports Council International-North America (ACI-NA), the American Association of Airport Executives (AAAE), the National Association of State Aviation Officials (NASAO), Airlines for America (A4A), and the Airport Consultants Council (ACC) as vital links to the airport community; (2) TRB as program manager and secretariat for the governing board; and (3) the FAA as program sponsor. In October 2005, the FAA executed a contract with the National Academy of Sciences formally initiating the program.

ACRP benefits from the cooperation and participation of airport professionals, air carriers, shippers, state and local government officials, equipment and service suppliers, other airport users, and research organizations. Each of these participants has different interests and responsibilities, and each is an integral part of this cooperative research effort.

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Once selected, each ACRP project is assigned to an expert panel appointed by TRB. Panels include experienced practitioners and research specialists; heavy emphasis is placed on including airport professionals, the intended users of the research products. The panels prepare project statements (requests for proposals), select contractors, and provide technical guidance and counsel throughout the life of the project. The process for developing research problem statements and selecting research agencies has been used by TRB in managing cooperative research programs since 1962. As in other TRB activities, ACRP project panels serve voluntarily without compensation.

Primary emphasis is placed on disseminating ACRP results to the intended users of the research: airport operating agencies, service providers, and academic institutions. ACRP produces a series of research reports for use by airport operators, local agencies, the FAA, and other interested parties; industry associations may arrange for workshops, training aids, field visits, webinars, and other activities to ensure that results are implemented by airport industry practitioners.

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# Foreword



By **Theresia H. Schatz**  
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The Next Generation Air Transportation System (NextGen) refers to the federal programs (predominately airspace, air traffic, or avionics related) that are designed to modernize the National Airspace System (NAS). ACRP's NextGen initiative aims to inform airport operators about some of these programs and how the enabling practices, data, and technologies resulting from them will affect airports and change how they operate.

*ACRP Report 150: NextGen for Airports, Volume 2: Engaging Airport Stakeholders: Guidebook* is the second report in this series. This report provides guidance to help airports engage the FAA, aircraft operators, community representatives, and other airport stakeholders during the planning, environmental review, design, deployment, and monitoring phases of NextGen implementation. The guidance includes tools that encourage proactive communication and collaboration specifically tailored for a variety of factors, including airport category, stakeholder role, and type of NextGen technology being implemented. The goal is to help airports establish a continuous engagement strategy that will achieve an equitable balance between stakeholder needs and efficient NextGen implementation.

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Some of the airport-relevant effects that are expected from NextGen include:

- Safety—situational awareness, less divergence from intended tracks, increased information without an increased burden of communication;
- Efficiency—aircraft fuel savings, improved airspace and infrastructure utilization, improved taxiing performance;
- Sustainability—altered noise distribution, emissions reductions; and
- Reliability—consistency in practice, improved access to airports in varying weather conditions.

Unfortunately, airport stakeholders are often engaged in NextGen implementation near the end of the process, when many decisions have already been made. This engenders a narrow focus on the environmental issues of noise and emissions and misses the opportunity to engage and inform the overall community of the safety, capacity, and economic impacts that such procedures offer. What is increasingly needed is a more inclusive approach that looks at the benefits of NextGen for the airport and its stakeholders.

An effective stakeholder engagement strategy encompasses the adaptation of materials and methods focused on NextGen initiatives and stakeholder scenarios that are important to an airport. To help



achieve this goal, a NextGen Outreach Toolkit that includes customizable electronic engagement materials is available online. Access can be found online by searching for *ACRP Report 150, Volume 2*. The materials provided in the toolkit include an interactive flow chart, a sample agenda for stakeholder meetings, a sample community presentation, a flyer, FAQs, a glossary of terms, and a library of documents.

Within the guidebook, case studies that describe how a representative spectrum of airports have implemented such materials are provided to highlight effective practices and lessons learned. The case studies offer varying perspectives from FAA, airport management, airline representatives, and, where appropriate, members of the community.

This project is part of an ACRP NextGen initiative that comprises five distinct projects, which have been conducted simultaneously. The scope, ideas, and preliminary results have been shared among all five projects. The titles of the ACRP projects included in the ACRP NextGen Initiative are as follows:

- ACRP 01-27, NextGen—A Primer;
- ACRP 01-28, NextGen—Guidance for Engaging Airport Stakeholders;
- ACRP 03-33, NextGen—Airport Planning and Development;
- ACRP 03-34, NextGen—Understanding the Airport’s Role in Performance-Based Navigation (PBN); and
- ACRP 09-12, NextGen—Leveraging NextGen Spatial Data to Benefit Airports.

Under ACRP Project 01-28, research was conducted by Grafton Technologies, Inc., in association with Harris Miller Miller & Hanson, Inc., Eastern Research Group, Inc., and Grafton Information Services, Inc.

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# Summary

## Guidance for Engaging Airport Stakeholders

The Next Generation Air Transportation System (NextGen) is now a reality for most U.S. airports. Performance-based navigation (PBN) procedures have been implemented at almost 3,000 airports, 10 airports have improved multiple runway operations (MRO), 36 have improved surface operations, and 41 have benefited from changes to aircraft separation requirements (FAA NextGen Portfolios n.d.). Although progress has been significant, thousands of new, NextGen-enabled flight procedures are currently being developed (FAA 2016). Other NextGen capabilities, many of which are relevant to airports, will continue to be rolled out for several years. Ultimately, this comprehensive modernization of the national airspace system (NAS) will have an impact on all airports, all operators, all passengers, and many other stakeholders. Appropriately engaging these stakeholders in the process of implementing NextGen is essential to ensure an effective and equitable result.

**Engaging stakeholders in the process of implementing NextGen is essential to ensure an effective and equitable result.**

Airports play a critical role in the implementation of NextGen. The RTCA (formerly Radio Technical Commission for Aeronautics) put together a PBN Blueprint Task Group representing all types of NextGen stakeholders which concluded that airports “should be engaged from the very beginning of the PBN initiative to provide input that would be used in formulating the overall goal of the PBN effort and the associated community outreach” (RTCA NextGen Advisory Committee 2014). FAA agreed,

**Airports play a critical role in the implementation of NextGen, yet many have struggled to become engaged.**

stating that “the participation of representatives from the respective airport authorities is a critical component of successfully implementing new PBN initiatives and procedures” (FAA 2015a). In its response FAA notes that airport participation is necessary to identify existing agreements and analyses, impacted parties who should be notified or consulted, and stakeholders who may support or object to the proposed changes. FAA also requires that airports provide accurate map data on

runway ends, navigational aids, and obstacles that are an essential ingredient in the development of flight procedures (DeLeon 2012).

The implementation of NextGen can benefit airports either directly, through increased revenue and higher customer satisfaction, or indirectly, through increased passenger satisfaction and reduced emissions. Airports are also a critical connection between FAA, which is leading the implementation of NextGen, and the communities they serve.

Despite their importance in this process, many airports and communities have found it challenging to become engaged in the implementation of NextGen. Lack of knowledge of FAA plans, confusion about NextGen technology and terminology, uncertainty over roles and responsibilities, and several other factors have been constraints. The RTCA PBN Blueprint Task Group observed that “there is a general lack of understanding by the public and elected officials of what NextGen and PBN is and is not.” The task group felt that education is a critical component of any outreach program (RTCA NextGen Advisory Committee 2014). Airports and other stakeholders that have worked to overcome these constraints have benefited from NextGen capabilities and, in turn benefited the communities they serve. Other airports have struggled with stakeholder engagement or opted for a passive approach that has sometimes led to frustration.

Stakeholder engagement starts with establishing a strategy and committing to allocate the human resources and funding needed to properly support engagement activities. One size does not fit all situations, and the benefits of stakeholder engagement will vary based on senior management’s priorities, the size of the airport, the airport’s need for NextGen capabilities, the timing of implementing these capabilities, and other details of the specific implementation.

Often an airport’s stakeholder engagement activities are led by airport planners, community affairs, or media relations staff. They must first determine which external stakeholder groups (e.g., FAA’s Flight Procedures Office and Airports District Office [ADO], aircraft operators, tenants, elected officials, community representatives, or members of the press) to engage in specific initiatives and when to engage them (e.g., during planning or at the implementation of a new PBN procedure). They must then determine what information each stakeholder group needs and what information, if any, is needed from the stakeholders; how best to provide or receive that information; and when to provide or collect it. A two-way dialogue is best but is not always feasible. As they provide this information, the airport’s engagement team also should listen, consult, and participate in dialogues with internal stakeholders, reporting the relevant information and their overall progress to senior management and peers in airport operations and other affected departments. The goal of the engagement effort is to let all stakeholders know how NextGen will impact them and others, so that an overarching solution can be found. Given the breadth of this goal, the ACRP Project 01-28 research team settled on an encapsulating theme and logo for use in the *ACRP Report 150* guidebooks (see figure). Airports and other stakeholders can use this logo if they choose in their stakeholder engagement materials related to NextGen.



**Knowing NextGen.** *This logo, encapsulating the theme of the ACRP Report 150 series, is used throughout the model documents and tools developed in conjunction with this guidebook.*

This guidebook and the accompanying electronic tools and engagement materials provided in the NextGen Outreach Toolkit (accessible from the webpage for this guidebook) explain the important role of airports in the implementation of PBN procedures and other NextGen initiatives. These materials also describe how airport planners, communications and marketing staff, and operations managers and staff can contribute to developing, implementing, and sustaining an effective stakeholder engagement program that is central to optimal implementation of NextGen capabilities.

# 1 Introduction

This guidebook is Volume 2 in a multi-volume series designed to provide airports, airport consultants, and other stakeholders with the information they need to understand and efficiently implement NextGen in a way that achieves an optimal balance of stakeholder needs. The complete series will include:

- A primer on what airports need to know about NextGen;
- Details for airport planners;
- Specifics on performance-based navigation (PBN);
- Guidance on how to effectively engage stakeholders (this guidebook); and
- Insight into how mapping information provides critical support.

## Objectives

This guidebook focuses on how airports can effectively engage stakeholders in the process of implementing NextGen. Stakeholder groups include various divisions and offices within FAA, airlines and other operators of aircraft at the airport, community members or their representatives, the media, and others.

Although NextGen is a series of programs led by FAA, airports play a critical role in the implementation of these programs. For example, several NextGen initiatives change the paths aircraft take when approaching or departing an airport. These new flight procedures, along with improved efficiencies while aircraft move on the ground, can significantly increase air service capacity and reduce delays. Other NextGen initiatives, particularly those at larger airports, require new equipment and decommission older equipment on airport property. The more involved an airport becomes in implementing these changes, the more likely it is that the airport's needs, as well as those of airport customers and the communities they serve, will be satisfied.

This guidebook helps airports understand and fulfill their role in implementing NextGen. It identifies the NextGen initiatives that are relevant to airports, the stakeholders that need to be engaged, and how to effectively engage those stakeholders. It describes the information stakeholders require and illustrates best practices that airports and other organizations have used to communicate this information. This guidance provides airports with specifics that help them set objectives, contribute information, and serve as a bridge to their communities as envisioned in the RTCA's Blueprint for Success to Implementing Performance-Based Navigation (RTCA NextGen Advisory Committee 2014).

This guidebook also describes a series of stakeholder engagement materials that are provided electronically in a NextGen Outreach Toolkit (accessible from the guidebook webpage). These engagement materials include a sample agenda, presentations, community flyers, and other documents that each

airport can adapt to meet its specific engagement needs, as well as an interactive literature search and other resources. The sample materials focus on the implementation of PBN procedures, which to date has been the NextGen initiative that has affected the most airports. An interactive flow chart walks users through the steps of implementing PBN procedures and where these sample materials can best be applied. The role of airports and their stakeholders also is described.

## Intended Audiences

This guidebook and the accompanying NextGen Outreach Toolkit are intended to assist airport managers, staff, and consultants in fulfilling a role that encourages an effective and equitable implementation of NextGen capabilities at their airports. The following airport managers, staff members, and consultants make up the primary audience that this guidebook was designed to help:

- Planners are the primary beneficiaries of the information in this document. Most of the stakeholder engagement needed occurs during the planning phase of implementing new capabilities. For this reason, airport planners typically are entrusted to fill the primary roles described in this guidebook. The case studies illustrate how their peers have fulfilled such roles at other airports. Airport planners also will benefit from the information provided in the series volume dedicated to NextGen details for airport planners.
- Noise and environmental personnel typically manage much of the airport's noise-related outreach activities. As a result, these personnel often take the lead with FAA on related community engagement (e.g., education, engagement, and advocacy outreach). They may also manage National Environmental Policy Act (NEPA) documents and processes that prompt noise studies and further community engagement.
- Communications and marketing personnel contribute to NextGen implementation as they help airport planners communicate information to other stakeholders. Communications and marketing personnel often create or adapt the outreach material and manage how it is shared with intended stakeholders. The sample outreach materials developed with this guidebook will be of particular interest to these stakeholders.
- Operations personnel need to be familiar with several steps presented in this guidebook because they have a direct impact on aircraft operations, both in the air and on the ground. Operations personnel also can work closely with airport planners to provide information and feedback on proposed airspace changes. Operations personnel will also benefit from the additional details provided in Volume 1 of the *ACRP Report 150* series, which addresses PBN procedures.
- Designers and engineers create the infrastructure needed to support aircraft operations, and can use this guidebook to help them be involved in stakeholder engagement activities that influence airfield capacity, efficiency, and safety.
- Geographic information systems (GIS) specialists will learn how they can prepare vital mapping information that supports NextGen-related stakeholder engagement in the accompanying volume on spatial data. This guidebook offers these technical specialists a perspective on how their maps are used to communicate information to the stakeholders who require it. The case studies also provide examples of maps airports have effectively used. GIS specialists will find more detailed information about how they can prepare vital mapping information that supports NextGen-related stakeholder engagement in the *ACRP Report 150* series volume on spatial data.



- Senior management provides high-level oversight of airports' NextGen implementation and stakeholder engagement activities. Such oversight can benefit from managers' familiarity with the details presented in this guidebook and the other volumes of the *ACRP Report 150* series. Senior management will benefit the most from the series' primer on NextGen, which has been developed to provide the overview they need.

Stakeholders with whom airports must engage are an important secondary audience for this guidebook. Stakeholders who may benefit the most include the following groups:

- FAA representatives, in particular ADO managers and FAA representatives within the Air Traffic Organization (ATO) including local air traffic controllers who are essential to the safe and efficient operation of the local airspace, may find this volume helpful given their work with airports to implement FAA funded projects and other initiatives.
- Airlines and other aircraft operators will directly benefit from most NextGen capabilities and therefore play an essential role in the effective implementation of those capabilities. Pilots, dispatchers, operations personnel, schedulers, station managers, and procedure designers that may be employed by an airline all play a role and should be engaged in the implementation process.
- Government and non-government officials including state aviation officials, regional metropolitan planning organizations (MPOs), and local non-governmental organizations (NGOs) often help small- and medium-sized airports fulfill their obligations. The case studies in this guidebook provide helpful illustrations of how these officials can help with NextGen implementation.
- Elected and appointed representatives and community members are the ultimate audience for much of the material described in this guidebook and may wish to become aware of, use, or contribute to the types of information stakeholders require.
- Media correspondents/members of the press must convey information related to NextGen and can use the information and sample materials presented in this guidebook to convey clear, consistent, and accurate messages about NextGen.

## How to Use This Guidebook

The audiences for this guidebook can review the information presented to understand the importance of their roles in the implementation of NextGen. The information will help them fulfill their roles by describing the steps they should take, the information they will need, where to obtain the information, and with whom and how they will need to communicate.

This guidebook was prepared using research conducted for ACRP Project 01-28, "NextGen—Guidance for Engaging Airport Stakeholders." Similar material has been and will continue to be produced by FAA (see <https://www.faa.gov/nextgen>), as well as by industry associations such as ACI-NA (see <http://www.aci-na.org/opstechnextgen>) and the National Association of State Aviation Officials (NASAO) (see <http://www.nasao.org/resources/nextgen-resources/>). Collectively, these resources provide information in support of NextGen implementation.

## How to Use the Engagement Tools and Materials

The NextGen Outreach Toolkit was developed concurrently with this guidebook to make adaptable, electronic versions of useful stakeholder engagement tools and materials available to airports. These materials include an interactive flow chart to help users understand the process of implementing PBN procedures and, more importantly, the role they play. Each step in the flow chart is described from the perspective of airport managers, staff, or consultants. Links in the chart connect users to sample engagement materials that have been formatted in a manner that allows airport planners and communications staff to customize them as needed.

To access the NextGen Outreach Toolkit online, search for “*ACRP Report 150, Volume 2*”. The webpage for the guidebook includes a link to a project website that provides instructional material, stakeholder engagement materials, a glossary, and linked resources identified by the research teams that produced other volumes in the *ACRP Report 150* series.

The engagement material has been provided in an editable electronic format so that airports can adapt it to their specific needs. The website, or the NextGen Outreach Toolkit, will work within most standard browsers on most computers and operating systems without requiring software aside from Adobe Acrobat Reader (or an equivalent) for viewing Portable Document Format (PDF) files. The engagement material provided in the NextGen Outreach Toolkit may be downloaded, copied, and distributed for educational or not-for-profit uses. As with all CRP-published material, this content is provided with the understanding that none of the material will be used to imply FAA endorsement of a particular product, method, or practice.

## 2 NextGen from an Airport's Perspective

**N**extGen consists of a series of FAA-led programs to implement new technologies and improve processes that will enhance the capacity, safety, efficiency, and ecology of air transportation in the United States. NextGen includes increased use of satellite-based navigation signals that are augmented by systems on board aircraft, as well as new technologies on the ground. Processes that streamline how the information required by these systems is created, validated, and exchanged by the people who use them are also an important element of NextGen.

The details about these technologies and process improvements can be challenging to understand for many reasons. First, they are complex. NextGen relies on disciplines and technology that require specialized experience and background knowledge to understand. Second, the degree to which airports are required to play a direct role in the implementation of these technologies has increased. For example, FAA now requires airports to supply data essential to the implementation of NextGen. (Information on FAA's Airports Geographic Information System (AGIS) is given in the *ACRP Report 150* volume on spatial data and NextGen.) Many airports, and in some cases the communities they serve, have also decided to become more proactively involved, which means that airport staff and consultants must learn new concepts and skills. Finally, complex terminology, myriad acronyms, inconsistent definitions, and the evolving manner in which NextGen programs have been defined have not made it easier for airports and their stakeholders to understand what they can do. Given this complexity, some stakeholders have felt that they were not provided with necessary information or were left out of the implementation process.

Fortunately, FAA, industry associations, and—through this series of guidebooks—ACRP recognize this problem and have launched several efforts to ensure that stakeholders have the information they require. For example, FAA substantially redesigned its NextGen Update website which now references online videos and interactive webpages that transform complex statistics and maps into intuitive graphs and diagrams. FAA's Office of Environment and Energy has also been tasked with revising its Community Involvement Manual based on some of the recommendations made in the RTCA PBN Blueprint. The updated manual will include current requirements, expectations, best practices, and technologies that span relevant FAA lines of business (FAA 2015a). FAA's ATO updated its PBN Strategy document to guide future PBN implementation and strengthen a collaborative approach with airport operators. Associations have published memos and hosted events. Industry organizations have conducted assessments and made recommendations to which FAA has responded. Regional agencies have developed educational material, websites, and applications. ACRP has coordinated five projects to educate and guide airports. These and similar efforts have had, and are expected to continue having, a positive effect on stakeholder engagement. Although NextGen is a U.S.-based initiative, it is similar to initiatives being implemented across the globe. Other countries are carrying out similar activities from which U.S. stakeholders also can learn.

## Relevant NextGen Initiatives and Technologies

Not all NextGen initiatives are directly relevant to airports. Many initiatives deal with capabilities that support aircraft while they are en route between airports, aircraft equipage, and information flows within FAA. Other initiatives affect aircraft arrival, departure, or surface operations and are therefore directly relevant to airports. The following NextGen initiatives will be most relevant to airports in the short term (i.e., now or within the next 5 years):

- Performance-based navigation (PBN) is a suite of procedures that incorporate technical capabilities that allow aircraft to fly with greater accuracy and precision. These capabilities are made possible by technical and operational performance characteristics of aircraft supported by signals from satellites. PBN enables area navigation (RNAV) and required navigation performance (RNP) flight procedures that allow aircraft to safely fly closer together. The result allows airspace to be redesigned to improve efficiency, increase capacity, and preserve safety. More direct routes lead to fuel savings, fewer workload communications between pilots and controllers, and reduced emissions. For airports, PBN also enables procedures that increase capacity and access without adding additional costly, ground-based navigational aids. This increased capacity can lead to additional air service and new customers that increase revenue without generally requiring costly infrastructure (NextGen Portfolio on Performance Based Navigation, viewed 2015).
- Separation management and multiple runway operations (MRO) improvements are possible because of navigation equipment installed on aircraft that allows them to fly more precise and accurate approach and departure paths, automatic dependent surveillance-broadcast (ADS-B) surveillance equipment that shares their location with controllers and other pilots, and FAA authorization of reduced separation after careful analysis of specific situations. If reduced separation techniques such as wake categorization and closely spaced parallel operations are approved, airfield capacity can be significantly increased without adding additional infrastructure. For airports, the increased air service means higher revenue without the capital and operating expenses associated with new infrastructure (NextGen Portfolio on Separation Management, viewed 2015).
- Surface operations are improved by accurately tracking aircraft and other vehicles that operate on the surface of an airfield. Aircraft and vehicle positions are shared with controllers and other operators to provide increased situational awareness. This awareness allows movement to occur during periods of reduced visibility, which reduces delays caused by weather. The flow of aircraft can also be adjusted as weather and congestion conditions change to improve reliability. Airports will enjoy fewer delays, increased customer satisfaction, and fewer emissions from taxiing aircraft (NextGen Portfolio on Improved Surface Operations, viewed 2015).

Of these initiatives, PBN affects more airports and more stakeholders in more direct ways. For this reason, PBN was chosen as the primary focus of Volume 1 in the *ACRP Report 150* series and is featured in most of the examples used in this guidebook and the accompanying online material. Surface operations and MRO have the greatest impact at larger airports, and these NextGen initiatives directly impact fewer stakeholders. Although airport-focused stakeholder engagement will be less important for these initiatives, some guidance also is provided in this guidebook to help identify relevant stakeholders and the information they will require with regard to surface operation and MRO initiatives.

## 3 Stakeholders in NextGen

**S**takeholders are “people and organizations that have an interest in a particular project and become involved, to varying degrees, in decision making.” Primary stakeholders have a direct interest, meaning they depend on the decisions made or are directly impacted by the result. In the case of implementing PBN procedures, operators (e.g., airlines), users (e.g., passengers), and affected neighbors are direct stakeholders. Secondary stakeholders include those involved with managing the resource (e.g., FAA and airports) and those who depend on the revenue generated by an initiative (e.g., the communities served by airports) (Wheeler and Sillanpaa 1997).

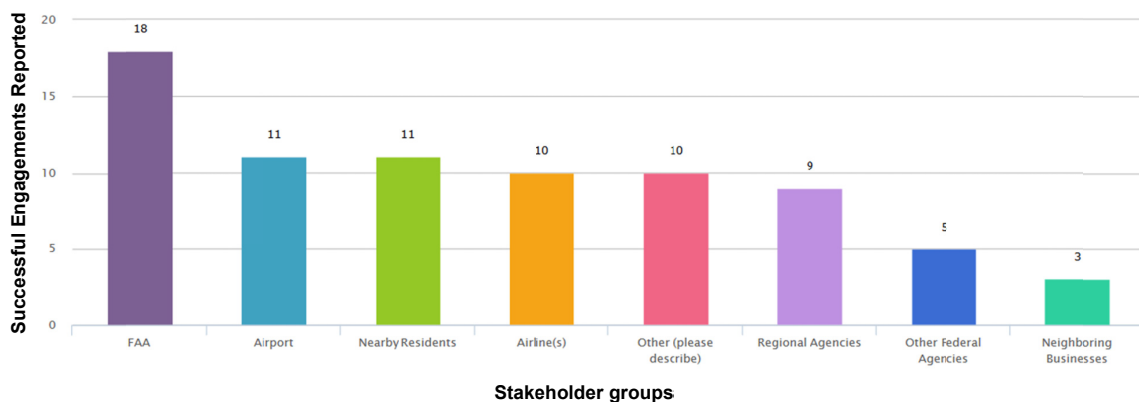
### Stakeholders in NextGen Implementation at Airports

Based on these definitions, many individuals and organizations can be considered stakeholders in NextGen. Grouping these stakeholders can be helpful when determining the priority and best strategy for engaging them. A categorized list of stakeholder groups is provided in the appendix to this volume.

Some stakeholders will require highly technical information on aircraft performance, runway configurations, and instrument procedure details. Others will require less technical information such as generalized flight tracks and population densities. Figure 3-1 reflects information contributed by ACRP Project 01-28 survey respondents. Of the 40 respondents, 23 reported successfully engaging on NextGen implementation with the stakeholder groups shown in the figure. Respondents could report engagement with more than one stakeholder group. The four groups that are ranked highest are the focus of the engagement strategies described in this guidebook and in the accompanying electronic materials; however, these materials also can be of use when engaging stakeholders from the other categories.

### Effects of NextGen Initiatives on Stakeholders

NextGen initiatives will have a variety of effects on stakeholders. Some of these effects will be positive and some will be negative. Most respondents to the project survey, as well as individuals interviewed as a part of the project, expressed opinions that the majority of the effects, and certainly their net impact, will be positive. These responses may be explained by the fact that, as aviation professionals, the survey and interview respondents are eager to benefit from the new capabilities NextGen promises to deliver.



Respondents (n = 23 of 40). Respondents could identify engagements with more than one group.  
 Source: ACRP Project 01-28 survey

**Figure 3-1.** Stakeholder groups in NextGen implementation.

Aircraft noise is perhaps the most direct effect experienced by the broadest number of stakeholders at or near airports. With NextGen initiatives, aircraft noise is expected to increase in some areas and decrease in others due to changes in the location, concentration, and altitude of flight paths over specific areas. Negative press and controversy about NextGen can result when airport neighbors are impacted by aircraft noise in new ways. On the other hand, these initiatives are generally expected to improve air service capacity, safety, and operational efficiency. These effects will help stimulate economic growth and improved customer service. At the same time, aircraft emissions and operating costs are expected to decline. Some stakeholders fear that airfields will suffer congestion, and a handful of stakeholders expect security to be improved.

Of the 40 respondents to the ACRP Project 01-28 survey, 34 respondents addressed the effects of NextGen implementation (see Table 3-1).

**Table 3-1.** Experienced or anticipated effects of NextGen implementation.

	Safety	Capacity	Operational Efficiency	Noise	Emissions	Operational Cost	Economic Growth	Airfield Congestion	Security	Customer Service	Responses
Increase	23 67.6%	18 52.9%	23 67.6%	14 41.2%	6 17.6%	5 14.7%	15 44.1%	4 11.8%	5 14.7%	10 29.4%	34
Decrease	0 0.0%	1 3.4%	4 13.8%	17 58.6%	18 62.1%	15 51.7%	0 0.0%	9 31.0%	0 0.0%	1 3.4%	29

Respondents (n = 34 of 40). Respondents could identify more than one effect.  
 Source: ACRP Project 01-28 survey

## Information Needed by Stakeholders

An important objective of stakeholder engagement is to provide information about the effects NextGen will have on specific groups. As one respondent stated, “information is power.” The ultimate goal is to improve the positive effects and diminish the negative effects so that the net impact of NextGen implementation reaches an optimal balance among all stakeholders. Some impacts may not be changeable, in which case stakeholders’ perceptions about them can be influenced by the information that is offered. For example, some interviewees found that community members’ concerns over noise caused by new procedures eased once they were briefed on the proposed changes, why the changes were important, and the overall impact the changes would have.

Stakeholders require general information about what NextGen is well in advance of any NextGen implementation activities. As specific procedures are being considered, stakeholders require information on what changes are being proposed and why. This information sharing should occur early enough in the process that modifications can still be made based on stakeholder input. These general information needs are consistent among all stakeholder groups regardless of their familiarity with NextGen or technical acumen. The differences lie in the level of details needed or required by various stakeholder groups. Survey respondents and interviewees identified several categories of information needed by stakeholders in order of relevance, as follows:

- General information is required to understand the changes that NextGen will bring and the impacts stakeholders will experience. Stakeholders who are unfamiliar with NextGen have the most need for this information, but even experienced professionals can benefit from clearly stated objectives and clear definitions to ensure consistent understanding.
- Maps that show current air traffic compared with proposed flight tracks help illustrate the proposed flight procedure changes. Adding contours of day-night average sound levels (DNLs) or grid cells that show percent change illustrate who will be most impacted. These data can be superimposed over land use and population density details so that stakeholders can discern the effects on their communities. Maps showing the current and future configuration of the airfield also are important when assessing changes related to surface operations improvements, MROs, and separation management initiatives. As needed, simple diagrams can be created to show conceptual changes or detailed maps can be developed based on accurate survey information. More information about the mapping information required for implementation of NextGen initiatives by airports can be found in the accompanying guidebook on spatial data.
- Statistics help determine the volume of impact stakeholders can expect to experience. Statistical data examined will include the number, type, and mix of aircraft operations that currently occur and those that are expected to occur. Changes in noise levels can be shown over time or for different alternatives. Information from near-term airline schedules and longer term air service demand forecasts can help in anticipating future impacts. Past and future expectations of weather impacts also help in this understanding. In communicating with stakeholders, charts, graphs, and infographics (i.e., highly visual integrations of key messages, statistics, and images) can display this statistical information in visually intuitive ways.
- Program information about when changes will be implemented, or at least about their relative priority as well as the expected costs and benefits, helps stakeholders anticipate when they will be affected, which influences how accepting they will be. Airports and stakeholders have complained that much program information is not available, and FAA has noted that such information is subject to frequent changes driven by legislation and agency budgets. FAA has taken steps to convey NextGen program information in a meaningful and timely manner, and airports are engaging with ADO and regional airspace and procedures teams (RAPTs) to obtain the information they need.

When FAA's PBN Program Office (AJV-14) notifies the FAA Office of Airport Safety and Standards of proposed PBN procedures, that office can then convey the information to airport senior management so that they can become engaged in the process. The ATO Service Center will also invite airports to participate in the center's PBN Working Groups (FAA 2015a).

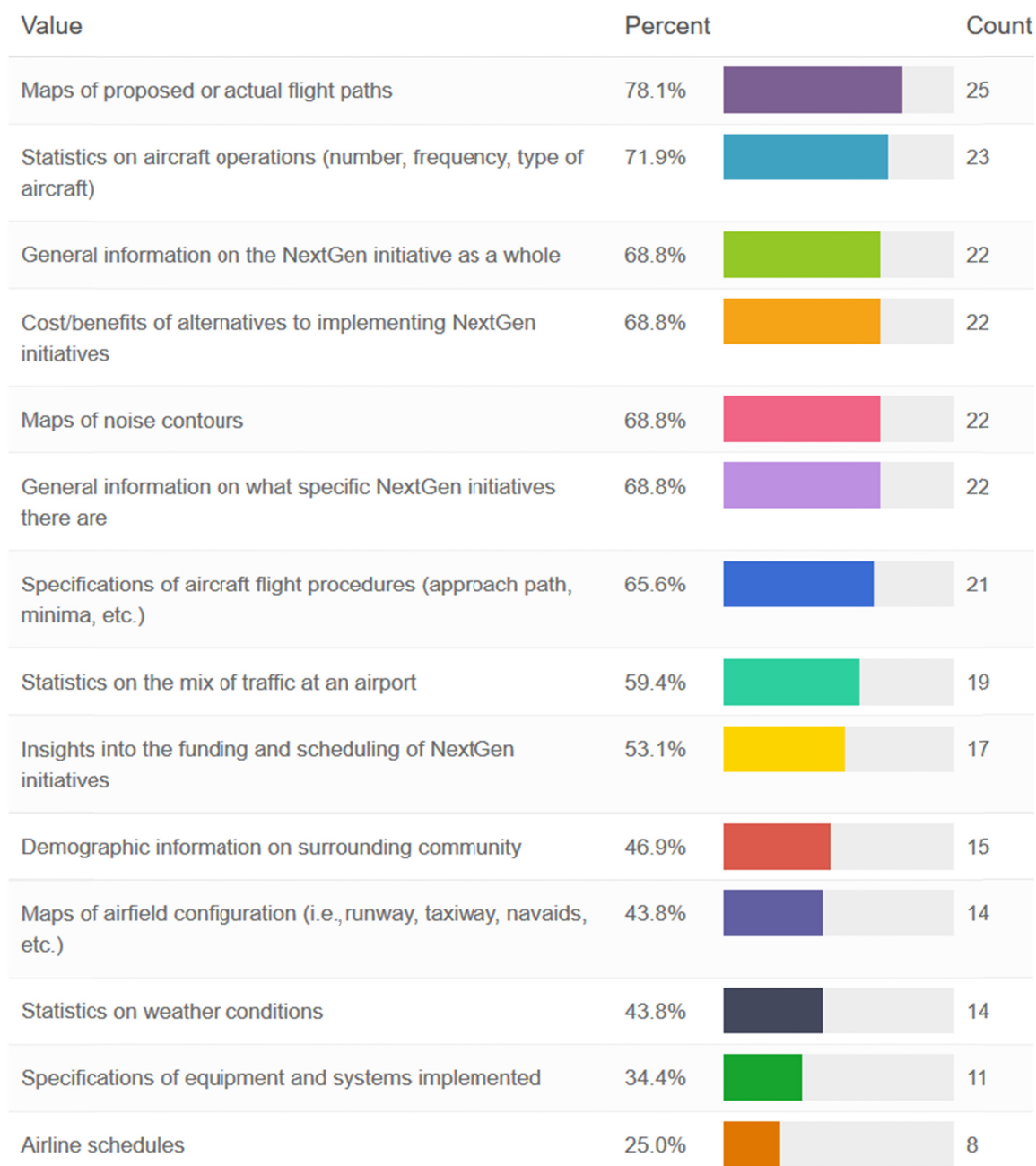
- Specifications about the procedures being implemented are needed by airport planners, designers, engineers, and operations personnel to understand the specific impact the new procedures will have and to determine what infrastructure, land use, obstacle clearance, noise mitigation, or airfield configuration changes may be necessary.

Figure 3-2 lists the types of information identified as desirable by 34 airports and other stakeholders who responded to this part of the ACRP Project 01-28 survey. The figure also presents the number and percentage of respondents who indicated the information was relevant when assessing the effects of NextGen.

## Sources of Desired Information

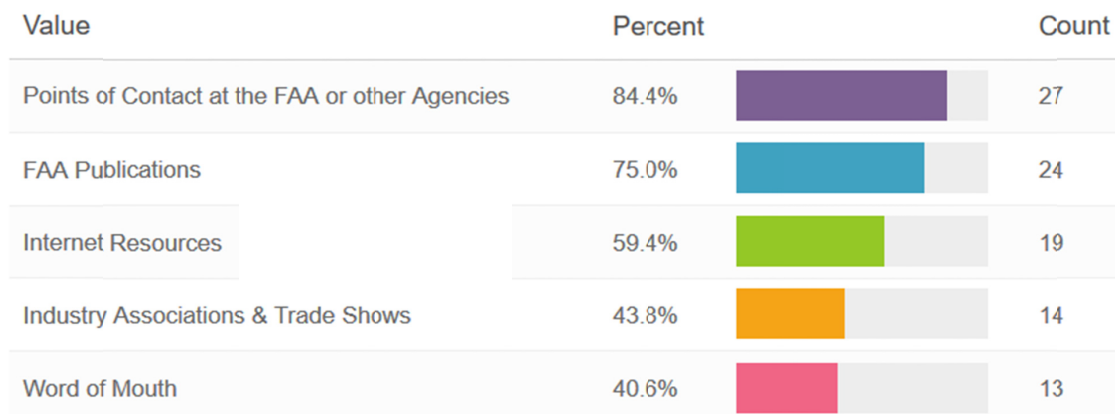
A growing number of sources exist for obtaining the NextGen information airports desire. Unsurprisingly, FAA headquarters and regional and local FAA offices head the list, particularly as FAA has also increased efforts to publish and disseminate online resources about NextGen. Industry associations are also important sources of information. Within airports, the planning, noise, and communications departments are important resources. Stakeholder engagement about NextGen needs to be a two-way dialogue, so meetings, briefings, workshops, conferences, and conversations with points of contact are also important ways to learn about NextGen. In the ACRP Project 01-28 survey, 32 of the 40 respondents identified sources that they anticipate using to learn more about NextGen (see Figure 3-3). Survey respondents could identify more than one resource. Specific resources are provided in the NextGen Outreach Toolkit.





Respondents (n = 34 of 40). Respondents could identify more than one information type.  
 Source: ACRP Project 01-28 survey

**Figure 3-2.** Information desired by stakeholders.



Respondents (n = 32 of 40). Respondents could identify more than one source of information.  
 Source: ACRP Project 01-28 survey

**Figure 3-3.** Anticipated sources of NextGen information.

## 4 Stakeholder Engagement Objectives

Stakeholder engagement is “a two-way communication process that provides a mechanism for exchanging information and promoting stakeholder interaction with the formal decision makers” (Cascetta and Pagliara 2013). It provides an opportunity to improve stakeholders’ understanding of the issues being decided by policy makers (Woodward, Briscoe, and Dunholter 2009). “Effective engagement can bring about better policy directions, improved local services, possibly new ways to initiate or plan for a particular situation, and a better understanding of the local situation by technical experts and community members” (Bickerstaff, Tolley, and Walzer 2002).

NextGen is a major transformation that many industry practitioners feel is long overdue (PANYNJ 2015). This transformation will impact many stakeholders for decades to come. Proactive and effective stakeholder engagement can be seen as an investment to ensure that an optimal balance of stakeholder needs is achieved.

The overall objective of stakeholder engagement is “to achieve a transparent decision-making process with greater input from stakeholders and their support of the decisions that are taken” (Kelly, Jones, Barta, Hossinger, Witte, and Christian 2004). It must convey the usefulness of the project to various stakeholders and the net benefit of the option that is ultimately selected. To accomplish these objectives, stakeholder engagement must be taken into account from the beginning and encompass the whole planning and design process (Cascetta and Pagliara 2013).

Unfortunately, transportation planning and infrastructure design initiatives often are considered too technical for many stakeholders to comprehend. As a result, their input may be seen as a hindrance to the process and as something that ultimately adds little value. Taking this viewpoint tends to result in a decide-announce-defend (DAD) approach to implementation, which means that many stakeholders are unaware of the decisions planners have been made until an initiative has been implemented and the impacts of those decisions must now be defended (Susskind and Elliot 1983). One interviewee noted that, even though the DAD approach may be appealing, the cost of defending the decisions that were made may be greater in the long run. Deliberate stakeholder engagement actions help planners avoid the pitfalls of the DAD approach (Cascetta and Pagliara 2013) by:

- Identifying and categorizing stakeholders based on their degree of influence on the decision-making process and the degree to which they are directly impacted by the result;
- Listening to the needs and concerns of all stakeholders;
- Providing the information that stakeholders need to understand the options and that decision makers need to make informed decisions;
- Consulting with decision makers to determine options for addressing stakeholder needs and considering and easing their concerns; and
- Engaging or partnering with stakeholders in the decision-making process.

## 5 Effective Engagement Methods

There are many ways to achieve the objectives of stakeholder engagement, but the following methods clearly stand out as the primary actions that airports have found most effective. Each method is described based on the value it offers to the stakeholder engagement process. Factors that drive the cost of each approach are described. Specific costs will vary depending on the type, quality, and quantity of the material used. Sample stakeholder engagement materials that airports can adapt to their needs are provided in the NextGen Outreach Toolkit that accompanies this guidebook, including a cost estimating spreadsheet tool to help airports estimate the costs of using these materials. The benefits of applying each approach are described in this chapter. It is not feasible to quantify these benefits given the wide variety of possible results and the many interrelated factors that influence them. Examples of airports that have applied these methods of stakeholder engagement have been listed and described more fully in the case studies provided in Chapter 9.

It may appear that the least costly form of stakeholder engagement is to do nothing. However, doing nothing may foster mistrust when NextGen initiatives are implemented and can increase the likelihood of an unanticipated reaction that will leave the airport little time to react without impacting implementation schedules (Woodward, Briscoe, and Dunholter 2009). Such an approach also may increase the likelihood of litigation, the cost of which ultimately can far exceed the costs of the proactive stakeholder engagement methods described in this guidebook.

### Briefings and Meetings

Briefings and meetings stand out as the primary way to achieve effective two-way communication. Ideally, initial briefings are conducted well in advance of any specific NextGen activities and should be used to introduce NextGen at a high level. As specific NextGen procedures are identified, subsequent meetings should evolve to cover more specific content. These meetings can be carried out in several ways including the following (Woodward, Briscoe, and Dunholter 2009):

- Open houses at which stakeholders can meet with airport representatives and specialists on an informal one-on-one basis.
- Workshops that convene stakeholders and specialists to present and discuss relevant information.
- Public meetings and hearings to which large numbers of community members and representatives are invited to hear formal presentations with question-and-answer periods.
- Focus group sessions that bring together a limited number of representative stakeholders who are interested in a specific topic.
- Community advisory group meetings that bring together representatives of residents, business, and other groups interested in the community around an airport.

- Roundtables and working group meetings that bring together stakeholders on a regular basis to meet, discuss, and work on specific activities.

These forums allow proponents of an initiative to present their needs and options for satisfying those needs at an appropriate level of detail to affected stakeholders, who can then ask questions and share their concerns. The approach allows presenters to carefully prepare material based on thorough analyses and thoughtful consideration of the audience's need for information but at the same time to be flexible and receptive to questions that arise. It also allows presenters to listen, consult, and participate with stakeholders. Some meetings are regularly scheduled, while others occur as needed. Meeting agendas and slide presentations are the most commonly used ways to distribute information during meetings, but flyers and posters are sometimes used as well. Some interviewees cautioned that meetings, particularly those with public stakeholders, are sometimes poorly attended or can become "gripe sessions" for individuals who wish to promote their personal objectives. Despite these concerns, briefings and meetings are by far the most common approach to stakeholder engagement.

Engaging stakeholders using face-to-face meetings has both benefits and associated costs.

- **Benefits**
  - Meetings allow for thorough preparation but can be dynamic as presenters respond to attendee questions and comments.
  - Most presenters are familiar with and can prepare for meetings without external support, except in situations that require high-quality graphics or analytic studies.
  - Face-to-face meetings do not require Internet access or familiarity with Internet browsing.
  - Meetings foster two-way communication and a sense of stakeholder participation and transparency.
  - They also provide opportunities for stakeholders to advocate for their specific needs.
- **Costs**
  - Face-to-face meetings can require time from technical and/or graphics professionals to prepare analyses and presentation materials.
  - Attendance requires time from busy professionals (both presenters and stakeholder attendees).
  - Preparation of high-quality presentations, posters, and handouts can be expensive.
  - Language translation services may be required for some attendees.

## Case Study Examples

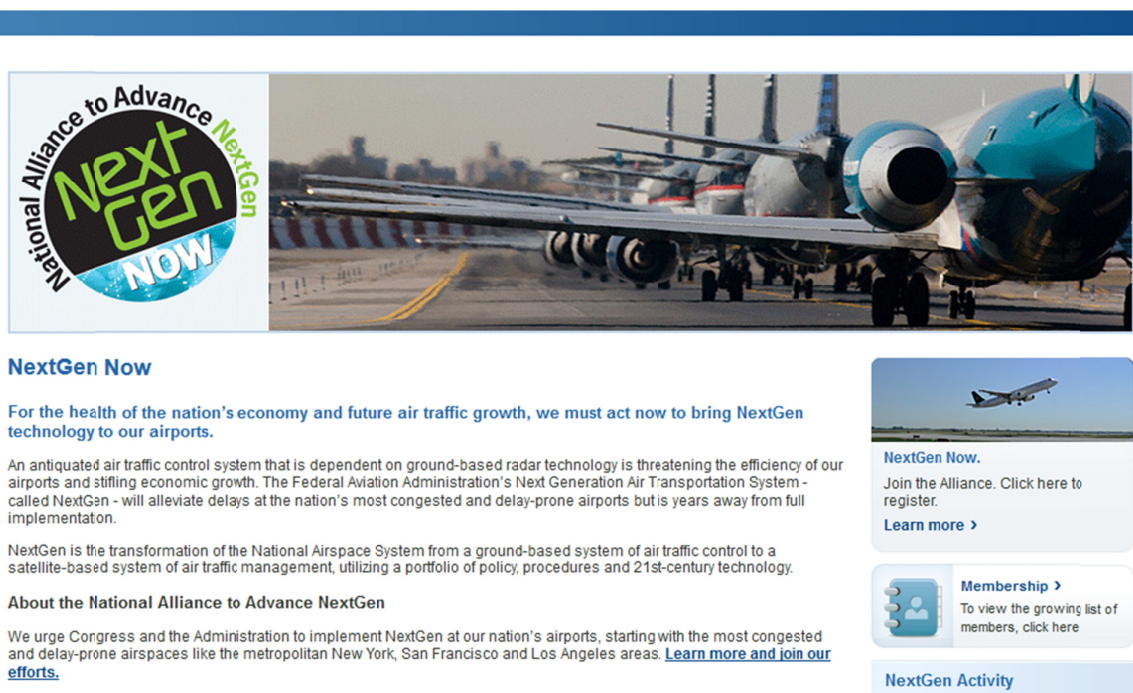
As part of ACRP Project 01-28, the research team developed case studies to examine airport-based stakeholder engagement efforts that focus on the techniques presented in this guidebook (see Chapter 9). Three of the case studies include helpful examples of face-to-face meetings.

- The Puget Sound Regional Council is developing an iPad application to show three-dimensional animated renderings of proposed procedures and airspace during face-to-face meetings with stakeholders.
- Chicago O'Hare International Airport held a series of public outreach meetings to convey the impact its modernization plans will have on neighbors and other stakeholders.
- Dallas/Fort Worth International Airport led a series of meetings with representatives of communities that would be impacted by new RNAV procedures before the procedures were implemented.

## The Internet

The “Internet is increasingly being used as a tool for engaging with the public as part of the transport decision-making process” (Cascetta and Pagliara 2013). This trend is substantiated by most respondents to the ACRP Project 01-28 survey: 19 of 32 respondents (59.4% of those who responded to the question) indicated that the Internet was an important source for the information they require on NextGen. FAA’s move to publish the 2015 version of the NextGen Update as an interactive webpage is an example of this trend.

Several airports have also established websites to provide information to, and in some cases encourage a two-way flow of communications with, their customers and members of the communities they serve. Content on these websites typically includes general information about the airport, information on future airport plans (e.g., links to the master plan and/or lists of capital improvement projects), and contact information for various airport departments. Sometimes information on the impact of aircraft noise on surrounding communities is provided via static maps or dynamic applications that incorporate actual flight tracks. For example, in 2009 the Port Authority of New York and New Jersey (PANYNJ) established NAAN, a coalition of civic, business, and aviation leaders (PANYNJ 2015). Working with NAAN, PANYNJ maintains a dedicated website on the relevance of NextGen for the airport that provides links to general information sources and to specific information on NextGen activities (see Figure 5-1).



Source: PANYNJ (<http://www.panynj.gov/airports/nextgen.html>)

**Figure 5-1.** Example of an airport-hosted NextGen website.

The Internet offers many capabilities for disseminating information beyond websites. Web logs (blogs) provide a periodically updated stream of comments and updates. Online videos and recorded webinars enable dissemination of animated and narrated content. The Internet can also foster two-way

communication via online surveys, forms users can submit, and e-mail links. Social media sites have also become a popular place to encourage two-way dialogue about specific topics.

Using the Internet for stakeholder engagement also involves benefits and costs.

- **Benefits**
  - Multimedia (i.e., written, graphical, and video) content can be dynamic and interactive.
  - The Internet offers an easy way to reach the largest possible number of people via a variety of devices.
  - Two-way communication can be enabled via e-mail links or forms.
- **Costs**
  - Professional design and development requires graphics and programming skills, although many templates and easy-to-use tools are available.
  - Maintenance of an Internet presence requires payment of web-hosting fees and may involve software updates and patches.

## Case Study Examples

Two of the ACRP Project 01-28 case studies provide helpful examples of using the Internet to engage with stakeholders.

- PANYNJ maintains a NextGen Now website (at <http://www.panynj.gov/airports/nextgen.html>) dedicated to the relevance of NextGen.
- Beverly Municipal Airport maintains a website (at <http://www.beverlyairport.com>) that provides information directed at multiple stakeholder groups including businesses, pilots, and community members. Information about the airport's plans, policies, past and upcoming meetings, and the airport's noise abatement program can be accessed along with other documentation. To foster two-way communication, contact information is provided that includes e-mail links and a form to enter a noise complaint.

## Press and Media

Press and media broadcasts and publications are an effective way to reach many stakeholders. The costs of this engagement method are largely covered by media advertisers or subscribers, but the content and timing of broadcasts and articles in mass market publications typically are not within the airport's control. Media coverage may be sparse at the onset of a NextGen initiative when stakeholder engagement is essential. By contrast, media coverage often follows the DAD approach, when coverage of public outcry may even amplify the need to defend decisions that already have been made.

Press releases, media kits that contain photos, and prepared videos facilitate media coverage during earlier stages of a NextGen initiative, thus encouraging more productive use of this engagement method. Following are some of the benefits and associated costs of developing a media kit to encourage proper press coverage of NextGen implementation activities.

- Benefits
  - Media coverage reaches many stakeholders through channels with which they are familiar.
  - The cost of preparing the printed or broadcast material is largely covered by advertisers or subscribers.
- Costs
  - Preparation and dissemination of press releases, media kits, or videos may require professional time and skills, and physical kits will require a budget to produce and distribute or mail.

## Mail and E-Mail

Airports have used both mail and e-mail to disseminate information about NextGen to their stakeholders. Flyers, study results, and policy information are among the kinds of information distributed this way. Maintaining lists of recipients who have voluntarily indicated their desire to receive additional information is a means of respecting individuals' privacy and reducing spam. Following are some of the benefits, associated costs, and a few examples of using mail or e-mail to communicate with stakeholders.

- Benefits
  - Mail and e-mail messages can be targeted to reach specific individuals or organizations.
  - Messages sent by mail or e-mail can reach individuals who are not willing or able to attend meetings or access websites.
- Costs
  - Time is required to create and maintain mailing lists.
  - Physical mail involves costs for preparation, printing, and sending the pieces.
  - E-mail also involves a cost to prepare message and maintain recipient lists.

### Case Study Example

One of the ACRP Project 01-28 case studies is of particular use when examining mail and e-mail messaging with stakeholders: The Beverly Municipal Airport maintains a list of neighbors and businesses who have voluntarily asked to be kept informed of airport plans that may affect them. The airport sends this group updates to its capital improvement plan as well as notices of construction activity that it expects will impact specific neighbors.



## 6 Helpful Engagement Tools

A variety of tools can be used to engage stakeholders. In this guidebook the term “engagement tools” is used to refer to the interactive, electronic instruments in the NextGen Outreach Toolkit. These tools are intended to help airport personnel or their consultants engage stakeholders with regard to NextGen. They also help airport users determine which stakeholder engagement methods and materials are best to use in specific situations. The tools discussed in this chapter include an interactive flow chart, a cost estimating spreadsheet, a library of relevant literature, and a glossary of terms and abbreviations.

### Interactive PBN Implementation Flow Chart

Successful stakeholder engagement requires communicating the right information to the right people at the right time. The challenge of meeting these requirements is heightened by the fact that the process of implementing NextGen capabilities is complex and not well understood by many stakeholders. For example, FAA has documented the process of implementing PBN procedures in FAA JO 7100.41. The RTCA PBN Blueprint Task Group, however, identified that “a major limitation of this order is that it applies only to [FAA] Air Traffic Organization (ATO) service units” and recommended that the order be “applied to the entire stakeholder community engaged in PBN development and implementation” (RTCA NextGen Advisory Committee 2014).

An interactive flow chart that is based on the process defined in FAA JO 7100.41 but highlights the role airports play has been developed to help address this limitation (see Figure 6-1). This flow chart walks airport managers, staff, and consultants through the process of developing PBN procedures. The goal of the flow chart is not to make the process of implementing PBN seem simple. Acknowledging the complexity of the process, the chart places focus on the steps in the process in which airport staff and their consultants can play an effective role. Each step is described so that users of the flow chart understand what the objectives of the step are and what they can do to help achieve those objectives. The emphasis is on what information users need to provide or receive from other stakeholders to ensure that the implementation of PBN procedures achieves an optimal balance of stakeholder needs. Use of the interactive flow chart thus supports the objectives of stakeholder engagement as defined in Chapter 5 of this guidebook.

The flow chart is interactive in that links embedded in the chart allow users to navigate to the relevant steps and content at any particular time. The links connect to stakeholder engagement materials that can be used to convey information at specific steps in the process, case study examples that demonstrate how others have carried out these steps, and references to additional material and key terms where applicable. Narration is provided to help users understand the process. PBN was selected as the focus of this flow chart because it is the NextGen initiative that has and will likely continue to impact the most airports in the short term. Airports can adapt the methods described in this guidebook and

the engagement materials and tools provided in the NextGen Outreach Toolkit to use with stakeholder engagement activities that support other NextGen initiatives relevant to airports.

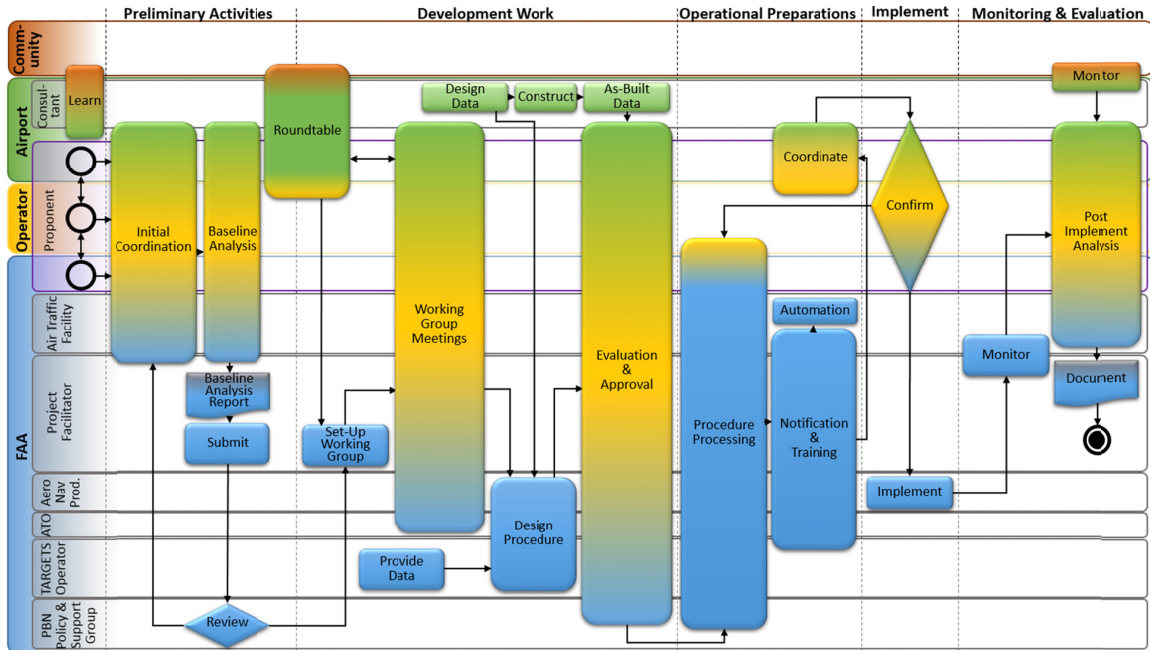


Figure 6-1. Interactive flow chart (PBN for Your Airport), available on the NextGen Outreach Toolkit.

## Cost Estimating Spreadsheet

Cost is an important factor when deciding what stakeholder engagement methods and materials to use. Costs will vary greatly depending on the capabilities of the airport and the approach it selects. Costs also will vary depending on where the airport is in the stakeholder engagement process. It is therefore impossible to specify a definitive cost or range of costs.

To overcome this challenge, the research team developed a cost estimating spreadsheet that identifies various costs and allows users to provide input based on their situation that will help them determine the stakeholder engagement costs they can expect. The resulting estimates are rough order of magnitude (ROM) costs suitable for planning purposes, meaning that they can vary +/- 50% in most cases (Project Management Institute 2013). In some circumstances the cost estimates may vary beyond these limits. For these reasons, the estimates should be refined with specific information before being used for budgeting or procurement activities that require more accurate values.

The cost estimating spreadsheet tool is available as a Microsoft Excel® spreadsheet accessed from within the NextGen Outreach Toolkit. Users will notice that within the pre-formatted spreadsheet, values that appear in blue are inputs that can be changed, whereas values that appear in black are the results. Instructions for the cost estimating spreadsheet tool are provided within the spreadsheet file.

## Library of Relevant Literature

An extensive literature search was conducted to support the findings presented in the *ACRP Report 150* series, and much of this literature is cited in the guidebooks. FAA also has produced a great deal of literature that is helpful to airports, such as the brochure “NextGen Works for Airports” (FAA 2014). An even broader array of literature may be of interest to users wishing to learn more about a particular aspect of NextGen.

The NextGen Outreach Toolkit contains an interactive library that allows users to search for NextGen documents that are of interest to them (Figure 6-2). The library can be accessed by clicking on the “binocular” icon, which opens the search tool. Entering search terms or keywords will filter and sort the list of available documents based on their relevance. In many cases the documents can then be viewed. Some documents can be accessed directly from links on the webpage but others will require retrieval from external online sources. Citation information is provided for documents that are not available through either of these means. In a few cases, obtaining access to externally produced documents will require payment of a fee to the publisher.

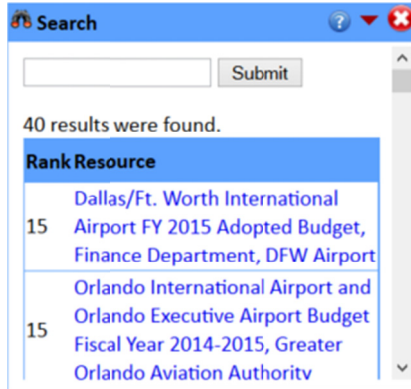


Figure 6-2. Interactive library.

## NextGen Glossary

NextGen is a complex series of programs that are described using a variety of terms and acronyms. An important factor in successful stakeholder engagement is establishment of a common lexicon that is understood by all parties involved in the discussion. To encourage this common dialogue and to avoid the potential for misunderstanding, the research teams of ACRP Projects 01-27, 01-28, 03-33, 03-34, and 09-12 collaborated to develop a comprehensive and consistent NextGen glossary (Figure 6-3). The NextGen glossary, which also includes commonly referenced abbreviations, is formatted alphabetically as a searchable list that can be accessed from within the NextGen Outreach Toolkit.

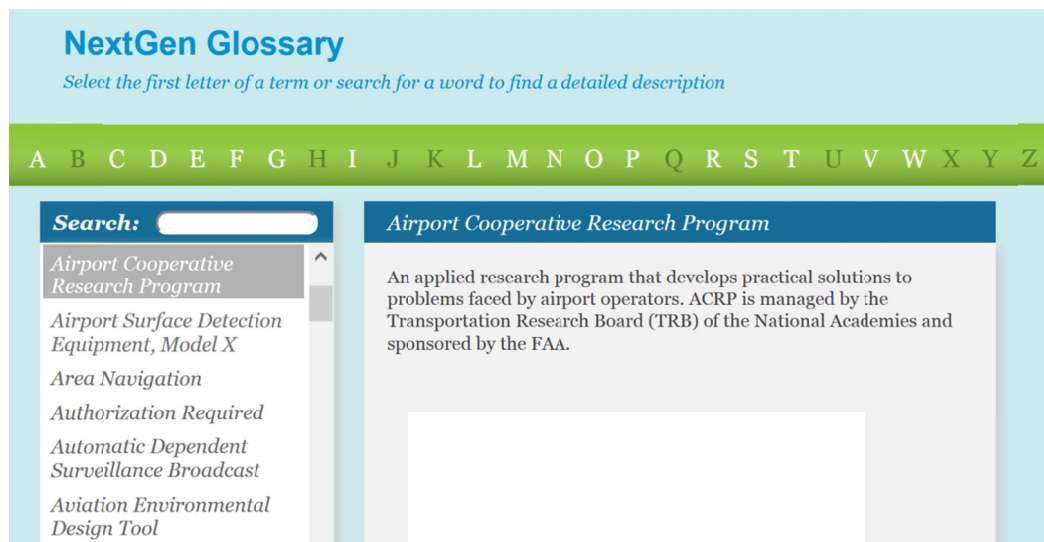


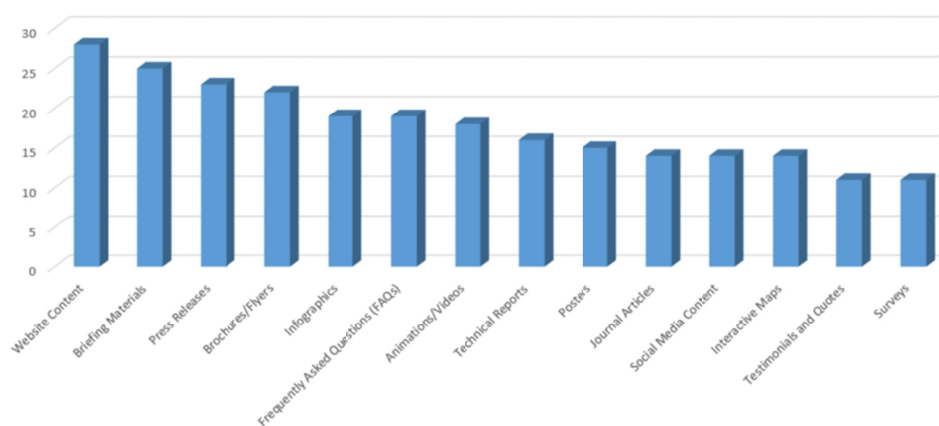
Figure 6-3. Searchable NextGen glossary.

## 7 Engagement Materials

The engagement materials that are discussed in this guidebook with samples provided in electronic form in the NextGen Outreach Toolkit have been written and formatted to effectively convey relevant NextGen information to stakeholders. Some of this information can be used by all airports. However, many survey respondents (22 of 33, or 66.7% of the respondents who answered the question) indicated that effective stakeholder engagement information must also be specific to individual airport circumstances. To address this need, the material provided in the toolkit was made editable where specific details such as airport contact information, statistics, and images can best be used. References provided in the NextGen Outreach Toolkit also will help airports find specific information they may need to fill in some of the customizable details. The editable content has been provided using Microsoft® Office-based files so that most users will be able to access and edit the content without needing to acquire or learn additional software. Similarly, the graphics and images provided were carefully selected so that they can be printed effectively by professional printers, local copy stores, or even on color office printers.

To make complex ideas more understandable, engagement materials should be highly graphical (Woodward, Briscoe, and Dunholter 2009). Maps can be used to communicate important information such as flight procedure routes, actual flight tracks, areas impacted by different levels of aircraft noise, and land use patterns more effectively than other means. Animations can show the positions of aircraft at various points of time and can illustrate change from current to future conditions. Infographics—highly visual integrations of key messages, statistics, and images into a poster-like format—can convey a lot of information concisely and intuitively. Charts and graphs can display trends and numerical information clearly.

Many types of material can be used to convey the information stakeholders require. Figure 7-1 ranks types of material identified by survey respondents based on the frequency in which they were men-



Respondents (n = 29 of 40). Respondents could identify more than one type of material.  
Source: ACRP Project 01-28 survey

**Figure 7-1.** *Types of material stakeholders feel has been successful.*

tioned. The balance of this chapter discusses the four categories of materials (websites, briefing materials, media kits, and flyers) that were ranked as having the most importance by ACRP Project 01-28 survey respondents. Samples of these engagement materials are offered in the NextGen Outreach Toolkit. A brief discussion of some additional materials such as Frequently Asked Question (FAQ) sheets and posters is grouped in with the discussion of flyers.

## Websites

Our initial prioritization, literature search, survey results, and case study interviews all highlighted the importance of websites when engaging stakeholders. Websites offer a lower cost way to stimulate two-way communication between airports and their stakeholders. With an average of 5.7 connected devices per household with Internet service (Protalinski 2013) and the possibility of 10 Internet connected devices per person by 2020 (Dell 2014), it is clear that the Internet is an important way to reach people.

Creating and hosting a website can be a burden for some airports. Even if the airport maintains a primary site, the additional work required to maintain a specialty site on NextGen capabilities may present a barrier to stakeholder engagement.

To overcome this barrier, an airport-focused NextGen website template has been made available as part of the NextGen Outreach Toolkit (see Figure 7-2). References to external sources uncovered during the literature search for ACRP Project 01-28 have been incorporated; additional links can be incorporated by airport users of the template.

Airports can customize and deploy a website based on this template to support NextGen-related stakeholder engagement. Engagement material can be downloaded and edited in word processing software. The airport's website can be hosted either on an internal website or using an external commercial website host, as desired. The cost the airport pays to a service for hosting the site online will vary depending on the amount of content, the level of service desired, and the pricing of the hosting provider. However, the airport's overall cost will be reduced by starting with a template designed to support NextGen-related engagement and pre-populated with graphics, content, and links that can deliver the information stakeholders require.

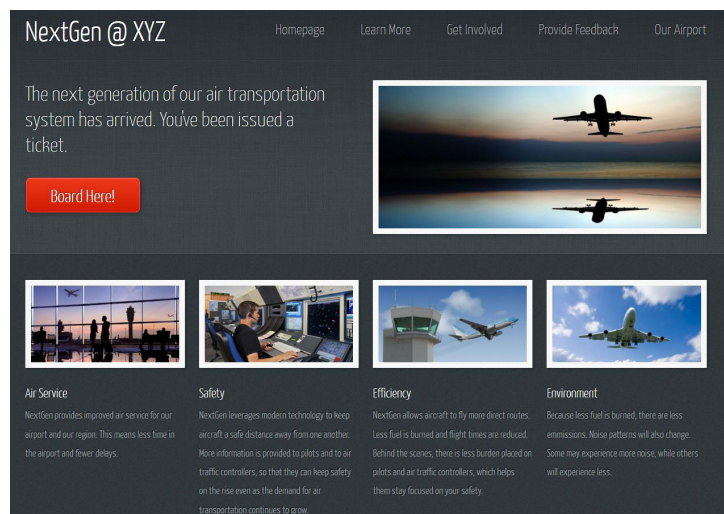


Figure 7-2. Screenshot of website template in the NextGen Outreach Toolkit.

## Briefing Materials

Face-to-face meetings were highlighted as a critical engagement method in the ACRP Project 01-28 literature search, survey results, and interview remarks. The following materials have been prepared to help airports proactively convene and run meetings that inform community members, local elected officials, and tenants about NextGen and its impact. These materials also may help airports coordinate with regional FAA staff regarding this aspect of stakeholder engagement. The goal of face-to-face briefings will be to establish a two-way dialogue so that stakeholders can learn, express their interests, and collaboratively craft an outcome that achieves the optimal balance of their needs.

### Agendas

Well-run meetings have an agenda. They set expectations about what will be covered and allow attendees to prepare. They establish a commitment made by the meeting organizer about the information that will be provided in exchange for the attendees' time. The agenda items listed in Figure 7-3 are deliberately over-complete. Not all of the agenda items listed are appropriate for every meeting. Airport meeting organizers can choose from or add to the items listed to create a targeted meeting agenda that suits the situation.

Agenda for Community Meeting on NextGen Implementation	Agenda for Airport Meeting with Operator or FAA
<ul style="list-style-type: none"> <li>• Introduction of Speakers</li> <li>• Our Airport               <ul style="list-style-type: none"> <li>○ Past</li> <li>○ Present</li> <li>○ Future</li> </ul> </li> <li>• Our Community               <ul style="list-style-type: none"> <li>○ Past</li> <li>○ Present</li> <li>○ Future</li> <li>○ Aviation Benefits</li> <li>○ Aviation Impacts</li> </ul> </li> <li>• Our NextGen               <ul style="list-style-type: none"> <li>○ What is NextGen?</li> <li>○ What are its effects?</li> <li>○ What does it mean for us?</li> </ul> </li> <li>• Noise is a big concern               <ul style="list-style-type: none"> <li>○ Why is noise a big concern?</li> <li>○ What can be done?</li> <li>○ What are we doing?</li> </ul> </li> <li>• What can you do?</li> <li>• What's Next?</li> </ul>	<ul style="list-style-type: none"> <li>• Introduction of Attendees</li> <li>• Objective of Proponent(s)</li> <li>• Current Situation               <ul style="list-style-type: none"> <li>○ Based aircraft, operations, primary operators, passenger enplanements, cargo volume</li> <li>○ Runway configuration</li> <li>○ Nearby airports and their traffic patterns</li> <li>○ Demographic of surrounding area</li> </ul> </li> <li>• Current Issues Faced               <ul style="list-style-type: none"> <li>○ Noise</li> <li>○ Obstacles</li> <li>○ Airspace Congestion</li> </ul> </li> <li>• Future Situation               <ul style="list-style-type: none"> <li>○ Forecast of enplanements and cargo volume</li> <li>○ Anticipated changes in operations or operators</li> </ul> </li> <li>• Planned Airport Changes               <ul style="list-style-type: none"> <li>○ Overview of Master Plan</li> <li>○ New procedures</li> <li>○ New navigational equipment</li> </ul> </li> <li>• Process for Implementing Changes               <ul style="list-style-type: none"> <li>○ Overview</li> <li>○ Who should be involved</li> <li>○ Schedule and milestones</li> <li>○ Data collection</li> </ul> </li> <li>• Action items and next steps</li> </ul>

Figure 7-3. Agenda items for community and operator/FAA meetings.

### Presentations

Many meeting organizers use slide presentations to convey the pertinent information. A sample presentation that focuses on PBN procedures has been included in the NextGen Outreach Toolkit to help airport staff members organize and present relevant information to their stakeholders (Figure 7-4). The research conducted for ACRP Project 01-28 indicates that much of the information must be specific to the time and location of the PBN procedures being implemented. Accordingly, the sample presenta-

tion will need to be customized. That said, using the presentation template provided will allow airport staff members to save time in organizing layout and flow of the general information common to most presentations, freeing them to focus on adding or customizing the specific PBN implementation information needed by their stakeholders. It is suggested that this presentation be given early, when specifics of implementation of the NextGen initiative are still being planned, so that modifications prompted by stakeholder engagement can still be made.



**Figure 7-4.** Sample presentation slide in the NextGen Outreach Toolkit.

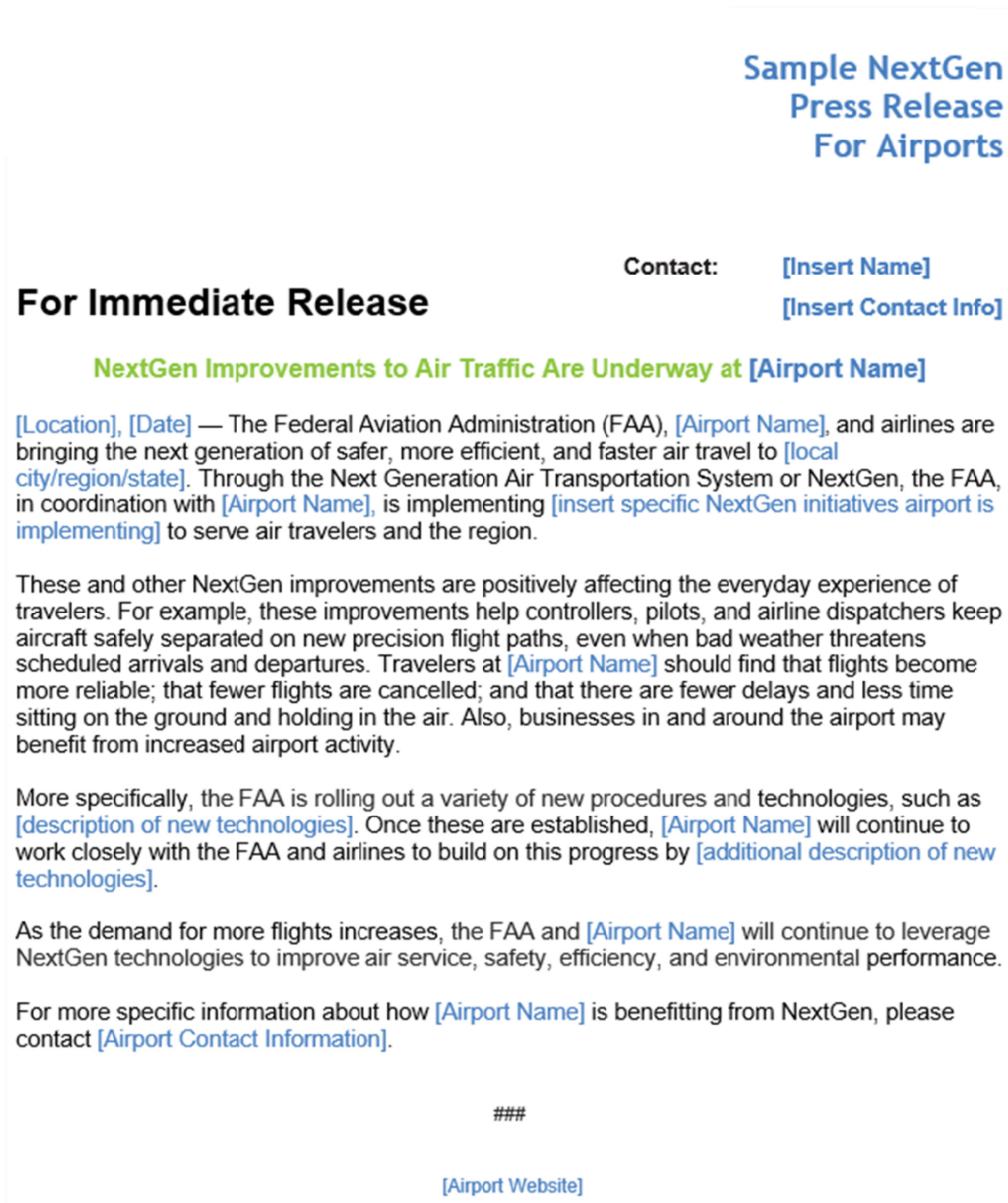
## Media Kits

NextGen implementation will bring increasing news coverage. Articles and television stories about the noise impact on airport neighbors may begin to proliferate. Airports can provide media outlets with positive and accurate information about NextGen initiatives using pre-written press or media kits. By proactively providing this information, airports can help media deliver a more balanced and complete story about the changes NextGen is bringing, not only to a local community but to the national airspace.

### Press Releases

Airports can use press releases to inform local media of new PBN procedures, what they will bring to the airport and community, the impact they may have, how interested parties can become involved, upcoming events, and points of contact. A sample press release, included in the NextGen Outreach Toolkit, is intended to cover most of the pertinent information an airport would share with the media about NextGen, although relevant specifics should be added where indicated and irrelevant sections can be omitted (see Figure 7-5).

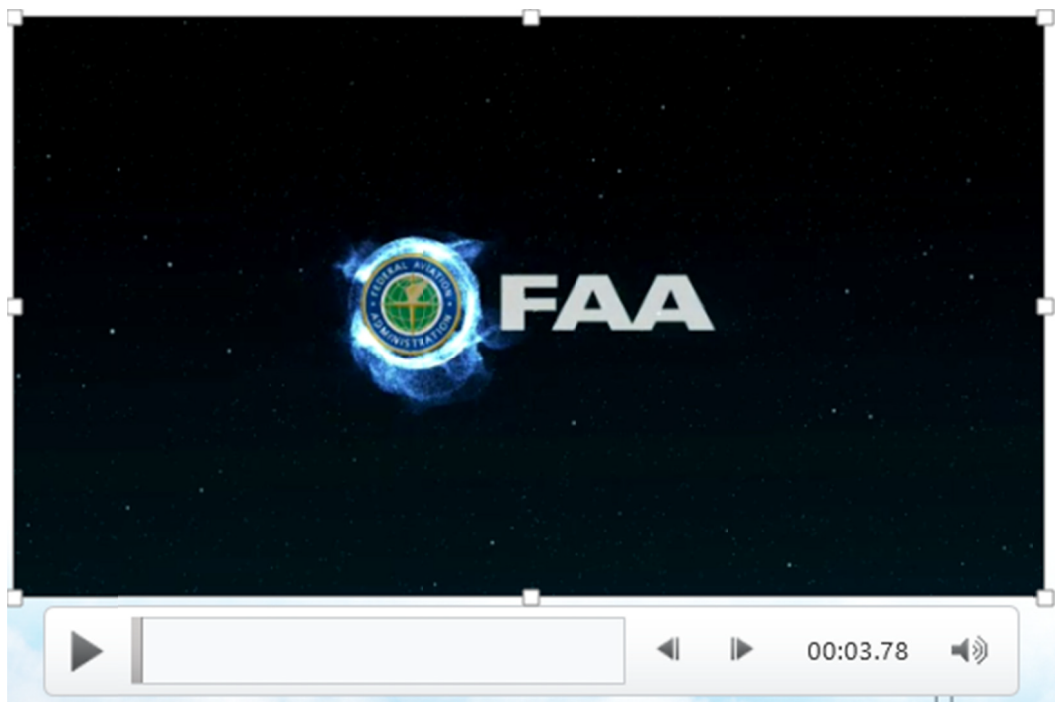




**Figure 7-5.** Sample NextGen press release for airports.

## Photos and Videos

Journalists need images and videos to complement the text they write. To complement the press release, an airport may want to provide relevant photos and videos. Beyond stock images of planes taking off, landing, or taxiing, these visual resources can provide the press with more meaningful material that helps convey the NextGen story. A collection of royalty-free images and videos has already been produced by FAA. These images and videos are available on the FAA website, and a link to the FAA library is included in the NextGen Outreach Toolkit (see Figure 7-6).



Source: FAA (<http://www.faa.gov/tv/?categoryId=44>)

**Figure 7-6.** Screenshot from FAA sample photo and video library.

## Flyers and Ancillary Materials

Airports can use various types of printed materials to disseminate information about NextGen. Flyers can convey targeted information using an intuitive graphical format that does not require the reader to attend a meeting or browse to a website. Of the many forms of printed materials available, tri-fold flyers, fact sheets, and pages addressing FAQs can be the most effective for concisely providing community stakeholders with the focused information they need.

### Flyers

A basic tri-fold flyer can be used to briefly explain to community members what NextGen is, what PBN is, and what impacts they may expect from a NextGen PBN initiative. The sample flyer shown in Figure 7-7 is laid out in a manner that accentuates the information the project team's research indicates is most relevant. The sample flyer incorporates the "Knowing NextGen" graphical design adopted by the five research teams that produced the *ACRP Report 150* series, and it is provided among the editable stakeholder engagement materials in the NextGen Outreach Toolkit. On the sample flyer, space has been left blank intentionally so that airports can add their own logos, a map, a description of local NextGen initiatives, and their contact information. Airports can thus download, adapt, and print the flyer for use locally.



Figure 7-7. Sample tri-fold flyer for informing community members near an airport.

## Fact Sheets

A fact sheet presents the information on the flyer in an 8.5"×11" format (Figure 7-8). Airports may prefer this format as a handout at meetings or other events.

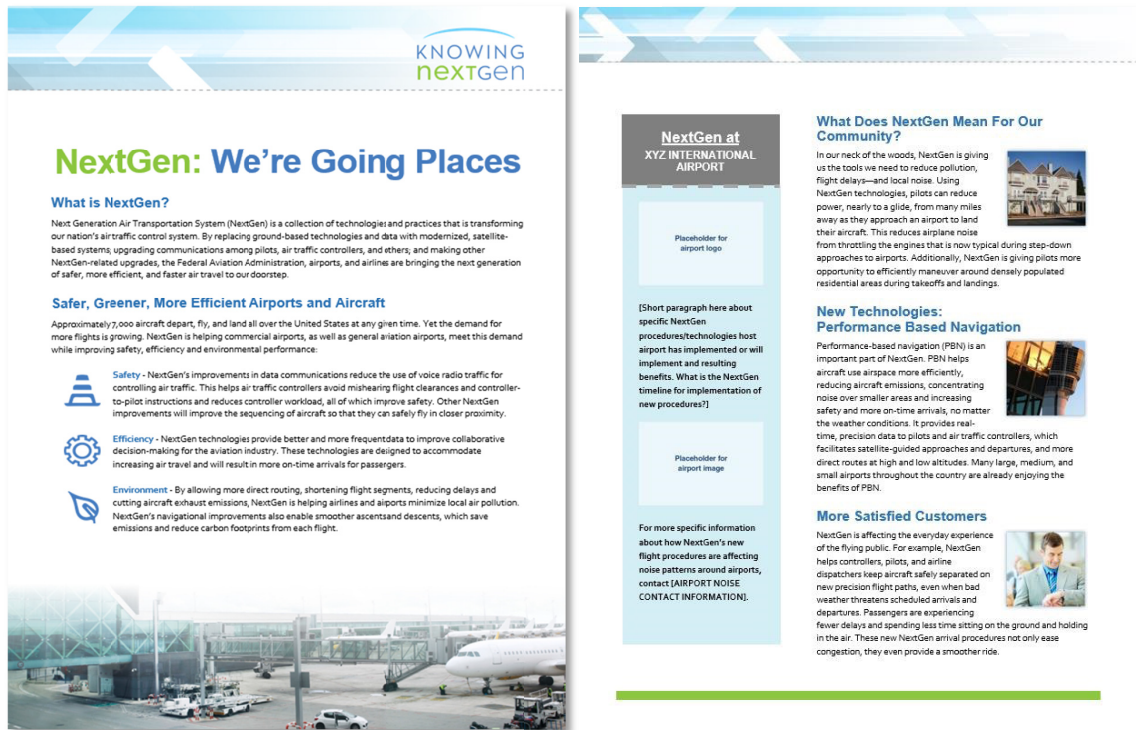



Figure 7-8. Sample informational fact sheet for community members near an airport.

## FAQ Sheets

FAQs have become a common way to quickly deliver answers to the questions stakeholders most often have. Based on research conducted for ACRP Project 01-28 and on team member experience, the research team identified 10 common questions about NextGen and created brief, non-technical answers. The resulting FAQ sheet can be distributed at meetings, mailed along with other material, or included at displays or kiosks (see Figure 7-9). Airports that maintain a Next-Gen related website also can post the FAQs online. As with the other community engagement materials included in the Next-Gen Outreach Toolkit, the FAQ document can be modified by an airport and printed locally. Additional questions and answers that airports may wish to incorporate can be found on FAA's webpage on Next-Gen for Airports (<https://www.faa.gov/nextgen/qanda/airports/>).



## NextGen FAQs for Airport Communities

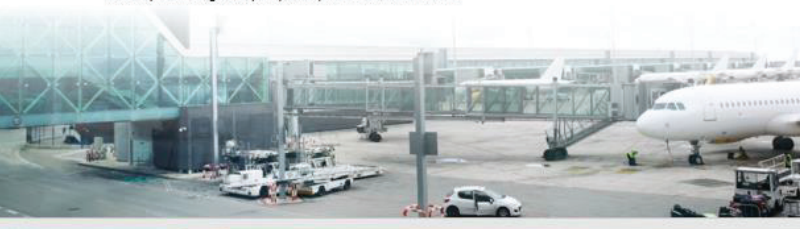
- 1. What is NextGen?**

NextGen is short for "Next Generation of Air Transportation Systems." It is a collection of technologies and practices that are transforming our nation's air traffic control system into a safer, more efficient, and less polluting set of aviation improvements that will benefit our community and the whole country.
- 2. Why do we need NextGen?**

Approximately 7,000 aircraft are taking off, flying, and landing all over the United States at any given time. Yet the demand for more flights is growing. NextGen is helping commercial airports, as well as general aviation airports, expand their capacity safely and efficiently and in an environmentally sensitive manner to meet this demand. New flight procedures, adjustments to flight spacing made possible by more precise navigational equipment, improved operation of aircraft on the ground, greater use of data to reduce the burden on pilots and controllers, and other improvements mean a safer, more efficient, and enjoyable air travel experience with room to grow.
- 3. How is NextGen different from our current air traffic control system?**

NextGen technologies take advantage of satellite-based signals, as opposed to a predominately ground-based network of navigational equipment. NextGen also relies on better and more frequent data exchange among many parties involved in the safe and efficient operation of aircraft throughout the National Airspace System. Also, NextGen's data communications procedures reduce the use of voice radio traffic for controlling air traffic. This helps pilots and air traffic controllers avoid mishearing flight clearances and controller-to-pilot instructions and reduces controller workload, all of which improve safety.
- 4. How will NextGen change my travel experience?**

With NextGen, air travel should be safer and with fewer delays. NextGen helps controllers, pilots, and airline dispatchers keep aircraft safely separated on precision flight paths, even when bad weather threatens scheduled arrivals and departures. Among the many benefits NextGen brings, passengers experience fewer delays and spend less time sitting on the ground and holding in the air. These new NextGen arrival procedures not only ease congestion, they even provide a smoother ride.



- 5. How will NextGen enhance airport operations?**

Modern NextGen technologies will make air travel more predictable. Air traffic controllers and pilots will be able to communicate more easily and with greater precision. To meet the demand for more flights, many airports will be able to offer additional arrivals and departures per hour using existing runways and facilities. While NextGen helps most airports maximize their present infrastructure, some of the busiest airports will need to continue to expand to meet the demand for air service.
- 6. Will NextGen change aircraft noise in my local community?**

New NextGen flight procedures could result in shifts in noise patterns around airports. Using NextGen technologies, pilots can reduce power, nearly to a continuous glide, as they start their descent many miles away and approach an airport to land. This reduces the noise from throttling the engines during step-down approaches to airports. Additionally, NextGen will allow pilots to make smooth, controlled turns closer to airports, increasing the possibility of reducing noise over densely populated residential areas. To find out more about how your neighborhood might be affected, contact your local airport noise office.
- 7. How will NextGen improve safety?**

By enhancing communication capabilities between pilots and air traffic controllers and getting the right information to the right people at the right time, NextGen safety management procedures proactively identify and resolve potential hazards on the ground and in the sky, helping to meet our increasing safety and national security needs.
- 8. How can NextGen reduce pollution?**

In general, by reducing delays and cutting aircraft exhaust emissions, NextGen is helping airlines and airports minimize local air pollution. Thanks to NextGen navigational improvements, smoother ascents and descents and more direct routing help reduce carbon footprints from each flight. Improved information for dispatchers and pilots can also lower emissions of aircraft while they're on the ground.
- 9. Who is responsible for implementing NextGen?**

The entire aviation industry is working collaboratively to introduce NextGen across the entire National Airspace System, including airports, large and small. The Federal Aviation Administration, the National Air Traffic Controllers Association, airports, pilots, airlines, and local communities each have an important role to play, depending on the NextGen practice or technology in question.
- 10. What is Performance Based Navigation (PBN)?**

An important collection of NextGen technologies, PBN provides real-time, precision data to enable satellite-guided arrivals, departures, approaches, and routes at high and low altitudes.

Figure 7-9. Sample layout for NextGen FAQs.

## 8

# Establishing and Maintaining a Stakeholder Engagement Program

Stakeholder engagement is most effective when it is carried out in a series of well-thought-out activities. “Poorly thought-through engagement practice[s] can create mistrust, waste stakeholders’ time, and lead to ‘engagement fatigue’—a reluctance to participate in future consultations” (Department of Education and Early Childhood Development 2011). A well-thought-out process requires a series of steps, which are described in this chapter.

## Establish a Strategy for Stakeholder Engagement

First, senior management establishes a strategy for stakeholder engagement. As a part of this strategy, management decides what level of engagement is desired for typical airport activities such as approval of a new master plan, significant capital improvements, and the implementation of new procedures. The desired outcomes of stakeholder engagement efforts also should be defined. For the implementation of PBN and other NextGen capabilities, desired outcomes may include faster implementation, compatibility with community land use, reduced noise impact, and increased air service.

Establishment of a strategy for stakeholder engagement requires input from airport planners, operations personnel, communications and marketing specialists, and others, but the decisions should be made by the senior managers that have oversight over these airport departments.

When implementing the strategy, senior management should promote a culture of two-way engagement of stakeholders. They should encourage transparency, so that relevant factors are shared with stakeholders as soon as possible. They should encourage staff to share information openly and to be effective listeners. The goal should be not only to provide information but also to receive it (Woodward, Briscoe, and Dunholter 2009). Airport staff should then act, as appropriate, using the information that has been received from stakeholders. Openness, listening, and action are critical in fostering the trust that is required for effective long-term engagement (Woodward, Briscoe, and Dunholter 2009).

Once the desired level of engagement has been determined, human and financial resources need to be allocated and assigned to carry out the strategy. The human resources include individuals responsible for carrying out stakeholder engagement activities, specialists who can conduct any necessary analyses, analysts who can prepare maps, and communications specialists who can develop the materials required. The individuals senior management selects for a stakeholder engagement initiative should bring a public service attitude and strong people skills to the process along with technical knowledge of the subject at hand (Woodward, Briscoe, and Dunholter 2009). These human resources may be existing employees, new hires, consultants, or service providers.

Stakeholder engagement activities are often led from within their airport planning department. This is logical because planners are often involved in the early phases of changes when stakeholder engagement is best initiated. Other airports, particularly smaller and medium-sized airports that do not have

large staffs, tend to rely on senior management to fulfill these functions. Most of the airports that responded to the survey (14 of 17, or 82.4%) have internal communications or marketing departments, all of which indicated that they help with communications with external stakeholders. Regardless of whether the airport has communications staff or consultants available to help them, senior management should participate in stakeholder engagement meetings when possible. Their involvement demonstrates the airport's commitment to the engagement effort and illustrates that the airport holds stakeholder comments and questions in high regard. The presence of senior management also attracts senior level managers and decision makers to the discussion (Woodward, Briscoe, and Dunholter 2009).

Funding should be identified at the onset of a stakeholder engagement program. Given the variety of factors involved, no single funding level can be prescribed, or even ranges based on airport size. Funding requirements vary based on the level of stakeholder engagement desired and fluctuate as the airport or FAA implement changes that affect stakeholders. A cost estimating spreadsheet tool (provided online in the NextGen Outreach Toolkit) can help each airport determine rough order of magnitude (ROM) costs that can assist in determining the funding requirements of their stakeholder engagement program.

Finally, it bears repeating that clear lines of communication should be established at the early stages of forming a stakeholder engagement program. Those responsible for carrying out the program need to know to whom they are to report, on what subjects, and when. Expectations for participating in meetings need to be established so that department managers can allocate their staff resources accordingly. All airport staff and consultants who have valid information needs with regard to the NextGen initiative should be kept informed, and relationships with external stakeholders established to keep lines of communication open between and beyond formal meetings.

To improve coordination with airports with regard to stakeholder communications on NextGen, FAA has published printed and electronic material that describes NextGen, identifies successes achieved, and outlines the implementation plan going forward at a national scale. At a local level, FAA has promoted, supported, and, in some cases, led many stakeholder engagement activities related to NextGen. Examples of these efforts include the case studies on the O'Hare Modernization Program and the Puget Sound Regional Council's engagement activities described in Chapter 9 of this guidebook. At the same time, a growing number of airports are proactively seeking information on NextGen initiatives that will impact them through dialogue with their ADO manager, local ATO representatives, regional flight procedures teams (FPTs) and regional airspace and procedures teams (RAPTs). Information on FPTs is available online (FAA 2013a; FAA 2016).

## Understand the Issues and Concerns

An important next step in stakeholder engagement is to be sure that all stakeholders understand the issues, options, and concerns about NextGen. Fortunately, all stakeholders do not need to know all the complex details about NextGen. They do, however, need to understand their specific roles in NextGen implementation and enough of the details to effectively contribute to and fulfill those roles. The interactive flow chart provided in the NextGen Outreach Toolkit highlights the airport's role within the complex process of implementing PBN procedures. Details and links are provided in the flow chart to cover each step that involves airport stakeholders. The other volumes in the *ACRP Report 150* series provide further details on NextGen as it relates to senior management, airport planning, PBN, and mapping data.

## Identify the Who, When, and How of Engaging Stakeholders

Carrying out a stakeholder engagement program involves understanding who should be engaged, when they should be engaged, and how they can be engaged most effectively.

- Senior managers examine, as early as possible in the planning of a NextGen initiative, the opportunities and risks associated with the implementation of NextGen capabilities. These opportunities and risks include the timing and impact of NextGen-related changes on identified internal and external stakeholders. Potential benefits to air service, operational efficiency, and safety, along with any environmental impacts, also should be understood. As the initiative progresses—or whenever relevant factors change considerably—senior management will need to be updated.
- Airport planners and consultants study the potential impacts on stakeholders of the new capabilities during planning and identify beneficial—or mitigating—options that may exist.
- Airport planners and/or communications specialists share information with and seek feedback from community representatives, elected officials, and the media/press before changes occur. Planners continue to be involved as the implementation of the NextGen capability progresses, monitoring the results of the newly implemented capability. Together with communications specialists, airport planners may also be involved with collecting and responding to complaints from airport neighbors.
- FAA flight procedures representatives, significant aircraft operators, and airport operations staff are engaged both during planning and throughout implementation of the NextGen initiative, collaborating through formal working group meetings or ad-hoc meetings or teleconference calls to ensure that operational considerations are met.

Although a list can clarify these responsibilities and roles, it is difficult to accurately convey the “when” in linear fashion. In reality the contributions of an airport’s internal stakeholders to a stakeholder engagement program require varying levels of involvement across all stages of the program. For example, airport operators and operations staff may be tapped to contribute information that helps senior management understand and assess risks and benefits very early during the planning stage, and senior management will want to be informed about—and may participate in responses to—serious complaints should they be raised by airport neighbors.

## Evaluate and Monitor Program Success

As with any ongoing program, an effective stakeholder engagement program will periodically evaluate how well it has met the original objectives. Adjustments and changes can be made if necessary. As different NextGen capabilities are implemented, the strategy and methods of stakeholder engagement also must be reevaluated and adjusted. To borrow a quotation from a public involvement benchmarking study by FHWA, “Because you got it right once, don’t think you’ve got it down” (Matley 2002).

The RTCA PBN Blueprint Task Group recommends defining stakeholder engagement goals as key performance areas (KPA) that describe the overall outcomes desired. Specific objectives that can be measured in terms of their contribution toward achieving a KPA are referred to as “sub KPAs” and the results of these measurements are expressed as key performance indicators (KPIs).



Lessons learned from KPIs can be used to adjust the original goals or redefine the scope of an initiative as needed (RTCA NextGen Advisory Committee 2014). Tables 8-1 and 8-2 relate KPAs and KPIs for stakeholder engagement in relation to for PBN implementation.

**Table 8-1.** Stakeholder engagement KPAs and KPIs.

Key Performance Area	Key Performance Indicators
Reach Appropriate Stakeholders	Number and type of stakeholders who participated Level of effort stakeholders expended to participate Did senior management participate?
Two-Way Engagement	Did participants learn new information that was relevant to them? Number of questions and comments received
Efficiency	Staff time required to prepare for and conduct stakeholder engagement Actual amount of funds spent versus estimated budget
Effectiveness	Were questions raised that should have been addressed in the material? Number of follow-up inquiries or action items required

Sources: ACRP Project 01-28 and Marsh (2001)

The ultimate indicator of success is how well the stakeholder engagement activities have achieved an optimal balance of stakeholder objectives for the NextGen capabilities being implemented. Table 8-2 presents KPIs that can be monitored to assess whether important KPAs of PBN implementation have been met.

**Table 8-2.** PBN implementation KPAs and KPIs.

Key Performance Area	Key Performance Indicators
Flight Safety	Number of incidents recorded Feedback from pilots
Increased Air Service	Procedure usage statistics Enplanements over time Aircraft landing fees and parking revenue over time
Operational Efficiency	Comparison of actual flight tracks to intended flight tracks Feedback from operators Comparison of schedule versus actual arrival and departure times
Decreased Noise Impact	Comparison of actual flight tracks with noise abatement procedures Trends in number, location, and anger intensity of noise complaints Community attitude surveys and feedback from focus groups Results from noise monitoring equipment

Sources: ACRP Project 01-28 and Woodward, Briscoe, and Dunholter (2009)

It is suggested that the individuals responsible for PBN-related stakeholder engagement at airports monitor these and other KPIs they deem relevant to their airport. For maximum efficiency, these individuals can seek help from their colleagues in airport planning, operations, and marketing. They also should refer to the growing number of statistical sources available from FAA. At this stage, their goal is to monitor the success of NextGen implementation with regard to the objectives expressed by stakeholders. Airport participants in PBN working groups also should be prepared to share evaluation

information, including KPIs, with the NextGen project manager so that it can be included in the Post-Implementation Analysis Report (PIAR) required by FAA.

## Identify and Overcome Risks

An important part of managing any program is to identify and mitigate potential risks to the program's success. Acting within the overall strategy and risk guidelines established by senior management, this can be best accomplished by the individuals tasked to lead specific stakeholder engagement activities as part of their program planning. Information on risks that have been realized and steps taken to mitigate them also need to be communicated to senior management as a part of program monitoring and reporting activities. Following are some of the risks NextGen-related stakeholder engagement programs may face and recommended steps to mitigate those risks:

- Too little engagement may occur. This situation leaves some stakeholders feeling as though their needs have not been adequately represented. Too little engagement can lead to negative press, organized uprisings and boycotts, and action by elected officials. Open and transparent communications with all relevant stakeholders can minimize this risk. Although there will always be some stakeholders who will speak out against a change, adequate levels of engagement ensure that they are fewer in number and reduce the likelihood of political action.
- Too much engagement occurs. This situation hinders the implementation process. Overly engaging stakeholders can result in less willingness on the part of stakeholders to participate in what becomes perceived as an overbearing process. Also, providing too much technical information to stakeholders who are not also informed about how to interpret it can lead to false conclusions. To mitigate this risk, each stakeholder group's need for information should be assessed and met at the appropriate level.
- Lines of communication are unclear. This situation can occur with various stakeholders and can result in individuals feeling uninformed or not empowered to share relevant information with others. To mitigate this risk, it is necessary to clearly identify and convey the authority, authorization, and accountability of all individuals involved in the stakeholder engagement process. In other words, participants need to have well-defined expectations about whom they are expected to communicate with, about what, and when.
- Information is inaccessible, too abstract, or overly complicated. Stakeholders need to be able to understand the information that is shared. Complex information should be shared in a manner and at a level of detail that helps stakeholders to understand it. Background information, definitions, and instructional materials should be made available to help individuals understand concepts that are new to them and help those familiar with the concepts ensure that their understanding is consistent with that of their peers.

## Engage Stakeholders in NextGen Initiatives Beyond PBN

The engagement tools and materials presented in this guidebook deliberately focus on the implementation of PBN flight procedures because PBN has and will continue to be the NextGen capability that

impacts most airports. PBN also is the NextGen initiative that is the most influenced by stakeholder engagement activity. PBN is the most logical place to begin, but other NextGen initiatives such as multiple runway operations (MRO), separation management, and improved surface operations also will directly impact airports.

- MRO will increase the utilization of closely spaced parallel runways by allowing simultaneous parallel operations, reducing separation between staggered operations, and alleviating the effects of wake turbulence between aircraft.
- Separation management will enable aircraft to operate closer together without compromising safety due to equipment installed on the aircraft, improved communication with controllers, and more details on weather conditions.
- Improved surface operations will allow aircraft and other vehicles on the surface of an airfield to operate with greater efficiency, allowing flexibility to adapt to changing conditions without compromising safety. These benefits are made possible by a combination of location sensors, data exchanged and communication technologies, and traffic flow management (TFM) procedures.

Like PBN, MRO and separation management initiatives will change the volume and tracks of arriving and departing aircraft. For this reason, the approach to stakeholder engagement for these initiatives will likely resemble that used for PBN. The objectives, methods, tools, and materials described in this guidebook and provided in the NextGen Outreach Toolkit can be adapted or expanded by airports to address MRO, separation management, and other NextGen initiatives. For these NextGen capabilities, as well as for surface operations, airport operations personnel may wish to become more engaged given the changes that will occur to the routes taken by taxiing aircraft and the volume of parked aircraft to be accommodated.

## 9 Case Studies

The case studies in this chapter have been prepared to illustrate stakeholder engagement activities at airports that have experienced or hope to benefit from the implementation of new NextGen capabilities. For the most part, they describe engagement activities related to the implementation of PBN procedures, which is the NextGen initiative that has and will continue to impact the most airports. Airports of varying sizes have been included to demonstrate differing challenges and various approaches to overcoming those challenges. Although not NextGen-specific, FAA's briefings about Chicago O'Hare International Airport's modernization program are included because they illustrate a successful approach to community outreach about new flight procedures that will result from runway realignments. EUROCONTROL's *Specification for Collaborative Environmental Management* also describes stakeholder engagement guidelines that have been successful in support of activities in Europe that are analogous to NextGen.

These case studies highlight the following best practices for stakeholder engagement on NextGen implementation:

- Data collection, analysis, and relationship-building with interested stakeholders are recognized as important prerequisites to NextGen implementation.
- Airports and community representatives are notified as early as possible about proposed flight procedure and airspace changes.
- Stakeholder engagement fosters two-way dialogue through which each party is informed of the other's objectives, questions, and concerns.
- Collaborative and trusting relationships among all relevant stakeholders are created and sustained as essential to efficiently achieving optimally balanced results.
- Stakeholder engagement is promoted by senior management as part of an airport's culture.
- Individuals are empowered, enabled, and held accountable for learning about, communicating, and leading engagement activities concerning NextGen implementation.
- Airports contribute important information on local population centers, noise concerns, land use patterns, and abatement procedures that are factored into the flight procedure design process.
- Airports provide an important communications bridge between FAA, operators, and community stakeholders.
- Public outreach efforts are well-publicized, accessible, and clearly communicated.
- Face-to-face meetings are used effectively to establish two-way communication.
- The Internet, electronic media, and portable devices are incorporated as new and innovative ways of communicating and disseminating information.

- General information is provided and common terminology is employed to establish a common ground for communication, but specific implementation schedules, maps showing areas of impact, and statistics that quantify the degree of change also are shared as required.
- In-house communications, marketing, and GIS staff can help keep the costs of developing engagement material down. Consultants may be required to collect data and conduct analyses.

## Proactive Engagement at Dallas/ Fort Worth International Airport

### Background

Dallas/Fort Worth International Airport (DFW) was established by a contract between the cities of Dallas and Fort Worth, Texas, in 1968. In 2014 DFW had 679,820 operations, making it the fourth busiest airport in the United States.

DFW benefits from a great deal of land that is owned by the airport (over 17,000 acres). Use of surrounding land also has been planned with airport compatibility in mind. This foresight was partially enabled in 1971 when the North Central Texas Council of Governments (NCTCOG) developed noise exposure maps of then-forecast 1985 operations. NCTCOG provided the noise contour map and a model land use ordinance to surrounding cities to aid in compatible land zoning around DFW. Many surrounding jurisdictions subsequently enacted ordinances to control land development within these areas. The noise contours and contours from the 1992 Final Environmental Impact Statement (FEIS) also were incorporated into land use planning for surrounding cities. With the advance of quieter jets, these conservative policy contours continue to serve the airport and surrounding communities well, providing stable elements of city master plans and zoning ordinances.

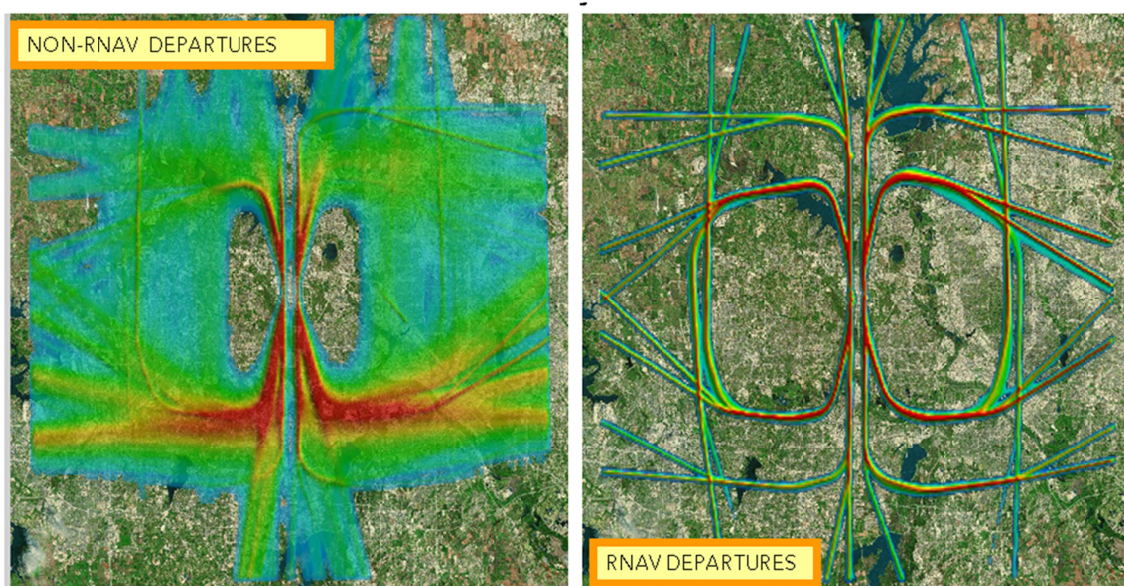
In the late 1980s DFW foresaw the need for two additional north/south runways and the need to expand the number of departures from a single departure heading to multiple, divergent headings to increase departure throughput and accommodate growing capacity needs while maintaining safe separation. An Environmental Impact Statement (EIS) was prepared under the National Environmental Policy Act (NEPA). The EIS evaluated the environmental effects of constructing and operating two additional runways as well as the necessary redesign of the Metroplex airspace, which included these divergent “fanned” departure headings. Concern about noise from operation of the new runways was the dominant issue during the EIS development, leading to lawsuits that went to the Supreme Court. FAA approved the FEIS in 1992, giving the airport the authority to build two new runways and redesign its airspace including expanding the number of departure headings available to air traffic control (ATC). One runway was constructed and the airspace redesign was implemented; however, the planned expansion in the number of headings was not implemented. A subsequent NEPA study in 1998 again included the additional approved departure headings. During the intervening years, the need for the expansion of optional headings had become more significant in order to alleviate departure throughput issues attributed to growth in air traffic and the conversion of turboprops to regional jets. (During this time, turboprops shifted from 30% of DFW’s fleet to < 5%.)

Implementation of the expanded departure procedures was not technically feasible for FAA until FAA’s NextGen program. Area navigation (RNAV) technologies used in performance-based navigation (PBN) procedures have provided FAA the means to enable multiple departure headings within the existing airspace structure. A significant number of airlines equipped their aircraft to take advantage of the new performance-based capabilities. Local FAA air traffic management (ATM) designed RNAV procedures

to provide two RNAV courses from each departure runway, explored lessons learned at other airports, and worked with multiple stakeholders during development and testing from the start. FAA and DFW staff worked collaboratively in the development of RNAV flight tracks (see Figure 9-1). The airlines, being important beneficiaries, were also active stakeholders in the development of the new procedures. To engage them, FAA conducted meetings that involved airline and airport representatives. American Airlines, a significant carrier at DFW, also offered the use of their simulators so that the new procedures could be flown virtually before they were implemented.

FAA and DFW worked together to develop a noise study of the proposed RNAV departure procedures; the study indicated that no significant impact would occur with RNAV and overall noise would be reduced. An independent environmental review of the implementation of these RNAV procedures was not required, however, because given the findings of the earlier NEPA studies a formal community engagement effort was not required.

Nevertheless, DFW and FAA's Airports District Office (ADO) concurred that it was important to engage local communities on the proposed change in advance. The ATO agreed and participated in a public outreach campaign that the airport initiated.



Source: DFW Airport

**Figure 9-1.** Maps showing the difference between traditional flight tracks (left) and RNAV flight tracks (right).

## Stakeholder Engagement Methods Used

Aviation planners at DFW initiated a public outreach campaign to inform the surrounding municipalities of the upcoming implementation of RNAV procedures well in advance of implementation. The airport allowed each city to determine the audience for the joint airport/FAA presentations which varied from small meetings with city leaders and elected officials to briefings before local city councils. During these meetings, airport representatives explained the drivers behind the need for change, why these procedures were important to air service at DFW, and the careful consideration that was being given to where the new flight tracks would go. FAA representatives provided information on what RNAV is and why it is important on a national scale. To complement this general information, the airport also developed a grid point analysis showing noise impacts at day-night average sound levels (DNLs) of

60 and 65 decibels (dB). Slide presentations were used to convey this information. The presentations were adapted to the specifics of each community and in most cases one meeting per community was sufficient.

The reaction to these briefings was largely positive. One municipality had their outside noise expert study the noise impacts further. Some concern was expressed about the portion of aircraft that were equipped with the avionics necessary to use the RNAV procedures, thus eliminating drift and the possibility of aircraft spreading noise impacts more broadly than the specified routes. Fortunately, it was determined that 85% of the aircraft would be RNAV capable and therefore the projected noise impacts being communicated were fairly accurate.

RNAV procedures were planned to be initiated in October 2004. The proposed date had been communicated during the public outreach campaign; however, the date had to be adjusted to November due to charting dates. Ironically, residents began complaining on the earlier, initially published, date. RNAV officially began in September 2005 with few complaints from east-side residents where the RNAV tracks were moved closer to residential areas. Some residents living just outside the boundaries of the previous noise mitigation areas (mitigated for impacts from the new east-side runway as required by the 1992 FEIS) were interested in whether they would be now eligible for noise mitigation measures (which they were not). The airport also received, recorded, and responded to noise complaints.

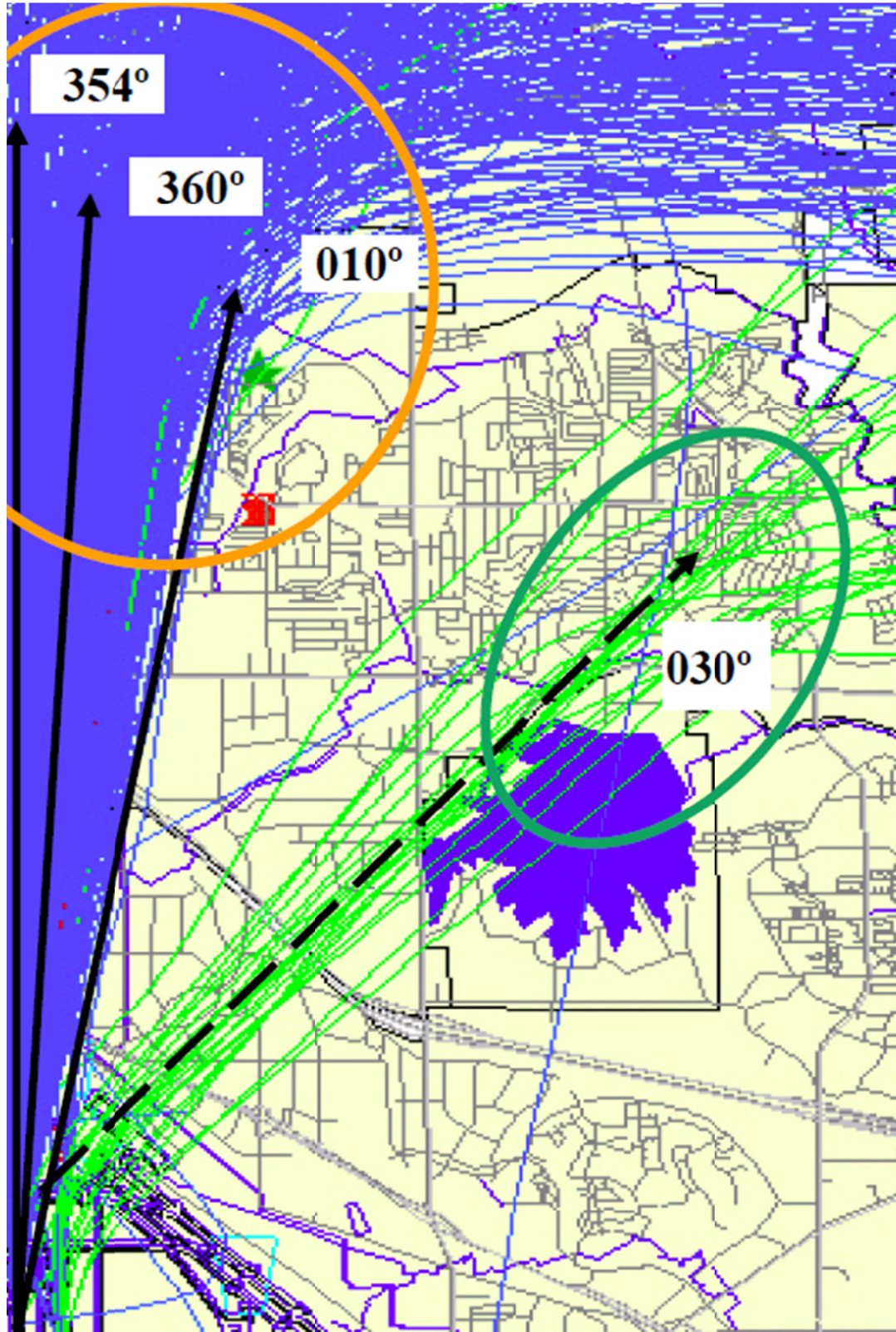
## Supportive Map Data

Mapping data were an important element of the information used to communicate the impact of the new procedures among FAA, airport, airline, and community stakeholders. Of the graphics used in one NextGen-related community outreach presentations, not counting logos and a few general photos of aircraft, 90% were maps. Flight tracks from DFW's Airport Noise and Operations Monitoring System (ANOMS) helped illustrate existing conditions. Recognizing the importance of showing both the "before" and "after" conditions, the airport created its own graphics to show proposed conditions. An example of these maps is shown in Figure 9-2. These comparisons helped illustrate that, even though the implementation of the RNAV procedures brought aircraft closer to city centers, the tighter flight tracks that resulted reduced the area of land impacted. Noise contours that had been developed by airport consultants were shared with communities upon request. Statistics showing fleet mix changes over time complemented this map information.

## Complementary Environmental Analyses

In 2008 DFW initiated an airport-wide sustainability program. An important objective of this program was to complement and support sustained aviation growth through the development of a NextGen Environmental Management System (EMS). Analysis of four criteria—air quality, climate, energy, and noise—helped DFW evaluate the environmental and energy related impacts of NextGen capabilities.

- With regard to air quality, emissions were anticipated to increase; however, DFW had already significantly reduced emissions through changes to its central utility plant and replacement of airport ground support vehicles.
- With regard to climate, analysis suggested that technology, alternative fuel, operational improvement, and policy solutions could help mitigate the expected increase of CO<sub>2</sub> emissions.
- With regard to energy, increased efficiencies were expected to result in a net decrease in energy consumption.



Source: DFW Airport

**Figure 9-2.** Map showing 30% authorized deviations (in green) from normal flight paths (in blue).



- With regard to noise, NextGen would provide aircraft noise-reduction improvements via the Continuous Lower Energy, Emissions, and Noise (CLEEN) program and operational procedures such as RNAV and those outlined in the North Texas Optimization of Airspace and Procedures in the Metroplex (OAPM) study.

During the development of the EMS, stakeholder outreach was required to be responsive to the needs of numerous stakeholders at various levels including:

- Federal
  - FAA (headquarters, region, district, and ATC offices)
  - EPA
  - U.S. Army Corps of Engineers (USACE)
  - U.S. Department of Justice (DOJ)
- State
  - Departments of transportation (DOTs), environmental agencies
- Regional/Local
  - Airlines
  - Environmental agencies
  - Community interest groups
  - Metropolitan planning organizations (MPOs)
  - Financial institutions
  - Contractors
- Airport Departments
  - Airport management
  - Communications
  - Environmental affairs
  - Real estate
  - Energy
  - GIS
  - Operations
  - Engineering
  - Planning

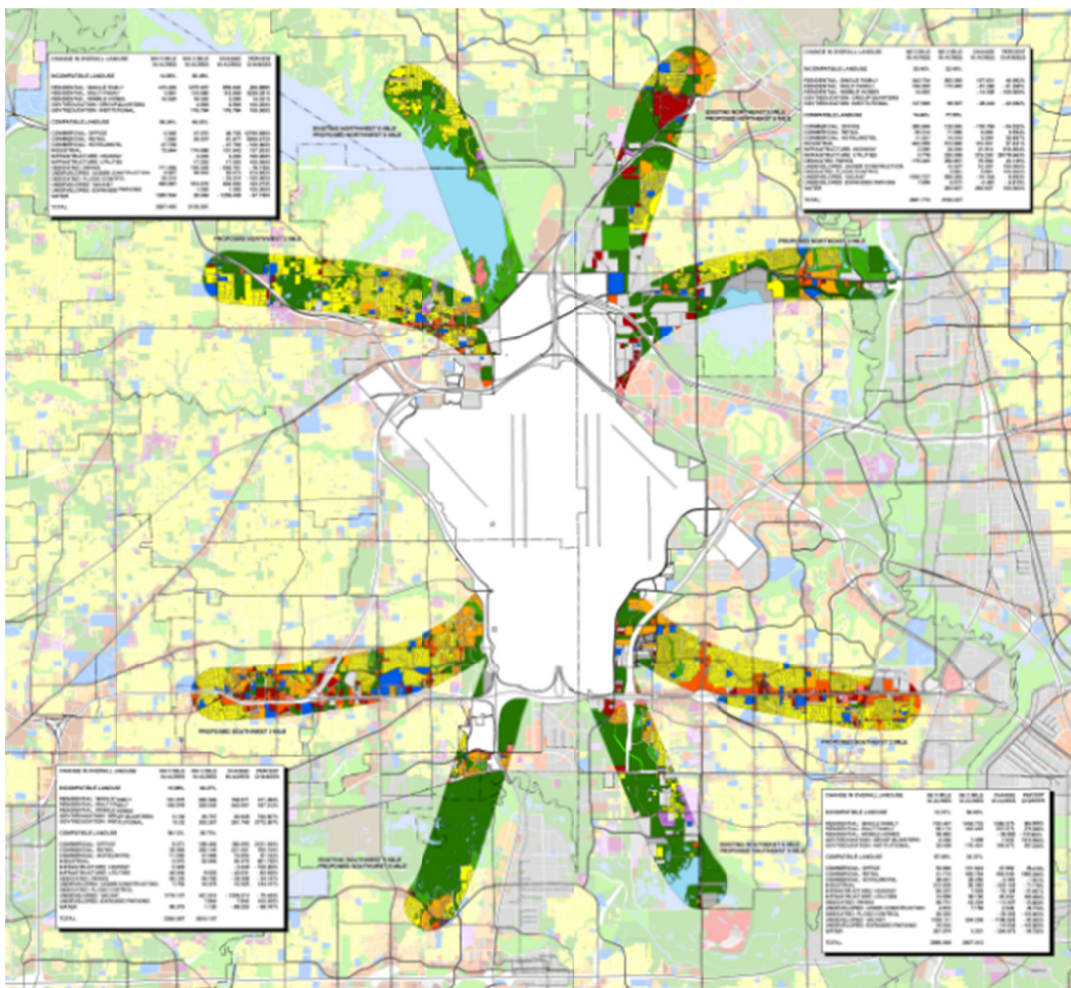
## Successes

DFW's proactive approach toward stakeholder engagement was and continues to be a key factor in achieving the following results:

- Stakeholder engagement has become engrained in DFW's culture. It is "just something they do."
- DFW's community outreach program for RNAV was positive in that it met each community's unique needs, requirements, and desires. As a result, communities accepted the planned changes without resistance once they understood them. DFW educated, engaged, and gained advocacy for the final outcome—communities owned the outcome. Even though some residents received in-

creased noise, because of early education and engagement, the community understood, continued to support, and advocated for implementation.

- DFW and its owner and host cities declared a “NextGen Day” in 2012, issuing their strong support for FAA’s NextGen. The airport reported in a press release that the surrounding municipalities of Dallas, Fort Worth, Coppell, Euless, Grapevine, and Irving had issued proclamations supporting NextGen implementation.
- DFW conducts briefings individually with local communities to educate and inform them about the FAA NextGen program well in advance of any identified NextGen procedures. The goal of these briefings is to communicate with local communities about the basic principles of NextGen and overall environmental benefits, to learn of communities’ specific needs and concerns, and to partner with all relevant stakeholders, including local communities, in future NextGen developments.
- DFW’s approach has helped airport managers engage airlines to produce an optimal balance of results. In one such case an airline sought the ability to turn aircraft early in order to save fuel. Their plan was to fly down a nearby highway where compatible land use existed on either side. The airport conducted a GIS analysis of a proposed departure procedure change, calculating the underlying land use compatibility for the existing turn as well as the proposed early turns (see Figure 9-3).



Source: DFW Airport

**Figure 9-3.** Land uses under proposed flight tracks.

The net results showed that the early turns would result in a greater adverse effect of noise and mitigation costs that would have far exceeded any fuel savings.

- Although committed to ongoing stakeholder engagement, the airport has kept the costs of engagement low by utilizing in-house GIS and communications personnel to help develop the materials that airport planners need. In-house personnel also respond to noise complaints. When necessary, the airport uses outside consultants to conduct noise analyses and other studies.
- FAA reported that “By [DFW] using these, the implementation of NextGen EMS Framework and collaboration will be compatible with on-going stakeholder environmental programs and initiatives. In turn the stakeholder community will be encouraged to collaborate and meet the aviation environmental and energy goals” (FAA 2013b).
- DFW’s efforts will be leveraged to advise future NextGen EMS frameworks and collaborations through similar, detailed use of examples, case studies, and direct stakeholder involvement.

## Metroplex Planning at Denver International Airport

### Background

Beginning in 2010, several ATC offices within FAA, as well as the City and County of Denver, operator of Denver International Airport (DEN), and several key airlines initiated a “local” process to introduce new RNAV technologies and improve the efficiency of the airspace surrounding DEN. The process ultimately included a wider group of stakeholders and unfolded over a nearly 4-year period, yielding 17 new RNAV standard terminal arrival routes (STARs) and 16 new RNAV standard instrument departures (SIDs) for DEN, as well as several additional STARs and SIDs for Centennial Airport (APA) and Rocky Mountain Metropolitan Airport (BJC), both of which are also within the Denver airspace. Recognized by FAA’s NextGen Office as an exemplary implementation of NextGen procedures, this airspace redesign effort became a prototype for others to follow.

Earlier efforts to redesign arrival and departure routes for DEN had stalled in part because of the complexities of resolving issues related to overlapping but segmented airspace responsibilities. By 2010, changes in personnel and FAA’s broadening of the initial stakeholder group created a working group of approximately 50 people who could focus on a common solution. This group represented:

- Multiple levels of FAA (including the NextGen office in Washington, DC; an FAA design team leader; air route traffic control center (ARTCC), terminal radar approach control facility (TRACON), and air traffic control tower (ATCT) personnel; and environmental protection specialists from the Northwest Mountain Regional office;
- Three major air carriers that had the equipment needed to fly RNAV procedures;
- City and County of Denver personnel representing the airport’s planning and noise abatement offices;
- Arapahoe County Public Airport Authority personnel representing the planning and noise offices of Centennial Airport; and
- Multiple consultant firms assisting the FAA design team, conducting the FAA environmental assessment (EA) process, and representing the airport’s operational and environmental concerns.

The group also incorporated limited representation of local planning jurisdictions.

## Stakeholder Engagement Methods Used

In a series of working group meetings, initially held monthly and later every 2 to 3 months, members worked closely on the common goal of designing and implementing RNAV procedures as efficiently and effectively as possible, focusing first on departure routings, then on arrivals. FAA Terminal Area Route Generation, and Traffic Simulation (TARGETS) modelers worked side by side with airport consultants to develop flyable routes while minimizing noise impacts and noise-related penalties; airlines offered the use of their simulators for flight tests; FAA provided human-in-the-loop (HITL) training for controllers to work through transitions and airspace conflicts; and FAA's environmental consultant worked closely with airport personnel to conduct effective public outreach efforts.

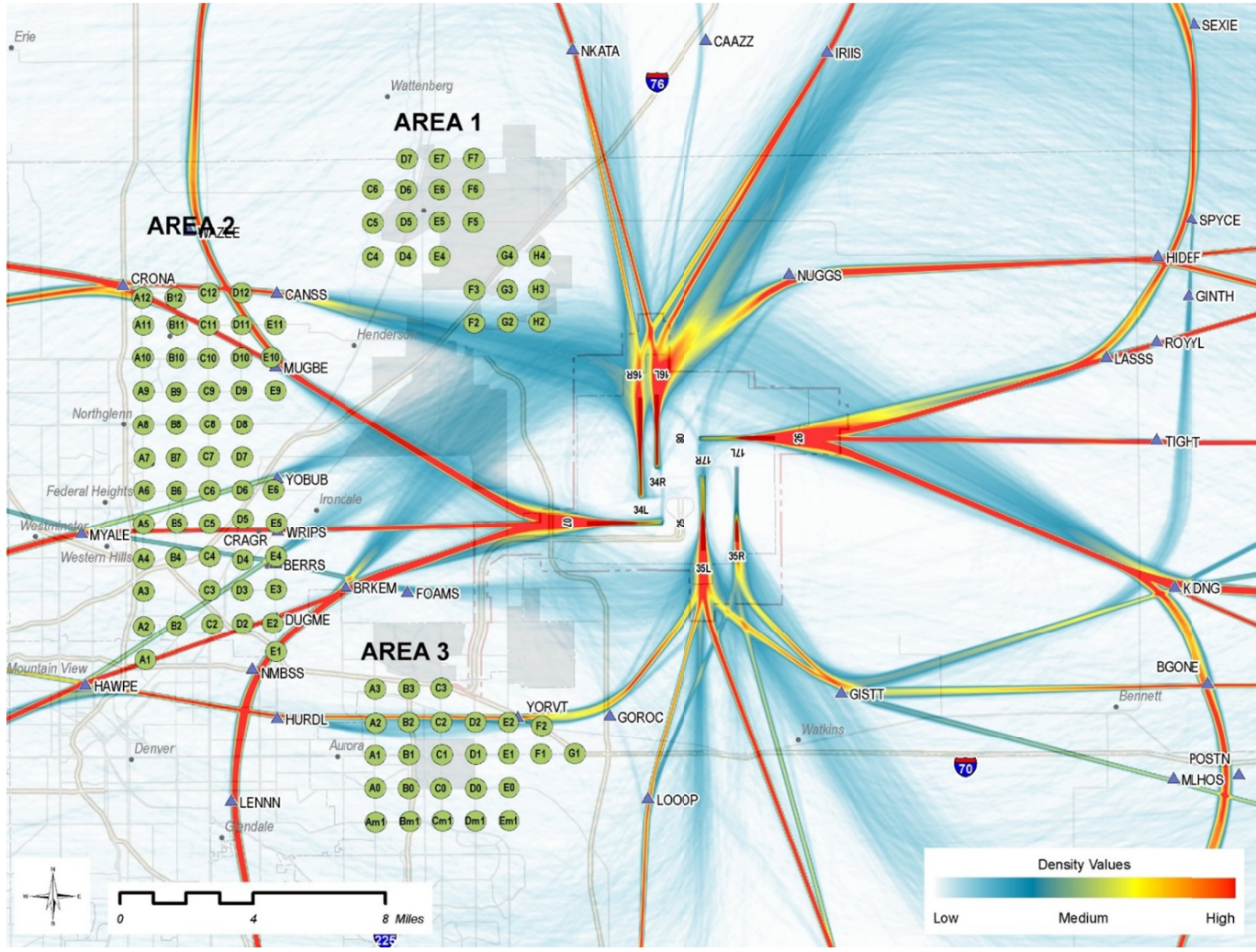
Information exchange within the working group included formal technical presentations by FAA's design team leader, the airport's noise abatement manager, the airport's noise consultant, and others, each representing a different stakeholder viewpoint. One example of the detailed information presented and discussed is shown in Figures 9-4 and 9-5. These maps compare flight track densities from an 81-day sample of radar data for jet departures with the same set of data following an early iteration of the proposed RNAV SIDs. The groups of points to the northwest, west, and southwest of the airport are critical noise locations.

Waypoints, speeds and altitudes, and other information associated with each proposed procedure in and out of each arrival and departure gate were presented graphically and discussed one by one with airlines, air traffic controllers, and consultants who provided feedback on issues such as fly-ability, handoff procedures between ATC facilities, noise impacts, and suggestions for changes to alleviate problems.

As the overall design became more stable, FAA's environmental consultant initiated development of the public outreach effort. Before this point, only a few representatives of the general public had been included in the working group process. Public outreach involved the following methods:

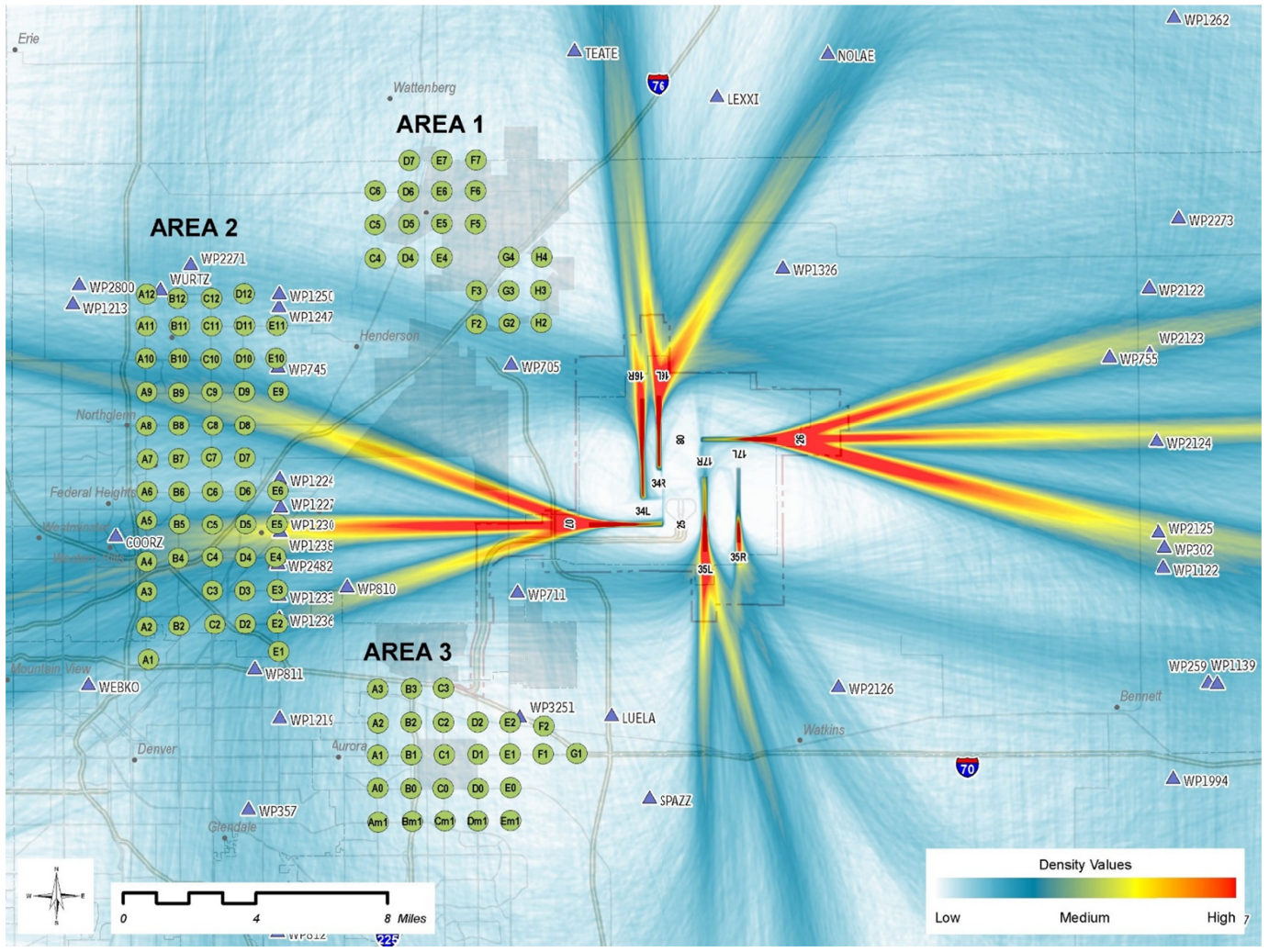
- Four scoping meetings were conducted to explain the proposed redesign effort, describe the proposed public outreach effort, and receive comments on the proposed EA process.
  - One scoping meeting was held for federal, state, and local agencies which included the U.S. Fish and Wildlife Service, the U.S. National Park Service, the U.S. Forest Service; EPA; the State Historic Preservation Office; Adams, Arapahoe, and Douglas Counties; the Cities of Aurora and Denver; and others.
  - Three scoping meetings—one near DEN, one near APA, and one near BJC (all within and affected by elements of the Denver airspace redesign) were held in an open house format for the general public and included a presentation, staffed poster stations, and handouts.
- Individual meetings were held with the National Park Service, the Colorado State Parks Commission, the Centennial Airport Noise Round Table, and DEN planning and noise office personnel.
- A second round of public meetings used the same open house format and same meeting locations as the scoping meetings. The purpose for this later round of meetings was to describe the findings reported in the Draft EA and receive public comments on the draft before publishing the Final EA.

Information describing the successes of the airspace redesign at Denver also extended beyond FAA's working group and EA process. Presentations and technical talks were conducted at various conferences, including one given by Denver's Mayor Michael Hancock at the NextGen Institute's 2013 Annual Meeting; a June 2014 presentation by the DEN noise abatement manager to the NextGen Advisory Committee titled "Denver PBN Implementation," and an October 2010 presentation to a meeting of the American Association of Airport Executives (AAAE) on "The Role of NextGen at Airports."



Source: DEN Airport

Figure 9-4. Departure flight tracks prior to implementation of RNAV SIDs.



Source: DEN Airport

Figure 9-5. Departure flight tracks after implementation of RNAV SIDs.

Continuing to lead by example, DEN has been selected to serve as the demonstration airport for testing another NextGen initiative, the application of simultaneous required navigation performance (RNP) procedures on widely spaced parallels, a technology that is currently available only during visual flight rules (VFR) weather. The Denver airspace also is currently undergoing a further review as part of FAA's national OAPM program.

## Successes and Lessons Learned

Denver's success can be largely attributed to three factors:

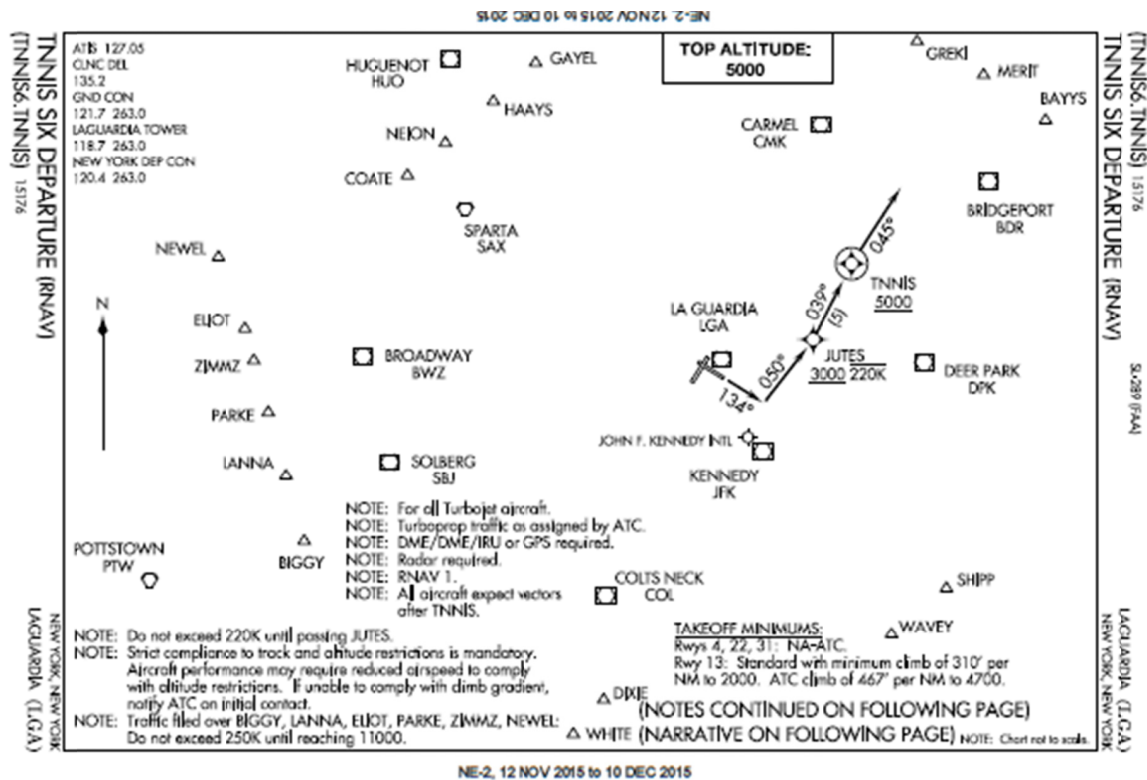
- The collaborative efforts of the working group and its multiple stakeholders. In the words of FAA's design team leader, "It's the people." They put their agendas aside to solve a problem.
- DEN is an airport at which the manager of the noise abatement office is knowledgeable about and fully engrossed in local airspace issues, airport development plans, RNAV technologies (including through the manager's seat on the RTCA NextGen Advisory Committee), and land use development proposals, and who brings to the working group and EA process the added sensitivity this knowledge conveys about impacts on the surrounding communities.
- The Inter-Governmental Agreement (IGA) between the City and County of Denver and Adams County, the jurisdiction whose land was annexed to build the new airport. The IGA stipulates extremely constraining noise limits at the 101 points identified in Figures 9-4 and 9-5, an exceedance at any one of which carries an extremely expensive penalty (\$500,000 per annual occurrence). This financial incentive for success is significant.

# Implementation of the TNNIS Departure at LaGuardia Airport

## Background

The TNNIS ("Tennis") departure, referred to on current FAA-published charts as the "TNNIS SIX DEPARTURE (RNAV)" and shown in a horizontal orientation in Figure 9-6, was developed initially as an infrequently used RNAV procedure for RNAV-equipped aircraft taking off from Runway 13 at LaGuardia Airport (LGA). The procedure was designed as an overlay to the previously used standard departure from Runway 13, referred to informally as the "Flushing Climb," which had been established in the 1960s to avoid conflict with traffic on an instrument landing system (ILS) approach to Runway 13 at John F. Kennedy International Airport (JFK). Both the original procedure and the new overlay involved a straight-out departure on runway heading, followed by an 86° left turn to the northeast. The older Flushing Climb procedures had been developed and assigned to aircraft by FAA ATC personnel to eliminate conflict with JFK arrivals assigned the 13L ILS. Later, both the TNNIS and Flushing procedures were used to minimize noise and disruption during the U.S. Open tennis tournament, which takes place annually at the U.S. Tennis Association's facility at Flushing Meadows in Queens, New York.

Samples of flight tracks flown by aircraft assigned to the Flushing and TNNIS departure procedures, as well as a sample of tracks assigned to the even older Whitestone Climb, were obtained from FAA by *The New York Times* and illustrated in an August 25, 2013, article regarding the noise complaints that had arisen from the implementation of the TNNIS departure (Buckley 2013). The graphic used in the *Times* article is shown in Figure 9-7.



Source: [http://flightaware.com/resources/airport/LGA/DP/TNNIS+SIX+\(RNAV\)/pdf](http://flightaware.com/resources/airport/LGA/DP/TNNIS+SIX+(RNAV)/pdf)

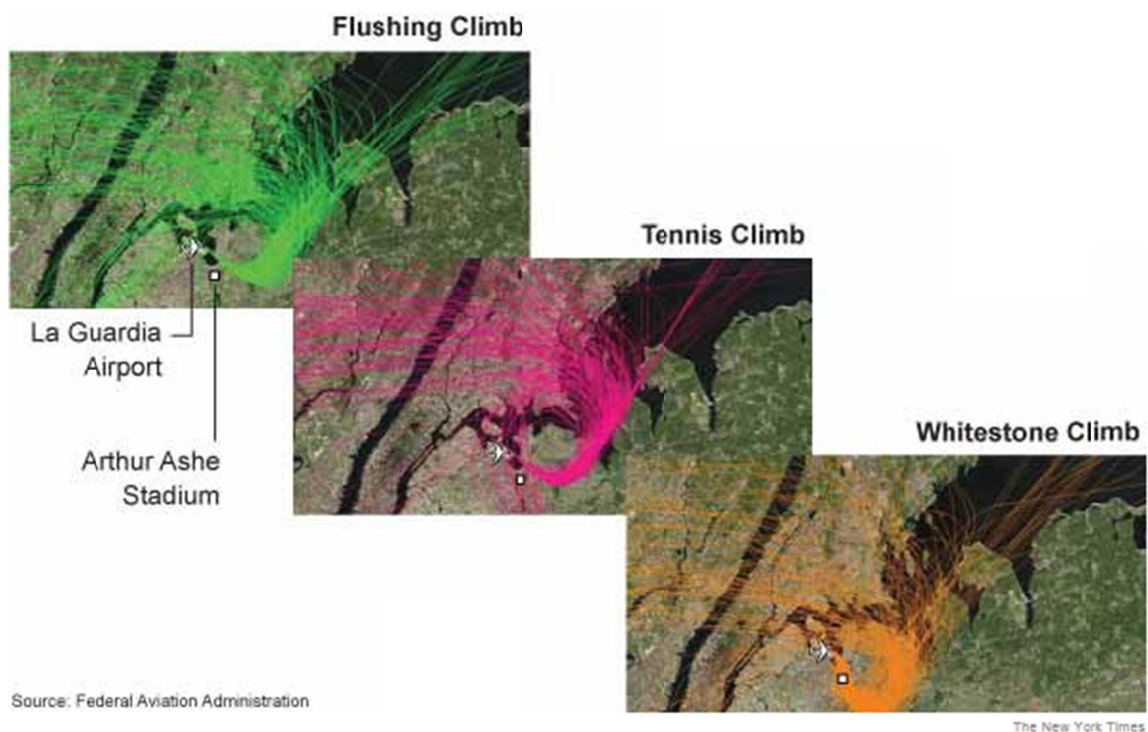
Figure 9-6. TNNIS Six RNAV departure procedure.

As shown in both the first and second panels of Figure 9-7, the Flushing and Tennis climbs each achieve the goal of bypassing Arthur Ashe Stadium (the tournament's main facility, shown as a small white square in each panel) to the north, thereby resulting in less interruption of the tennis matches. The second panel also shows the very narrow dispersion of RNAV-equipped aircraft heading off to the northeast (toward the "s" in Tennis) on the TNNIS departure, compared to the widely varying pattern of tracks following the Flushing Climb (or following the Tennis Climb without RNAV equipage).

When FAA designed the initial versions of the Tennis overlay, the Flushing Climb and TNNIS departure procedures were only being used when winds were generally from the southeast and only during the 2-week period in late August and early September when the U.S. Open tennis matches were being played. The relatively infrequent use of these procedures and the fact that the TNNIS departure was an overlay to an existing flight corridor led FAA at the time to believe that its effect on the noise environment beyond the tennis stadium would be minimal. Consequently, FAA perceived little need to engage the general public before implementation.

As air traffic with RNAV-equipped instrumentation increased in the New York metropolitan area, particularly at JFK, the New York TRACON identified a need to decouple (ensure separation of) departures on LGA's Runway 13 from landings on JFK's Runway 22L. Anticipating the need to alter activity on the TNNIS departure and reduce potential conflicts between LGA and JFK traffic, in April 2011, FAA's Air Traffic Eastern Service Center conducted an internal environmental review of potential noise problems from increased use of the procedure. The service center's analysis identified two population centroids where the noise increase would be significant but concluded that the nearby land uses were largely compatible and that overall there would be little or no environmental impact. As a result of this review, FAA issued a Categorical Exclusion allowing the TRACON to initiate a 180-day test whose purpose was





Source: (Buckley 2013)

**Figure 9-7.** Comparison of radar traces for aircraft following the Flushing, “Tennis,” and Whitestone Climb procedures.

to evaluate different runway configurations and weather conditions when conflicts between JFK and LGA traffic could be minimized. The test was initiated on February 13, 2012, and ended on August 13. During this time, more than 2,600 delays at JFK were determined to have been avoided. Immediately following the test, the de-coupling measures were implemented permanently. At no time before or during FAA’s testing of increased use of the TNNIS departure was it considered necessary to provide public notice of the test, nor did FAA determine that public involvement was appropriate. It is unclear whether FAA notified the Port Authority of New York and New Jersey (PANYNJ), the operator of LGA, that the test was to take place. Therefore, it was only as use of the Tennis departures increased during the summer of 2012 that the public became aware of the changes taking place.

## Stakeholder Engagement Methods Used

Residents of Bayside and Flushing, NY, who received large increases in overflights during the test period, were incensed over the resulting noise levels, and borough leaders were critical of FAA’s lack of prior public notification that a test would be undertaken. An article in the *Queens Courier* on September 14, 2012, cited Queens Borough President Helen Marshall as saying to an FAA representative who had briefed the borough about the test after the fact, “This is the borough board ... This is where you start. You don’t end up here. I don’t think you’re in touch. I don’t understand why you didn’t let us know about this a long time ago.” Councilmember Daniel Dromm added, “You’re telling us now that this has already been happening—for what purpose?” The FAA representative responded with an acknowledgment that, despite no requirement to do so, a better job “probably should have” been done in notifying people (Chan 2012). The August 2013 article in *The New York Times* stated, “For many officials, activists, and New Yorkers, the FAA’s move was yet another example of what they see as the agency’s overriding community anguish in pursuit of its own ends” (Buckley 2013).

Several New York congressional delegates demanded follow-up meetings and FAA's New York regional administrator met with members of the public on at least one occasion, but few other outreach efforts were conducted.

Eventual political pressures that evolved from the TNNIS departure led New York Governor Andrew Cuomo to direct PANYNJ to conduct its first-ever pair of 14 CFR Part 150 Airport Noise Compatibility Planning Studies at LGA and JFK. The studies were initiated in October 2014, included regular participation by a large stakeholder roundtable committee, and involved a significant public outreach effort. The planning studies are expected to be completed in August 2017.

## Successes and Lessons Learned

The FAA air traffic environmental specialist who conducted the agency's environmental review suggested in a phone conversation regarding the LGA case study that perhaps, "for any large change to a procedure in a highly populated area, FAA at least ought to provide public notice." In another conversation a member of FAA TRACON involved with the original design of the TNNIS departure, indicated that FAA "probably should have done something" to alert the public, but because the original procedure was not used very often, FAA did not think noise would be an issue, adding that "maybe fear" of a community-initiated delay may also have factored in not announcing the test in advance. The presence of two population centroids predicted to have significant noise impact during the environmental review process should not have been ignored and may well have been predictive of the public reaction that followed.

Ultimately, the LGA case study illustrates what may have been a lost opportunity to collaborate over potential noise issues resulting from implementation of a NextGen initiative. Airports live with and are usually far more connected to the sensitivities of their constituent neighborhoods than is FAA's ATO. Had they taken place, preliminary discussions with PANYNJ and the community might well have permitted PANYNJ noise office personnel to alert FAA or take steps themselves to contain the development of public concerns into a potential problem. FAA's unannounced increased use of the TNNIS departure illustrates the importance of the need to remove organizational siloes and take advantage of collective knowledge about local noise concerns and problems before important air traffic changes are formally implemented.

# PBN Implementation at Seattle-Tacoma International Airport

## Background

In early 2010 one of the largest air carriers based at Seattle-Tacoma International Airport (SEA), having equipped many of its aircraft with RNP capability and trained its pilots to fly RNP procedures with authorization required (AR) into small airports with difficult weather and terrain constraints, began to lobby for the implementation of PBN procedures at SEA. Called "Greener Skies," the carrier's program promoted NextGen publicly as a technology that could significantly reduce flight miles and save fuel for its aircraft entering the Seattle airspace to land. The reduced fuel use would result in fewer hydrocarbons released into the atmosphere and have a beneficial effect on the air quality of the region. The new procedures also were promoted as beneficial for noise by keeping aircraft in narrow corridors concentrated on downwind legs over Puget Sound to the west, with RNP turns to final over Elliott Bay to the north and Commencement Bay to the south.

Following early meetings with the Port of Seattle as the owner and operator of SEA, and with FAA senior management and elected officials of several surrounding jurisdictions to gauge public support, the carrier requested that FAA take over the procedure design and environmental analyses required for implementation. Only arrival procedures on the west side of the airport were to be revamped, maximizing flights over water while avoiding changes to the east where population densities and the likelihood of controversy were much higher. Toward the end of 2010, FAA accepted responsibility for the task and initiated a two-phased study. Phase I was to design the new RNAV/RNP procedures and carry out an EA on the flight procedure changes. Phase II was to be a research study using SEA as a demonstration airport to investigate the safety, policy changes, and ATC technology improvements needed to implement RNAV/RNP procedures on closely spaced parallels throughout the national airspace system (NAS).

Figure 9-8 depicts a sample of the then-current radar traffic and Figure 9-9 depicts the proposed changes that were eventually developed through FAA's design review process. The 90,000 square-mile study area for the EA is shown by the dashed rectangle in each. The radar sample shows the current dispersion of arrivals (in red) and departures (in green) in a north flow runway configuration where all operations are on Runways 36L, 36C, and 36R, which appear just south of the words "King County." In addition to an expected narrowing of the flight corridors west of the airport, similar to the narrow bands of radar flight paths entering the study area from the northwest and south, the proposed RNAV procedures with their RNAV/RNP final approach segments in orange (Figure 9-9) would bring arrivals over several new communities in the Seattle area, but closer to the airport, which would allow many arrivals to follow curved RNP approaches over water until joining short final approaches to land. The complete set of new procedures included two new STARs and 21 new RNP and RNP-to-ILS procedures to SEA's six runway ends.

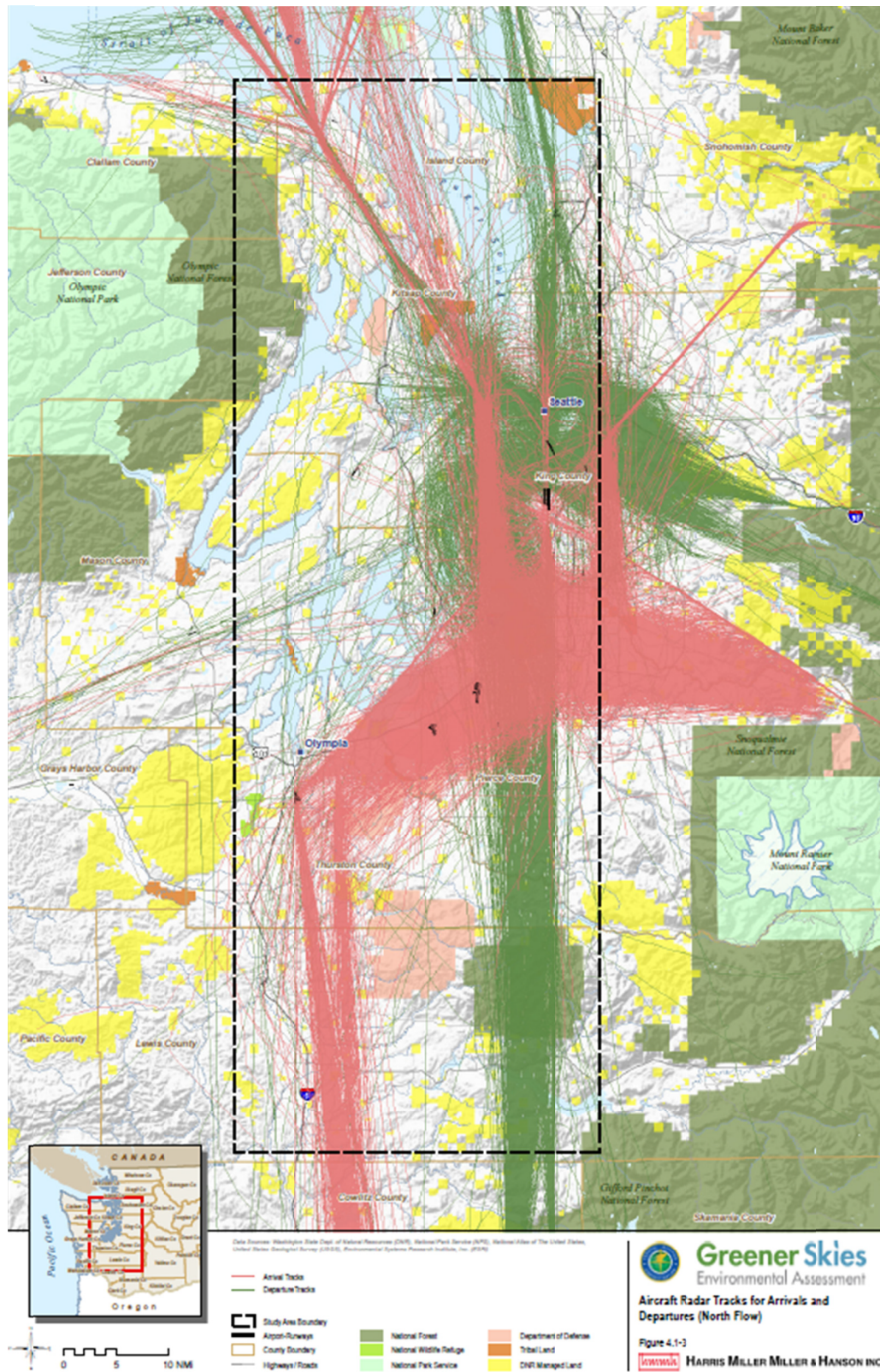
The new designs also included optimized profile descents (OPDs), allowing aircraft to begin flight-idle descents from altitudes as high as 38,000 feet and minimize interim level-off segments all the way to the landing runway. Fewer level flight segments requiring higher engine thrusts combined with shorter flight legs, especially for aircraft arriving from the south, would result in important fuel savings with minimal increases in noise close to SEA.

Phase II of the Greener Skies initiative affected none of these Phase I operations, though it could, at some point in the future, open the possibility of having two aircraft fly simultaneous RNP approaches to closely spaced parallels in poor weather. Those potential benefits were insufficiently defined to be assessed as part of the Phase I EA.

## Stakeholder Engagement Methods Used

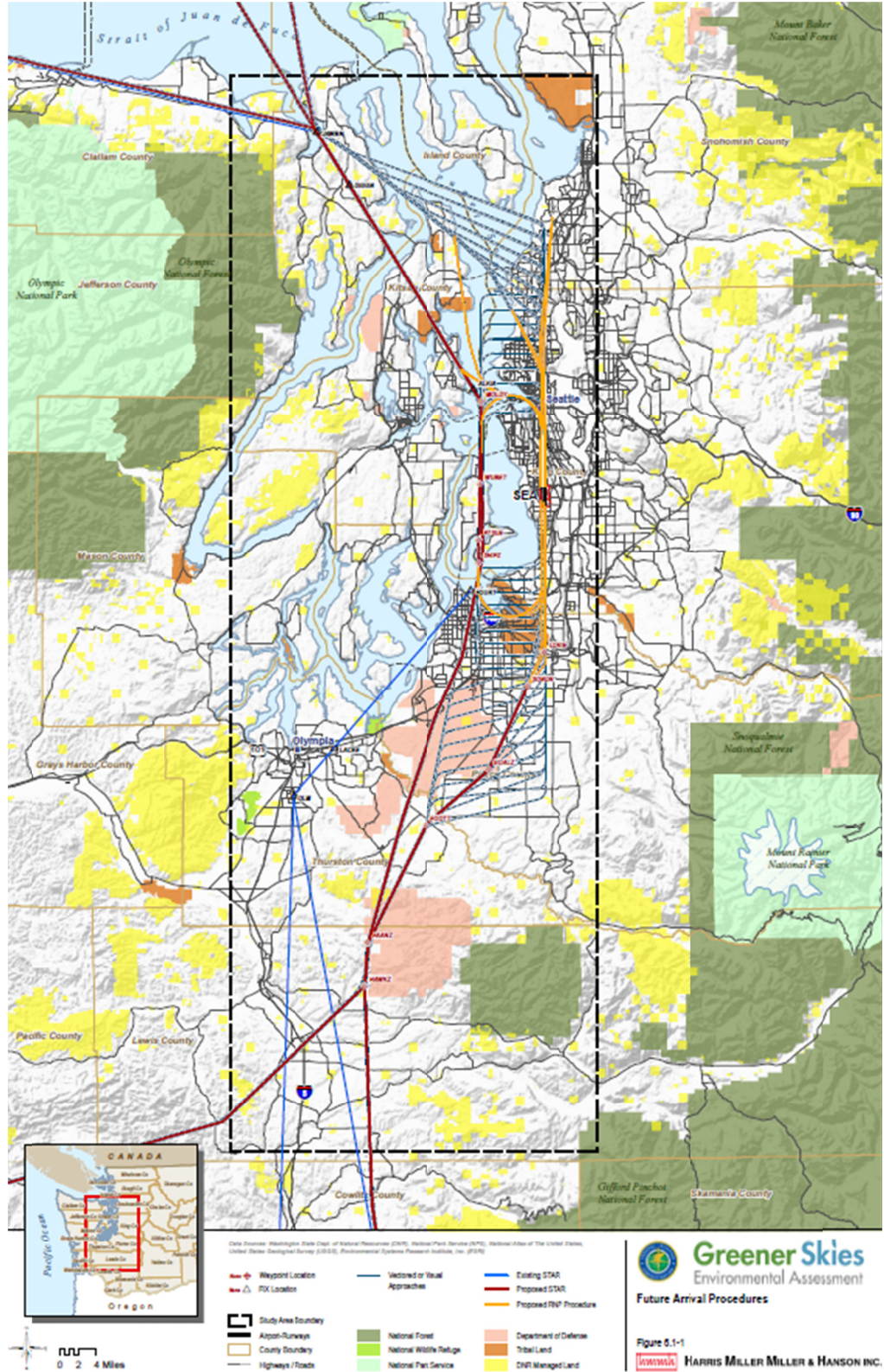
Under pressures to get the new procedures in place as soon as possible, FAA began procedure design in the spring of 2011, and the EA and the Phase II research project (referred to as I2) got underway in November of that year. *The Seattle Times* ran several stories on the NextGen projects but the first formal outreach efforts took place in January 2012. These efforts consisted of two scoping meetings, one to the north and one to the south of SEA, in which FAA and its environmental consultant team introduced the project and the EA process to the public through workshops for the purpose of obtaining public input on the project.

Because of prior controversies over noise, including litigation over SEA's third runway, publicity for the meetings was closely controlled by FAA and kept narrow in scope. A single legal notice ran for 2 days in print in *The Seattle Times* and in the *Highline Times* (to reach southern readers), and for 14 days online in *The Seattle Times* nwsourc@ classifieds. Other resources such as mailing lists, local neighborhood newsletters, or other local knowledge available from the SEA Noise Office were left untapped, resulting in relatively few attendees at either meeting. A third agency meeting was held at FAA's



Source: SEA Airport

Figure 9-8. SEA radar tracks of arrivals and departures (north flow).



Source: SEA Airport

**Figure 9-9.** SEA future arrival procedures.

regional office for the purpose of briefing federal, state, local, and tribal representatives on the upcoming project and to obtain official comments on the study. The content and format of all three meetings was identical: introductory boards set up at stations attended by FAA and/or consultant representatives outlining the EA process, presenting examples of current radar data, and describing the expected timeline and future outreach opportunities. A slide presentation covered much of the same material, and FAA presented a high-quality video using animation to illustrate the intended benefits of PBN procedures specific to SEA. Printed tri-fold handouts were available explaining the project background, elements of the EA process, and opportunities for public feedback.

A second round of meetings consisting of two public workshops and another agency meeting followed the release of the draft EA for the purpose of reporting findings and encouraging comments on the document. Meeting venues and notices were the same as those used during the scoping process. A court reporter was onsite at the two public meetings to record formal statements that the public wished to make. Attendance was generally higher at the second round of public workshops, both to the north and to the south. Public participation at the meeting to the north was more vocal and disruptive than it had been for the scoping meetings, in large part because a group of residents in a neighborhood north of SEA had organized themselves around issues of changes in flight procedures, insufficient public outreach, a poorly selected meeting location, and lack of translators. However, neither the meetings nor any resultant comments received on the Draft EA delayed the project beyond the deadline for the release of FAA's Finding of No Significant Impact (FONSI) and Record of Decision (ROD).

Additional outreach methods used included the following:

- A project website that described the project, included copies of the slide presentations used in the scoping and public meetings, presented graphics, and included the Draft EA and later the Final EA. An interactive window on the site allowed visitors to submit comments on the documents.
- Hard copies of the Draft EA and Final EA documents were left on file at three area libraries and at the FAA regional office.

## Successes and Lessons Learned

The Greener Skies EA process was successful from the perspective that the EA was completed on time and found no significant impacts from the proposed RNAV/RNP procedures, leading FAA to issue its FONSI/ROD on schedule and allowing the new procedures to be published and implemented on schedule in April 2013.

Public reaction to the project, however, was critical of the outreach effort and of the public workshops in particular. Some of the difficulties of the outreach effort stemmed from these factors:

- FAA placed strict constraints on the level of public outreach, on the use of known newsletter address lists, and on any contact with airport staff. SEA's noise office had years of experience addressing the public's concerns over numerous noise problems, was well aware of noise-sensitive neighborhoods and their community leaders, had mailing lists for its own public meetings, and could have provided advice on convenient and appropriate venues. None of this experience was accessible for the EA. Although NEPA requires lead federal agencies to maintain an arms-length relationship with a project sponsor, it is unusual to have so little interaction on a topic that has no direct bearing on the subject of the EA (the RNAV/RNP procedures).
- Announcements of the public outreach meetings were made through small legal announcements in *The Seattle Times* and *Highline Times*, the project website (which was not publicized widely), and word of mouth. Attendance consisted of no more than a handful of people until the final public meeting, by which time community activists had got word of the meeting and recruited their

neighbors to come. Even then, about 50 people showed up, though they were disruptive and demanded a subsequent meeting to address noise issues in their own neighborhood.

- FAA agreed to the extra meeting, at which they made their own presentations but were careful to specify that such meetings were outside the purview of the EA. According to an FAA spokesperson involved with both the EA workshops and the subsequent community meeting, neighbors viewed the subsequent presentations even more poorly than they did those associated with the EA, emphasizing the benefit that could have been realized by permitting communications with the airport.
- Some of the results presented in the EA might have been presented differently. For example, increases and decreases in DNL exposure levels as small as one-tenth or two-tenths of a decibel (dB) might better have been reported simply as “insignificant” rather than drawing attention to them as increases or decreases. Although the public presentation characterized the changes as insignificant, many of the concerned neighbors who attended the second workshop north of SEA lived in areas where *any increase at all* was of concern to the residents.
- Following the conclusion of the EA, the proposed procedures were implemented only partially with initial publication of the two new STARs, greatly reducing the expected benefits of the RNP procedures as evaluated in the environmental review process. New RNP procedures have since been added to each of the six runway ends and are now used regularly, largely without community reaction.

## Support from the Puget Sound Regional Council

In some parts of the country, councils of government, MPOs, or other non-government organizations (NGOs) have helped airports within their region overcome specific challenges. The NCTCOG, for example, has helped establish zoning overlays near airports and provides guidance on airport land use compatibility planning (see the DFW case study in this chapter). In Georgia, the Savannah Area Geographic Information Services has helped Savannah/Hilton Head International Airport (SAV) comply with FAA AGIS data collection requirements. The Puget Sound Regional Council (PSRC), however, has been a leader in helping airports in northwestern Washington State prepare for NextGen.

PSRC is a MPO that provides regional transportation planning, growth management, and economic development support to counties, municipalities, ports, tribes, and transit agencies in the central Puget Sound area. The organization works closely with state government, and, in the case of aviation, with FAA’s Northwest Mountain (ANM) Regional Office (RO) and the Seattle ADO. PSRC supports land use compatibility planning, zoning overlays, and other types of activities relevant to airports in the region.

In 2012 FAA Seattle ADO provided PSRC with a grant to complete a study that resulted in a regional plan to help general aviation airports realize the benefits of NextGen. As a part of this study, airports that could benefit from NextGen capabilities were identified. The degree to which these airports were prepared to implement NextGen capabilities and any design or operational deficiencies that could stand in the way were identified. Capital Improvement Plans (CIPs) were then developed to support any necessary improvements. Finally, the study identified an approach and strategies that airports could use to evaluate NextGen-related options as part of their normal planning and development process. The study resulted in an extensive report that provided general information about NextGen and its various initiatives from an airport’s perspective and also provided specific findings and action items for general aviation airports in the region.

In 2014 additional funding was provided by FAA to support Phase II of PSRC's study. The objectives of this phase are to build upon the Phase I results to complete a NextGen airspace study for the PSRC. Airspace, flight procedures, aircraft operations, and obstructions to navigable airspace are being modeled at a regional level. A regional airspace map will be prepared, compatible land use recommendations will be made, and costs for mitigating obstructions will be estimated. This study and related deliverables include material that will communicate the benefits of NextGen and provide findings on how airports can facilitate the implementation of NextGen capabilities. The material to be produced includes three-dimensional (3-D) animations, slide presentations, reports, a brochure, and an innovative iPad application. The iPad application is intended to provide a more interactive means of communicating the benefits of NextGen to FAA, general aviation, and public stakeholders and informing them what they can do to help.

Twenty-five (25) airports were included in the Phase I study and will directly benefit from the products being developed in Phase II. Among them are King County International Airport/Boeing Field (BFI) and Snohomish County Airport/Paine Field (PAE). The experiences of these two airports in preparing for NextGen are described in the next two case studies.

## Preparations at King County International Airport/Boeing Field

### Background

King County International Airport/Boeing Field (BFI) is a non-hub, primary airport with one 3,710 ft. runway and approximately 400 based aircraft. What makes BFI unique is its significant testing of Boeing commercial and military aircraft, comingled airspace with Seattle-Tacoma International Airport (SEA), and significant cargo operations conducted by United Parcel Service and DHL (Deutsche Post DHL Group—a global logistics company). Increased production of Boeing 737 and military tanker aircraft are prompting the development of new hangar facilities at the airport that will coincide with planned increases in aircraft testing operations.

Although the airport enjoys several RNAV, STAR, and traditional ILS procedures, it has yet to fully benefit from NextGen PBN. One approach uses RNP procedures, but it requires authorization from the control tower, which is seldom provided because of operational restrictions. The limited use of this approach is also apparent in FAA procedure use statistics.

As a part of the airport's current master plan update, the FAA Regional Office (RO) has encouraged the airport to include the development of an electronic Airport Layout Plan (eALP). These data will be submitted to FAA via FAA's web-based AGIS, which is considered an enabler of NextGen, providing safety-critical mapping data that are used in new procedure development. These data will also provide benefit to the airport.

### Stakeholder Engagement Methods Used

BFI understands how important stakeholder engagement can be when pursuing these objectives. The airport has found that its engagement methods have been particularly successful with FAA and with regional agencies (i.e., PSRC). New staff at the FAA RO and ADO, including a former peer from a nearby airport, have been particularly proactive in creating and welcoming two-way dialogue with the region's airports.



BFI finds it helpful to discuss conceptual plans with these FAA staff members, as well as with PSRC and other nearby airports. Further details about the procedures, funding requirements, and environmental impacts are then discussed with FAA. These communications occur via monthly meetings. Before each meeting, an airport staff member will poll airport and FAA participants to set the agenda, which can cover upcoming capital improvement projects, grant activity, reporting requirements, the current master plan update, and other topics. NextGen procedure development may come up once or twice a year. Other stakeholders, including tenants, may join these meetings on an as-needed basis. The airport also conducts quarterly meetings with large commercial and general aviation tenants. Collectively, these meetings have been very helpful in keeping all parties informed and in fostering discussion of the best path forward for all parties involved. In addition to meeting materials, the airport has found press releases, technical reports, website content, and documents that address Frequently Asked Questions (FAQs) to be successful tools for stakeholder engagement.

The airport has enjoyed the use of an on-staff community outreach specialist, but airport marketing and business development needs are increasingly becoming a priority. Its surrounding communities are very proactive, however, and the airport makes a point of keeping them informed with timely information about aircraft run-ups, airshows, and new aircraft test programs that may have an impact on local residents. Because of the significant presence and impact of Boeing's aircraft testing operations, BFI has required Boeing to have a communication plan. Stakeholder engagement guidance and tools provided by PSRC and others may help the airport keep up with its responsibility.

## Successes and Lessons Learned

BFI has realized limited NextGen capabilities to date, but the airport has significant hopes for the future and a history of proactive community engagement that can help facilitate implementation. By reconfiguring the airspace and enabling tighter flight procedure routes, NextGen may decouple the currently comingled airspace between SEA and BFI, which currently constrains BFI's operations to favor the more active commercial hub airport. Specifically, NextGen collaborative air traffic management (CATM), global navigation satellite system landing system, PBN, and separation management initiatives are expected to provide direct benefits to BFI. The capabilities these initiatives offer should improve safety, capacity, operational efficiency, and customer service.

NextGen has the potential to provide a lot of value to BFI. Although the cost of equipping general aviation aircraft will present some constraints, doing so also offers the opportunity to improve capacity, operational efficiency, and safety in a dense airspace with significant commercial activity and many restricted areas. BFI believes that the PSRC's Phase I study has better prepared it to benefit from NextGen and illustrates how helpful regional councils can be.

# Unique Challenges at Snohomish County Airport/Paine Field

## Background

Snohomish County Airport/Paine Field (PAE) is a reliever airport with 9,010 ft. and 3,004 ft. parallel runways. The airport has approximately 560 based general aviation aircraft. As with BFI Airport, the airport faces unique operations challenges. PAE is adjacent to Boeing's Everett factory where 747, 767, 777, and 787 aircraft are assembled. To support this operation, PAE provides airfield service for the Boeing facility to receive parts (including the fuselage section of the 787), for delivering new aircraft,

and for receiving aircraft due for heavy maintenance. PAE is also host to two flight museums that actively operate vintage aircraft. These unique operations, along with the active fleet of general aviation aircraft, place unique challenges on the airport and the surrounding communities, which NextGen may help alleviate.

Atlas Air operates the Boeing Dreamlifter, which imports 787 fuselage sections into PAE. Given flight and supply chain logistics, these aircraft often arrive in the middle of the night. They are also heavily loaded and fly slow, low, and dirty (i.e., with flaps and landing gear extended) over surrounding communities. These communities include Everett and Mukiteo, which have grown in population and size over the years to encroach upon the airport. As a result, the Boeing Dreamlifter flights and other operations at PAE now lead to an average of three to four noise complaints a day.

To reduce the noise impact of the Dreamlifter, Atlas Air approached the airport to propose implementing four PBN procedures, one from each of the four cardinal directions. Together, the airport and Atlas Air became proponents for the new procedures and approached FAA. The PBN implementation process outlined in FAA Order JO 7100.41 was followed and a core working group (CWG) was established that included FAA, Atlas Air, airport, and Boeing representatives. Meetings have been held every couple of months and have proceeded well. Recently, the process passed the baseline analysis review (BAR) stage. The airport hopes that, once in place, the procedures will significantly alleviate the noise impact of the Dreamlifter.

## Stakeholder Engagement Methods Used

PAE takes several measures into account in addressing community concerns about noise around the airport. The airport conducts public noise meetings; regularly sends representatives to community council meetings that, on average, are attended by 40–50 residents and community representatives; and occasionally meets with the mayors of adjacent municipalities. The airport also operates three noise monitors and has developed noise abatement procedures that it proactively reminds pilots to follow.

## Successes and Lessons Learned

Although the airport employs some RNAV procedures, thus far the impact of NextGen has been minimal, and additional NextGen capabilities will likely be implemented incrementally. The airport has played a proactive role in promoting new procedures that will alleviate some of the unique challenges their operators face. The new procedures proposed for the Dreamlifter operations will benefit Boeing and also will reduce late-night noise events in adjacent communities. Boeing would eventually like to have ground-based augmentation system (GBAS) equipment installed at the airport. Like BFI, PAE has also found the PSRC Phase I study to be helpful in preparing for NextGen and looks forward to the analysis and tools Phase II will bring.

# Improved Air Service at Beverly Regional Airport

## Background

Beverly Regional Airport (BVY) in Massachusetts (formerly Beverly Municipal Airport) was established in 1928 as the home of a flying club founded by early aviation enthusiasts. These early aviators recognized the importance of stakeholder engagement. To achieve their goals, the club convinced city elected officials about the benefits of air transportation and the positive effects it could have on their

community. This early stakeholder engagement set a precedent of active involvement of local elected officials, residents, and businesses that continues to the present day.

In the 1940s the U.S. Navy acquired the airport and invested in airfield infrastructure to support pilot training. In August 1941 the airport boasted the longest paved runway in New England. In 1946 the Navy returned the airport to the city and fixed base operators (FBOs) moved in to provide training, maintenance, and aircraft sales. Eventually, airfield take-offs and landings peaked at approximately 220,000 operations per year.

With the nationwide decline of general aviation, economic pressures on private flying, and competition for corporate jets from nearby Boston's Logan International Airport (BOS) and Bedford's Hanscom Field (BED), Beverly saw a decline to approximately 67,000 operations per year. One FBO remains: North Atlantic Air provides fuel, parking, maintenance, and training services for private and corporate aircraft operators. An ATCT operates at the airport, although this was threatened by a wave of contract tower closures proposed in 2013.

The airport manager, commissioners, and tenants recognize the value the airport offers to the surrounding community and have actively advocated its use for aviation, as well as compatible non-aviation uses. Since the Navy left, improvements to the airport's infrastructure have been made using federal grant monies augmented with local and state funds. Such improvements have included rebuilding the airport's two runways, building a new apron that can support corporate aircraft, and providing for additional overnight parking. Private tenants have built hangars, and several corporations have offices on the airport's 415 acre property, which spans three municipalities. In total the annual economic impact of the airport is approximately \$22M.

In 2011 a wide area augmentation system (WAAS) was installed, providing horizontal and vertical guidance to the airport's longest runway, Runway 34. This installation paved the way for a series of RNAV procedures that now serve Runways 16, 27, and 34, as well as two STAR procedures. A localizer performance with vertical guidance (LPV) approach to Runway 16 also was established, offering the highest precision possible with a WAAS-improved global positioning system (GPS) signal. This improvement enabled a reduction in low-visibility minima from 480 ft. to 250 ft., which gave corporate aircraft greater flexibility when landing in adverse weather conditions and enabled access into BVY when landing at other airports was not feasible.

These NextGen-enabled procedures have resulted in an increase in corporate jet traffic serving a variety of small and large companies, as well as increasingly popular fractional jet ownership programs that make private jet travel more accessible to corporations and individuals. One corporate jet operator has moved its operations to the airport. The FBO enjoys increased fuel sales, which make up a significant portion of its revenue. Two new hangars have been built to accommodate new jets based at BVY. The increased airport business has had a positive impact on commerce in the surrounding community. The NextGen equipment installation and new GPS-based procedures have made the airport more of a destination, which has had a positive effect on the airport, its tenants, and the surrounding communities.

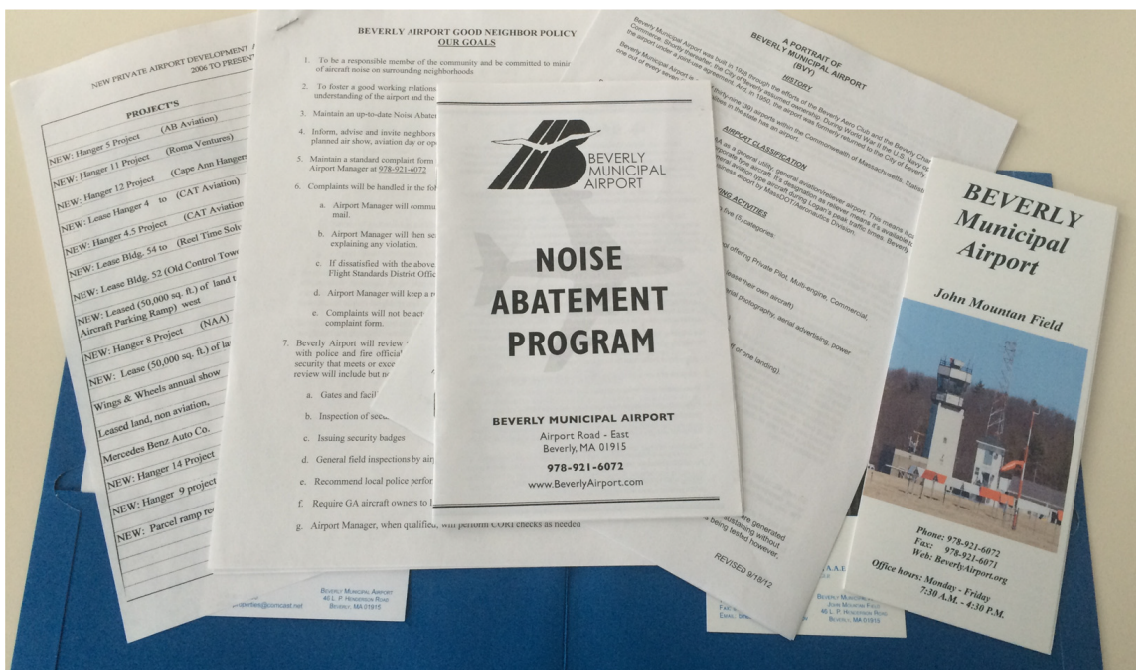
## Stakeholder Engagement Methods Used

A large part of the airport's success can be attributed to the proactive approach its manager, staff, and commissioners have taken with regard to stakeholder outreach and engagement. Following are some of the methods and tools the airport has found effective.

- A presentation that outlines the history, current status, future plans, and economic impact of the airport is frequently used to brief local elected officials, agencies, businesses, and other interested parties.

- A package of printed engagement materials that provide information on the airport’s history, capital improvement program, noise abatement program, land acquisitions and sales, policies, economic impact, and points of contact is readily available to interested parties (Figure 9-10).
- An actively maintained website that offers access to copies of the materials as well as other resources for residents and the surrounding community (Figure 9-11). Commission meeting minutes, airport newsletters, rules, regulations, policies, studies, and the long-term master plan are all available for public download. Points of contact in companies doing business at the airport are provided along with resources for pilots and other visitors.
- Brochures that provide airport facts and information on the noise abatement program are made available at prominent locations throughout the surrounding community.
- A list of voluntarily provided e-mail addresses and (where e-mail is not available) street addresses that are maintained and used to inform abutters of airport capital improvement projects, construction activities, and other relevant events.
- A “good neighbor” policy that prohibits touch-and-go operations during weekends and encourages pilot training in designated low-impact areas.
- The involvement of two members from adjacent municipalities that serve on the airport commission even though the airport is owned and operated by the City of Beverly.

The successes BVY has experienced as a result of NextGen-enabled procedures were to be highlighted in brochure based on the New England General Aviation Regional Study.



Source: BVY Airport (Beverly [MA] Regional Airport)

**Figure 9-10.** Printed engagement materials used by Beverly Regional Airport.

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**BEVERLY** REGIONAL AIRPORT

Welcome to the Beverly Airport Website

[find us on facebook](#)

**News:**

- The FBO, NAA is now approved to accept international waste. [Click here to view](#)
- New Administration Building Nearing Completion [Click here to view](#)
- FAA and MassDOT Drone Information [Click here to view](#)
- Spill Prevention, Control, & Countermeasure Plan-April 2013 [Click here to view](#)
- Pay Your Bills Online! [Click here to view](#)
- BVY Fuel Pricing at North Atlantic Air, Inc. [Click here to view](#)
- Noise Abatement Program [Click here to view](#)
- Beverly Airport Commission Meeting for May 2016 [Click here to view](#)

[Click here for Noise Complaint Form](#)

**John Mountan Field**

Beverly Regional Airport is classified as a general utility, general aviation/reliever airport. This means it can accommodate all small aircraft and larger corporate type aircraft. Its designation as reliever means it is available to relieve Logan International Airport of small general aviation type aircraft during Logan's peak traffic times.

**Airport Activities**

Traffic at Beverly Regional Airport can be grouped into five categories:

- Recreational

Source: BVY Airport (<http://www.beverlyairport.com/>)

Figure 9-11. Beverly Regional Airport website.

Despite the proactive measures taken to inform, educate, and engage its stakeholders, the airport has faced some challenges, as follows.

- Partial cutting to resolve a tree hazard on private land abutting the airport was challenged in court by the landowner. Even after the airport had offered alternatives, the lawsuit was elevated to the Massachusetts Commonwealth's Supreme Court and a jury awarded significant damages to the resident.
- Many residents do not yet understand that the new RNAV procedures allow aircraft to approach at a steeper angle so that they clear homes and other obstacles at a higher and therefore safer altitude.

## Successes and Lessons Learned

NextGen improvements, continued federal investment in airfield infrastructure, and a proactive stakeholder engagement program have allowed Beverly Regional Airport to serve a growing number of corporate aviation customers and business tenants. The result has been a productive use of a community asset that provides a significant economic benefit to the surrounding region with minimal noise or environmental impact.

# Modernization at Chicago O'Hare International Airport

## Background

The O'Hare Modernization Program (OMP) is the City of Chicago's multi-year plan to modernize Chicago O'Hare International Airport (ORD), converting it from a triangular runway configuration to a primarily east-west traffic flow and making it more efficient and safer in the process. The OMP was initially proposed by the city more than 10 years ago and was modified and evaluated along with various alternatives, culminating in the FEIS published in July 2005. FAA approved the preferred alternative in its September 2005 ROD (FAA 2005).

Subsequent delays in the OMP construction schedule, caused largely by a lawsuit filed against the city by United and American Airlines regarding the timing and funding of OMP projects still to be constructed, led the city to issue a letter to FAA in November 2013, in which the city identified construction schedule modifications that had not been anticipated or evaluated in the EIS. Though the final airfield configuration was unaffected by the new interim conditions, FAA considered the modifications to be substantive and deserving of their own environmental review. As a result, in November 2014, FAA initiated a re-evaluation of the OMP EIS to disclose the environmental impacts of the interim conditions generated by airfield construction schedule modifications (FAA 2015b).

OMP runway projects already completed at the time the re-evaluation was initiated included the new Runway 9L/27R on the north airfield and an extension to Runway 10L/28R on the south airfield, both of which opened in 2008, and the new Runway 10C/28C, which opened in 2013. Given the re-evaluation, the opening of new Runways 10R/28L and 9C/27C and the extension of Runway 9R/27L, all of which had initially been planned for completion in 2013, would not occur as anticipated in the 2005 FEIS. Runway 10R/28L was now anticipated to open on October 15, 2015, Runway 9C/27C was planned for opening in November 2020, and the extension of Runway 9R/27L was planned for opening in November 2021.

Given the construction schedule modifications and staggered openings of the three as-yet uncompleted runway projects, FAA elected to prepare the re-evaluation to disclose new or changed conditions or impacts that had not been evaluated in the initial EIS. Two new interim conditions were to be examined:

- The airfield as it would operate after the October 15, 2015 opening of Runway 10R/27L, and
- The airfield as it would operate after the November 2020 opening of Runway 9C/27C until completion of the extension of 9R/27L.

On completion of construction of extended Runway 9R/27L, all runway components of the build out approved in FAA's ROD on the initial FEIS would be complete. The condition of the airfield with all components completed had already been fully evaluated in the original EIS, so it was not to be reassessed.

As operator of Chicago O'Hare International Airport, the City of Chicago had a limited, though critically important role in the development of FAA's environmental document. The city served as the contracting authority and administrator for FAA's independent third-party contractor (TPC) on the re-evaluation. Also, the city's Noise Office provided key data including a year's sample of current radar data from the ORD noise management system, and for consistency with prior analysis methods the city's planning consultant conducted simulation modeling for the two yet-to-be built runway configurations using procedures that had been applied successfully in the original EIS. Outputs from each of these data sources were used by FAA's TPC to generate modeled flight paths, runway utilizations, taxi and airspace delays, and other key information supporting the noise and air quality analyses of the re-evaluation.

The two interim configurations assessed in the re-evaluation are shown in Figures 9-12 and 9-13. As the city continues ORD's conversion to the new, primarily east-west traffic flow, previously operational southeast-northwest Runways 14L/32R and 14R/32L have been or are scheduled to be decommissioned. The reduced flexibility in the orientation of runways (and presumed inability to use the closed runways in a nighttime noise mitigation program), combined with the recent openings of the new east-west runways, have been viewed by many residents surrounding ORD as a detriment to their noise environment. This public perception has caused a major increase in the number of noise complaints received by the city. The heightened awareness of the changes and resulting increased community annoyance has led FAA to undertake an unusually comprehensive public outreach program in conjunction with the re-evaluation. The summary of outreach efforts in the next section of this case study largely draws from Chapter 4 of the re-evaluation report.

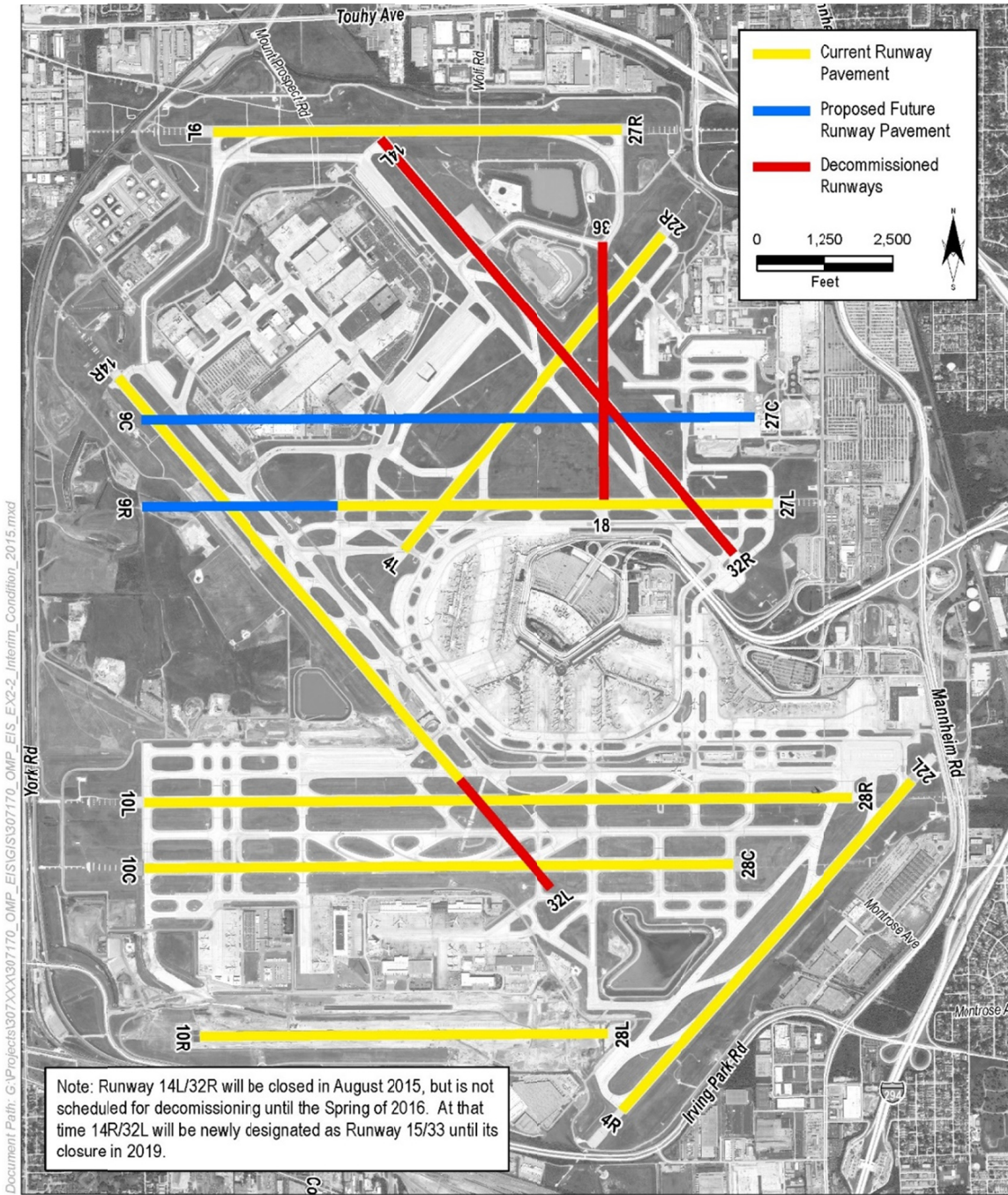
## Stakeholder Engagement Methods Used

### *Public Information*

To facilitate public access to complex technical information used in the noise and air quality analyses reported in the Draft Re-Evaluation, early release of certain material related to the study was provided through an FAA website ([http://www.faa.gov/airports/airport\\_development/omp/eis\\_re-eval/](http://www.faa.gov/airports/airport_development/omp/eis_re-eval/)). On June 2, 2015, FAA released a re-evaluation overview. Public workshop dates, times, and locations and Total Airspace and Airport Modeler (TAAM) simulation studies were published by FAA on July 10, 2015.

### *Availability of the Re-Evaluation*

FAA published notice of the availability of the Draft Re-Evaluation document on its website on July 27, 2015. FAA also delivered hard copies of the document to 73 public libraries in Chicago and suburbs



Chicago O'Hare International Airport

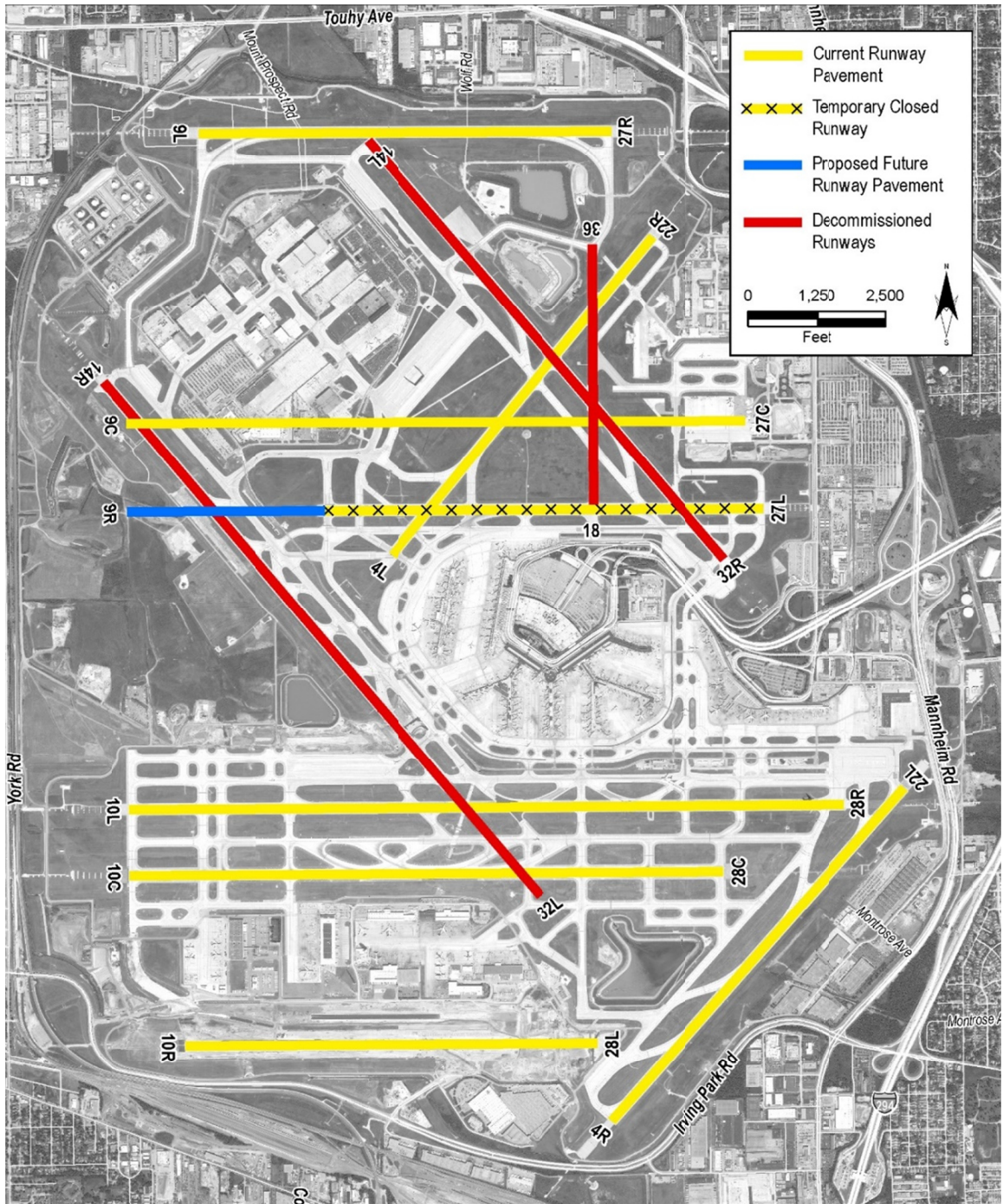
2015 Interim Condition

**Final  
Re-Evaluation of the O'Hare  
Modernization EIS**

► Exhibit 2-2

Figure 9-12. Map of Chicago O'Hare International Airport showing 2015 interim condition.





Source: Letter from Michael Boland, City of Chicago Department of Aviation, to Christina Drovot, FAA, November 5, 2013



Chicago O'Hare International Airport

**Final  
Re-Evaluation of the O'Hare  
Modernization EIS**

2020 Interim Condition

► Exhibit 2-3

Figure 9-13. Map of Chicago O'Hare International Airport showing 2020 interim condition.

surrounding ORD. Notice of the availability of the Draft Re-Evaluation also was published in the *Federal Register*, *Chicago Tribune*, *Chicago Sun Times*, and *Daily Herald* on July 27, 2015.

### **Public Workshops**

To provide the public with opportunities to comment on the Draft Re-Evaluation, FAA hosted four 8-hour public workshops in neighborhoods surrounding ORD. Facilities were selected based on having capacities of approximately 1,000 people, free parking, ADA compliance, and public transportation accessibility. Public workshop dates, times, and locations were published as public notices in the *Federal Register*, *Chicago Tribune*, *Chicago Sun Times*, and *Daily Herald* on July 13, 2015.

FAA efforts to publicize and present the findings of the re-evaluation at the public workshops included the following.

- More than 70 exhibit boards on display. These boards included summary information presented graphically, in tabular form, and as text illustrating various aspects of the Draft Re-Evaluation. Copies of the boards were included in Appendix H, Attachment H-4 of the Final Re-Evaluation report, and can be found online at [ftp://public-ftp.agl.faa.gov/2015%20re-eval/final%20re-eval/appendix\\_h.pdf](ftp://public-ftp.agl.faa.gov/2015%20re-eval/final%20re-eval/appendix_h.pdf).
- Several thousand copies of printed handouts for attendees at each workshop that (1) summarized major findings of the re-evaluation, (2) presented background technical information on how noise is described at ORD, and (3) showed a map and addresses of the 73 libraries where hard copies of the Draft Re-Evaluation document could be reviewed. Electronic copies of the handouts are available for viewing online at the same URL.
- More than 60 individuals representing FAA and contractor staff were available onsite to answer questions from the public and provide assistance to attendees. Among the staff available were many of the technical experts that were directly involved with the analysis for and development of the Draft Re-Evaluation.
- An audio-visual presentation approximately 8 minutes in length described the Draft Re-Evaluation in a voice-over of several key exhibit boards and reviewed the public workshop process. This recording played continuously for public viewing in a separate exhibit hall.
- Brief segments of TAAM animations of the 2015 and 2020 interim conditions were displayed on two large TV monitors in a continuous loop for the duration of the public workshops.
- Representatives from the O'Hare Noise Compatibility Commission (ONCC) were available to answer questions about the O'Hare Residential and School Sound Insulation Programs.
- Security was provided at each workshop using members of local police departments at each workshop location.

The workshops also allowed for the filing of comments on the Draft Re-Evaluation via blank comment forms, court reporters, or other forms of submittals. Spanish-language translators were available throughout the entire 8 hours of each workshop.

In total approximately 2,230 people attended the public workshops over the 4 days. Approximately 2,940 written comment submittals were handed in at the public workshops, and approximately 790 people provided verbal comments to court reporters. Approximately 430 additional submittals were sent directly to FAA via mail, e-mail, or FAX. From these submittals, FAA identified a total of 13,650 individual comments, which were addressed in the Final Re-Evaluation report (FAA 2015b).

## Successes and Lessons Learned

- FAA guidance on EIS re-evaluations does not require public outreach; however, FAA was sensitive to the increased public awareness and concern over the changes at O’Hare and acted to provide a huge public outreach effort.
- FAA management and staff fully embraced their direct involvement in the workshops. Nearly 20 FAA personnel attended all 8 hours of all four events. That included the FAA regional administrator, the acting deputy administrator, the regional division executive manager, the ADO manager and assistant manager, and many other senior staff. Every FAA staff member in attendance participated actively in responding to individual attendees’ questions.
- Preparations for the public workshops were extensive, not just in the preparation and review of all outreach materials, but also in visiting the workshop locations in advance; drafting the room layouts; rehearsing for the workshops and practicing responding to challenging questions; and numerous other behind-the-scenes details.
- Most public comments received pertained to concerns about increased noise and operations and reflected negative and even suspicious attitudes on the part of the commenters, but many comments also acknowledged the degree and quality of the outreach effort.
- Responses to 13,000 comments were processed from the close of the 30-day comment period on August 26, 2015, until the delivery of the Final Re-Evaluation report on October 14, 2015 (FAA 2015b). Spreadsheets were used to document every commenter’s name, address, comment number, comment category, and other information. Comments expressing similar questions or concerns were categorized and expansive responses addressed subtle differences between commenters. The unique approach used to respond to public comments is being applied on another FAA project that involves numerous comments on a NextGen Metroplex study.

## Exemplary Collaboration at European Airports

### Background

The European Organisation for the Safety of Air Navigation (EUROCONTROL), together with core stakeholders and other advisory groups, created the voluntary *Specification for Collaborative Environmental Management (CEM)* (EUROCONTROL 2014). The objectives of the CEM guidebook are to guide the efforts of core stakeholders in increasing ATM capacity and flight efficiency and thereby to support sustainable airport development in general. The guidebook identifies airport operators, aircraft operators, and air navigation service providers (ANSPs) as the core stakeholders, though other entities could be considered core stakeholders depending on the local situation. EUROCONTROL also sees the specification as a practical way to help meet the requirements of the Single European Sky ATM Research (SESAR) program and other pieces of environmental legislation. Although technically it does not fall under NextGen, this effort bears many similarities and relevant details that are applicable to U.S airports and their stakeholders.

In 2008 the concepts and protocols of CEM, though not yet formalized, were documented, and implementation began. EUROCONTROL published a 32-page guidance document that centered on the concept of environmental partnerships for airports (EUROCONTROL 2008). That document defines CEM and explains the protocols to facilitate formation and implementation of a partnership among stakeholders to address environmental challenges at airports. The document also presents a CEM case study involving such a partnership at Manchester Airport (UK). In 2009 David McMillan,

then director general of EUROCONTROL, wrote an article about the fast and continuing implementation of continuous descent arrivals (CDAs) that minimize level flight and therefore reduce noise and emissions (McMillan 2009). In the article McMillan points out that successful implementation of CDA requires cooperative effort among the core stakeholders and points to CEM as a practical path to CDA implementation, further noting that CEM can be applied to address many different environmental issues caused by airport operations. At that time the Single European Sky ATM Master Plan was also promoting CDA and CEM, calling for both to be in common use by 2013, the year the first drafts of the CEM formal specification were created and circulated.

EUROCONTROL worked closely with Airports Council International (ACI-Europe) and interested industry parties over several years to draft the specification to help operators and ANSPs operate and develop airports sustainably. At the 9th ACI Airport Exchange in Paris on November 4, 2014, EUROCONTROL introduced the final draft of the specification. Soon thereafter, ACI-Europe approved the CEM specification as ACI Recommended Practice 3/14. The introduction to the recommended practice document states the following:

The way in which this Recommended Practice helps produce joint solutions is by promoting a better understanding of the business interdependencies between airports, airlines and ANSPs as well as their common environmental impact. The underlying working arrangements represent a natural step forward for environmental management at airports ... CEM addresses real-world needs building on real-world practices ... By offering a general rubric for airport partners to address them [noise, local air quality, and greenhouse gas emissions] in a collaborative manner, the CEM Protocol helps them to identify trade-offs between the objectives and to make informed decisions (ACI-Europe 2014).

## Stakeholder Engagement Methods Used

The underlying principle of the CEM specification is that the collaboration that must take place to solve environmental problems sustainably can be achieved only when all core stakeholders understand the interdependencies of their actions and decisions. The recommended stakeholder engagement method is to establish collaborative working arrangements among stakeholders. The working arrangements ensure that all stakeholders' ideas and concerns in relation to the environmental impacts of a proposed operational change are considered. An example of how this principle is applied at Vienna International Airport (VIE) is described below. Austria's largest airport, VIE is a hub airport with approximately 250,000 aircraft operations annually. The airport is located in the plains of the Dunărea River, east of the terminus of the Alps in eastern Austria. Collaborative working arrangements at VIE incorporate the following elements:

- The Mediation Forum, a series of meetings held throughout the year, brings together representatives of ATC, Austrian Airlines, VIE, mayors of the surrounding communities, elected officials from multiple political parties, and representatives of associations of NGOs. Topics discussed generally concern improvement of the environmental situation around the airport and future development of the airport and its surroundings.
- The Dialogue Forum (an outgrowth of the Mediation Forum) is similar to the Mediation Forum and involves the same stakeholders, but focuses more on the concerns of the surrounding communities, NGOs, and political representatives.
- Working groups are smaller groups that are established as a part of the Dialogue Forum process. Each working group includes personnel appropriate to specific topics relevant to environmental management around airports.
- ATC Operations (ATC-Ops) also holds regular meetings so that representatives of ATC-Ops, the airlines, VIE, and the Ministry of Transport can discuss proposed airspace changes. Additional ATC-Ops meetings also are held specifically with airlines as customers of the airport.

## Successes and Lessons Learned

The CEM process has helped VIE achieve the following successes:

- A high degree of acceptance of current and planned airport operations among surrounding communities, NGOs, and local authorities has been achieved because of the CEM process.
- Targeted, practical mitigation solutions have been possible because of the focused consideration of stakeholder concerns that occurs in the working groups.
- Every complaint or question from participants in the Dialogue Forum at VIE is referred to the appropriate working group, which enables a quick thoughtful response.
- VIE has been successful in avoiding negative environmental impacts on populated areas by proactively engaging local land use planning authorities in its collaborative process.
- VIE now has established contracts with local land use authorities so that it avoids residential development in agreed noise corridors.

Other European airports have achieved results similar to VIE using the CEM process (EUROCONTROL 2014).

# References

**M**uch literature about NextGen has been published. Relevant portions of this material have been reviewed as a part of the research for this guidebook and the accompanying volumes in the *ACRP Report 150* series. References directly used in this guidebook are cited below. These references, along with other relevant material, also appear in a searchable library included with the NextGen Outreach Toolkit.

- ACI-Europe. 2014. ACI-Europe Recommended Practice 3/14: Collaborative Environmental Management. Airports Council International–Europe. Available at: <https://www.eurocontrol.int/sites/default/files/article/files/ACI%20EUROPE%20CEM%20RP.pdf>.
- Bickerstaff, K., Tolley, R., and Walzer, G. 2002. Transport planning and participation: the rhetoric and realities of public involvement. *Journal of Transport Geography*, Vol. 10, No. 1. (March 2002), pp. 61–73.
- Buckley, C. 2013. “A Rumble in the Sky and Grumbles Below.” *The New York Times* (August 25, 2013). Available at: <http://www.nytimes.com/2013/08/26/nyregion/planes-roar-from-above-creates-a-rumble-on-the-ground.html>.
- Cascetta, E. and Pagliara, F. 2013. Public engagement for planning and designing transportation systems. *Procedia - Social and Behavioral Sciences*. Vol. 87, Iss. 0, pp 103–116. Available at: <http://www.sciencedirect.com/science/article/pii/S1877042813040421>. Accessed Dec. 20 2015.
- Chan, M. 2012. “FAA says it should have notified residents of increased plane noise.” QNS.com, September 14, 2012. Available at: <http://qns.com/story/2012/09/14/faa-says-it-should-have-notified-residents-of-increased-plane-noise/>.
- DeLeon, B. 2012. Airports Geographic Information System Transition Policy for Non-Safety Critical Projects. Memorandum to Regional Airports Division Managers (August 23, 2012).
- Dell, M. Interview by David Brancaccio, *Marketplace® Morning Report: Mid-Day Update*. Podcast audio March 6, 2014. Available at: <http://www.marketplace.org/podcasts>.
- Department of Education and Early Childhood Development, Melbourne, Australia. 2011. “Stakeholder Engagement Framework.” Available at: <http://www.education.vic.gov.au/Documents/about/programs/partnerships/stakeholderengagement11.pdf>. Melbourne, Victoria, Australia. Accessed December 20, 2015.
- EUROCONTROL. 2008. Airport Environmental Partnership: A Guide to Implementing Collaborative Environmental Management at Airports. Eurocontrol, November 2008. Available at: [http://www.obsa.org/Lists/Documentacion/Attachments/130/Airport\\_Environmental\\_Partnership\\_EN.pdf](http://www.obsa.org/Lists/Documentacion/Attachments/130/Airport_Environmental_Partnership_EN.pdf).
- EUROCONTROL. 2014. *Specification for Collaborative Environmental Management (CEM)*. EUROCONTROL-Spec-156. (August 9, 2014). Available at: <http://www.eurocontrol.int/sites/default/files/content/documents/single-sky/specifications/20140908-cem-spec-v1.0.pdf>.
- FAA. n.d. NextGen Portfolios. Federal Aviation Administration. Website available at: <https://www.faa.gov/nextgen/snapshots/portfolios/>. Accessed December 15, 2015.

- FAA. n.d. NextGen Portfolio - Improved Multiple Runway Operations. Federal Aviation Administration. Webpage available at: <https://www.faa.gov/nextgen/snapshots/portfolios/?portfolioId=9>. Accessed December 12, 2015.
- FAA. n.d. NextGen Portfolio - Improved Surface Operations. Federal Aviation Administration. Webpage available at: <https://www.faa.gov/nextgen/snapshots/portfolios/?portfolioId=7>. Accessed December 12, 2015.
- FAA. n.d. NextGen Portfolio - Performance Based Navigation. Federal Aviation Administration. Webpage available at: <https://www.faa.gov/nextgen/snapshots/portfolios/?portfolioId=10>. Accessed December 12, 2015.
- FAA. n.d. NextGen Portfolio - Separation Management. Federal Aviation Administration. Webpage available at: <https://www.faa.gov/nextgen/snapshots/portfolios/?portfolioId=13>. Accessed December 12, 2015.
- FAA. 2005. O'Hare Modernization Final Environmental Impact Statement. (July 2005). Chicago O'Hare International Airport, Chicago, Illinois.
- FAA. 2013a. Flight Procedures Teams. Webpage. Federal Aviation Administration. Available at: [https://www.faa.gov/air\\_traffic/flight\\_info/aeronav/procedures/ifp\\_initiation/ifp\\_development\\_offices/](https://www.faa.gov/air_traffic/flight_info/aeronav/procedures/ifp_initiation/ifp_development_offices/).
- FAA. 2013b. NextGen Environmental Management System Framework and Collaboration, Pilot Study Summary Report: Dallas/Fort Worth International Airport (DFW) (January 28, 2013). Office of Environment and Energy. Online document available at: [https://www.faa.gov/about/office\\_org/headquarters\\_offices/apl/research/environmental\\_policy/media/NextGen\\_Environmental\\_Report.pdf](https://www.faa.gov/about/office_org/headquarters_offices/apl/research/environmental_policy/media/NextGen_Environmental_Report.pdf).
- FAA. 2014. NextGen Works for Airports. Brochure. Online document available at: <https://www.faa.gov/nextgen/media/nextgenForAirports.pdf>.
- FAA. 2015a. FAA Response to RTCA, Inc., Blueprint for Success to Implementing Performance Based Navigation Recommendations (Final). AJV-14. 5 (June 2015). Federal Aviation Administration, Air Traffic Organization, Performance Based Navigation Program Office.
- FAA. 2015b. Final Re-Evaluation of July 2005 Environmental Impact Statement and September 2005 Record of Decision. O'Hare Modernization Program. (October 2015). Chicago O'Hare International Airport, Chicago, Illinois.
- FAA. 2016. FAA Instrument Procedures Information Gateway, FAA Aeronautical Information Services. Available at: [https://www.faa.gov/air\\_traffic/flight\\_info/aeronav/procedures](https://www.faa.gov/air_traffic/flight_info/aeronav/procedures). Accessed July 7, 2016.
- Kelly, J., Jones, P., Barta, F., Hossinger, R., Witte, A., and Christian, A. 2004. "Successful transport decision-making. A project management and stakeholder engagement handbook." Guide-maps Consortium. Online document available at: [http://www.osmose-os.org/documents/316/GUIDEMAPSHandbook\\_web%5B1%5D.pdf](http://www.osmose-os.org/documents/316/GUIDEMAPSHandbook_web%5B1%5D.pdf).
- Marsh, E. 2001. "Stakeholder Involvement & Public Participation by the U.S. EPA. Lessons Learned, Barriers, & Innovative Approaches." EPA Report No. 100-R-00-040. United States Environmental Protection Agency Office of Policy, Economics, and Innovation. Jan. 2001.
- Matley, T. 2002. "Effective Public Involvement in Transportation: A Primer for Practitioners." TR NEWS, Public Involvement in Transportation: Best Practices, New Approaches. No. 220. pp. 4-7. May-Jun 2002.
- McMillan, D. 2009. "The Continuing Rise of Continuous Descents." *International Airport Review* (Issue 6). pp. 20-22. <http://www.eurocontrol.int/sites/default/files/article/files/internairportreview-cda.pdf>.

- PANYNJ. 2015. NextGen Now. National Alliance to Advance NextGen. Website. Available at: [www.panynj.gov/airports/nextgen.html](http://www.panynj.gov/airports/nextgen.html). Accessed December 13, 2015.
- Project Management Institute. 2013. *A Guide to the Project Management Body of Knowledge*, 5th ed. Newtown Square, PA.
- Protalinski, E. 2013. "NPD: US homes now hold over 500m Internet-connected devices with apps, at an average of 5.7 per household." The Next Web "Insider" Webpage (March 18, 2013). Document available at: <http://thenextweb.com/insider/2013/03/18/npd-us-homes-now-hold-over-500m-internet-connected-devices-with-apps-at-an-average-of-5-7-per-household/#gref>.
- RTCA NextGen Advisory Committee. 2014. *Blueprint for Success to Implementing Performance Based Navigation: Report of the NextGen Advisory Committee in Response to a Tasking from The Federal Aviation Administration* NextGen Advisory Committee. (October 2014). RTCA, Inc. Washington, D.C. Available at: <http://www.rtca.org/Files/Committee%20Meeting%20Summaries/Summary%20Oct%208%20NAC%20Meeting%20w%20attch.pdf>.
- Susskind, L. and Elliot, M. 1983. *Paternalism, Conflict and Coproduction*. New York: Plenum Press.
- Wheeler, D. and Sillanpaa, M. 1997. *The Stakeholder Corporation*. London: Pitman.
- Woodward, J. M., Briscoe, L. L., and Dunholter, P. 2009. *ACRP Report 15: Aircraft Noise: A Toolkit for Managing Community Expectations*. Transportation Research Board of the National Academies, Washington, D.C., 2009.



## APPENDIX

## Stakeholders in NextGen Implementation

Following is a categorized list of stakeholders in NextGen implementation. This list can be used as a guide when prioritizing stakeholders with which to engage on various NextGen implementation topics.

Category	Stakeholder Type
Airport Users	Passengers
Airport Users	Service Providers
Airport Users	Tenants
Airport Users	Trade Unions
Airport Users	Visitors
Airports	Air Service Development/Marketing
Airports	Community Affairs
Airports	Construction
Airports	Design
Airports	Executive Managers
Airports	Maintenance
Airports	Media Relations
Airports	Operations
Airports	Planning
Airports	Security
Associations	AAAE
Associations	ACI
Associations	NASAO
FAA	Air Traffic Controllers/Air Navigation Service Provider
FAA	Office of Airports
FAA	Joint Program Development Office (JPDO)
FAA	NextGen Program Office - Air Traffic Program
FAA	NextGen Program Office - NextGen Program Planning
FAA	NextGen Program Office - Program Management
Flight Operators	Charter Freight Carriers
Flight Operators	Charter Passenger Airlines
Flight Operators	Express Carriers
Flight Operators	General Aviation - Corporate
Flight Operators	General Aviation - Private
Flight Operators	Scheduled Passenger Airlines
Flight Operators	Shippers

<b>Category</b>	<b>Stakeholder Type</b>
Manufacturers & Suppliers	Aeronautics Industry
Manufacturers & Suppliers	Air Navigation Service Providers (ANSPs)
Manufacturers & Suppliers	Aircraft
Manufacturers & Suppliers	Aircraft Industry
Manufacturers & Suppliers	Avionics
Non-Governmental Organizations (NGOs)	International Civil Aviation Organization (ICAO)
NGOs	Regional Councils of Government
NGOs	Single European Sky ATM Research (SESAR)
Other Agencies	Army Corps of Engineers (COE)
Other Agencies	Bureau of Land Management (BLM)
Other Agencies	Department of Defense (DOD)
Other Agencies	Department of Interior (DOI)
Other Agencies	Environmental Protection Agency (EPA)
Other Agencies	Federal Highway Administration (FHWA)
Other Agencies	Fish and Wildlife Service (FWS)
Other Agencies	National Aeronautics and Space Administration (NASA)
Other Agencies	National Marine Fisheries
Other Agencies	National Park Service (NPS)
Other Agencies	Native American Tribes
Other Agencies	United States Department of Transportation (U.S. DOT)
Public	Local Businesses (Non-Airport Tenants)
Public	Local Elected Officials
Public	Local Residents
Public	Media

*Abbreviations and acronyms used without definitions in TRB publications:*

A4A	Airlines for America
AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI-NA	Airports Council International-North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FAST	Fixing America's Surface Transportation Act (2015)
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
MAP-21	Moving Ahead for Progress in the 21st Century Act (2012)
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TDC	Transit Development Corporation
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S.DOT	United States Department of Transportation

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