Airports’ Role in the Development and Implementation of Performance Based Navigation (PBN) Flight Procedures

Airports Council International-North America
NextGen Working Group
Version 1.1, March 2013
Acknowledgements

ACI-NA wishes to thank all the NextGen Working Group members who took the time to develop this paper on a voluntary basis. In particular we would like to thank those individuals who led this effort:

- Chad Leqve, Minneapolis-St. Paul Metropolitan Airports Commission
- Rick Busch, Denver International Airport
- Mary Ellen Eagan, Harris Miller Miller & Hanson, Inc.
- Jason Schwartz, Port of Portland

We also would like to thank members of ACI-NA’s NextGen Working Group, Operations & Technical Affairs Committee, and Environmental Affairs Committee that contributed to the materials included in the paper and its review.
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Executive Summary

“NextGen begins and ends at airports.” – Greg Principato, ACI-NA President

A critical component of the Federal Aviation Administration’s (FAA) Next Generation Air Transportation System (NextGen) is Performance-Based Navigation (PBN). FAA’s focus on the design and implementation of PBN aircraft procedures has accelerated. The Airports Council International – North America (ACI-NA) established the NextGen Working Group to assist airports in understanding the issues related to PBN and the critical role that airports play in the deployment of PBN procedures throughout the National Airspace System (NAS).

The NextGen Working Group was tasked with developing this white paper to provide information on how airport members can effectively engage the FAA Air Traffic Organization (ATO), airport operators (including airlines general aviation operators), and community stakeholders as critical partners during the development of PBN procedures, with a goal of providing benefits to all stakeholders, including airports and local communities.

The focus of this paper is on PBN as a critical element of the NextGen architecture. PBN will bring new capabilities to airports across the nation. However, leveraging this technology through successful implementation will require the active and sustained involvement of U.S. airports in the procedure design and implementation processes and a prioritization by ATO of this involvement in its process. Maximizing the benefits of PBN will depend on inclusive collaboration among all stakeholders including the FAA, aircraft operators (specifically commercial and corporate aviation), and airports.

Proactive and early engagement by airports, that is recognized by ATO in its leadership role, bringing a coordinated plan that evaluates the effects on existing programs and provides documentation and analysis of needs, in a manner that incorporates community coordination and local perspectives, is critical to ensuring that airport and community needs are incorporated in the PBN design and implementation process.

Although the specifics and scope of this process will vary airport to airport, the need for a collaborative approach which includes airport involvement and an understanding of local interests and concerns will not. Airports can provide tremendous value to PBN development and help ensure the success of, and community support for, implementation.
This section provides details on the Federal Aviation Administration’s (FAA) Next Generation Air Transportation System (NextGen), focusing on the critical component of Performance-Based Navigation (PBN) that will provide for the next evolution in aircraft navigation and operational efficiency in the National Airspace System (NAS). Special attention is given in this section to the various stakeholders’ interests in the successful implementation of NextGen, and specifically PBN.

The focus of this paper is on PBN as a critical element of the NextGen architecture. PBN will bring new capabilities to airports across the nation. However, leveraging this technology through successful implementation will require the active and sustained involvement of U.S. airports in the procedure design and implementation processes. Maximizing the many benefits of PBN will depend on inclusive collaboration among all stakeholders including the FAA, aircraft operators (specifically commercial and corporate aviation), and airports.

1.1 Basics of NextGen

The National Airspace System (NAS) is the critical component in air transportation within the U.S. Just as roads and highways provide thoroughfares for automobile transportation, the NAS provides the infrastructure that enables the safe and efficient flow of people and goods through the sky. Although the current elements of the NAS, including ground-based surveillance and communication technologies, have served the country well for more than a half century, there have not been substantial updates to the supporting infrastructure and airspace procedures in decades.

To meet this modernization need, the FAA has developed a program referred to as the Next Generation Air Transportation System (NextGen), which includes complex initiatives ranging from concept development to the deployment of new capabilities in the NAS. NextGen is the FAA’s effort to transform and modernize the NAS by increasing capacity, efficiency, and safety. These increased efficiencies will allow the NAS to better handle forecast air traffic growth while concurrently improving safety, reducing environmental impacts, improving operational returns, and increasing access to the NAS.

Key elements of NextGen include the following:

- Automatic Dependent Surveillance-Broadcast (ADS-B) to enhance surveillance and support enhanced communications
- Collaborative Air Traffic Management Technologies (CATMT) to improve air traffic control efficiency
- Data Communications (Data Comm) to enhance air traffic communications
- Common Support Services – Weather (CSS-Wx) to provide more accurate, useful real-time weather data to pilots and other system users
- National Airspace System Voice System (NVS) to improve voice communications capabilities in the NAS
- System Wide Information Management (SWIM) to provide a means to share data and other flight critical information among NAS users
- Performance-Based Navigation (PBN) relying on a more robust set of navigation sources, including satellite-based navigation sources

As detailed above, NextGen includes many new navigation, communication and data-sharing technologies that will help to transform the NAS.

**Performance-Based Navigation**

PBN represents a shift from sensor-based to performance-based navigation requirements, providing a framework for defining performance requirements that contain detailed aircraft and pilot requirements. These requirements are defined in terms of accuracy, integrity, availability, continuity and functionality required for precise operations in the context of a particular airspace, when supported by the appropriate navigation infrastructure.

Put another way, with PBN, the types of flight procedures an aircraft can fly will be determined by enhanced technology and the capabilities of the aircraft, rather than by the capabilities associated with, and the locations of, traditional ground-based navigational aids. PBN relies on a variety of sources for navigational information—including satellite- and aircraft-based sources—rather than solely relying on fixed ground-based radio beacons like very-high frequency omnidirectional ranges (VORs), localizers, and glide slopes.

In terms of the terminal area airspace around our nation's airports, Area Navigation (RNAV) and Required Navigation Performance (RNP) represent the major components of PBN that will help to define arrival and departure procedures at airports as part of NextGen.

RNAV enables aircraft to fly on any desired flight path within the coverage of ground- or space-based navigation aids. RNP allows for onboard performance monitoring and alerting capability and informs the crew if the system is not functioning in accordance with predetermined standards; it also allows increased situational awareness with reduced separation requirements, allowing the ability to condense controlled air traffic. RNAV and RNP procedures create synergies that result in significant benefits to both industry and community stakeholders. These benefits can include reductions in flight time and total miles flown, reductions in fuel-burn, enhancements to efficiency, airspace and airport capacity, and safety. Resulting environmental benefits include reduction in aircraft emissions (including criteria pollutants and greenhouse gases), noise reduction (based on integration of an Optimized Profile Descent), and flexibility in aircraft routing (ground track) to minimize or avoid overflight of non-compatible areas when within the terminal airspace. Additional operational benefits allow the de-coupling of traffic flows in complex airspace, safety enhancements associated with reduced risk of Controlled Flight Into Terrain (CFIT) due to increased lateral and vertical situational awareness, a reduction in diversions caused by adverse weather conditions, and enabling aircraft to reliably access airports with lower visibility restrictions.

*The benefits of PBN are significant for a variety of stakeholders.* As an example, the FAA estimates that implementation of RNP approaches at Seattle International Airport (as
opposed to Boeing Field) will result in reductions in fuel burn by as much as 30 percent on selected routes, with the number of residents expected to experience decreased noise outnumbering those experiencing an increase by more than two to one. Moreover, the new RNAV/RNP arrival routes and RNP/RVFP approaches will permit ATC to issue simpler instruction and let the aircraft’s Flight Management System (FMS) fly the preprogrammed route, including vertical and lateral track information, all the way to the landing runway, increasing efficiency and further reducing opportunities for communications errors.

The FAA has begun implementing new PBN routes and procedures that exploit these technologies and related aircraft navigation capabilities. In many cases this is occurring as part of the Optimization of Airspace and Procedures in the Metroplex (OAPM) initiative, while in other cases the procedures are being implemented at the airport level.

Section 213 of the 2012 FAA Modernization and Reform Act identifies the need for accelerated implementation of NextGen technologies. The Act establishes reporting requirements for Operational Evolution Partnership (OEP) and non-OEP airports, detailing RNP/RNAV procedure development, certification and publication requirements. Section 213 also calls for the coordinated and expedited review of PBN procedures. This review process presumes that all procedures developed under Section 213 of the Act are Categorically Excluded (CatEx) from further detailed environmental review unless extraordinary circumstances are determined to exist by the FAA Administrator. Specifically, the Act states that “Any navigation performance or other performance based navigation procedure developed, certified, published or implemented that, in the determination of the Administrator, would result in measurable reductions in fuel consumption, carbon dioxide emissions, and noise, on a per flight basis, as compared to aircraft operations that follow existing instrument flight rule procedures in the same airspace, shall be presumed to have no significant effect on the quality of the human environment and the Administrator shall issue and file a categorical exclusion for the new procedure.”

ACI-NA expressed its concern with the interpretation and implementation of Section 213 in a letter to FAA, dated June 12, 2012. A copy of the letter is provided in Appendix A. In October 2012, ACI-NA was asked to participate with other industry stakeholders on a
Working Group convened under the FAA’s NextGen Advisory Committee to review provisions Section 213—particularly how noise reductions can be evaluated on a per flight basis. As of March 2013, these efforts are ongoing.

ACI-NA expressed its concern with the interpretation and implementation of Section 213 in a letter to FAA, dated June 12, 2012. A copy of the letter is provided in Appendix A. ACI-NA has subsequently been asked to participate in a NextGen Advisory Committee review of the language.

1.2 Understanding Stakeholder Interests

There are a wide range of stakeholders who will be responsible for successful implementation of Performance Based Navigation (PBN) procedures, including: the FAA, airlines (and other airport users), the flying public, airport neighbors, and the Airport Operator.

Airlines and other aircraft operators have traditionally been leaders in assisting the FAA with making progress to implement PBN procedures and routes largely because of the reduced flight time and the associated fuel savings. In addition to fuel savings, other airline interests include having reliable access to cities with difficult approaches/departures and regular poor weather conditions, the cost of technology and crew training versus the ability to recoup those costs, and the timeline for implementation of PBN procedures and routes.

The flying public generates the demand for air travel. In recent years, the public has been very vocal about the adequacy of air service, schedule reliability, and airline communications about delays/cancellations. While the details and intricacy of PBN may not be understood by the flying public, the net benefits of safety, efficiency, reliability and sustainability are supported.

There are many significant benefits for communities located near airports. Airports provide tremendous economic impact for their community as well as support for essential services including law enforcement, firefighting, and emergency medical services. Communities surrounding airports can also experience other impacts. These include exposure to aircraft overflights/noise, emissions and local traffic congestion. The FAA’s 1976 Aviation Noise Abatement Policy makes clear that the communities’ role is to work with the airport and other stakeholders to understand the noise conditions and what can be done to mitigate the impacts. As a result, many airport operators have a long history of working with their communities to establish balanced and cost-effective ways of reducing impacts, including noise abatement procedures. Changes to these procedures may be met with resistance, unless outreach is made to the neighbors to explain the change and the anticipated effects. Although in some cases noise exposure levels in surrounding communities are not expected to result in significant changes with the implementation of PBN procedures, with minor increases and decreases in noise projected (most on the order of 0.1 to 0.2 dB, but some areas experiencing up to a 1 dB change), meeting local outreach expectations is critical.

The airport operator is in the unique position to address and understand the interests of all stakeholders. The Noise Abatement Policy notes that airport operators are “primarily responsible for planning and implementing actions designed to reduce the effect of noise on residents…” Since PBN procedures and routes can be designed for individual airport approaches and/or departures, airports have an opportunity to ensure that users have
access to state of the art technology and to procedures that are as efficient as possible, while minimizing the negative effects on the local community.

In general, most of the interests and objectives of the individual stakeholders are aligned; all are seeking a safe and efficient system that serves the interests of all stakeholders. However, interests may diverge based on expectations or communication/outreach. Industry stakeholders at some locations have implemented PBN procedures and routes with little or no input from others or with ATO procedure planning and publication process schedules that did not allow for the time required to adequately implement locally developed outreach strategies. In many cases, the airport operator's involvement has not been requested and in many others, community involvement has not been sought. While in many cases proposed PBN procedures and routes are not expected to result in adverse effects, not involving stakeholder input has created distrust that takes time and effort to overcome.

Airports are an important stakeholder representing a critical strategic resource in the successful implementation of PBN in a manner that reduces opposition from community stakeholders and maximizes the operational and environmental benefits of the technology.

Airports have extensive knowledge about local politics and community expectations regarding engagement and environmental considerations related to proposed government actions. This insight, and the related relationships and processes, are critical factors that should not be overlooked in the PBN design and implementation process.

With this in mind, airports must position themselves as a critical resource for the FAA ATO and other industry stakeholders to ensure local expectations are understood and respected, conflict is minimized, and the technology is leveraged to the maximum extent possible, not only providing operational and safety benefits, but environmental benefits as well.
In short, the airport’s role is best defined as a resource to ensure that the ATO’s process adequately considers local community expectations, the technology is leveraged to the greatest degree possible providing environmental benefits and operational and safety gains, and that efficiencies are leveraged to reduce capital costs at the airport. Accomplishing this requires a proactive approach with the FAA ATO with thorough and persistent engagement while providing valuable contributions to the effort.
This section focuses on two areas that represent opportunities for airports to leverage PBN to provide specific benefit to airports and the communities around them. Specifically, leveraging PBN as an environmental asset and as an important gateway technology allowing enhancement of operations and reducing capital costs represent important considerations for airports.

### 2.1 PBN: Environmental Considerations for Airports

The introduction of more efficient flight routes and climb and descent profiles made possible by PBN can substantially reduce fuel consumption and associated air emissions. This benefit is most pronounced with respect to greenhouse gas emissions, which are generated throughout the duration of the flight. While reductions in the pollutants regulated by the Clean Air Act (criteria pollutants) are less dramatic because such pollutants are only relevant at lower altitudes (typically below 3,000 feet above ground level), the introduction of PBN procedures can nevertheless improve regional air quality.

The noise benefits of PBN procedures are more localized. Concentrating aircraft arrivals and departures in noise tolerant corridors has always been a staple in noise compatibility planning. Historically, the ability to keep aircraft in noise abatement corridors has been complicated by difficulties in defining the corridors so that pilots could easily stay within them. Visually defined corridors (typically designed around ground-based references) are difficult to follow at night or under poor weather conditions and, even when visibility is not an issue, visual cues may not be clearly visible in the cockpit (particularly if the aircraft is climbing), or to flight crews unfamiliar with the area. In addition, the benefits of ATC vectored noise abatement flight tracks have been limited by the natural dispersion of flight tracks flown due to atmospheric conditions, individual pilot and air traffic controller techniques, and different aircraft performance characteristics.

The introduction of PBN technology enables pilots in suitably equipped aircraft to follow very precise tracks over the ground. When this ability is coupled with required time of arrival (RTA) capabilities that meter aircraft more precisely on approach paths, it becomes possible to concentrate more aircraft activity in narrower corridors than has been possible prior to NextGen. Implementation of continuous climb profiles and Optimized Profile Descents (OPD) that minimize the need for aircraft to fly level segments at relatively high power settings on departure and approach can reduce noise for communities that remain under the departure and approach corridors. Collectively, these techniques can substantially reduce noise exposure in the airport environs.

The early and sustained involvement by airports in the design of PBN procedures, and an associated recognition by ATO of the importance of this as a priority in its planning process, are critical components to ensure that the implementation addresses desired airport benefits and adopts an approach that supports existing airport noise measures, explores new solutions to existing noise issues, and addresses the public’s expectations for environmental benefits and review.
The relationships that airports have with their communities, knowledge of community expectations relative to the environmental review and environmental benefits, and the strategies to ensure that the PBN initiative addresses these factors in the design and implementation process, are critical components to the ATO’s success. This needs to be established early, and preferably proactively, by the airport in the process with the ATO as well as other FAA stakeholders (e.g. Airports District Office).

To accomplish this, airports must understand how existing noise abatement procedures could be impacted or enhanced, and new opportunities pursued, as part of the procedure design process. To accomplish this, airports must assess the environmental needs to help establish an environmental strategy for the PBN design and implementation. In addition, it is critical that airports help ATO establish environmental review expectations that align with community expectations, and communicate those to the ATO and other industry partners, prior to commencement of PBN design.

By bringing comprehensive insights and community and political supported initiatives to the PBN process early on, airports legitimize themselves as significant contributors in the successful implementation and realization of the many airport and environmental benefits that can result from effective PBN procedure design and implementation. Although this is a critical component in the success of PBN initiatives, equally critical is ATO’s willingness to place this as a high priority, and dedicate adequate resources and time to these efforts in its procedure planning and implementation process, to ensure the community expectations are met.

### 2.2 Enhancing Operations and Reducing Capital Costs through PBN Design and Implementation

There is significant potential for PBN to allow airport operators to get more capacity out of available and planned infrastructure. Gauging the impact of this on airports should, therefore, be a part of the airport planning process.

RNAV procedures can provide economic and safety benefits in all phases of flight, including departure, en route, arrival, approach, and transitional airspace. In addition to the environmental benefits discussed above, other potential benefits to airports and their constituents include:

- Increased predictability of operations
- Reduced interaction between dependent flows of traffic in complex airspace

RNAV Required Navigation Performance (RNP) procedures have been used across the NAS to improve or replace existing procedures and allow airspace redesign at a level that would not have been possible using ground-based NAVAIDS. RNAV RNP has been used successfully to develop arrival and departure procedures (SIDs and STARS) that reduce variability of arrival and departure profiles while optimizing fuel burn. Optimizing flight paths through the use of this technology is also reducing flight track miles significantly as more of the procedures are implemented.

RNAV RNP can also be used to create approach procedures known as RNAV RNP ARs (Authorization Required). Within certain limitations RNAV RNP AR procedures can incorporate curved approach paths and provide for navigational performance within .3 or less nautical miles on portions of the procedure. Operators using these procedures must be equipped, trained and “signed off” (authorized) by the FAA before using them.
RNAV RNP does not by itself add capacity to a terminal area, but the use of RNAV capability coupled with more precise surveillance tools being introduced with NextGen, such as ADS-B, can offer unique opportunities, especially in congested terminal areas. For example, in certain terminal areas an airport’s proximity to another airport can have an impact on the capacity of one or both of the operations. In many cases the “containment” aspect of RNAV RNP may be used to “decouple” the operations and allow the airports to run independently of each other and at full capacity during a greater range of weather conditions.

PBN is a critical gateway technology that provides access to other NextGen benefits in the areas of aircraft and airport operations, airport planning and development, and can open up opportunities for better timing, or avoidance, of capital cost. PBN is flexible, safe and portable and has been implemented across all of the NAS operating environments.

It is important to note that within the NextGen NAS the impact on the airport and its systems will extend well beyond the surface of the airport. Related to departures, the operating environment of the airport will come into play well before passengers are boarded and will extend to the top of aircraft climb. Related to arrivals, managing the smooth arrival of a flight will commence well before top of descent and go beyond gate arrival. Improved Approaches and Low Visibility Operations, Improved Surface Operations, Closely Spaced Parallel Runway Operations, Converging and Intersecting Runway Operations and PBN are just a few of the nine “Implementation Portfolios” referenced in Appendix B of the NextGen Implementation Plan (NGIP). These portfolios offer significant improvements in the ability of airports to operate more efficiently in all weather conditions. In addition, the Wide Area Augmentation System (WAAS) and other advances to the remaining surface-based approach aids will greatly reduce the cost to maintain all weather capabilities.

NextGen programs such as Wake Re-categorization (RECAT) and Closely Spaced Parallel Operations (CSPO), when combined with PBN, can add capacity and reduce delays at congested airports. Airports with significant capital outlays for runways and taxiways in their master plans need to consider the timing of such investments where these programs are driven by congestion-related delay estimates. For example, RECAT is expected to add as much as five percent more capacity at congested airports when it is needed most – in heavy mixed afternoon operations. When these components of NextGen are available at each airport it could have an impact on the timing of important investment decisions and possibly alternative costs.

Specific delay reduction estimates have been tied to NextGen programs through the 2015, or “near term NextGen,” time frame. This work is being done by the FAA’s “Future Airport Capacity Task” group (FACT). Other programs through 2020 (the mid-term) have been identified as having potential to reduce delays, though the FAA has not published specific estimates yet. Beyond 2020 much of NextGen is still in the concept definition stage. As these programs get closer to implementation, their impacts will become estimable. Planning for their impact on capital programs will be easier and could well delay or possibly negate the need for (expensive) capital projects.
This section provides strategies in the critical areas that airports must consider to successfully ensure their environmental and operational goals are understood and addressed in the Performance Based Navigation (PBN) implementation process.

### 3.1 Essential Airport Considerations in Effective PBN Development and Implementation

Airports have much to lose, as do the FAA and aircraft operators, if community support disintegrates and controversy and legal actions follow. As has been said, “airports are the face of NextGen to the community,” not the FAA and not aircraft operators who are typically removed from local community actions and concerns. Airports need to help both industry stakeholders (e.g. FAA and aircraft operators) and the community stakeholders in understanding the collective interests and managing expectations on both sides. The FAA and aircraft operators need to understand that, in many respects, “NextGen begins and ends at airports”. Past airspace efforts such as the Expanded East Coast Plan and the original RNAV procedure implementation at Las Vegas became controversial due to perceived community impacts. Other efforts have been successful when the airports have been engaged in PBN development: Denver, Portland, and Minneapolis are good examples.

### 3.2 Engaging Industry (FAA and Aircraft Operators) Proactively with Communities

It is vitally important to the success of any PBN effort for airports to be involved at the beginning of development efforts. Long before procedure development begins airport operators need to be aware of, and involved in, the concepts that underlie PBN procedures development.

Early partnering for the PBN planning and implementation should be supported by airport’s senior management, local FAA ATO and ADO leadership, lead airlines and other principal aircraft operators at the airport. This is the key to insuring airport involvement as PBN procedure development begins. As part of the partnering effort, airport management and staff must establish their credibility in the process and demonstrate the value of airport participation.

Airports are involved with community and local/regional outreach to all impacted constituencies. No other entity impacted by, or involved in, PBN development has the local presence or level of responsibility to the community that the airport operator does. Communities that are concerned about noise, operators that are focused on cost, safety groups, local governmental entities, state agencies and many others all have vital interest in changes to the use of local and regional airspace. Getting these constituents involved and managing their input and expectations is a very important part of PBN development that has, to date, been handled with varying degrees of success. Each of
these constituencies has different perspectives and different specific needs and interests. It is rare, however, that they are truly at cross purposes. PBN development represents a unique opportunity for the local airport operator to act as an important resource to ATO in bringing them all together with the possibility of making the system work better for everyone.

Involvement at the concept stage of PBN development by airports, in a manner that brings the above-mentioned insights to the table, assures that PBN development efforts will be directed properly. A procedure that is developed with the sole focus on gaining a categorical exclusion (CatEx) from the NEPA process as an implementation objective may provide some fuel savings and emission reduction benefits but may miss opportunities to provide noise reduction or other benefits if the airport and communities are not engaged in the process. Airports typically know more about, and deal with, environmental sustainability regulations and processes more than the local air traffic facilities and airlines. This is also the case with local politics, funding and a host of other vitally important issues that airports manage as part of their being the stewards of vital community resources.

### 3.3 Establishing the Airport as a Critical Resource in PBN Engagement with Community and Industry Stakeholders: Case Studies

By serving as an important resource to ATO in its formalization of a proactive community dialogue plan, airports can ensure that the local community perspective is understood and that the FAA and airport users grasp the importance of considering these perspectives. By airports advising ATO on the establishment of community and industry dialogue mechanisms, procedure design environmental and operational goals can be enhanced, a framework for planning and environmental review can be focused, and operational and safety needs understood by community stakeholders. This process can take many forms. A common approach is through ongoing noise committees or special purpose working groups. Many airports have standing committees or working groups that bring airport operators, air traffic controllers, airport users and community members together. In some cases, these organizations have been active for decades. ATO participants in such groups have been able to see how the application of PBN technologies could solve problems raised by airport staff or members of the community. ATO management participation in such groups also helps to educate them about community concerns, which can be valuable as they participate in FAA initiated PBN implementation.

The following case studies illustrate some of the ways in which airports have initiated communications with communities and ATO to enhance the performance of noise abatement procedures and to avoid or mitigate the degradation of existing noise abatement procedures in FAA initiated airspace or procedural changes.

- **Portland International Airport** (PDX) has a long history of noise compatibility planning that includes maintaining a Noise Advisory Committee which includes ATCT representation. Their Part 150 study recommended the use of “satellite based navigation” to enhance conformance to noise abatement departure and arrival corridors. As a result of the airport’s efforts between 2000 and 2007, the FAA published RNAV departure procedures that enhanced the performance of the airport’s approved Noise Compatibility Program (NCP). This working relationship also proved to be beneficial when the Port approached the FAA to
request development RNAV/RNP arrival procedures to enhance the precision and predictability of noise abatement arrival procedures and to incorporate the use of Optimized Profile Descents which reduced single-event noise levels as well as emissions and fuel-burn. Through coordination with the local FAA ATCT and partner airlines, the airport noise office was eventually able to work with the ATO to make the procedures consistent with the NCP.

- **Denver International Airport** (DEN) has maintained a dialogue with FAA's TRACON and Tower since the new airport was built in 1995. The intergovernmental agreement that permitted Denver to build the new airport in Adams County limits the amount of noise the airport can generate at specific locations. Failure to comply with these noise limits results in substantial financial penalties. For that reason, airport staff, working with ATC staff, routinely monitor flight tracks in an effort to stay within the noise limits imposed by the agreement. This ongoing relationship helped airport staff to actively participate in an FAA-initiated Metroplex study. Airport staffs are especially concerned about the effects of concentrating aircraft activity on RNAV routes over the locations specified in the intergovernmental agreement. The need for the airport to monitor compliance with the agreement also provided airport staff with the tools and expertise to understand how proposed changes would affect the noise environment and to participate in the PBN development process. Local FAA staff considered the Airport’s suggestions and integrated them, to the extent possible, in the PBN-based airspace redesign. New RNAV/RNP STARs arrival routes were successfully implemented in December 2012 and new RNAV SID departure routes are scheduled for implementation in February 2013.

- **Los Angeles World Airports** (LAWA) has long participated in a Noise Round Table in which representatives of the Tower and TRACON, along with a wide range of community interests, participate. Over the years, this dialogue has led to the implementation of measures, including RNAV departures, to reduce noise exposure for airport neighbors. The FAA’s willingness to consider procedural changes to enhance noise compatibility depends to some degree on the attitudes of the individuals representing ATO. Having established lines of communications with the Tower and TRACON have also been helpful in correcting unexpected problems that have occasionally arisen following the implementation of new procedures. More recently, the FAA has initiated work on the Southern California Metroplex study to enhance efficiency as part of the NextGen initiative. LAWA staff have been invited to briefings and been given and opportunity to comment on proposed procedural changes. This opportunity has enabled LAWA to prepare for meaningful participation in the Metroplex study.

- **Louisville International Airport** (SDF) sought to implement SIDs to enhance compliance with noise abatement departure routes incorporated in its NCP. During this time UPS, the airport’s major user, sought to establish STARs to enhance efficiency. Although the ATCT Manager’s attendance at meetings of the airport’s Community Noise Forum helped to bring the community’s concerns to the ATO’s attention, the airport was not initially invited to participate in the development of these procedures. The airport was eventually able to get involved in the process and the FAA ultimately agreed to implement both SIDs and STARs. The airport noise office considers the preservation of the measures in the NCP to be the primary benefit of the airport’s involvement in the process.
• **Nashville International Airport** (BNA) initiated a Part 150 update that started at about the same time that FAA initiated work on PBN procedures. This fortunate coincidence created a situation in which the airport was well prepared to participate in the PBN implementation process. As a result, the airport was able to point out inconsistencies with the noise abatement program that were subsequently resolved.

• The **Minneapolis-St. Paul International Airport** (MSP) Noise Oversight Committee (NOC) began investigating the use of RNAV to enhance operational compliance with longstanding vectored noise abatement procedures at MSP in 2007. Through coordination with FAA, the FAA's PBN Program Office determined that MSP was an excellent airport for airspace-wide RNAV and RNP implementation given the present airspace design and the lack of conflicts with other airport airspaces. Subsequently, local FAA Tower personnel moved forward with the airspace-wide RNAV and RNP implementation at MSP. With the exception of one procedure that proceeded forward independently, all of the noise-specific RNAV work conducted by the NOC was incorporated into the airspace-wide FAA initiative. In 2011, the NOC began the process of establishing procedure design noise criteria to be forwarded to the FAA for consideration in the procedure development/implementation process at MSP. The Committee unanimously adopted noise abatement goals and criteria that were used as part of a collaborative process between the MAC, FAA, and communities as part of the procedure design and implementation process at MSP. This effort has resulted in establishing local support for RNAV/RNP OPD approaches to all of the major runways (six different approaches) at the airport and RNAV SIDs for departure operations off of three of the five major runway ends at the airport. Due to continuing community concerns related to RNAV SIDs off Runways 30L and 30R, those implementation efforts have been postponed by ATO. Pending final SMS panel review, the locally supported RNAV/RNP OPD approaches are planned to be published in July 2014 and the RNAV SIDs are planned to be published in September 2014.

The above examples provide insight into the various forms that an airport’s coordination role in a proactive dialogue about PBN design and implementation can take. The exact approach at an airport will be determined by existing communication mechanisms and noise program planning strategies.

### 3.4 Establishing the Airport as an Important PBN Design and Implementation Resource for the FAA ATO

As a valuable resource for the FAA, airports need to bring information to the table to help in the process of addressing unique local needs effectively. These value-added contributions to addressing these issues legitimize the airport as a critical contributor to the success of the PBN design and implementation process. This provides an opportunity for airports to work with the FAA and aircraft operators to make their airfields more efficient and environmentally compatible and to meet both national and local needs.

In addition to providing a locally coordinated position on procedure design and environmental review expectations, airports bring data regarding their operations, air traffic characteristics, established procedures and local technical knowledge to the process. Airports should be prepared to help the FAA ATO address local interests in the context of this information. These contributions may include providing information to ATO that
bridges the possible gaps between FAA ATO information and process plans and what the communities expect, as well as providing input and data for ATO evaluations of the effect of the procedures on airport and aircraft operation efficiencies in the context of existing and forecasted operations and development plans at the airport. As airports and local communities place environmental demands on the PBN design and implementation process, airports must be prepared to contribute insights to the ATO as it addresses the environmental analysis and evaluation processes that are necessary to ensure local community expectations and environmental goals are met. This approach will position the airport and community environmental expectations and requests in an effective manner with FAA ATO by ensuring critical environmental elements are included in the procedure design while offering to advise FAA ATO to ensure that local insights are contributed to the effort.

Airports also have a keen interest in the operational and safety benefits that will flow from PBN design and implementation. Ensuring that PBN is leveraged in a way that compliments airport development plans to meet future demand and capacity requirements is critical. Airports are well-positioned to act as a critical resource for the FAA ATO with its efforts to address these issues, not only in the case of their own inquiry, but also those of their tenant airlines, in a manner that includes existing airport planning and related operation forecast documents.

Providing input on FAA ATO operation simulations that are based on airport plans and related operation forecasts could help to ensure that the PBN initiative is meeting the intended operational goals and meeting the airport and airline interests in operational efficiencies in the context of existing and future scenarios at the airport.

Just as airports proactively engaging the FAA ATO on PBN design and implementation is critical to ensuring the airport and community interests are considered, sustained dialogue and collaboration with the FAA ATO on future enhancements is critical to ensure future developments are conceptualized and implemented in a consistent fashion.
Appendix A

June 12, 2012 ACI-NA Letter to FAA
Regarding Section 213
June 12, 2012

Ms. Christa Fornarotto
Associate Administrator for Airports
Federal Aviation Administration
800 Independence Ave., SW
Washington, DC 20591

Dear Ms. Fornarotto:

Airports Council International-North America (ACI-NA) has been a strong proponent for accelerated implementation of the Next Generation Air Transportation System—or NextGen. We have been particularly supportive of NextGen capabilities that enhance airport safety, capacity, and efficiency or reduce aviation’s environmental footprint either through noise or emissions reductions. Such capabilities include required navigational performance/area navigation (RNP/RNAV) flight procedures including optimized profile descent and climb procedures, airport surface management systems, and air traffic automation systems that facilitate more efficient time-based flow management techniques.

You have probably heard us say “NextGen begins and ends at airports.” First coined in 2008, we believe that this phrase accurately encapsulates our vision for airports in the implementation of NextGen—how the benefits the program will provide to its environmental impacts, both positive and negative, to the need for airports involvement from inception to implementation.

In order to realize NextGen benefits, airport operators—who know the communities they serve best—must be involved in the development of NextGen capabilities in and around their airports early in their development to ensure noise and other environmental impacts on their surrounding communities are considered appropriately. This is especially true when NextGen implementation involves changes to existing flight procedures and associated aircraft noise exposure. Without such involvement, we risk potentially lengthy and expensive legal and environmental challenges to NextGen initiatives. We also risk undermining hard won credibility that airports have established with their communities.

In this context, ACI-NA is very interested in the NextGen provisions contained in the Federal Aviation Administration (FAA) Modernization and Reform Act of 2012 (the Act). We are especially interested in Section 213, which facilitates expedited environmental review of RNAV/RNP flight procedures under certain conditions.

As we have already noted, ACI-NA strongly supports NextGen implementation and has long been a proponent of expedited environmental reviews of critical improvements to our National Airspace System. However, we are concerned that the requirements in the Act related to the categorical exclusion (CatEx) could result in conflicts with environmental reviews conducted under the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) guidance.
We are also concerned that if procedures receive categorical exclusions without appropriate consideration of community noise impacts, they can undermine years of work airports have put into working with their communities. In turn, this would set the stage for adversarial relationships between these communities, airports, and the FAA during future NextGen and airport infrastructure development efforts.

We understand that the FAA is currently working to develop procedures, guidance, and analysis methodologies to implement the provisions contained in Section 213 of the Act. In keeping with the spirit that NextGen begins and ends at airports, ACI-NA and our member airports would like to be involved in these discussions. We hope that these discussions can address a number of questions, including:

- How can the language in Section 213 of the Act be reconciled with FAA orders implementing the National Environmental Policy Act (NEPA) and recent Council on Environmental Quality (CEQ) guidance on categorical exclusions, particularly the requirement for federal agencies to consider the potential for extraordinary circumstances in issuing categorical exclusions?

- How can we as an industry communicate the accelerated environmental process to communities that already have long-standing expectations regarding NEPA processes and associated public review requirements?

- How will "measurable reductions in aircraft noise on a per flight basis" be estimated and how can this new noise metric be reconciled with the Federal government's decades-old reliance on the cumulative Day-Night Average Sound Level (DNL) in defining noise impact around U.S. airports?

- To what extent will environmental analyses conducted in order to establish particular procedures' eligibility for categorical exclusions involve stakeholder involvement including that of airport operators?

- How will existing airport noise mitigation program elements (e.g., flight tracks established under a 14 CFR Part 150 program) be considered in the development Section 213 procedures?

We also believe that airport officials at facilities where RNP/RNAV procedure implementation will be accelerated must be involved in procedure development from inception to implementation. Doing so will ensure that local issues—including noise concerns, planned infrastructure improvements, unique airport operational characteristics, and existing environmental commitments—can be taken into consideration early in the procedure design process.

Recent experiences in Minneapolis, Denver, and Seattle all provide excellent examples of the value of early coordination and collaboration among the FAA, airport operators, the airlines, procedure designers, and communities as RNP/RNAV procedures are being developed. We look forward to similar collaborative efforts under Section 213 implementations.

As a next step, ACI-NA staff Debby McElroy, Chris Oswald, and Katherine Preston would like to meet with you, Julie Oettinger, Vicky Cox and possibly a representative of the Air Traffic Organization to discuss the issues described in this letter. At the meeting, we'd like to discuss how airports can be involved in the development of (1) policies and procedures related to implementation of Section 213 provisions and (2) guidance regarding how airports can be involved in RNP/RNAV procedure development.
Thank you for your consideration and understanding of our concerns. ACI-NA looks forward to continuing this dialogue to ensure that we collectively implement NextGen beneficial flight procedures both expeditiously and in a manner that recognizes existing relationships and commitments airports have to the communities they serve.

Sincerely,

[Signature]

Gregory Principato
President

cc: Ms. Victoria Cox, Assistant Administrator for NextGen, FAA
    Ms. Julie Oetinger, Assistant Administrator for Policy, International Affairs & Environment, FAA
    Ms. Lynn Ray, Vice President-Mission Support, FAA Air Traffic Organization
    Ms. Deborah McElroy, ACI-NA
    Mr. Christopher Oswald, ACI-NA
    Ms. Katherine Preston, ACI-NA