DCA Fly Quiet White Paper
Vianair, Inc.

April 24, 2022

DCA Noise Abatement

Ronald Reagan Washington National Airport (DCA) is surrounded on all sides by noise-sensitive, residential communities. The regional airspace is very complex due to the proximity to other airports including Baltimore/Washington International Thurgood Marshall Airport (BWI), Washington Dulles International Airport (IAD), and prohibited airspace including P-56A which protects The White House and National Mall.

DCA has implemented a number of policies and procedures intended to reduce noise impacts on surrounding communities. The primary efforts have focused on developing arrival and departure procedures that maximize overflight of the Potomac and Anacostia Rivers, reducing overflight of residential communities where possible.

> "At Reagan National, a key strategy for limiting aircraft noise exposure over the broader region is to maximize aircraft movements over water and minimize aircraft movements over more densely populated communities."

Source: https://www.flyreagan.com/about-airport/aircraft-noise-information/dca-reagan-national-aircraft-procedures

Table of Contents

Introduction to Fly Quiet Program Concepts

The terms “Fly Quiet” and “Fly Friendly” typically refer to airport noise abatement programs and these terms are interchangeable. Most of these programs include flight procedures and practices intended to reduce aircraft noise exposure and community impacts. Within this whitepaper, the term “Fly Quiet program” will be used generically to describe airport noise abatement programs. There are three main components to Fly Quiet programs: operational elements, conformance monitoring, and industry/community engagement. Many airports across the United States manage noise abatement programs, often using terms like Fly Quiet, Fly Friendly, or Fly Neighborly. Most programs include operational procedures and recommended practices. However, the more robust and more effective programs include three components: operational procedures, conformance monitoring, and industry/community engagement. These will be described in detail within this whitepaper. Airports with comprehensive “Fly Quiet” programs (incorporating the three components) include Seattle-Tacoma International Airport, San Francisco International Airport, and Chicago O’Hare International Airport. Information about these programs is available on the airport’s websites.

Operational procedures and practices form the basis for airport noise abatement programs. These may include “preferred” arrival and departures procedures intended to reduce community aircraft noise impacts by avoiding residential overflights (lateral shifts in the flight paths to avoid residential and noise-sensitive areas) and increasing altitude when overflying residential areas. Other procedures and practices can address how aircraft are flown, using specialized departure profiles which prescribe thrust/flap/gear settings and ascent rates to reduce noise, and arrival profiles such as continuous descent approaches where engine power is reduced, reducing noise exposure in communities below. Preferential runway programs encourage use of runways that result in less noise impact for nearby communities.

Some airports utilize conformance monitoring and analysis as part of their noise abatement programs. Conformance monitoring and analyses are used to understand conformance levels and to help better understand community impacts (i.e., identifying areas of low performance which may correlate to community complaints). This can also help identify opportunities to improve program conformance and overall effectiveness

The third component is outreach and engagement. Outreach and engagement include two primary audiences, the community, and industry. Community outreach generally takes the form of public reporting of program conformance. Community reporting is intended to support transparency and to help the community understand noise program conformance levels. Industry engagement focuses on advising industry stakeholders (aircraft operators, air traffic control, etc.) This can be

used to report and monitor high conformance and in the case of performance concerns, this can be used to identify opportunities for improvement improve.

In summary, the most effective Fly Quiet programs incorporate the five components below:

- Noise Program Operational Elements (Policies, practices, and procedures)
- Conformance Monitoring (Flight Tracking and/or Noise Measurement/Modeling)
- Analysis and Reporting
- Recognition and Incentives
- Industry and Community Outreach and Engagement

Goals of Fly Quiet Programs

Ultimately, the goals of Fly Quiet programs should include encouraging industry (aircraft operators and air traffic control) participation or conformance with noise abatement program elements, reporting participation and conformance levels, and encouraging realistic expectations.

While establishing noise abatement operational elements (procedures, practices, etc.) is important, the absence of performance monitoring, analysis, and reporting may impede assessment of the effectiveness of the program. Public reporting promotes transparency and awareness of noise program conformance levels and should include the ongoing efforts to encourage performance improvements. Community engagement can also help identify opportunities for program expansion and improvement.

Industry engagement is an essential element for an effective Fly Quiet program. Most programs include basic outreach which may include information on the airport website and posters, placards, pilot brochures, etc. The goals of industry engagement should be to actively encourage awareness of the noise program elements and to encourage industry participation and in the end, conformance with the program measures. Industry engagement efforts should include both aircraft operators and air traffic control.

Direct engagement with aircraft operators is essential. Direct engagement includes working directly with the airlines (and other aircraft operators) to ensure awareness of the Fly Quiet program objectives and program elements and to encourage participation. Direct engagement can include collaborating directly with the company Chief Pilots or Technical, and Public Relations departments and providing periodic (i.e., monthly, or quarterly) performance reports which describe the individual conformance levels within the Fly Quiet program elements. Engagement should be ongoing. Conformance reporting is a minimum requirement for industry engagement. Ideally, conformance reporting is supplemented with ongoing engagement (i.e., check-ins,

briefings, etc.) These can be part of other airport/airline and airport/air traffic control meetings or part of meetings specific to discussing community and aircraft noise issues.

In addition to encouraging industry (aircraft operators and air traffic control) participation, some Fly Quiet programs include incentivization. Federal aviation regulations apply to airport revenues and expenditures as well as airport charges. For this reason, Fly Quiet incentives are typically not financially based. Recognition and awards are the most common type of incentives used. As an example, Seattle-Tacoma International Airport publishes annual Fly Quiet awards, naming airline winners in multiple categories.

Many Fly Quiet programs focus solely on aircraft operator performance, leaving out air traffic control. However, conformance with noise program elements is often contingent upon air traffic control approval. Engaging both aircraft operators and air traffic control are equally important in Fly Quiet program development, management, and overall effectiveness.

Community outreach provides the public with accurate and reliable information about aircraft operator performance levels and can help educate the community about the Fly Quiet Program and help set realistic expectations concerning noise mitigation within the community. This also provides the opportunity for the community to provide feedback to the airport about opportunities to further expand/improve the noise program.

Applying Fly Quiet Program elements to DCA

DCA has a number of noise abatement measures, which are not part of a comprehensive noise abatement program. Metropolitan Washington Airport Authority (MWAA) has worked with the Federal Aviation Administration and the Community Noise Working Group to develop and refine flight procedures (arrivals and departures) intended to reduce community overflight and noise impacts. DCA also maintains a "Nighttime Noise Rule" which discourages aircraft noise events, which exceed specified noise exposure levels. The nighttime noise rule was implemented in early 1980s when aircraft were significantly noisier than they are today. These two elements seem the only two noise abatement/noise program elements in effect at DCA.

Additional potential noise program (Fly Quiet) elements as well as conformance analyses and reporting are described below.

Fleet Mix Data

DCA's reporting includes reference to total fleet mix. It is unclear if this information is used in airline engagement to encourage use of quieter aircraft and the phasing-out of older, noisier aircraft.

Airline fleet decisions are based on a complex formula of factors, but many airports' Fly Quiet programs monitor and report fleet mix, encouraging the use of the quietest aircraft.

Expanding the current DCA Fleet Mix reporting could be enhanced by characterizing the number or percentage of noisier versus quieter aircraft and how it changes over time. Some Fly Quiet programs include fleet data per airline, noting which airlines operate the quietest aircraft. This is sometimes referred to as "Fleet Noise Quality" or "Fleet Fly Quiet Ranking." It is unlikely that airlines will make fleet-mix decisions based specifically on an airport Fly Quiet program but encouraging the use of the quietest aircraft is something that should be actively encouraged when working with aircraft operators as part of Fly Quiet airline engagement. Additionally, this information can be used to highlight the noise reduction attributed to shifts from older, noisier aircraft to newer, quieter aircraft over time.

Preferential Runway Use

DCA's noise reporting includes runway use statistics which analyze and quantify runway use. Many airports incorporate preferential runway use programs as part of their Fly Quiet program. Preferential runway use has been explored at DCA; however, it's been difficult to identify a preferential runway which is acceptable to all communities. DCA operates in either a north or south flow and communities north and south experience differing levels of noise exposure based on the specific flow.

Based on DCA's location adjacent to the Potomac River, one option may be to leverage use of the Potomac River Corridor by establishing Runways 1 and 19 as the preferential runway. The use of runways 15-33 and 4-22 have a greater impact on airport-adjacent communities as aircraft are over residential communities without the benefit of the overflying the Potomac River.

Nighttime Operations (DCA Noise Rule)

MWAA tracks and reports violation of the DCA Nighttime Noise Rule. Fines may be imposed by MWAA for violations of the nighttime noise rule which is a clear deterrent. This existing policy and reporting could be incorporated into a DCA Fly Quiet program.

The Nighttime Noise Rule does not restrict flight operations overnight. Instead, the rule applies to specified noise exceedances. When the specified noise limit is exceeded, the operator may be subject to fines.

Nighttime curfews or limits on nighttime operations as part of an effort to reduce noise impacts is prohibited (in most cases) in the United States. However, many airports implement voluntary curfews discouraging operations during nighttime hours when aircraft noise events can be most impactful for nearby communities. Voluntary curfews have been implemented with varying levels of effectiveness.

Should DCA choose to adopt a voluntary nighttime curfew, the number of operations during the "curfew" window should be incorporated into Fly Quiet analysis and reporting.

Flight Procedures – Maximize overflight of Potomac River

The Metropolitan Washington Airport Authority (MWAA) has a long history of collaborating with their Community Noise Working Group (CWG) and the Federal Aviation Administration to establish formal arrival and departure procedures intended to reduce community noise impacts by maximizing overflight of the Potomac River and non-residential areas. Conventional procedures including the National (Departure) and LDA (Arrival) result in high community noise impact due to overflight of dense residential communities. Newer flight procedures which leverage NextGen navigation technologies enable flights to overfly the river corridor more closely, thereby reducing community noise impacts. While these do not eliminate community impacts, they are reduced, and use is encouraged.

Components of a DCA Fly Quiet Program could include tracking the use of preferred and non-preferred flight procedures. This information would be useful in providing more transparency to the public, including the conformance rates of preferred flight procedures. This information would also be useful in engaging airlines with poor performance rates and in engaging air traffic control to address overall performance.

Use of the Terminal Arrival Area (TAA) Concept

The TAA concept was introduced in 2021 to increase track variability (dispersion) of arrivals over communities north and northwest of DCA. Use of TAA is completely dependent upon air traffic control and is not expected to be used at all times until the new procedures (GPS 19 Approach) are implemented. However, use of TAA can reduce the concentration of overflights of communities between the FERGI and DARIC waypoints. TAA-usage could be incorporated in DCA Fly Quiet reporting and used during engagement with the Federal Aviation Administration (FAA) to encourage use when appropriate. By definition, once DARIC becomes the Initial Approach Fix, all arrivals will use the TAA Concept. When this is implemented, the level of dispersion of flights approaching the DARIC waypoint would be a more appropriate metric. This could be accomplished with the current analysis tools used by Vianair and proposed to be used by MWAA.

Development and Deployment of a DCA Fly Quiet Program

DCA currently has a number of noise abatement measures that could provide the foundational elements of a Fly Quiet Program. A program could be launched based on existing measures and/or include additional ones including those listed above. Management of a Fly Quiet program will require additional staff resources from MWAA. However, if managed properly, a Fly Quiet program could be used to encourage collaboration with DCA airlines and air traffic control in

support of expanding the existing noise abatement elements and encouraging conformance, thereby reducing noise impacts for communities surrounding DCA.

Next Steps

Pursuit of a Fly Quiet program for DCA would require buy-in by airport leadership. Support from DCA airlines and FAA/air traffic control is also preferable. The initial step for the CWG would be establishing a formal recommendation to MWAA to establish a Fly Quiet program. The content in this document could be used to provide the basics of what components should be included and the benefits to the MWAA, the Airport and the community.

Development of a program could be managed by MWAA/DCA, contracted out to a consultant, or through a combination of the two. Often, airports cite limited resources as an obstacle to development of Fly Quiet type programs. The initial development of these programs requires a lot of time and resources, but once launched, ongoing operation of the program is typically less demanding.

Initial steps for DCA should include:

1. Development of a Fly Quiet Technical Advisory Group (TAG) and Fly Quiet Committee (or working group). The existing Fly Quiet committee could be leveraged, or a new working group could be established. The FQ Committee would focus on developing the overall mission and objectives of the Fly Quiet program and identify program components. They would also develop the public reporting. The role of the Technical Advisory Group would be to focus on the technical aspects of program development. The TAG would take the recommendations from the FQ committee for program elements (what to monitor and report) and identify strategies for determining conformance and developing the tools for conformance tracking. The TAG would also develop the industry (airline and ATC) engagement plan and industry reporting. It is typically most effective to establish two separate groups for these tasks.

2. Establish the mission and objectives of the DCA Fly Quiet program and identify/recommend initial operational measures to be included in the program. These should be selected from existing noise program measures.

3. Establish performance criteria to identify conformance versus non-conformance.

4. Develop operational tracking and/or noise monitoring/modeling tools to enable Fly Quiet performance. Extensive testing should be conducted with review/input from both the FQ committee (or working group) and TAG. Determine analysis and reporting frequency

(i.e., monthly, quarterly, etc.) The appropriate reporting frequency for community and industry may differ.

5. Develop Fly Quiet reports and outreach/engagement tools and strategies for both industry and community stakeholders. Report templates and engagement strategies customized to each group (industry versus community).

6. Fly Quiet briefings (by MWAA) should be included in CWG meetings as a standing agenda item.

7. Annual program reviews should be conducted by the CWG, Fly Quiet committee (or working group) and TAG to review program effectiveness.