Vianair South of Ronald Reagan Washington National Airport (DCA) Project

Final Report

Identification and Evaluation of Strategies to Reduce Aircraft Noise Impacts

A Community-Based Approach

Executive Summary

The City of Alexandria, Fairfax County, and Prince George's County hired Vianair to help identify strategies to reduce noise impacts for communities south of Ronald Reagan Washington National Airport (DCA). The purpose of the South of Airport (SoA) Noise Mitigation Project is to provide recommendations to the Federal Aviation Administration (FAA), through the Community Working Group (CWG), to reduce noise concentration from aircraft routes converging over areas of the three jurisdictions. The recommendations include moving the departing aircraft towards the center of the Potomac River where possible and moving arriving aircraft over less populated areas and over the Potomac River where possible, in accordance with the design philosophy.

Vianair takes a unique approach to aircraft noise abatement/mitigation by directly involving the impacted communities and helping them to identify viable solutions. Our approach leverages collaboration among both community and industry stakeholders, and incorporates expert technical support through a collaborative, regional effort resulting in actionable and implementable solutions.

A core principle of the DCA Project is the collaboration with key industry stakeholders including the Federal Aviation Administration's (FAA) Potomac Terminal Radar Approach Control (TRACON), and the South of Airport (SoA) Subcommittee(SC), referred to as the SoA Design Team, which included community representatives from the City of Alexandria, Virginia, Prince Georges County, Maryland, and Fairfax County, Virgina all of which were representatives on the DCA Metropolitan Washington Airports Authority (MWAA) CWG.

The Design Team was facilitated by Vianair and was solely responsible for the development of the notional flight procedures intended to mitigate aircraft noise in their respective communities. Vianair consultants functioned as facilitators for this group to ensure that FAA criteria and operational requirements were known to the team and complied with. Additionally, Vianair consultants guided the Design Team while formulating the Design Philosophy for this project.

The Design Philosophy is a set of guidelines for the Design Team to follow that are prioritized into a hierarchical order with the intent of defining success at the front end of the project. The Design Philosophy is also intended to be a regional approach to mitigating noise so that at the end of the project the notional designs can be mapped back to the Design Philosophy. If in the end, the notional designs comply with the Design Philosophy, by definition the project has been successful. This philosophy ensures that the final recommendations are not contingent on individual property owners and reflect the best interest of the region in reducing overall noise impacts.

Design Philosophy

The Design Philosophy for this project is:

1. Maximize overflight over the center of the river and "compatible" areas including industrial areas, major highways, etc.
2. Maximize altitude through use of Optimized Profile Descent to reduce noise over noise-sensitive areas and analyze and recommend use of Noise Abatement Departure Profile.
3. Increase track variability (reduce concentration over noise-sensitive areas).
4. Avoid disproportionate impact on any single entity (county, town, etc.).
5. Minimize overflight of noise sensitive areas, schools, hospitals, churches, historical sites.

Through collaboration with these entities, Vianair was able to develop new notional flight procedures and new notional Standard Operating Procedures (SOPs) which can be implemented within a reasonable timeframe and will deliver improvement in the noise impact.

The SoA Design Team focused on three areas:

1. Standard Instrument Departures (SIDs),
2. Standard Terminal Arrivals (STARs), and
3. Standard Instrument Approach Procedures (SIAPs).

There are nine (9) Area Navigation (RNAV) SIDs published for DCA: six (6) that generally head west out of the airspace and three (3) that generally head east out of the airspace. The Design Team recommended modifications to those segments of the flight procedures south of the airport associated with Runways 19 and 15.

Note - The National Eight SID is a conventional SID that is normally only used when aircraft cannot fly the RNAV SIDs and was out of scope for this project.

The Approaches considered by the Design team were the existing RNAV (RNP) RWY 01 Approach, the ILS RWY 01 Approach, and the Mount Vernon Visual RWY 01. The Copter ILS or LOC/DME RWY 01 and the RNAV (GPS) RWY 33 were not considered except to recommend that the initial altitude at KATRN be raised from 2,500 to 3,000 feet MSL.

Vianair took a holistic approach to the process. The process involved input from members of the community through surveys, community forums, and the Design Team.

The result of these efforts culminated in recommendations to revise all approaches to RWY 01 and RWY 33, raise the altitude at KATRN to 3,000 feet MSL and to add a new Initial Approach Fix (IAF) to the ILS and RNP approaches to RWY 01. This will result in aircraft crossing over the Accokeek area communities at an altitude 500 feet higher than they currently operate.

Ultimately, we believe all the communities involved will eventually gain a degree of relief in this process.

Safety Improvements

The new notional designs improve safety by ensuring all flight procedures are brought into compliance with current FAA criteria. Additionally, the SIDs have been modified to reduce the potential for aircraft departing eastbound from Runway 15 to turn back towards the departure corridor for Runway 19.

Efficiency Improvements

The current configuration of the RNAV SIDs does not allow the Equivalent Lateral Separation Operations (ELSO) rules to be used. The notional RNAV SIDs comply with all ELSO criteria allowing reduced divergence separation standards to be used in all weather conditions.

Community Engagement

This was a community centric project with community representatives involved in every phase of the project. Community representatives comprised the Design Team and the community at-large were engaged from the three jurisdictions through public meetings, a community survey, the project website, and feedback from community members to provide feedback to the Design Team. Finally, community members also had opportunities to provide feedback and comments to their respective jurisdictions (city and county councils and boards) and through the MWAA CWG.

(See Appendix 3 for more information.)

Industry Coordination

The project team kept the stakeholders and representatives engaged in the process via collaboration with Potomac Terminal Radar Approach Control (PCT TRACON), informal briefings to the MWAA DCA Noise Office and the airlines. The final notional designs were shared with American Airlines, which is the largest air carrier operating at DCA airport.

Final coordination with MWAA and the FAA took place with a formal briefing of the notional flight procedure designs to the full CWG on October 23, 2025. The full CWG approved all notional flight procedure designs and recommendations by a unanimous vote.

Project Results

The notional designs move westbound aircraft departing runway 19 closer to the center of the river and away from the Alexandria shoreline. This will provide Alexandria residents a noticeable visual shift of where aircraft are flying. Additionally, westbound aircraft departing runway 15 will remain well clear of the Alexandria shoreline.

The benefits to Fairfax County from the proposed flight path changes will be measurable, and the visual perception of aircraft flying further away from densely populated residential areas will be noticeable. The increase in track variability will provide the residents with relief depending on the direction of operation at DCA, which was not previously the case. The notional designs meet the stated goals of this project and are in keeping with the Design Philosophy approved by the project Design Team.

The benefits to Prince George's County from the proposed flight path changes will be measurable, and the visual perception of aircraft flying further away from densely populated residential areas will be noticable. The increase in track varibility will provide the residents relief depending on the direction of operation at DCA which was not previously the case. Additionally, the increase in altitude at KATRN, a longstanding request, will raise the published altitude from 2500 feet to 3000 feet.

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Introduction

The City of Alexandria, Fairfax County, and Prince George's County, as well as other communities in the D.C. area, have long endured aircraft noise impacts from the Ronald Reagan Washington National Airport (DCA). After the DCA Metroplex project and other stand-alone changes, numerous requests to mitigate aircraft noise from the Metropolitan Washington Airports Authority (MWAA) Community Working Group (CWG) were met with limited success. However, an earlier and similar project in 2020 on the north side of DCA resulted in meaningful and measurable changes in aircraft noise through the implementation of flight procedures in July 2024 designed by the North of Airport (NoA) Subcommittee (SC) which was facilitated by Vianair. Subsequent to the success of the NoA project, the communities south of DCA sought out technical expertise to explore options to mitigate noise impacts on their communities.

Purpose of the Project

The City of Alexandria, Fairfax County, and Prince George's County hired Vianair to help identify strategies to reduce aircraft noise impacts for communities south of DCA. The purpose of the South of Airport (SoA) Noise Mitigation Project is to provide recommendations to the Federal Aviation Administration (FAA), through the CWG, to reduce noise concentration from aircraft routes converging over areas of the three jurisdictions. The recommendations include moving the departing aircraft towards the center of the Potomac River where possible and moving arriving aircraft over less populated areas and over the Potomac River where possible, in accordance with the design philosophy.

Vianair was asked to analyze the following:

- Community noise exposure levels resulting from select Performance-Based Navigation (PBN) procedures compared to existing legacy flight procedures at DCA.
- Flight procedure designs to minimize/avoid overflight of residential and noise-sensitive areas.
- Opportunities to reduce concentration of low-altitude operations over residential areas.
- Analysis of the current MWAA-stated goal of "maximizing flight time over water" as a means of achieving noise reduction and mitigation, relative to other alternatives.
- Track and waypoint adjustments along departure and arrival procedures.

- Noise tradeoffs between altitude, thrust, climb-rate and speed.

- Analysis of the opportunities for noise reduction associated with optimized departures and optimized profile descents (OPD).

- The feasibility of raising altitudes on arrival procedures and the potential noise impacts along the arrival corridor.

- The feasibility of creating dispersion along a departure and/or arrival corridor utilizing one runway.

- Identification of refinements to existing procedures to minimize overflight of noise sensitive areas and, where able, maximize overflight of non-noise-sensitive areas such as major bodies of water, industrial areas, etc.

Note - Each of these areas is discussed later in this report.

The Process

Vianair utilizes a unique approach toward community involvement in resolving aircraft noise issues. When there are competing interests, which is very common, Vianair applies the NowGEN® Model for Noise Mitigation $(NM)^2$ Process.[1] The $(NM)^2$ Model is a process where key stakeholder groups identify, discuss, and prioritize the issues, goals, constraints, etc., enabling determination of the most cost-effective approaches with the highest likelihood of successful implementation. Once the priorities are established, Vianair utilizes a similar approach to problem resolution and procedure design as the former FAA Order 7100.41A, *Performance Based Navigation (PBN) Implementation Process*. Vianair's approach differs from others in that it incorporates direct community involvement in the procedure design process. DCA already had the framework in place with their longstanding and well-functioning CWG. The next step was to develop consensus among all stakeholders represented on the CWG, using this proven approach.

Initially, Vianair performed a baseline study of the noise issues which included reviewing the history of flight procedures, Part 150 studies, environmental analyses, master plans, etc. The baseline study was summarized in a report which is available for download from the project website: www.vianair.com/soa. Vianair reviewed community input from surveys, noise complaints, community meetings, CWG meeting summaries, and other data sources. This was accomplished prior to any engagement, so that the Vianair team could be familiar with the unique issues and be prepared to assist the community in effectively advocating for their goals with the FAA, airlines, and other industry stakeholders and decision-makers.

Once the baseline review was completed, Vianair developed initial concepts of notional procedures and practices based upon the results of the baseline assessment. At that time, SoA Committee representatives from the CWG were brought into the procedure design process. Vianair believes that direct involvement in the design process leads to a deeper understanding of all the considerations including the complex operational constraints that go into procedure design. This includes compliance with FAA criteria, rules, and regulations, and applying firsthand knowledge to address noise impacts on their communities. Past experience has shown that it is very useful when those impacted are engaged in developing solutions and get a first-hand look at the process.

[1] The NowGEN® Model for Noise Mitigation $(NM)^2$ Process is a proprietary process of Vianair, LLC.

This community involvement usually comes in the form of a Procedure Design Working Group (Design Team), which was utilized for this project. The Vianair Team hosted fifteen (15) Design Team meetings to address the issues identified in the Baseline Study. The Design Team included community representatives from the City of Alexandria and Fairfax County, VA, and Prince George's County, MD. This ensured that all communities potentially affected by the proposed designs were represented.

Methodology

The Design Team meetings were conducted utilizing the Vianair proprietary software called Airspace Information Modeling (AIM). AIM is unique in the industry as it combines flight procedure design technologies, airspace modeling, noise analysis, real-time criteria checking and verification, and intuitive visualizations. AIM is a tool allowing community members, who may not be familiar with the flight procedure design process, to intuitively understand what is being presented. It provides the ability to make informed judgements as to the effectiveness of the design being proposed, thereby giving community members the capability to come to consensus on a design that meets the objectives of the Design Philosophy. It also identifies constraints due to FAA criteria, aircraft performance, and other considerations.

Design Philosophy

The Design Philosophy is the most important part of the process and where the community helps define what constitutes success. The Design Philosophy can consist of a number of guiding principles that point the team in the direction of a "successful outcome." As an example, guiding principles may include:

- Prioritizing flight procedures that overfly compatible land uses, such as industrial complexes, interstates, or open areas with little or no residential neighborhoods;
- Avoidance of schools and/or churches;
- Equitable distribution of noise between certain populations, such as between counties, states, or neighborhoods;
- Use of historic flight paths;
- Use of flight track variability when practical

It is particularly important for the group to agree on the Design Philosophy up front to minimize special interests, or "NIMBYism."[2] Once the Design Philosophy is finalized, the design process can begin with the common goal of achieving a successful implementation. Consensus on a given procedure must be in accordance with the Design Philosophy. Once achieved, the group can remain focused on the agreed upon criteria for determining what constitutes a successful design.

The Design Philosophy for this project was as follows:

1. Maximize overflight over the center of the river and "compatible" areas including industrial areas, major highways, etc.
2. Maximize altitude (use of Optimized Profile Descent to reduce noise over noise-sensitive areas)
    - Analyze and recommend use of Noise Abatement Departure Profile
3. Increase track variability (reduce concentration over noise-sensitive areas)
4. Avoid disproportionate impact on any single entity (county, town, etc.)
5. Minimize overflight of noise sensitive areas, schools, hospitals, churches, historical sites

[2] NIMBYism is a colloquialism used to express interest in one's own circumstances without consideration of the whole process or issues affect the broader community. NIMBY meaning – "Not In My Back Yard."

CWG and SoA Considerations as Incorporated in the Design Philosophy

Community noise exposure levels resulting from select PBN versus legacy flight procedures

There have been numerous changes in flight procedures over the years. Some provide benefit to one community while providing disbenefit to others. Over the course of this project, it was determined that at one time or another, each community has or will benefit in terms of noise exposure reduction. This project sought to provide an equitable and optimized solution that shares the noise burdens among the affected communities, while meeting the needs/goals of industry and the FAA. This was accomplished by utilizing compatible land as much as possible and balancing the noise impact where compatible land is not available, in accordance with the Design Philosophy. Ultimately all the communities involved will eventually gain some degree of relief in this process.

Historic and current north flow and south flow airport operations split and the costs, benefits, and feasibility of a 50/50 balance between north flow and south flow

Vianair determined, through conversations with the SoA Design Team and PCT, that this issue has been previously explored with the CWG. There have been numerous proposals to implement a runway use program at DCA, but as of the writing of this report, no consensus has been reached that meets community interests, and airport / air traffic control operational requirements.

Preferential and rotational runway use programs

The same challenges related to the 50/50 split of north versus south flow apply to the preferential and rotational runway concepts that have been proposed. Both this and the above considerations are determined by wind and weather conditions, and safety issues. The FAA is unwilling to negotiate on these topics.

Flight procedure designs to minimize/avoid overflight of residential and noise-sensitive areas

In accordance with the Design Philosophy, where possible, revised flight paths have been recommended for both arrivals and departures that move existing flight paths from residential areas to more compatible areas.

Opportunities to reduce low-altitude operations over residential areas

This project addressed the standard Noise Abatement Departure Profiles (NADP-1/NADP-2) of DCA departures in an effort to determine the profile that best meets the group's Design Philosophy. There was a brief implementation of NADP-1 as a result of recommendations during the NoA

project. However, this resulted in separation issues for the PCT departure controllers and exposed differences in the application of NADP-1 amongst the different airlines and therefore the procedure was terminated. It has been recommended that the FAA pursue a more standardized application of NADP-1 and that once that has been done, implementation at DCA could be attempted again. At the writing of this report, there has been no movement on the part of FAA or air carriers to further standardize NADP-1.

Additionally, this project addressed the long-standing request from the SoA to raise the altitude at KATRN which has been incorporated into the new notional flight procedure designs.

The merits of the current MWAA-stated goal of "maximizing flight time over water" as a means of achieving noise reduction and mitigation, relative to other alternatives

With guidance from Vianair, the SoA SC formulated and approved the Design Philosophy used on this project. The top priority was to keep aircraft over compatible land to the maximum extent possible. Close to the airport, the only compatible land is the river; however, further away from the airport there are opportunities to move flight paths over other compatible land areas that will better serve the communities. The resulting notional designs aim to better center aircraft between heavily populated residential areas, and where possible, maximizing flight time over water.

Track and waypoint adjustments along departure and arrival procedures, including the south-flow departure procedures

The Design Team was able to come to a consensus on moving several waypoints and routes to adjust flight paths to better fit over compatible land along the river and on government land. Noise modeling indicated that these modifications may not make a perceptible difference in noise in all areas but will result in a visually perceptible difference, especially along the river next to the City of Alexandria. The proposed adjustments do achieve the priority of keeping flight tracks over compatible land/water and are therefore worthwhile changes to implement from a community perspective.

Noise tradeoffs of altitude and thrust, climb rate and speed

This project evaluated the interaction between the arrivals and departures to determine if there were opportunities to increase the likelihood of unrestricted climbs for south departures. It was determined that by moving the CAPSS STAR slightly to the east and keeping the aircraft slightly higher, the likelihood of west departures to be able to continue an unrestricted climb was increased. Unrestricted climbs are normally of interest to communities, ATC, and the industry because of the reduction in noise, the efficiency of the airspace, and fuel and emissions savings by not requiring aircraft to level off on departure.

Analysis of the opportunities for noise reduction associated with Optimized Profile Descents

Optimized Profile Descents are not currently used in the terminal airspace south of the airport. However, the Design Team was able to modify the instrument approach procedures to provide notional designs that utilize the 3-degree glidepath which will result in the use of minimum thrust on arrivals from the CAPSS STAR landing Runway 1/33 and a new notional Initial Approach Fix (IAF) for the ILS and RNAV approaches at 5,000 feet approximately 15 miles south of the DCA Airport.

The feasibility of raising altitudes on arrival procedures and the potential noise impacts along the arrival corridor

As previously stated, the new notional approach designs raise the altitude at KATRN from 2,500 feet to 3,000 feet. An additional 500 feet of altitude will slightly decrease noise levels along the final approach path over the Accokeek area and placement of aircraft on a 3-degree glidepath more often will result in minimum thrust being used along the final approach course to Runway 1/33.

The feasibility of re-creating dispersion along a departure and/or arrival corridor utilizing one runway

The Design Team looked at three opportunities for introducing track variability. One is the use of Reduced Divergence Departures to move aircraft further away from the City of Alexandria. Next is the possibility of splitting the westbound departures into two groups to provide track variability and not concentrating the westbound departures over the same area as is used by the TRUPS and FRDMM STARs. Finally, rerouting the TRUPS/FRDMM STARs over government land provides track variability away from the concentrated area of flight procedures over dense residential areas of Fairfax County.

Identification of refinements to existing procedures to minimize overflight of noise sensitive areas and, where able, maximize overflight of non-noise-sensitive areas such as major bodies of water, industrial areas, etc.

The SoA SC, with guidance from Vianair, formulated and approved the Design Philosophy used on this project. The top priority was to keep aircraft over compatible land to the maximum extent possible. Close to the airport, the only compatible land is the river; however, further away from the airport there are opportunities to move flight paths over other compatible land areas such as Army and Marine installations where the new notional flight paths cross back over land from the river. These areas provide an opportunity to move flight paths further away from residential areas and will have a positive effect on the communities.

Collaboration and Implementation

Implementation of notional flight procedures requires collaboration with industry stakeholders including the airport, airlines, and the FAA, etc. The only way to get to achieve a new procedure implementation is to ensure that the FAA's mandate to "*provide a safe and efficient National Airspace System (NAS)"* is also considered. This requires compliance with FAA criteria, consideration of Air Traffic Control operational requirements and workload, and compliance with airspace and terrain and obstruction clearance criteria. The FAA is also tasked with ensuring system "efficiency." This means that they must consider the impact on the system and system users/operators during the review and approval process of any flight procedures or other operational changes. For example, if the design submitted to resolve noise issues takes aircraft several nautical miles out of their way, the FAA will likely not approve the procedure due to the impact on efficiency in/out of the airport. Flight procedures need to be optimized, meaning that all aspects of the procedure; safety, efficiency, and environmental impacts, are fully vetted in the process.

Our experience suggests that the most effective path to successful implementation of flight procedures includes regular dialogue with the appropriate air traffic control facility affected by the proposed changes. Collaboration at the front-end of the process leads to a higher likelihood of successful implementation. During this project, collaboration with the FAA began through the CWG. The request was made through the CWG, and the FAA designated a point of contact (POC) at PCT for the Technical Expert (Vianair) to work with directly. Generally, the POC should be an operational person, such as an Airspace and Procedures Operations Support Specialist, who is responsible for the specific area within the ATC facility that will be affected by the proposals of the Design Team. This enables the free and open exchange of information between the Design Team and the FAA, resulting in the highest likelihood of implementation of the proposed procedures or revisions. It is important for the technical expert to speak the FAA's language and know when it is possible to respond to a "non-acceptance" with viable alternatives that enable the FAA to move from "No" to "Yes, if…"

In the case of this project, Vianair was able to work collaboratively with the PCT POC to determine the feasibility of the procedures being proposed. Several of the procedures were determined to be feasible. Through a collaborative effort, both the community and the FAA were able to propose acceptable modifications to the flight procedures that are expected to result in a win-win scenario when the procedures are implemented. It should be noted that collaboration with the facility (PCT) to determine feasibility of a procedure does not constitute approval of a proposed procedure. It is merely an indicator that the proposed solution is more likely to be implemented than if proposals had been forwarded to the FAA "in the blind" without pre-coordination and collaboration.

As a result of collaboration with PCT the following recommendations/action items were evaluated:

1. Implementation of Reduced Divergence Departures from Runway 19 with improvements in flight paths from Runway 15 to move aircraft further away from Alexandria while coming into compliance with current criteria allowing for a more safe and efficient operation at DCA.

2. Splitting west departures into two groups, northwest departures and southwest departures, to provide track variability and comply with the Design Philosophy concerning utilization of the river.

3. Modification of the CAPSS STAR to increase the likelihood of unrestricted climbs for departures in a south operation, and to come into compliance with current criteria in a north operation, while providing improvements to flight paths for noise abatement and the possible implementation of OPDs to Runway 1/33 in the future.

4. Modification of existing Instrument Approach Procedures (IAP) and one Charted Visual Flight Procedure (CVFP) to increase the altitude at the KATRN fix from 2,500 feet to 3,000 feet to address a long-standing recommendation from the community.

5. Modification to the TRUPS/FRDMM STARs to place a portion of the STARs over more compatible land and to increase track variability by moving flight paths away from a densely populated residential area of Fairfax County where flight paths currently converge. As a result of this modification, flight track miles were also reduced, benefiting the industry.

Recommendations for Consideration by the CWG

(See TARGETS File - Appendix 2 for additional details)

Based on the Design Philosophy adopted by the SoA SC, Vianair facilitated numerous Design Team meetings which included procedure design experts from Vianair as well as representatives from the CWG SoA SC.

Initial discussions included a review of the Design Philosophy and key issues and concerns expressed by the community. These community issues as they relate to existing flight procedures and noise impacts served as the basis for the discussions about modifications to existing procedures. Key goals included reducing the concentration of operations (and the unfair burden to any one community), avoiding dense residential areas and overflying "compatible" areas when able, and increasing altitudes. The following elements were developed as a result of the planning and design work conducted by the Design Team.

Reduced Divergence Departures

The current departure procedures are designed in such a way that they bring aircraft closer to, if not over, the City of Alexandria on a regular basis. The current design was also determined by the FAA not to follow current Reduced Divergence Departure criteria also known as Equivalent Lateral Spacing Operations or ELSO. This provided an obvious opportunity for a win-win-win solution that would reduce noise impacts to Alexandria by moving departures further off the shoreline and closer to the middle of the river and bring the departure design into compliance with current criteria, thereby increasing efficiency and reducing departure delays, which is of interest to both ATC and the airlines.

Under existing procedures, aircraft departing DCA are allowed to turn directly to the CAPVC waypoint upon reaching an altitude of 500 feet above the departure end of the runway. This allows aircraft to turn early enough to overfly the shoreline of Alexandria. The new notional design requires aircraft to fly the runway heading for a longer period of time, which places them closer to the center of the river. Noise analysis shows that there will be a slight reduction in noise. Residents should also notice that aircraft are flying further away from the shoreline and near the middle of the river on a more regular basis.

There will still be times when aircraft turn early over Alexandria, most notably when an aircraft has a missed approach, but the departures will normally fly closer to the center of the river returning them to a path that was prevalent prior to the implementation of the NEXTGEN flight procedures. (See Figure 1).

In this picture, the initial flight path of the existing westbound flight procedures is shown in red, and the initial flight path of the new notional flight procedure is shown in green. The initial departure segments will be applied to all westbound SIDs moving the departures closer to the middle of the river for a longer distance.

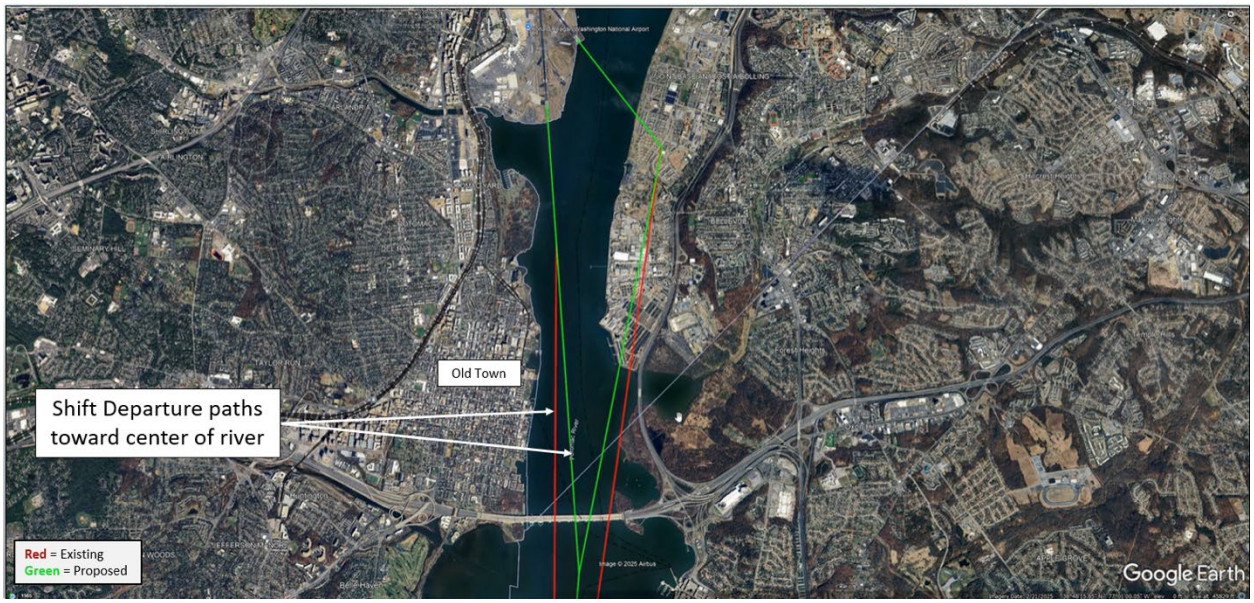

***Figure 1**. Existing Condition (Red) vs Notional Condition (Green).*

The eastbound SIDs moved slightly to the east due to the necessity of the FIMBI being required to move to meet criteria for the Reduced Divergence (ELSO) Departures. (Figure 2)

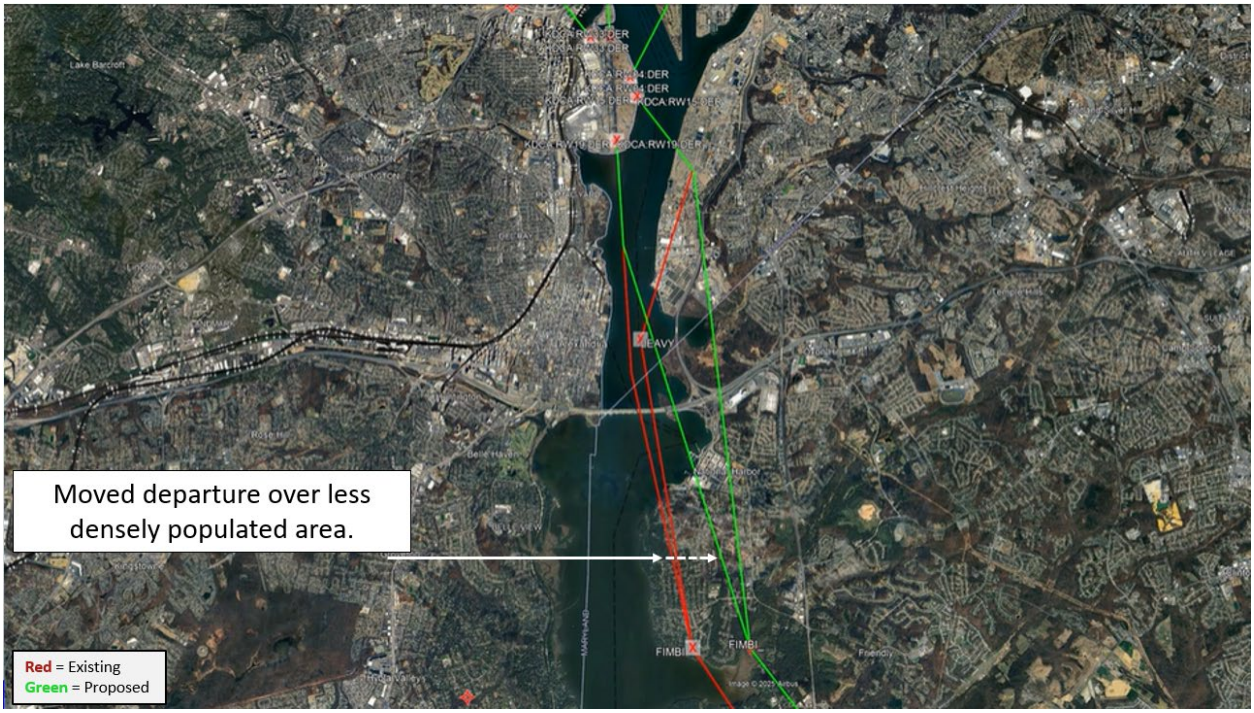

***Figure 2**. Existing Condition (Red) vs Notional Condition (Green).*

The SIDs continuing southeast bound from FIMBI waypoint were moved over less densely populated areas giving some relief to the Fort Washington and Accokeek areas.

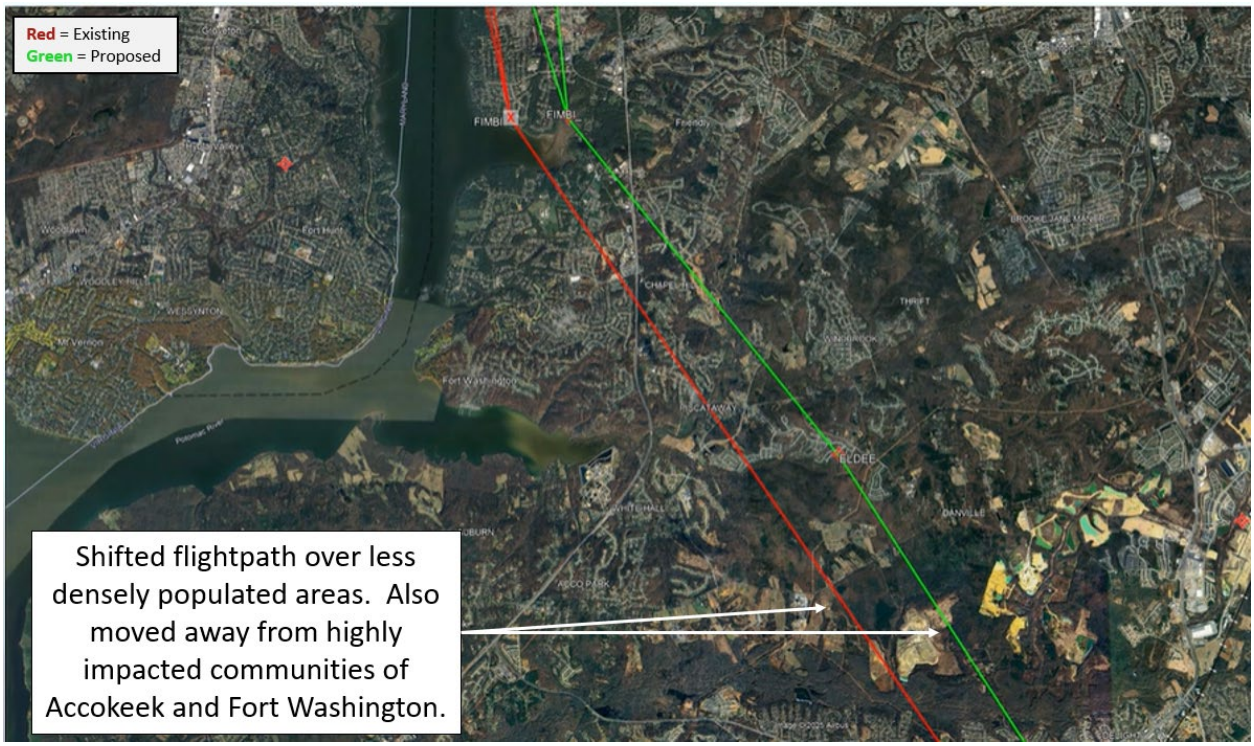

***Figure 3**. Existing Condition (Red) vs Notional Condition (Green).*

Westbound Departure Split

This was a longstanding recommendation by the CWG (Recommendation 8) to split the northwest departures and the southwest departures to reduce the impacts over densely populated areas of Fairfax County. The Design Philosophy required the team to keep aircraft over the river as much as possible and then to keep aircraft over other compatible land when it was not possible to keep them over the river. This notional design accomplishes those requirements.

By splitting the departures and placing the southwest SIDs over the river, it reduces by approximately 43% of the aircraft overflying Fairfax County on the west side of the river near the airport. The aircraft will fly further down the river before turning southwest and then overfly two military installations as they climb.

Figure 4 (below) depicts the new notional departure split. The existing departure flight paths are yellow, red, and magenta, and the new notional flight paths are green.

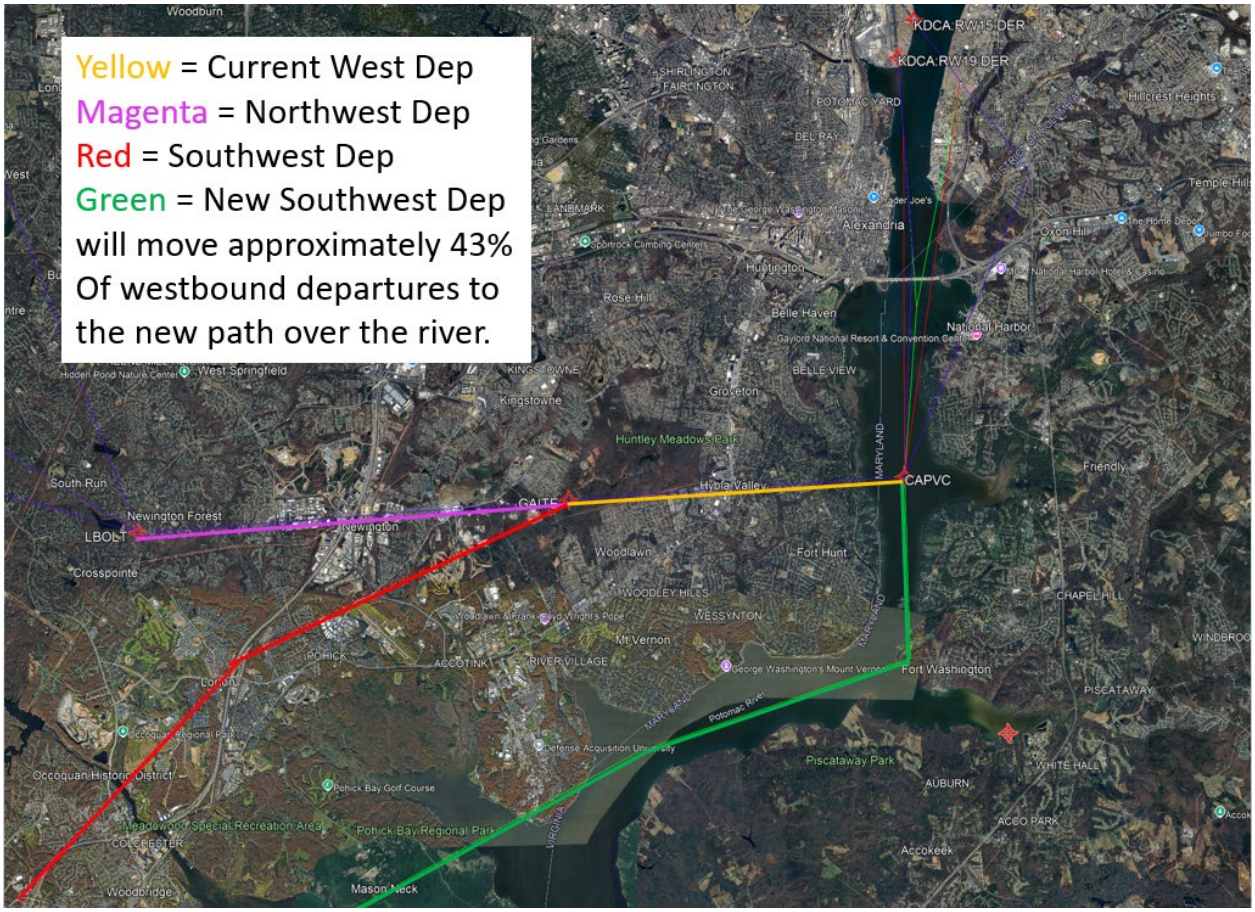

***Figure 4**. Existing Departure Flight Paths (Yellow, Red, Purple) – New Notional Flight Paths (Green).*

Moving three of the SIDs to the river (JDUBB, CLTCH, SCRAM) as required in the Design Philosophy, results in approximately 43% of the westbound departures moving to the river.

Modification of CAPSS STAR

The CAPSS STAR has been modified for each respective flow, North Flow and South Flow. North Flow modifications were primarily intended to provide an OPD arrival, if possible, and to raise the altitude over the KATRN waypoint in the vicinity of Accokeek.

The South Flow modifications were intended to provide relief for the area of Fairfax County which receives noise from low flying aircraft in both a North Flow operation and a South Flow Operation.

CAPSS – North Flow Operation

The existing CAPSS STAR allows aircraft from the south to proceed either along the STAR or direct to the KATRN waypoint descending to 2,500 feet MSL. This results in aircraft flying low over the Accokeek area on a consistent and repetitive basis. (See Figure 5 below)

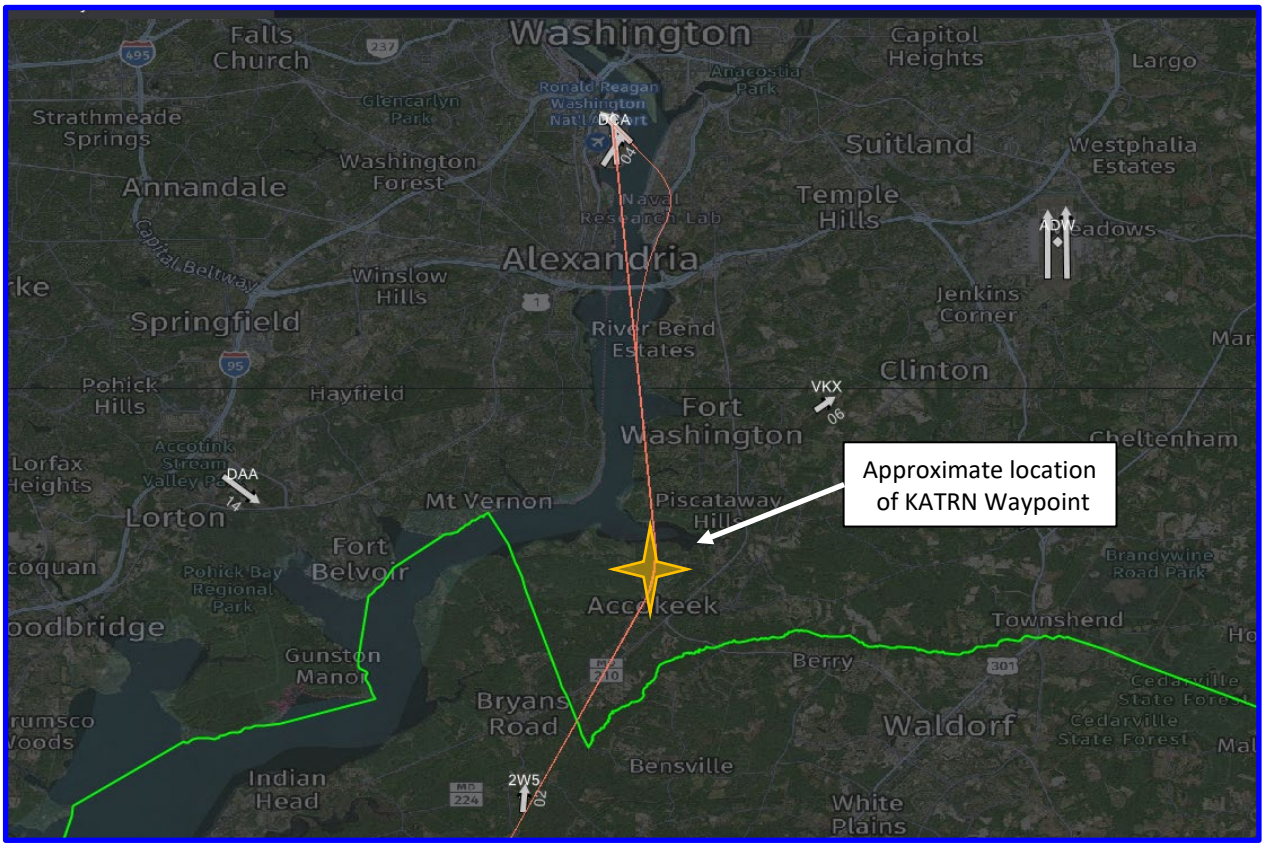

Figure 5. *Existing location of KATRN Waypoint with crossing altitude published at or above 2,500 feet MSL.*

The notional changes proposed raise the altitude at KATRN to 3,000 feet MSL and provide alternate points to intercept the final approach course. Two versions of this concept exist in the recommendations, the first provides an OPD arrival, while the second is accommodation for the Potomac TRACON (PCT) that stops the aircraft at 9,000 feet MSL and allows the controllers to descend the aircraft based upon existing traffic conditions. Our primary recommendation is to implement the OPD, however, operational conditions may not allow an OPD at the present time. If it is determined that an OPD cannot be implemented at this time, we urge the PCT to continue to evaluate the practicality of implementing an OPD as operational conditions permit in the future.

Figure 6 below illustrates the notional change in the flight path for aircraft conducting an OPD arrival to Runway 1 along the CAPSS STAR.

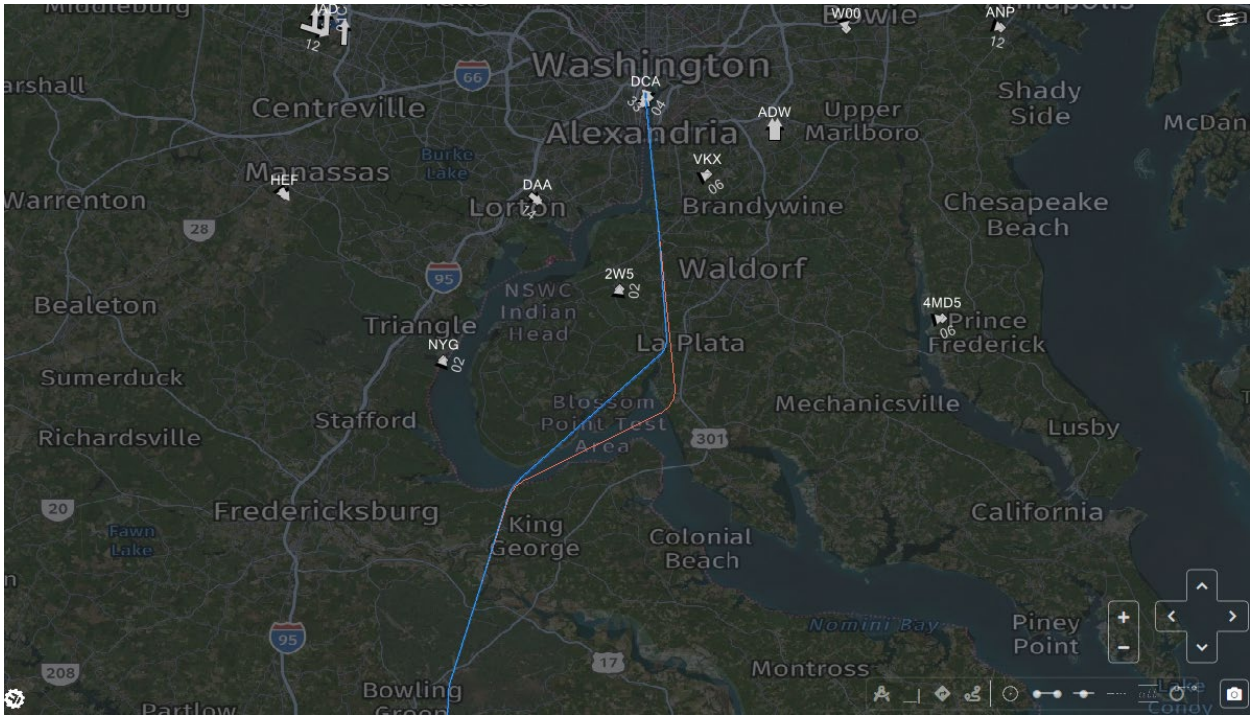

Figure 6. *Existing CAPSS STAR in Blue. Notional CAPSS STAR in Red. The Red flight path can be used with either an OPD or with controllers manually controlling the descent of the aircraft from 9,000 feet MSL*

CAPSS – South Flow Operation

When DCA is in a South Flow, aircraft on the CAPSS STAR will overfly the area south of DCA at much higher altitudes. Since the new configuration of the Southwest SIDs takes aircraft down the river, the SoA Design Team recommends moving the CAPSS STAR slightly to the east to facilitate the likelihood of more unrestricted climbs for departing aircraft to the west.

Figure 7 below illustrates the movement of the CAPSS STAR to the east.

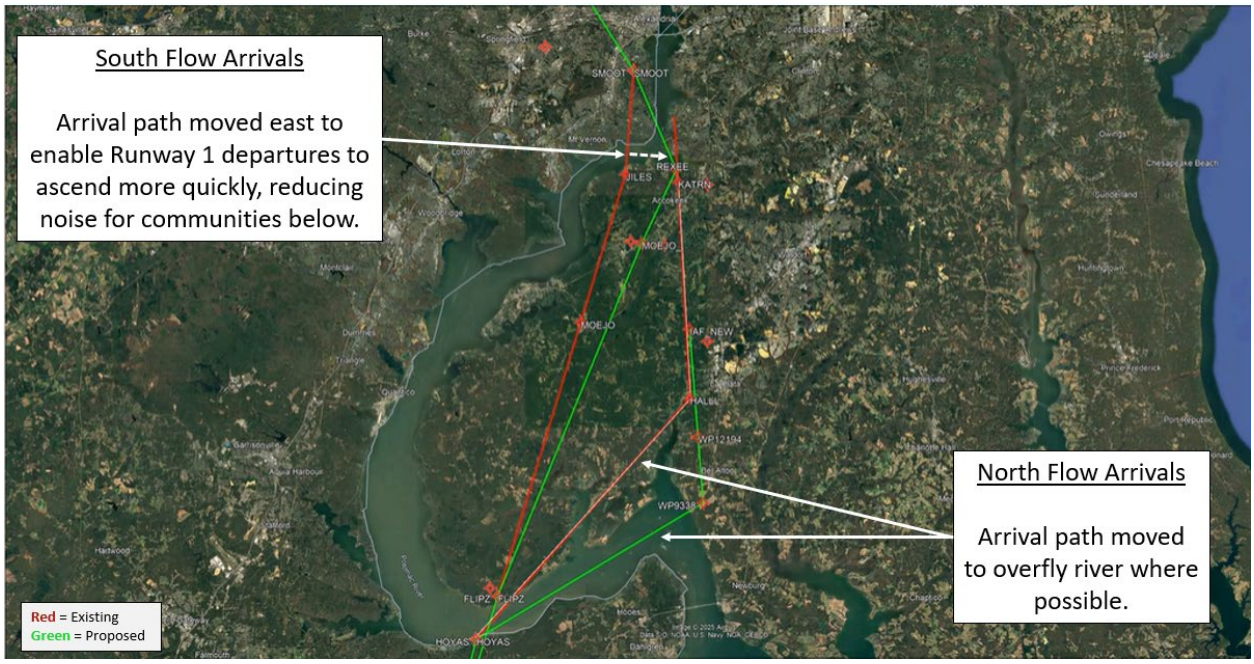

Figure 7. *Existing CAPSS STAR in Red. Notional CAPSS STAR in Green.*

The new notional path clears the departure path sooner, allowing the departures an opportunity to climb sooner. The arrival altitude was also raised from 7,000 feet to 8,000 feet until the STAR turns to the northwest where the aircraft begin descent to land on Runway 19. The difference in noise for communities south of the airport will not be perceptible. This is because the increase in altitude offsets the movement of the STAR to the east, so there is very little change in the noise footprint.

TRUPS/FRDMM STARs – North Flow Operation

The TRUPS/FRDMM STARs currently overfly Fairfax County and converge at a point where they cross the westbound SIDs. (See Figure 8 below) This results in the area directly under the crossout point experiencing noise in both a north flow operation and a south flow operation. Fairfax County will receive a benefit from the shift of the TRUPS/FRDMM STARs when DCA is landing north flow operations[3]. The TRUPS/FRDMM STARs will move to the southwest, away from the area of concentration described above and over more compatible land uses. The Design Philosophy requires that no one area/community experience disproportionate noise impacts compared to other areas/communities. The new notional design spreads the noise over a wider area resulting in periods of relief for all residents.

[3] North Flow Operations is when DCA is landing/departing Runways 1, 4, and 33. South Flow Operations is when DCA is landing/departing Runways 19, 22, and 15

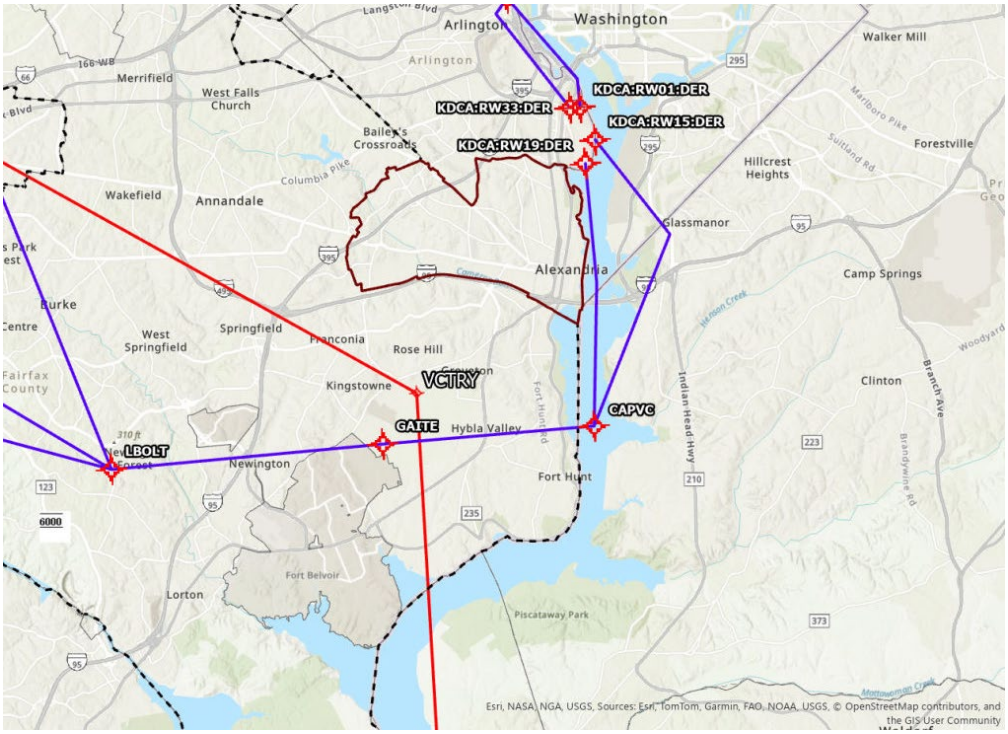

Figure 8. *Existing TRUPS/FRDMM STARs in Red. Westbound Departures in Purple.*

The new notional flight path of the STARs will only be active when the airport is landing to the north. When the airport is departing to the south, residents in the vicinity of Springfield will not be overflown by aircraft on the STARs, as shown in Figure 9 below.

Figure 9. *Existing TRUPS/FRDMM STARs in Red. Notional TRUPS/FRDMM STARs in Green.*

Other Recommendations

Use of NADP-1

The North of Airport (NoA) project previously recommended the use of Noise Abatement Departure Procedure 1 (NADP-1) to reduce noise impacts on communities located near the airport. However, implementation of NADP-1 during north-flow operations at DCA was deemed impractical due to inconsistencies in how various aircraft types integrate NADP-1 within their onboard automation systems. These inconsistencies led to variations in climb performance and raised concerns about maintaining adequate longitudinal separation between successive departures.

A contributing factor is that aircraft departing northbound from Runway 1 typically do not diverge for several miles after takeoff, increasing the risk of spacing conflicts. In contrast, during south-flow operations, aircraft typically diverge within 2 nautical miles of the departure end of the runway. This divergence provides greater flexibility and should make the use of NADP-1 more feasible and operationally safe during south operations at DCA.

Given this, we respectfully request reconsideration of implementing NADP-1 during south-flow operations. Doing so could provide meaningful noise relief to communities in close proximity to the airport, including Alexandria and Fort Washington.

Project Summary: Enhancing Safety, Efficiency, and Community Noise Relief through Procedure Redesign South of DCA Airport

The goal of this project was to provide solutions that address community noise concerns while simultaneously increasing both safety and operational efficiency at Ronald Reagan Washington National Airport (DCA). A key component of this effort involved modifying the Standard Instrument Departures (SIDs) to comply with ELSO criteria. These changes will enable more efficient departure operations and improved throughput in all weather conditions—capabilities that the current procedures do not allow due to non-compliance with modern design criteria.

By bringing the SIDs into compliance, we can unlock the benefits of continuous climb operations and more consistent routing, significantly enhancing airspace capacity.

The new SID designs also bring aircraft departing Runway 19 back near the center of the river and further away from the Alexandria shoreline. This provides modest relief to residents that will experience a few less events per day above 55dB but the flight path will be visually perceptible as being further away from the City.

In parallel, Standard Terminal Arrival Routes (STARs) have been redesigned to shift aircraft paths over less densely populated areas, particularly for arrivals from the northwest via the TRUPS and FRDMM STARs. This change not only reduces overall track miles but also improves vectoring flexibility for controllers, enhancing both safety and efficiency.

The STARs have been relocated to the southwest to minimize the overlap of arrival and departure paths, providing periodic relief to affected communities in Fairfax County—especially during north-flow operations. Under south-flow operations, departures will overfly these communities 43% less than under current procedures, resulting from a SID realignment along the Potomac River. This routing reflects a long-standing recommendation of the CWG.

The approach to Runway 1 has also been updated. Aircraft crossing the KATRN waypoint will now be designed to maintain a minimum altitude of 3,000 feet, an increase from the previous 2,500 feet (or lower, when vectored). This change, combined with new Instrument Landing System (ILS) and Required Navigation Performance (RNP) procedures, offers measurable noise relief to the communities of Prince George's County, such as Accokeek and surrounding areas. The changes are expected to be perceptible, with aircraft flying visibly higher over these neighborhoods.

Additionally, the updated ILS procedure will include two new waypoints: a step-down fix at 4,000 feet and an initial approach fix at 5,000 feet. These changes support the potential for Optimized Profile Descents (OPD), allowing aircraft to descend at idle thrust and reduce noise. For arrivals from the south via the CAP STAR, aircraft may be able to follow a continuous descent from the HOYAS waypoint (at 9,000 feet) down to the runway along a 3-degree glide path.

These recommendations provide flexibility for controllers to route aircraft via the STAR's lateral path, directly to the new initial approach fix, or to KATRN. This expanded set of sequencing

options will increase efficiency, reduce vectoring, and allow aircraft to rely more on automated guidance.

With aircraft arriving on the west downwind at 3,000 feet, on the east downwind at 4,000 feet, and the new initial approach fix at 5,000 feet, vertical separation between arrival streams will also be improved—enhancing operational safety.

Conclusion: A Balanced Approach to Progress

We believe these notional designs represent a triple win:

- **For communities**: tangible noise relief and reduced overflights
- **For air traffic control and the airport**: increased efficiency and operational flexibility
- **For airlines**: reduced track miles and more efficient procedures.

We appreciate your consideration of these proposed changes and look forward to a favorable response and eventual implementation. Please do not hesitate to reach out with any questions or requests for clarification regarding these designs.

Additionally, we respectfully request that Vianair, be permitted to attend any upcoming Performance Based Navigation (PBN) implementation meetings related to these procedures.

Thank you,

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Glossary

A-RNP – Advanced Required Navigation Performance

ATC – Air Traffic Control

ATIS – Automatic Terminal Information Service. Broadcast service at airports which provides non-control airport/terminal area and meteorological information to pilots.

CAPSS – The “Caps” STAR

CONVENTIONAL PROCEDURE – An instrument flight procedure that requires ground based navigational aids (NAVAID) to provide course guidance for an instrument approach to an airport or a departure procedure from an airport.

CWG – Community Working Group

DCA – The three-letter identifier for either the Ronald Reagan Washington National Airport or the ground based navigational aid associated with the airport – the DCA VOR/DME.

FRDMM – The “Freedom” STAR

GPS – Global Positioning System – A satellite-based navigational aid.

IFP – Instrument Flight Procedure

IMC – Instrument Meteorological Conditions – Instrument meteorological conditions means weather conditions below the minimums prescribed for flight under Visual Flight Rules (VFR).

LDA – Localizer type Directional Aid – A localizer normally located off-airport or on-airport that is not directly aligned with the runway.

Localizer – A ground-based directional aid that provides precision lateral guidance to an airport or runway.

MARS – Multiple Airport Route Separation – A new separation standard currently under development by the FAA to enable reduced lateral separation between aircraft flying RNAV routes within terminal airspace.

MWAA – Metropolitan Washington Airports Authority

NADP-1/2 – Noise Abatement Departure Procedure – Two specific standard climb profiles involving power settings and climb rates for departing aircraft to use resulting in reduced noise impact along the departure route.

NOA – North of Airport Committee of the Community Working Group (CWG)

P-56 – Prohibited Area 56 – The airspace that surrounds the White House, Capitol Building, and other government office buildings in which flight by aircraft is prohibited.

PBN – Performance Based Navigation – A very precise navigational criteria or standard by which instrument flight procedures are designed allowing the use of RNAV and/or GPS to fly very accurate arrival and departure routes.

PCT – Potomac Terminal Radar Approach Control, also known as the Potomac Consolidated TRACON, is the Air Traffic Control facility that handles flights in the Washington Metroplex.

RADIAL – A specific electronic course defined in one of 360-degrees from a NAVAID such as a VOR or TACAN that aircraft may use to navigate to/from a station expressed as a number followed by the letter "R" – i.e., 328R

RF – Radius-To-Fix – A type of RNAV leg or approach segment of an IFP that is made up of two waypoints connected by an arc or uniform curved flight path.

RNAV – Area Navigation – RNAV can be one of several kinds of systems (including GPS) used by aircraft to navigate point to point without having to fly directly to/from a NAVAID.

RNP – Required Navigation Performance – RNP is a very precise version of RNAV that is normally used for instrument approach procedures but that may also be used in other instrument flight procedures.

RWY – Runway

SIAP – Standard Instrument Approach Procedure

SID – Standard Instrument Departure

SOP – Standard Operating Procedure

STAR – Standard Terminal Arrival Route

TAA – Terminal Arrival Area – Criteria used within TERPS to allow aircraft to conduct approaches from a wide area surrounding an IAF or IF that protects aircraft from terrain and obstructions without having to be established on the final approach course.

TAA Concept Test – An evaluation of a proposed SOP that will allow air traffic controllers to sequence aircraft to the IF (DARIC) rather than the IAF (FERGI) in a more randomized manner resulting in track variability over residential areas.

TERPS – Terminal Procedures – The criteria by which the FAA designs instrument flight procedures.

TF – Track-To-Fix – A type of RNAV leg or approach segment of an IFP that is made up of two waypoints connected by a straight-line flight path.

TRACON – Terminal Radar Approach Control

TRUPS – The “Troops” STAR

VFR – Visual Flight Rules – Weather conditions reported as less than 3 statute miles visibility, or the ceiling is less than 1000 feet above the ground.

WP – Waypoint – A point in space that aircraft can navigate to using RNAV.

Appendix 1 – Recommendations and Noise Analysis

Recommendations and Cumulative New Noise Analysis PowerPoint (Attachment)

Appendix 2 – TARGETS File

The Project TARGETS File is included here by reference.

Appendix 3 – Community Engagement Report

The Community Engagement Report is included here by reference.