

First Look: Proposed BWI Marshall Flight Procedure Changes Developed by Roundtable Technical Committee

Presented by the DC Metroplex BWI Community Roundtable Technical Committee
with support from Roundtable technical advisors
the Maryland Department of Transportation Maryland Aviation Administration (MDOT MAA) and Industry

October 15, 2019



Agenda

- History of procedure change/Roundtable Technical Committee process
- Historical/FAA Proposed BWI Marshall arrival and departure flight tracks
- Goals of Roundtable proposed procedure changes and anticipated benefits
- Purpose of tonight's meeting
- Proposed BWI Marshall flight procedure changes:
 - Runway 33L proposed arrival and approach procedure changes
 - Runway 10 proposed arrival and approach procedure changes
 - Runway 15R proposed approach procedure changes
- Next steps
- Discussion

Purpose of Tonight's Meeting

- Engage the full Roundtable to present a “first look” at the proposed procedure changes developed and supported by the Roundtable Technical Committee, MDOT MAA, and Industry
 - High-level summary and overview of proposed procedure changes and potential benefits
 - Detailed noise and technical analysis to follow at November 19 Roundtable meeting
 - **Material presented tonight DOES NOT constitute final submittal package of proposed procedure changes that may be provided to the FAA for consideration or plans for potential future FAA implementation**
- Goal at November meeting is to come to agreement as a Roundtable to support proposed procedure changes and begin developing submittal package for provision to FAA. **However, additional changes to procedures may be considered if necessary after November meeting**

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History of Procedure Change/Roundtable Technical Committee Process

Timeline of Procedure Change/Roundtable Technical Committee Process

- **March 2015:** FAA completed implementation of DC Metroplex at BWI Marshall, communities voice concerns regarding flight path changes
- **February 2016:** FAA further modifies departure procedure (TERPZ) for Runways 10 and 15R
- **March 2017:** DC Metroplex BWI Community Roundtable formed to address community concerns regarding flight path changes
- **August 2017:** FAA convenes PBN Working Group to evaluate modifying BWI Marshall procedures
- **April 2018:** FAA presents proposed procedures from PBN Working Group to Roundtable, mainly departure procedure changes with small modifications to arrivals
- **June 2018:** State files Administrative Petition against FAA regarding DC Metroplex
- **November 2018:** State files Petition for Review against FAA regarding DC Metroplex

Timeline of Procedure Change/Roundtable Technical Committee Process

- **December 2018:** MDOT MAA presents noise analysis of FAA proposed procedure changes from April 24, 2018 as presented to Roundtable
- **January 2019:** Roundtable sends FAA letter assessing proposed procedure changes, plans to work additional procedure changes through workshops lead by Roundtable Technical Committee, MDOT MAA, and Industry
- **February 2019:** Roundtable Technical Committee meets with MDOT MAA for first time to begin developing additional flight procedure changes
- **April – August 2019:** Roundtable Technical Committee, MDOT MAA, and Industry meet to explore and finalize procedure change alternatives
- **July 2019:** FAA files motion to hold State’s case in abeyance and reconsider State’s Administrative Petition
- **September 2019:** Roundtable Technical Committee and MDOT MAA present “first look” of proposed procedure changes to Roundtable Ad-Hoc Executive Committee

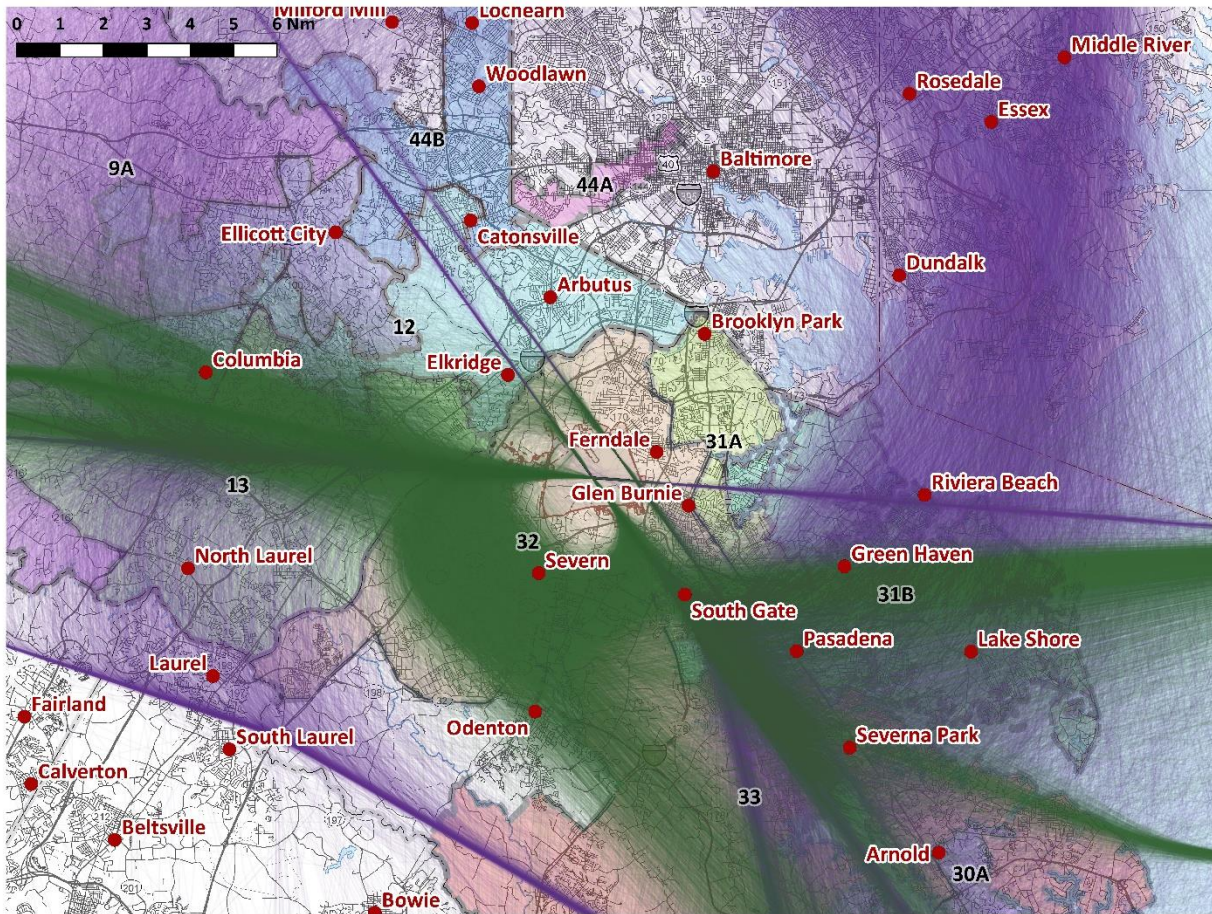


Historical/FAA Proposed BWI Marshall Arrival and Departure Flight Tracks

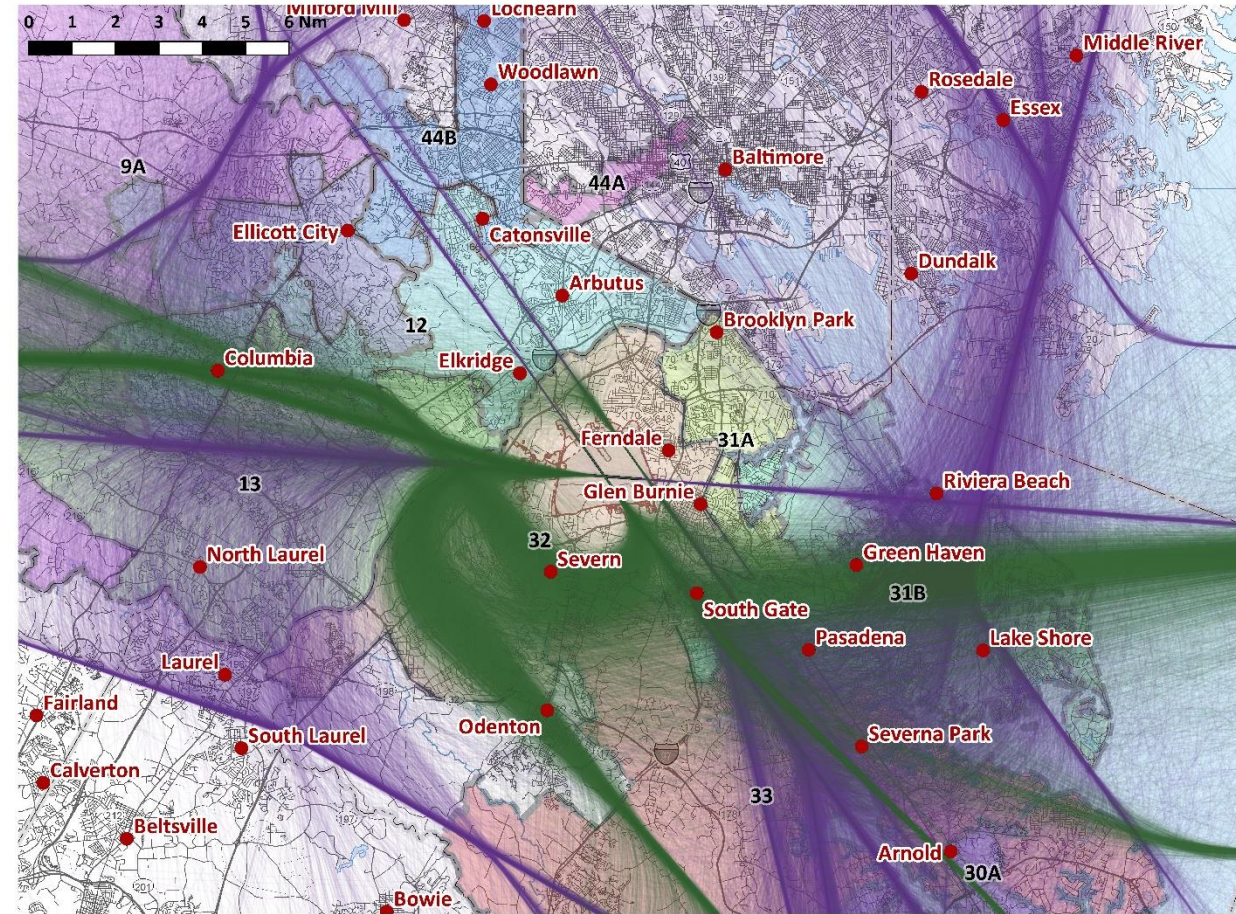
Historical/FAA Proposed BWI Marshall Flight Tracks

- The following slides present historical and proposed(simulated) flight tracks for context regarding the following time periods:
 - **Pre-Metroplex:** February 9, 2012 to May 2, 2012 (84-days)
 - **Post-Metroplex:** February 2, 2017 to April 26, 2017 (84-days)
 - **Post Metroplex with FAA proposed/simulated changes:** February 2, 2017 to April 26, 2017 (84-days) modified to reflect FAA's proposed April 24, 2018 procedure changes
- All tracks and separated into predominant BWI Marshall operating configurations (East and West flow)
 - Arrival flight tracks are depicted in Purple
 - Departure flight tracks are depicted in Green
 - Darker shades of color represent areas with greater concentrations of flight tracks, lighter shades represent areas of lesser concentrations

BWI Marshall Arrival and Departure Flight Tracks – All Flows



2012 Pre-Metroplex arrival and departure flight tracks



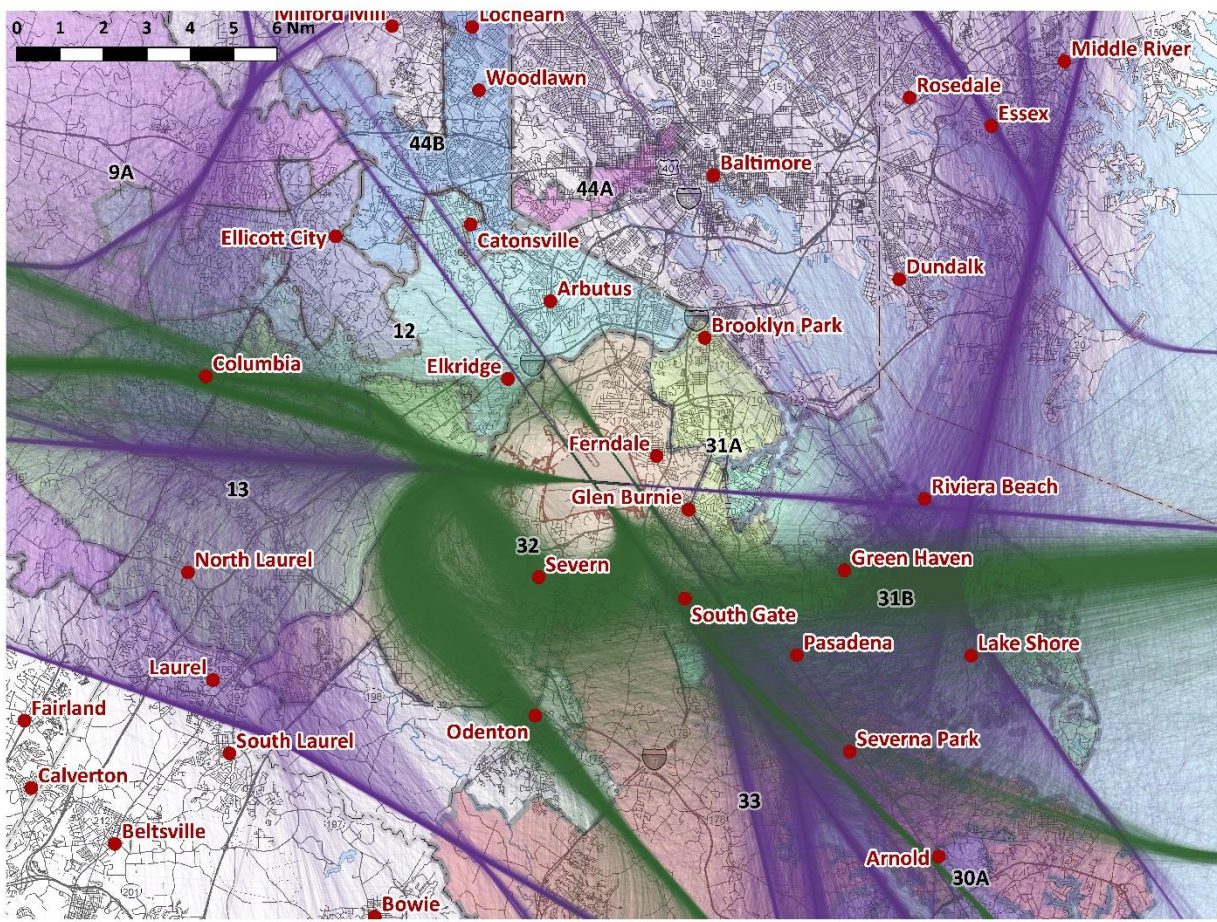
2017 Existing arrival and departure flight tracks

Legend

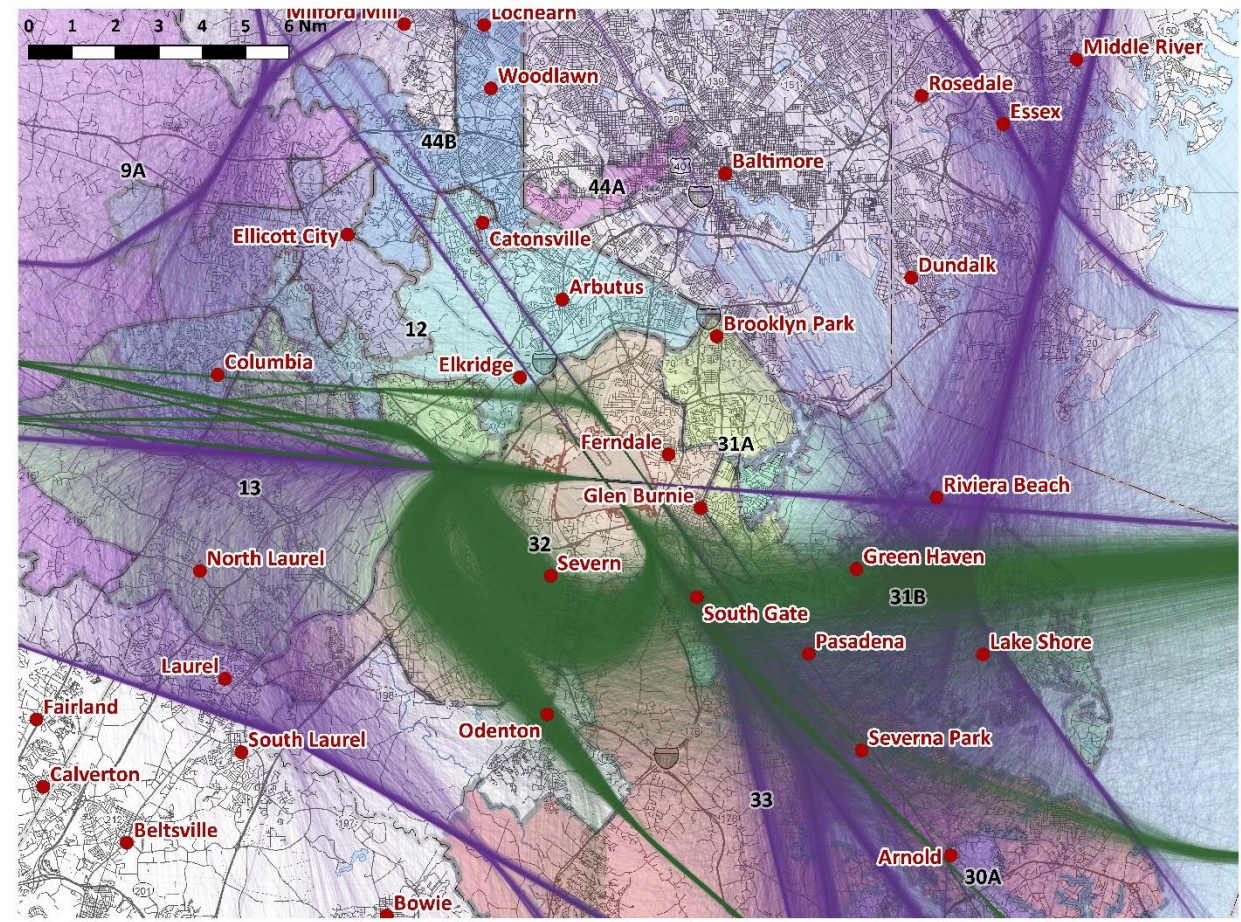
- Departure Flight Tracks
- Arrival Flight Tracks



BWI Marshall Arrival and Departure Flight Tracks – All Flows



2017 Existing arrival and departure flight tracks



2017 FAA proposed arrival and departure flight tracks

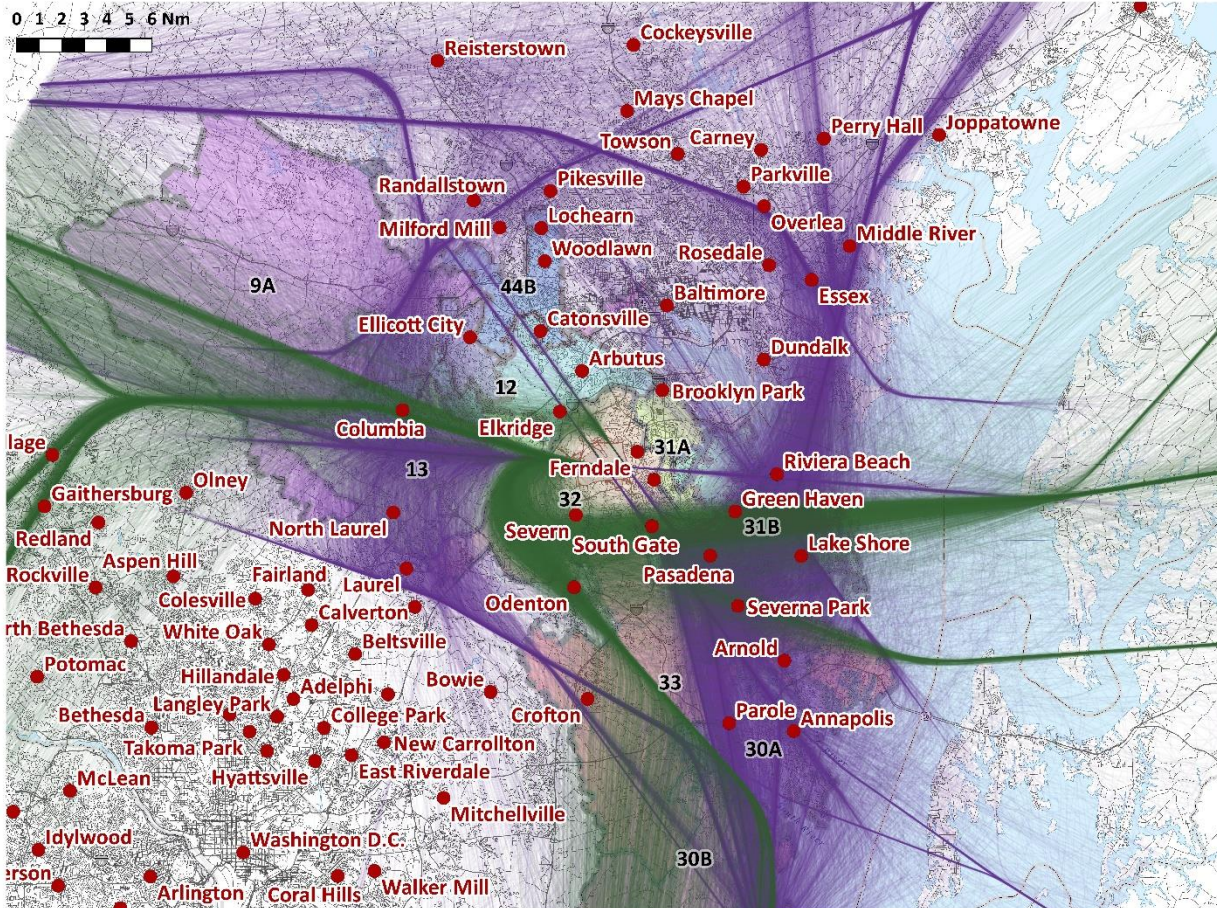
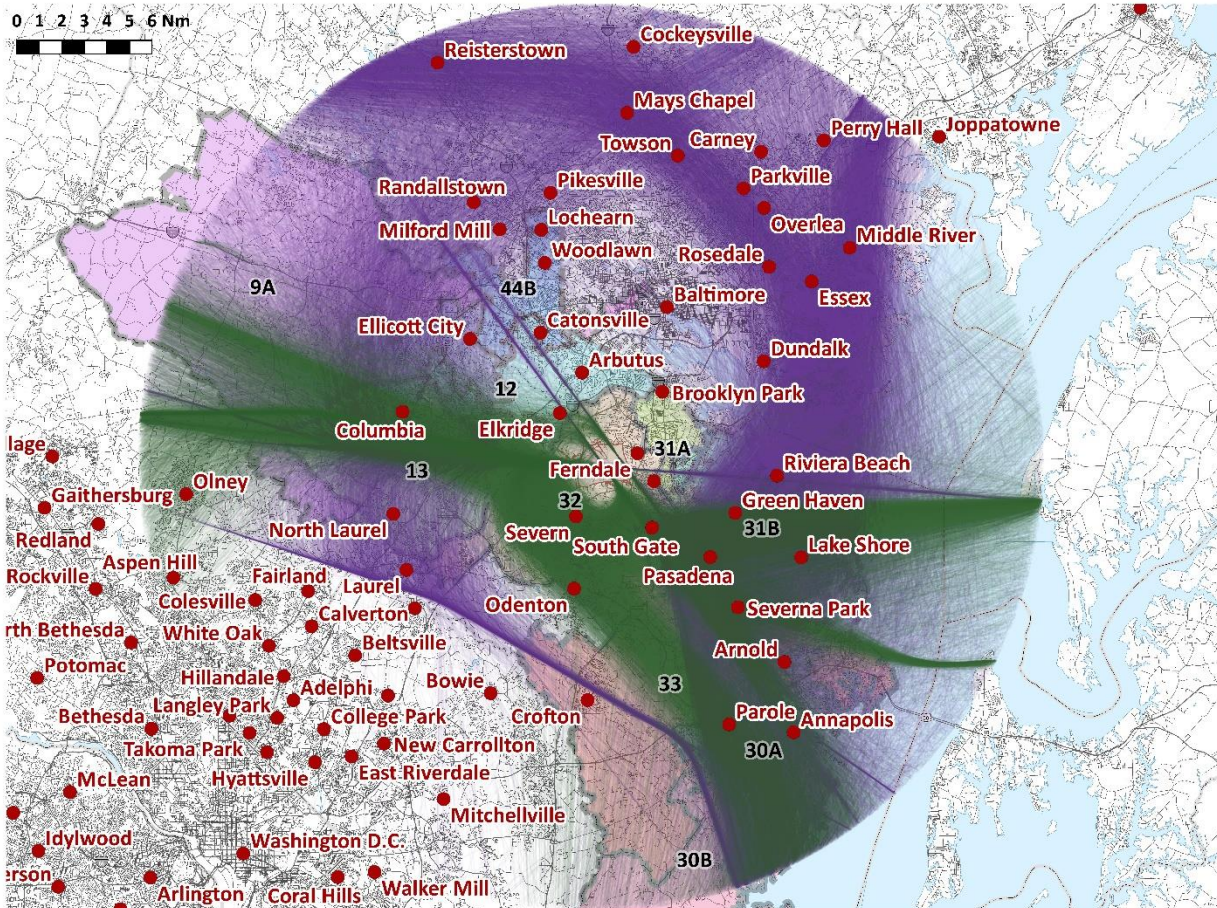
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BWI Marshall Arrival and Departure Flight Tracks – All Flows



2012 Pre-Metroplex arrival and departure flight tracks

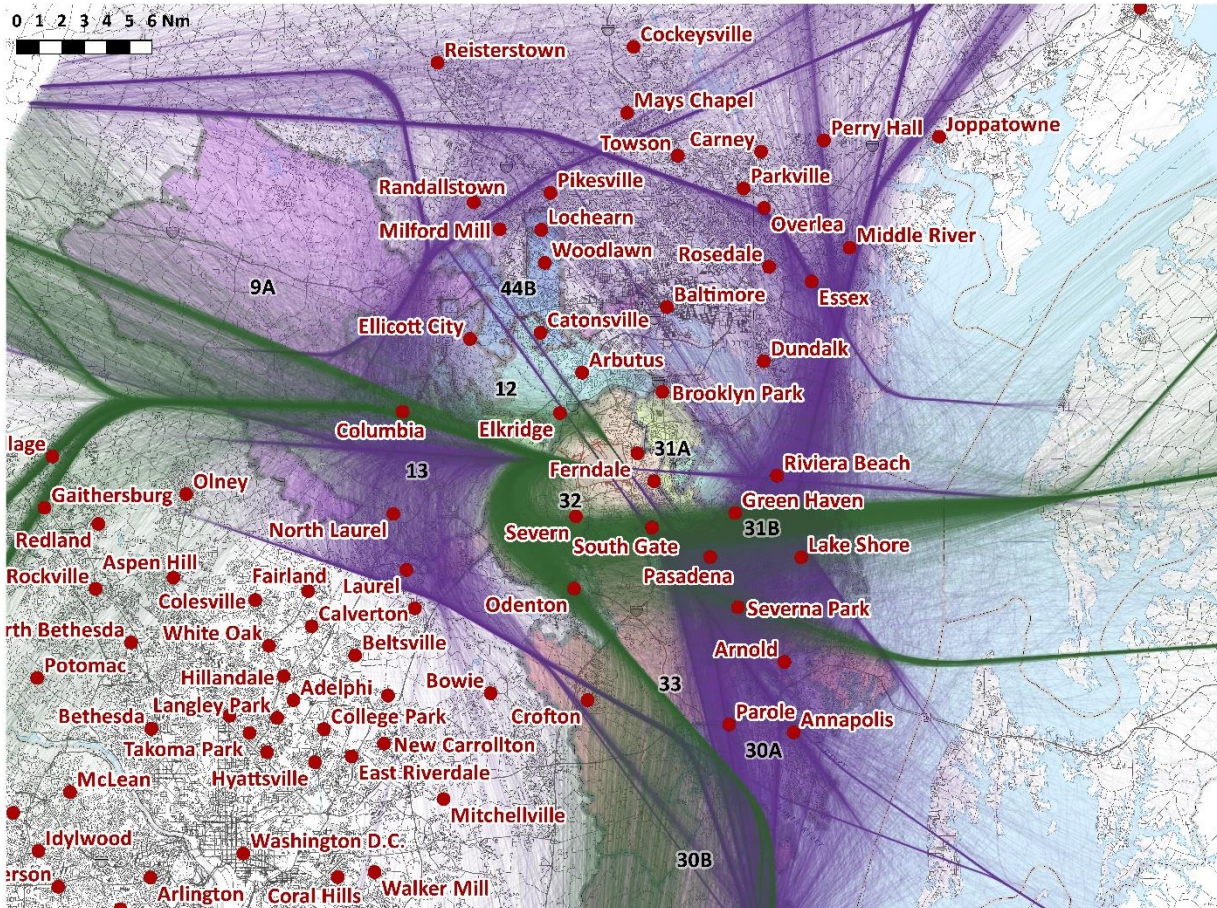
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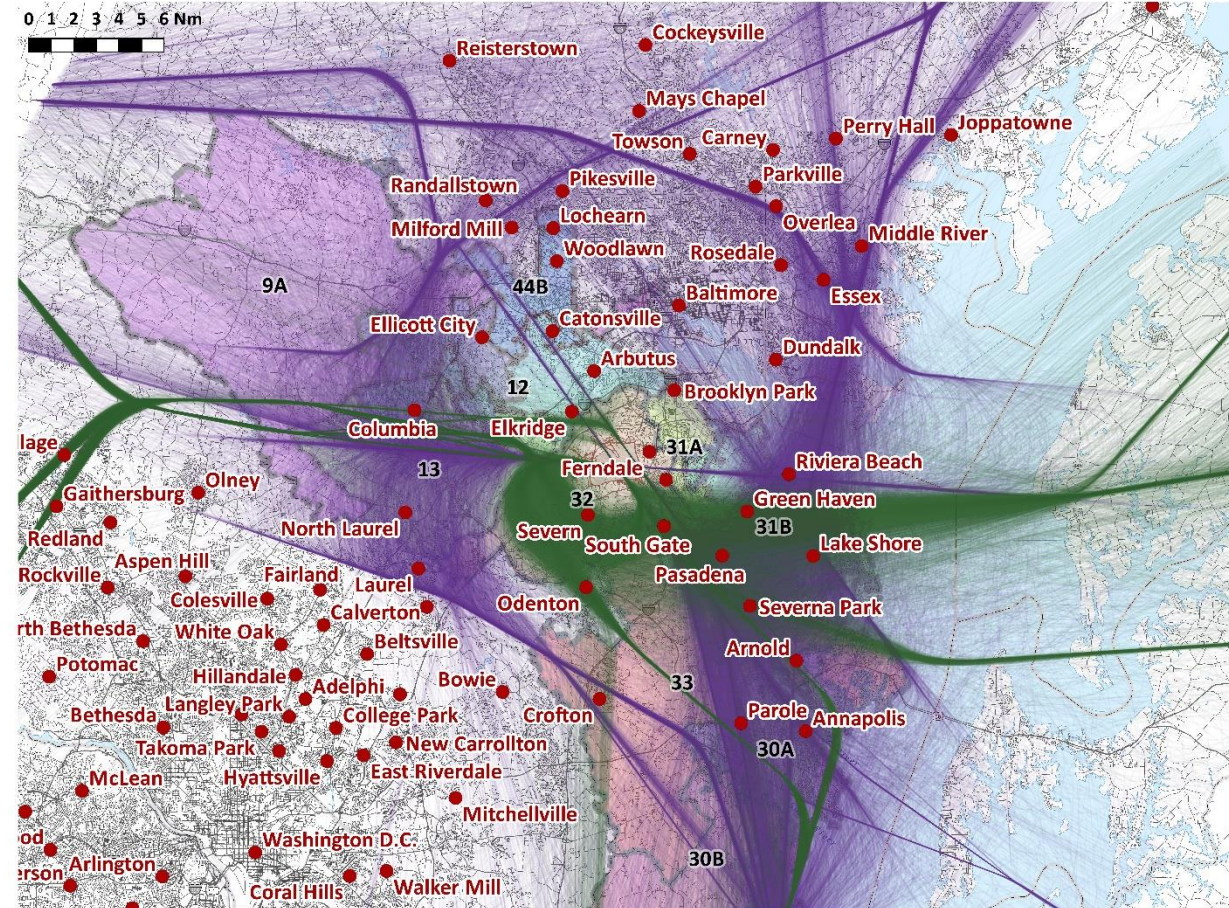
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BWI Marshall Arrival and Departure Flight Tracks – All Flows



2017 Existing arrival and departure flight tracks



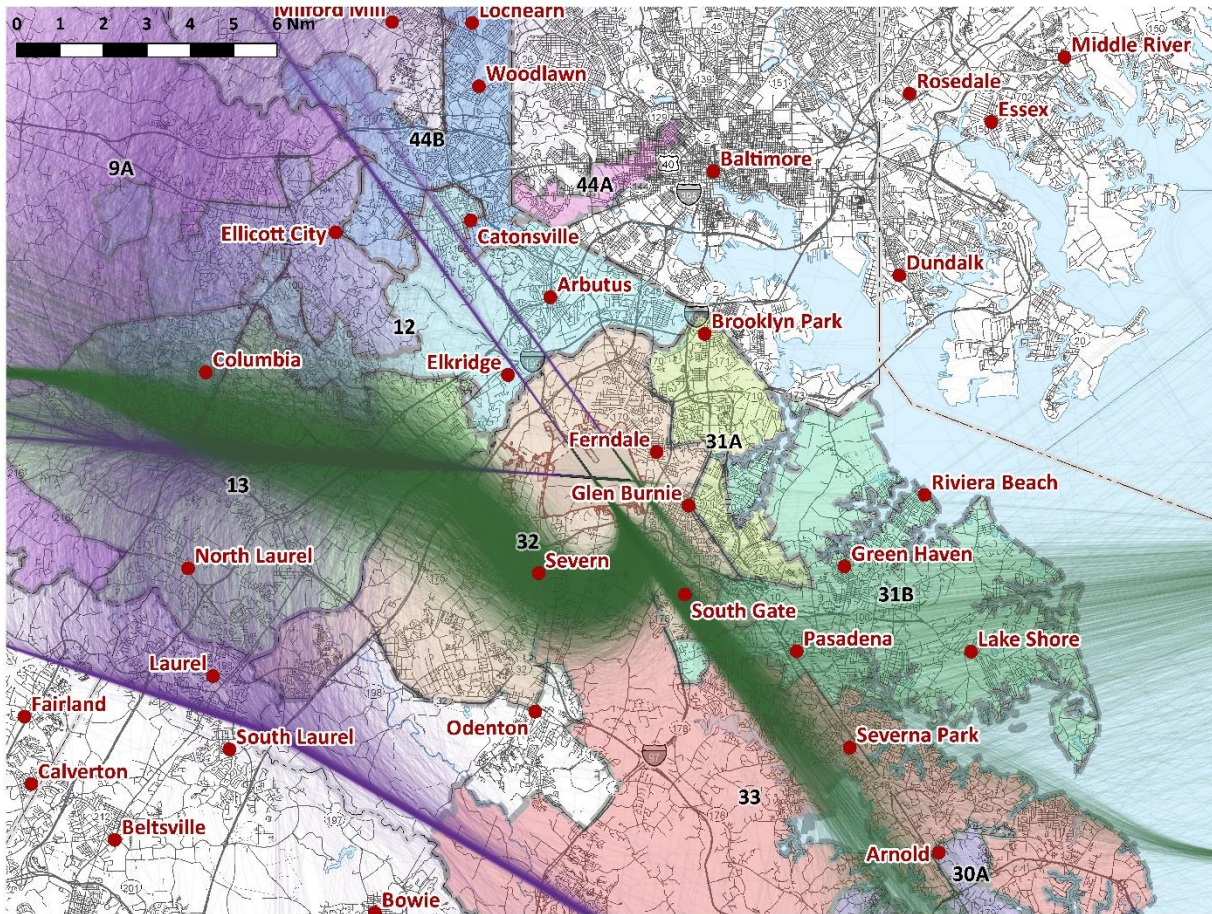
2017 FAA proposed arrival and departure flight tracks

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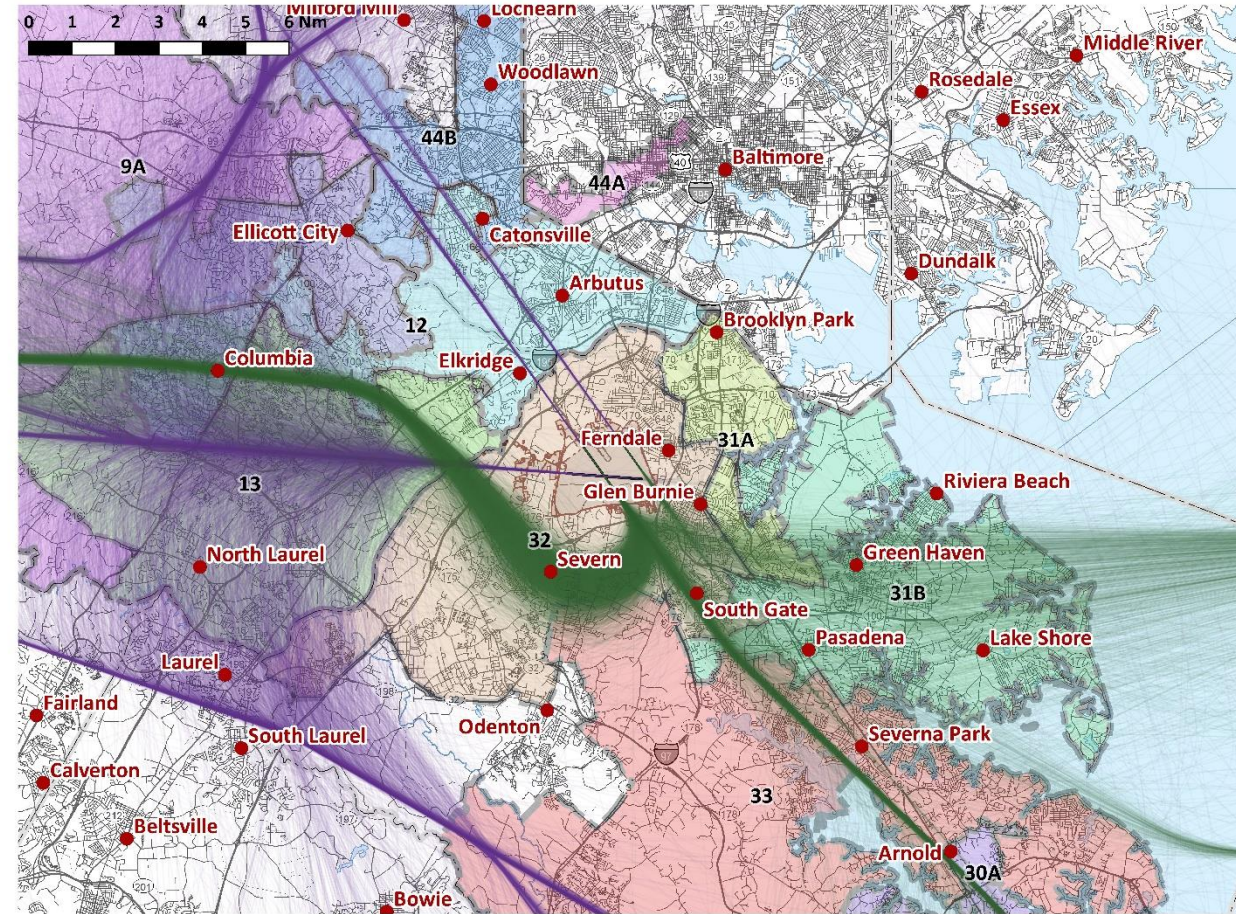
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BWI Marshall Arrival and Departure Flight Tracks – East Flow



2012 Pre-Metroplex arrival and departure flight tracks

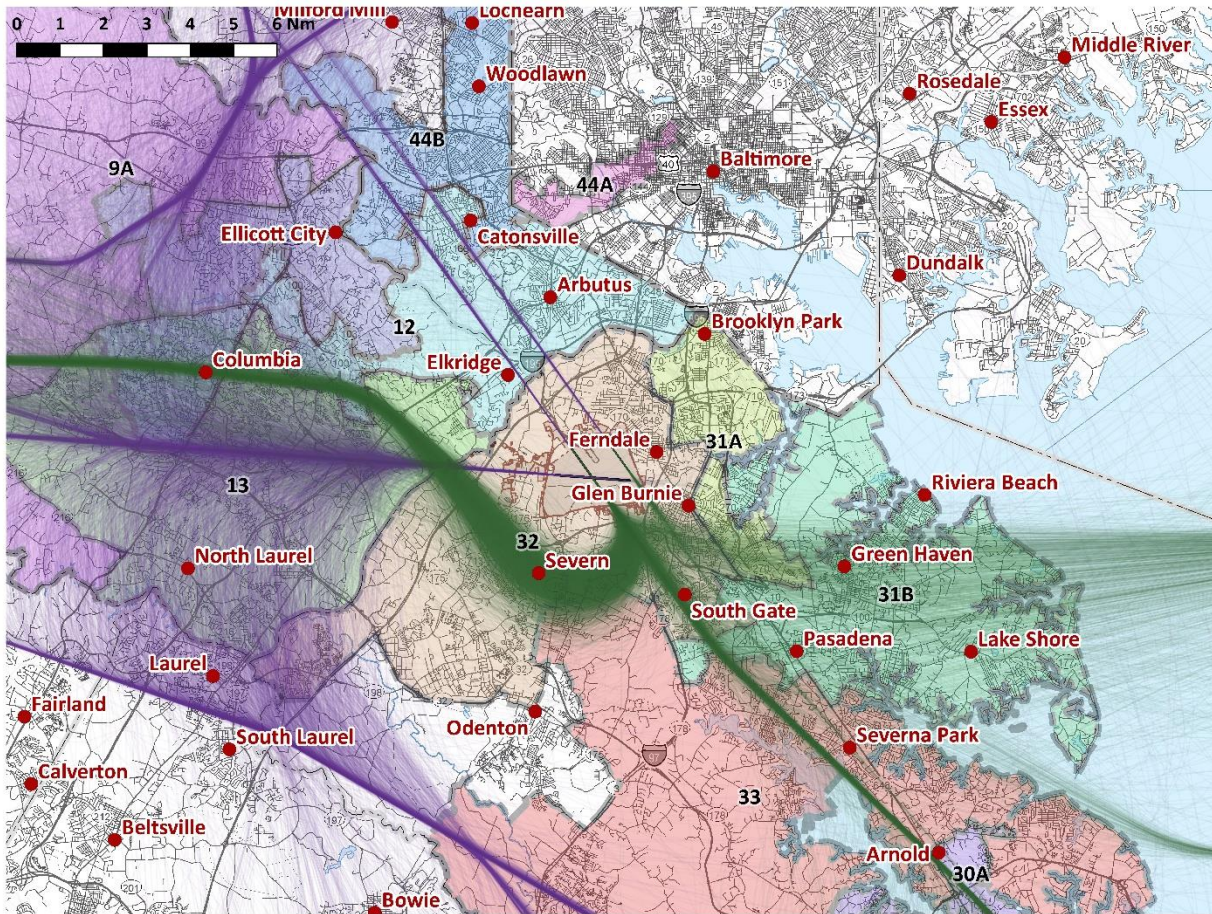


2017 Existing arrival and departure flight tracks

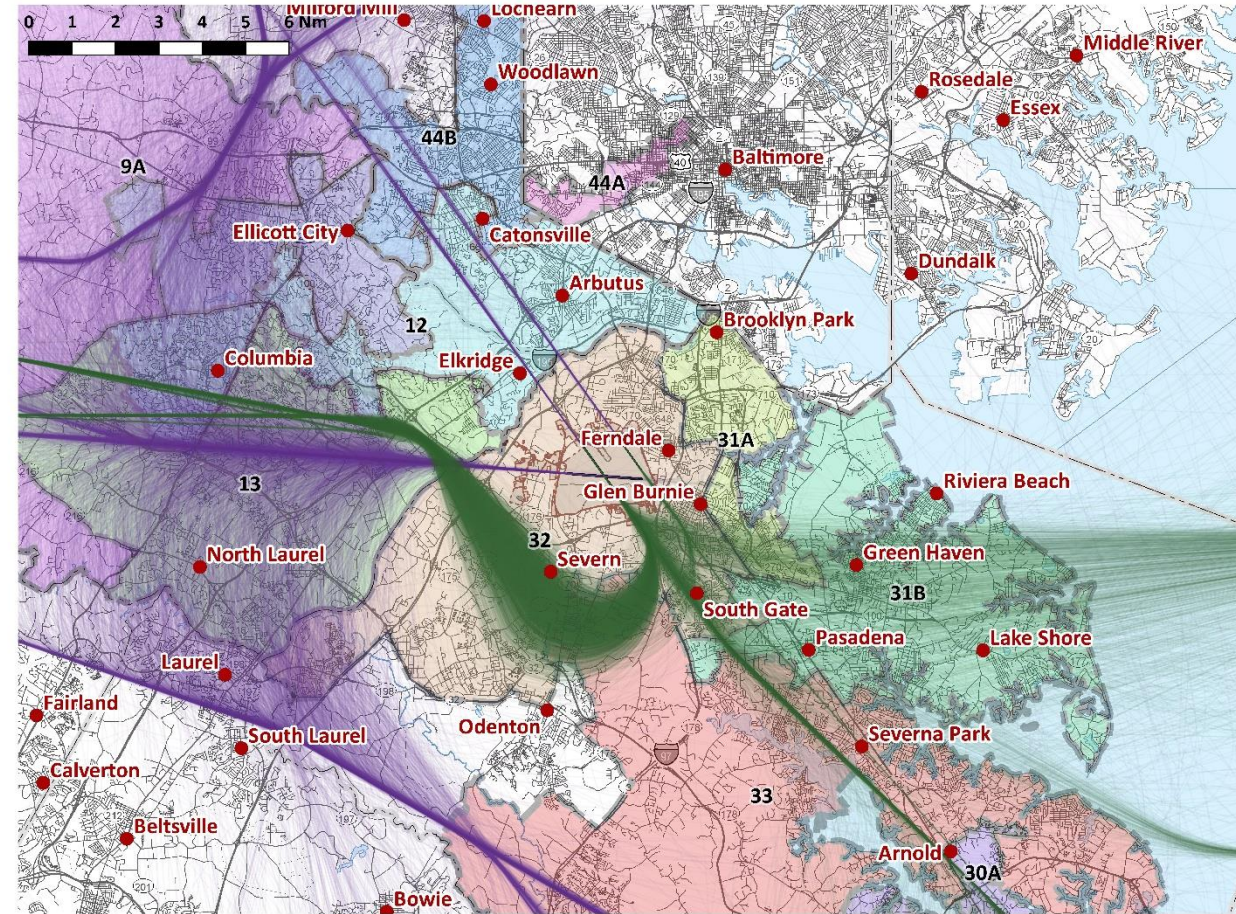
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BWI Marshall Arrival and Departure Flight Tracks – East Flow



2017 Existing arrival and departure flight tracks

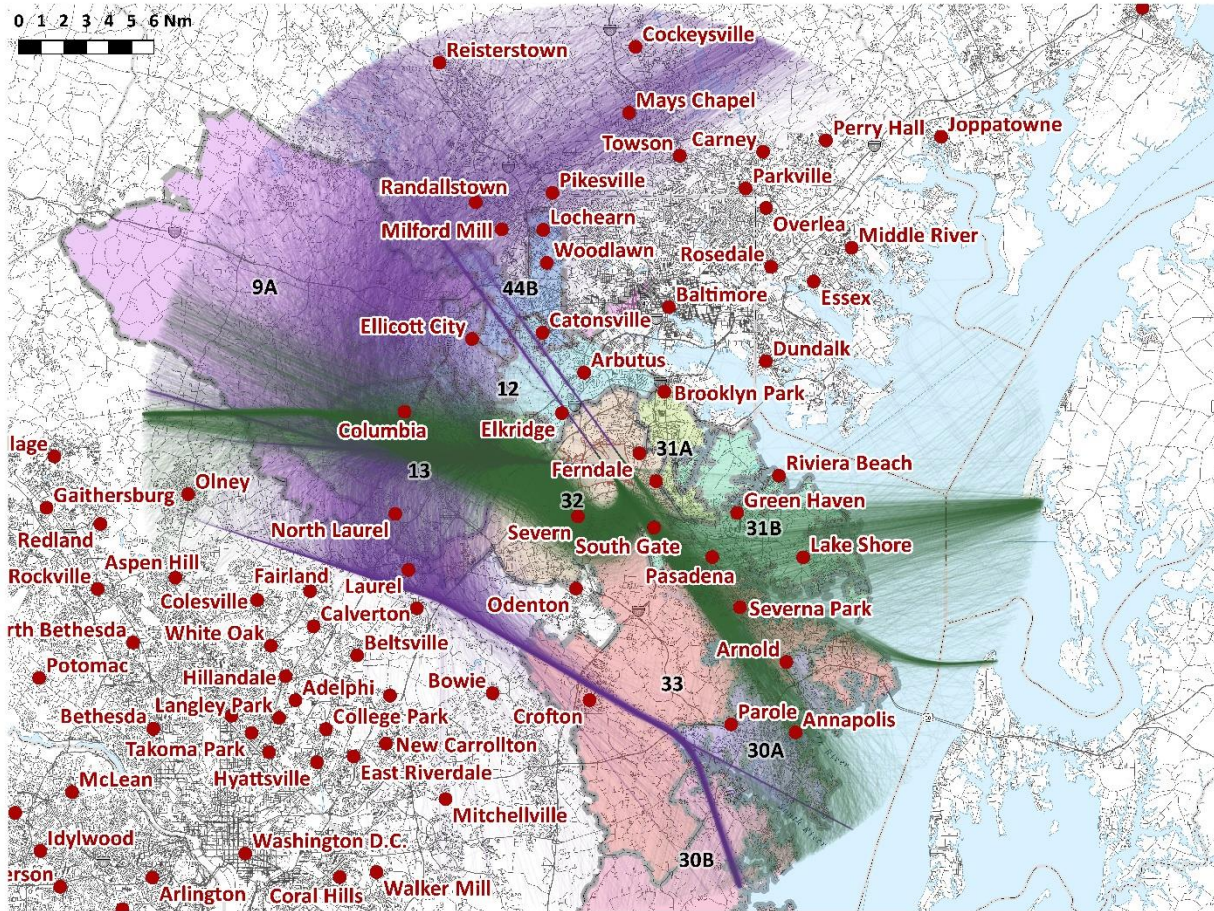


2017 FAA proposed arrival and departure flight tracks

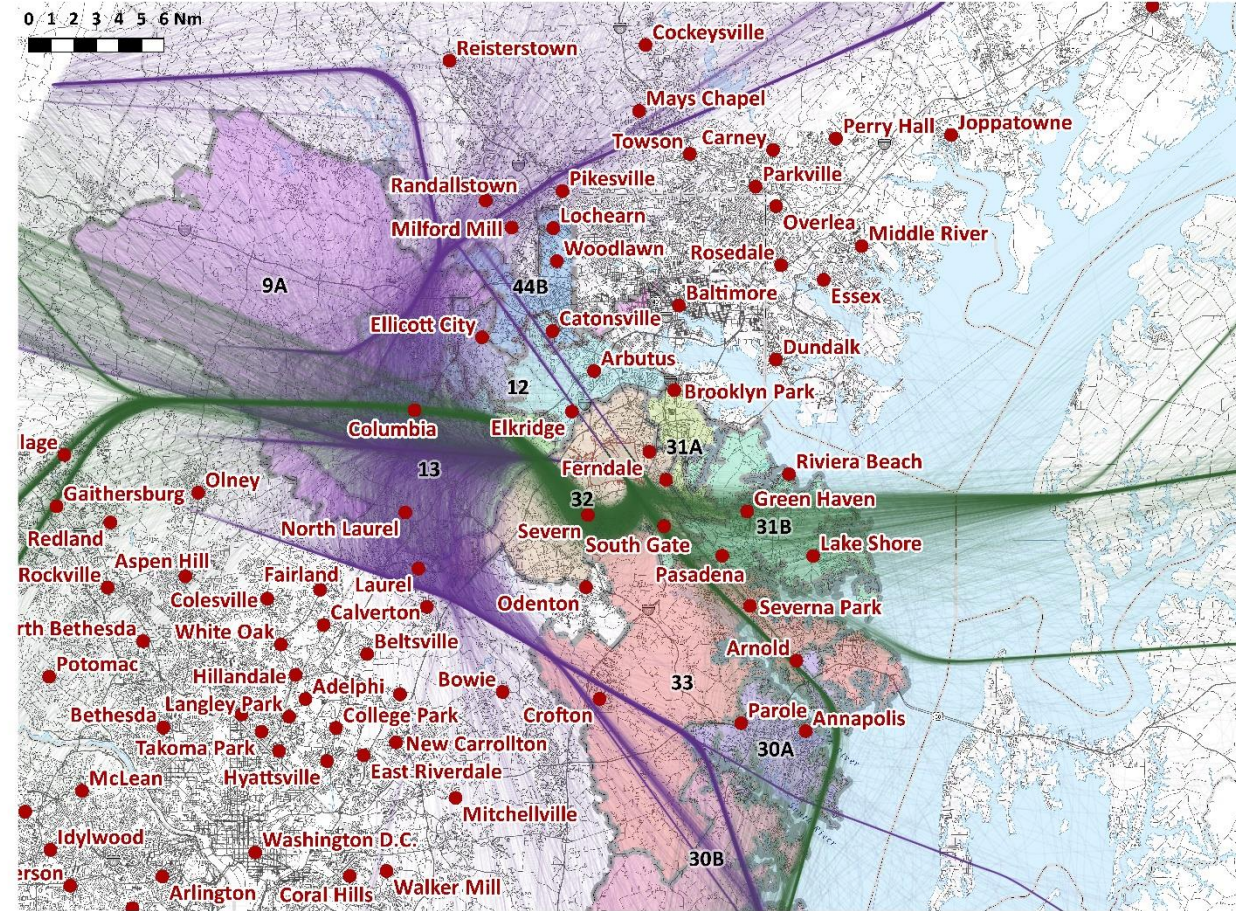
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BWI Marshall Arrival and Departure Flight Tracks – East Flow



2012 Pre-Metroplex arrival and departure flight tracks



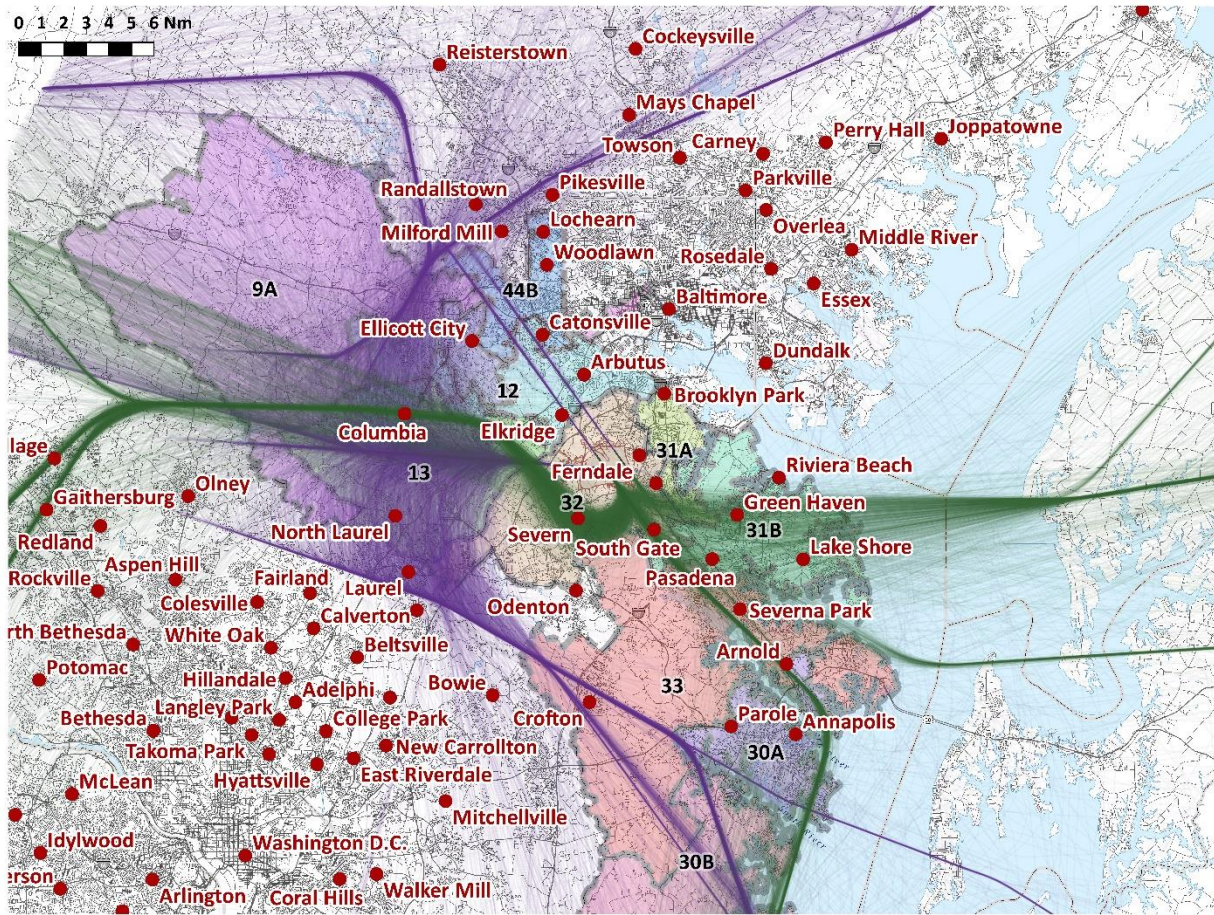
2017 Existing arrival and departure flight tracks

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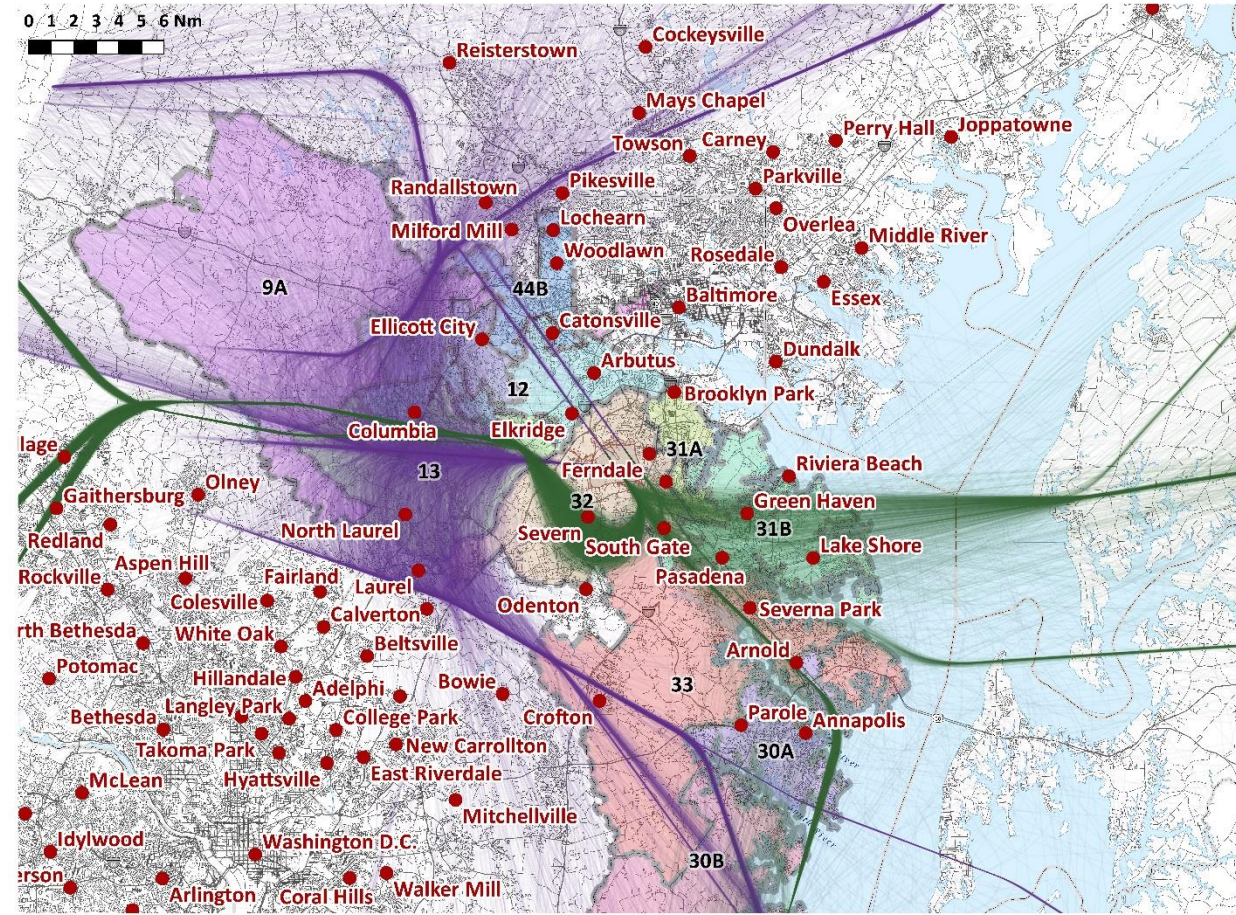
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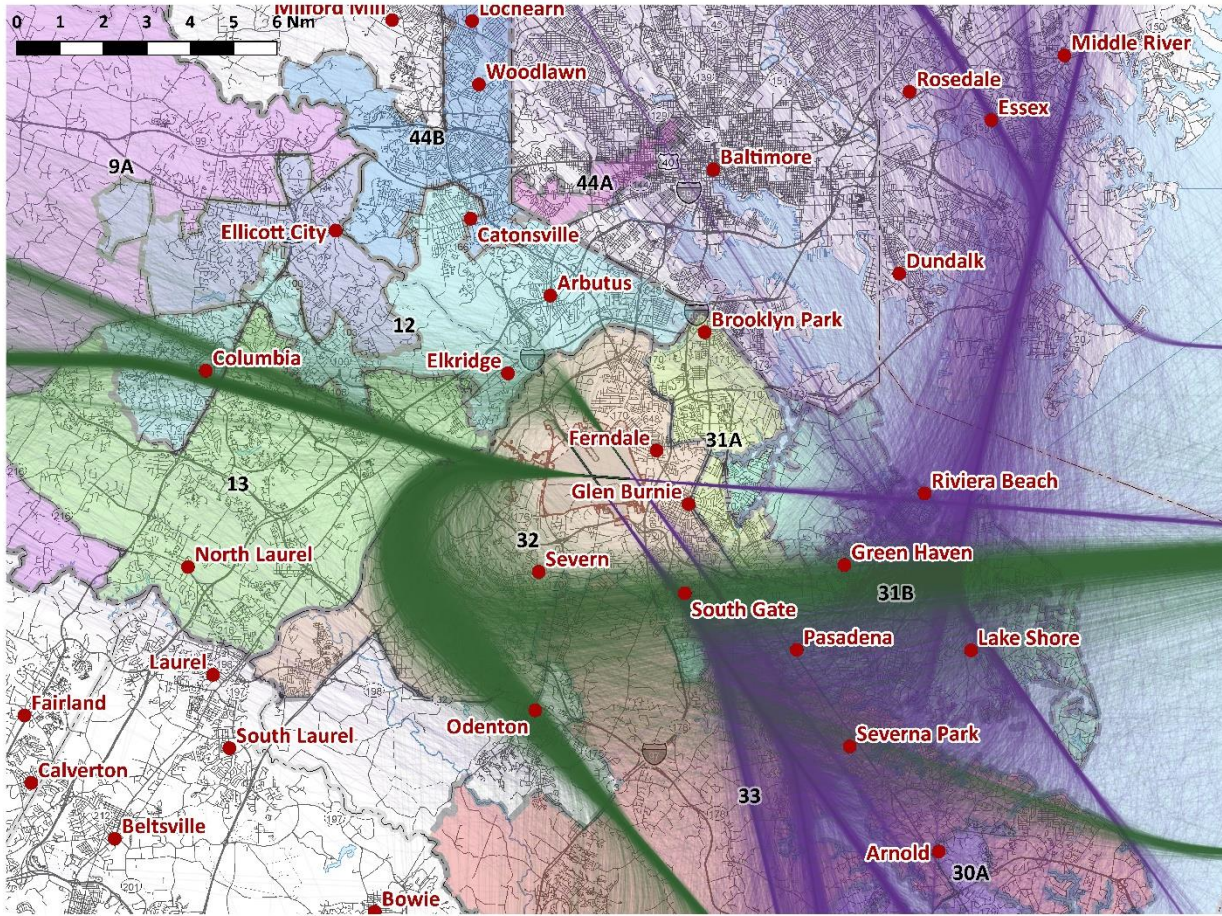
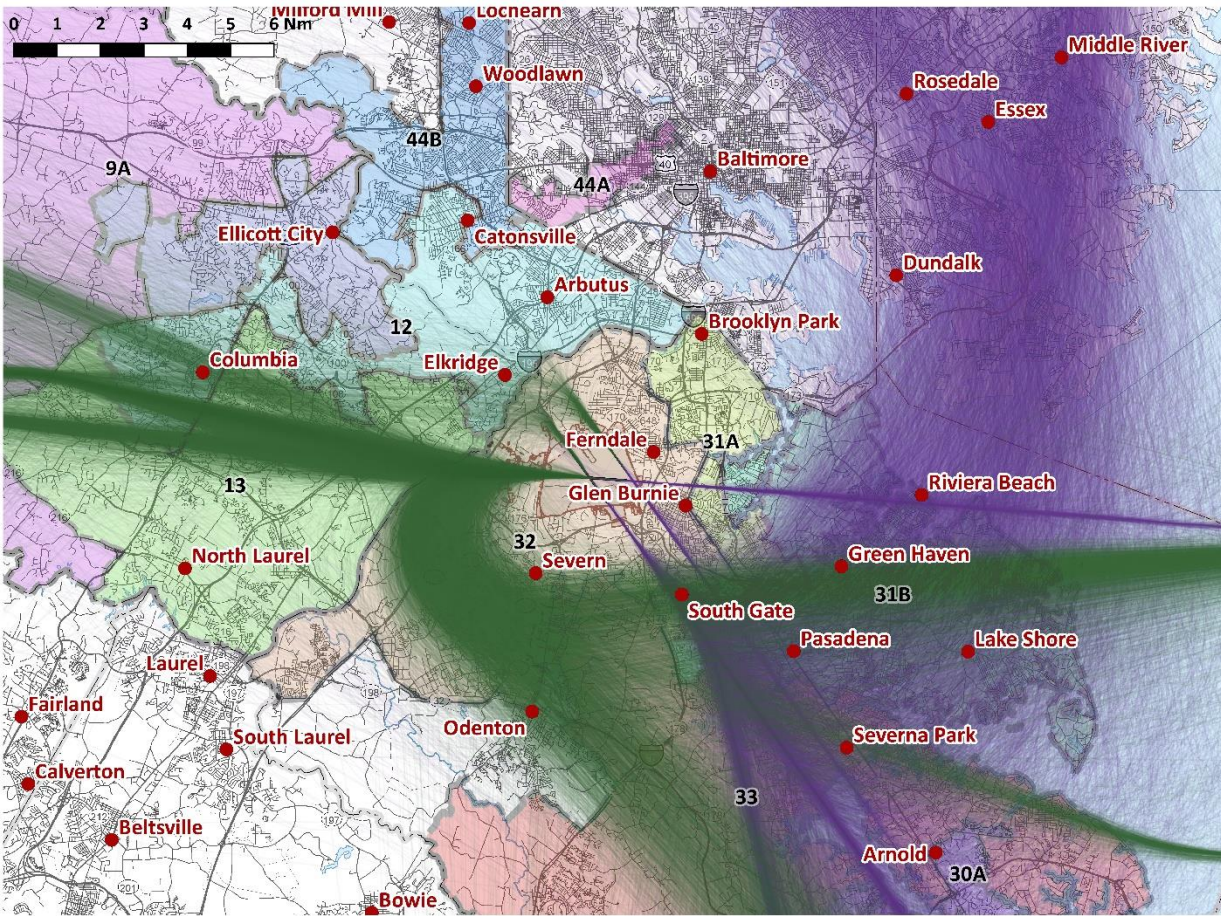


2017 FAA proposed arrival and departure flight tracks

Legend

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BWI Marshall Arrival and Departure Flight Tracks – West Flow



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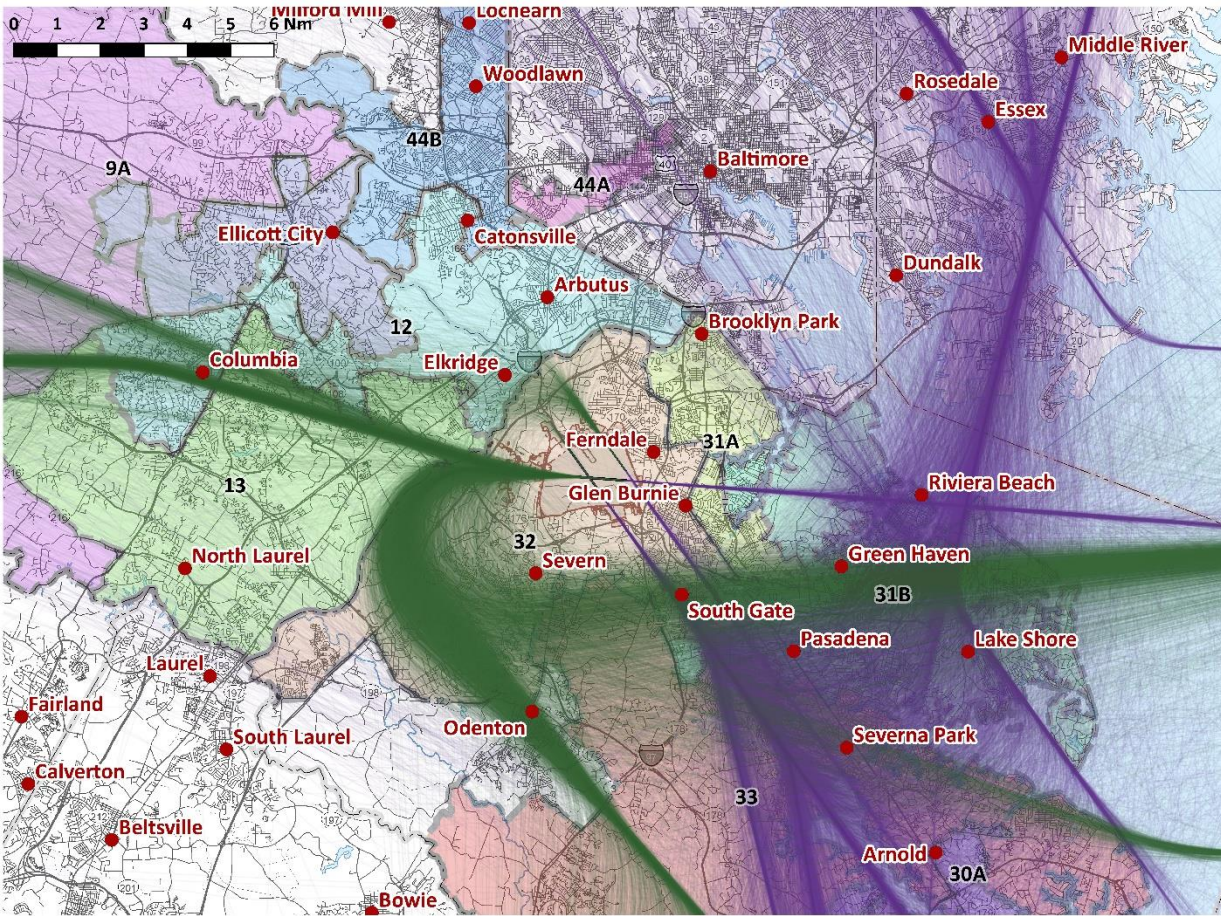
2017 Existing arrival and departure flight tracks

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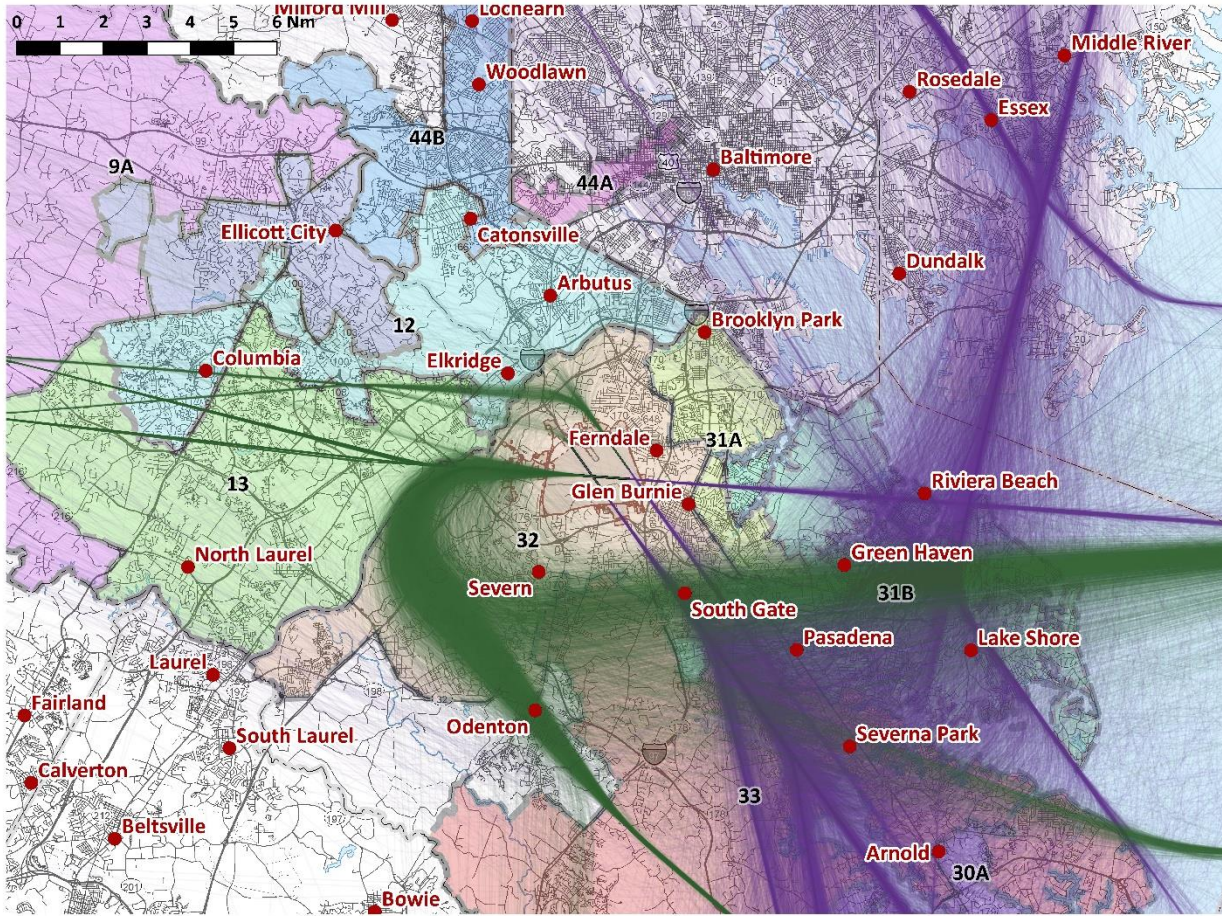
- Departure Flight Tracks
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BWI Marshall Arrival and Departure Flight Tracks – West Flow



2017 Existing arrival and departure flight tracks



2017 FAA proposed arrival and departure flight tracks

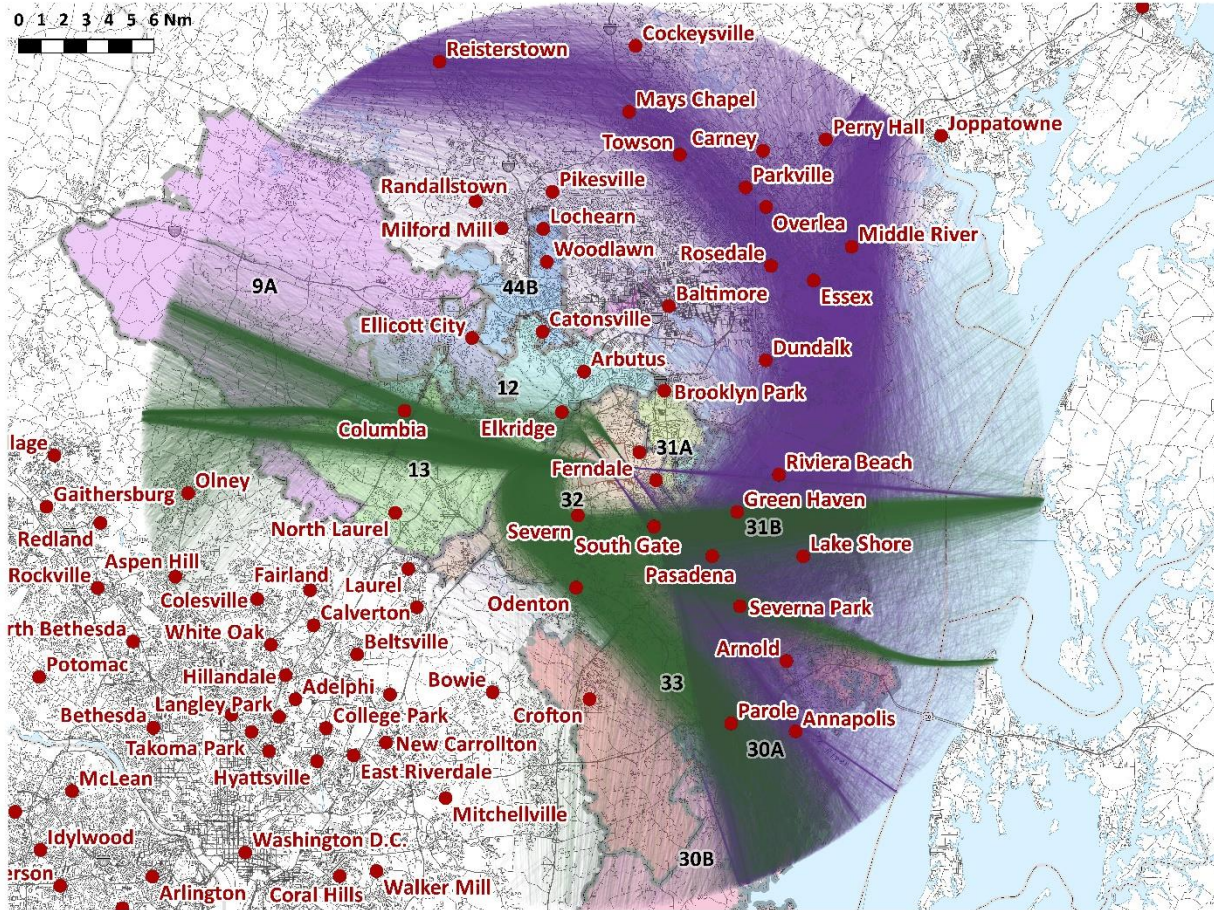
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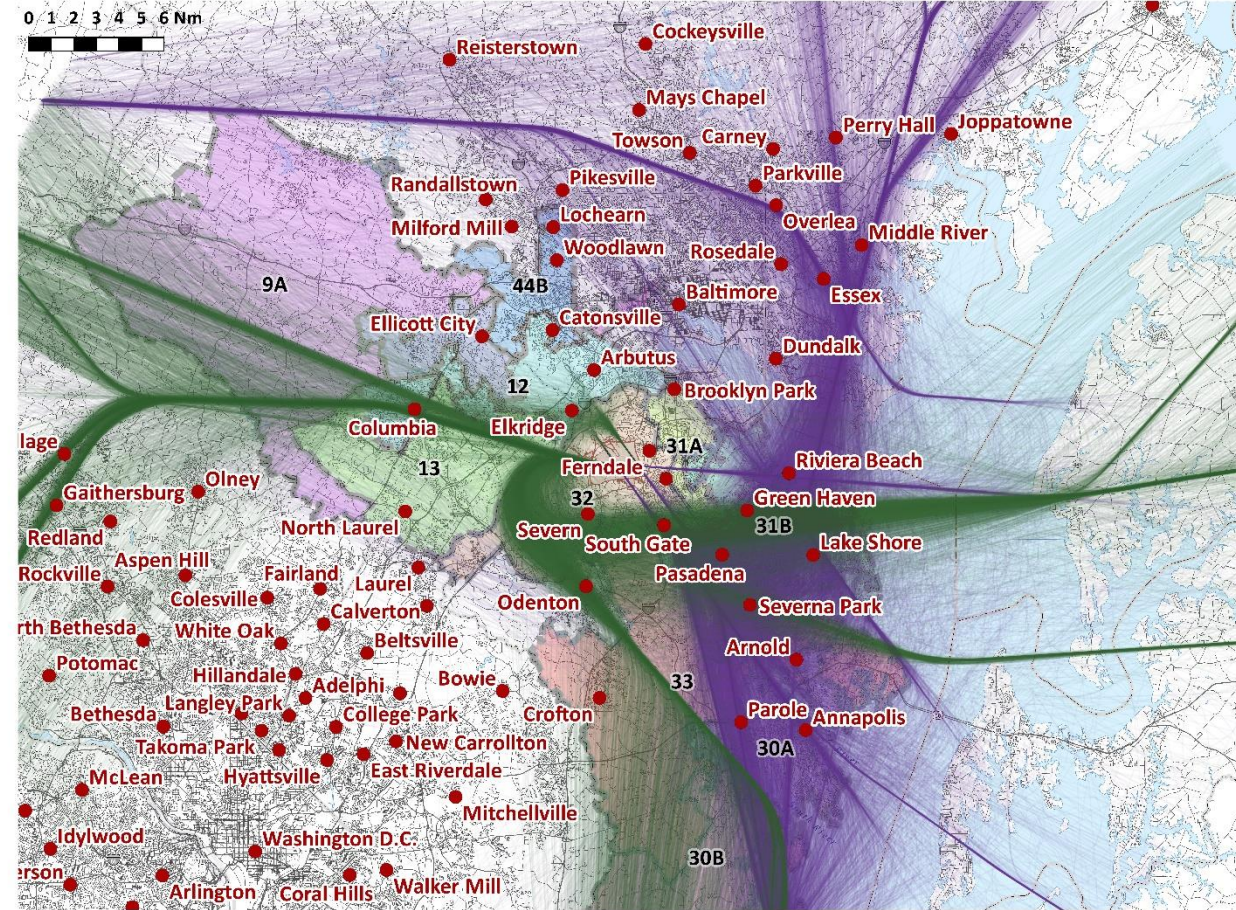


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BWI Marshall Arrival and Departure Flight Tracks – West Flow



2012 Pre-Metroplex arrival and departure flight tracks

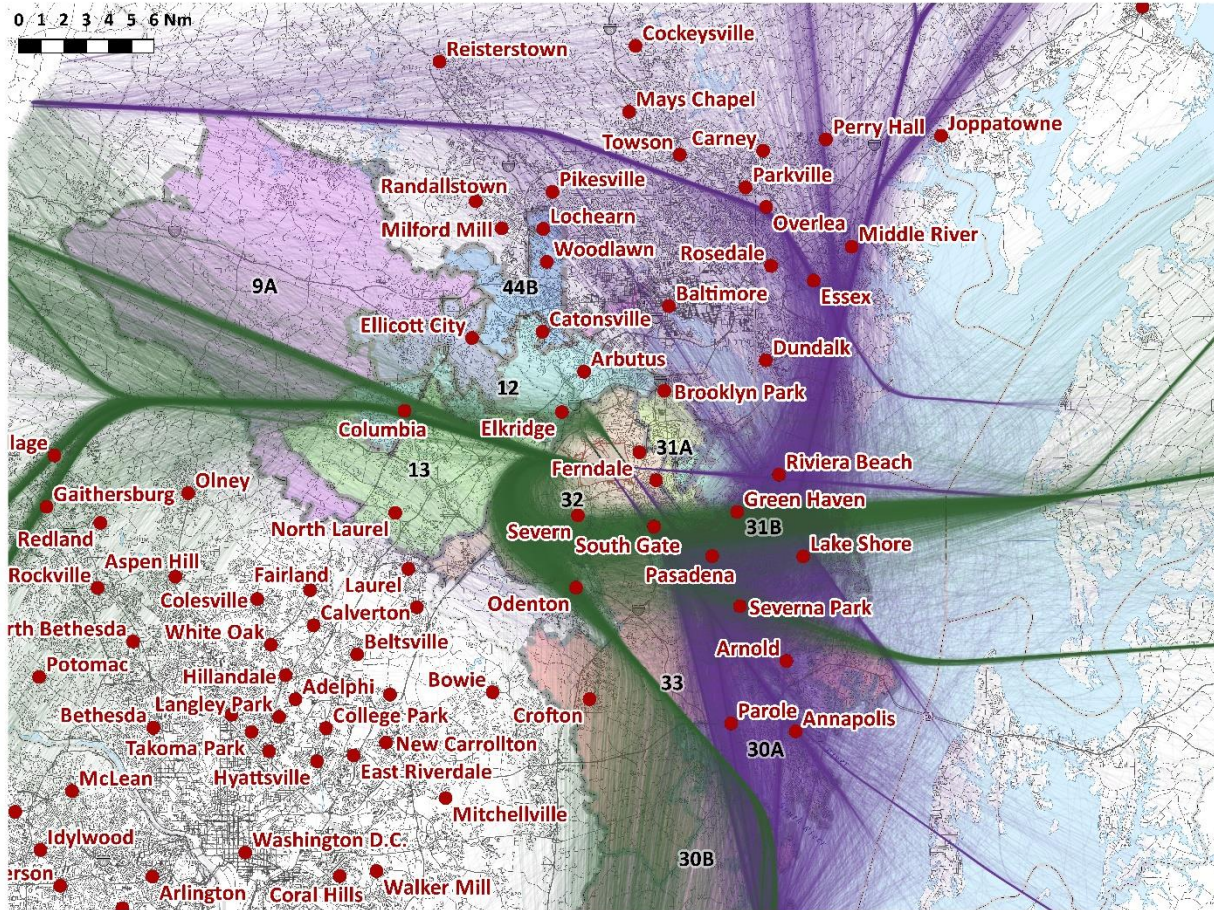


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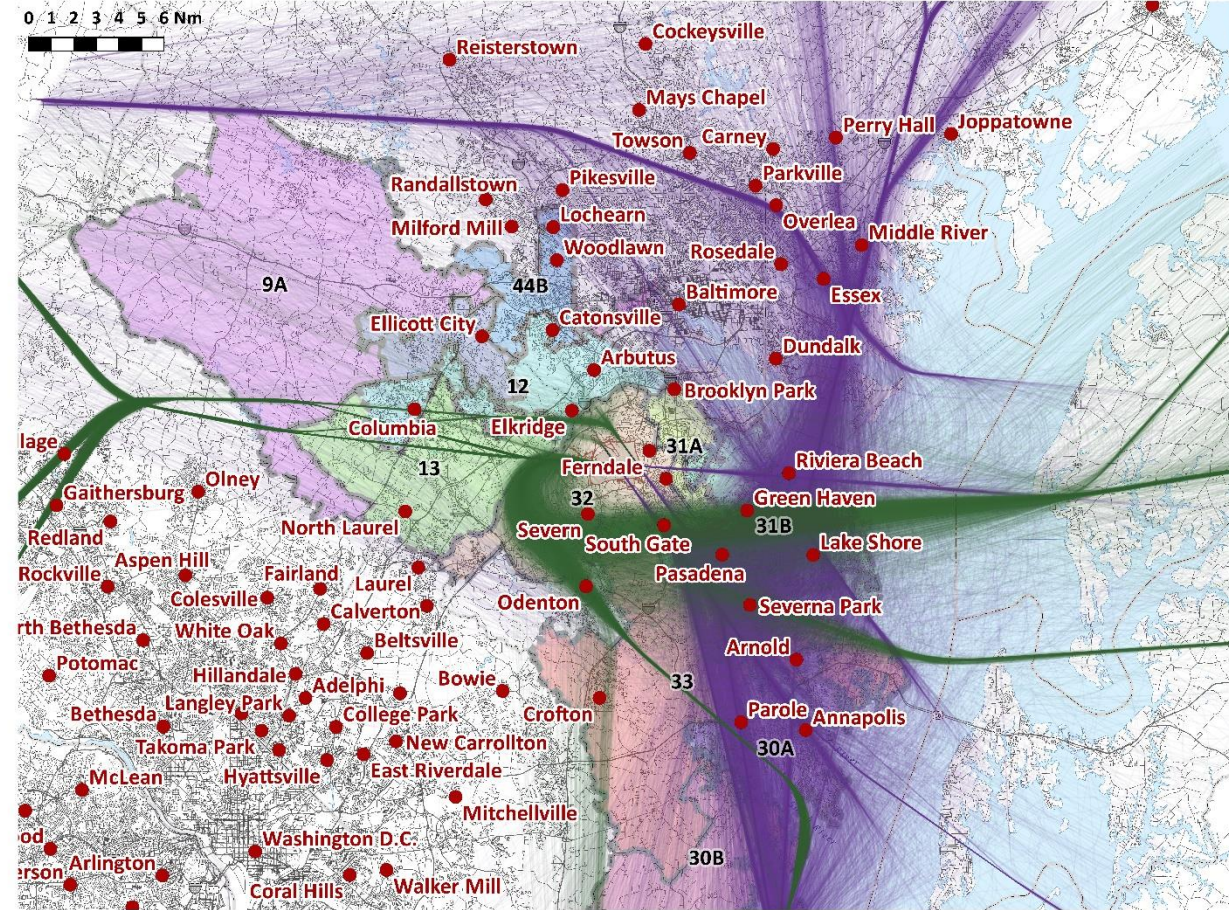
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BWI Marshall Arrival and Departure Flight Tracks – West Flow



2017 Existing arrival and departure flight tracks



2017 FAA proposed arrival and departure flight tracks

Legend

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Goals of Technical Committee Proposed Procedure Changes and Anticipated Benefits

Goals of the Technical Committee in Developing Procedure Changes

- The goal of the Roundtable Technical Committee was to develop solutions that address the following issues that have resulted from the implementation of NextGen at BWI Marshall, and related Performance Based Navigation (PBN) procedures:
 - Concentrated flight paths associated with existing FAA published and proposed NEXTGEN arrival and departure procedures
 - Extended periods of level flight by arrival aircraft at low altitudes and low altitude approaches
 - Changes to lateral flight paths of arrival and departures to relocate flight parts to historical locations or locations with the potential to reduce community noise exposure
- Roundtable developed proposed procedure changes with the goal of developing procedures that can be supported by the Roundtable, MDOT MAA, and Industry
- MDOT MAA and Industry support proposed changes, now seek support of the full Roundtable to move proposals forward to FAA

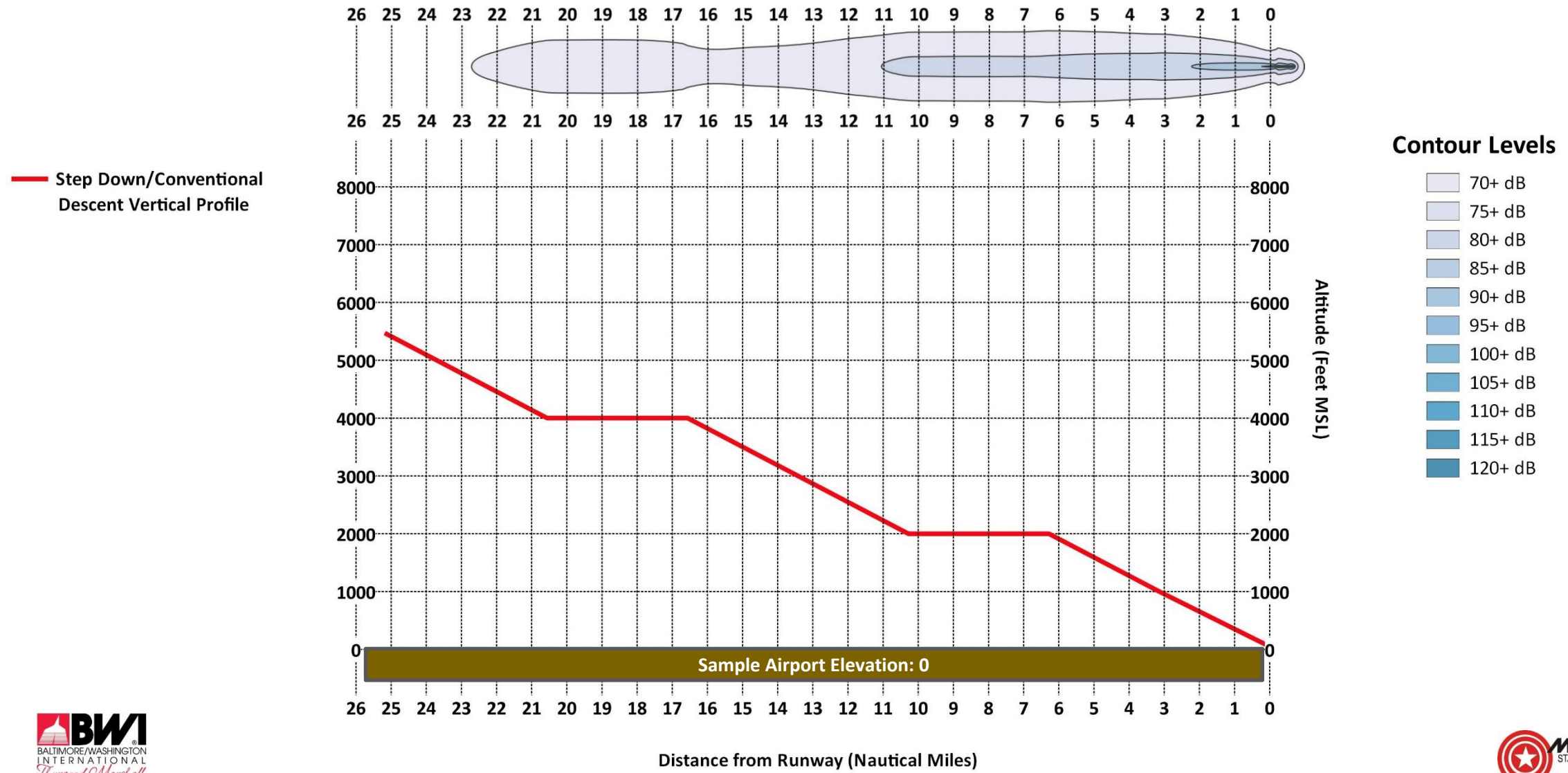
Anticipated Benefits of Proposed Procedure Changes

- Increased/higher aircraft altitudes on arrival where possible
- Increased/higher aircraft altitudes on approach during good and bad weather conditions leveraging Continuous Descent Approaches (CDAs)
 - Fewer instances of aircraft flying large distances from the airport at lower altitudes in level flight
 - Reduced/near-idle engine power settings due to continuous descent
 - Published procedures along existing approach corridors used during good weather (visual approaches) that allow for vertical guidance
- Better distribution of approach operations
- Relocation of flight paths to locations with the potential to reduce cumulative community noise exposure

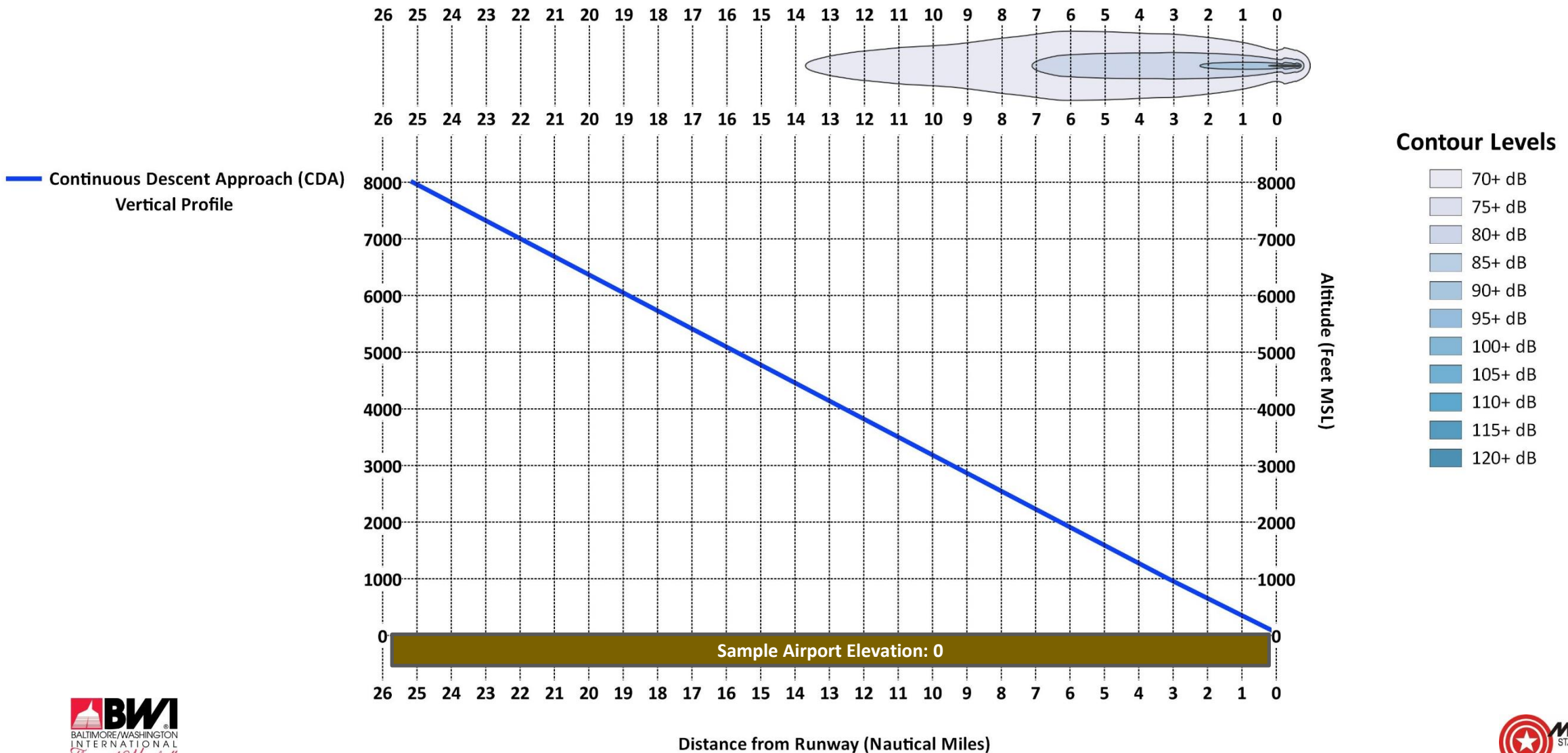
Example of Anticipated Benefits – Sound Exposure Level (SEL) Contours

- Modeled generic example of Boeing 737-700 flying a traditional approach descent profile versus a CDA in the Aviation Environmental Design Tool (AEDT)
 - AEDT is the FAA approved model for evaluating aircraft noise at airports
 - Boeing 737-700 is most common aircraft type operating at BWI Marshall
 - Example is not specific to BWI Marshall, but is applicable as aircraft fly similar approach descent profiles
- Sound Exposure Level (SEL) Contours
 - A way to describe the “noisiness” of a complete noise event
 - Accounts for sound amplitude and the duration of a noise event
 - Useful for comparing the total noise energy between events
- The following slides present plots of modeled altitude profiles for the Boeing 737-700 in AEDT and resulting SEL Contours

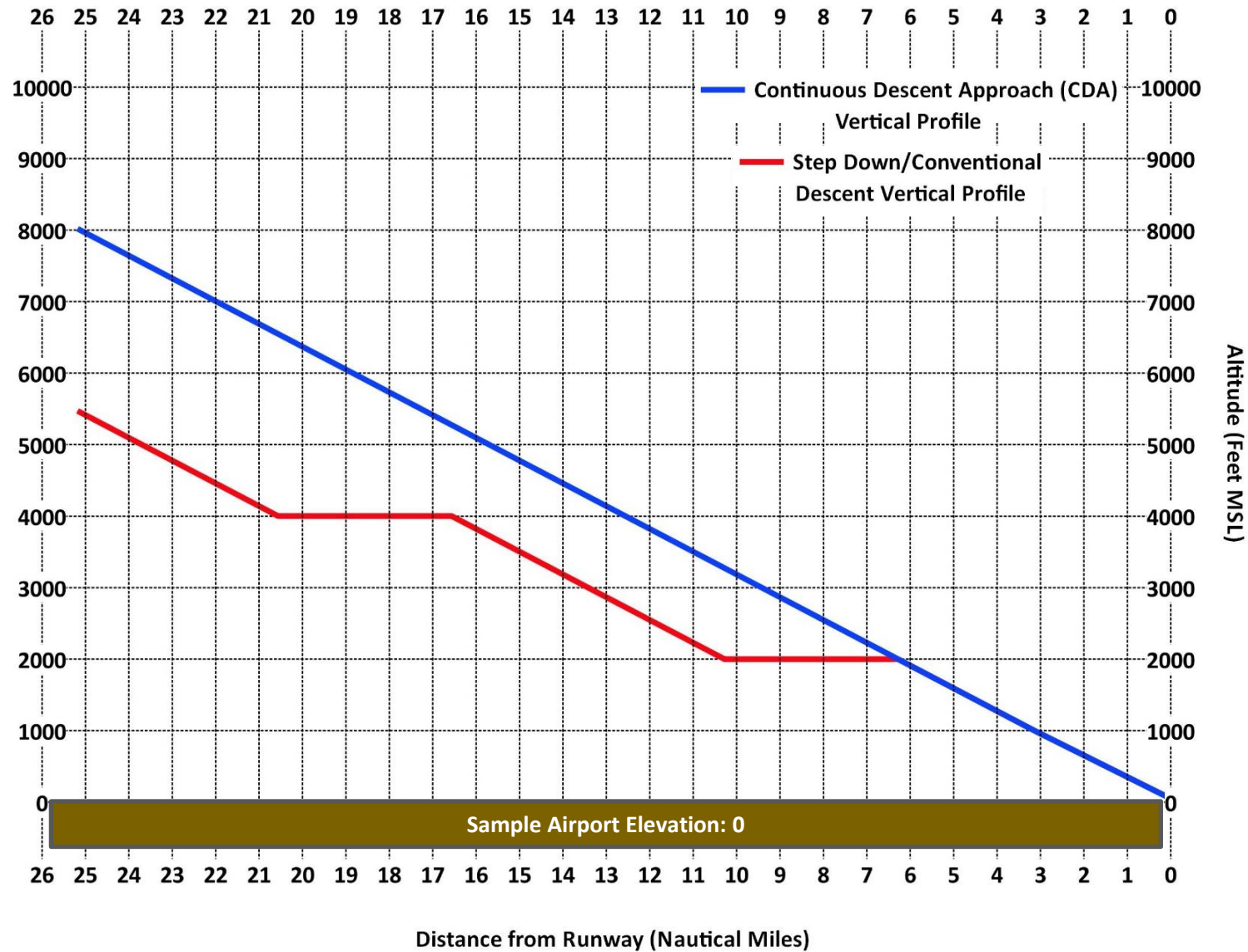
SEL Contours - Boeing 737-700 with Traditional Descent Profile



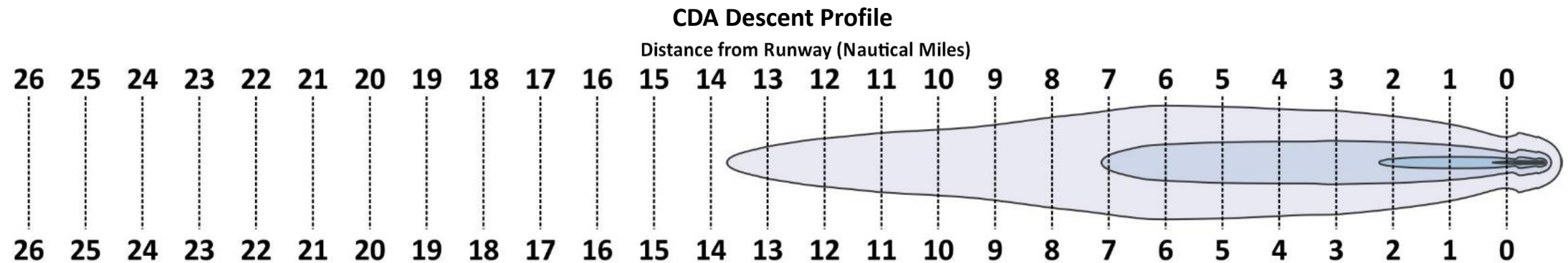
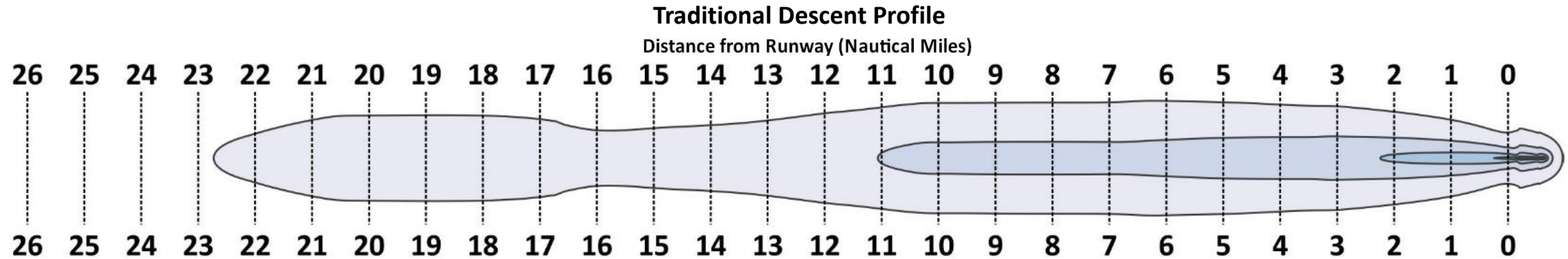
SEL Contours - Boeing 737-700 with (CDA)



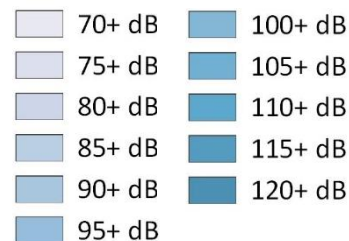
Vertical Profiles – CDA Compared to Traditional Descent Profile



SEL Contours – Boeing 737-700 with Traditional Descent Profile Compared to CDA



Contour Levels





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Proposed Technical Committee BWI Marshall Procedure Changes

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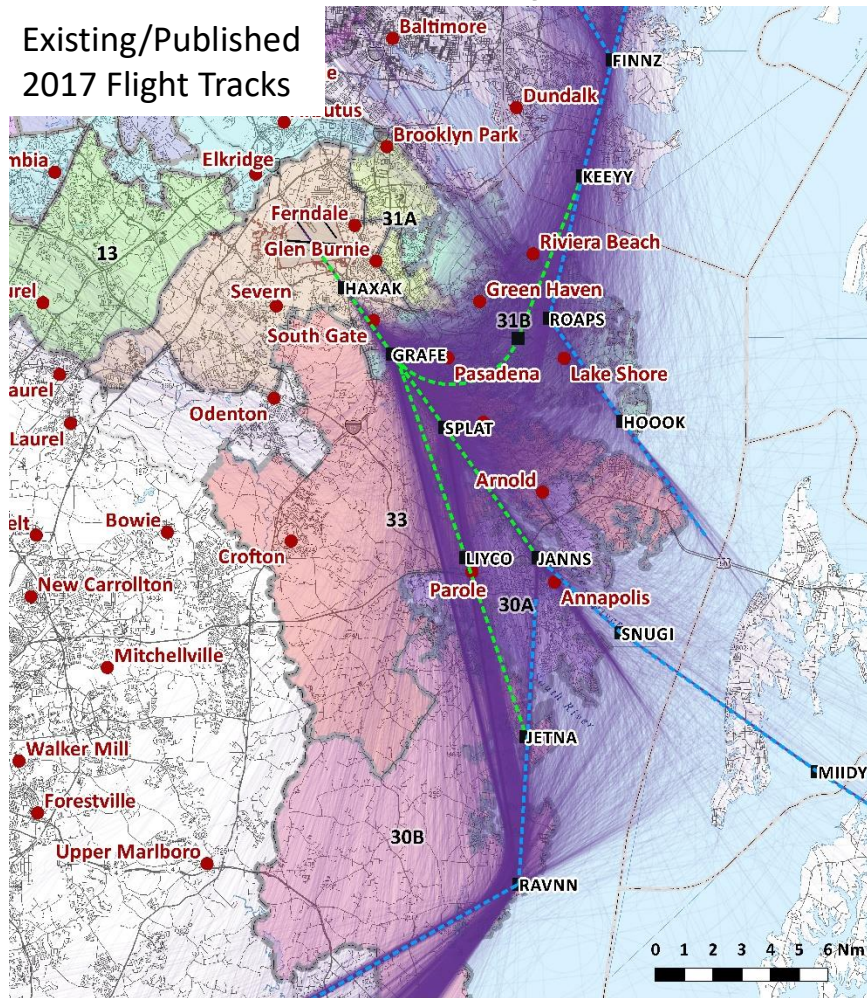
- The following slides present historical (post-Metroplex) flight tracks compared to existing published and Technical Committee proposed flight procedure changes
 - Existing published procedures are shown on the left
 - Technical Committee proposed published procedures are shown on the right
 - Altitudes shown are minimums derived from radar for existing procedures and anticipated published altitudes for Technical Committee proposed procedures
- Existing published and Technical Committee proposed procedures also compared to maps of 2010 US Census population density



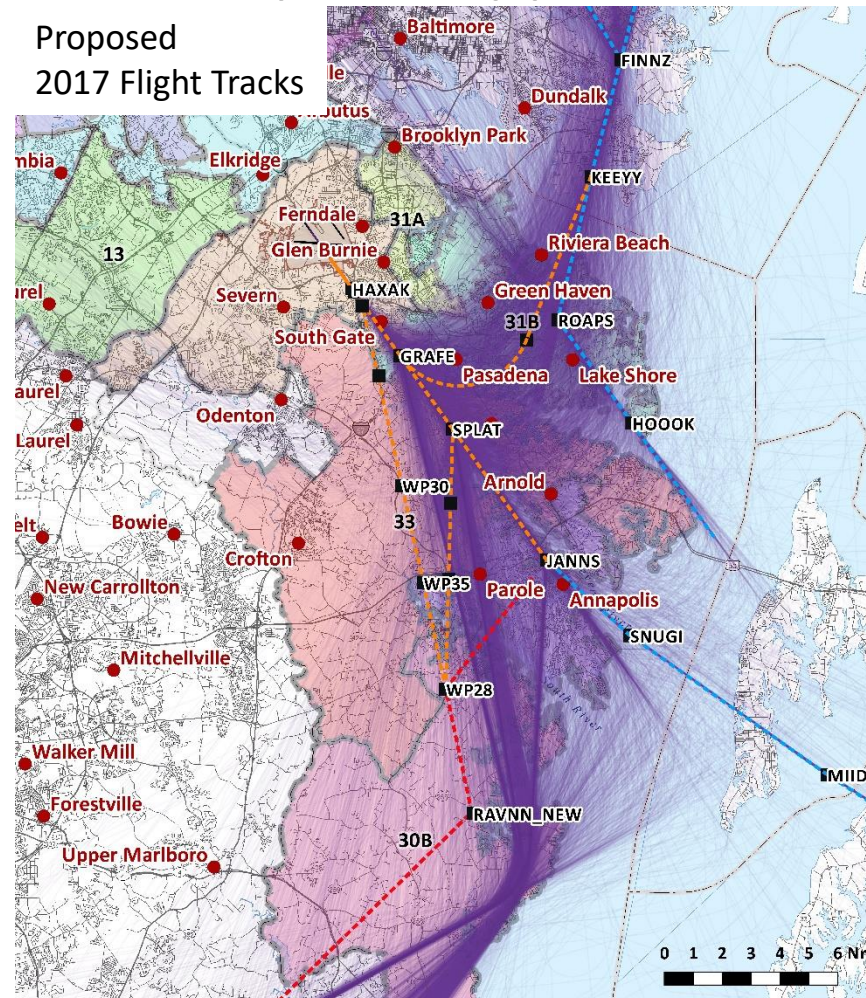
BWI Marshall Runway 33L Proposed Arrival and Approach Procedure Changes

RAVNN Runway 33L Arrivals and Runway 33L Approaches

Existing/Published
2017 Flight Tracks



Proposed
2017 Flight Tracks



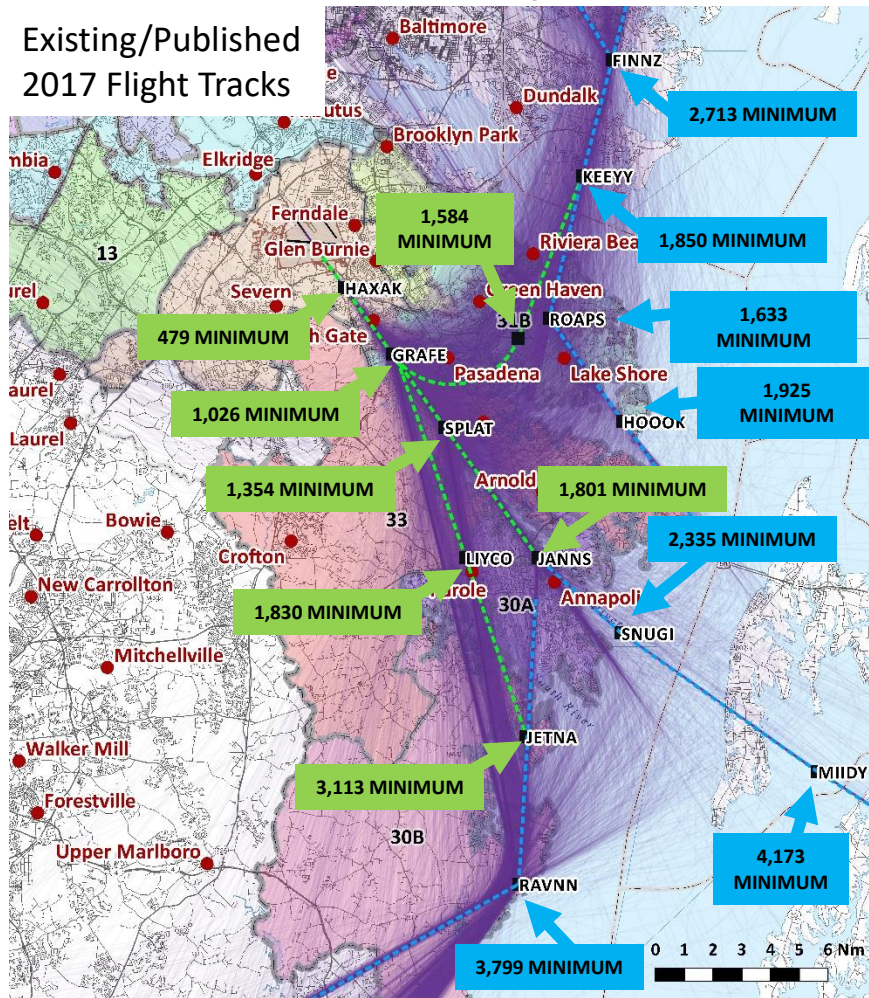
Legend

- Navigational Points
- Proposed Arrival Procedure Changes
- Existing Published Arrival Procedures
- Proposed Approach Procedure Changes
- Existing Published Approach Procedures
- Arrival Flight Tracks

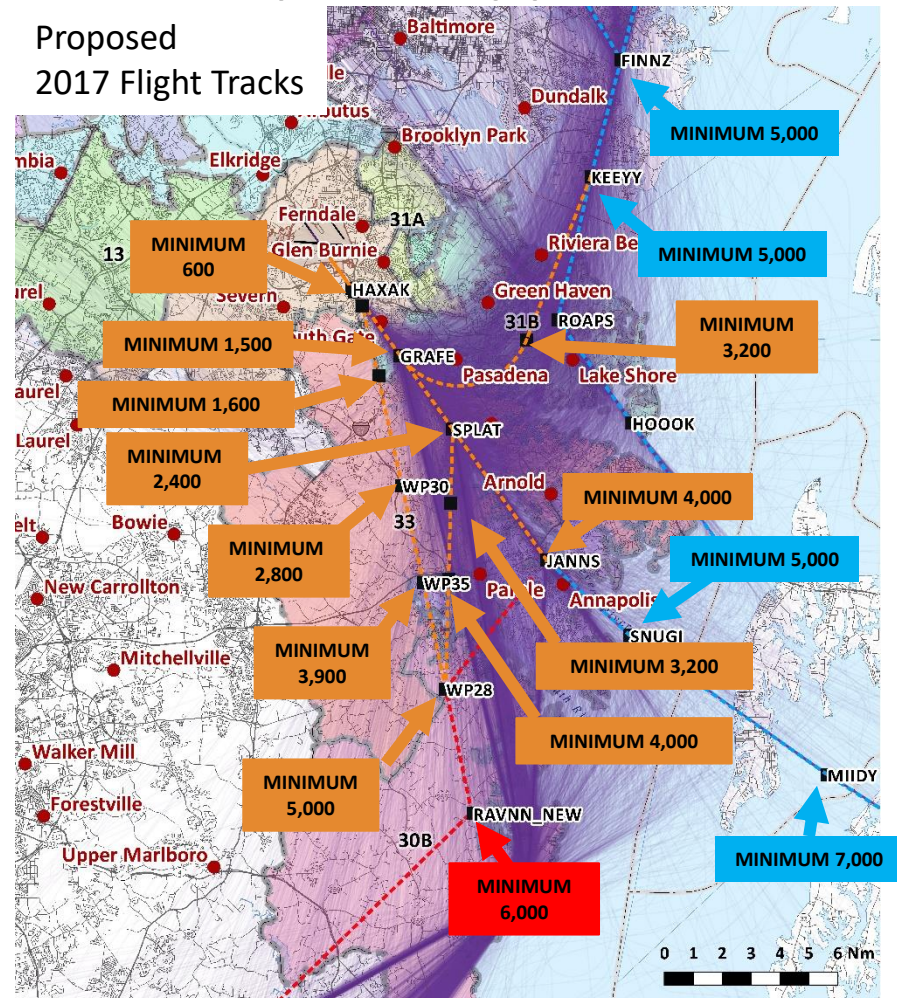
Pre-Decisional: For informational purposes only

RAVNN Runway 33L Arrivals and Runway 33L Approaches

Existing/Published 2017 Flight Tracks



Proposed 2017 Flight Tracks

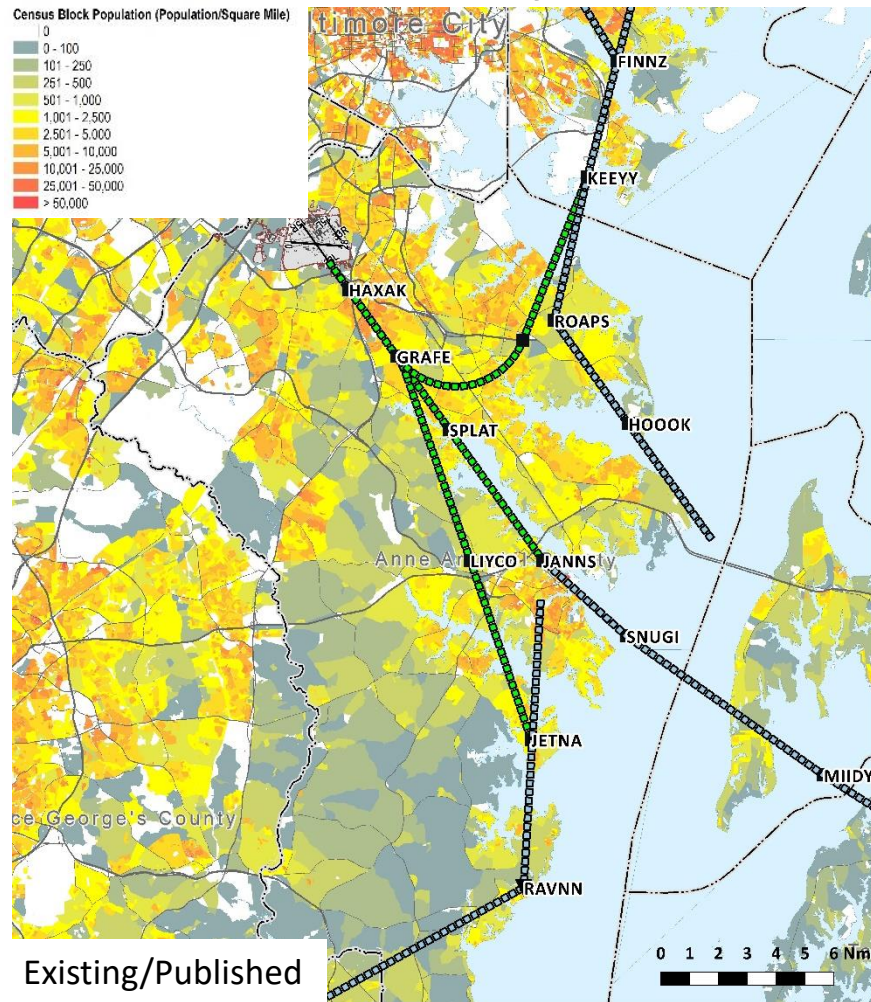


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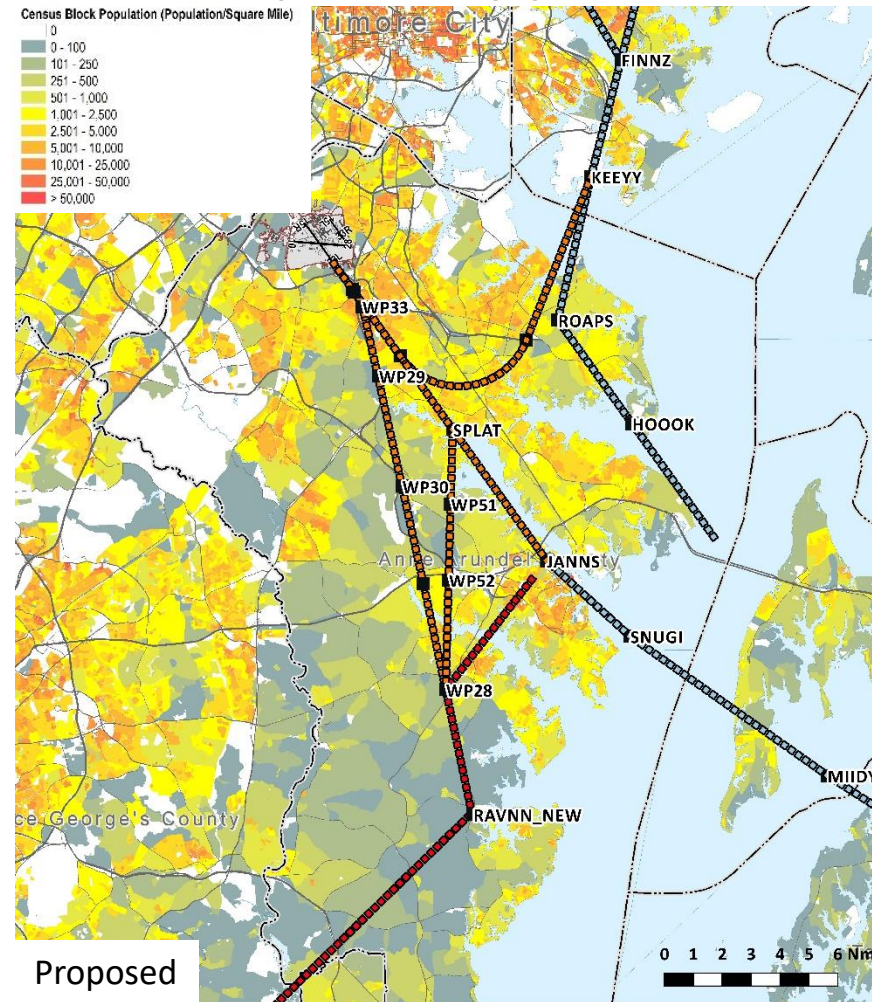
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RAVNN Runway 33L Arrivals and Runway 33L Approaches



Existing/Published



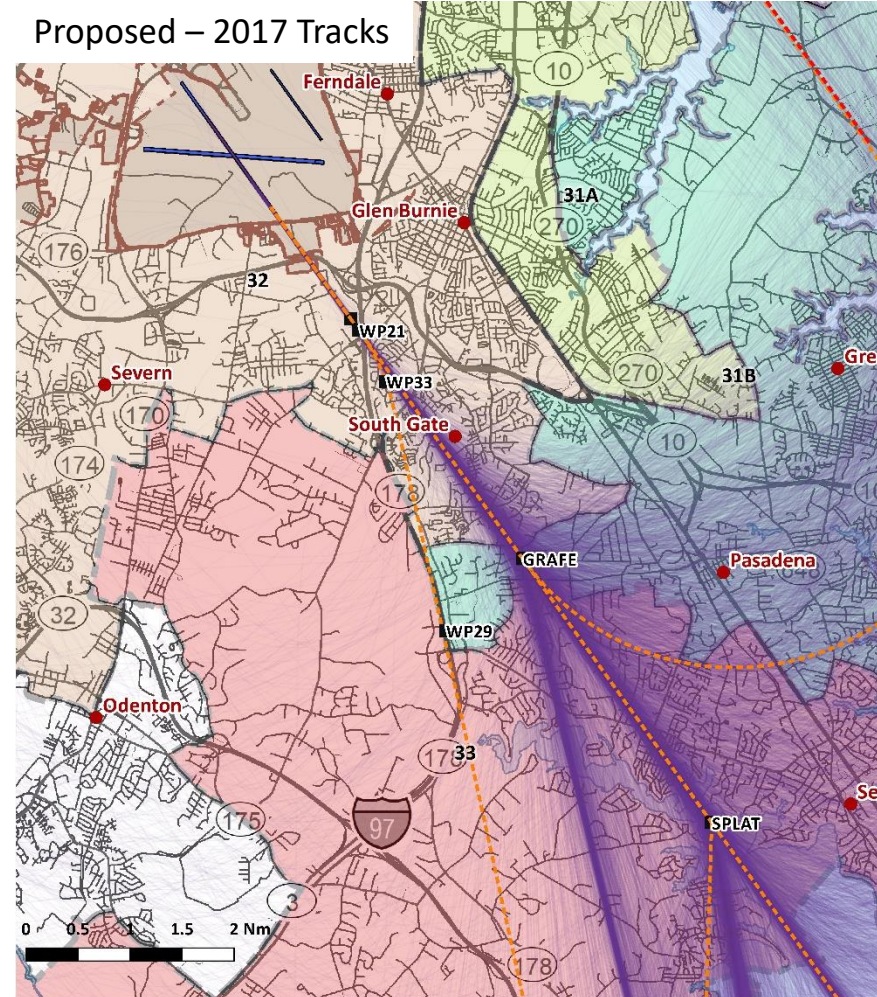
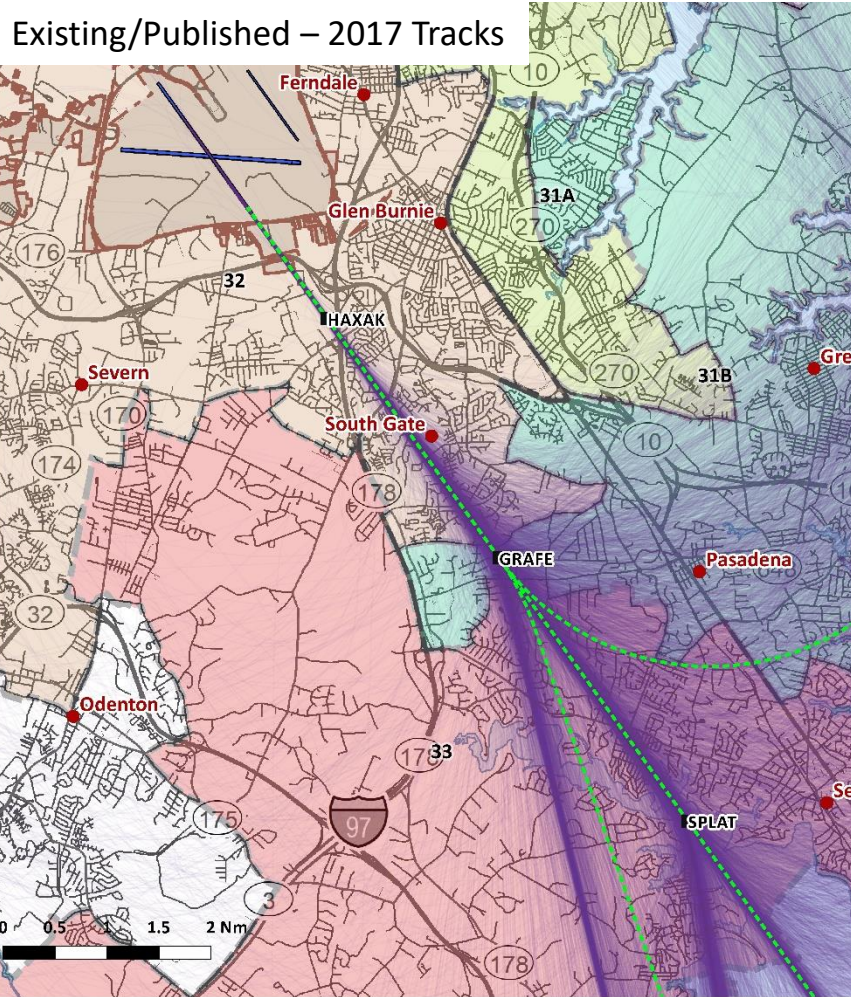
Proposed

Legend

- Navigational Points
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RAVNN Runway 33L Arrivals and Runway 33L Approaches

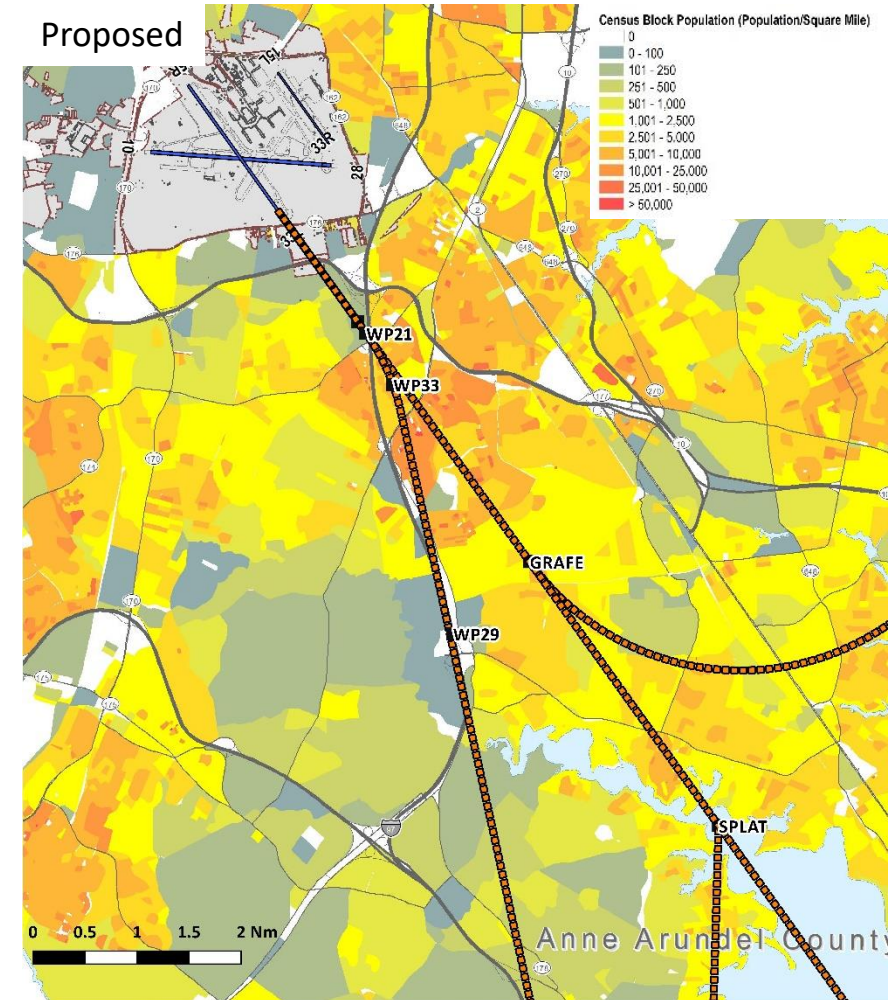
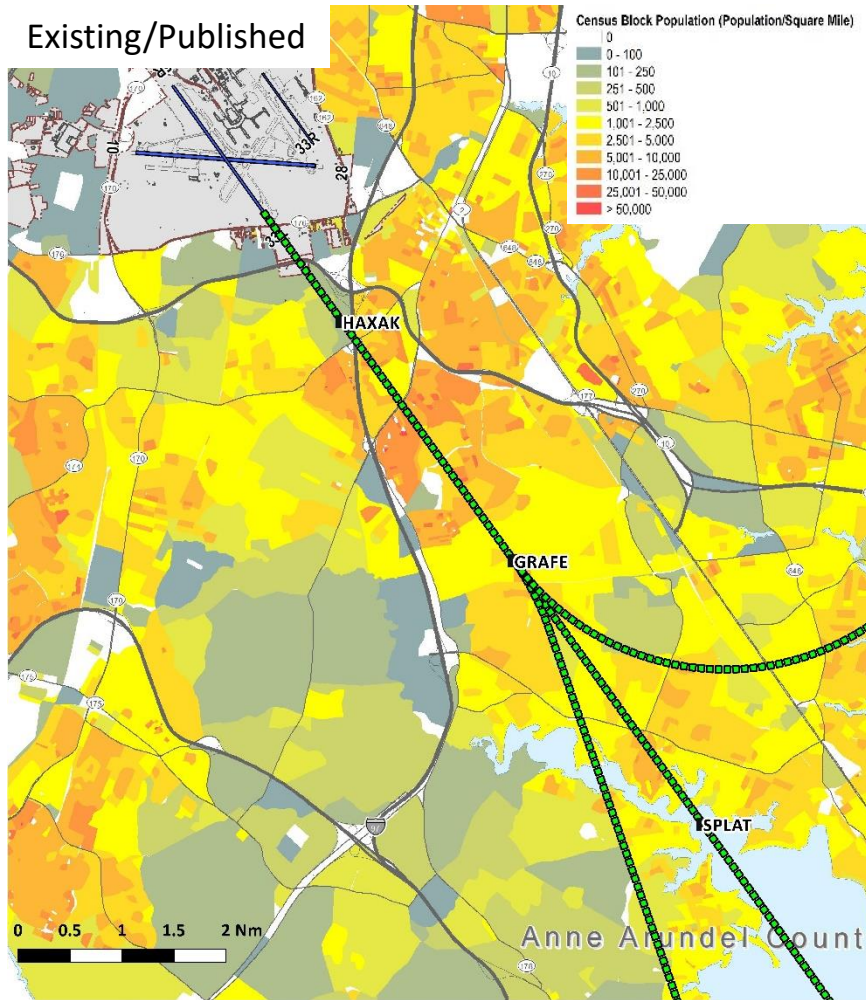


Legend

- Navigational Points
- Existing Published Arrival Procedures
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RAVNN Runway 33L Arrivals and Runway 33L Approaches



Legend

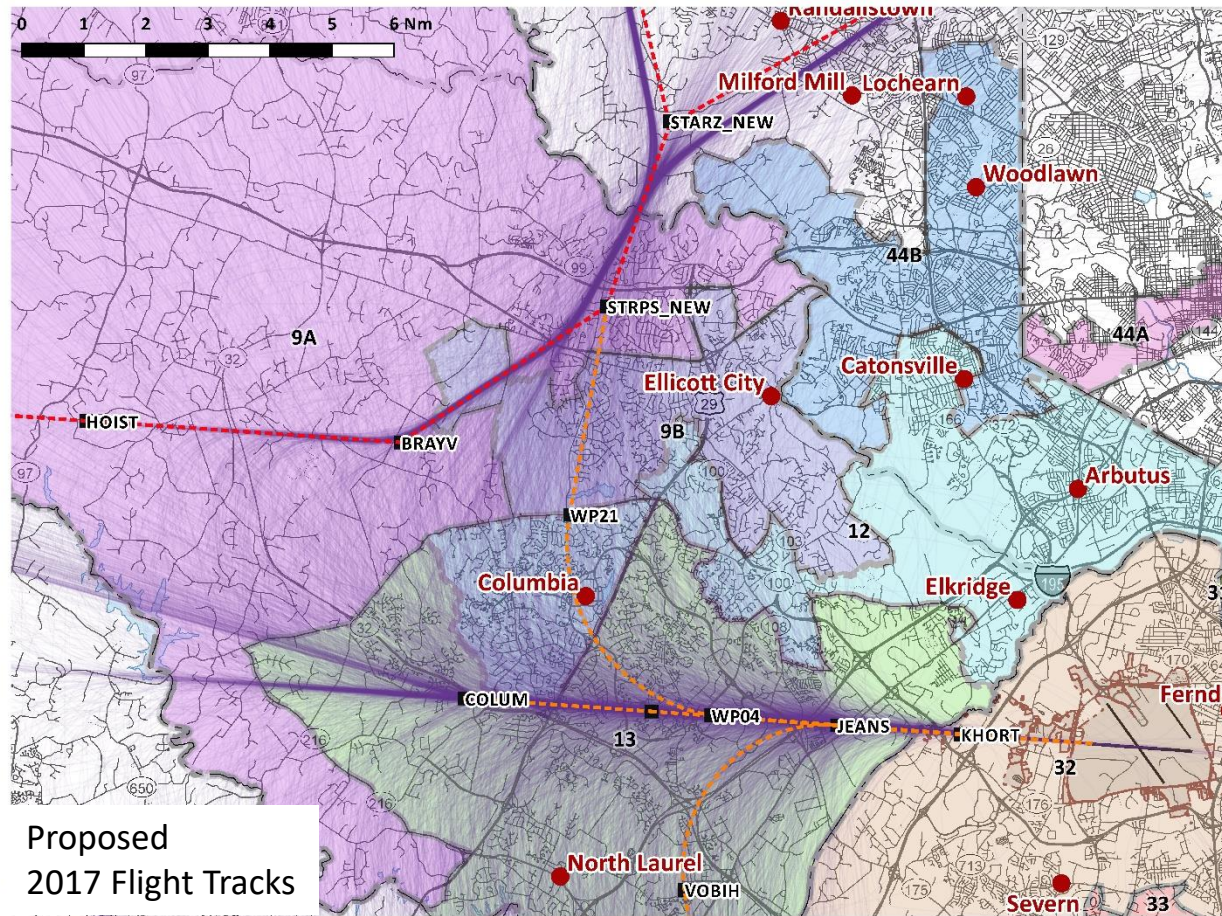
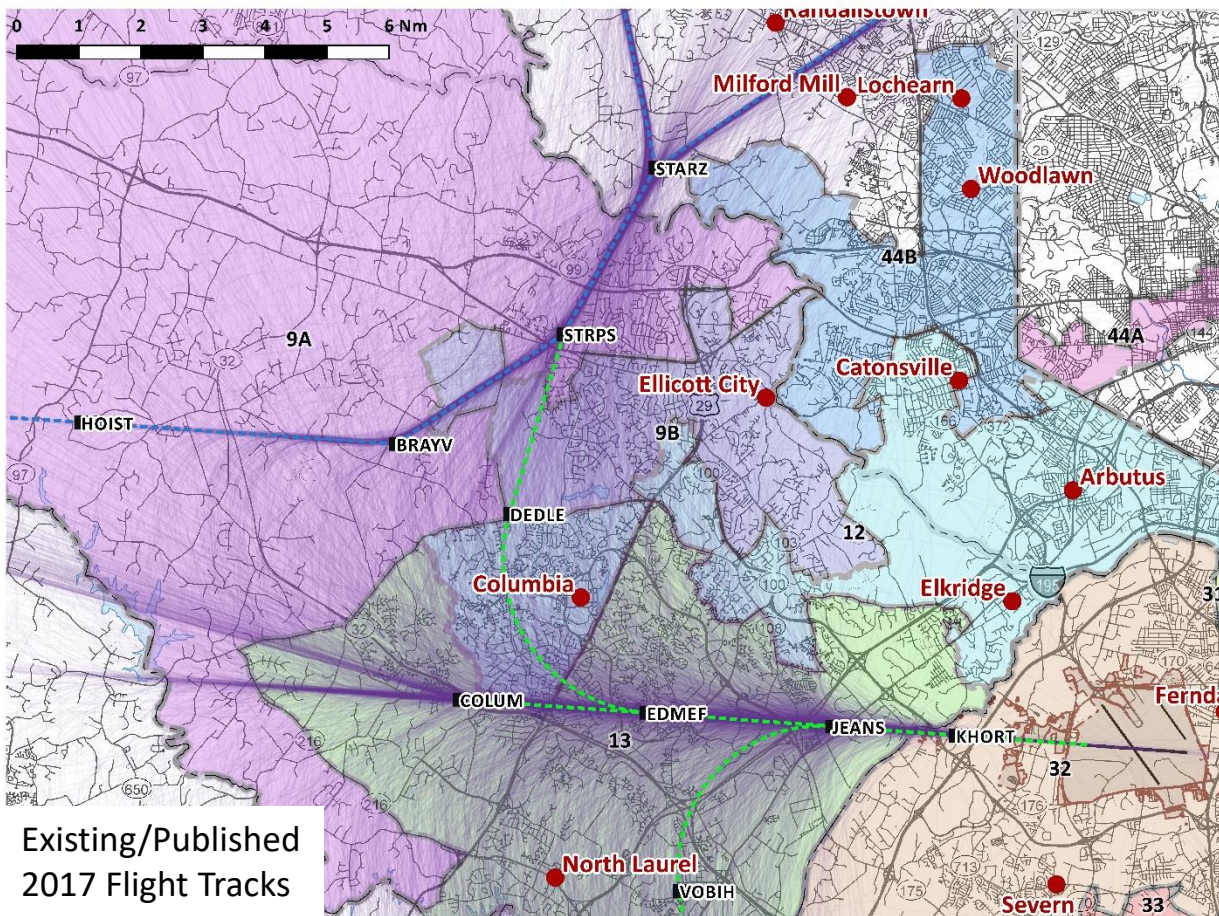
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Pre-Decisional: For informational purposes only



BWI Marshall Runway 10 Proposed Arrival and Approach Procedure Changes

ANTHM and TRISH Runway 10 Arrivals and Runway 10 Approaches

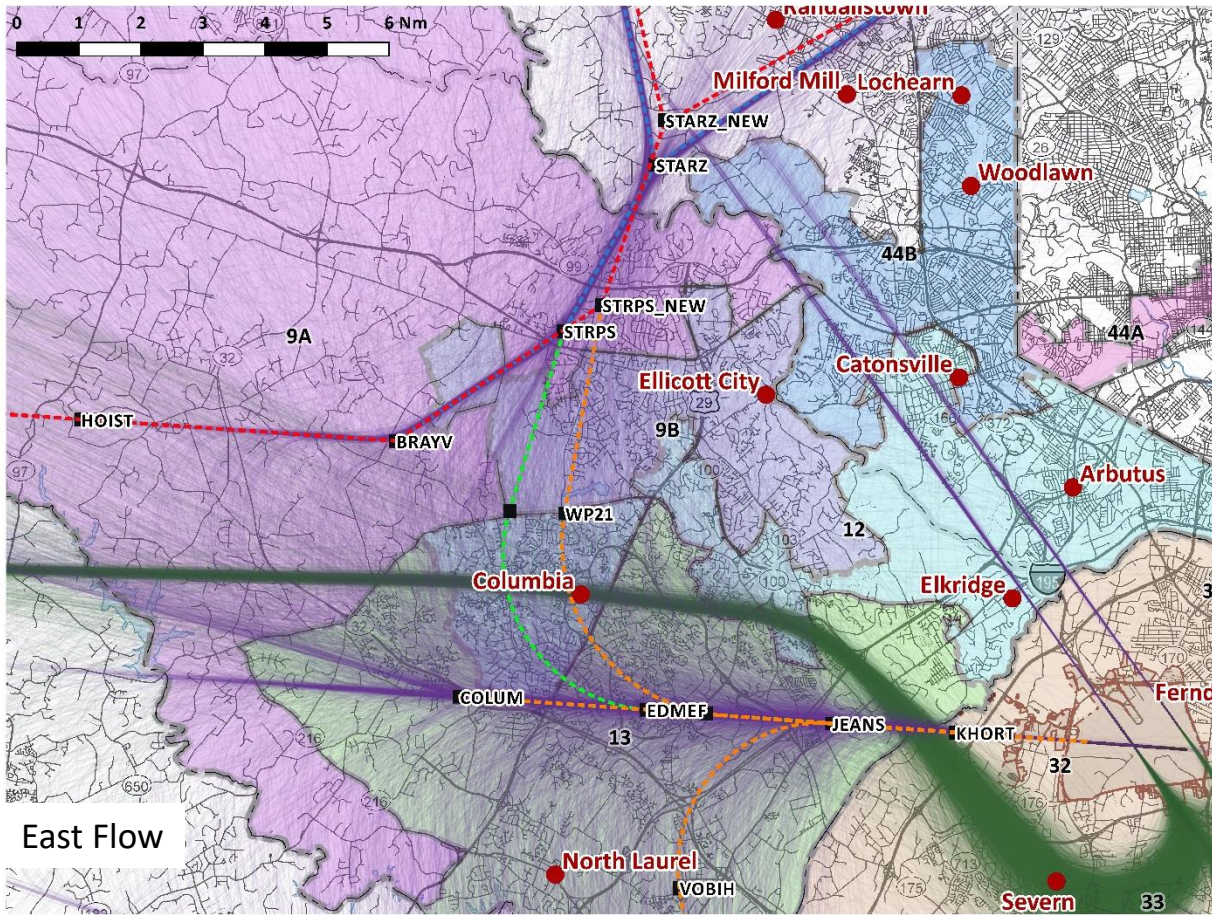


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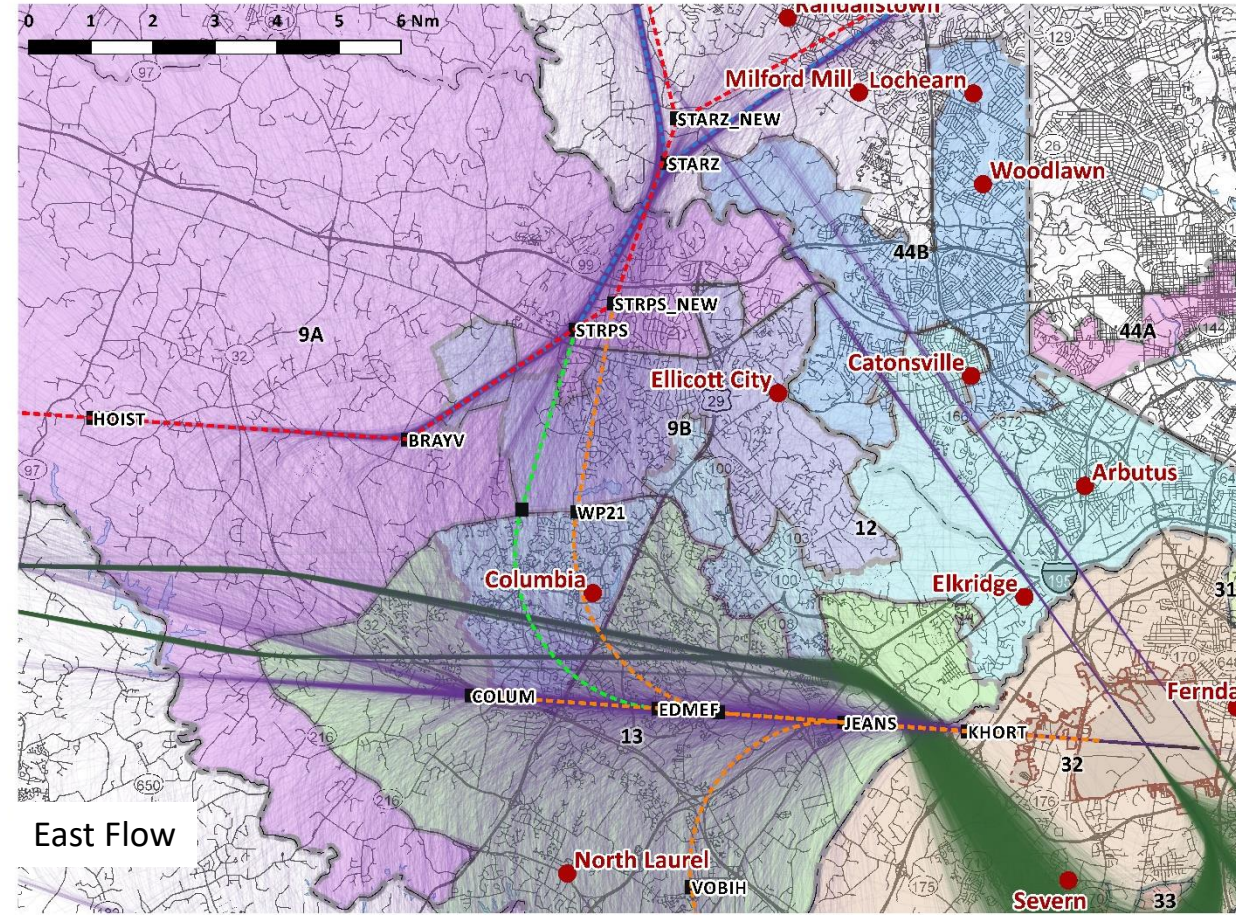
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ANTHM and TRISH Runway 10 Arrivals and Runway 10 Approaches



2017 Existing arrival and departure flight tracks



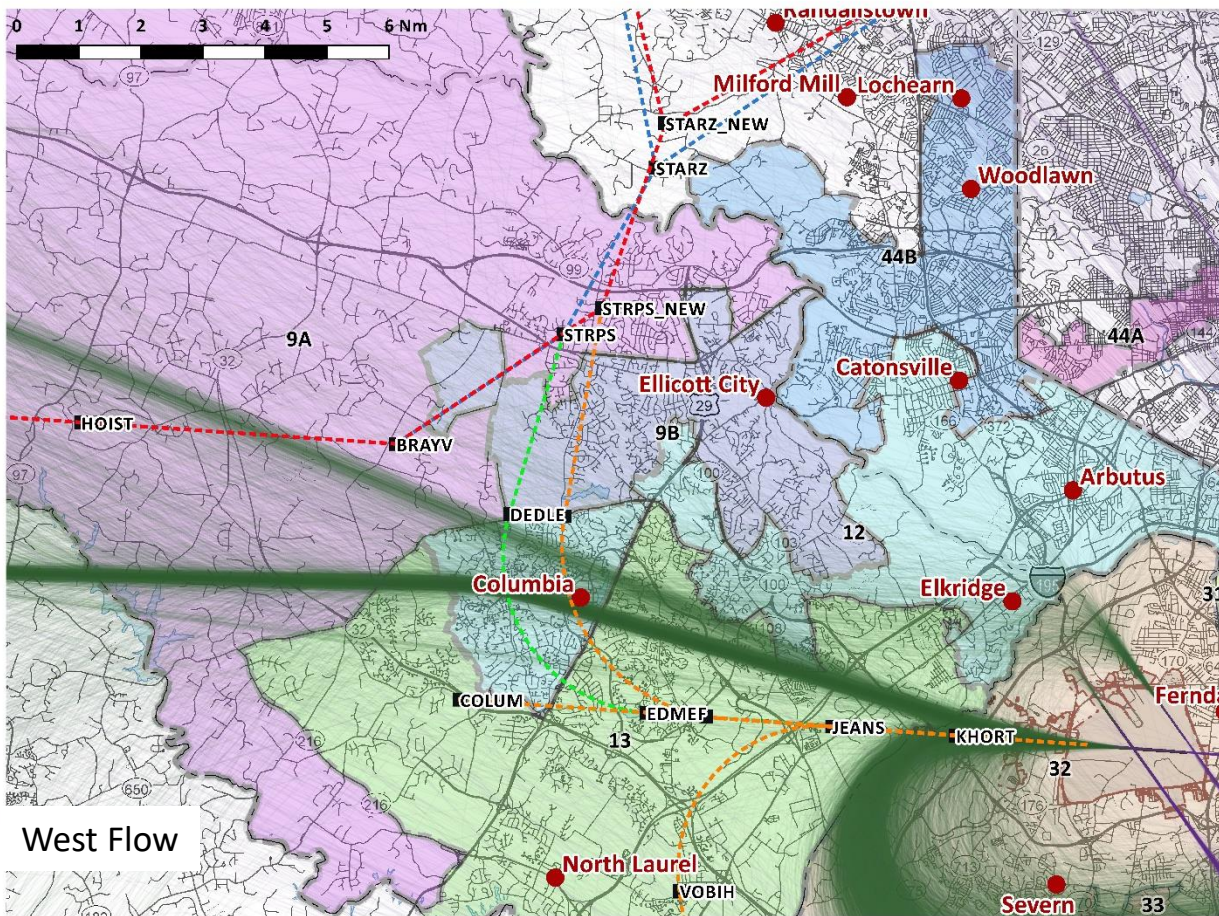
2017 FAA proposed arrival and departure flight tracks

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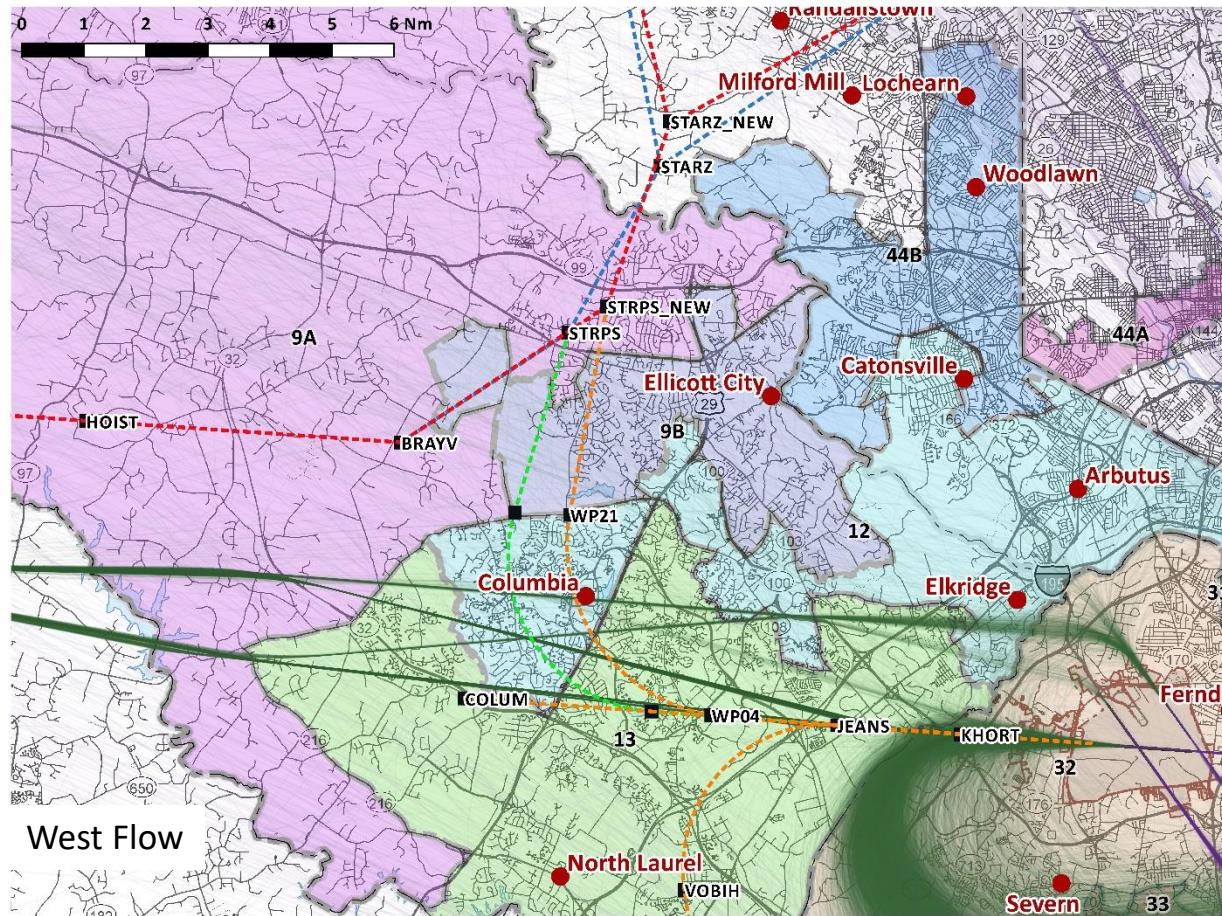
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ANTHM and TRISH Runway 10 Arrivals and Runway 10 Approaches



2017 Existing arrival and departure flight tracks



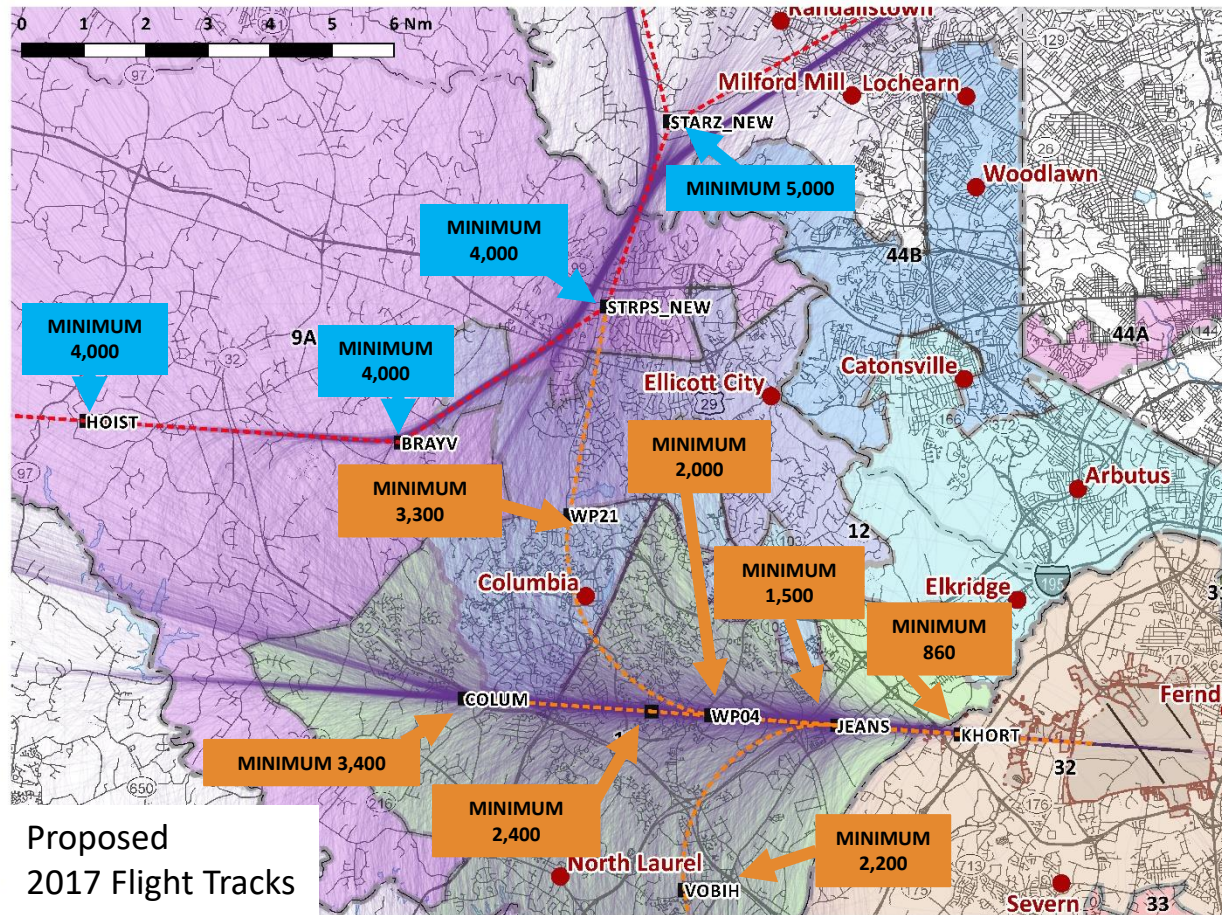
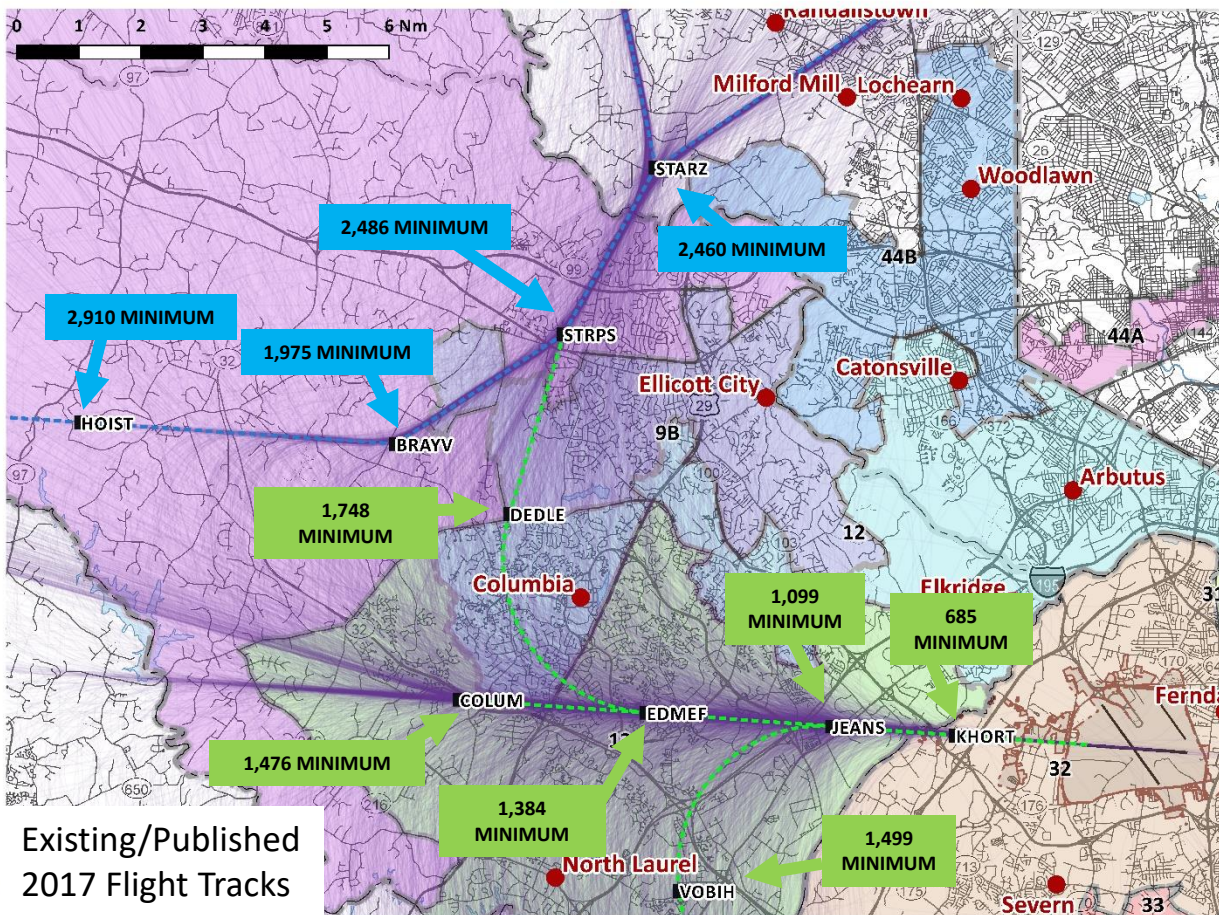
2017 FAA proposed arrival and departure flight tracks

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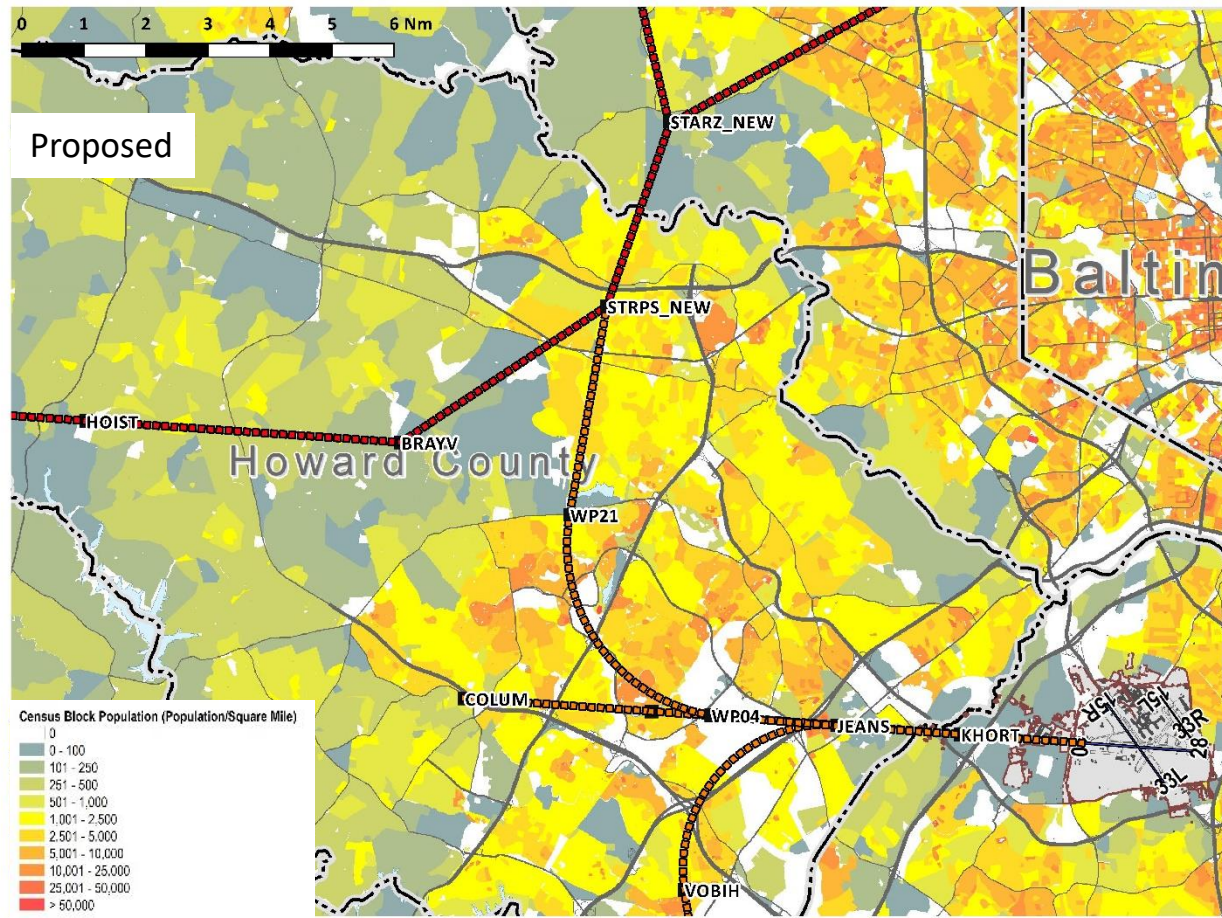
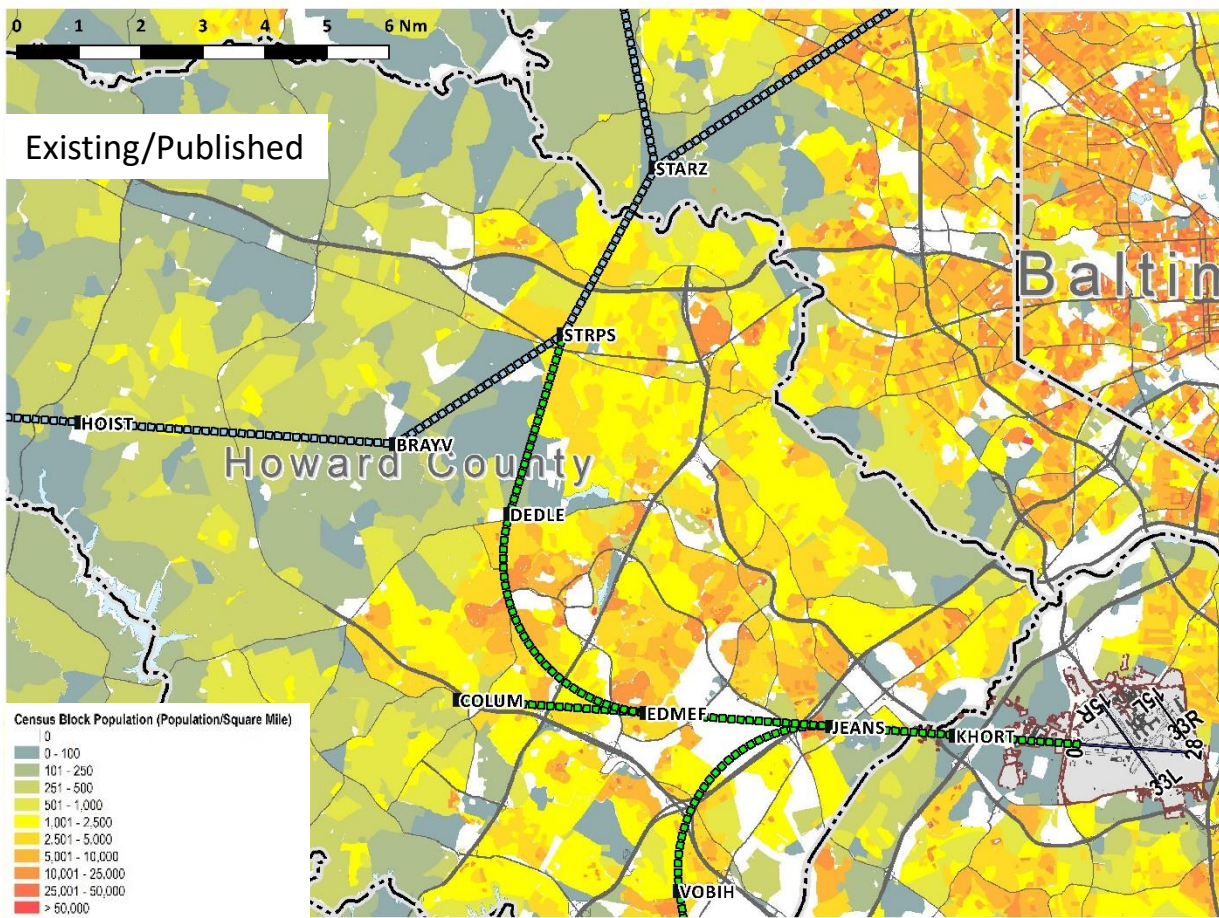
ANTHM and TRISH Runway 10 Arrivals and Runway 10 Approaches



Legend

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ANTHM and TRISH Runway 10 Arrivals and Runway 10 Approaches



Legend

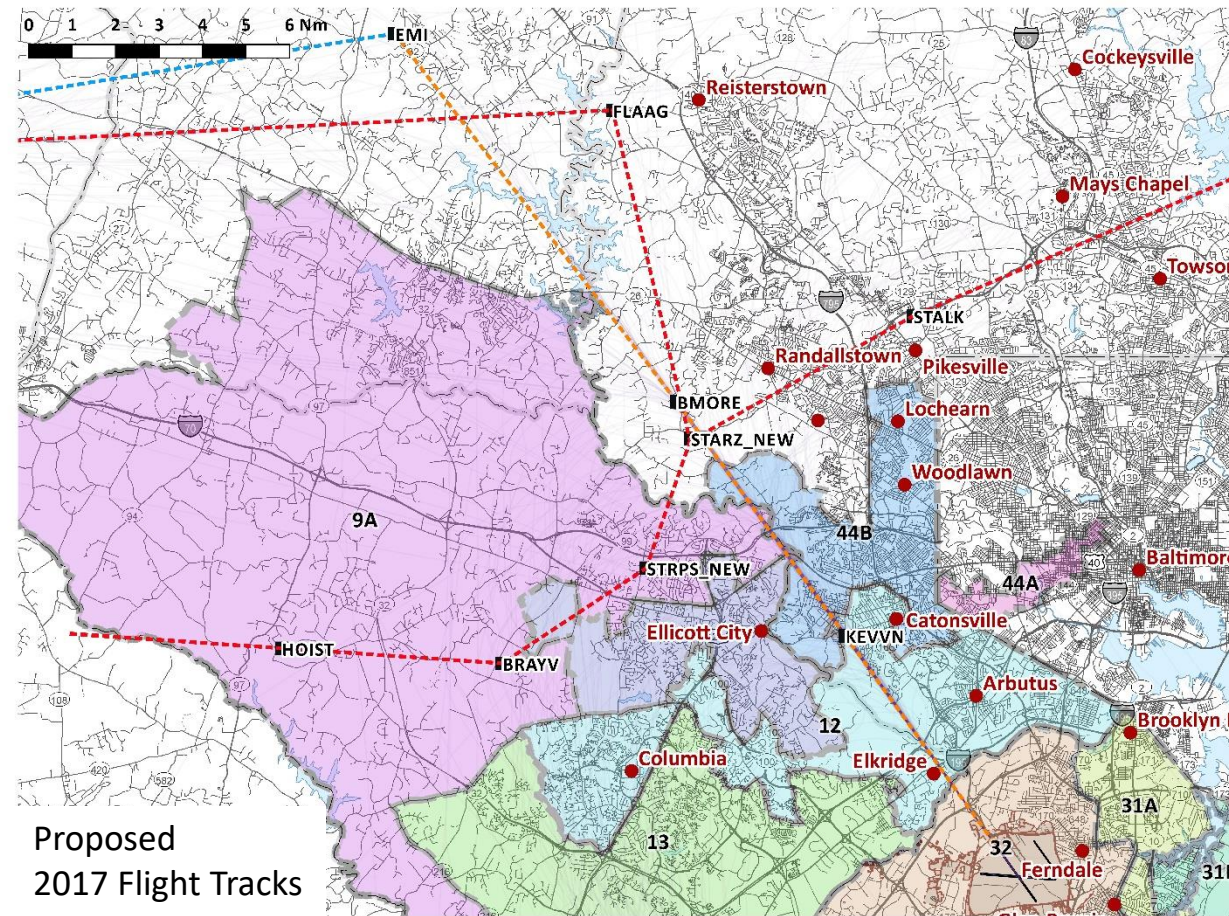
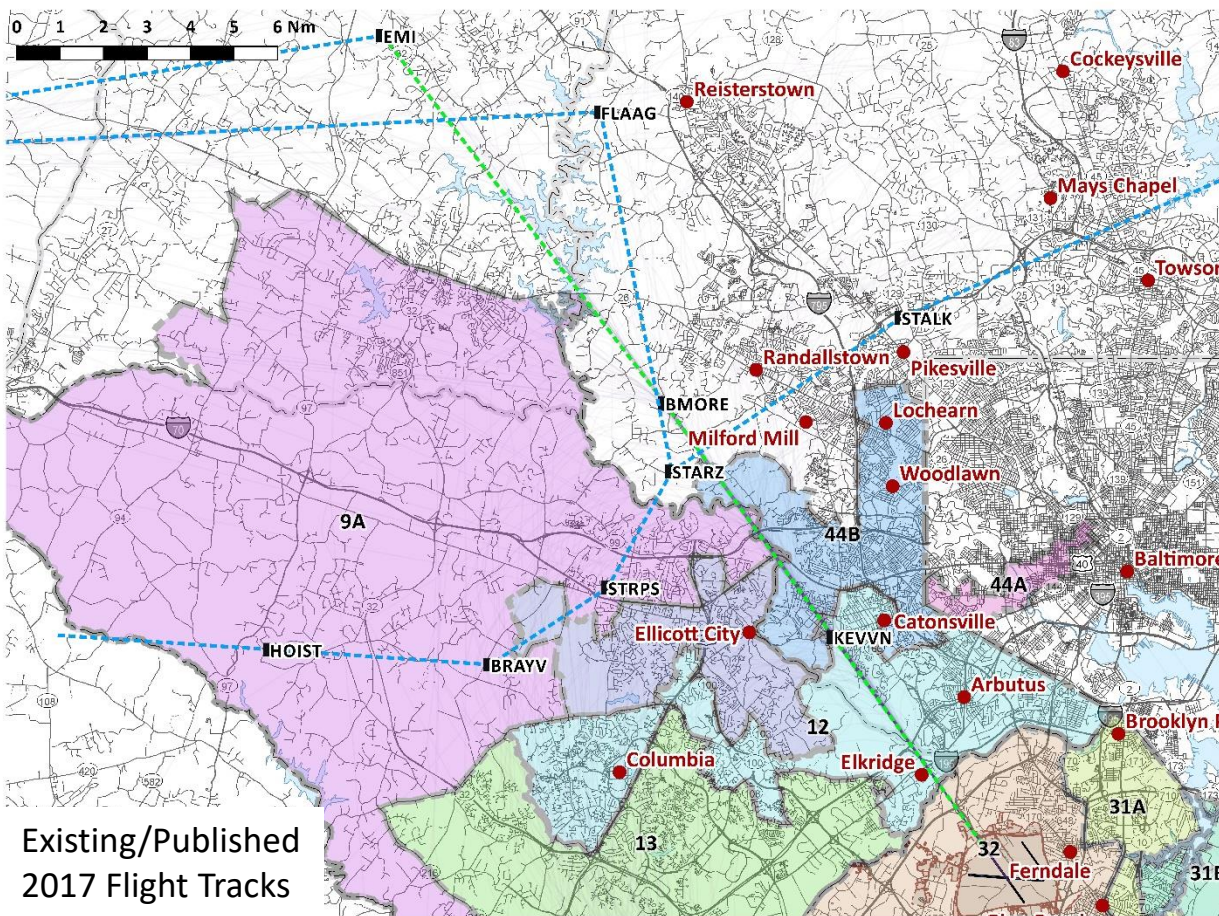
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BWI Marshall Runway 15R Proposed Approach Procedure Changes

Proposed Runway 15R RNP Approach

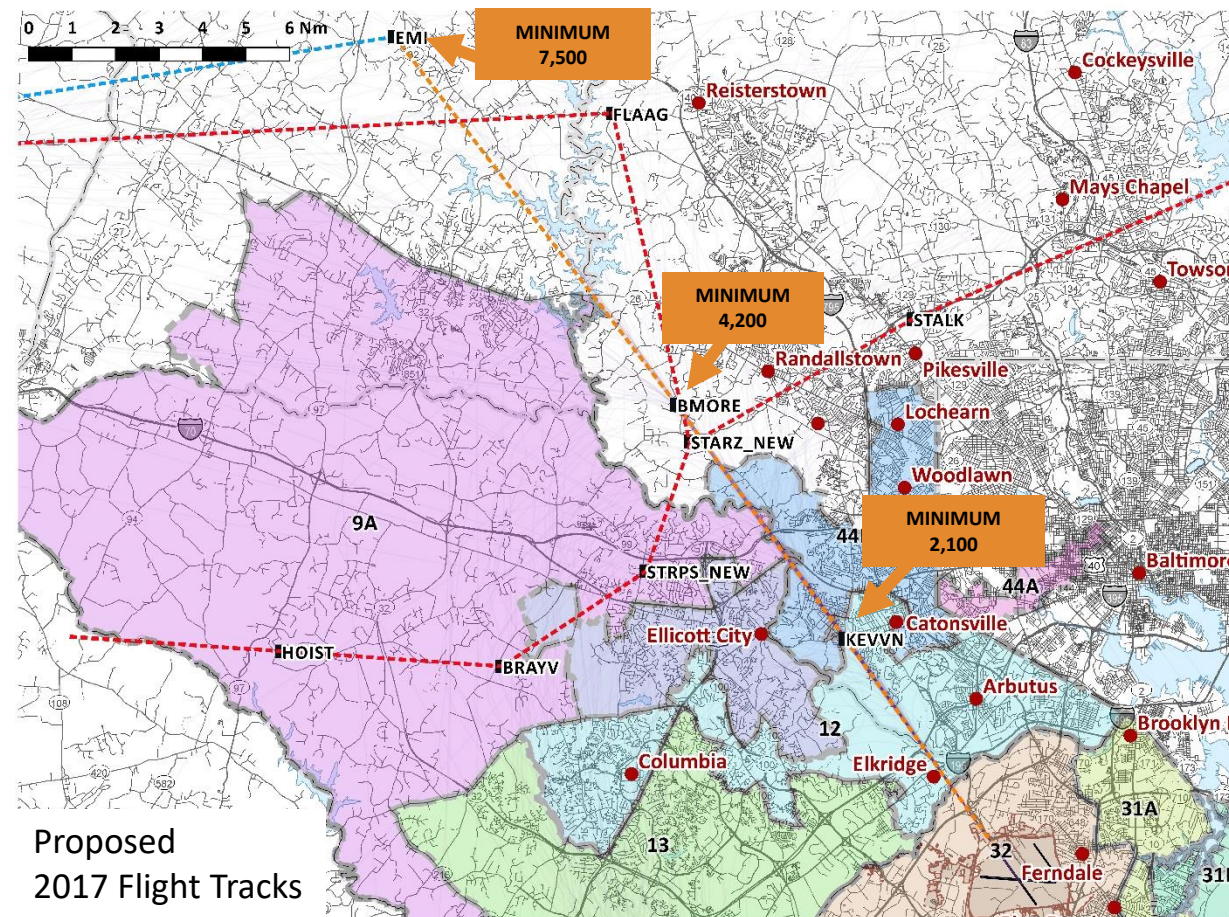
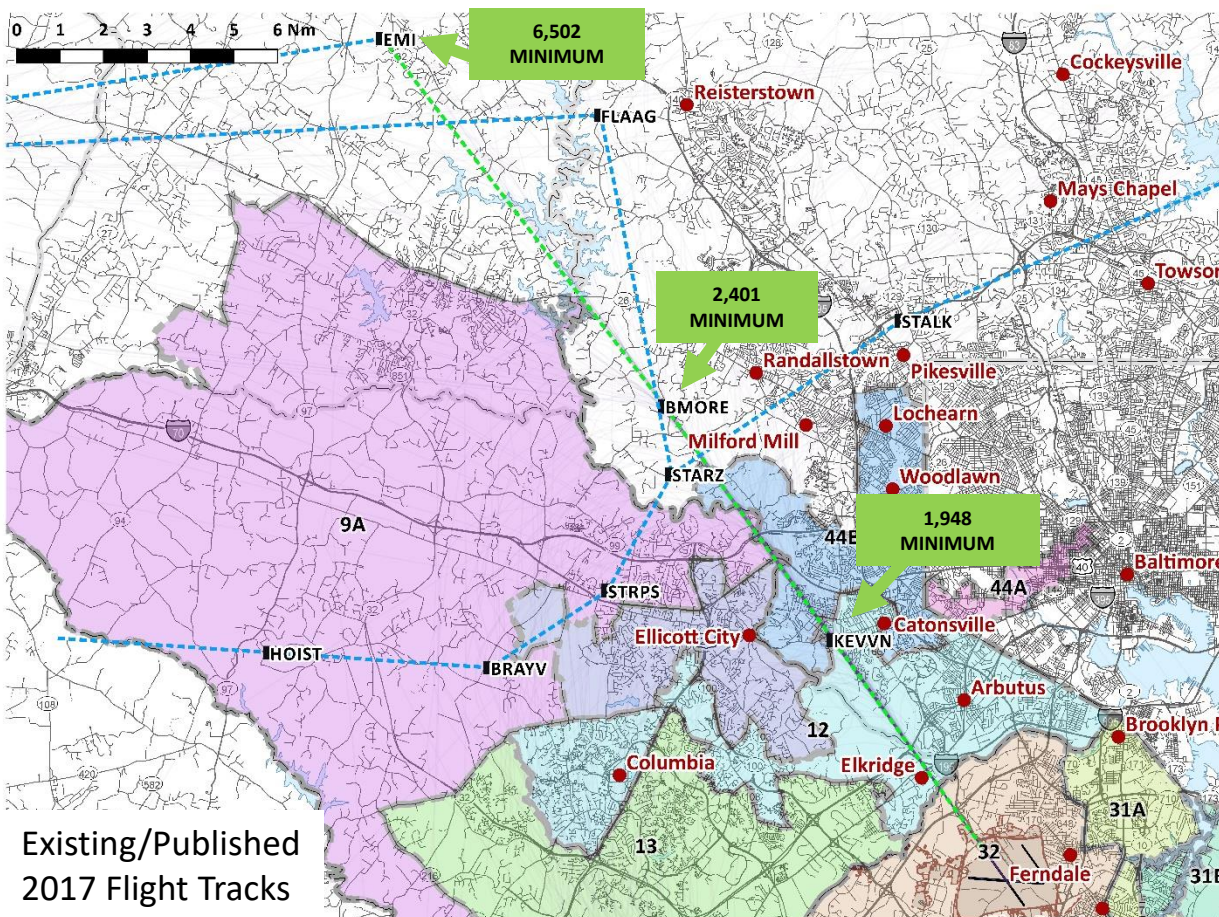


Legend

- Navigational Points
- Proposed Arrival Procedure Changes
- Existing Published Arrival Procedures
- Proposed Approach Procedure Changes
- Existing Published Approach Procedures
- Arrival Flight Tracks

Pre-Decisional: For informational purposes only

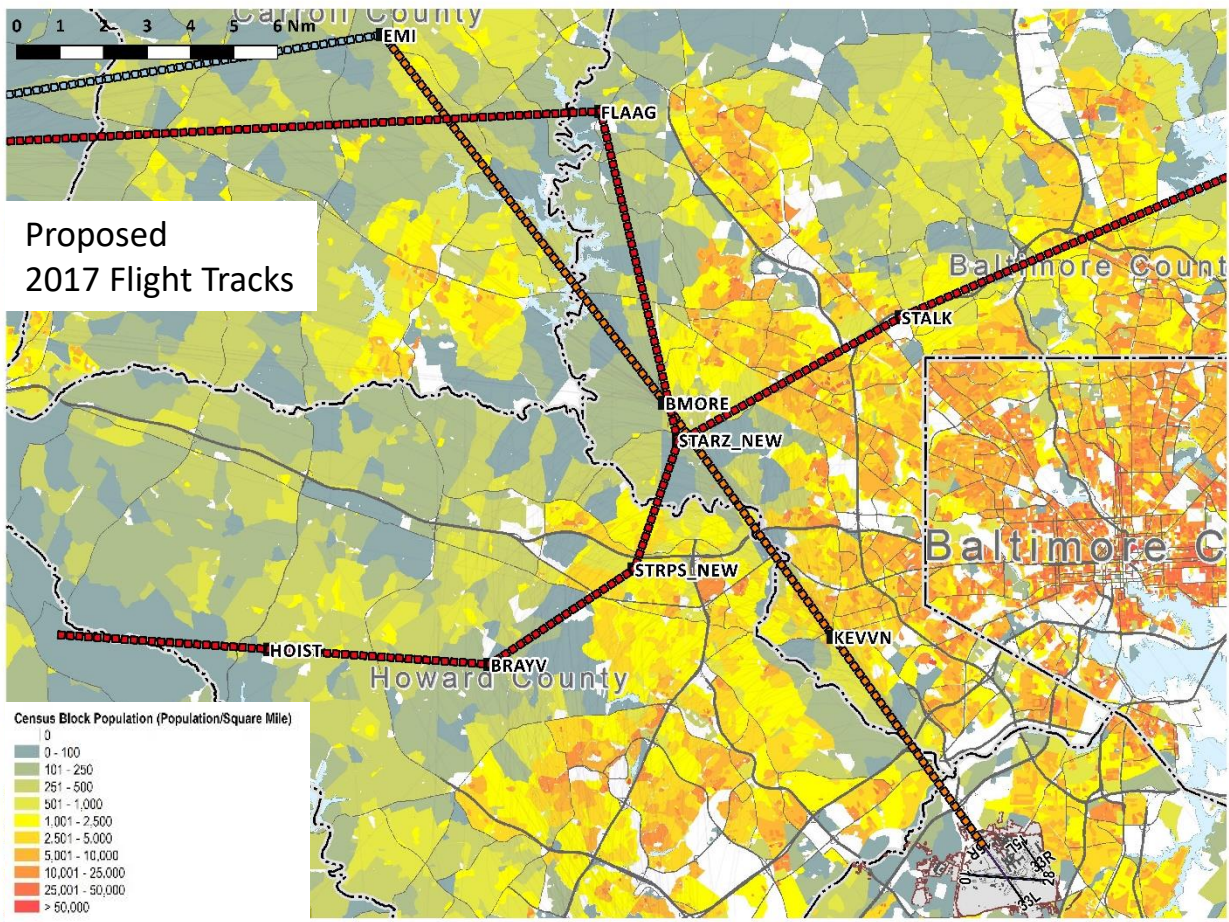
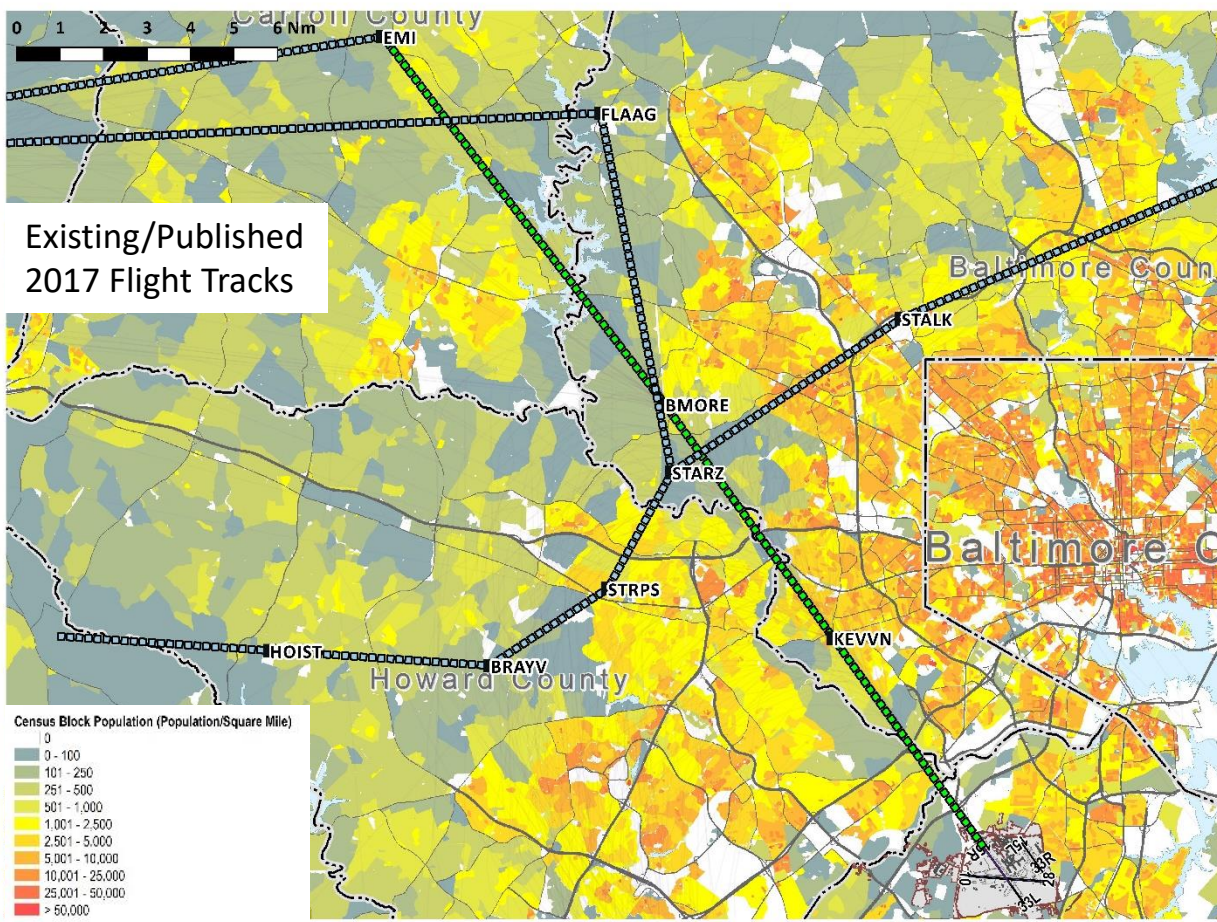
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Next Steps

Planning and Meeting Schedule Moving Forward

- **November**
 - Present full noise analysis of proposed procedures selected by Roundtable to bring forth to the FAA at November 19 Roundtable meeting
 - Solicit feedback from members
 - Determine if additional meeting required in December to resolve any open questions/concerns
- **December**
 - TBD December Roundtable meeting (if necessary) to resolve any open questions/concerns
 - Assemble/submit final submittal package to FAA for consideration at Performance Based Navigation (PBN) Working Group meeting in late-winter/early-spring of 2020



Discussion