Washington Dulles International Airport (IAD) Aircraft Noise Overlay Update

Scenario Development

2nd Working Group Briefing

For Publication on MWAA Website

4/20/18

Meeting Purpose

- Discuss airfield activity scenarios to model in the Airport Environmental Decision Tool (AEDT)
- Discuss methodology to calculate ultimate operational activity input into the AEDT

Agenda

- Study Purpose
- Background
- Discussion
  - Scenario Identification
  - Annual Service Volume (ASV)
  - Potential Fleet Mix
  - Potential Operations By Time Of Day
- Conclusion
- Project Timeline/Next Steps

Study Purpose

Update the Dulles Airport noise contour map to incorporate changes in the aviation environment so that the future vision reflects these changes:

- Flight tracks and overall utility of the airfield have evolved
- Evolution will continue with implementation of NextGen
- Flight procedures will soon allow for triple simultaneous runway operations during low visibility conditions (IFR)
- Airport operational forecast changes

Background

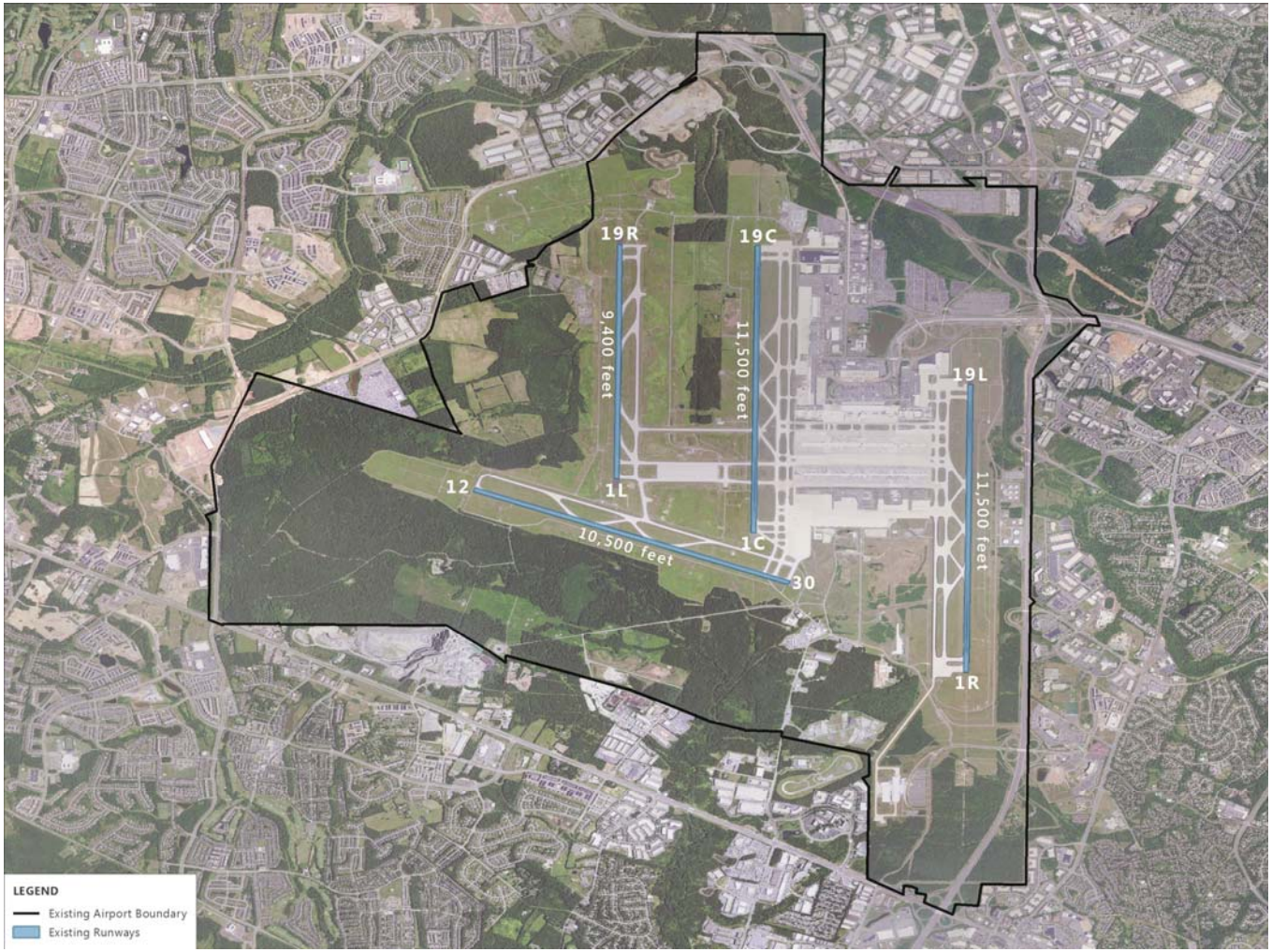
New Noise Contours Maps will:

- incorporate changes since the 1993 update critical to the region and the Airport
  - Significant tool the airport uses to assist local governments with their off-Airport land planning and zoning decisions
- continue to ensure compatibility between the Airport and local jurisdictional land use and ensure local jurisdictions have the latest information available to make land use decisions
- be based on Ultimate Build Scenarios

Discussion
Scenario Identification

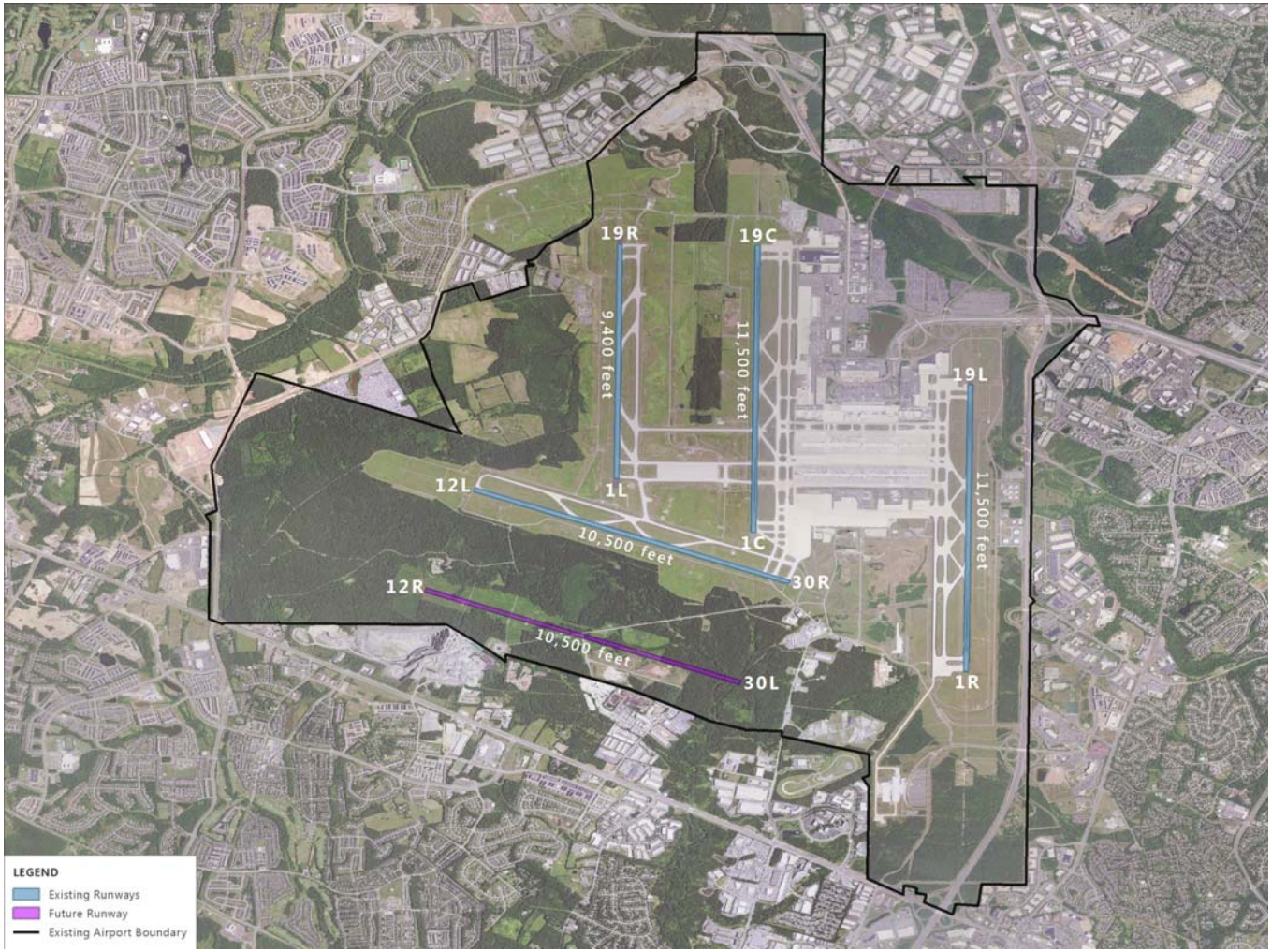
- Identify up to three scenarios reflecting ultimate runway capacity for:
  - Current four-runway airfield
  - Future five-runway full-build airfield
- Account for increased nighttime activity including passenger and air cargo aircraft
- Consider future locations for on-Airport development
- Develop various future runway use scenarios to ensure recommended overlays include areas potentially affected by long-term aircraft noise exposure

Discussion – Scenario Identification
Current 4-Runway Configuration



Source: aerial photograph: USDA-FSA-APFO Aerial Photography Field Office, Virginia 1m NAIP Imagery, 2016

Discussion - Scenario Identification
Future 5-Runway Configuration

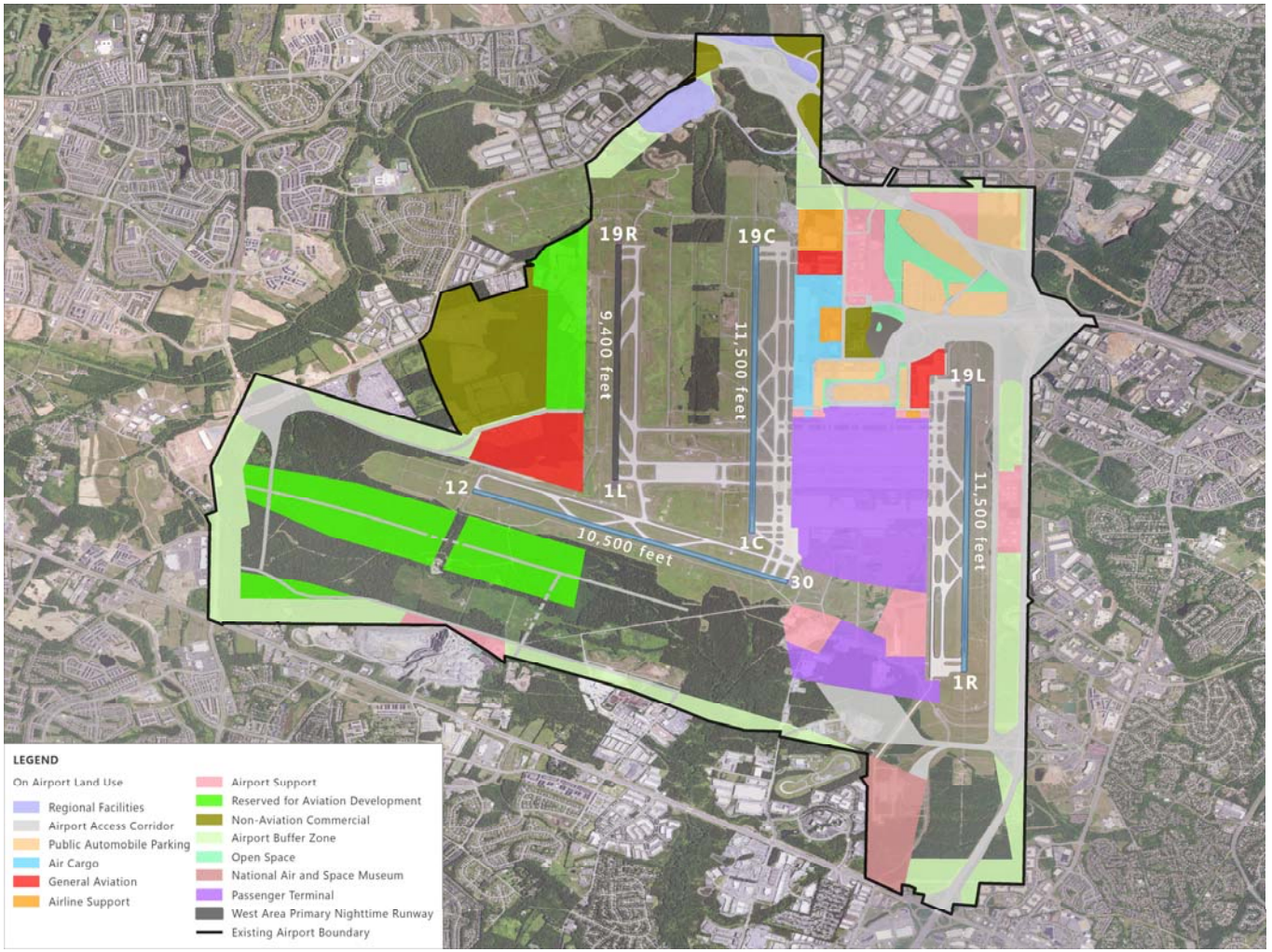


Source: aerial photograph: USDA-FSA-APFO Aerial Photography Field Office, Virginia 1m NAIP Imagery, 2016; new runway: MWAA, April 2018.

Discussion - Scenario Identification
Recommended Scenarios

- Scenario 1
  - Four-runway airfield
  - Most effective use of runways during daytime
  - Runway 1L-19R operational efficiency utilization for nighttime activity
- Scenario 2
  - Five-runway airfield
  - Most effective use of runways during daytime
  - Runway 1C-19C operational efficiency utilization for nighttime activity
- Scenario 3
  - Five-runway airfield
  - Most effective use of runways during daytime
  - Runway 12L-30R operational efficiency utilization for nighttime activity

Discussion Scenario Identification - Scenario 1

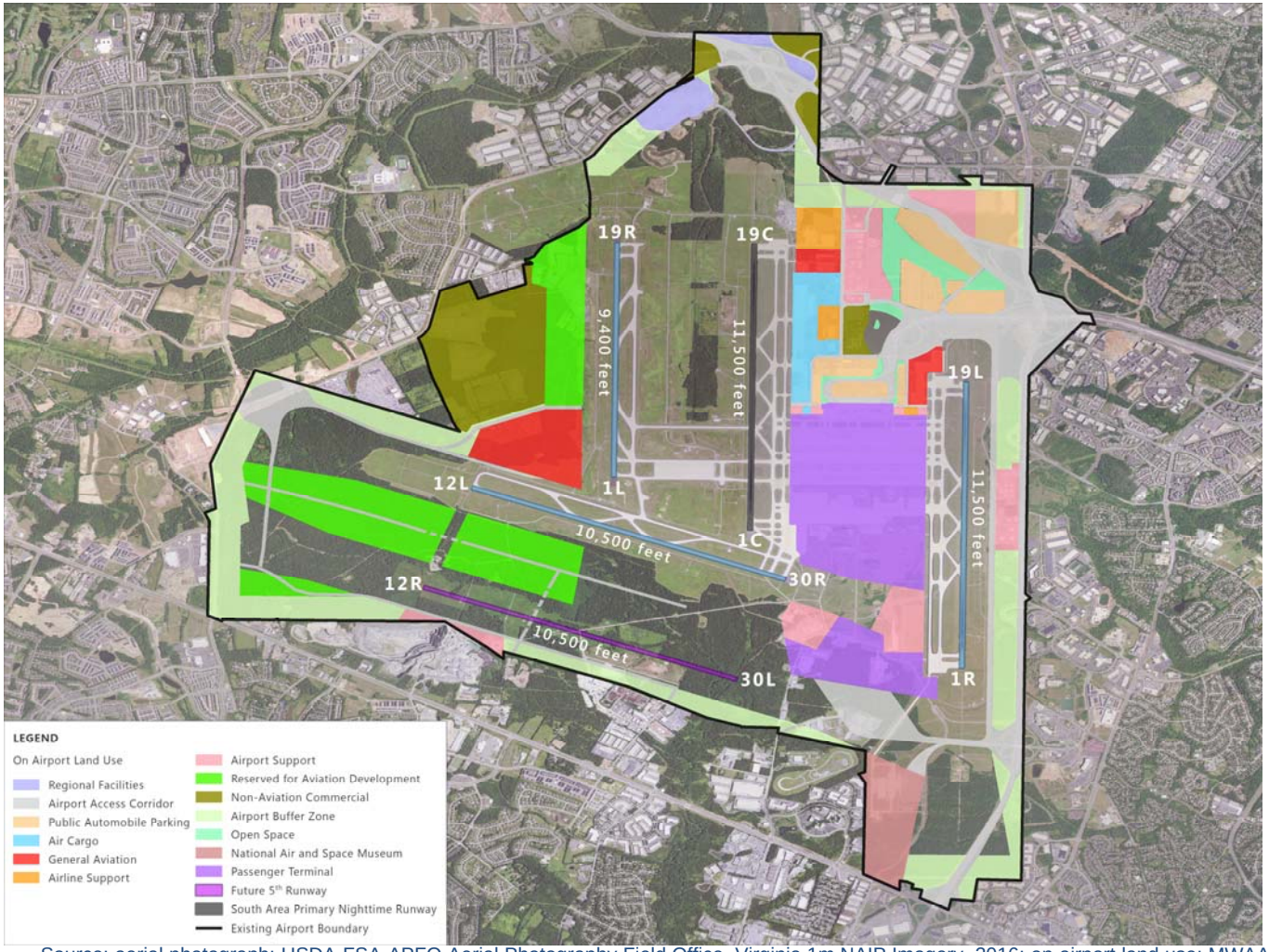


Source: aerial photograph: USDA-FSA-APFO Aerial Photography Field Office, Virginia 1m NAIP Imagery, 2016; on-airport land use: MWAA, April 2018

Discussion – Scenario Identification
Scenario 1

- Four-runway configuration
- Most effective runway use for safe and efficient operations during daytime periods
- Reflects primary runway use associated with on-Airport development west of Runway 1L-19R during nighttime periods

Discussion – Scenario Identification
Scenario 2

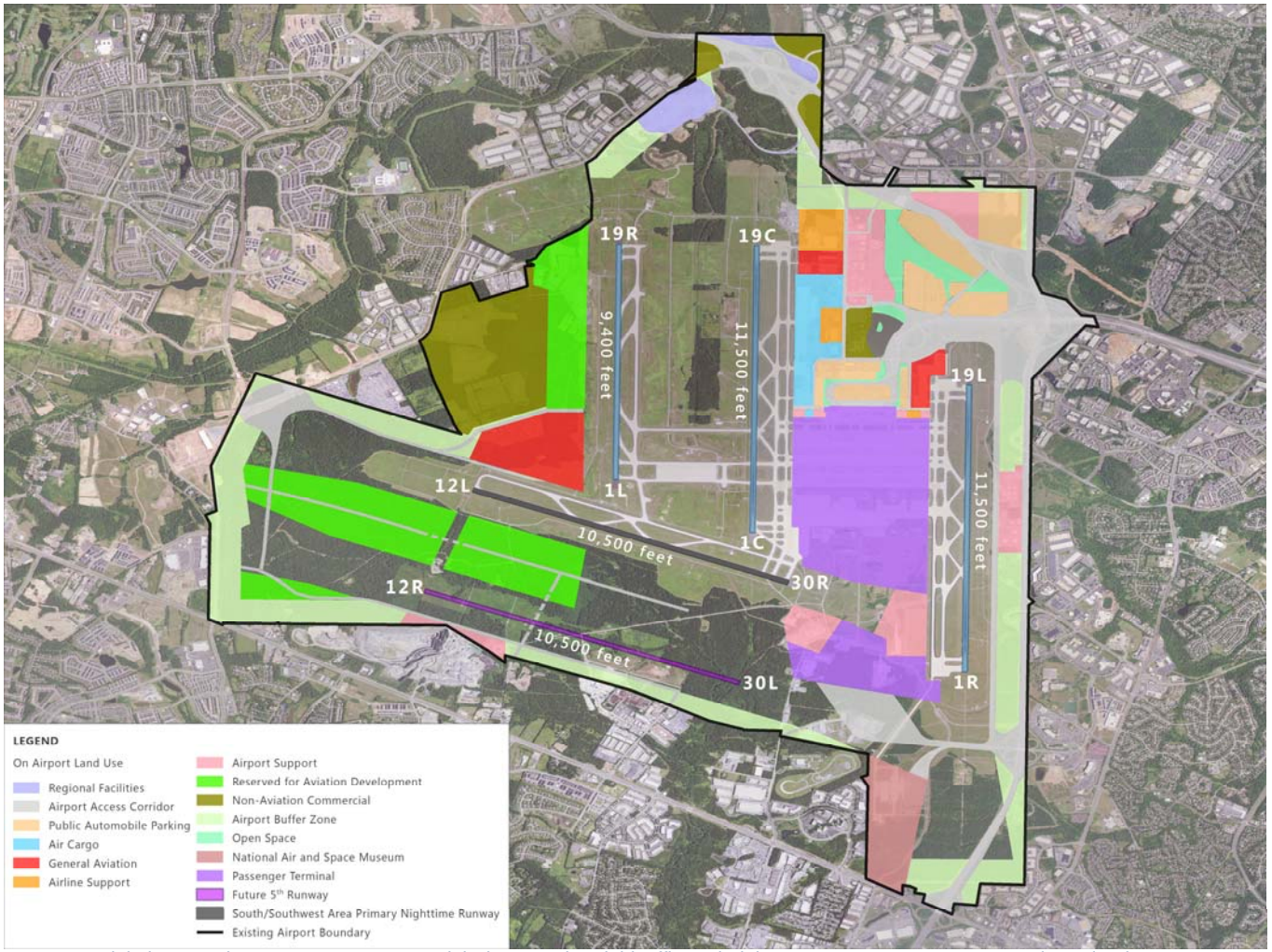


Source: aerial photograph: USDA-FSA-APFO Aerial Photography Field Office, Virginia 1m NAIP Imagery, 2016; on-airport land use: MWAA, April 2018; new runway: MWAA, April 2018.

Discussion – Scenario Identification
Scenario 2

- Five-runway configuration
- Most effective runway use for safe and efficient operations during daytime periods
- Reflects primary runway use associated with on-Airport development south of the existing terminal during nighttime periods

Discussion Scenario Identification - Scenario 3



Source: aerial photograph: USDA-FSA-APFO Aerial Photography Field Office, Virginia 1m NAIP Imagery, 2016; on-airport land use: MWAA, April 2018; new runway: MWAA, April 2018.

Discussion – Scenario Identification
Scenario 3

- Five-runway configuration
- Most effective runway use for safe and efficient operations during daytime periods
- Reflects primary runway use associated with on-Airport development south of the existing terminal or between Runways 12L-30R and 12R-30L

Discussion – Annual Service Volume
Maximum Sustainable Throughput

- The number of aircraft operations that can reasonably be accommodated over a period of continuous demand (FAA Advisory Circular 150/5060-5)
- Most common time intervals are hourly and annual
- Maximum sustainable throughput is based on runway dimensions, airfield design standards, air traffic control rules/procedures, and aircraft capabilities

Discussion
Annual Service Volume

- *Annual Service Volume* - an estimate of how many aircraft operations the airport runway system can accommodate in a year
- Accounts for differences in throughput related to runway use, fleet mix, and weather conditions that would be encountered over the year
- Serves as the basis for the potential number of annual operations at IAD
- Based on a specified level of average annual delay

Discussion – Annual Service Volume
Factors Affecting Airfield Capacity

- Runways
- Taxiways
- Runway exit taxiways – runway occupancy time
- Fleet mix
- Weather
- Air traffic control procedures
  - Wake turbulence separation
  - Radar separation
  - Procedure separation
  - Buffers to separation requirements
  - Divergent headings

Discussion – Potential Enhancements to IAD Airfield Capacity – 5th Runway

The fifth runway at IAD would provide:

- capability to accommodate additional landings and takeoffs.
- adequate separation from existing Runway 12-30 to allow simultaneous dual instrument arrivals in all weather conditions.
- increased throughput when wind and weather require aircraft to land/depart only in a westerly direction.

Discussion – Potential Effects on IAD Airfield Capacity – NextGen

NextGen initiatives that could potentially affect IAD include:

- triple simultaneous instrument approaches during all weather conditions.
- wake turbulence recategorization for aircraft that would reduce the required separation between aircraft landing or departing on the same runway.
- Equivalent Lateral Spacing Operations (ELSO) could increase the number of departure routes from individual and parallel runways.

Discussion
Potential Daily Operations Level Development

- Calculate ASV and average annual day (AAD) based on 4-Runway and 5-Runway scenario and foreseeable FAA NextGen improvements
- Develop potential AAD fleet mix
- Distribute AAD operations by time of day
- Add potential cargo and international operations to nighttime hours
- Prepare AEDT daily operations file representing AAD

Discussion – Annual Service Volume Calculation Methodology

- Objective: Calculate ASV for the 4- and 5-runway airfield
- Assumptions:
  - Taxiways adequate to expedite movement onto and off of all runways will be in place
  - Other facilities (terminals, gates, cargo and general aviation) will be available to accommodate demand
  - Airspace and procedures available to accommodate maximum sustained throughput
  - Airport operation level of service is tolerable up to capacity constrained levels

Discussion - Annual Service Volume Calculation Methodology *Continued*

- Apply FAA methodology to calculate maximum sustainable hourly throughput rate
- Apply historic weather conditions, historic and expected runway use, runway configuration throughput weighting
- Extrapolate ASV to account for average delay per operation equivalent to capacity constrained airport thresholds (FAA, *FACT3: Airport Capacity Needs in the National Airspace System Study*) = Potential ASV

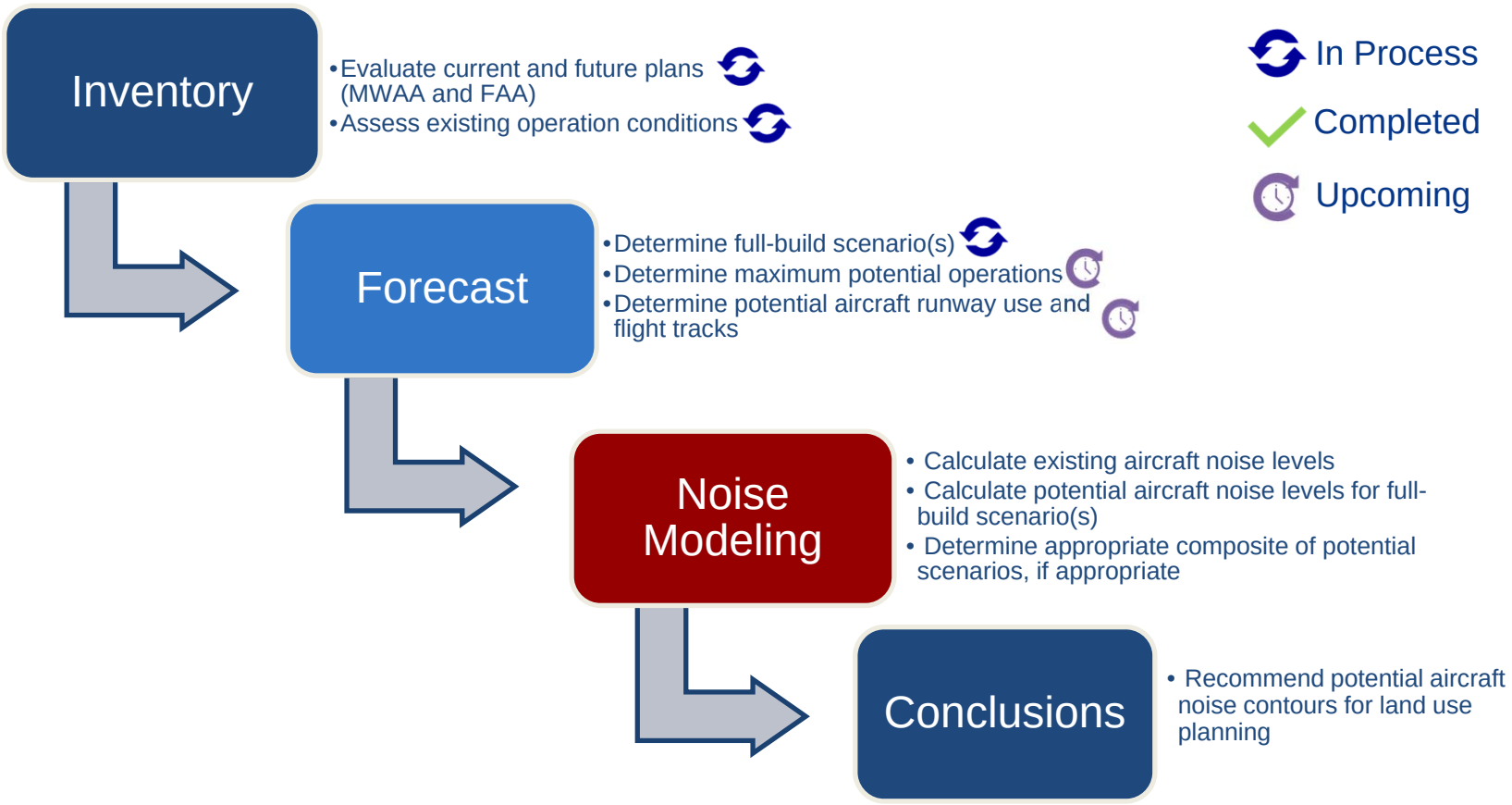
Discussion
Potential Fleet Mix

- Begin with existing aircraft types
- Identify aircraft subject for replacement based on:
  - Age (e.g., older Boeing 737 models, Boeing 757, Boeing 747-400)
  - Airline orders
  - Airline announcements (e.g., American Airline's recent announcement to replace Boeing 767 and Airbus 300 with Boeing 787 models)
- Assess potential replacement of smaller regional jets (e.g., Embraer 145) with larger regional jets (e.g., Embraer 190) and larger regional jets with new 100-seat mainline jets (e.g., Canadair C-Series)

Discussion
Potential Operations by Time of Day

- Day-Night Average Noise Level (DNL) reflects AAD and applies 10-dBA factor to nighttime operations
- Not sensitive to hourly peaks
- Daytime will reflect maximum sustainability hourly throughput levels
- Nighttime will reflect:
  - maximum sustainable hourly throughput levels for “shoulder” hours (6:00 am to 6:59 am and 10:00 pm to 11:00 pm)
  - potential cargo operations
  - potential international operations between 11:00 pm and 6:00 am

Progress and Next Steps



Conclusion

- Schedule next working group meeting
- Feedback from Working Group

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

MWAA.COM

@Reagan_Airport @Dulles_Airport @Dulles_Toll_Road reaganairport FlyDulles dullestollroad