# DCA AIRPLANE NOISE ASSESSMENT PROJECT

FREYTAG & ASSOCIATES LLC
ACOUSTICAL CONSULTANTS

DEPARTMENT OF ENERGY & ENVIRONMENT

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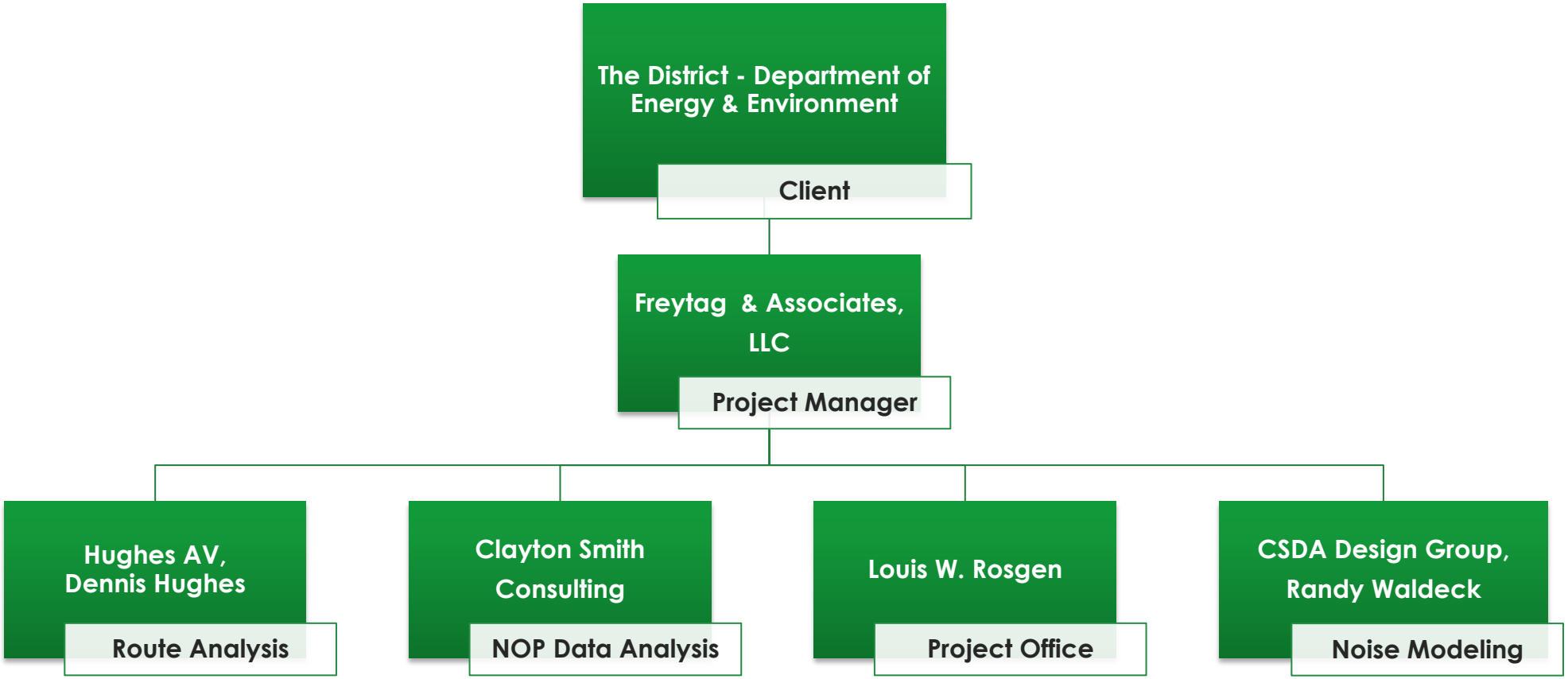
## AIR QUALITY DIVISION, MONITORING AND ASSESSMENT BRANCH



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# PROJECT OBJECTIVES

- Investigate noise impacts from DCA air traffic operations
- Thoroughly review existing data, supplemented by new investigations, to document the past and current airplane noise environment over the District
- Identify operational changes to minimize noise
- Review current noise abatement procedures
- Assist FAA in NextGen implementation while minimizing noise
- Develop revised air traffic procedures, acceptable to the FAA, to minimize the current noise impact on the District

# NEXTGEN

- A new national airspace system transforming America's air traffic control system from a ground-based navigation/radar system with radio communication, to a satellite-based (GPS) system
- Implementation across the U.S. from 2012 to 2025
- Advantages:
  - shorter routes (more direct)
  - saves time and fuel
  - reduces traffic delays
  - increases capacity
  - minimizes voice communication
  - greater safety
  - reduces controller and cockpit work load
- Disadvantage: New air traffic control routes were established over noise-sensitive areas.

# PROJECT ACTIVITIES:
# EXISTING DATA ASSESSMENT

- Noise complaints – historical review
- Published air routes – review and assess
- DCA noise monitoring records – review and assess
- Noise monitoring in the community

# PROJECT ACTIVITIES:
# PREDICTION AND RECOMMENDATIONS

- Sleep interference study
- Classroom disruption study
- Recommend new air traffic control routes and procedures
- Computer noise modeling – past and proposed
- Final report – written and presentation

# AIR TRAFFIC CONTROL PROCEDURES
## APPROACH AND DEPARTURE




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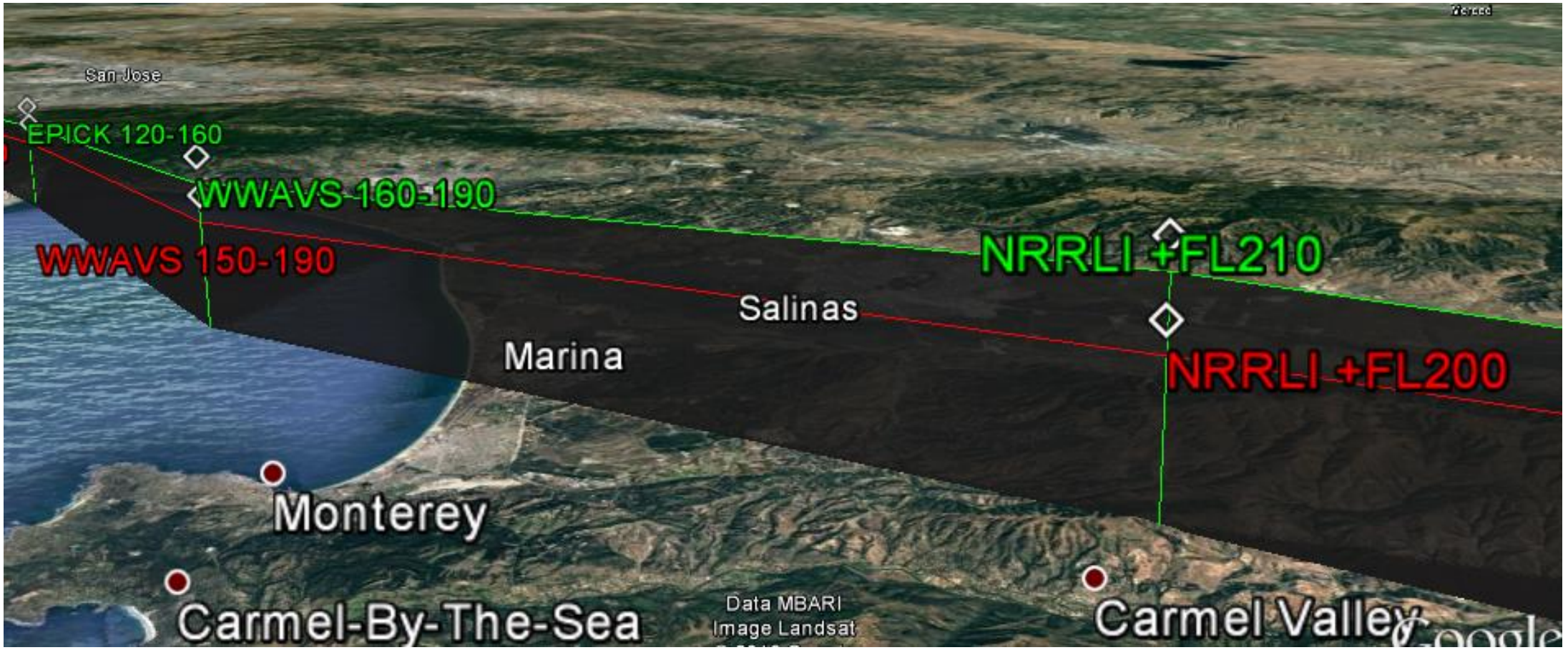
# SAMPLE AIR TRAFFIC CONTROL APPROACH



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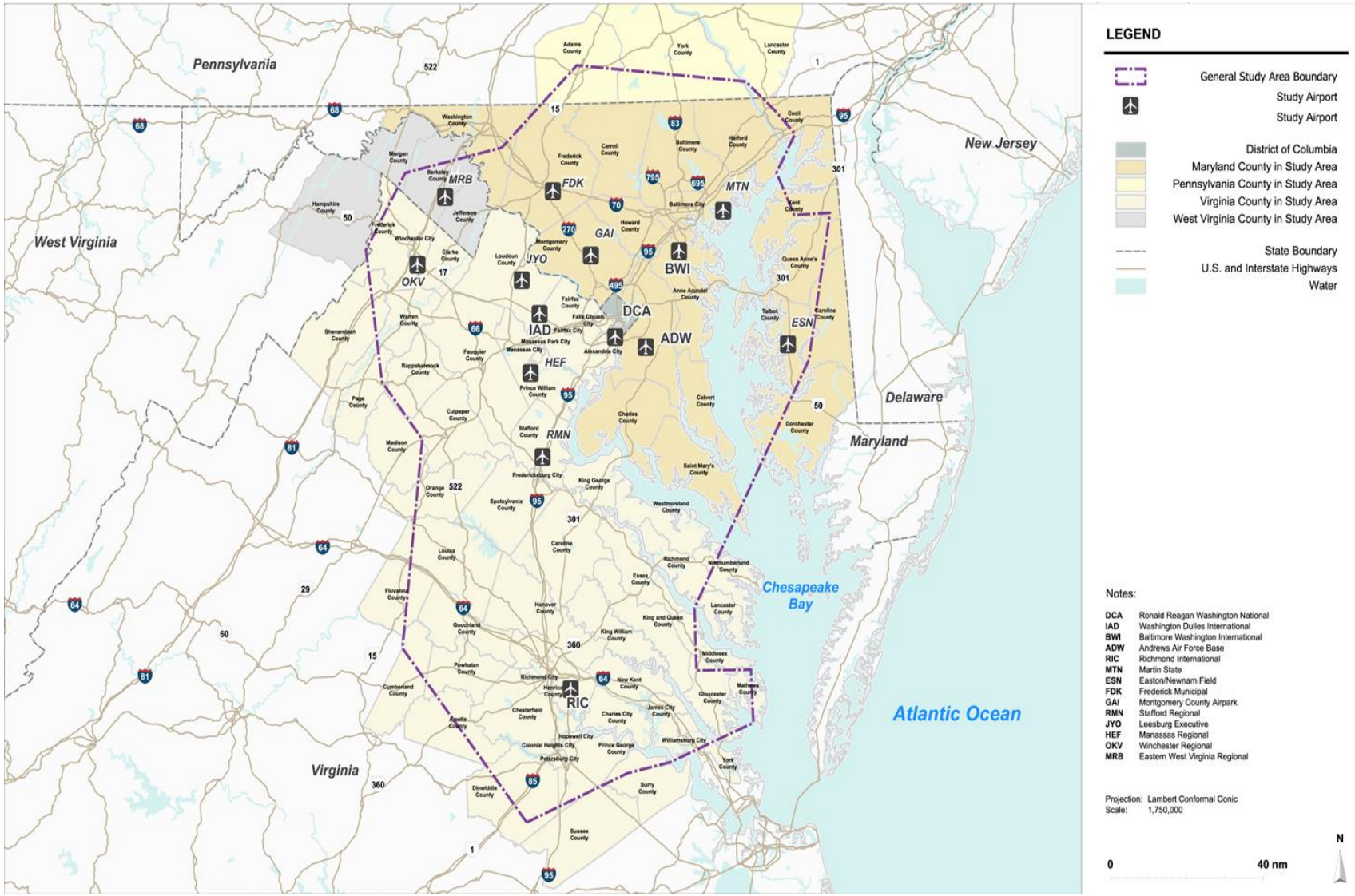
# WASHINGTON METROPLEX STUDY AREA



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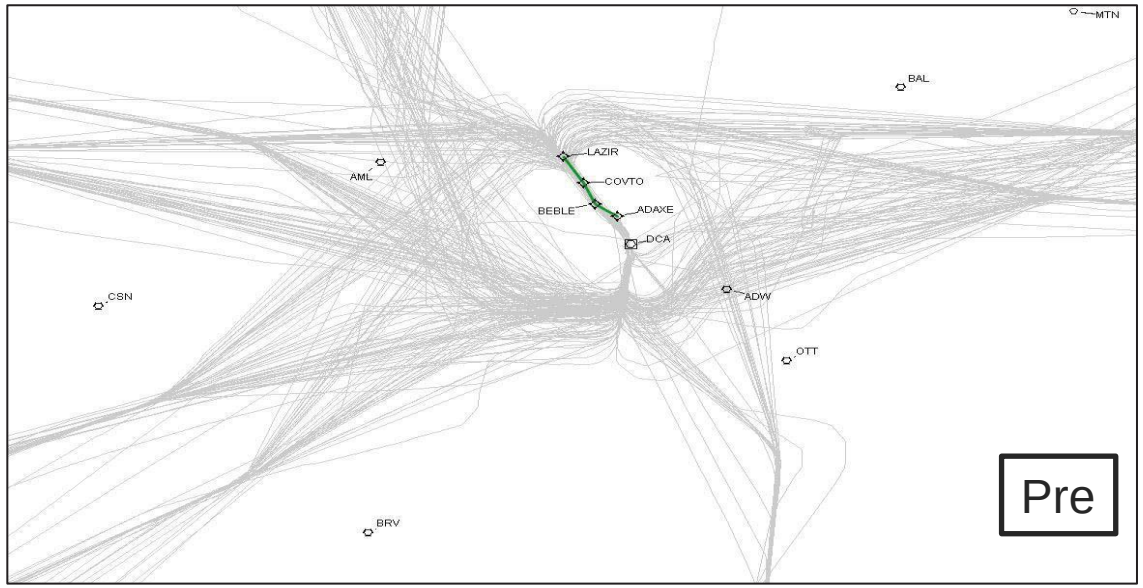
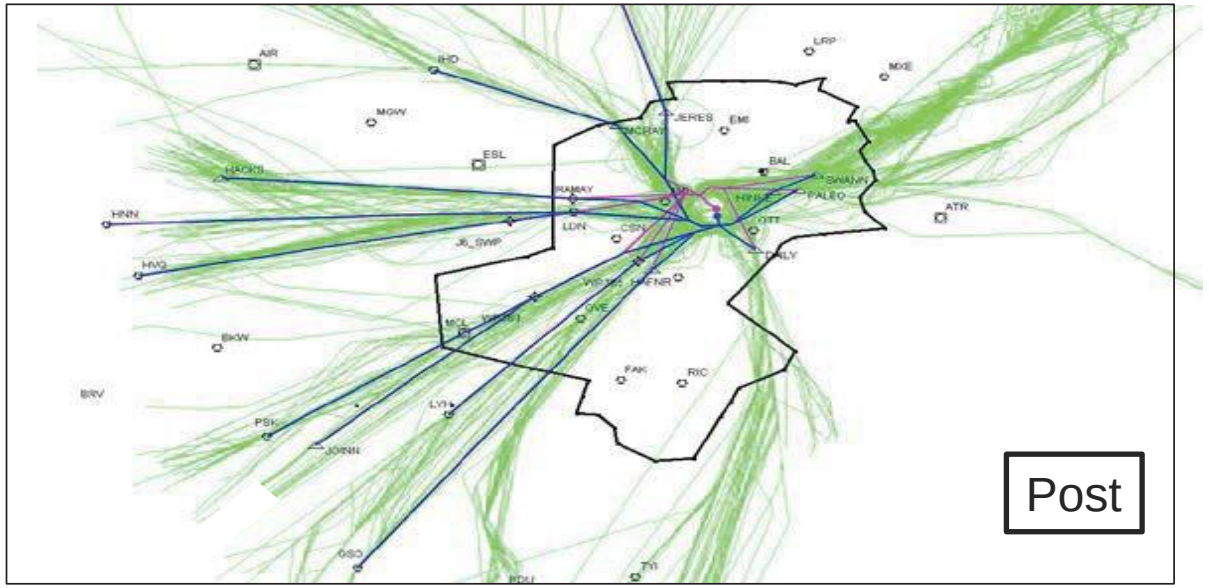
# WASHINGTON, DC METROPLEX



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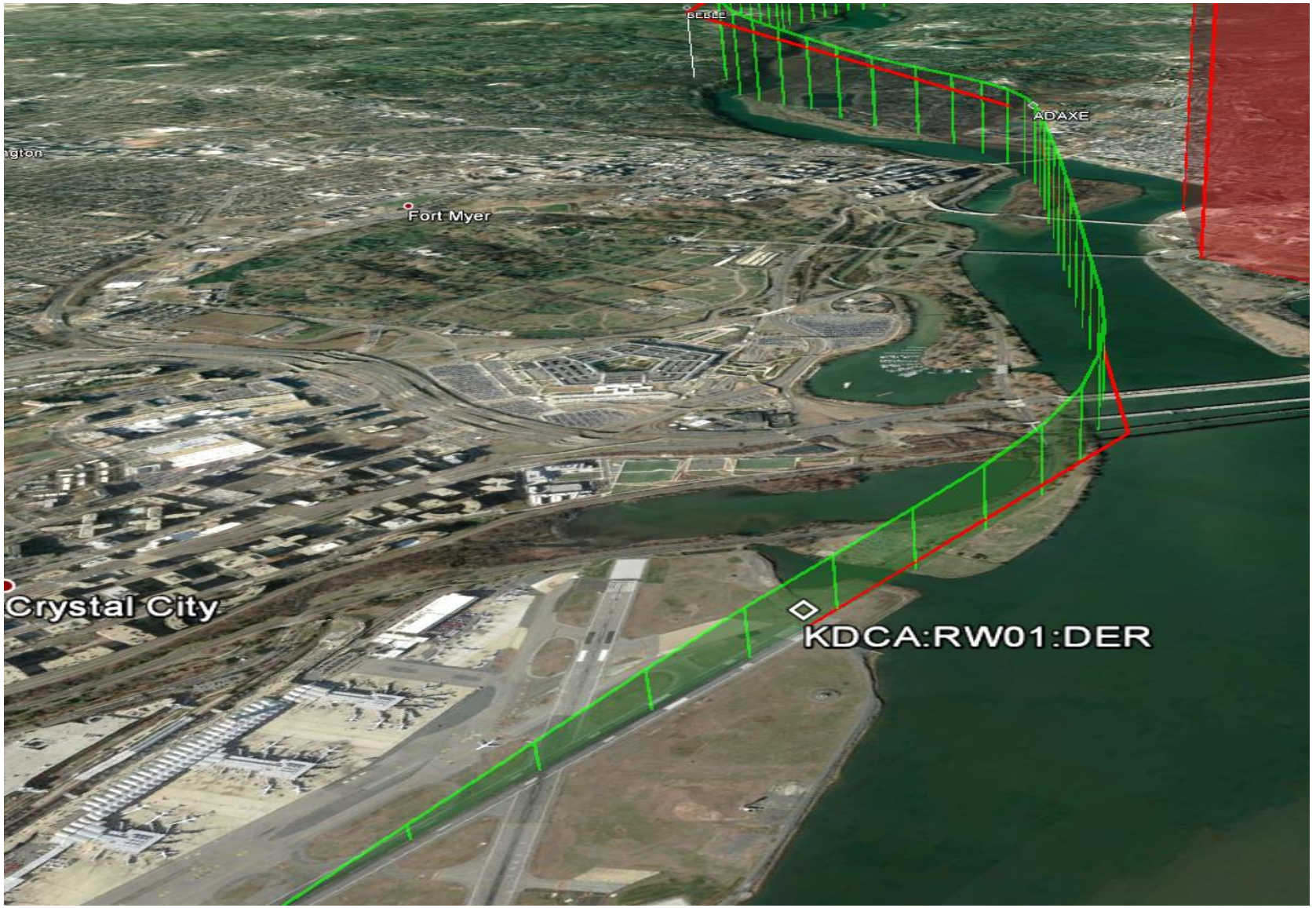
# BOOCK TWO RNAV SID: INITIAL TRACK (RWY 01)



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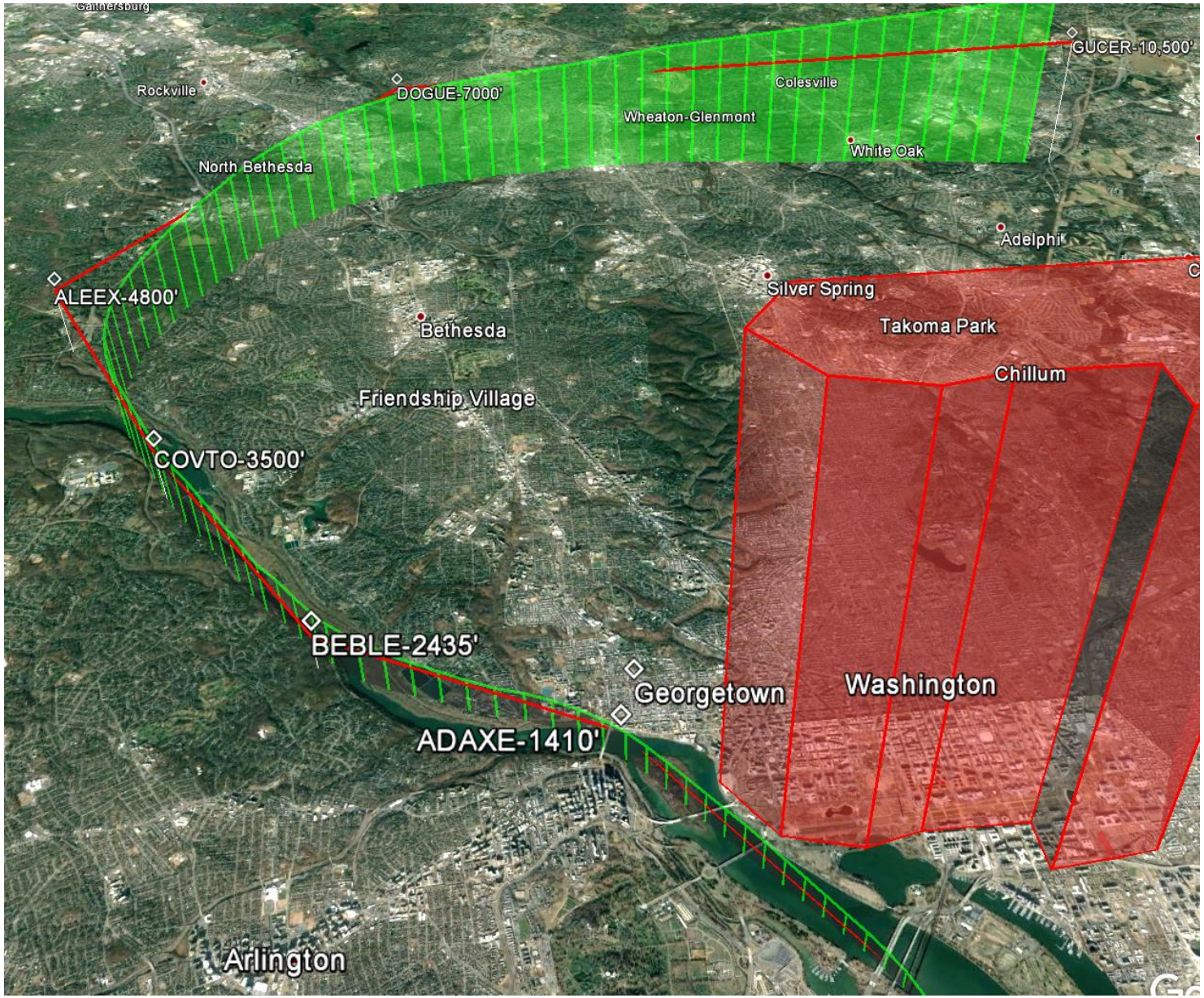


# BOOCK TWO RNAV SID NORTH – EAST TRACK (ALTITUDES TARGETS CLIMB RATE)



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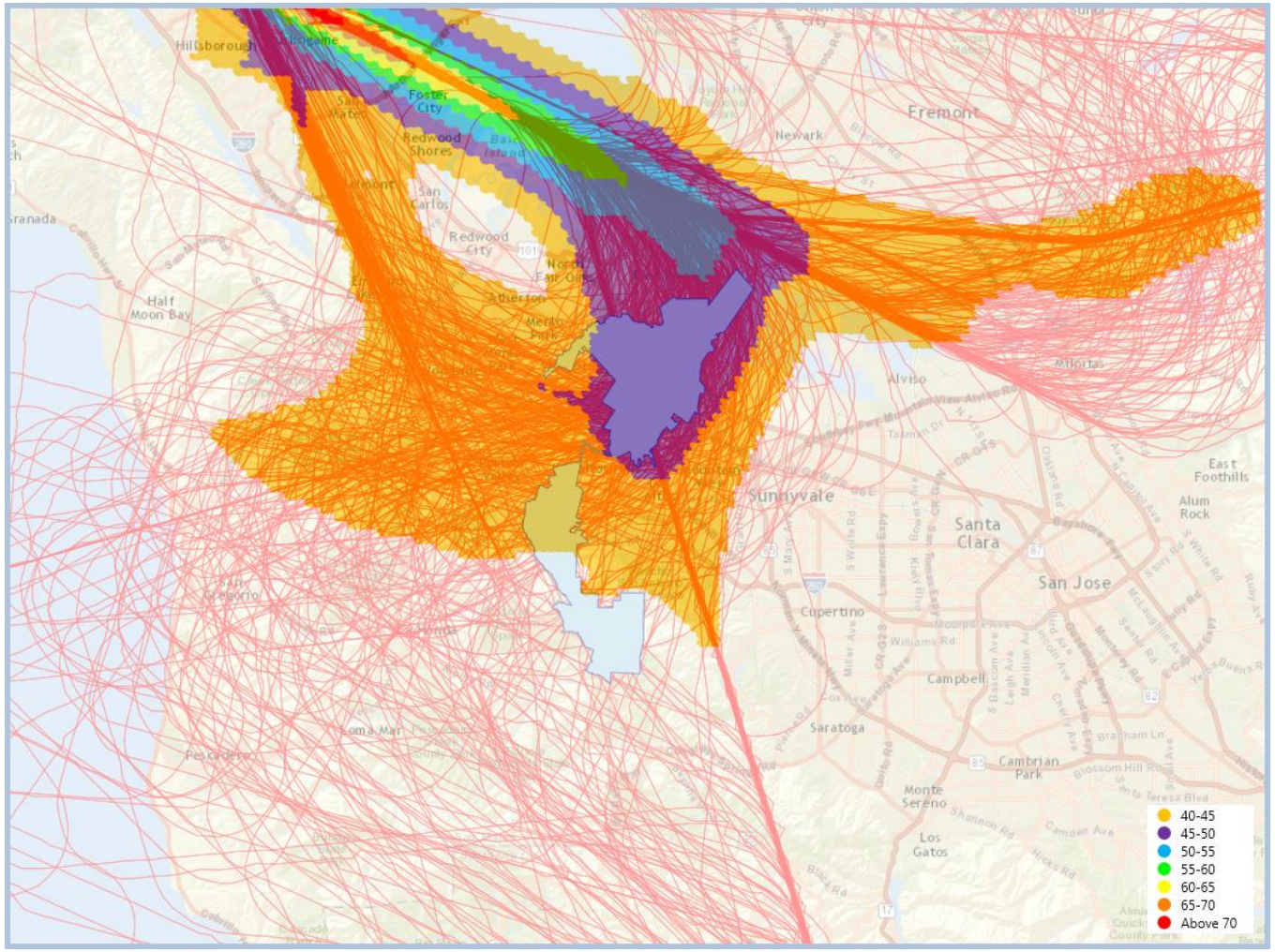
# NOISE EXPOSURE CONTOUR (DNL)




- FAA AEDT Noise Model
- Actual flight tracks (in red)
- Models actual aircraft type, altitudes, operation time



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# OPTIONS FOR REDUCING NOISE EXPOSURE TO DC COMMUNITIES

- Arrival and/or departure route (altitude) modification
- Arrivals: Optimized Profile Descent (OPD)
- Arrival traffic management: In-trail sequencing – inbound flights
- New and more precise Area Navigation (RNAV) procedures
- Amend descent profiles fix to fix
- Reduce track miles and amend track speed
- Minimize delayed vectoring

# COMMUNITY INPUT

- **Record major noise events**
  - ✓ Date, time, location, direction, aircraft
- **Noise monitoring at three locations**
  - ✓ Greater noise impact,  diverse communities, quiet locations
- **Nighttime noise monitoring in three homes**
  - ✓ Noise impact, diverse locations, quiet interior (no occupants)
- **Noise monitoring at two schools (school day)**
  - ✓ Noise impact, diverse locations, no occupants

# PALO ALTO RESULTS

- Identified new air traffic control procedures to minimize noise
- Showed noise exposure increases with NextGen
- Documented all results
- Community presentation
- Submitted to the FAA for review – Select Committee from local communities

# CONCLUSIONS

- **Assessments:**
  - Published routes
  - Actual procedures
  - Old and new noise monitoring data
  - Noise modeling of existing and recommended procedures
- **Recommendations**
  - Viable changes in ATC procedures to minimize noise throughout the District

# CONTACT INFO

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- Monitoring and Assessment Branch, Air Quality Division
  - Phone: 202.535.2250

# POTENTIAL MEASUREMENT LOCATIONS




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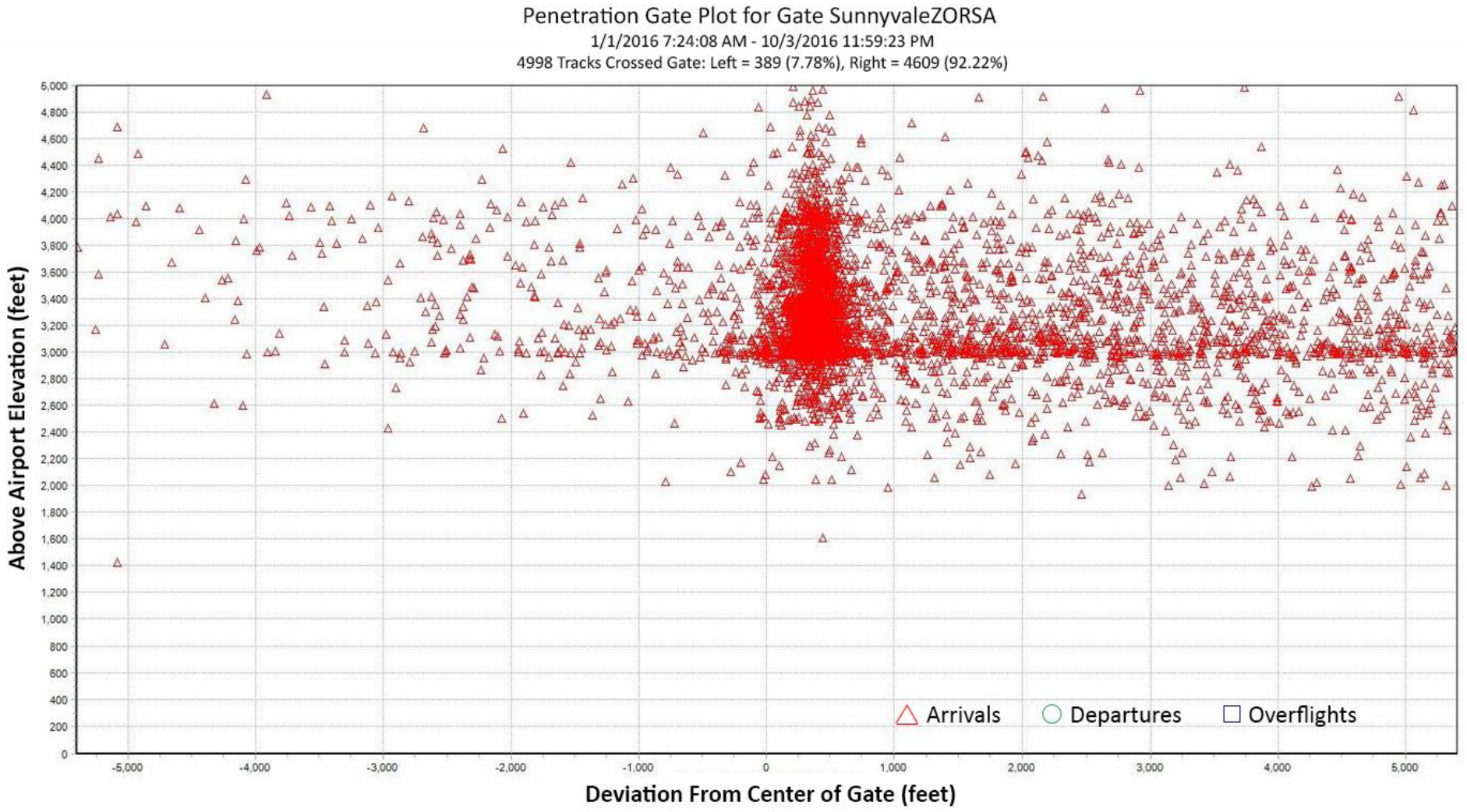
# WAYPOINT SCATTERGRAM

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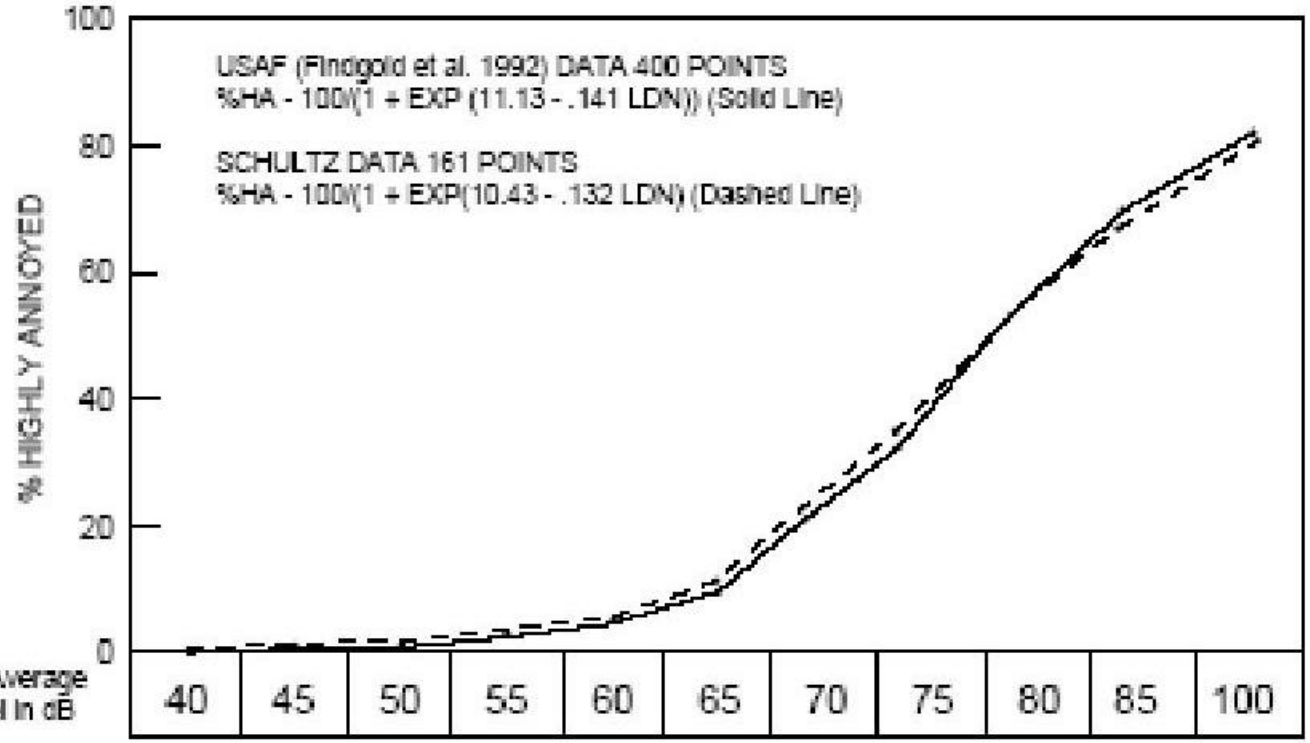
# FICON 1992 Re-Affirmation of Schultz Curve




| Calculated %HA Points | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| USAF | 0.41 | 0.831 | 1.66 | 3.31 | 6.48 | 12.29 | 22.1 | 36.47 | 53.74 | 70.16 | 82.64 |
| SCHULTZ | 0.576 | 1.11 | 2.12 | 4.03 | 7.52 | 13.59 | 23.32 | 37.05 | 53.25 | 68.78 | 81 |

**FICON (1992) re-affirmation of Schultz (1978) and DNL was the last in-depth review for the FAA**

Source: Federal Agency Review of Selected Airport Noise Analysis Issues, Volume 2: Technical Report, Federal Interagency Committee on Noise, August1992