

# Data Development and Integration

Analysis and Tools Development

**Presented to:** REDAC E&E Subcommittee

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**Federal Aviation  
Administration**



# Presentation Outline

- **The challenges and opportunities offered by a data and information rich environment**
- **AEE's plan on tackling data**
- **Implementation plan overview**



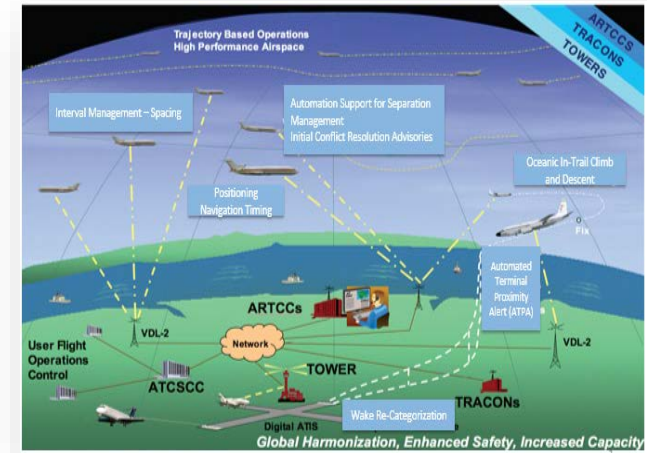
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# Current Situation (1 of 2)

- **Data in the NAS**
  - Generated in large quantities
  - Processed and stored by variety of FAA programs
  - Used to generate valuable information
  - Not always shared

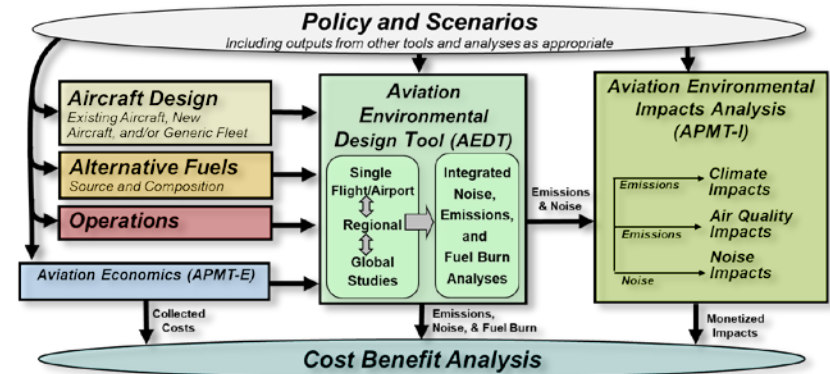


- **FAA is modernizing its approach to data and information**
  - Updating its Data Policy to institutionalize sharing
  - Transforming its technological infrastructure to facilitate sharing



# Current Situation (2 of 2)

- Environmental issues have high visibility
- AEE has developed a variety high quality and high fidelity tools and databases
- Those resources are used for analysis to support
  - Internal and external decision making
  - Public communication
- Agency-wide use of these data and information would improve overall agency consistency on environmental issues



# Desired End State: Consistent Data for All

- Develop an integrated system for data processing and warehousing where all the components rely on a common validated set of data.
- Provide tools that facilitate access to the data, support a variety of use cases, and support consistent presentation
- The data will benefit the key environmental programs
  - Aviation Environmental Design Tool (AEDT)
  - Updated Noise Screening Tool
  - Environmental Visualization Tool (EVT)
  - Community Outreach
- Basing all environmental related activities on a consistent and validated set of data will ensure better outcomes for the Agency



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# Approach: Technology Welding and Deployment (TWD)

- **Reference data infrastructure fabrication**
  - Identify authoritative data sources
  - Establish data paths between authoritative sources and reference databases
  - Develop automated processes for update, validation, and maintenance
- **Data processes infrastructure fabrication**
  - Identify processes that have been developed by other LOBs which generate data and information that are of use to the environmental use case
  - Continue development of those processes that have been built by AEE
  - Develop a plan for the integration of all processes into a single system
- **Tools infrastructure fabrication**
  - Ensure that the all current and upcoming environmental tools link to the established data infrastructure for input and output
  - Support linking of other tools related to this use case (e.g. TARGETS)
  - EVT will be developed to act as the primary portal to the data infrastructure
- **Implement the resulting integrated infrastructure on the FAA Enterprise Information Management (EIM) system**





# Current Status toward TWD

- **Reference data infrastructure fabrication**
  - Several authoritative data sources have been already identified
  - Have begun reaching out to coordinate on FAA specific databases
  - Have already created data paths for some external databases
  - Have already established a system in EVT to directly access GIS authoritative layers
- **Data processes infrastructure fabrication**
  - Work continues on the trajectory data process, which is already being used to support the AEE inventory rebaselining work
  - Have developed plan and concepts for additional processes integration focused on supporting various aspects of existing and upcoming tools data needs
- **Tools infrastructure fabrication**
  - AEDT is already setup to take advantage of the data provided by this infrastructure
  - The new screening tool will also be designed to allow direct and indirect integration
  - EVT development plans have been expanded to begin its move to the EIM and towards becoming the portal to the integrated system
- **EIM integration**
  - Work continues on becoming familiar with the EIM and its functionality by using the AEE inventory and rebaselining analyses as the initial test platforms

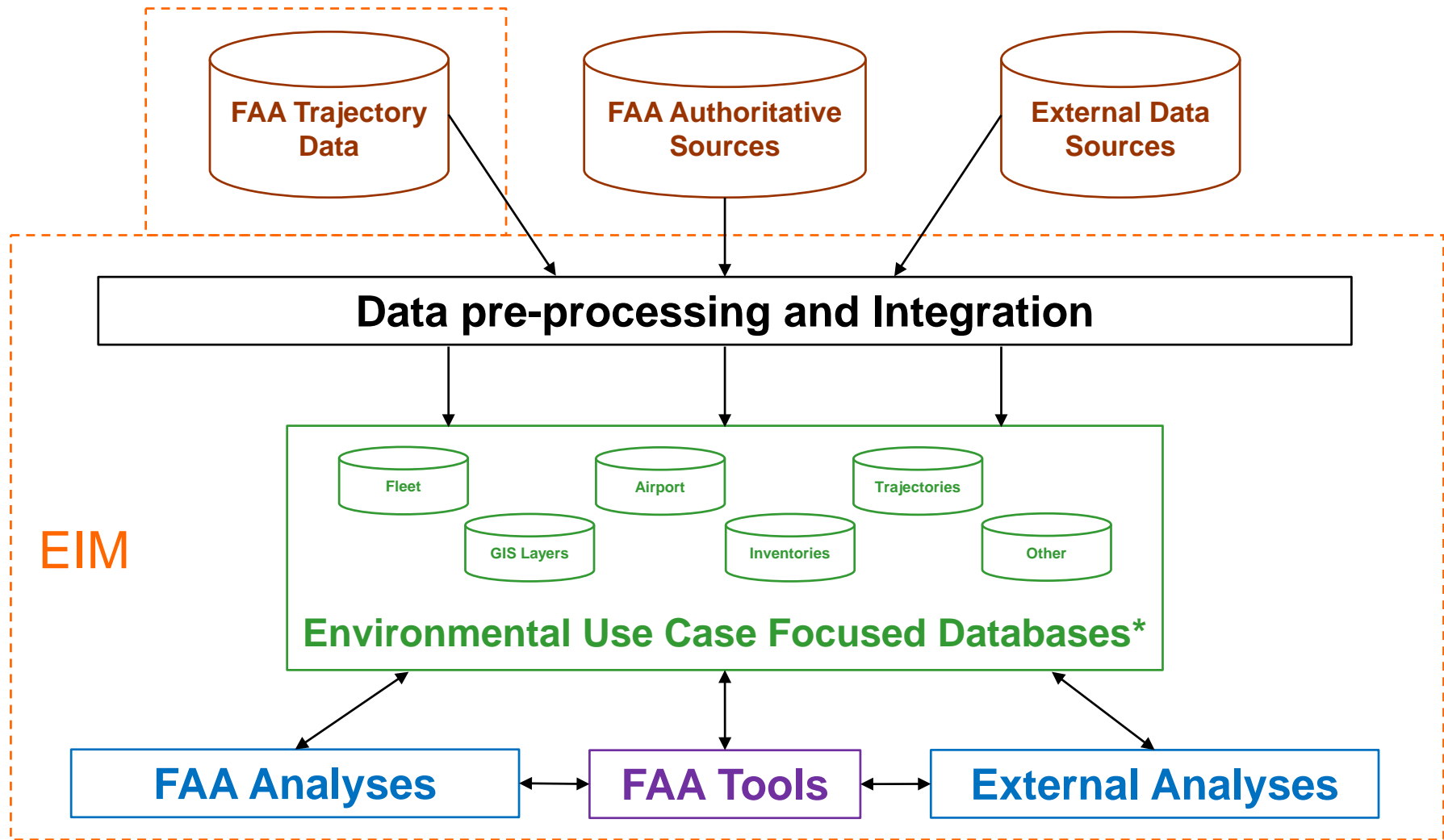


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# High-level Infrastructure representation

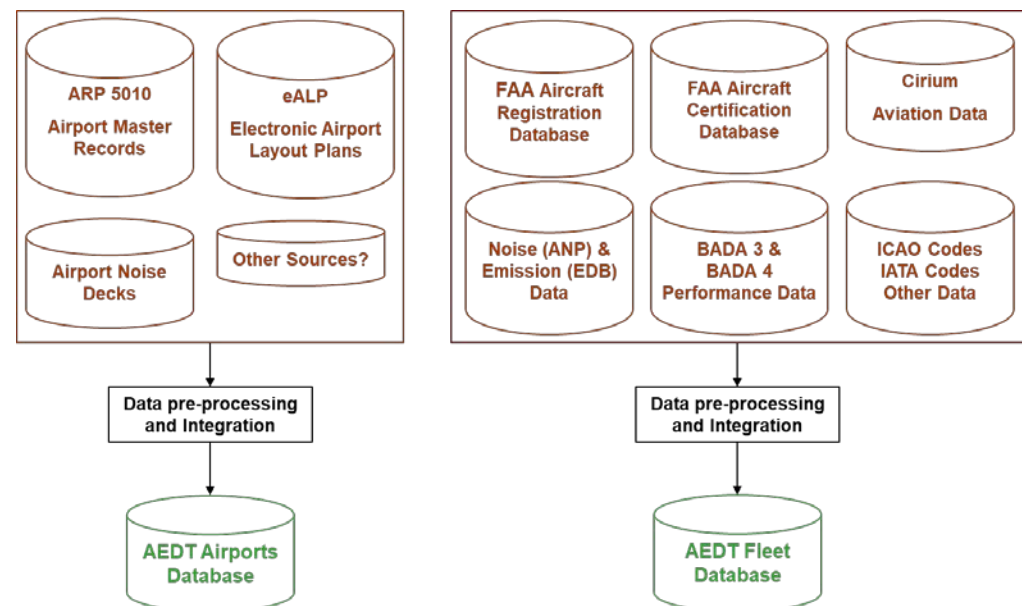


\*While the development driver is the environmental use case, these databases are suitable for a much larger set of FAA applications.



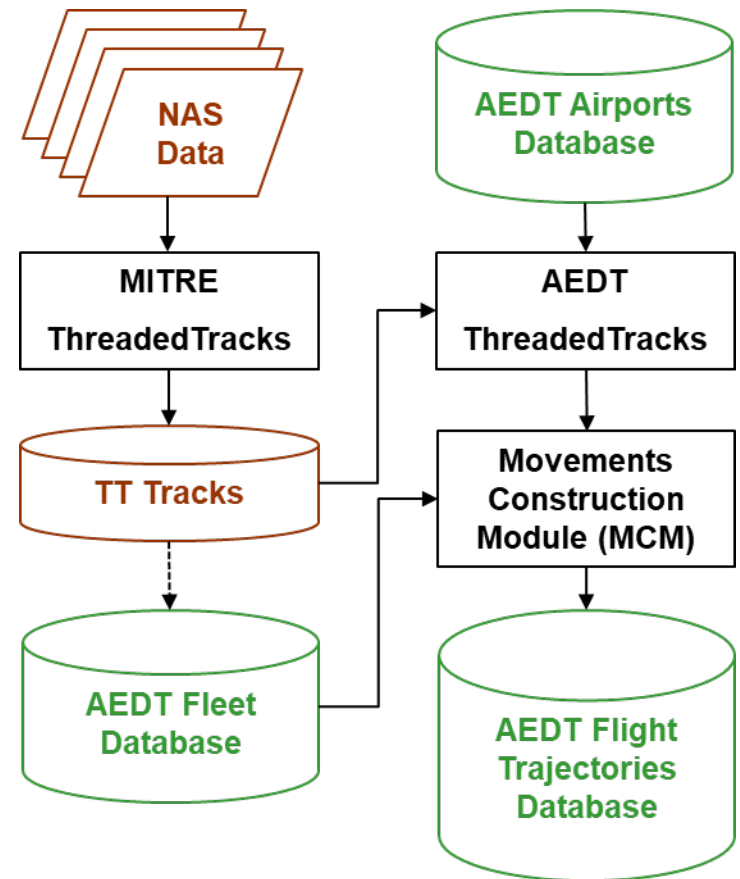
# AEDT Reference Databases

- AEDT's reference databases will have the key role of providing a consistent and curated source of key data to the system
- Data are periodically updated, but time information is preserved to provide tracking and access of historical information
- Currently they are developed independently by AEE and data paths and quality control processes have been established for several external sources
- We have begun identifying the appropriate sources of FAA authoritative data
- We have made initial contact with the lead office for the airport data and have received a positive response
- We will work towards a common understanding on establishing an automated preprocessing and integration path



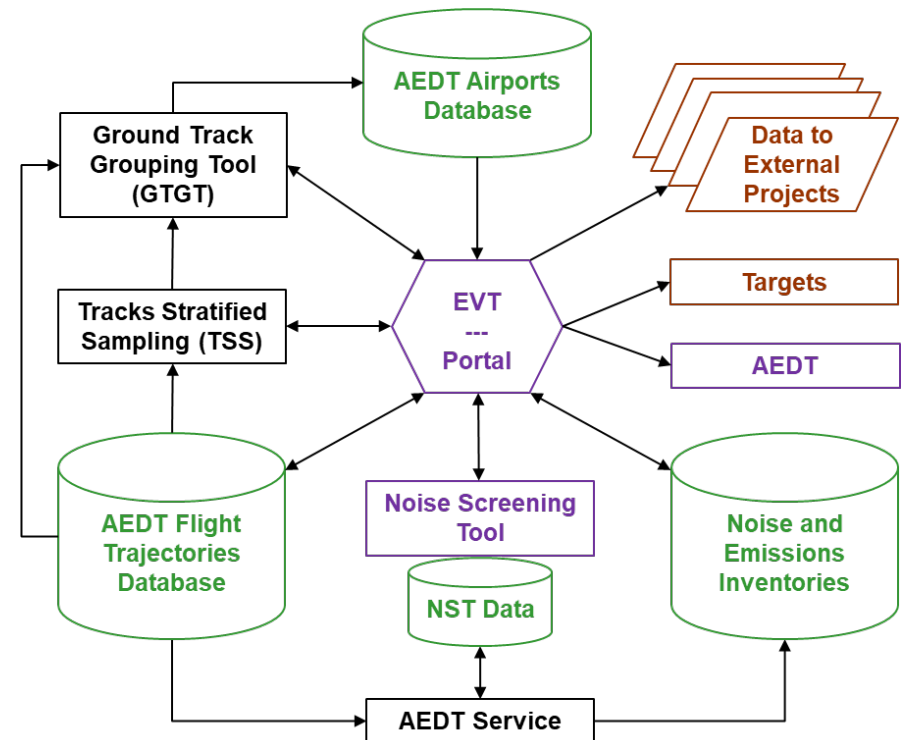
# AEDT-Ready Trajectory Data Processing Infrastructure

- **AEDT-Ready flight trajectory data are developed using a two-step process**
  - The MITRE ThreadedTracks (TT) is used to convert raw data into coherent tracks
  - An AEDT focused process (AEDT-TT) further processes the tracks by refining the trajectory information for use in performance modeling and by augmenting the associated metadata
  - The two processes will for the moment be kept distinct as the timeline for the TT technology transfer and its migration to the EIM is uncertain at this time
  - The AEDT-specific process will be migrated to the EIM as soon as a better understanding of the new system and its capabilities is reached
  - AEDT-TT and MCM will be merged into a single process



# Additional Data Processes Infrastructure and Data Portal

- **Additional process will be integrated to provide additional data derived from AEDT Flight Trajectories**
  - Sampled airport specific datasets to be used for screening modeling (TSS)
  - Generation of airport specific Tracks and Sub-tracks with associated utilization percentages for use for screening or full resolution noise modeling (GTGT)
  - FAA Noise and emissions inventory modeling
  - Screening tool reference data noise data generation
  - Data export for use in external analyses, projects, and tools
- **Access to these data and capabilities will be provided via the EVT Portal functionality**



# EVT as Visualization Tool

- **Leveraging EVT's flexible structure**

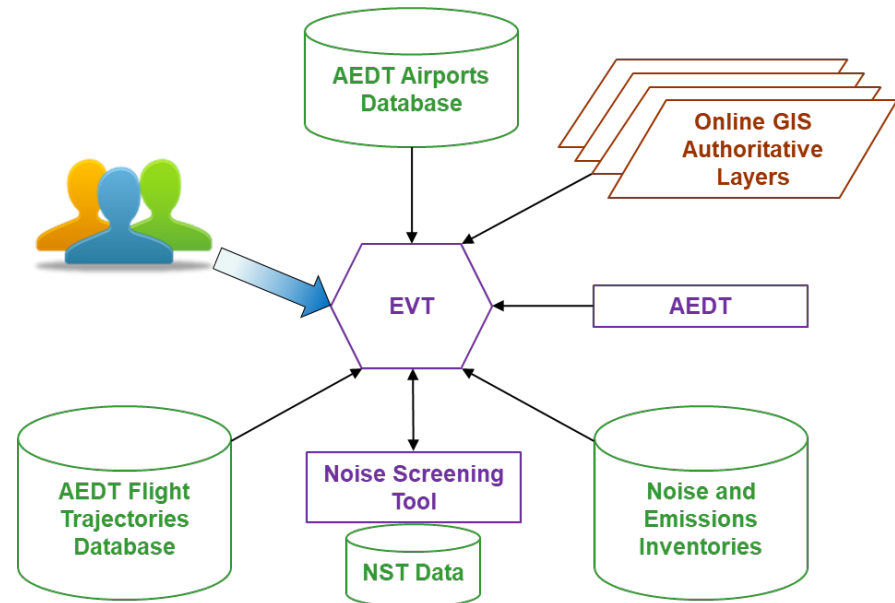
- The tool's modular approach allows to add and remove 'toolboxes' as needed and dynamically
- Implementations of operational modes will allow the tool to function in multiple capacities
- Implementation of PIV access will support controlled access to functionality and resources

- **EVT will continue to support its role as Visualization tool**

- Buy-in by users to the current functionality has been increasing with significant improvements in communication and coordination

- **Under consideration is also using EVT as the interface for the Noise screening tool currently under development**

- Implementation will also be through an additional toolbox



# Questions?

