

AEDT's framework incorporates emissions and dispersion modeling functionality from the FAA's Emissions and Dispersion Modeling System (EDMS). These models are further discussed within this section.

5.1.1. AEDT Development and Architecture

In 2012, AEDT version 2a (i.e., AEDT 2a) replaced the "legacy" regional noise analysis tool, the Noise Integrated Routing System (NIRS).¹⁷ As such, the primary purpose of AEDT 2a was to model the environmental consequences of air traffic airspace and procedure actions being designed and implemented by the FAA's Air Traffic Organization (ATO). AEDT 2a also included the capability to assess CO₂ emissions from aircraft main engines. Of note, AEDT 2a is the required model for air traffic airspace and procedure action NEPA analyses.¹⁸

AEDT version 2b will replace AEDT 2a and the legacy airport air quality and noise analysis tools - the EDMS and the Integrated Noise Model (INM). AEDT2b will then become FAA's single environmental assessment tool for air quality and noise for all projects, including but not limited to airport and airspace NEPA reviews, General Conformity determinations, Master Planning studies, and Part 150 Noise Compatibility Programs.

The AEDT user interface and underlying software architecture are distinct from that of the EDMS and INM models. AEDT is built on the Microsoft .NET Framework and is capable of running on Microsoft Windows desktop and server operating systems. It is supported by an extensive system of relational databases and an ESRI¹⁹ geospatial capability. Input data are entered into AEDT using the user interface, an XML-based AEDT Standard Input File (ASIF), and/or other EDMS/INM model import tools.

5.1.2. AEDT Usage for Air Quality Assessments

Using AEDT 2b, aviation-related emissions inventories can be computed for the EPA criteria air pollutants (e.g., CO, Pb, NO₂, O₃, PM₁₀, PM_{2.5}, and SO₂) and their precursors (e.g., NO_x and VOCs). Sources of airport emissions included in AEDT2b encompass aircraft, APUs, GSE, and an array of stationary sources (e.g., boilers, generators, etc.). For this version, the user utilizes the Motor Vehicle Emission Simulator (EPA's MOVES)²⁰ model independently of AEDT 2b to obtain the necessary data for computing motor vehicle emissions.

Dispersion modeling can also be conducted within the AEDT interface, based on the results of the emissions inventory and supplemented with meteorological data and the definition of receptor sets. Once the necessary data are inputted to AEDT, AEDT internally calls for the EPA AERMOD modeling system to perform the specified dispersion calculations. The resulting

¹⁷ FAA, *Guidance on Using AEDT 2a to Conduct Environmental Modeling for FAA Air Traffic Airspace and Procedure Actions*, March 2012, http://www.faa.gov/air_traffic/environmental_issues/media/Memo-AEE-400_GuidncMem4_UsingAEDT2a_EnviroModeling_21MAR2012.pdf.

¹⁸ 77 FR 18297 - *Air Traffic Noise, Fuel Burn, and Emissions Modeling Using the Aviation Environmental Design Tool Version 2a*, <http://www.gpo.gov/fdsys/granule/FR-2012-03-27/2012-7354/content-detail.html>.

¹⁹ ESRI's GIS (geographic information systems) mapping software enables the visualization of geographic data, <http://www.esri.com/>.

²⁰ EPA, MOVES (Motor Vehicle Emission Simulator), <http://www.epa.gov/otaq/models/moves/index.htm#generalinfo>.