FINAL AIR QUALITY ASSESSMENT TECHNICAL REPORT: CENTRAL TERMINAL AREA EXPANSION

Project no. **1690015627-019**
Recipient **Sandra Lancaster**
Date **November 8, 2023**
Prepared by **John Grant, Ramboll**
Checked by **Krish Vijayaraghavan, Ramboll**
Approved by **Megan Neiderhiser, Ramboll**

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Acronyms and Abbreviations

AAD	Average Annual Day
ACEIT	Airport Construction Emissions Inventory Tool
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
AEDT	Aviation Environmental Design Tool
AEP	Aircraft Entry Point
AFE	Above Field Elevation
AOA	Airfield Operations Area
AP-42	Compilation of Air Pollutant Emissions Factors
APM	Automated People Mover
APU	Auxiliary Power Unit
ASPM	Aviation System Performance Metrics
BHS	Baggage Handling System
CAA	Federal Clean Air Act
CAP	Criteria Air Pollutant
CATEX	Categorical Exclusion
CTA	Central Terminal Area
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_{2e}	Carbon Dioxide Equivalents
CY	Calendar Year
DCE	Diesel Construction Equipment
DFW	Dallas Fort Worth International Airport
EA	Environmental Assessment
eCUP	Electric Central Utility Plant
EIS	Environmental Impact Statement
EV	Electric Vehicle
FAA	Federal Aviation Administration
FAA Handbook	FAA Aviation Emissions and Air Quality Handbook
FY	Fiscal Year
GHG	Greenhouse Gas

GSE	Ground Support Equipment
GWP	Global Warming Potential
HAP	Hazardous Air Pollutant
LFA	Lead Federal Agency
LTO	Landing and Takeoff Operation
MOVES3	MOtor Vehicle Emission Simulator Version 3
mph	Miles per Hour
N_2O	Nitrous Oxide
NAA	No Action Alternative
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
NSR	New Source Review
Pb	Lead
PM_{10}	Particulate Matter Less Than 10 Microns in Diameter
$PM_{2.5}$	Particulate Matter Less Than 2.5 Microns in Diameter
PSL	Project Support Location
RTC	Regional Transportation Council
SADF	Spent Aircraft Deicing Fluid
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
TAF	Terminal Area Forecast
TCEQ	Texas Commission on Environmental Quality
tpy	Short Tons Per Year
TRB	Transportation Research Board
USEPA	United States Environmental Protection Agency
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound

Executive Summary

This technical report provides an assessment of the air quality impacts associated with the expansion of the Central Terminal Area (CTA) at Dallas Fort Worth International Airport (the Airport or DFW). The Proposed Action Alternative (or "Proposed Project") would construct one (1) new terminal, two (2) new terminal piers, and a new station for the automated people mover (APM) Skylink network. In addition, the Proposed Project will include the following modifications to existing infrastructure: i) the expansion of passenger support facilities at one (1) terminal; ii) upgrades to passenger and baggage screening at (1) terminal; iii) full renovation of one (1) terminal, and iv) additional requisite upgrades and modifications to aprons, parking garages, and utility underpinnings.

The Ramboll Team evaluated impacts to air quality due to the Proposed Project under the National Environmental Policy Act (NEPA) in accordance with the guidelines provided in the Federal Aviation Administration (FAA) Aviation Emissions and Air Quality Handbook Version 3 Update 1 (FAA Handbook); FAA Order 5050.4B, NEPA Implementing Instructions for Airport Actions; and FAA Order 1050.1F, Environmental Impacts: Policies and Procedures.

The Ramboll Team estimated criteria air pollutant (CAP) and greenhouse gas (GHG) emissions associated with construction and operation of the Proposed Project. Construction emission estimates for the Proposed Project were developed based on (i) activity estimates for vehicles, nonroad equipment, and project dimensions provided by DFW and based on the Airport Construction Emissions Inventory Tool (ACEIT)[1] and (ii) emission factors from the United States Environmental Protection Agency (USEPA) MOtor Vehicle Emission Simulator Version 3 (MOVES3)[2] and guidance from USEPA Compilation of Air Pollutant Emissions Factors (AP-42) chapters 11 and 13.[3] Proposed Project airside operational emission estimates were developed based on (i) aircraft, ground support equipment (GSE) and auxiliary power unit (APU) activity estimates for the Proposed Project and No Action and (ii) Aviation Environmental Design Tool (AEDT) Version 3e. Proposed Project landside operational emission estimates were developed based on (i) vehicle activity to and from the airport for the Proposed Project and No Action and (ii) emission factors from USEPA MOVES3. The methodology for GHG emissions calculations are provided in this document while the GHG emissions results and other aspects of GHGs and climate change relevant to NEPA are discussed in a separate technical report.[4]

The Ramboll Team evaluated the Proposed Project's significance with respect to air quality impacts under NEPA by comparing Project emissions to applicable USEPA *de minimis* levels established under

[1] Transportation Research Board. 2014. Airport Construction Emissions Inventory Tool. Available at: https://www.trb.org/Main/Blurbs/170234.aspx. Accessed: August 2023.

[2] US Environmental Protection Agency. 2023. Motor Vehicle Emission Simulator, Version 3 (MOVES3). Available at: https://www.epa.gov/moves/latest-version-motor-vehicle-emission-simulator-moves. Accessed: August 2023.

[3] US Environmental Protection Agency. 1995. AP-42: Compilation of Air Emissions Factors. Available at: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors. Accessed: August 2023.

[4] Ramboll, 2023. Greenhouse Gas and Climate Change Impact Assessment: Central Terminal Area Expansion Project. Dallas Fort-Worth Airport. September.

the General Conformity Rule[5]. Dallas-Fort Worth is in a Severe Ozone Nonattainment Area[6]; therefore, the Proposed Project is subject to 25 short tons per year (tpy) volatile organic compounds (VOCs) and nitrogen oxides (NO_X) *de minimis* thresholds under the General Conformity Rule, to determine compliance with the Clean Air Act (CAA) and the Texas Commission on Environmental Quality's (TCEQ) Dallas-Fort Worth Eight-Hour Ozone State Implementation Plan (SIP).

Table ES-1 shows that maximum estimated emissions from the Proposed Project exceed applicable *de minimis* thresholds under the current severe designation for the Dallas-Fort Worth Ozone Nonattainment Area for NO_X in 2024, 2025, 2026, 2027, 2028, 2031, and 2036 and for VOCs in 2031 and 2036.

Table ES-1. Proposed Project Total Emissions Compared to Applicable General Conformity De Minimis Thresholds

Project Year	Project Emissions (short tons/yr)		General Conformity De Minimis Threshold (short tons/yr)		Project Emissions less than General Conformity De Minimis Threshold?	
	NO_X	VOC	NO_X	VOC	NO_X	VOC
Severe Ozone Classification						
2024	23.6	4.1	25	25	Yes	Yes
2025	35.8	8.8	25	25	No	Yes
2026	73.1	7.3	25	25	No	Yes
2027	135.6	11.8	25	25	No	Yes
2028	211.8	18.6	25	25	No	Yes
2031	447.2	39.8	25	25	No	No
2036	942.8	80.9	25	25	No	No

[1] Source: 40 CFR 93.153(b) *de minimis* thresholds applied to Dallas-Fort Worth Nonattainment Area under the current "Severe" classification.

1. Introduction

DFW Airport is located in the Dallas-Fort Worth ozone nonattainment area. DFW is sponsoring this airport development projects with the FAA serving as the Lead Federal Agency (LFA) under NEPA. Federal actions must be evaluated under federal General Conformity rules. This technical report has been prepared to discuss the potential environmental impacts associated with the Proposed Project, expansion of the CTA. In conformance with the NEPA, this analysis identifies and assesses the impacts that would result from the Proposed Project's emission of CAPs. It also describes potential hazardous air pollutant (HAP) emissions. Emissions of GHGs are discussed in a separate technical report on GHGs and climate change.[4]

[5] 40 CFR 93 Subpart B. Available at: https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-93/subpart-B. Accessed online: August 2023.

[6] USEPA. Green Book. 2023. Texas Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Dallas-Fort Worth. Available Online: https://www3.epa.gov/airquality/greenbook/anayo_tx.html. Accessed: August 2023.

This analysis evaluates the potential air quality-related impacts of the Proposed Project, which would encompass various components aimed at enhancing and expanding the airport's facilities. DFW is proposing to construct the Proposed Project to increase total passenger gates, rehabilitate, reconstruct, and modernize aging infrastructure, and provide enhanced connectivity between existing and new terminal facilities. The Proposed Project includes the construction of a Pier at Terminal A, with a net five new gates, a Pier at Terminal C with a net four new gates, a new Terminal F, located south of Terminal D, with up to 22 new gates, baggage and passenger processing improvements at Terminal E in support of Terminal F, a service corridor connecting Terminals E and F, a full renovation of Terminal C, as well as associated airside ramp and apron improvements, including supporting utility, fuel, and drainage infrastructure. Overall, the proposed CTA Expansion Project would provide up to 31 new passenger gates at Terminals A, C, and F. The Proposed Project would also rehabilitate and modernize aging infrastructure within Terminal C. Furthermore, the Proposed Project would include the rehabilitation and reconstruction of the Terminal C parking garages and roadways; as well as the requisite modifications to the Skylink system and the construction of an automated people mover (APM) (aka Skylink) station to connect Terminals E and F.

This technical report describes the scope and methodology for evaluation of air quality impacts from construction and operational sources, where relevant. The results of these evaluations are compared to the standards of significance identified by the Federal CAA.

1.1 Overall Approach and Regulatory Setting

NEPA provides for an environmental review process to disclose the potential impacts, including air quality and climate, from a proposed federal action on the human environment. Per the USEPA, NEPA's basic policy is to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment.

The impacts to air quality due to the Proposed Project for NEPA are determined in accordance with the guidelines provided in the FAA Handbook[7]; FAA Order 5050.4B, NEPA Implementing Instructions for Airport Actions[8] and associated Environmental Desk Reference[9]; and FAA Order 1050.1F, Environmental Impacts: Policies and Procedures[10] and associated desk reference.[11] Potential air quality and climate change impacts are categories that are required to be analyzed per these orders and guidance. Climate change impacts are discussed in a separate report. [4]

[7] FAA. 2015. Aviation Emissions and Air Quality Handbook, Version 3, Update 1. Available at: https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook. Accessed: August 2023.

[8] FAA. 2006. Order 5050.4B NEPA Implementing Instructions for Airport Actions. Available at: https://www.faa.gov/airports/resources/publications/orders/environmental_5050_4. Accessed: August 2023.

[9] FAA. 2007. Environmental Desk Reference for Airport Actions. Available at: https://www.faa.gov/airports/environmental/environmental_desk_ref. Accessed: August 2023.

[10] FAA. 2015. Order 1050.1F Environmental Impacts: Policies and Procedures. Available at: https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.current/documentnumber/1050.1. Accessed: August 2023.

[11] FAA. 2023. 1050.1F Desk Reference. Available at: https://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/policy/faa_nepa_order/desk_ref. Accessed: August 2023.

FAA 1050.1F, Exhibit 4-1 defines the significance threshold for air quality as when "[t]he action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS), as established by the USEPA under the CAA, for any of the time period analyzed, or to increase the frequency or severity of any such existing violations." FAA guidance requests that air quality analysis focus on NAAQS CAPs and that a separate section should address climate.

The CAA requires adoption of NAAQS, which are periodically updated, to protect public health and welfare from the effects of air pollution. Current federal standards are set for the seven (7) CAP categories: sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone, particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and lead (Pb).[12] Specific geographic areas are classified as either Attainment, Nonattainment or Maintenance areas for each pollutant based on a comparison of measured air concentrations with the NAAQS. Nonattainment areas are those whose ambient design value concentrations for a particular CAP (and averaging time) exceed the NAAQS. Areas designated as Attainment have ambient design value concentrations below the NAAQS, and Maintenance areas are geographic areas that violated NAAQS standards in recent years but were able to return to concentrations lower than the NAAQS. Nonattainment areas are required to prepare regional air quality plans, which set forth a strategy for bringing an area into compliance with the standards. These regional air quality plans developed to meet federal requirements are included in an overall program referred to as the SIP.

The Proposed Project is located in Dallas and Tarrant counties. These two counties are in the Dallas-Forth Worth area which has been designated by the USEPA as being in nonattainment for the 2008 and 2015 ozone standards. A summary of pollutants and attainment classifications is outlined below:[13]

- *Attainment or Unclassified:* CO (1-hr, 8-hr), NO_2 (1-hr, Annual), SO_2 (1-hr, 3-hr), PM_{10} (24-hr), $PM_{2.5}$ (24-hr, Annual), and Pb (Rolling 3-month average);
- *Nonattainment:* Ozone (2008 8-hr, Severe), ozone (2015 8-hr, Moderate).

Per above, the Dallas-Fort Worth area's NAAQS nonattainment designations are limited to ozone. Ozone is not directly emitted but is formed in the atmosphere when NO_X and VOCs react in sunlight. Ozone is considered a regional pollutant because NO_X and VOC emissions throughout the air basin are involved in ozone formation. A regional photochemical model that considers emissions throughout the air basin would be required to explicitly model ozone concentrations. Instead, the potential impacts to ozone concentrations are typically based on annual or daily estimates of NO_X and VOC emissions. Air pollutant emissions from construction and any net increases in emissions associated with operation of the Proposed Project and No Action Alternative would be calculated as relevant to ozone formation and concentration.

[12] USEPA. NAAQS Table. Available at: https://www.epa.gov/criteria-air-pollutants/naaqs-table. Accessed: August 2023.

[13] USEPA. Green Book. 2023. Texas Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Dallas-Fort Worth. Available Online: https://www3.epa.gov/airquality/greenbook/anayo_tx.html. Accessed: August 2023. Available Online: https://www3.epa.gov/airquality/greenbook/anayo_tx.html. Accessed: August 2023.

1.2 Existing Conditions

DFW is located between its owner cities of Dallas and Fort Worth, Texas, with portions included in both Dallas and Tarrant counties. In 2022, it serviced over 73 million passengers to 265 destinations around the world.[14,15]

Figure 1-1 shows the general Airport location and surroundings. DFW currently encompasses 17,207 acres (approximately 27 square miles) in Dallas and Tarrant Counties, and contains five terminals (named Terminals A, B, C, D, and E), seven runways (13L/31R, 13R/31L, 17C/35C, 17L/35R, 17R/35L, 18L/36R, and 18R/36L), and 170 gates.

[14] ACI. *International travel returns: Top 10 busiest airports in the world revealed.* Published April 5, 2023. Available online at https://aci.aero/2023/04/05/international-travel-returns-top-10-busiest-airports-in-the-world-revealed/. Accessed August 2023.

[15] DFW Airport News. About DFW & Fast Facts. Available online at: https://www.dfwairport.com/business/about/facts/. Accessed August 2023.

Figure 1-1. DFW General Location

In response to forecasted growth of the airport as detailed in the Terminal Area Forecast, the Proposed Project will develop and renovate terminals, build a new Terminal F, upgrade the existing Terminal C, improve the passenger experience with improved flows, additional concession areas, and new boarding facilities, and extend the life of the facility. In addition, the Proposed Project will also provide new technology, increase security, and meet changing customer expectations.

1.3 Project Description

The Proposed Project has been designed to ensure that DFW can continue to fill a crucial role in the local and national air travel sectors and maintain both safe and efficient operations as demand grows. The Proposed Project will consist of the following key elements:

- ***Construction to increase the total passenger gates:*** The project would add two piers, one at each Terminals A and C, that would increase the total number of gates at DFW. Ten gates would be added to the new Terminal A Pier, which after gate reconfiguration, would result in a net increase of five gates. Nine gates would be added to the new Terminal C Pier, which after gate reconfiguration would result in a net increase of four gates. With the two new piers, there would be a net increase of nine gates. Development of Terminal F would add up to 22 gates, adding over 215,000 square feet of new concourse space. Traditionally, passenger and baggage processing would occur in terminal facilities; however, Terminal F baggage and passenger processing would occur within an expansion to Terminal E. The expansion of Terminal E involves the build-out of a vacant infill surface parking area within the current building footprint. Terminal F would be connected to the existing CTA via a new Skylink station.
- ***Rehabilitation and reconstruction to improve and modernize aging infrastructure***: The Proposed Project would rehabilitate, renovate, and modernize Terminal C through the demolition of the concourse level, and reconstruction through modular and traditional construction methods. Modifications would be made within the existing terminal to improve the passenger experience, including additional screening lanes and security checkpoint reconfiguration to improve passenger flows, additional concession areas, new gate lounges, and boarding facilities. Ramp level and apron work would occur to relocate baggage claim to the lower level, to renovate building support and services rooms, and airline operations rooms, as well as accommodate some utility relocation, including drainage and fueling. The Proposed Action would also include structural repairs and Americans with Disabilities Act (ADA) code modernization in Terminal C Garages, Sections A and B, along with roadway rehabilitation and replacement and utility work. The Terminal C, Section C, which is at the end of its useful life would be demolished and reconstructed within its existing lateral footprint, and would be expanded vertically to include an additional level, taking it from its existing five levels to six levels.
- ***Connectivity Between Terminal E and Future Terminal F:*** As mentioned previously, modifications to Terminal E are necessary for passenger and baggage processing for Terminal F. A new Baggage Handling System (BHS) building for outbound baggage handling would be constructed in the current in-fill surface parking lot in addition to Terminal E modifications to accommodate ticketing and passenger interactions. Terminals E and F, the BHS building, and a Terminal F Dock, which would provide for goods and services movements through an underground corridor. No changes to the Terminal E parking garage and roadway would be anticipated.

- **Ramp Area Improvements**: The Proposed Action would also include the expansion of Infield 6 to develop additional aircraft entry points (AEP), aircraft parking positions, hydrant fuel pits, (north of Skylink) and aircraft pavement areas to support aircraft operations, specifically for Terminal F.

1.4 Connected Actions

Connected actions per 40 CFR 1508.25, are actions, "… *that are closely related and therefore should be discussed in the same impact statement. Actions are connected if they: (i) automatically trigger other actions which may require environmental impact statements, (ii) cannot or will not proceed unless other actions are taken previously or simultaneously, or (iii) are interdependent parts of a larger action and depend on the larger action for their justification.*" DFW has looked at other actions that occur simultaneously as supporting actions to the Proposed Action or would occur near the Proposed Action, either before or immediately after. These connected actions include.

- Project support locations (PSL) including proposed staging areas and pre-fabrication yards for modular building components for Proposed Project element construction.
- Utility infrastructure developments, including the Utility and Baggage Transfer Tunnel supporting Terminals E and F, and utility mains for Terminal F,
- Demolition of the Terminal E In-Fill Surface Parking lot and regrading for new Terminal E support facilities which are included within the Proposed Action,
- Demolition of the South Express Parking lot (east of existing Skylink facilities) and then site stabilization for future development opportunities,

Air emissions of CAPs and GHGs from construction of the above-listed project elements were analyzed for the anticipated construction years of 2024 to 2028. Similarly, operational emissions of criteria pollutants and GHGs that are projected to result from the Proposed Project were analyzed for three years: 2026 (implementation year), 2031 (project implementation plus 5 years), and 2036 (project implementation plus 10 years). Net operational emissions were evaluated by comparison of the Proposed Project and the No Action Alternative. The No Action Alternative is the forecasted operational scenario that would exist without the proposed modifications. Proposed Project construction and operational emissions estimation methodology is described in **Section 2.4.1** and **Section 2.4.2**, and construction and operational emissions are presented in **Section 4.1** and **Section 4.2** of this technical report.

1.5 Project Design Features

DFW is an industry leader in sustainability and climate action; a commitment that has garnered international recognition, most notably in 2016 when DFW became the first airport in North America (and the largest airport in the world) to achieve carbon neutrality.[16] In keeping with a well-defined culture of holistic, sustainable practices, DFW has established key policies that guide both current and future

[16] Airports Council International article: DFW Named First North American Airport to Achieve Carbon Neutral Certification, August 4, 2016. Available online at: https://airportscouncil.org/press_release/dfw-named-first-north-american-airport-to-achieve-carbon-neutral-certification/. Accessed: August 2023.

operations. DFW's Clean Air policy[17] (effective 8/1/2020) describes measures which are either already in place or will be implemented at the Airport in the near future. Measures from the Clean Air Policy that will benefit DFW area air quality are listed below. DFW policies and measures towards sustainability and climate action are also discussed in detail in the GHG and climate change analysis report.[4]

- 3.2.1 Ensure compliance by meeting or exceeding all applicable air quality laws, regulations, and Texas SIP requirements.
- 3.2.2 Achieve and maintain carbon neutrality certification on a pathway to net zero carbon emissions by 2030 in accordance with Level 4+ Airport Carbon Accreditation Program requirements.
- 3.2.3 Identify future air quality requirements and initiate procedures to meet or exceed them.
- 3.2.4 Incorporate energy efficiency and carbon emissions reduction priorities into the strategic plan.
- 3.2.5 Require use of 100 percent renewable energy in electricity supplied to the Board.
- 3.2.6 Develop and utilize innovative strategies in expanding the Board's current commitments to improve air quality.
- 3.2.7 Establish, track and analyze metrics to monitor air quality performance, and to set goals for continuous improvement.
- 3.2.8 Actively engage with tenants and other business partners to improve energy performance, optimize operational efficiency, and reduce emissions through their own reduction plans or through measures initiated by the airport.
- 3.2.9 Maintain a Clean Fleet Standard Operating Procedure (SOP) that prioritizes zero emission vehicle and equipment purchases for fleet operations in accordance with the Regional Transportation Council's (RTC) Clean Fleet Policy.
- 3.2.10 Actively promote the transition to electric vehicles (EVs) through the provision of required infrastructure, incentives, and partnerships.
- 3.2.11 Discourage vehicle idling in order to support regional efforts to improve air quality.
- 3.2.12 Continue to integrate energy efficiency into its facilities, systems, processes, and operations and ensure the best available technologies are utilized.
- 3.2.13 Partner with agencies, academia, nongovernmental organizations, business associations, and other interested stakeholders to develop effective and sustainable solutions to local air quality challenges.

[17] DFW. 2020. Clean Air policy. Available at: https://www.dfwairport.com/business/community/sustainability/. Accessed: August 2023.

2. Methodology

The steps performed under this air quality analysis are consistent with the FAA Handbook as follows: (1) Determine the need for the assessment; (2) Select the assessment methodology; and (3) Conduct the assessment and assess the Proposed Project's impact relative to the numeric thresholds.

2.1 Need for Assessment

The FAA Handbook establishes the following steps to determine when an air quality assessment is required and the type of assessment that may be needed.

1. Determine the project definition, described in **Section 1.3**.
2. Determine whether FAA involvement is associated with the project. In this case, DFW has already been in discussions with the FAA regarding this project. In this step, the Proposed project has been confirmed not to fall under a categorical exclusion (CATEX), so an environmental assessment (EA) will be developed.
3. Determine if the project will cause or create a reasonably foreseeable increase in air emissions; as described further below, construction and operations of this project may cause an increase in air emissions.
4. Establish the attainment/nonattainment status for the project area and identify pollutants for which the area is designated a nonattainment/maintenance area, described in **Section 1.1**.
5. Evaluate agency/public scoping comments concerning air quality. This step is only a requirement when preparing an EIS and is not addressed explicitly in this report.

Based on the results of Steps 1 through 4 above, an air quality assessment has been conducted as described below.

2.2 Assessment Methodology

The FAA Handbook describes several different potential assessment methodologies that can be pursued when an air quality assessment is needed. Figure 4-5 of the FAA Handbook provides examples that show which methodologies are appropriate, potentially appropriate, or unnecessary for various project action categories.

The potential methodologies for the Air Quality Assessment are summarized below. The construction emissions inventory for the Proposed Project is described as "appropriate" and all other methodologies as "potentially appropriate." The decision to evaluate the "potentially appropriate" methodologies was assessed using Project-specific information. Selected analysis methods and analysis methods that were evaluated but not selected are summarized below.

Selected Analysis Methods

- Construction Emissions Inventory: A construction emissions inventory is designed to quantify the mass of CAP emissions and precursors associated with construction activity in a proposed action. This is described in Sections 2.3.1 and 2.4.1 below.
- Operational Emissions Inventory: An operational emissions inventory is designed to quantify the mass of CAP emissions and precursors associated with operational activity in a proposed action. This is described in Sections 2.3.2 and 2.4.2 below.
- GHG Emissions Inventory: A GHG emissions inventory is designed to quantify the mass of GHG emissions associated with a proposed action. Project GHG emissions are quantified for both construction and operations. As noted above, the GHG emissions methodology is provided in this report while results and climate change impacts are discussed separately.[4]

Analysis Methods that were not Selected

- Qualitative Assessment: When it has been determined that the project will not cause or create a reasonably foreseeable increase in air emissions, a qualitative assessment of air quality impacts is likely all that is necessary. This assessment should contain an explanation of the conditions and rationale upon which this finding is based. This is not necessary given that a quantitative analysis of construction and operational emissions has been performed as described above.
- Atmospheric Dispersion Modeling: Dispersion modeling is used to further refine the results of the operational and construction emissions inventory by distributing the emissions across a project area both spatially and temporally based on the operational and physical characteristics of the emission source(s) combined with meteorological and local terrain data. This is not necessary for this project given the nonattainment pollutant of interest, ozone, is assessed indirectly through a quantitative analysis of its precursor emissions, i.e., NOx and VOC.
- Roadway “Hot-Spot” Analysis: Hot-spot modeling is designed to assess the effects of motor vehicle traffic emissions on local air quality conditions. This is not applicable to the Proposed project given that it will not result in large increases in vehicle traffic.
- HAPs Emissions Inventory: A HAPs inventory is designed to quantify the mass of HAP emissions associated with operational activity in a proposed action. This is not performed as part of this project because operational HAP emission increases are expected to be small.

2.3 Scenarios Evaluated

2.3.1 Construction Scenarios Evaluated

The Ramboll Team evaluated CAP and GHG emissions associated with construction of the Proposed Project, which would consist of the various elements summarized in **Section 1.3** above. Construction activities would take place between 2024 and 2028. Emissions during construction depend on the activity levels of heavy-duty nonroad equipment, haul truck trips, and vehicle trips made by construction workers and vendors traveling to and from the Proposed Project site.

The annual construction schedule for the CTA Expansion Project is summarized in **Table 2-1**.

Table 2-1. CTA Expansion Project Schedule

Activity Description	Start Date	End Date
Batch Plant	2024	2028
Good/Services Dock	2024	2026
Terminal A	2024	2027
Terminal C	2024	2028
Terminal C Garage	2024	2028
Terminal E	2024	2026
Terminal F	2024	2026
Tunnels	2024	2025

2.3.2 Operational Scenarios Evaluated

The Proposed Project would result in operational emission increases from two primary sources: 1) aircraft: the terminal upgrades will facilitate increased aircraft traffic and associated ground support equipment use; and 2) on road vehicles: the enhanced availability of flights will result in more on road vehicle traffic as passengers travel to, from, and within the airport. The Ramboll Team evaluated incremental operational emission increases that are estimated to occur as a result of the Proposed Project.

2.4 Emission Inventory Development

This section describes the methodology that the Ramboll Team used to develop construction and operational emissions inventories for the Proposed Project and No Action Alternative. This analysis evaluates CAPs and GHGs. Disclosure of HAPs is recommended for operational emissions but not for construction. Operational HAPs emissions are not considered as noted above. For this analysis, the following pollutants were considered:

- Ozone precursors: VOCs and NO_X
- CAPs: CO, SO_2, PM_{10}, and $PM_{2.5}$
- GHGs: CO_2 (carbon dioxide), CH_4 (methane), N_2O (nitrous oxide); total GHG emissions are reported as CO_2e (carbon dioxide equivalents)

Because ozone is a secondary pollutant (i.e., it is not directly emitted but is formed in the atmosphere), emissions of VOCs and NO_X, which react in the presence of sunlight to form ozone, were used to assess potential impacts on ozone levels.

CO_2e emissions were estimated based on 20-year global warming potential (GWP) estimates for CH_4 (82.5) and N_2O (273)[18], conservatively, as 20-year GWPs will result in higher CO_2e estimates compared to 100-year GWP estimates.

To estimate emissions from the Proposed Project, the Ramboll Team directly or indirectly relied primarily on emissions estimation guidance from government-sponsored organizations, project specific studies (e.g., design documents), and emission estimation software.

2.4.1 Construction Emissions Inventory

This section provides a description of the methodology for estimating emissions from Proposed Project construction. The primary sources of construction-related emissions are nonroad construction equipment and on road vehicles (including construction-related truck trips, vendor vehicles, and employee commute vehicles). Emissions associated with each of these activities during all phases of construction were estimated.

To determine project-related air emissions, DFW relied on emissions estimation guidance and models from government agencies such as the USEPA and project-specific activities. Construction emission estimation methodology is discussed in the following subsections.

2.4.1.1 On road Vehicles

Proposed Project on road vehicle activity estimates were provided by Landrum & Brown[20] (trip counts and miles per trip by year and purpose). On road vehicle activity during project construction was estimated based on ACEIT with adjustments to reflect project specific considerations. ACEIT generates on road vehicle activity based on high-level project inputs such as project capital costs and project size by phase. ACEIT on road vehicle activity is differentiated according to trip purpose (e.g., material delivery, employee commute). Heavy duty vehicle activities (e.g., material delivery) were associated with diesel-fueled, combination short haul trucks and employee commutes were associated with gasoline-fueled passenger cars.

Emission factors were estimated based on MOVES3 model output. A MOVES3 run was conducted for Dallas County[19] at the national scale for calendar years 2024 through 2028. Emissions and activity were exported from MOVES3 by vehicle type, fuel type, urban road type, and process for each applicable calendar year. Emissions were aggregated over six emission process types to facilitate application to activity for development of Proposed Project emissions. **Table 2-2** lists MOVES3 emission process types, aggregate groupings, road type and activity surrogates. Emission factors were estimated by aggregate grouping by dividing MOVES3 output emissions by MOVES3 output activity.

[18] Intergovernmental Panel on Climate Change (IPCC), 2021. AR6 Synthesis Report: Climate Change 2021. Available at: https://www.ipcc.ch/assessment-report/ar6/. Accessed: August 2023.

[19] DFW is located in Dallas and Tarrant counties. In the case where the project spans multiple counties, the county of the greatest populace should be used based on the ACRP Report 102 guidance. Dallas County population is greater than Tarrant County; therefore, MOVES3 was run for Dallas County.

Table 2-2. MOVES Process Grouping and Activity Surrogates

MOVES3 Emission Process[8]	Aggregate Grouping	Road Type[9]	Activity Surrogate	
			Description	Metric
Crankcase Running Exhaust	RPD [2]	Urban Unrestricted Access	Distance	Miles
Running Exhaust	RPD [2]	Urban Unrestricted Access	Distance	Miles
Brake Wear	RPD_WEAR [3]	Urban Unrestricted Access	Distance	Miles
Tire Wear	RPD_WEAR [3]	Urban Unrestricted Access	Distance	Miles
Evaporation Fuel Leaks	RPD_EVAP [4]	Urban Unrestricted Access	Distance	Miles
Evaporation Fuel Vapor Venting	RPD_EVAP [4]	Urban Unrestricted Access	Distance	Miles
Evaporation Permeation	RPD_EVAP [4]	Urban Unrestricted Access	Distance	Miles
Crankcase Start Exhaust	RPV_START [5]	Off-Network	Starts	One-Way Trips[1]
Start Exhaust	RPV_START [5]	Off-Network	Starts	One-Way Trips[1]
Evaporation Fuel Vapor Venting	DIURNAL [6]	Off-Network	Vehicle Population	Vehicle-days
Evaporation Fuel Leaks	RPV_EVAP [7]	Off-Network	Vehicle Population	Vehicle-days
Evaporation Permeation	RPV_EVAP [7]	Off-Network	Vehicle Population	Vehicle-days

[1] For onroad emission factors, one-way trips are assumed equal to number of starts
[2] RPD: rate per distance for exhaust processes
[3] RPD_WEAR: rate per distance for brake wear and tire wear processes
[4] RPD_EVAP: rate per distance for evaporative processes
[5] RPV_START: rate per vehicle for start processes
[6] DIURNAL: (rate per vehicle for) diurnal processes
[7] RPV_EVAP: rate per vehicle for evaporative processes
[8] For onroad emission processes engineering judgement was used to aggregate MOVES processes into emission groups listed above
[9] DFW assumes all onroad activity will occur on urban unrestricted access roads, all off road activity is assumed to occur off-network

Urban Unrestricted Access was assumed to be the representative road type to calculate RPD, RPD_Wear, and RPD_Evap emission factors. Off-Network was assumed to be the representative road type to calculate RPV_Start, RPV_Evap, and DIURNAL emission factors. All rate per distance emission factors were calculated in grams per mile; all start exhaust emission factors were calculated in grams per one-way trip, and all off-network evaporative process emission factors were calculated in grams per vehicle-day. Emissions were then estimated as the product of applicable Proposed Project annual activity and MOVES3-based emission factors according to the equation below.

$$E_i = \text{Activity} \times EF_i / 907185$$

where:

E_i = Emissions of pollutant *i* (short tons per year)

Activity = applicable annual activity (i.e., miles per year, starts per year, or number of vehicles per year)

EF_i = emission factor of pollutant *i* (grams per activity)

907185 = unit conversion from grams to short tons (grams per short ton)

Detailed tables describing Proposed Project onroad vehicle data used (i.e., vehicle activity, vehicle emission factors, and vehicle emissions) to estimate emissions are provided in **Appendix A**.

2.4.1.2 Construction Equipment

Proposed Project construction equipment activity estimates were provided by Landrum & Brown[20] (annual operating hours and rated horsepower by equipment type). Construction equipment activity was estimated based on ACEIT with adjustments to reflect project specific considerations. ACEIT generates construction equipment activity based on high-level project inputs such as project capital costs and project size by phase. ACEIT construction equipment activity is differentiated by equipment type and is assumed to be carried out by a predominantly diesel-fueled equipment fleet. Equipment types primarily included in Proposed Project construction are listed below:

- Backhoes
- Cranes
- Excavators
- Forklifts
- Fuel and Dump Trucks
- Loaders
- Off-Highway Truck
- Pavers
- Rollers

Construction equipment emissions were estimated by the following formula:

$$E_i = N \times HP \times LF \times Activity \times EF_i / 907185$$

where:

E_i = Emissions of pollutant *i* (short tons per year)

N = number of units (pieces of equipment)

HP = average rated horsepower (horsepower)

LF = equipment load factor (unitless)

Activity = activity (hours per year)

EF_i = emission factor of pollutant *i* (grams per brake horsepower-hour)

907185 = unit conversion from grams to short tons (grams per short ton)

The number of units and average rated horsepower for applicable equipment were based on Proposed Project equipment activity rosters. Equipment load factors and emission factors were based on TexN2.2 model estimates for applicable equipment types and calendar years[21]. TexN2.2 was run for Dallas

[20] Email from Landrum & Brown (Jesse Baker) to John Grant (Ramboll). June 7, 2023.

[21] Eastern Research Group. (ERG). 2021. TexN2.2 Utility Updates for Compatibility with the USEPA MOES3 Model. 23 April. https://www.tceq.texas.gov/downloads/air-quality/research/reports/emissions-inventory/5822111300fy2021-20210423-erg-texn2-update.pdf. Retrieved 17 February 2023.

County for applicable calendar years. Emission and activity data were output from TexN2.2 for nonroad equipment by equipment type, fuel type, and horsepower bin by construction equipment sector (i.e., non-diesel construction equipment (non-DCE), commercial construction, boring and drilling equipment, trenchers, transportation/sales/services, skid steer loaders, and miscellaneous diesel equipment plus all equipment less than 25 hp) for each calendar year. Emission factors were estimated for each equipment type and fuel type by dividing TexN2.2 output emissions by TexN2.2 estimated energy consumption in horsepower-hours. TexN2.2 does not estimate N_2O emissions; therefore, the nonroad N_2O emission factor was taken from the USEPA Inventory of U.S. Greenhouse Gas Emissions and Sinks[22].

Nonroad equipment activity for this project includes off-highway truck activities that are expected to be carried out by on road vehicles (e.g., pickup truck, dump truck, and tractor trailer). With DFW concurrence, the Ramboll Team determined that some off-highway trucks should be reclassified to on road vehicles. The Ramboll Team estimated grams per hour emission factors for these on road vehicles based on a MOVES3 run for Dallas County, Texas as the ratio of MOVES3 (i) emissions outputs across aggregate road types, aggregate fuel types, and process types to (ii) source hour operating activity outputs.

Detailed tables describing Proposed Project construction equipment activity and emission factors are provided in **Appendix B**. Detailed tables describing Proposed Project reclassified nonroad equipment activity and emission factors are provided in **Appendix C**.

2.4.1.3 Fugitive Emissions

Proposed Project fugitive emission inputs for all fugitive source types were obtained from ACEIT and provided by Landrum & Brown[23]. ACEIT applies USEPA AP-42 guidance document methodology to estimate fugitive emissions. The Ramboll Team reviewed ACEIT emission estimation methodology, emission factors and ancillary factors and made project-specific adjustments to develop fugitive emissions as described in **Table 2-3.** The ratio of $PM_{2.5}$ to PM_{10} emissions for fugitive emissions is provided in **Table 2-4** by construction activity.

22 US Environmental Protection Agency. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018, Annex A. Available at https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks. Accessed: August 2023.

23 Email from Landrum & Brown (Jesse Baker) to John Grant (Ramboll). June 7, 2023.

Table 2-3. Fugitive Emissions Estimation Methodology and Project-Specific Adjustments

Fugitive Source	Methodology	Project-specific Input Adjustments
Concrete Mixing/Batching	AP-42 11.12	Emission inputs unchanged from ACEIT output.
Soil Handling	AP-42 13.2.4	Emission inputs unchanged from ACEIT output.
Unstabilized Land and Wind Erosion	AP-42 11.9	Emission inputs unchanged from ACEIT output
Asphalt Drying	FAA Handbook Version 3 Update 1 emission rate per unit area	Emission inputs unchanged from ACEIT output
Asphalt Storage and Batching	Mobile emission estimates are included; stationary source emissions are covered under TCEQ permits and are therefore not included herein.	Not estimated (assumed to occur offsite)
Material Movement (Paved Roads)	AP-42 13.2.1	ACEIT default vehicle miles traveled (VMT) scaled to Proposed Project square footage for building and site work project types.
Material Movement (Unpaved Roads)	AP-42 13.2.2	ACEIT default VMT scaled to Proposed Project square footage for building and site work project types.

Table 2-4. Fugitives $PM_{2.5}$ to PM_{10} Emission Ratios

Construction Activity	$PM_{2.5}/PM_{10}$	Source
Asphalt Drying	-	No PM Emissions
Asphalt Storage and Batching	0.06	AP-42 11.1-2
Concrete Mixing/Batching	0.15	AP-42 11.12
Material Movement (Paved Roads)	0.25	AP-42 13.2.1-1
Material Movement (Unpaved Roads)	0.1	AP-42 13.2.2-2
Soil Handling	0.15	AP-42 13.2.4
Unstabilized Land and Wind Erosion	0.15	AP-42 13.2.5

A complete list of fugitive inputs and emissions by project type and construction activity is provided in **Appendix D**.

2.4.2 Operational Emissions Inventory

This section provides a description of the proposed methodology for estimating emissions from project operation. The sources of operation-related emissions include ground access vehicles and aircraft and associated airport GSE and APUs. Emissions resulting from the operational activities under the Proposed Action and the No Action Alternatives were estimated.

2.4.2.1 Ground Access Vehicles

The Proposed Project will result in increased vehicle traffic; therefore, an air quality evaluation of operational phase vehicle emissions is required. Operational phase on road vehicle activity were estimated based on DFW-provided Traffic Study documentation[24], including ground access vehicle activity estimates for existing conditions, future No Action, and future Proposed Action.

Emission factors were estimated based on MOVES3 model output. DFW Airport is in both Tarrant and Dallas Counties. In the case where a project site is located in more than one county, the county with the greatest population should be used for emission factor development (Airport Cooperative Research Program [ACRP] Report 102). According to the most recent population figures, Dallas County population is greater than Tarrant County. Therefore, MOVES3 was run for Dallas County[25] at the national scale for calendar years of interest. Emissions and activity were exported from MOVES3 by vehicle type, aggregate fuel type, aggregate road type, and process for each applicable calendar year. Emission factors were calculated for the emission processes shown in **Table 2-5**.

Table 2-5. MOVES3 Emissions Process

MOVES3 Emission Process	Activity Surrogate	
	Description	Metric
Crankcase Running Exhaust	Distance	Miles
Running Exhaust	Distance	Miles
Brake Wear	Distance	Miles
Tire Wear	Distance	Miles
Evaporation Fuel Leaks	Distance	Miles
Evaporation Fuel Vapor Venting	Distance	Miles
Evaporation Permeation	Distance	Miles
Crankcase Start Exhaust	Starts	Vehicles
Start Exhaust	Starts	Vehicle
Crankcase Extended Idle Exhaust	Vehicle Population	Vehicle-days

24 DFW. 2023. "DFW Traffic Impact Memo: Potential Traffic Impacts Resulting from CTA Development", March 27, 2023.

25 DFW is located in Dallas and Tarrant counties. In the case where the project spans multiple counties, the county of the greatest populace should be used based on the ACRP Report 102 guidance. Dallas County population is greater than Tarrant County, therefore MOVES were run for Dallas County.

MOVES3 Emission Process	Activity Surrogate	
	Description	Metric
Extended Idle Exhaust	Vehicle Population	Vehicle-days
Evaporation Fuel Vapor Venting	Vehicle Population	Vehicle-days
Evaporation Fuel Leaks	Vehicle Population	Vehicle-days
Evaporation Permeation	Vehicle Population	Vehicle-days
Refueling Spillage Loss	Vehicle Population	Vehicle-days
Refueling Displacement Vapor Loss	Vehicle Population	Vehicle-days

Default road type assumptions were used to calculate the emission factors. All rate per distance emission factors were calculated in grams per mile; all start exhaust emission factors were calculated in grams per one-way trip, and all off-network evaporative process emission factors were calculated in grams per vehicle-day. Emissions were estimated as the product of applicable Project annual activity and MOVES3-based emission factors.

A complete list of operational traffic activity inputs, emission factors, and emissions by project type and construction activity is provided in **Appendix E**.

2.4.2.2 Aircraft

This section provides the description of aircraft operations at DFW used for the development of existing and future emission inventories. The modeled operational data for the Existing Condition and Future Alternatives is based on the Fiscal year (FY) and then adjusted to reflect the calendar year as required for reporting. The operational emissions data was prepared using existing and forecast operational data for DFW and AEDT Version 3e in compliance with FAA Order 1050.1F and FAA Order 5050.4B. Aircraft operational emissions estimated for this analysis include CAP emissions below the AEDT default 3,000 feet mixing height and GHG emissions below 10,000 feet for departures and 6,000 feet for arrivals and include:

- Start up
- Taxi Out
- Climb below the mixing height
- Descend below the mixing height
- Taxi In
- GSE for landing and takeoff
- APUs

2.4.2.2.1 Aviation Environmental Design Tool

For an action occurring on, or in the vicinity of a single airport, or as part of an air traffic action, the FAA directs the use of the latest version of the AEDT for aircraft emissions inventories and evaluations. The aircraft emissions analysis for the Environmental Assessment (EA) uses AEDT Version 3e (released 9 May 2022).

All AEDT modeling conducted for this study adheres to Guidance on Using the Aviation Environmental Design Tool (AEDT) to Conduct Environmental Modeling for FAA Actions Subject to NEPA.[26] AEDT is a combined noise and emission model that uses a database of aircraft noise and performance characteristics. AEDT calculates air pollutant emissions from aircraft engines for air quality analyses, enables air quality calculations on a regional basis (as opposed to in the immediate airport environment only), and includes updated databases for newer aircraft models. The model also computes emissions from GSE associated with the aircraft movements.

The primary data input categories for the AEDT include the following:

- Airfield layout, which includes the coordinates of each runway centerline endpoint, runway widths, approach threshold crossing heights, and runway end elevations.
- Meteorological data, which refers to weather conditions affecting sound propagation and aircraft performance. AEDT's database of airports was accessed to obtain annual average daily DFW weather conditions. AEDT's airport database contains 10-year average meteorological data (from 2012 to 2021), which AEDT uses to adjust aircraft performance and sound propagation parameters from standard day conditions.
    - Temperature: 66.72° F
    - Station Pressure: 994.68 mbar
    - Sea Level Pressure: 1015.75 mbar
    - Dew point: 52.88° F
    - Relative humidity: 61.15%
    - Wind Speed: 9.31 knots
- Specific aircraft types in DFW's fleet mix, defined by airframe and engine type combinations. All aircraft types evaluated for the DFW modeling are either in the AEDT database or have approved substitutions within the model.
- Aircraft flight operations, which are numbers of Average Annual Day (AAD) aircraft operations by day-night average sound level (DNL) time periods and by aircraft type. Daytime is defined as 7:00 a.m. to 9:59 p.m., and nighttime is defined as 10:00 p.m. to 6:59 a.m. Departures and arrivals were the two types of flight operations modeled for the EA. Touch-and-go or circuit operations are not conducted at DFW.
- Aircraft noise and performance characteristics. The AEDT database contains noise and performance data for more than 300 different aircraft types. AEDT accesses the noise and performance data for takeoff, landing, and pattern operations by those aircraft. The database provides single-event noise levels for slant distances from 200 feet to 25,000 feet for several thrust or power settings for each aircraft type. Performance data includes thrust, speed, and altitude profiles for takeoffs and landings. For those aircraft types operating at DFW which are not directly represented in the AEDT database, the AEDT contains FAA-approved substitutions for noise modeling.
- Stage length, which is a surrogate for an aircraft's weight that varies according to its fuel load. Stage length is assigned according to each departure's trip distance to its destination, using

[26] https://aedt.faa.gov/Documents/guidance_aedt_nepa.pdf

city-pair information provided in the operations forecast. The assigned stage length then determines the appropriate flight performance profile from the AEDT database.

- Flight profiles, which are based on standard flight procedures for each aircraft type contained in the AEDT database. Information in the flight profiles describe the sequence of altitudes, thrust/power settings, and airspeeds for departure and arrival operations.
- Runway use, which is the allocation of flight operations to each runway, on an AAD basis, by DNL time periods, operation type, and aircraft type.
- Taxi Times, which define the average amount of time aircraft travel to or from the gate, travel across the taxiway system to or from the runway. These times also include the average amount of time aircraft wait for a departure or to arrive at a gate.
- Flight tracks and their usage. A flight track is the two-dimensional projection of the aircraft's three-dimensional flight path onto the ground. A modeled flight track represents one or more actual flight tracks. Modeled flight tracks for a given flight corridor typically consist of a backbone track and sub-tracks which represent the average location and dispersion of the actual flights in the corridor. Each backbone flight track typically represents a general heading for departures or originating point for arrivals. As each runway usually has multiple headings and originating points, the distribution of operations, or track use, on an AAD basis, must be specified. Operations are further spread on backbone tracks and sub-tracks via distribution percentages on an AAD basis.
- GSE, which supports each arrival and departure operation. The AEDT contains a database of GSE, fuel types, time in use, etc. AEDT default GSE equipment was used for all of the non-project specific aircraft operations.
- APUs are smaller engines that many aircraft have, which are used when the aircraft are parked at the gate. The AEDT contains a database of these engines, and the default operating times (26 minutes) were used for each landing-takeoff operation (LTO).

2.4.2.2.2 Existing Conditions

2.4.2.2.2.1 Existing Operations

The existing aircraft emission inventory for DFW was evaluated based upon the Existing Condition aircraft operations and the associated airport operational characteristics. FY 2022, a 12-month period spanning October 1, 2021, through September 30, 2022, was identified as the baseline year and source of data to develop the Existing Condition dataset. Emissions were subsequently estimated for calendar year 2022.

Radar data from DFW Noise and Operations Monitoring System (NOMS) and the FAA's Operational Network (OPSNET) operational data for FY 2022 were used to determine the Existing Condition. The radar data provided the aircraft fleet mix and runway use. The fleet mix developed from the DFW NOMS data was grouped into FAA operational categories (Air Carrier, Air Taxi, and General Aviation), and the totals were scaled to match the tower count for that period. During the Existing Condition period, 663,426 annual operations occurred at DFW. Due to the low numbers of military aircraft and the absence of dominant military aircraft types, the military operations were distributed into the Air Carrier and General

Aviation categories based on an analysis of the sizes of military aircraft reported by the FAA's Traffic Flow Management System Counts (TFMSC) for the same period. **Table 2-6** presents the annual operations modeled in the AEDT for the Existing Condition, as well as the FAA OPSNET operations for comparison. **Table 2-7** provides the average daily operations, by aircraft type, that were used in AEDT for the Existing Conditions. The average daily number of aircraft arrivals and departures for the Existing Condition Noise Contour are calculated by determining the total annual operations and dividing by 365 (days in a year).

Table 2-6. Existing Condition Operations

Category	Air Carrier	Air Taxi	General Aviation	Military	Total
FAA OPSNET (FY 2022)	585,862	71,205	6,189	170	663,426
Existing Condition (FY 2022)	585,963	71,205	6,258	0	663,426

Notes: Military data was split between Air Carrier and General Aviation.
Totals may not match exactly due to rounding.

Source: FAA OPSNET, Data prepared by HMMH

Table 2-7. DFW Modeled AAD Aircraft Operations for the Existing Condition (FY2022)

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total
			Day	Night	Total	Day	Night	Total	
Air Carrier	Jet	737700	13	<1	14	10	4	14	28
		737800*	161	10	171	162	9	171	342
		7378MAX	3	<1	3	3	<1	3	6
		747400	2	1	3	2	1	3	6
		747400RN	<1	<1	<1	<1	<1	<1	<1
		7478	1	<1	2	1	<1	2	3
		757PW	<1	2	3	<1	2	3	5
		757RR	<1	3	4	<1	3	4	8
		7673ER	5	2	8	5	3	8	15
		777200	5	2	7	7	<1	7	14
		777300	3	1	4	2	2	4	8
		7773ER	4	<1	4	3	<1	4	8
		7878R	3	<1	4	3	<1	3	7
		7879	11	2	13	13	<1	13	26
		A300-622R	2	2	4	1	3	4	8
		A319-131	82	3	84	80	4	84	168
		A320-211	13	2	15	13	2	15	30
		A320-232	23	5	28	23	5	28	55
		A320-271N	11	3	14	12	2	14	27
		A321-232	160	18	178	163	15	178	356
		A350-941	<1	0	<1	<1	<1	<1	2
		A380-841	1	0	1	1	0	1	2
		DC1010	<1	<1	<1	<1	<1	<1	<1

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total
			Day	Night	Total	Day	Night	Total	
		MD11GE	1	<1	2	1	<1	2	4
		MD11PW	2	<1	2	2	<1	2	5
	Regional Jet	CRJ9-ER	126	5	131	123	8	131	263
		EMB170	90	3	93	85	8	93	186
		EMB175	9	<1	10	9	<1	10	20
	Subtotal		**733**	**70**	**803**	**727**	**76**	**803**	**1,605**
Air Taxi	**Jet**	CNA680	<1	<1	<1	<1	<1	<1	2
		EMB14L	89	3	92	88	4	92	184
	Non-jet	1900D	1	<1	1	<1	<1	1	2
		CNA208	2	<1	2	2	<1	2	5
		DHC6	1	<1	1	<1	<1	1	3
	Subtotal		**93**	**4**	**98**	**92**	**6**	**98**	**195**
General Aviation	**Jet**	CL600	<1	<1	<1	<1	<1	<1	<1
		CNA525C	<1	<1	<1	<1	<1	<1	<1
		CNA55B	<1	<1	<1	<1	<1	<1	<1
		CNA560XL	<1	<1	<1	<1	<1	<1	<1
		G650ER	<1	0	<1	<1	0	<1	<1
		GIV	<1	<1	<1	<1	<1	<1	<1
		GV	<1	0	<1	<1	<1	<1	<1
		LEAR35	<1	<1	<1	<1	<1	<1	<1
	Non-jet	CNA208	6	<1	6	6	<1	6	12
	Subtotal		**8**	**<1**	**9**	**8**	**<1**	**9**	**17**
Grand Total			**835**	**74**	**909**	**827**	**82**	**909**	**1,818**

Notes: Totals may not match exactly due to rounding.
*ANP Type 737800 represents both B738 and B739 operations, which account for 97 percent and 3 percent, respectively.
*AAD refers to Average Annual Day

Source: DFW NOMS, Data prepared by HMMH

2.4.2.2.2.2 Runway Utilization

DFW has two main runway complexes, the east side and west side, that have seven runways, four to the east and three to the west. Aircraft typically arrive on the outermost main north/south runways as well as some of the outboards and typically depart on the innermost runways main north/south runways (inboards). DFW typically uses its north/south runways for most arrivals and departures. Historic data shows that DFW is operated in one of two main operating configurations: south flow (departing to the south and arriving from the north) approximately 70 percent and north flow (departing to the north and arriving from the south) approximately 30 percent. Aircraft normally take off and land into the wind. However, runway end utilization can also be affected by aircraft type, type of activity, and if applicable any airport runway use plans.

FY 2022 runway utilization data was used to represent the Existing Condition. The 2022 usage was normalized to the historical north flow (30 percent), south flow (70 percent) split. **Table 2-8** summarizes the percentage developed from the DFW NOMS radar data that each runway was used for departures and arrivals. This data was used to model the Existing Condition and generate the Existing Conditions Noise Contour. For the runway use assignment, the outboard runways (Runways 17L/35R, 13R/31L and

13L/31R) were open until 11.00 p.m. The runway percentage use for day and night includes the assumption that the outboard runways (Runway 17L/35R, 13L/31R and 13R/31L) are not typically used after 10 p.m. or before 6 a.m. Nighttime operations runway utilization includes the predominant use of the main runways for arrivals and departures. **Table 2-8** provides the breakdown by time of day for arrivals and departures.

Table 2-8. DFW Runway Utilization Summary – Existing Condition (FY2022)

Runway ID	Arrival Percent			Departure Percent		
	Day	Night	Total	Day	Night	Total
13L	<1%	0%	<1%	<1%	<1%	<1%
13R	4%	<1%	3%	<1%	0%	<1%
17C	27%	32%	27%	<1%	1%	<1%
17L	11%	1%	10%	<1%	0%	<1%
17R	<1%	7%	<1%	38%	32%	38%
18L	<1%	4%	<1%	31%	30%	31%
18R	28%	25%	28%	<1%	6%	<1%
31L	<1%	0%	<1%	<1%	<1%	<1%
31R	1%	<1%	<1%	<1%	0%	<1%
35C	11%	14%	11%	<1%	<1%	<1%
35L	<1%	3%	<1%	16%	14%	16%
35R	5%	<1%	5%	<1%	0%	<1%
36L	12%	11%	12%	<1%	3%	<1%
36R	<1%	1%	<1%	14%	13%	14%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: DFW NOMS, Data prepared by HMMH

2.4.2.2.2.3 Taxi-Time Data

Average taxi-time by runway end was obtained from the FAA Aviation System Performance Metrics (ASPM) database for FY 2022 and was used to represent the Existing Conditions and for the future conditions taxi times. As shown in **Table 2-9**, the taxi-times are shown in minutes with an overall taxi-in time of 11.2 minutes, and taxi-out time of 17.8 minutes per operation.

Table 2-9. DFW Taxi Time Summary – Existing Condition (FY2022)

Runway	Departure	Arrivals
	Average Taxi-Out Minutes	Average Taxi-In Minutes
Overall	**17.8**	**11.2**

Source: FAA ASPM, May 2023, Data prepared by HMMH

2.4.2.2.3 Future Conditions

2.4.2.2.3.1 Forecast Operations

The proposed project would add 31 new gates, nine gates would be provided through the construction of the Terminal A and C Piers project, and the remaining 22 gates are planned to be provided through the construction of Terminal F. The new gates in Terminal F are expected to be available for operation in 2026; therefore, 2026 is included in the EA implementation year. 2031 is included as the year of implementation (buildout) plus five years. As the project would not be fully implemented in five years, 2036 is included as the year of implementation plus 10 years.

The FAA 2021 Terminal Area Forecast (TAF) released in March 2022 for DFW was used for the forecast. Using the FAA 2021 TAF data, DFW developed a forecast to cover the three future years of the EA. Since the initial development of the forecast, which used the FAA's 2021 TAF, the FAA released its updated 2022 TAF. The 2022 TAF forecasted fewer operations than the 2021 forecast, with approximately 5 percent fewer operations in the near term (late 2020s) and 2 percent fewer in the out years (2030s). DFW has seen a consistent growth trend in its annual operations and enplaned passengers. It has also recovered from the pandemic more quickly than other large hub airports. Given DFW's recovery, as evidenced by robust operational rankings and a review of the 2022 TAF which reflects lower growth levels, DFW determined that the 2021 TAF is more relevant to the existing and anticipated operating environment. The growth rate within the 2021 TAF more accurately mirrors DFW's recovery from the COVID-19 pandemic and DFW's anticipated future growth. The FAA agreed with DFW assessment of future operations and that the 2021 TAF may be used for this EA. The FAA approved forecast[27] is based on the 2021 TAF; therefore, the future year operational levels are also based on the FY and will be adjusted to CY results for reporting.

Similar to the Existing Condition, the military operations were distributed between Air Carrier operations and General Aviation operations. This is shown in the AAD counts for each alternative in **Table 2-10**.

The 19th Street Cargo Development Project would be complete and operational in 2025. The proposed project assumes that the EA has been completed for the 19th Street project[28], and thus, the additional 7,300 annual cargo operations disclosed in the 19th Street Cargo Proposed Action would be included in the No Action and Proposed Action Alternatives[29].

The proposed project would add 5,962 additional annual operations in the proposed implementation year of 2026, 70,441 annual operations in the year of implementation plus five years (2031), and 132,871 annual operations in the year of implementation plus 10 years (2036). This resulted in the totals for each category and each future year listed in **Table 2-10**.

[27] The DFW Operations memo and FAA approval is provided in **EA Appendix H**.

[28] https://www.permits.performance.gov/permitting-project/dot-projects/dfw-airport-19th-street-cargo-project

[29] HMMH, 2023. "DFW 19th Street Cargo Redevelopment Environmental Assessment: Draft Aircraft Emissions Technical Report". Prepared for: Dallas-Fort Worth International Airport. July 2023.

Table 2-10. Forecast NAA and Proposed Action Alternative Operations

Alternative	Modeling Scenario	Air Carrier	Air Taxi	General Aviation	Military	Total
No Action	2026	775,695	27,886	6,363	213	810,157
	AAD 2026	2,125.4	76.4	17.8	0.0	2,219.6
Proposed Action	2026	781,450	28,093	6,363	213	816,119
	AAD 2026	2,141.2	77.0	17.8	0.0	2,235.9
No Action	2031	789,196	24,165	6,461	213	820,035
	AAD 2031	2,162.4	66.2	18.1	0.0	2,246.7
Proposed Action	2031	857,544	26,258	6,461	213	890,476
	AAD 2031	2,349.7	71.9	18.1	0.0	2,439.7
No Action	2036	799,475	24,105	6,561	213	830,354
	AAD 2036	2,190.6	66.0	18.3	0.0	2,274.9
Proposed Action	2036	928,457	27,994	6,561	213	963,225
	AAD 2036	2,544.0	76.7	18.3	0.0	2,639.0

Note: Totals may not match exactly due to rounding

Source: FAA 2021 TAF; Centurion Planning and Design, 2023[30]; Data Prepared by HMMH

2.4.2.2.3.2 Future (2026) No Action Alternative

The 19th Street Cargo Redevelopment Project would be complete and operational in 2025[29]. Therefore, the Future (2026) NAA would include the additional 7,300 cargo operations disclosed in the 19th Street Cargo EA Proposed Action. Under the 2026 NAA, there would be no changes to the use of the existing gates at DFW. Therefore, overall operational levels would grow at a natural growth rate to over 810,000 operations.

2.4.2.2.3.2.1 Aircraft Activity Levels and Fleet Mix

The 810,157 annual operations predicted for 2026 translate to 2,220 AAD operations to be modeled for the FY2026 NAA emission inventory. **Table 2-11** provides representative aircraft and engine combinations and the number of average daily operations that were modeled in AEDT for the Future (FY2026) NAA. The future fleet mix would include a reduction in Air Taxi fleet operations (reduction in 50 seat and smaller regional jets) and the phase out of DC10 operations compared to the Existing Condition.

[30] DFW Operations Memo, March 23, 2023; Updated: April 24, 2023, To: Federal Aviation Administration, Subject: Additional Gate and Cargo Capacity at DFW

Table 2-11. DFW Modeled AAD Aircraft Operations for FY2026 NAA

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total Daily
			Day	Night	Total	Day	Night	Total	
Air Carrier	Jet	737700	66	2	69	60	9	69	138
		737800	205	13	218	207	11	218	435
		7378MAX	49	3	52	49	3	52	104
		747400	7	<1	8	7	<1	8	16
		747400RN	<1	<1	<1	<1	<1	<1	<1
		7478	1	<1	2	2	<1	2	4
		757PW	<1	2	3	<1	2	3	5
		757RR	<1	3	4	<1	3	4	7
		7673ER	9	4	13	8	5	13	26
		777200	6	4	10	9	1	10	20
		777300	10	2	12	9	3	12	24
		7773ER	5	<1	5	4	<1	5	11
		7878R	4	<1	5	4	<1	5	9
		7879	15	2	17	17	<1	17	35
		A300-622R	2	2	5	1	3	5	9
		A319-131	91	3	94	90	4	94	188
		A320-211	16	3	18	15	3	18	37
		A320-232	35	7	42	35	7	42	83
		A320-271N	42	7	50	43	6	50	99
		A321-232	206	24	229	209	20	229	459
		A350-941	1	0	1	1	<1	1	2
		A380-841	1	0	1	1	0	1	2
		MD11GE	<1	<1	<1	<1	<1	<1	2
		MD11PW	<1	<1	1	<1	<1	1	3
	Regional Jet	CRJ9-ER	97	3	100	94	6	100	201
		EMB170	88	3	91	84	8	91	183
		EMB175	9	<1	10	9	<1	10	20
		EMB190	2	0	2	2	0	2	4
	Subtotal		**970**	**92**	**1,063**	**964**	**99**	**1,063**	**2,125**
Air Taxi	Jet	CNA680	<1	<1	<1	<1	<1	<1	1
		EMB14L	34	1	35	30	5	35	69
	Non-jet	1900D	<1	<1	<1	<1	<1	<1	1
		CNA208	1	<1	2	1	<1	2	3
		DHC6	<1	<1	<1	<1	<1	<1	2
	Subtotal		**37**	**2**	**38**	**32**	**6**	**38**	**76**
	Jet	CL600	<1	<1	<1	<1	<1	<1	<1

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total Daily
			Day	Night	Total	Day	Night	Total	
General Aviation		CNA525C	<1	<1	<1	<1	<1	<1	<1
		CNA55B	<1	<1	<1	<1	<1	<1	<1
		CNA560XL	<1	<1	<1	<1	<1	<1	<1
		G650ER	<1	0	<1	<1	0	<1	<1
		GIV	<1	<1	<1	<1	<1	<1	<1
		GV	<1	0	<1	<1	<1	<1	<1
		LEAR35	<1	<1	<1	<1	<1	<1	<1
	Non-jet	CNA208	6	<1	7	6	<1	7	13
	Subtotal		**8**	**<1**	**9**	**9**	**<1**	**9**	**18**
Grand Total			**1,015**	**94**	**1,110**	**1,005**	**105**	**1,110**	**2,220**

Note: Totals may not match exactly due to rounding.

*ANP Type 737800 represents both B738 and B739 operations, which account for 97 percent and 3 percent, respectively.

Source: FAA TAF; Centurion Planning and Design, 2023[30]; Data prepared by HMMH

2.4.2.2.3.2.2 Runway Utilization

Runway end utilization for all of the future alternatives would be similar to the Existing Condition (see **Table 2-12)**. Runway use data from the FAA System Wide Information Management (SWIM) system data was used to develop the future runway use percentages. The runway percentage use for day and night includes the assumption that the outboard runways (Runways 17L/35R, 13L/31R and 13R/31L) are not typically used after 10 p.m. or before 6 a.m.

When compared to the existing runway use, the runway use for future alternatives would be as follows:

- Daytime south flow. There are slightly less arrivals (1 percent to 3 percent) to Runway 13R and 17C and slightly more arrivals (1 percent to 3 percent) on Runway 17L and 18R.
- Nighttime south flow. There are less arrivals (7 percent) to Runway 17C and more arrivals (3 percent to 5 percent) on Runway 17R and 18L.
- Daytime north flow. There are slightly less arrivals (3 percent) to Runway 35C and slightly more arrivals (1 percent to 3 percent) on Runway 35R and 36L.
- Nighttime north flow. There are slightly less arrivals (3 percent) to Runway 35C and slightly more arrivals (1 percent to 2 percent) on Runway 35L and 36R.
- South flow departures. There is very little difference (within 1 percent) except for a small reduction (2 percent) on Runway 17R at night.
- North flow departures. There is very little difference (within 1 percent).

Table 2-12 provides the breakdown by time of day for arrivals and departures.

Table 2-12. DFW Runway Utilization Summary for All Future Alternatives

Runway ID	Arrival Percent			Departure Percent		
	Day	Night	Total	Day	Night	Total
13L	0%	0%	0%	0%	0%	0%
13R	3%	<1%	3%	0%	0%	0%
17C	24%	25%	24%	<1%	2%	<1%
17L	13%	<1%	12%	0%	0%	0%
17R	<1%	12%	1%	39%	30%	38%
18L	<1%	7%	<1%	31%	31%	31%
18R	29%	25%	29%	<1%	6%	<1%
31L	0%	0%	0%	<1%	<1%	<1%
31R	1%	<1%	1%	0%	0%	0%
35C	8%	11%	8%	<1%	2%	<1%
35L	<1%	4%	<1%	15%	13%	15%
35R	8%	<1%	7%	0%	0%	0%
36L	13%	11%	13%	<1%	2%	<1%
36R	<1%	3%	<1%	14%	14%	14%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: FAA SWIM; Centurion Planning and Design, 2023[30]

2.4.2.2.3.2.3 Taxi-Time Data

The taxi-times for the Existing Condition was used for the Future (2026) NAA (see **Section 2.4.2.2.2.3**). As shown in **Table 2-9**, the taxi-times are shown in minutes and with an overall taxi-in time of 11.2 minutes and taxi-out time of 17.8 minutes per operation.

2.4.2.2.3.3 Future (2026) Proposed Action Alternative

The 19th Street Cargo Redevelopment Project would be complete and operational in 2025. Therefore, the Future (2026) Proposed Action Alternative would include the additional cargo operations disclosed in the 19th Street Cargo EA Proposed Action.

The Proposed Action consists of the construction of a new Terminal (Terminal F) and associated tunnels and a new SkyLink station, two Terminal piers (Terminal A and C Piers), expansion of Terminal A passenger support facilities and Terminal E, renovation of Terminal C, new airside aircraft pavement, pavement and alignment modifications for aircraft ingress/egress, and all associated necessary utilities infrastructure, which includes demolition, relocation, connection, and creation, as necessary for the project. The proposed project would add 31 new gates, nine gates would be provided through the construction of the Terminal A and C Piers project, and the remaining 22 gates are planned to be provided through the construction of Terminal F. The new gates in Terminal F are expected to be available for operation in 2026; therefore, 2026 is included as the EA implementation year.

2.4.2.2.3.3.1 Aircraft Activity Levels and Fleet Mix

Though the new Terminal F gates would be available in 2026, the operational demand is not forecasted to fully exist until later (estimated 2028). Beginning in 2026, the new gates would be used to (1) offset existing operations from Terminal C during the phased renovation project and (2) accommodate new operations over time. Consequently, 5,962 additional operations were added to the number of operations and fleet mix for the Future FY2026 Proposed Action Alternative compared to the Future FY2026 NAA.

The 816,119 annual operations predicted for 2026 translate to 2,236 AAD operations to be modeled for the FY2026 Proposed Action Alternative. **Table 2-13** provides representative aircraft and engine combinations and the number of average daily operations that were modeled in AEDT for the FY2026 Proposed Action Alternative. The FY2026 Proposed Action fleet mix would include the additional operations in the Air Carrier and Air Taxi categories (an additional 16 operations in Air Carrier and an additional one operation in Air Taxi) compared to the FY2026 NAA.

Table 2-13. DFW Modeled AAD Aircraft Operations for FY2026 Proposed Action Alternative

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total Daily
			Day	Night	Total	Day	Night	Total	
Air Carrier	Jet	737700	66	3	69	61	9	70	139
		737800	205	13	218	207	11	218	436
		7378MAX	49	4	53	49	4	53	106
		747400	7	<1	8	7	<1	8	16
		747400RN	<1	<1	<1	<1	<1	<1	<1
		7478	1	<1	2	2	<1	2	5
		757PW	<1	2	3	<1	2	3	5
		757RR	<1	3	4	<1	3	4	7
		7673ER	10	4	14	8	5	14	27
		777200	7	4	11	10	<1	10	21
		777300	10	2	12	9	2	12	24
		7773ER	5	<1	6	5	<1	6	11
		7878R	4	<1	5	5	<1	5	9
		7879	16	3	18	18	<1	18	36
		A300-622R	2	2	5	1	3	5	9
		A319-131	91	3	94	90	4	94	188
		A320-211	16	3	19	15	3	18	37
		A320-232	35	7	42	35	7	42	83
		A320-271N	45	5	50	46	4	50	100
		A321-232	207	24	230	210	20	230	461
		A350-941	1	0	1	1	<1	1	3
		A380-841	1	0	1	1	0	1	2
		MD11GE	<1	<1	<1	<1	<1	<1	2

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total Daily
			Day	Night	Total	Day	Night	Total	
		MD11PW	<1	<1	1	<1	<1	1	3
	Regional Jet	CRJ9-ER	97	4	101	95	6	101	202
		EMB170	89	3	92	84	8	92	184
		EMB175	9	<1	10	10	<1	10	21
		EMB190	2	<1	2	2	<1	2	4
	Subtotal		**979**	**92**	**1,071**	**973**	**97**	**1,071**	**2,141**
Air Taxi	**Jet**	CNA680	<1	<1	<1	<1	<1	<1	1
		EMB14L	34	<1	35	33	1	35	69
	Non-jet	1900D	<1	<1	<1	<1	<1	<1	1
		CNA208	1	<1	2	2	<1	2	4
		DHC6	<1	<1	<1	<1	<1	<1	2
	Subtotal		**37**	**1**	**39**	**36**	**2**	**38**	**77**
General Aviation	**Jet**	CL600	<1	<1	<1	<1	<1	<1	<1
		CNA525C	<1	<1	<1	<1	<1	<1	<1
		CNA55B	<1	<1	<1	<1	<1	<1	<1
		CNA560XL	<1	<1	<1	<1	<1	<1	<1
		G650ER	<1	0	<1	<1	0	<1	<1
		GIV	<1	<1	<1	<1	<1	<1	<1
		GV	<1	0	<1	<1	<1	<1	<1
		LEAR35	<1	<1	<1	<1	<1	<1	<1
	Non-jet	CNA208	6	<1	7	6	<1	7	13
	Subtotal		**8**	**<1**	**9**	**9**	**<1**	**9**	**18**
Grand Total			**1,025**	**93**	**1,118**	**1,018**	**100**	**1,118**	**2,236**

Notes: Totals may not match exactly due to rounding.

*ANP Type 737800 represents both B738 and B739 operations, which account for 97 percent and 3 percent, respectively. Source: FAA TAF; Centurion Planning and Design, 2023[30]; Data prepared by HMMH

2.4.2.2.3.3.2 Runway Utilization

The Proposed Action would not alter the location or length of the runways nor would it alter future runway use. Runway end utilization for the Future (FY2026) Proposed Action Alternative is expected to be the same as the FY2026 NAA (see **Table 2-12)**.

2.4.2.2.3.3.3 Taxi-Time Data

Taxi-time for the Future (2026) Proposed Action would be expected to be the same as the existing conditions (see **Section 2.4.2.2.2.3**). As shown in **Table 2-9** the taxi-times are shown in minutes and with an overall taxi-in time of 11.2 minutes and taxi-out time of 17.8 minutes per operation.

2.4.2.2.3.4 Future (2031) No Action Alternative

The Future (2031) NAA would include the additional cargo operations disclosed in the 19th Street Cargo EA Proposed Action. Under the Future (2031) NAA, there would be no changes to the use of existing gates at DFW, passenger operations would be constrained due to lack of sufficient facilities and overall operational levels would grow at a minimal growth rate to over 820,000 operations.

2.4.2.2.3.4.1 Aircraft Activity Levels and Fleet Mix

The 820,035 annual operations predicted for year 2031 translate to 2,247 AAD operations to be modeled for the FY2031 NAA emission inventory. **Table 2-14** provides representative aircraft and engine combinations and the number of average daily operations that were modeled in AEDT for the FY2031 NAA. The FY2031 NAA fleet mix would include changes in the Air Carrier fleet mix (the retirement of the older DC1010, DC1030, MD11GE, and MD11PW) and a reduction in Air Taxi fleet operations (reduction in 50 seat and smaller regional jets) compared to the Existing Condition and the FY2026 alternatives.

Table 2-14. DFW Modeled AAD Aircraft Operations for FY2031 NAA

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total Daily
			Day	Night	Total	Day	Night	Total	
Air Carrier	Jet	737700	73	3	76	66	9	76	152
		737800	228	14	242	229	12	242	483
		7378MAX	49	3	52	49	3	52	105
		747400	7	<1	8	7	<1	8	16
		747400RN	<1	<1	<1	<1	<1	<1	<1
		7478	1	<1	2	2	<1	2	5
		757PW	<1	2	2	<1	2	2	4
		757RR	<1	2	3	<1	2	3	6
		7673ER	8	3	11	7	4	11	22
		777200	6	4	10	9	1	10	20
		777300	10	2	12	9	3	12	24
		7773ER	5	<1	6	5	1	6	12
		7878R	4	<1	5	5	<1	5	9
		7879	15	2	18	17	<1	18	35
		A300-622R	2	2	4	1	3	4	7
		A319-131	97	3	100	96	4	100	200
		A320-211	15	2	18	15	3	18	36
		A320-232	35	7	42	35	7	42	84
		A320-271N	40	5	45	42	4	45	91
		A321-232	214	24	239	218	21	239	477
		A350-941	1	0	1	1	<1	1	2
		A380-841	1	0	1	1	0	1	2
		CRJ9-ER	86	3	89	84	5	89	179

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total Daily
			Day	Night	Total	Day	Night	Total	
	Regional Jet	EMB170	81	3	84	77	7	84	167
		EMB175	8	<1	9	9	<1	9	18
		EMB190	2	0	2	2	0	2	4
	Subtotal		**992**	**89**	**1,081**	**986**	**95**	**1,081**	**2,162**
Air Taxi	**Jet**	CNA680	<1	<1	<1	<1	<1	<1	1
		EMB14L	29	<1	30	26	4	30	60
	Non-jet	1900D	<1	<1	<1	<1	<1	<1	1
		CNA208	1	<1	1	1	<1	1	3
		DHC6	<1	<1	<1	<1	<1	<1	1
	Subtotal		**32**	**1**	**33**	**28**	**5**	**33**	**66**
General Aviation	**Jet**	CL600	<1	<1	<1	<1	<1	<1	<1
		CNA525C	<1	<1	<1	<1	<1	<1	<1
		CNA55B	<1	<1	<1	<1	<1	<1	<1
		CNA560XL	<1	<1	<1	<1	<1	<1	<1
		G650ER	<1	0	<1	<1	0	<1	<1
		GIV	<1	<1	<1	<1	<1	<1	<1
		GV	<1	0	<1	<1	<1	<1	<1
		LEAR35	<1	<1	<1	<1	<1	<1	<1
	Non-jet	CNA208	6	<1	7	7	<1	7	14
	Subtotal		**9**	**<1**	**9**	**9**	**<1**	**9**	**18**
Grand Total			**1,032**	**91**	**1,123**	**1,022**	**101**	**1,123**	**2,247**

Note: Totals may not match exactly due to rounding.

*ANP Type 737800 represents both B738 and B739 operations, which account for 97 percent and 3 percent, respectively.

Source: FAA TAF; Centurion Planning and Design, 2023[30]; Data prepared by HMMH

2.4.2.2.3.4.2 Runway Utilization

The proposed action would not alter the location or length of the runways nor would it alter future runway use. Runway end utilization for the Future (FY2031) NAA is expected to be the same as the Future (FY2026) NAA (see **Table 2-12)**.

2.4.2.2.3.4.3 Taxi-Time data

The taxi-times for the Future (FY2031) NAA is same as the Existing Condition (see **Section 2.4.2.2.2.3**). As shown in **Table 2-9**, the taxi-times are shown in minutes and with an overall taxi-in time of 11.2 minutes and taxi-out time of 17.8 minutes per operation.

2.4.2.2.3.5 Future (2031) Proposed Action Alternative

The Future (2031) Proposed Action Alternative is the year of implementation (2026) plus five years. The Future (2031) Proposed Action Alternative would include the additional cargo operations disclosed in the

19th Street Cargo EA Proposed Action. The Terminal F gates would come online in 2026 and the new Terminal A and C gates would come online in 2027 and 2028. The proposed new gates are expected to relieve the constraints of passenger operations at DFW. Therefore, the forecast annual operations for Future (2031) Proposed Action Alternative would grow to over 890,000 annual operations.

2.4.2.2.3.5.1 Aircraft Activity Levels and Fleet Mix

The 890,476 annual operations predicted for year 2031 translate to 2,440 AAD operations to be modeled for the FY2031 Proposed Action Alternative emission inventory. **Table 2-15** provides representative aircraft and engine combinations and the number of average daily operations that were modeled in AEDT for the Future FY2031 Proposed Action Alternative. The Future FY2031 Proposed Action fleet mix would include the additional operations in the Air Carrier and Air Taxi categories (an additional 187 operations in Air Carrier and an additional six operations in Air Taxi) compared to the FY2031 NAA.

Table 2-15. DFW Modeled AAD Aircraft Operations for FY2031 Proposed Action Alternative

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total Daily
			Day	Night	Total	Day	Night	Total	
Air Carrier	Jet	737700	75	3	79	68	10	79	157
		737800	235	15	250	238	13	250	501
		7378MAX	53	3	56	53	4	56	112
		747400	7	<1	8	7	<1	8	16
		747400RN	<1	<1	<1	<1	<1	<1	<1
		7478	1	<1	2	2	<1	2	5
		757PW	<1	2	2	<1	2	2	4
		757RR	<1	3	3	<1	3	3	6
		7673ER	11	4	15	9	6	15	30
		777200	10	5	15	13	2	15	29
		777300	10	2	12	9	2	12	24
		7773ER	6	<1	6	5	1	6	12
		7878R	4	<1	5	5	<1	5	10
		7879	17	3	20	19	<1	20	40
		A300-622R	2	3	5	2	3	5	10
		A319-131	101	3	104	100	5	104	209
		A320-211	19	3	22	18	4	22	44
		A320-232	38	7	45	38	7	45	91
		A320-271N	44	6	50	46	4	50	100
		A321-232	231	26	257	235	22	257	514
		A350-941	1	0	1	1	<1	1	3
		A380-841	1	0	1	1	0	1	2
	Regional Jet	CRJ9-ER	105	4	109	102	7	109	218
		EMB170	91	3	94	86	8	94	187
		EMB175	9	<1	10	10	<1	10	20
		EMB190	2	<1	2	2	<1	2	5
	Subtotal		**1,076**	**98**	**1,175**	**1,070**	**105**	**1,175**	**2,350**
Air Taxi	Jet	CNA680	<1	<1	<1	<1	<1	<1	2
		EMB14L	30	<1	31	30	<1	31	62

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total Daily
			Day	Night	Total	Day	Night	Total	
	Non-jet	1900D	<1	<1	<1	<1	<1	<1	2
		CNA208	2	<1	2	2	<1	2	4
		DHC6	<1	<1	1	<1	<1	1	2
	Subtotal		**34**	**2**	**36**	**34**	**2**	**36**	**72**
General Aviation	**Jet**	CL600	<1	<1	<1	<1	<1	<1	<1
		CNA525C	<1	<1	<1	<1	<1	<1	<1
		CNA55B	<1	<1	<1	<1	<1	<1	<1
		CNA560XL	<1	<1	<1	<1	<1	<1	<1
		G650ER	<1	0	<1	<1	0	<1	<1
		GIV	<1	<1	<1	<1	<1	<1	<1
		GV	<1	0	<1	<1	<1	<1	<1
		LEAR35	<1	<1	<1	<1	<1	<1	<1
	Non-jet	CNA208	6	<1	7	6	<1	7	14
	Subtotal		**9**	**<1**	**9**	**9**	**<1**	**9**	**18**
Grand Total			**1,119**	**100**	**1,220**	**1,112**	**108**	**1,220**	**2,440**

Note: Totals may not match exactly due to rounding.
*ANP Type 737800 represents both B738 and B739 operations, which account for 97 percent and 3 percent, respectively.
Source: FAA TAF; Centurion Planning and Design, 2023[30]; Data prepared by HMMH

2.4.2.2.3.5.2 Runway Utilization

The proposed action would not alter the location or length of the runways nor would it alter future runway use. Runway end utilization for the Future (FY2031) Proposed Action Alternative is expected to be the same as the Future (FY2026) NAA (see **Table 2-12**).

2.4.2.2.3.5.3 Taxi-Time Data

Similar to the Proposed Action Alternative (FY2026), taxi-times for the Future (2031) Proposed Action would be expected to be the same as the existing conditions (see **Section 2.4.2.2.2.3**). As shown in **Table 2-9**, the taxi-times are shown in minutes and with an overall taxi-in time of 11.2 minutes and taxi-out time of 17.8 minutes per operation.

2.4.2.2.3.6 Future (2036) No Action Alternative

The Future (2036) NAA would include the additional cargo operations disclosed in the 19th Street Cargo EA Proposed Action. Under the Future (2036) NAA, there would be no changes to the use of existing gates at DFW, passenger operations would be constrained due to lack of sufficient facilities and overall operational levels would grow at a minimal rate to over 830,000 operations.

2.4.2.2.3.6.1 Aircraft Activity Levels and Fleet Mix

The 830,354 annual operations predicted for 2036 translate to 2,275 AAD operations to be modeled for the FY2036 NAA emission inventory. **Table 2-16** provides representative aircraft and engine combinations and the number of average daily operations that were modeled in AEDT for the FY2036 NAA. The FY2036 NAA fleet mix would include changes in the Air Carrier fleet mix (the retirement of the older DC1010, DC1030, MD11GE, and MD11PW) and a reduction in Air Taxi fleet operations (reduction in 50 seat and smaller regional jets) compared to the Existing Condition.

Table 2-16. DFW Modeled AAD Aircraft Operations for FY2036 NAA

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total Daily
			Day	Night	Total	Day	Night	Total	
Air Carrier	Jet	737700	73	3	76	66	9	76	152
		737800	228	14	242	229	12	242	483
		7378MAX	49	3	52	49	3	52	105
		747400	7	<1	8	7	<1	8	16
		747400RN	<1	<1	<1	<1	<1	<1	<1
		7478	1	<1	2	2	<1	2	5
		757PW	<1	2	2	<1	2	2	4
		757RR	<1	2	3	<1	2	3	6
		7673ER	8	3	11	7	4	11	22
		777200	6	4	10	9	1	10	20
		777300	10	2	12	9	3	12	24
		7773ER	5	<1	6	5	1	6	12
		7878R	4	<1	5	5	<1	5	9
		7879	15	2	18	17	<1	18	35
		A300-622R	2	2	4	1	3	4	7
		A319-131	97	3	100	96	4	100	200
		A320-211	15	2	18	15	3	18	36
		A320-232	35	7	42	35	7	42	84
		A320-271N	40	5	45	42	4	45	91
		A321-232	214	24	239	218	21	239	477
		A350-941	1	0	1	1	<1	1	2
		A380-841	1	0	1	1	0	1	2
	Regional Jet	CRJ9-ER	86	3	89	84	5	89	179
		EMB170	81	3	84	77	7	84	167
		EMB175	8	<1	9	9	<1	9	18
		EMB190	2	0	2	2	0	2	4
	Subtotal		**992**	**89**	**1,081**	**986**	**95**	**1,081**	**2,162**
Air Taxi	Jet	CNA680	<1	<1	<1	<1	<1	<1	1
		EMB14L	29	<1	30	26	4	30	60
	Non-jet	1900D	<1	<1	<1	<1	<1	<1	1
		CNA208	1	<1	1	1	<1	1	3
		DHC6	<1	<1	<1	<1	<1	<1	1
	Subtotal		**32**	**1**	**33**	**28**	**5**	**33**	**66**

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total Daily
			Day	Night	Total	Day	Night	Total	
General Aviation	**Jet**	CL600	<1	<1	<1	<1	<1	<1	<1
		CNA525C	<1	<1	<1	<1	<1	<1	<1
		CNA55B	<1	<1	<1	<1	<1	<1	<1
		CNA560XL	<1	<1	<1	<1	<1	<1	<1
		G650ER	<1	0	<1	<1	0	<1	<1
		GIV	<1	<1	<1	<1	<1	<1	<1
		GV	<1	0	<1	<1	<1	<1	<1
		LEAR35	<1	<1	<1	<1	<1	<1	<1
	Non-jet	CNA208	6	<1	7	7	<1	7	14
	Subtotal		**9**	**<1**	**9**	**9**	**<1**	**9**	**18**
Grand Total			**1,032**	**91**	**1,123**	**1,022**	**101**	**1,123**	**2,247**

Note: Totals may not match exactly due to rounding.

*ANP Type 737800 represents both B738 and B739 operations, which account for 97 percent and 3 percent, respectively.

Source: FAA TAF; Centurion Planning and Design, 2023[30]; Data prepared by HMMH

2.4.2.2.3.6.2 Runway Utilization

The proposed action would not alter the location or length of the runways nor would it alter future runway use. Runway end utilization for the Future (FY2036) NAA is expected to be the same as the Future (FY2026) NAA (see **Table 2-12**).

2.4.2.2.3.6.3 Taxi-Time data

The taxi-times for the Future (FY2036) NAA is same as the Existing Condition (see **Section 2.4.2.2.2.3**). As shown in **Table 2-9**, the taxi-times are shown in minutes and with an overall taxi-in time of 11.2 minutes and taxi-out time of 17.8 minutes per operation.

2.4.2.2.3.7 Future (2036) Proposed Action Alternative

The Future (2036) Proposed Action Alternative is the year of implementation (2026) plus 10 years. The Future (2036) Proposed Action Alternative would include the additional cargo operations disclosed in the 19th Street Cargo EA Proposed Action. The Terminal F gates would come online in 2026 and the new Terminal A and C gates would come online in 2027 and 2028. The proposed new gates are expected to relieve the constraints of passenger operations at DFW. Therefore, the forecast annual operations for Future (2036) Proposed Action Alternative would grow to over 960,000 annual operations.

2.4.2.2.3.7.1 Aircraft Activity Levels and Fleet Mix

The 963,225 annual operations predicted for 2036 translate to 2,639 AAD operations to be modeled for the FY2036 Proposed Action Alternative emission inventory. **Table 2-17** provides representative aircraft and engine combinations and the number of average daily operations that were modeled in AEDT for the Future FY2036 Proposed Action Alternative. The Future FY2036 Proposed Action fleet mix would include the additional operations in the Air Carrier and Air Taxi categories (an additional 353 operations in Air Carrier and an additional 11 operations in Air Taxi) compared to the FY2036 NAA.

Table 2-17. DFW Modeled AAD Aircraft Operations for FY2036 Proposed Action Alternative

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total Daily
			Day	Night	Total	Day	Night	Total	
Air Carrier	Jet	737700	81	4	85	74	11	85	170
		737800	255	16	271	257	14	271	541
		7378MAX	60	6	66	59	6	66	131
		747400	7	<1	8	7	<1	8	16
		747400RN	<1	<1	<1	<1	<1	<1	<1
		7478	2	1	3	2	<1	3	5
		757PW	<1	1	2	<1	2	2	4
		757RR	<1	2	3	<1	2	3	6
		7673ER	11	5	17	10	7	17	33
		777200	10	6	16	14	2	16	32
		777300	10	2	12	9	2	12	24
		7773ER	7	<1	7	6	1	7	14
		7878R	5	1	6	6	<1	6	12
		7879	18	3	21	21	<1	21	43
		A300-622R	<1	<1	<1	<1	<1	<1	1
		A319-131	110	3	113	108	5	113	226
		A320-211	20	3	24	20	4	24	47
		A320-232	62	8	70	62	9	70	141
		A320-271N	64	6	70	65	5	70	140
		A321-232	260	29	290	265	25	290	579
		A350-941	1	0	1	1	<1	1	3
		A380-841	1	0	1	1	0	1	2
	Regional Jet	CRJ9-ER	91	4	94	88	6	94	188
		EMB170	78	3	81	74	7	81	162
		EMB175	8	<1	9	8	<1	9	18
		EMB190	2	<1	3	2	<1	3	5
	Subtotal		**1,166**	**106**	**1,272**	**1,161**	**111**	**1,272**	**2,544**
Air Taxi	Jet	CNA680	<1	<1	<1	<1	<1	<1	2
		EMB14L	32	1	33	32	1	33	66
	Non-jet	1900D	<1	<1	<1	<1	<1	<1	2
		CNA208	2	<1	2	2	<1	2	5
		DHC6	<1	<1	1	<1	<1	1	2
	Subtotal		**36**	**2**	**38**	**36**	**2**	**38**	**77**
General Aviation	Jet	CL600	<1	<1	<1	<1	<1	<1	<1
		CNA525C	<1	<1	<1	<1	<1	<1	<1

Tower Category	Propulsion	ANP Type	Arrivals			Departures			Total Daily
			Day	Night	Total	Day	Night	Total	
		CNA55B	<1	<1	<1	<1	<1	<1	<1
		CNA560XL	<1	<1	<1	<1	<1	<1	<1
		G650ER	<1	0	<1	<1	0	<1	<1
		GIV	<1	<1	<1	<1	<1	<1	<1
		GV	<1	0	<1	<1	<1	<1	<1
		LEAR35	<1	<1	<1	<1	<1	<1	<1
	Non-jet	CNA208	7	<1	7	7	<1	7	14
	Subtotal		**9**	**<1**	**9**	**9**	**<1**	**9**	**18**
Grand Total			**1,212**	**108**	**1,319**	**1,206**	**113**	**1,320**	**2,639**

Note: Totals may not match exactly due to rounding.

*ANP Type 737800 represents both B738 and B739 operations, which account for 97 percent and 3 percent, respectively.

Source: FAA TAF; Centurion Planning and Design, 2023[30]; Data prepared by HMMH

2.4.2.2.3.7.2 Runway Utilization

The proposed action would not alter the location or length of the runways nor would it alter future runway use. Runway end utilization for the Future (FY2036) Proposed Action Alternative is expected to be the same as the Future (FY2026) NAA (see **Table 2-12**).

2.4.2.2.3.7.3 Taxi-Time Data

Similar to Proposed Action Alternatives (FY2026 and FY 2031), average taxi-time for the Future (2036) Proposed Action would be expected to be the same as the existing conditions (see **Section 2.4.2.2.2.3**). As shown in **Table 2-9,** the taxi-times are shown in minutes and with an overall taxi-in time of 11.2 minutes and taxi-out time of 17.8 minutes per operation.

3. Significance Thresholds and General Conformity

This section discusses the criteria and general methods used to evaluate the Proposed Project's significance with respect to air quality impacts under NEPA.

The emissions inventories are used to determine the projected net annual increase in emissions, and the potential impact to air quality in the vicinity of DFW due to the Proposed Project. The General Conformity Rule ensures that federal activities do not cause or contribute to a violation of NAAQS. The General Conformity process begins with an Applicability Analysis. If General Conformity applies, the Agency must prepare a General Conformity Determination. Then federal, state, and local air quality governance are engaged in a public review process of the agency's determination.

When performing a General Conformity applicability analysis, the FAA considers a range of factors, including:

- If action will occur in a Nonattainment or Maintenance Area
- If specific exemptions in the General Conformity Rule apply

- If the action is on the federal agency's list of "presumed to conform" activities
- If total emissions exceed General Conformity *de minimis* thresholds, and
- If a USEPA-approved SIP has an emissions budget for which emissions with the action could be compared

If an action is not exempt or presumed to conform or found to cause emissions above applicable *de minimis* thresholds in any nonattainment or maintenance area, the agency must prepare a General Conformity Determination prior to taking the action.

DFW is in a Severe Ozone Nonattainment Area[31] (2008 standards)[32]; therefore, the 25 tpy VOC and NO_X *de minimis* thresholds apply to this Project[33]. The maximum annual Project emissions are compared to applicable *de minimis* thresholds below to determine compliance under the General Conformity Rule and compliance with the CAA and the Texas SIP.

4. Results

This section presents the emission inventory results and compares net Project emissions to the *de minimis* thresholds described above. Projects that have emissions below the *de minimis* threshold are presumed to conform with federal General Conformity requirements. For projects that exceed the *de minimis* thresholds, a General Conformity Determination is required.

4.1 Construction Emissions Inventory

Proposed Project total construction emissions include both non-conforming elements and elements that are presumed to conform because they are included in the FAA's list of Presumed to Conform actions.[34] Presumed to Conform project elements include the operation of two (2) concrete batch plants and one (1) asphalt batch plant. Batch plants are stationary sources of air emissions and will be permitted through the TCEQ New Source Review (NSR) permit program. The NSR permit process would be completed and approved for each batch plant before construction begins. Emissions from permitted stationary sources fall under the Presumed to Conform designation because they are accounted for in the SIP. All other project elements are absent from the Presumed to Conform list and require evaluation pursuant to the General Conformity Rule. **Table 4-1** presents CAP emissions associated with all construction elements of the Proposed Project by emissions source and year.

[31] DFW Airport sits in both Dallas and Tarrant Counties. Both Counties in their entirety are within the 2008 Severe Ozone Nonattainment Areas.

[32] USEPA. 2023. Green Book Nonattainment Areas by County. Available online: https://www3.epa.gov/airquality/greenbook/anayo_tx.html. Accessed: August 2023.

[33] FAA. 2015. Aviation Emissions & Air Quality Handbook, Version 3, Update 1. Section 8.1.1.4. January.

[34] FAA, Federal Presumed To Conform Actions, Under General Conformity, Federal Register / Vol. 72, No. 145 / Monday, July 30, 2007 / Notices. Available at: https://www.federalregister.gov/documents/2007/07/30/07-3695/federal-presumed-to-conform-actions-under-general-conformity. Accessed August 2023.

Table 4-1. Proposed Action Construction Phase CAP Emissions

Project Year	Emissions Source	Emissions (short tons/yr)					
		NO_X	CO	VOC	SO_2	Total PM_{10}	Total $PM_{2.5}$
2024	On road	12.13	109.28	2.99	0.10	2.89	0.59
2024	Nonroad	11.47	10.20	1.07	0.01	0.76	0.63
2024	Fugitives	-	-	0.02	-	6.47	0.97
2024	**Total**	**23.61**	**119.48**	**4.09**	**0.11**	**10.11**	**2.19**
2025	On road	14.63	271.52	6.85	0.23	5.97	1.06
2025	Nonroad	21.17	17.48	1.93	0.02	1.39	1.19
2025	Fugitives	-	-	-	-	12.34	1.87
2025	**Total**	**35.80**	**289.00**	**8.77**	**0.25**	**19.71**	**4.11**
2026	On road	10.57	100.83	2.40	0.09	2.91	0.55
2026	Nonroad	11.25	8.70	0.95	0.01	0.70	0.59
2026	Fugitives	-	-	-	-	2.94	0.44
2026	**Total**	**21.82**	**109.53**	**3.35**	**0.11**	**6.55**	**1.58**
2027	On road	1.79	19.02	0.45	0.02	0.55	0.10
2027	Nonroad	3.35	2.76	0.28	0.00	0.20	0.16
2027	Fugitives	-	-	-	-	1.67	0.25
2027	**Total**	**5.14**	**21.79**	**0.73**	**0.02**	**2.43**	**0.51**
2028	On road	0.63	10.97	0.25	0.01	0.29	0.05
2028	Nonroad	1.50	1.27	0.12	0.00	0.08	0.06
2028	Fugitives	-	-	-	-	0.20	0.03
2028	**Total**	**2.14**	**12.24**	**0.37**	**0.01**	**0.57**	**0.14**

4.2 Operational Emission Inventory

4.2.1 Existing Aircraft Emissions Inventory

Aircraft-related emissions were generated in the model based on the FY year data; however, for reporting, calendar year (CY) data is required. The FY emission results were adjusted to CY by comparing the modeled operations to the total reported operations for CY2022 and applying an adjustment factor as shown in **Table 4-2**. The CY operations for 2022 were slightly less than the FY; therefore, the emission results are slightly lowered than modeled in AEDT.

Table 4-2. Fiscal Year to Calendar Year Adjustment

Year	FY2022	CY2022	Adjustment
2022	663,426	656,676	0.989826

Source: FAA OPSNET, Data prepared by HMMH

Total operational emissions are from aircraft operations, GSE, and APUs. AEDT default data for APU and GSE equipment and duration was used in the modeling. The Existing Condition emission inventory provides aircraft emissions associated with taxi-in, taxi-out, and in-flight operations below the mixing height (AEDT default 3,000 feet). **Table 4-3** provides the operational emissions for all operations for the Existing Condition.

Table 4-3. Total Aircraft Operational Emissions for Existing Condition (CY2022)

Calendar Year	Operational Category	Pollutant (tpy)						
		CO	NOx	VOC	NMHC	SO_x	$PM_{2.5}$	PM_{10}
2022	Aircraft	2,939.35	3,494.54	388.17	390.21	324.66	33.13	33.13
	GSE LTO	556.19	55.43	20.56	19.64	0.39	3.09	3.30
	APU	112.09	115.01	9.48	9.53	15.99	16.05	16.05
	Total	**3,607.63**	**3,664.98**	**418.21**	**419.38**	**341.04**	**52.27**	**52.48**

Note: These emissions are based on the aircraft operations in **Table 2-7**.

Source: Data prepared by HMMH

4.2.2 Future Aircraft Emissions Inventory

4.2.2.1 Future (2026) No Action Alternative

Aircraft-related emissions were generated in the model based on the FY year data; however, for reporting, CY data is required. The FY emission results were adjusted to CY by comparing the modeled operations to the total operations calculated for CY 2026 and applying an adjustment factor as shown in **Table 4-4**. The CY operations were developed by adding 3/4 of FY2026 operations to 1/4 of FY2027 operations.[35] The CY operations for 2026 were slightly higher than the FY; therefore, the emission results are slightly higher than modeled in AEDT.

Table 4-4. Fiscal Year to Calendar Year Adjustment

Year	FY2026	CY2026	Adjustment
2026	810,157	810,645	1.000602

Source: FAA 2021 TAF; Centurion Planning and Design, 2023[30]; Data prepared by HMMH

Total operational emissions are from aircraft operations, GSE, and APUs. AEDT default data for APU and GSE equipment and duration was used in the modeling. Due to missing default GSE equipment data for 747400 and 777300 cargo aircraft in AEDT, a list of GSE equipment and duration used for the additional 19th Street Cargo operations was provided by DFW. GSE equipment and duration applied to the additional 19th Street Cargo Proposed Action operations were included as part of this alternative. DFW has assumed that half of the new GSE equipment will be electric for types that have an electric alternative. All other operations used the AEDT default data for GSE equipment and duration.

[35] CY 2026 = (FY2026 ops / 12) *9 + (FY2027 ops / 12) *3

The NAA CAP emission inventory provides aircraft emissions associated with taxi-in, taxi-out, and in-flight operations below the mixing height (AEDT default 3,000 feet). **Table 4-5** provides the operational emissions for all 2026 NAA operations.

Table 4-5. Total Aircraft Operational Emissions for the CY2026 NAA

Year	Operational Category	Pollutant (tpy)						
		CO	NO_x	VOC	NMHC	SO_x	$PM_{2.5}$	PM_{10}
2026 (NAA)	Aircraft	3,822.98	4,896.11	473.09	475.56	435.42	43.52	43.52
	GSE LTO	629.86	72.90	28.41	27.02	0.55	4.58	4.87
	APU	123.72	149.50	10.79	10.85	20.04	19.51	19.51
	Total	**4,576.56**	**5,118.51**	**512.29**	**513.43**	**456.00**	**67.62**	**67.91**

Note: These emissions are based on the aircraft operations in Table 2-11 adjusted to CY as shown in Table 4-4.

Source: Data prepared by HMMH

4.2.2.2 Future (2026) Proposed Action Alternative

Aircraft-related emissions were generated in the model based on the FY year data; however, for reporting, CY data is required. The FY emission results were adjusted to CY by comparing the modeled operations to the total operations calculated for CY 2026 and applying an adjustment factor as shown in **Table 4-6**. The CY operations were developed by adding 3/4 of FY2026 operations to 1/4 of FY2027 operations.[36] The CY operations for 2026 were slightly higher than the FY; therefore, the emission results are slightly higher than modeled in AEDT.

Table 4-6. Fiscal Year to Calendar Year Adjustment

Year	FY2026	CY2026	Adjustment
2026	816,119	819,663	1.004343

Source: FAA 2021 TAF; Centurion Planning and Design, 2023[30]; Data prepared by HMMH

Total operational emissions are from aircraft operations, GSE, and APUs. AEDT default data for APU and duration was used in the modeling. As discussed in **Section 4.2.2.1**, the GSE equipment and duration were applied to the 19th Street Cargo operations and included as part of this alternative. All other operations used the AEDT default data for GSE equipment and duration.

The 2026 Proposed Action Alternative CAP emission inventory provides aircraft emissions associated with taxi-in, taxi-out, and in-flight operations below the mixing height (AEDT default 3,000 feet). **Table 4-7** provides the operational emissions for all operations for the 2026 Proposed Action Alternative.[37]

[36] CY 2026 = (FY2026 ops / 12) *9 + (FY2027 ops / 12) *3
[37] These results are for all operations (2026 NAA + proposed project passenger operations = 2026 PAA operations)

Table 4-7. Total Aircraft Operational Emissions for CY2026 Proposed Action Alternative

Year	Operational Category	Pollutant (tpy)						
		CO	NO_x	VOC	NMHC	SO_x	$PM_{2.5}$	PM_{10}
2026 (Proposed Action)	Aircraft	3,855.66	4,945.53	476.67	479.16	439.31	43.78	43.78
	GSE LTO	633.96	73.31	28.58	27.18	0.55	4.60	4.90
	APU	125.39	150.79	10.96	11.01	20.23	19.79	19.79
	Total	**4,615.01**	**5,169.63**	**516.20**	**517.36**	**460.09**	**68.18**	**68.47**

Note: These emissions are based on the aircraft operations in Table 2-13 adjusted to CY as shown in Table 4-6.
Source: Data prepared by HMMH

4.2.2.3 Future (2031) No Action Alternative

Aircraft-related emissions were generated in the model based on the FY year data; however, for reporting, CY data is required. The FY emission results were adjusted to CY by comparing the modeled operations to the total operations calculated for CY 2031 and applying an adjustment factor as shown in **Table 4-8**. The CY operations were developed by adding 3/4 of FY2031 operations to 1/4 of FY2032 operations.[38] The CY operations for 2031 were slightly higher than the FY; therefore, the emission results are slightly higher than modeled in AEDT.

Table 4-8. Fiscal Year to Calendar Year Adjustment

Year	FY2031	CY2031	Adjustment
2031	820,035	820,548	1.000626

Source: FAA 2021 TAF; Centurion Planning and Design, 2023[30]; Data prepared by HMMH

Total operational emissions are from aircraft operations, GSE, and APUs. AEDT default data for APU and duration was used in the modeling. As discussed in **Section 4.2.2.1**, the GSE equipment and duration were applied to the 19th Street Cargo operations and included as part of this alternative. All other operations used the AEDT default data for GSE equipment and duration. The NAA CAP emission inventory provides aircraft emissions associated with taxi-in, taxi-out, and in-flight operations below the mixing height (AEDT default 3,000 feet). **Table 4-10** provides the operational emissions for all CY2031 NAA operations.

[38] CY 2031 = (FY2031 ops / 12) *9 + (FY2032 ops / 12) *3

Table 4-9. Total Aircraft Operational Emissions for the CY 2031 NAA

Year	Operational Category	Pollutant (tpy)						
		CO	NO_x	VOC	NMHC	SO_x	$PM_{2.5}$	PM_{10}
2031 (NAA)	Aircraft	3,867.95	5,016.49	475.38	477.87	444.03	44.80	44.80
	GSE LTO	621.20	68.04	28.39	27.00	0.56	4.50	4.79
	APU	121.08	152.98	10.63	10.68	20.33	19.54	19.54
	Total	**4,610.23**	**5,237.51**	**514.40**	**515.55**	**464.92**	**68.84**	**69.14**

Note: These emissions are based on the aircraft operations in Table 2-14 adjusted to CY as shown in Table 4-8.
Source: Data prepared by HMMH

4.2.2.4 Future (2031) Proposed Action Alternative

Aircraft-related emissions were generated in the model based on the FY year data; however, as noted above, CY data is required for reporting. The FY emission results were adjusted to CY by comparing the modeled operations to the total operations calculated for CY 2031 and applying an adjustment factor as shown in **Table 4-10**. The CY operations were developed by adding 3/4 of FY2031 operations to 1/4 of FY2032 operations.[39] The CY operations for 2031 were slightly higher than the FY; therefore, the emission results are slightly higher than modeled in AEDT.

Table 4-10. Fiscal Year to Calendar Year Adjustment

Year	FY2031	CY2031	Adjustment
2031	890,476	894,104	1.004074

Source: FAA 2021 TAF; Centurion Planning and Design, 2023[30]; Data prepared by HMMH

Total operational emissions are from aircraft operations, GSE, and APUs. AEDT default data for APU and duration was used in the modeling. As discussed in **Section 4.2.2.1**, the GSE equipment and duration were applied to the 19th Street Cargo operations and included as part of this alternative. All other operations used the AEDT default data for GSE equipment and duration. The 2031 Proposed Action Alternative CAP emission inventory provides aircraft emissions associated with taxi-in, taxi-out, and in-flight operations below the mixing height (AEDT default 3,000 feet). **Table 4-11** provides the operational emissions for all operations for the 2031 Proposed Action Alternative.[40]

[39] CY 2031 = (FY2031 ops / 12) *9 + (FY2032 ops / 12) *3
[40] These results are for all operations (2036 NAA + the proposed project passenger operations = 2036 PAA operations)

Table 4-11. Total Aircraft Operational Emissions for the CY2031 Proposed Action Alternative

Year	Operational Category	Pollutant (tpy)						
		CO	NO_x	VOC	NMHC	SO_x	$PM_{2.5}$	PM_{10}
2030 (Proposed Action)	Aircraft	4,182.58	5,436.13	509.47	512.14	481.72	48.29	48.29
	GSE LTO	671.18	72.35	30.34	28.86	0.60	4.78	5.09
	APU	135.24	166.95	11.82	11.88	22.20	21.53	21.53
	Total	**4,989.00**	**5,675.43**	**551.63**	**552.88**	**504.52**	**74.59**	**74.91**

Note: These emissions are based on the aircraft operations in Table 2-15 adjusted to CY as shown in Table 4-10.
Source: Data prepared by HMMH

4.2.2.5 Future (2036) No Action Alternative

Aircraft-related emissions were generated in the model based on the FY year data; however, for reporting, CY data is required. The FY emission results were adjusted to CY by comparing the modeled operations to the total operations calculated for CY 2036 and applying an adjustment factor as shown in **Table 4-12**. The CY operations were developed by adding 3/4 of FY2036 operations to 1/4 of FY2037 operations.[41] The CY operations for 2036 were slightly higher than the FY; therefore, the emission results are slightly higher than modeled in AEDT.

Table 4-12. Fiscal Year to Calendar Year Adjustment

Year	FY2036	CY2036	Adjustment
2036	830,354	830,874	1.000626

Source: FAA 2021 TAF; Centurion Planning and Design, 2023[30]; Data prepared by HMMH

Total operational emissions are from aircraft operations, GSE, and APUs. AEDT default data for APU and duration was used in the modeling. As discussed in **Section 4.2.2.1**, the GSE equipment and duration were applied to the 19th Street Cargo operations and included as part of this alternative. All other operations used the AEDT default data for GSE equipment and duration. The NAA CAP emission inventory provides aircraft emissions associated with taxi-in, taxi-out, and in-flight operations below the mixing height (AEDT default 3,000 feet). **Table 4-13** provides the operational emissions for all CY2036 NAA operations.

[41] CY 2036 = (FY2036 ops / 12) *9 + (FY2037 ops / 12) *3

Table 4-13. Total Aircraft Operational Emissions for the CY 2036 NAA

Year	Operational Category	Pollutant (tpy)						
		CO	NO_x	VOC	NMHC	SO_x	$PM_{2.5}$	PM_{10}
2036 (NAA)	Aircraft	3,903.91	5,095.14	479.51	482.02	449.11	45.23	45.23
	GSE LTO	629.48	67.25	28.71	27.30	0.57	4.49	4.79
	APU	122.96	155.55	10.77	10.83	20.68	19.87	19.87
	Total	**4,656.35**	**5,317.94**	**519.00**	**520.16**	**470.36**	**69.59**	**69.89**

Note: These emissions are based on the aircraft operations in Table 22 adjusted to CY as shown in Table 23.

Source: Data prepared by HMMH

4.2.2.6 Future (2036) Proposed Action Alternative

Aircraft-related emissions were generated in the model based on the FY year data; however, for reporting, CY data is required. The FY emission results were adjusted to CY by comparing the modeled operations to the total operations calculated for CY 2036 and applying an adjustment factor as shown in **Table 4-14**. The CY operations were developed by adding 3/4 of FY2036 operations to 1/4 of FY2037 operations.[42] The CY operations for 2036 were slightly higher than the FY; therefore, the emission results are slightly higher than modeled in AEDT.

Table 4-14. Fiscal Year to Calendar Year Adjustment

Year	FY2036	CY2036	Adjustment
2036	963,225	966,666	1.003572

Source: FAA 2021 TAF; Centurion Planning and Design, 2023[30]; Data prepared by HMMH

Total operational emissions are from aircraft operations, GSE, and APUs. AEDT default data for APU and duration was used in the modeling. As discussed in **Section 4.2.2.1**, the GSE equipment and duration were applied to the 19th Street Cargo operations and included as part of this alternative. All other operations used the AEDT default data for GSE equipment and duration. The 2036 Proposed Action Alternative CAP emission inventory provides aircraft emissions associated with taxi-in, taxi-out, and in-flight operations below the mixing height (AEDT default 3,000 feet). **Table 4-15** provides the operational emissions for all operations for the 2036 Proposed Action Alternative.[43]

[42] CY 2036 = (FY2036 ops / 12) *9 + (FY2037 ops / 12) *3

[43] These results are for all operations (2036 NAA + the proposed passenger operations = 2036 PAA operations)

Table 4-15. Total Aircraft Operational Emissions for the CY2036 Proposed Action Alternative

Year	Operational Category	Pollutant (tpy)						
		CO	NO_x	VOC	NMHC	SO_x	$PM_{2.5}$	PM_{10}
2030 (Proposed Action)	Aircraft	4,528.61	5,983.66	550.10	552.98	526.70	54.56	54.56
	GSE LTO	738.39	76.63	33.07	31.46	0.66	5.10	5.45
	APU	140.09	185.37	12.36	12.42	24.28	23.12	23.12
	Total	**5,407.09**	**6,245.66**	**595.53**	**596.87**	**551.64**	**82.78**	**83.12**

Note: These emissions are based on the aircraft operations in Table 2-17 adjusted to CY as shown in Table 4-14.

Source: Data prepared by HMMH

4.2.3 Change in Aircraft Operational Emissions

Changes between the CY2026 Proposed Action Alternative emissions in **Table 4-7** and the CY2026 NAA in **Table 4-5**, changes between the CY2031 Proposed Action Alternative emissions in **Table 4-11** and the CY2031 NAA in, and changes between the CY2036 Proposed Action Alternative emissions in **Table 4-15** and the CY2036 NAA in **Table 4-13** are a result of the additional passenger operations due to the Proposed Action. **Table 4-16** provides the comparison between the Future CY2026, CY2031, and CY2036 NAA and the Proposed Action operational emissions.

Table 4-16. Change in Aircraft Operational Emissions due to the Proposed Action Alternative

Year	Operational Category	Pollutant (tpy)						
		CO	NO_x	VOC	NMHC	SO_x	$PM_{2.5}$	PM_{10}
CY2026 (Proposed Action – No Action)	Aircraft	32.68	49.42	3.58	3.60	3.90	0.26	0.26
	GSE LTO	4.10	0.40	0.17	0.16	0.00	0.02	0.03
	APU	1.67	1.30	0.16	0.17	0.19	0.27	0.27
	Total	**38.45**	**51.12**	**3.91**	**3.93**	**4.09**	**0.56**	**0.56**
CY2031 (Proposed Action – No Action)	Aircraft	314.63	419.64	34.09	34.27	37.69	3.48	3.48
	GSE LTO	49.99	4.31	1.95	1.86	0.04	0.28	0.30
	APU	14.16	13.96	1.19	1.20	1.87	1.98	1.98
	Total	**378.78**	**437.92**	**37.23**	**37.33**	**39.60**	**5.75**	**5.77**
CY2036 (Proposed Action- No Action)	Aircraft	624.70	888.52	70.59	70.96	77.59	9.33	9.33
	GSE LTO	108.91	9.38	4.36	4.16	0.09	0.61	0.66
	APU	17.13	29.82	1.58	1.59	3.60	3.25	3.25
	Total	**750.74**	**927.72**	**76.53**	**76.71**	**81.28**	**13.19**	**13.24**

Source: Data prepared by HMMH

4.2.4 Vehicle Traffic

The CAP emissions inventory for vehicle traffic for the Existing Conditions is provided in **Table 4-17**, while the No Action Alternative and the Proposed Project emission inventories are provided in **Table 4-18**. The net operational CAP emissions (i.e., Proposed Action less No Action emissions) for vehicle traffic quantify the incremental operational emissions increases estimated to occur for the Proposed Project.

Table 4-17. Existing Conditions Vehicle Traffic CAP Emissions Inventory

Scenario	Project Year	Emissions (tons/yr)					
		NOx	CO	VOC	SO_2	Total PM_{10}	Total $PM_{2.5}$
Existing Conditions	2022	225	1,890	52	1.5	28	8.2

Source: Data prepared by Ramboll

Table 4-18. Operational Phase Vehicle Traffic CAP Emissions Inventory

Scenario	Project Year	Emissions (tons/yr)					
		NOx	CO	VOC	SO_2	Total PM_{10}	Total $PM_{2.5}$
Proposed Action	2026	183	1,933	42	1.7	33	7.8
No Action	2026	183	1,931	42	1.7	33	7.8
2026 Onroad Emission Difference		**0.13**	**1.4**	**0.031**	**0.0012**	**0.024**	**0.0057**
Proposed Action	2031	125	1,662	34	1.7	35	6.7
No Action	2031	116	1,538	32	1.6	32	6.2
2031 Onroad Emission Difference		**9.3**	**124**	**2.5**	**0.13**	**2.6**	**0.50**
Proposed Action	2036	111	1,485	32	1.8	38	6.5
No Action	2036	96	1,284	28	1.5	32	5.6
2036 Onroad Emission Difference		**15**	**201**	**4.4**	**0.24**	**5.1**	**0.88**

4.2.5 All Operational Sources Summary

The CAP emissions inventory for the Existing Conditions, No Action Alternative and the Proposed Project are provided in **Table 4-19**, **Table 4-20** and **Table 4-21**, respectively. **Table 4-22** shows the net operational CAP emissions (i.e., Proposed Action less No Action emissions) to quantify the incremental operational emissions increases estimated to occur for the Proposed Project. Aircraft, GSE, APUs, and vehicle traffic emissions are all expected to increase under the Proposed Project relative to the No Action Alternative.

Table 4-19. Existing Conditions Operational Phase CAP Emissions Inventory

Project Year	Emissions Source	Emissions (short tons/yr) [a]					
		NO_X	CO	VOC	SO_2	Total PM_{10}	Total $PM_{2.5}$
2022	Aircraft [b]	3,495	2,939	388	325	33	33
2022	GSE	55	556	21	0.39	3.3	3.1
2022	APU	115	112	9.5	16	16	16
2022	Traffic	225	1,890	52	1.5	28	8.2
2022	**Total**	**3,890**	**5,497**	**470**	**343**	**81**	**60**

Table 4-20. No Action CAP Emissions Inventory

Project Year	Emissions Source	Emissions (short tons/yr) [a]					
		NO_x	CO	VOC	SO_2	Total PM_{10}	Total $PM_{2.5}$
2026	Aircraft [b]	4,896	3,823	473	435	44	44
2026	GSE	73	630	28	0.55	4.9	4.6
2026	APU	149	124	11	20	20	20
2026	Traffic	183	1,931	42	1.7	33	7.8
2026	**Total**	**5,301**	**6,508**	**554**	**458**	**101**	**75**
2027	Aircraft [b]	4,920	3,832	474	437	44	44
2027	GSE	72	628	28	0.55	4.9	4.6
2027	APU	150	123	11	20	20	20
2027	Traffic	169	1,853	40	1.7	33	7.5
2027	**Total**	**5,311**	**6,436**	**553**	**459**	**101**	**75**
2028	Aircraft [b]	4,944	3,841	474	439	44	44
2028	GSE	71	626	28	0.55	4.8	4.5
2028	APU	151	123	11	20	20	20
2028	Traffic	156	1,774	38	1.6	32	7.2
2028	**Total**	**5,322**	**6,364**	**551**	**461**	**101**	**75**
2031	Aircraft [b]	5,016	3,868	475	444	45	45
2031	GSE	68	621	28	0.56	4.8	4.5
2031	APU	153	121	11	20	20	20
2031	Traffic	116	1,538	32	1.6	32	6.2
2031	**Total**	**5,353**	**6,148**	**546**	**467**	**101**	**75**
2036	Aircraft [b]	5,095	3,904	480	449	45	45
2036	GSE	67	629	29	0.57	4.8	4.5
2036	APU	156	123	11	21	20	20
2036	Traffic	96	1,284	28	1.5	32	5.6
2036	**Total**	**5,414**	**5,940**	**547**	**472**	**102**	**75**

[a] 2027 and 2028 operational phase emission estimates are linear interpolations of 2026 and 2031 emissions for use in comparison to General Conformity de minimis thresholds.

[b] Includes emissions associated with taxi-in, taxi-out and in-flight operations below mixing height.

Table 4-21. Proposed Project Operational Phase CAP Emissions Inventory

Project Year	Emissions Source	Emissions (short tons/yr) [a]					
		NO_x	CO	VOC	SO_2	Total PM_{10}	Total $PM_{2.5}$
2026	Aircraft [b]	4,946	3,856	477	439	44	44
2026	GSE	73	634	29	0.55	4.9	4.6
2026	APU	151	125	11	20	20	20
2026	Traffic	183	1,933	42	1.7	33	7.8
2026	**Total**	**5,352**	**6,548**	**558**	**462**	**101**	**76**
2027	Aircraft [b]	5,044	3,921	483	448	45	45
2027	GSE	73	641	29	0.56	4.9	4.6
2027	APU	154	127	11	21	20	20
2027	Traffic	171	1,878	41	1.7	33	7.6
2027	**Total**	**5,442**	**6,568**	**564**	**471**	**103**	**77**
2028	Aircraft [b]	5,142	3,986	490	456	46	46
2028	GSE	73	649	29	0.57	5.0	4.7
2028	APU	157	129	11	21	20	20
2028	Traffic	160	1,824	39	1.7	34	7.4
2028	**Total**	**5,532**	**6,589**	**569**	**480**	**105**	**78**
2031	Aircraft [b]	5,436	4,183	509	482	48	48
2031	GSE	72	671	30	0.60	5.1	4.8
2031	APU	167	135	12	22	22	22
2031	Traffic	125	1,662	34	1.7	35	6.7
2031	**Total**	**5,801**	**6,651**	**586**	**506**	**110**	**81**
2036	Aircraft [b]	5,984	4,529	550	527	55	55
2036	GSE	77	738	33	0.66	5.4	5.1
2036	APU	185	140	12	24	23	23
2036	Traffic	111	1,485	32	1.8	38	6.5
2036	**Total**	**6,357**	**6,892**	**628**	**553**	**121**	**89**

[a] 2027 and 2028 operational phase emission estimates are linear interpolations of 2026 and 2031 emissions for use in comparison to General Conformity de minimis thresholds.

[b] Includes emissions associated with taxi-in, taxi-out and in-flight operations below mixing height.

Table 4-22. Net Operational Phase CAP Emissions Inventory

Project Year	Emissions Source	Emissions (short tons/yr) [a]					
		NO_X	CO	VOC	SO_2	Total PM_{10}	Total $PM_{2.5}$
2026	Aircraft [b]	49	33	3.6	3.9	0.26	0.26
2026	GSE	0.40	4.1	0.17	0.0034	0.026	0.025
2026	APU	1.3	1.7	0.16	0.19	0.27	0.27
2026	Traffic	0.13	1.4	0.031	0.0012	0.024	0.0057
2026	**Total**	**51**	**40**	**3.9**	**4.1**	**0.59**	**0.57**
2027	Aircraft [b]	123	89	10	11	0.91	0.91
2027	GSE	1.2	13	0.52	0.011	0.082	0.076
2027	APU	3.8	4.2	0.37	0.53	0.62	0.62
2027	Traffic	2.0	26	0.53	0.027	0.54	0.11
2027	**Total**	**130**	**132**	**11**	**11**	**2.1**	**1.7**
2028	Aircraft [b]	198	145	16	17	1.6	1.6
2028	GSE	2.0	22	0.88	0.019	0.14	0.13
2028	APU	6.4	6.7	0.58	0.86	1.0	1.0
2028	Traffic	3.8	50	1.0	0.052	1.0	0.20
2028	**Total**	**210**	**225**	**18**	**18**	**3.7**	**2.8**
2031	Aircraft [b]	420	315	34	38	3.5	3.5
2031	GSE	4.3	50	1.9	0.042	0.30	0.28
2031	APU	14	14	1.2	1.9	2.0	2.0
2031	Traffic	9.3	124	2.5	0.13	2.6	0.50
2031	**Total**	**447**	**503**	**40**	**40**	**8.4**	**6.3**
2036	Aircraft [b]	889	625	71	78	9.3	9.3
2036	GSE	9.4	109	4.4	0.093	0.66	0.61
2036	APU	30	17	1.6	3.6	3.3	3.3
2036	Traffic	15	201	4.4	0.24	5.1	0.88
2036	**Total**	**943**	**952**	**81**	**82**	**18**	**14**

[a] 2027 and 2028 Operation emission estimates are linear interpolations of 2026 and 2031 emissions for use in comparison to General Conformity de minimis thresholds.

[b] Includes emissions associated with taxi-in, taxi-out and in-flight operations below mixing height.

4.3 General Conformity De Minimis Thresholds

As shown in **Table 4-23** , the combined construction and operational NO_X emissions exceed the applicable *de minimis* threshold under the current severe designation for the Dallas-Fort Worth Ozone Nonattainment Area for NO_X in 2024, 2025, 2026, 2027, 2028, 2031, and 2036 and for VOCs in 2031 and 2036

Table 4-23. Combined Construction and Operational Emissions Compared to De Minimis Thresholds

Project Year	Project Emissions (short tons/yr)		General Conformity De Minimis Threshold (short tons/yr)		Project Emissions less than General Conformity De Minimis Threshold?	
	NO_X	VOC	NO_X	VOC	NO_X	VOC
Current "Severe" Ozone Classification *						
2024	23.6	4.1	25	25	Yes	Yes
2025	35.8	8.8	25	25	No	Yes
2026	73.1	7.3	25	25	No	Yes
2027	135.6	11.8	25	25	No	Yes
2028	211.8	18.6	25	25	No	Yes
2031	447.2	39.8	25	25	No	No
2036	942.8	80.9	25	25	No	No

4.4 Project Alternatives

Under the No Action Alternative, DFW would not implement the proposed CTA Expansion and requisite modifications. The No Action Alternative would not involve any construction activities; therefore, there would be no construction emissions. With the No Action Alternative, the terminals would continue to deteriorate, and the airport would be ill-equipped to meet growing travel demand. The emissions impacts under the No Action Alternative were discussed above.

4.5 General Conformity Determination

The results from the emission inventory indicate that the construction emissions from the Proposed Project will trigger an exceedance of *de minimis* thresholds for NO_X and the operational emissions from the Proposed Project will trigger an exceedance of *de minimis* thresholds for both NO_X and VOCs. Thus, under federal General Conformity requirements[5], DFW must submit a General Conformity Determination for the Proposed Project. In order to demonstrate conformity, the General Conformity Determination must demonstrate that emissions from the Proposed Project would not exceed the emissions budgets in the SIP for each year an actions emissions exceed applicable *de minimis* thresholds for a pollutant[44] as described below.

1) The total direct and indirect emissions from the action are specifically identified and accounted for in the federally approved SIP; or

2) All direct and indirect emissions are fully offset such that there is no net increase of emissions of the pollutant or its precursors; or

[44] FAA. 2015. Aviation Emissions and Air Quality Handbook. Version 3, Update 1. Aviation Emissions and Air Quality Handbook (faa.gov)

3) The Proposed Project will not cause or contribute to a NAAQS violation in the area based on area-wide or local air quality modeling, and it will not increase the frequency or severity of any existing violation; or

4) State/local agency agrees to revise the SIP to accommodate the action's emissions.

A General Conformity Determination will be prepared because annual emissions from the Proposed Project exceed General Conformity *de minimis* thresholds (for severe ozone nonattainment areas) for NO_X (in 2025, 2026, 2027, 2028, 2031, and 2036) and VOCs (in 2031 and 2036). The approach used to meet General Conformity requirements must be approved by FAA in collaboration with DFW and TCEQ. Please see the associated General Conformity Determination submittal[45] for more information.

[45] Ramboll, 2023. Draft General Conformity Determination for the Dallas Fort Worth (DFW) Airport Development Project. September.

APPENDIX A: DETAILED CONSTRUCTION PHASE ONROAD EMISSIONS DATA

APPENDIX B: DETAILED CONSTRUCTION PHASE NONROAD EMISSIONS DATA

APPENDIX C: DETAILED CONSTRUCTION PHASE NONROAD RECLASSIFIED EMISSIONS DATA

APPENDIX D: DETAILED CONSTRUCTION PHASE FUGITIVE EMISSIONS DATA

APPENDIX E: DETAILED OPERATIONAL PHASE ONROAD TRAFFIC EMISSIONS DATA