Appendix B1: DRAFT DFW Runway 18L/36R Rehabilitation Project Construction Emissions Summary

August 2025

Recipients:	Cristian Sigala, DFW EAD Sam Tan, DFW EAD
HDR Project Manager:	Esther Chitsinde, HDR, Inc.
Prepared by:	Vicky Hsu, HDR, Inc. Steven Yu, HDR, Inc.
Reviewed by:	Ronald Ying, HDR, Inc. Kris Lloyd, HDR, Inc.

Executive Summary

This technical report provides an assessment of the construction air quality impacts associated with the Runway 18L/36R Rehabilitation Project (proposed action) at Dallas Fort Worth International Airport (the Airport or DFW). The proposed project consists of airside improvements to Runway 18L/36R that would involve demolition of existing taxiway pavement, installation of an asphalt overlay and no-taxi islands, utility improvements, and rehabilitation of runway stormwater drainage.

HDR evaluated impacts to air quality due to the proposed project for National Environmental Policy Act (NEPA) purposes in accordance with the guidelines provided in the Federal Aviation Administration (FAA) Aviation Emissions and Air Quality Handbook Version 4 (FAA Handbook); FAA Order 5050.4B: *NEPA Implementing Instructions for Airport Actions*; FAA Order 1050.1G: *NEPA Implementing Procedures*, and FAA Order 1050.1 *Desk Reference, Environmental Impacts: Policies and Procedures*.

HDR estimated criteria air pollutant (CAP) emissions associated with construction of the proposed project during the years 2026 and 2027. Proposed project construction emission estimates were developed based on 1) activity estimates for vehicle, nonroad equipment, and fugitive dust provided by DFW and 2) emission factors from the United States Environmental Protection Agency (USEPA) Motor Vehicle Emission Simulator (MOVES5), Texas Commission on Environmental Quality (TCEQ) TexN2.5, and USEPA AP-42 guidance.

HDR evaluated the proposed project's significance with respect to air pollutant emissions by comparing the estimated emissions to applicable USEPA *de minimis* levels under General Conformity Rules (40 CFR 93, Subpart B). As of September 3, 2025, DFW is in a Severe Ozone Non-Attainment Area for the 2008 8-hour ozone standard. Therefore, the proposed project is subject to 25 tons per year (tpy) volatile organic compounds (VOC) and nitrogen oxides (NO_x) *de minimis* thresholds under the General Conformity Rules. This analysis was initiated to determine compliance with the Clean Air Act (CAA) and the TCEQ Dallas-Fort Worth Eight-Hour Ozone State Implementation Plan (SIP). Executive Summary **ES: Table** 1 shows that annual construction emissions from the proposed project are below applicable *de minimis* thresholds of 25 tpy for NOx or VOCs. However, when the construction and aircraft operational emissions are combined, the total project emissions would exceed the *de minimis* thresholds for NOx and VOCs. Aircraft operational emissions were modeled using the FAA Aviation Environmental Design Tool (AEDT version 3g). The aircraft operational emissions were modeled by HMMH and are detailed in the Operational Emissions Technical Report (Appendix B)

ES: Table 1. Proposed Project Construction Emissions

Project Year	Project Emissions (tpy)		General Conformity De Minimis Threshold1 (tpy)	
	NO_x	VOC	NO_x	VOC
2026	14.24	6.68	25	25
2027	9.49	4.45	25	25

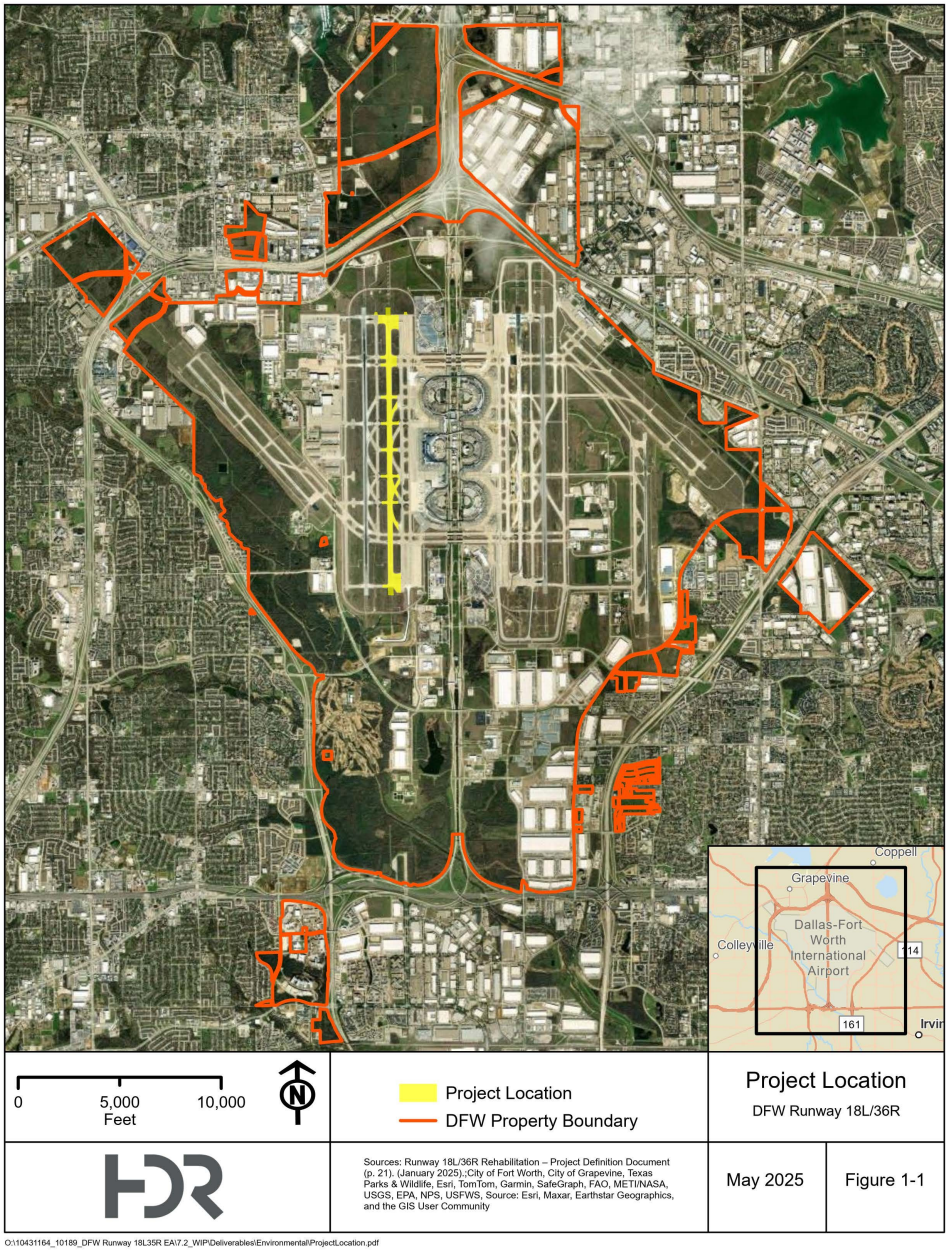
Source: HDR 2025

1 Introduction

This construction emissions technical report presents the construction emissions modeling results for the proposed Runway 18L/36R Rehabilitation Project at DFW, located in Dallas and Tarrant counties, Texas (**Figure 1**). This summary report provides an assessment of the air quality impacts associated with the construction of the proposed project. This summary report describes the scope and methodology for evaluation of air quality from construction sources and compares the construction emissions to the standards of significance identified by the Federal Clean Air Act. The estimated construction emissions were calculated using the TexN2.5 Utility which is compatible with USEPA's MOVES5. The analysis was completed based on the Civil Design Plans and other project data provided by the DFW Airport team, on behalf of the project developer.

The purpose of the summary report is to support compliance with the NEPA and other applicable federal, state, and location regulatory requirements.

Figure 1. Project Location Map



1.1 Overall Approach and Regulatory Setting

NEPA provides for an environmental review process to disclose the potential impacts, including on air quality, from a proposed federal action on the human environment. Per the USEPA, NEPA's policy is to assure that all branches of government properly consider 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 purposes are determined in accordance with the guidelines provided in the FAA Handbook; FAA Order 5050.4B, NEPA Implementing Instructions for Airport Actions; and FAA Order 1050.1G, Environmental Impacts: Policies and Procedures. Potential air quality impacts are required to be analyzed per these orders and guidance.

FAA 1050.1F, Exhibit 4-1, Significance Determination for FAA Actions, 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." This analysis develops emissions inventories to determine the projected net annual increase in emissions consistent with the FAA Handbook. The General Conformity Rule ensures that federal activities do not cause or contribute to a violation of NAAQS.

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 sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and Lead (Pb). The NAAQS are expressed in terms of pollutant concentration measured over a defined period of time and are two-tiered, with the primary standard intended to protect public health and the secondary standard intended to protect public welfare and the environment. The primary and secondary NAAQS standards for the CAPs are shown in **Table 2**.

Table 2. National Ambient Air Quality Standards

Pollutant	Averaging Time	Primary Standards	Secondary Standards
CO	Eight-hour	9 parts per million (ppm)	None
	One-hour	35 ppm	None
Pb	Rolling Three-Month Average	0.15 µg/m^3	Same as Primary
NO_2	Annual Arithmetic Mean	53 parts per billion (ppb)	Same as Primary
	One-hour	100 ppb Note 2	None
O_3	Eight-hour (2015 standard) Note 4	0.070 ppm	Same as Primary
$PM_{2.5}$	Annual Arithmetic Mean	9 µg/m^3 Note 5	15 µg/m^3
	24-hour	35 µg/m^3	Same as Primary
PM_{10}	24-hour	150 µg/m^3 Note 1	Same as Primary
SO_2	One-hour	75 ppb Note 3	None
	Three-hour	None	10 ppb

Source: USEPA. 2025. NAAQS Table. Available at: https://www.epa.gov/criteria-air-pollutants/naaqs-table. Accessed: September 2025.

Notes:

1. For PM_{10}, the 24-hour standard is not to be exceeded more than once per year on average over three years. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or are less than the standard.
2. To attain this standard, the three-year average of the 98th percentile of the daily maximum one-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).
3. Final rule signed June 2, 2010. To attain this standard, the three-year average of the 99th percentile of the daily maximum one-hour average at each monitor within an area must not exceed 75 ppb.
4. US EPA updated the NAAQS for O_3 to strengthen the primary eight-hour standard to 0.07 ppm on October 1, 2015. An area will meet the standard if the fourth-highest maximum daily eight-hour O_3 concentration per year, averaged over three years is equal to or less than 70 ppb.
5. US EPA strengthened the annual PM2.5 standard to 9 µg/m^3 on February 7, 2024. https://www.epa.gov/newsreleases/epa-finalizes-stronger-standards-harmful-soot-pollution-significantly-increasing

Specific geographic areas are classified as either "attainment" or "non-attainment" areas for each pollutant, based on comparing ambient air monitoring data with NAAQS. Those areas designated as "non-attainment" for purposes of NAAQS compliance 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 are developed to meet federal requirements and are included in an overall program referred to as the SIP.

The proposed DFW Runway 18L/36R Rehabilitation Project site is located in Dallas County, within the Dallas-Fort Worth metropolitan area and according to the USEPA, the Dallas-Fort Worth metropolitan area is designated as:

- *Attainment or Unclassified* for CO (1-hour (hr), 8-hr), NO_2 (1-hr, Annual), Sulfur Dioxide (SO_2) (1-hr, 3-hr.), PM_{10} (24-hr), $PM_{2.5}$ (24-hr, Annual), and Pb (Rolling 3-month average)
- *Severe Nonattainment* [1] for O_3 under the 2008 standard 8-hr averaging period
- *Serious Nonattainment* for O_3, under the 2015 standard 8-hr averaging period

As indicated above, the *Nonattainment* designation for the project area is limited to O_3, a secondary air pollutant formed in the atmosphere when NO_x and VOCs react under exposure to solar radiation. O_3 is considered a regional pollutant because NO_x and VOC emissions throughout the airshed are involved in the formation of O_3. A regional photochemical model that considers emissions throughout the airshed is used to model ozone concentrations. The potential project related impacts to ozone concentrations are typically based on estimates of annual or daily emissions of NO_x and VOC, measured in tpy or grams per day (gpd).

1.2 Existing Conditions

DFW is a commercial service airport that currently encompasses 17,207 acres (approximately 27 square miles) in Dallas and Tarrant counties. In the National Plan of Integrated Airport Systems, the FAA classifies the Airport as a large hub primary commercial service airport[2]. DFW's airfield system consists of seven runways (13L/31R, 13R/31L, 17C/35C, 17L/35R, 17R/35L, 18L/36R, and 18R/36L) separated by a spine road, International Parkway, into the east and west airfield complexes. DFW has five passenger terminals named Terminals A, B, C, D, and E.

Runway 18L/36R is 13,401 foot long and serves as DFW's west airfield primary departure runway. Runway 18L/36R is 200 feet wide with 40-foot-wide asphalt shoulders and accommodates Airplane Design Group (ADG) VI. The Runway 18L/36R Rehabilitation Project is part of DFW's Comprehensive Runway Rehabilitation Program, which started in 2018. This comprehensive rehabilitation program started with the rehabilitation of Runway 17C/35C from May 2018 to March 2019. In June 2020, DFW then initiated a project to rehabilitate Runway 18R/36L, which was completed in April 2021. In August 2023, DFW started the Runway 17R/35L Rehabilitation Project and completed it in October 2024. Runway 18L/36R is the fourth runway in the rehabilitation program; based on the 2019 pavement condition index (PCI) report, the condition of the keel section received a "fair" score of 66 and needed rehabilitation to restore the asset to good condition, reduce the number of unplanned runway closures and reduce maintenance costs. Since 2019, the Runway 18L/36R pavement has continued to deteriorate and evaluations of the pavement conditions sered signs of continued distress and deficiencies attributed to age infrastructure and inadequate drainage conditions. Similar to the recently completed projects in Comprehensive Runway Rehabilitation Program, the Runway 18L/36R Rehabilitation Project will also include installation of an asphalt overlay that will provide a reliable operational surface and standard maintenance cycle that aligns with the previous runway rehabilitation projects.

1.3 Project Description

Under the proposed project, the rehabilitation of Runway 18L/36R would consist of a closure of the runway from May 2026 through April 2027. During the period when the runway is closed, all aircraft operations would be moved from Runway 18L/36R; this change in aircraft operations and runway

[1] USEPA. Greenbook. 2024. Texas Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Available at: https://www3.epa.gov/airquality/greenbook/anayo_tx.html. Accessed: November 2024.

[2] FAA. Appendix A: List of NPIAS Airports. 2024. Available at: https://www.faa.gov/sites/faa.gov/files/airports/planning_capacity/npias/current/ARP-NPIAS-2025-2029-Appendix-A.pdf. Accessed September 2025.

utilization operations would be temporary, during the construction period only. The proposed project would include two phases:

- ***Phase 1*** would generally consist of construction of the PSLs at the north end of the project area. Near the end of Phase 1, Runway 18L/36R would be closed nightly for partial depth saw cutting. Phase 1 would also include the relocation of the Runway 36R threshold and partial demolition of Runway 36R Run-Up Area. The temporary relocation of the threshold would maintain a usable runway length of approximately 9,000 feet for ADG-III operations. Phase 1 would be scheduled to start in May 2026 and finish in August 2026.
- ***Phase 2*** would consist of the construction of an additional PSL and the demolition and reconstruction of the runway, connecting taxiways and rehabilitation of the NWHP. This phase would require the full closure of the runway. Taxiway WM would remain open at all times. Phase 2 would be scheduled to start in August 2026 and finish in April 2027.

The detailed project scope includes the following:

- Pavement and rehabilitation
    - Select panel replacement, joint seal, and spall repair
    - Reduce width of runway from 200 feet to 150 feet
    - Full-depth reconstruction of shoulder pavements to meet FAA AC 150/53000-13B Change 1 requirement
    - Full depth reconstruction of the blast pad to meet ADG VI runway design standards
    - Application of 6-inch Hot Mix Asphalt (HMA) overlay
- Non-FAA circuit rehabilitation (will be removed and either moved to a new location or returned to current location)
    - Touchdown zone, centerline, and edge light emitting diode (LED) upgrades
    - Manholes replaced with junction can plazas
    - Replacement of in-pavement can lights including taxiways
    - Non-standard signs with pig tails
    - Temperature sensors
    - Electrical box relocation (ADG-VI obstruction)
    - Removal of old electrical infrastructure in the Southwest Holdpad (SWHP)
- Utility improvements and rehabilitation of runway stormwater drainage
    - Relocate stormwater inlets
    - Relocate stormwater inlets within Taxiway F safety area
- Reset runway hold position markings
- Northwest Holdpad (NWHP) Rehabilitation and Taxiway Design Group (TDG) 6 Fillet Modifications
- SWHP TDG 6 Fillet Modifications
- TDG 6 fillet modifications and select panel replacement of all taxiways and high-speed taxiway exits within the Runway 18L/36R Object Free Area (OFA)
- Demolition of existing taxiway pavement on Taxiway WK, between Taxiways E and F
- Demolition of taxiway pavement on Taxiway G8, between Taxiways E and F
- Demolition of taxiway pavement on Taxiway WL, between Taxiways E and F
- Demolition of taxiway pavement on Taxiway F4, between Runway 18L/36R and Taxiway F
- Rehabilitation of Taxiway WF pavement, south of taxiway centerline
- Construction of the Northwest End Around Taxiway (NW EAT) pavement, north of Runway 18L within Runway Safety Area (RSA)
- Partial demolition of the Runway 36R run-up threshold
- Installation of No-Taxi islands at the following locations:
    - East of the Runway 18L threshold between Taxiway WF and Taxiway WG
    - East of the Runway 18L threshold between Taxiway WG and Taxiway WH
    - West of the Runway 18L threshold between Taxiway WF and Taxiway WG
    - East of the Runway 36R threshold between Taxiway WP and Taxiway WQ
    - East of the Runway 36R threshold between Taxiway WQ and Taxiway WR
    - East of Runway 18L/36R, between Taxiway Y and Taxiway Z
- Construction of requisite utilities and improvements to lighting, signage, and stormwater drainage infrastructure

- Final site-area grading, topsoil, seed/sod, and other erosion controls, as necessary. Limits of grading, topsoil, and sodding to encompass areas beyond the inlets/drains to mitigate infield problem areas; and
- Temporary lighting, signage, and pavement markings installation, as necessary, to support temporary taxiway routing during various phases of construction.

1.4 Project Construction Schedule

The construction of the proposed rehabilitation of Runway 18L/36R is anticipated to begin in May 2026 and be completed in April 2027. It is assumed that 60% of the construction activities would occur in 2026 and 40% of the construction activities would occur in 2027. There would be two main phases: shorten runway phase and full runway closure phase. The breakdown of the two phases by calendar year are shown in **Table 3**.

Table 3. Project Construction Schedule

Phase (Year)	Estimated Start and End Dates	Duration (days)
Shorten Runway (2026)	5/1/2026 to 8/13/2026	60 days
Full Runway Closure (2026)	8/14/2026 to 12/31/2026	140 days
Full Runway Closure (2027)	1/1/2027 to 4/30/2027	133 days

Source: DFW Airport Planning and DCC Departments

2 Methodology and Inventory

2.1.1 Air Quality Assessment Procedure

The FAA Handbook lays out steps needed to complete an air quality assessment under NEPA. This assessment process is intended for projects requiring a Federal Action, which are defined as aviation-related projects that require FAA funding, licensing, permitting, or approval. The NEPA air quality assessment can determine if Federal Action-generated emissions would exceed one or more of NAAQS and provide sufficient documentation of that assessment. The following steps are as follows:

1. Determine if the Federal Action falls within an exemption to General Conformity.
2. Does the Federal Action qualify as Presumed to Conform?
3. Determine if the Federal Action is in an EPA-designated nonattainment area or maintenance area
4. Evaluate if Attainment Screening Criteria is exceeded[3].

The proposed project is neither exempt nor presumed to conform. The proposed project is located in a severe nonattainment area for ozone. Therefore, based on the results of Steps 1 through 4 above, an air quality assessment has been conducted.

2.1.2 Construction Scenario Evaluated

HDR evaluated the ozone precursors, NO_x and VOCs, emissions associated with construction of the proposed project. The proposed project, which is the only scenario evaluated, would include demolition of taxiway pavement, pavement and circuit rehabilitation, and utility improvements. Construction emissions depend on activity levels for heavy-duty construction equipment, truck haul trips (bulk deliveries and demo debris to local landfill), and vehicle trips made by construction workers and vendors/material deliveries (cement mixer) traveling to and from the proposed project site.

2.1.3 Construction Emissions Inventory

Construction of the proposed project would generate emissions from construction equipment, material delivery trips, concrete and asphalt haul trips, construction worker- and vendor trips, asphalt drying, and

[3] FAA. 2024. Aviation Emissions and Air Quality Handbook Version 4. Available at: https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook/files/airquality_handbook_version_4.pdf. Accessed: September 2025

concrete storage and batching. Emissions would be generated from on-road vehicles and nonroad construction equipment, including but not limited to excavators, rollers, compressors, skid steer loaders, rubber tire loaders, concrete saws, pumps, bore drill rigs, trenchers, striping machines, backhoes, hoe rams, paint sprayers, cement mixers, cement delivery trucks, water trucks, passenger vehicles/trucks, and heavy-duty dump trucks. A full list of construction equipment and vehicles is included in **Appendix A**. The project details, construction schedule, and design plans were provided by DFW.

2.1.4 Emission Factors

For this analysis, emission factors were generated using MOVES5 and the TexN2.5 database to develop on-road and nonroad emission factors specific to Dallas County. These emission factors were applied to estimates of vehicle miles traveled (VMT) and construction equipment (hours, horsepower, load factor), respectively, for each construction activity and year. Spreadsheet calculations for construction are presented in **Appendix A**.

2.1.4.1 On-Road Equipment

HDR used MOVES5 to estimate on-road equipment emission factors for calendar year 2026. It is conservatively assumed that emission factors in 2027 would be similar to 2026. MOVES5 was run at a default (national) scale for Dallas County. Emissions and activity were output from MOVES by vehicle type, fuel type, road type, and process type for each calendar year. Passenger vehicles (light duty trucks and cars) are assumed to be gasoline fueled while dump trucks are assumed to be diesel fueled. One way trip lengths were assumed to be 20 miles to the nearest landfill and 30 miles for vendor and worker trips. Emissions were aggregated over several emission process types to facilitate application to activity for development of proposed project emissions.

2.1.4.2 Nonroad Equipment

To model the proposed project construction emissions from nonroad equipment, HDR used TexN2.5 with MOVES5 for calendar year 2026. It is conservatively assumed that emission factors in 2027 would be similar to 2026. TexN2.5 was run at a default scale for Dallas County. HDR utilized the construction schedule and project activity data such as equipment operating hours, equipment types, fuel types, and equipment size (horsepower). Most equipment provided was from model year 2000-2007. DFW-provided equipment activity was cross referenced to TexN2.5 equipment types based on name matching and experience in assigning appropriate types. Equipment emission factors matching those equipment proposed for the project were taken from the TexN2.5 database by dividing emission quantities by activity hours.

2.1.4.3 Fugitive VOC Emissions

Fugitive VOC emissions would be generated during the asphalt drying process, as VOCs are released when asphalt is laid at high temperatures and cools down. These fugitive VOC emissions were calculated using the FAA Handbook.

2.1.4.4 PM Emissions

PM_{10} and $PM_{2.5}$ emissions would be generated during concrete storage and batching. PM emissions were calculated using emission factors from AP-42 Section 11.12 “Concrete Batching” and the volume of asphalt for the proposed project.

2.1.4.5 Dust Emissions

Both fugitive dust and resuspended road dust emissions were calculated. Fugitive dust emissions were estimated using the Western Governors’ Association Western Regional Air Partnership (WRAP) Handbook. WRAP Level 1, which relies on the acreage affected, was used to determine PM emissions from soil disturbance and wind erosion. WRAP Level 4, which relies on mileage, was used to determine PM emissions from vehicle travel on unpaved roads. A limited 1/2 mi of on-site haulage (on unpaved work areas) is assumed for each dump truck roundtrip. DFW typically does not allow unpaved roads on the Airport Operations Area. For travel on paved roads, resuspended road dust emissions were calculated using AP-42 Section 13.2.1 “Paved Roads”.

3 Significance Thresholds

This section discusses the criteria and general methods used to evaluate the proposed Project's significance with respect to air quality impacts under NEPA. Emissions inventories are used to determine a proposed project's potential impact on air quality. The emissions inventories are compared to pollutant-specific *de minimis* thresholds established by the EPA. Per FAA Order 1050.1 Desk Reference, a significant air quality impact occurs when the proposed project *would cause pollutant concentrations to exceed one or more of the NAAQS, as established by the EPA under the CAA [Clean Air Act] section 176(c)146*, *for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations*[4].

The CAA conformity requirement integrates air quality planning on the state level with project planning on a federal level, to protect the integrity of state plans for improving air quality in in areas that do not meet the NAAQS—nonattainment and maintenance areas. The General Conformity Rule ensures that federal actions, such as airport development projects in nonattainment or maintenance areas, comply with the CAA and do not cause or contribute to a violation of NAAQS. When performing a General Conformity analysis, the FAA considers a range of factors, including:

- If action will occur in a Non-attainment 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* levels, and
- If an EPA-approved SIP has an emissions budget for which emissions with the action could be compared

As previously stated, the DFW metropolitan area is designated as a *Severe* nonattainment area for O_3, based on the 2008 eight-hour ozone standard and *Serious* nonattainment area for O_3, based on the 2015 eight-hour ozone standard. The applicable de minimis threshold based on the *Severe* nonattainment area designation is 25 tpy for each ozone precursor pollutant (NO_x and VOCs).

4 Results

4.1 Estimated Construction Emissions Inventory Results

HDR estimated NO_x and VOCs emissions associated with construction of the proposed DFW Runway 18L/36R Rehabilitation Project. The construction emissions inventory was developed using construction activity data provided by DFW on behalf of the project developer and emission factors from the TexN2.5 model. The proposed project's estimated emissions were compared to applicable *de minimis* thresholds (25 tpy for each ozone precursor), to determine compliance with the CAA and conformance to the TCEQ Dallas-Fort Worth Eight-Hour Ozone SIP, as required by the General Conformity Rule (40 CFR 93, Subpart B).

Table 4 shows that estimated NOx and VOC emissions that would result for the construction of the proposed DFW Runway 18L/36R Rehabilitation Project. As shown in Table 4 the estimated Runway 18L/36R Rehabilitation Project annual construction emissions are below applicable *de minimis* thresholds for 2026 and 2027. However, the estimated project aircraft operational emissions detailed in the **Runway 18L/36R Rehabilitation Project Aircraft Emissions Analysis Memorandum (Appendix A2)** exceed the applicable *de minimis* threshold. Aircraft operational emissions were modeled using the FAA Aviation Environmental Design Tool (AEDT version 3g). The aircraft operational emissions were modeled by HMMH and are detailed in the Operational Emissions Technical Report. As detailed in the Operational Emissions Technical Report the estimated emissions associated with the changes in aircraft operations due to the proposed project are as follows:

- In calendar year 2026 the estimated NOx emissions would be 30.26 tpy and the estimated VOCs emissions are 11.44 tpy.

[4] FAA. 2020. 1050.1 Desk Reference. Available at: https://www.faa.gov/sites/faa.gov/files/about/office_org/headquarters_offices/apl/1-air-quality.pdf. Accessed: September 2025

- In calendar year 2027 the estimated NOx emissions would be 32.89 tpy and the estimated VOCs are 11.68 tpy.

When the construction and aircraft operational emissions are combined, the total project-related emissions would exceed the applicable *de minimis* thresholds for NOx and VOCs in 2026 and 2027. Therefore, the proposed project would be subject of General Conformity Determination; Under the federal General Conformity Rule, DFW must submit a General Conformity Determination for the Proposed Action. The General Conformity Determination must demonstrate that emissions from the Proposed Action would not exceed the emissions budgets in the SIP for the years when the proposed project's emissions exceed applicable *de minimis* thresholds. The General Conformity Determination must be reviewed and approved by TCEQ.

Table 4. Summary of Emissions and Comparison to General Conformity *de minimis* thresholds.

Project Year and Emissions Source	Construction Emissions (tpy)		General Conformity *De Minimis* Threshold (tpy)	
	NOx	VOCs	NOx	VOC
2026 Non-Road	7.83	0.72	**25 tpy**	**25 tpy**
2026 On-Road	6.41	3.41		
Asphalt Fugitives	-	2.54		
2026 Total Emissions	**14.24**	**6.68**		
2027 Non-Road	5.22	0.48		
2027 On-Road	4.27	2.27		
Asphalt Fugitives	-	1.70		
2027 Total Emissions	**9.49**	**4.45**		

Note: Totals may not add up due to rounding.

This page is intentionally blank.

Appendix A. Project Data Inputs and TexN2.5, MOVES Output Tables – **Available Upon Request**

700 District Avenue, Suite 800
Burlington, MA 01803
781.229.0707
www.hmmh.com

Appendix B2: Runway 18L/36R Rehabilitation Project Aircraft (Operational) Emissions Analysis Memorandum

To:	Esther Chitsinde HDR Inc.
From:	Robert C. Mentzer, Jr. Kate Larson
Date:	September 17, 2025
Subject:	DRAFT - Dallas Fort Worth Airport Runway 18L/36R Rehabilitation Environmental Assessment: Aircraft Emissions Inventory DRAFT
Reference:	HMMH Project Number 23-0095C.003

As a subconsultant to HDR, Harris Miller Miller & Hanson Inc. (HMMH) is assisting Dallas-Fort Worth Airport (DFW) with the aircraft noise and emissions elements of the Environmental Assessment (EA) for the Runway 18L/36R Rehabilitation Project. The purpose of this technical memorandum is to provide the aircraft operations emissions inventory results for the existing conditions (calendar year 2024) and forecast conditions for the construction years (2026 and 2027).

The remainder of this memo is written for inclusion in HDR's Air Quality Technical Report with minimal editing required.

Air Quality: Aircraft Operational Emissions

This section provides the description of current and forecast aircraft operations at DFW used for the development of existing emission inventories. The existing condition inventory represents a 12-month period from the calendar year of 2024 (January 1 – December 31). The construction period is expected to begin in 2026 and end in 2027, so there are two forecast analysis years. The forecast emissions analysis compares No Action pollutant calculations to the Proposed Action calculations for each year, calculated using the Federal Aviation Administration's (FAA's) Aviation Environmental Design Tool (AEDT), Version 3g[1], in compliance with FAA Order 1050.1G and FAA Order 5050.4B.

1.0 Existing Conditions

The existing aircraft emission inventory for DFW was evaluated based upon the calendar year 2024 aircraft operations and the associated airport operational characteristics. Flight track and aircraft identification data from DFW's Noise and Operations Monitoring System (NOMS) and provided the aircraft fleet mix and runway use. The fleet mix developed from the DFW NOMS data was grouped into FAA operational categories (Air

[1] AEDT Version 3g released on August 28, 2024. FAA: AEDT Support Website

Carrier, Air Taxi, and General Aviation) and the totals were scaled to match the tower count for that period, provided by the FAA's Operational Network (OPSNET) operational data.

1.1 Aircraft Fleet Mix and Operations

During the existing conditions period, 743,203 annual operations occurred at DFW. **Table 1** presents the annual operations modeled in the AEDT for the existing conditions, where arrivals and departures are counted as separate operations. **Table 2** provides the annual operations, by AEDT aircraft type, that were used in AEDT to represent the existing conditions. The arrivals and departures are divided into day and night categories for the purposes of noise assessment, listed here in the same manner for consistency.

Table 1. Existing Conditions Annual Operations

Category	2024 Operations
Air Carrier Cargo	16,573
Air Carrier Passenger	705,825
Air Taxi Cargo	4,290
Air Taxi Passenger	10,580
General Aviation	5,724
Military	211
Total	**743,203**

Sources: DFW NOMS, FAA OPSNET, *HMMH analysis, 2025*

Table 2. DFW Modeled Annual Operations for Existing Conditions (Calendar Year 2024)

Tower Category	Propulsion Category	AEDT Aircraft Type	Arrivals Day	Arrivals Night	Departures Day	Departures Night	Total
Air Carrier Cargo	**Jet**	747400	304	148	298	154	905
		7478	344	246	375	215	1,180
		757PW	299	33	288	44	664
		757RR	435	42	417	60	954
		7673ER	2,012	933	1,569	1,376	5,890
		777300	645	402	405	642	2,094
		A300-622R	916	69	849	136	1,970
		MD11GE	405	322	444	283	1,454
		MD11PW	370	361	456	275	1,462
Air Carrier Passenger	**Jet**	737700	6,406	956	6,735	627	14,723
		737800	74,609	10,267	77,160	7,716	169,753
		7378MAX	2,826	970	3,418	378	7,593
		747400	324	135	323	136	917
		7478	22	95	74	43	235
		777200	2,109	267	2,268	108	4,753
		7773ER	1,953	14	1,699	268	3,934
		7878R	2,112	913	2,998	27	6,050
		7879	3,373	542	3,376	539	7,831
		A319-131	23,959	2,410	23,972	2,397	52,737
		A320-211	6,765	1,219	6,960	1,024	15,968
		A320-232	10,972	1,535	11,297	1,210	25,014
		A320-270N	8,045	3,045	8,123	2,967	22,180

Tower Category	Propulsion Category	AEDT Aircraft Type	Arrivals Day	Arrivals Night	Departures Day	Departures Night	Total
		A321-232	64,216	10,589	66,193	8,612	149,610
		A330-301	302	3	24	281	609
		A330-343	148	-	146	2	297
		A340-211	181	-	181	-	363
		A350-941	1,120	10	891	239	2,260
		A380-841	321	2	308	15	647
	Regional Jet	CRJ9-ER	30,118	4,602	31,760	2,960	69,439
		EMB170	12,205	1,659	12,581	1,283	27,728
		EMB175	55,668	5,563	56,228	5,003	122,462
		EMB190	359	2	358	3	722
Air Carrier total			**313,845**	**47,354**	**322,176**	**39,023**	**722,398**
Air Taxi Cargo	Non-jet	1900D	361	17	255	123	756
		CNA208	1,014	243	1,108	149	2,514
		DHC6	268	5	227	46	546
		SF340	149	88	214	23	474
Air Taxi Passenger	Jet	CL600	298	21	296	23	637
		CNA55B	549	31	548	32	1,160
		CNA560XL	308	13	311	10	643
		CNA680	842	48	855	35	1,779
	Regional Jet	CL600	368	3	368	3	742
		EMB145	243	2	243	2	490
		EMB14L	669	-	666	3	1,338
	Non-jet	CNA208	1,870	25	1,846	49	3,790
Air Taxi total			**6,939**	**496**	**6,937**	**498**	**14,870**
General Aviation	Jet	CL600	318	19	321	16	673
		CL601	740	49	765	24	1577
		CNA55B	355	10	333	32	730
		CNA560XL	593	28	581	40	1242
	Non-jet	CNA172	210	69	174	105	557
		CNA208	257	13	249	21	540
		DHC6	202	0	186	16	405
General Aviation Total			**2,674**	**188**	**2,608**	**254**	**5,724**
Military	Jet	C17	52	-	46	6	103
		LEAR35	38	3	41	-	82
	Non-jet	C130AD	13	-	13	-	26
Military Total			**103**	**3**	**100**	**6**	**211**
Grand Total			**323,561**	**48,041**	**331,821**	**39,781**	**743,203**

Note: Totals may not match exactly due to rounding
Sources: DFW NOMS, FAA OPSNET, FAA TAF, HMMH analysis 2025

Other parameters used in the AEDT model inputs which do not change from the existing to the forecast scenarios (aircraft noise and performance profile selection, flight tracks, meteorological, and terrain data) are described in the noise assessment documentation. Specific aircraft engine types and taxi times are needed to determine air quality pollutant emissions and to make fuel burn calculations. Since there is no change in aircraft operations between the No Action and Proposed Action scenarios, ground support equipment and auxiliary power unit usage are modeled using AEDT default assignments. The following two sections discuss the runway use and taxi-times inputs which would be affected by the proposed project.

1.2 Runway Use

DFW has two runway complexes: the east side and west side, comprised of 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 depart on the innermost runways main north/south runways (inboards). Aircraft normally take off and land into the wind. Choice of runway can be affected by aircraft type, type of activity, and where applicable, airport runway use plans. Historic data shows that DFW has two main operating configurations—south flow (departing to the south and arriving from the north) approximately 70 percent of the time and north flow (departing to the north and arriving from the south) approximately 30 percent of the time.

Table 3 summarizes the runway usage AEDT inputs developed from the DFW NOMS data for a recent 12-month period without any extended runway closures: October 2021 through September 2022, which is fiscal year (FY) 2022. DFW has had several runway reconstruction projects in the past two years, with the latest completed in October 2024. The air quality analysis for the EA should reflect typical annual runway use; therefore, the study team determined that FY 2022 rates would be used. The aircraft operations, separated into jets and non-jets, departures and arrivals, and day and nighttime periods determine the runway use distribution. The FY 2022 usage was normalized to the historical north flow (30 percent), south flow (70 percent) split.

Table 3. Runway Use Percentages, Existing Condition

Propulsion	Runway	Arrivals		Departures	
		Day	Night	Day	Night
Jet	13L	0%	0%	<1%	0%
	13R	3%	<1%	<1%	0%
	17C	27%	32%	<1%	1%
	17L	11%	1%	<1%	0%
	17R	<1%	7%	39%	33%
	18L	<1%	4%	31%	31%
	18R	28%	24%	<1%	6%
	31L	<1%	0%	<1%	0%
	31R	<1%	<1%	<1%	0%
	35C	11%	14%	<1%	<1%
	35L	<1%	3%	16%	15%
	35R	5%	<1%	<1%	0%
	36L	12%	10%	<1%	2%
	36R	<1%	1%	14%	13%
	SUBTOTAL	**100%**	**100%**	**100%**	**100%**
Non-Jet	13L	<1%	0%	<1%	<1%
	13R	28%	<1%	<1%	0%
	17C	9%	16%	3%	2%
	17L	23%	<1%	<1%	0%
	17R	<1%	4%	38%	15%
	18L	<1%	5%	24%	18%
	18R	9%	44%	5%	34%
	31L	<1%	0%	9%	2%
	31R	13%	0%	<1%	0%
	35C	2%	8%	2%	<1%
	35L	<1%	1%	15%	7%
	35R	3%	<1%	0%	0%
	36L	12%	18%	<1%	15%
	36R	<1%	1%	3%	5%
	SUBTOTAL	**100%**	**100%**	**100%**	**100%**

Sources: DFW NOMS FY2022, HMMH analysis 2025

1.3 Taxi-Times

DFW Design Code and Construction (DCC) provided the average taxi times (in minutes) for this analysis, which are shown in **Table 4**, supplemented with FY 2022 average taxi times obtained from the FAA Aviation System Performance Metrics (ASPM) database[2]. Annual aircraft taxiing emissions are a function of the number of aircraft operations, expressed as landing and takeoff (LTO) cycles, the aircraft fleet mix (specific types of aircraft/engines used), and the length of time aircraft spend in the taxiing mode of operation defined in AEDT.

[2] FY 2022 taxi times (and runway usage) were used in this analysis because FY 2022 is a recent 12-month period with no extended runway closures.

Table 4. Existing Condition Taxi Times, by Runway End

Scenario	Runway End	Taxi-In Time (Minutes)	Taxi-Out Time (Minutes)
Existing Condition and No Action	13L	11.2	16.0
	13R	14.2	16.0
	17C	12.8	8.4
	17L	14.7	16.4
	17R	7.0	17.5
	18L	8.2	16.9
	18R	10.5	9.6
	31L	14.2	24.6
	31R	11.1	40.1
	35C	12.3	16.7
	35L	8.4	18.4
	35R	14.9	17.8
	36L	11.7	16.5
	36R	11.4	17.7

Sources: DFW DCC, FAA Aviation System Performance Metrics (ASPM), accessed on July 14, 2025, HMMH analysis 2025

1.4 Aircraft-Related Operational Emissions

AEDT can calculate operational emissions from aircraft operations, ground service equipment (GSE), and auxiliary power units (APU). AEDT default data for APU and GSE equipment and duration was used in the modeling. The pollutant inventory calculations include aircraft emissions associated with taxi-in, taxi-out, and in-flight operations below mixing height[3]. **Table 5** provides the calculated operational emissions for the existing conditions, based on the operations in **Table 2**.

Table 5. Total Operational Emissions for Existing Conditions

Year	Operational Category	Pollutant (tons per year)						
		NO_x	CO	$PM_{2.5}$	PM_{10}	SO_x	VOC	CO_2
2024	Aircraft	3,988.80	4,077.97	38.553	38.553	442.90	451.25	1,468,172.40
	GSE LTO	25.67	727.28	1.388	1.494	0.22	19.64	14,881.56
	APU	122.70	106.33	16.135	16.135	16.45	8.81	60,000.21
	Total	**4,137.16**	**4,911.58**	**56.08**	**56.18**	**459.58**	**479.71**	**1,543,054.17**

Source: HMMH AEDT analysis, 2025

2.0 Forecast Years Conditions

The Proposed Action Alternative is comprised of the rehabilitation of Runway 18L/36R and its shoulders, upgrades to the electrical systems and components, and a full asphalt overlay. The Proposed Action Alternative would cause temporary changes in runway use, during construction only. As the construction is not expected to affect the number and type of aircraft operations using the airport, the only aircraft-related emissions changes would stem from changes in taxi times for the affected runways and changes in airport-

[3] The AEDT Default mixing height of 3,000 feet above field elevation was used.

wide runway usage rates during the construction period. The analysis years, 2026 and 2027, include periods prior to construction and after construction is completed when runway usage and taxi times are assumed to be the same as for the existing conditions. Once construction is complete in 2027, runway use and taxi times would return to normal conditions.

The Runway 18L/36R Rehabilitation is expected to be completed in three construction phases. Phase 1 would include all the preparation work and staging (not impacting runway operations) needed to begin Phase 2. Phases 2 and 3 would involve reduced length or full runway closures and are the subject of this emission inventory. Together, Phase 2 and Phase 3 cover 12 months from May 2026 to April 2027.

- Phase 2 – Runway 36R end closure – May 1, 2026 through July 31, 2026 (3 months)
- Phase 3 – Full Closure of Runway 18L/36R – August 1, 2026 to April 30, 2027 (9 months)

2.1 Aircraft Fleet Mix and Operations

An operational forecast prepared in the early stages of this EA was submitted to FAA for approval on July 7, 2025, including detailed operations tables for AEDT noise and emissions modeling for calendar years 2026 and 2027. The forecast operations are based on the FAA's 2024 Terminal Area Forecast (TAF) issued in January 2025 for DFW. The No Action and Proposed Action Alternatives assume the same level of operations for both scenarios because the Proposed Action is a runway rehabilitation project that does not alter the length of the runway or its expected use in the future. **Table 6** provides the proposed level of operations to be modeled for the EA forecast years 2026 and 2027, in comparison to the existing conditions year, 2024.

Table 6. Forecast Annual Operations

Category	2024 Existing Conditions	2026 Forecast (No Action and Proposed Action)	2027 Forecast (No Action and Proposed Action)
Air Carrier Cargo	16,573	26,727	28,189
Air Carrier Passenger	705,825	773,887	794,319
Air Taxi Cargo	4,290	4,676	4,738
Air Taxi Passenger	10,580	11,584	11,693
General Aviation	5,724	6,233	6,252
Military	211	197	197
Total	**743,203**	**823,304**	**845,388**

Sources: DFW NOMS, FAA OPSNET, *HMMH analysis, 2025*

Table 7 lists the annual operations, by AEDT aircraft type, that were input to AEDT to represent the two forecast years' operations, respectively. The fleet mix for each forecast year (2026, 2027) was initially based on the 2024 fleet mix operations. Overall flights were scaled proportionally to the future year's total operations by category and then air carrier fleets were adjusted to reflect expected increased use of newer aircraft models. For example, from 2024 to 2026, the air taxi category share of the regional jet activity is expected to decrease (e.g., CRJ-200 modeled as the CL600), and the air taxi jet category to increase (e.g., CL35 modeled as the CL600). From 2026 to 2027, the air taxi category share of the regional jet activity is predicted to decrease further, while the air taxi jet category is expected to increase further. The general aviation and military fleet mix is assumed to remain largely unchanged from 2024 to 2027. For additional information on the forecast, see Appendix xx.

Table 7. DFW Modeled Forecast Operations for Construction Years (2026 and 2027)

Tower Category	Propulsion Category	AEDT ANP Type	2026 Operations	2027 Operations
Air Carrier Cargo	Jet	747400	3,843	3,852
		7478	1,204	1,216
		757PW	664	664
		757RR	954	954
		7673ER	8,039	9,263
		777300	7,137	7,354
		A300-622R	1,970	1,970
		MD11GE	1,454	1,454
		MD11PW	1,462	1,462
Air Carrier Passenger	Jet	737700	16,022	16,525
		737800	169,455	167,402
		7378MAX	11,597	13,255
		747400	917	917
		7478	235	235
		777200	4,753	4,753
		7773ER	4,979	5,268
		7878R	7,965	8,593
		7879	10,309	11,122
		A319-131	51,526	51,122
		A320-211	13,947	13,193
		A320-232	21,739	19,914
		A320-270N	30,087	33,089
		A321-232	166,371	171,994
		A330-301	609	609
		A330-343	297	297
		A340-211	359	358
		A350-941	2,975	3,210
		A380-841	647	647
	Regional Jet	CRJ9-ER	69,439	69,439
		EMB170	27,728	27,728
		EMB175	161,210	173,928
		EMB190	722	722
Air Carrier Total			**800,614**	**822,508**
Air Taxi Cargo	Non-jet	1900D	756	756
		CNA208	2,900	2,962
		DHC6	546	546
		SF340	474	474
Air Taxi Passenger	Jet	CL600	735	751
		CNA55B	1,338	1,367
		CNA560XL	742	757
		CNA680	2,052	2,096
	Regional Jet	CL600	536	456
		EMB145	485	482
		EMB14L	1,325	1,318
	Non-jet	CNA208	4,372	4,466
Air Taxi Total			**16,260**	**16,431**

Tower Category	Propulsion Category	AEDT ANP Type	2026 Operations	2027 Operations
General Aviation	Jet	CL600	733	735
		CL601	1,717	1,723
		CNA55B	795	797
		CNA560XL	1,352	1,356
	Non-jet	CNA172	607	609
		CNA208	588	590
		DHC6	441	442
General Aviation Total			**6,233**	**6,252**
Military	Jet	C17	96	96
		LEAR35	77	77
	Non-jet	C130AD	24	24
Military Total			**197**	**197**
Grand Total			**823,304**	**845,388**

Note: Totals may not match exactly due to rounding.
Sources: DFW NOMS, FAA OPSNET, FAA TAF, HMMH analysis 2025

2.2 Runway Use

2.2.1 No Action Alternative

Under the No Action Alternative, the runway rehabilitation project would not occur and there would be no changes to the typical runway use at DFW for 2026 and 2027. Therefore, the runway use provided in **Table 3** for the existing conditions was used to represent the runway use in both forecast years' No Action scenarios.

2.2.2 Proposed Action Alternative

At DFW the outboard runways (Runways 17L/35R, 13R/31L, and 13L/31R) are open daily until 11 p.m. The modeled runway percentages includes the assumption that the outboard runways are not typically used between 10 p.m. or before 6 a.m. Nighttime runway utilization reflects the predominant use of the main parallel runways for arrivals and departures[4].

The Proposed Action assumes a 12-month active construction period in two phases for the Runway 18L/36R rehabilitation, following completion of the Phase 1 preparatory work. During Phase 2 (three months), the runway threshold for the Runway 36R end would be relocated 4,128 feet northward (to Taxiway WM) to allow the runway to continue departure operations on the remaining 9,273 feet while the south end is under construction. Runway use for construction Phase 2 is assumed to be the essentially same as for the Existing Conditions but with the few arrivals that would normally occur to Runway 18L/36R shifted proportionally to other runways. Runway use for construction Phase 3 (full closure of Runway 18L/36R for nine months) was provided by DFW for arrivals and departures overall. During Phase 3, arrivals would shift mainly to Runways 17L/35R, 17C/35C, and 13R while departures would shift to Runways 17R/35L, 18R/36L, and 31L. HMMH determined the separate day and night percentages for this period by applying the day/night proportions as seen in the Existing Conditions usage. **Table 8** presents the runway use percentages for each construction phase.

[4] Per FAA, nighttime operations are defined as 10:00 p.m. to 6:59 a.m. in the calculation of DNL.

Table 8. Runway Use Percentages, Forecast Years 2026 and 2027, Proposed Action Scenario

Category	Runway	During Construction Phase 2				During Construction Phase 3			
		Arrivals		Departures		Arrivals		Departures	
		Day	Night	Day	Night	Day	Night	Day	Night
Jet	13L	0%	0%	<1%	0%	0%	0%	0%	0%
	13R	3%	1%	<1%	0%	11%	2%	0%	0%
	17C	27%	34%	<1%	1%	27%	50%	0%	0%
	17L	11%	2%	<1%	0%	26%	5%	0%	0%
	17R	<1%	8%	39%	33%	0%	0%	60%	9%
	18L	**0%**	**0%**	**31%**	**31%**	**0%**	**0%**	**0%**	**0%**
	18R	28%	26%	<1%	6%	7%	12%	10%	60%
	31L	<1%	0%	<1%	0%	0%	0%	7%	0%
	31R	1%	<1%	<1%	0%	3%	<1%	0%	0%
	35C	11%	15%	<1%	<1%	11%	22%	0%	0%
	35L	<1%	3%	16%	15%	0%	0%	21%	3%
	35R	5%	1%	<1%	0%	11%	2%	0%	0%
	36L	12%	11%	<1%	2%	4%	6%	2%	27%
	36R	**0%**	**0%**	**14%**	**13%**	**0%**	**0%**	**0%**	**0%**
	SUBTOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Non-Jet	13L	<1%	0%	<1%	<1%	0%	0%	0%	0%
	13R	28%	<1%	<1%	0%	12%	<1%	0%	0%
	17C	9%	17%	3%	2%	26%	46%	0%	0%
	17L	23%	1%	<1%	0%	27%	1%	0%	0%
	17R	1%	5%	38%	15%	0%	0%	54%	12%
	18L	**0%**	**0%**	**24%**	**18%**	**0%**	**0%**	**0%**	**0%**
	18R	9%	47%	5%	34%	5%	23%	16%	58%
	31L	<1%	0%	9%	2%	0%	0%	7%	<1%
	31R	13%	0%	<1%	0%	4%	0%	0%	0%
	35C	2%	9%	2%	<1%	9%	25%	0%	0%
	35L	<1%	1%	15%	7%	0%	0%	21%	4%
	35R	3%	1%	0%	0%	12%	2%	0%	0%
	36L	12%	19%	1%	15%	5%	4%	2%	26%
	36R	**0%**	**0%**	**3%**	**5%**	**0%**	**0%**	**0%**	**0%**
	SUBTOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note: Runway 18L/36R in Bold - it would only handle departures in construction Phase 2, woudl be closed during construction Phase 3.

2.3 Taxi-Times

2.3.1 No Action Alternative

Under the No Action Alternative, the runway rehabilitation project would not occur and there would be no changes to the typical taxi times at DFW for 2026 and 2027. Therefore, the taxi times data provided in **Table 4** for the existing conditions was used to represent the taxi times in both forecast years' No Action scenarios.

2.3.2 Proposed Action Alternative

For runway ends where taxi times are anticipated to be changed in the Proposed Action, DFW DCC provided the taxi times to be used. **Table 9** presents the average taxi-in and taxi-out times by runway end for both phases of active construction. From the existing condition to construction phase 2 (partial closure of Runway

18L/36R), changes in average taxi times are generally less than 1 minute for any given runway, with the greatest change being a two-minute decrease in taxi out time for Runway 36R departures, due to its temporarily relocated runway threshold. From construction phase 2 to phase 3 (full closure of Runway 18L/36R), the most notable change in taxi-in times is an additional four minutes for arrivals to Runway 13R; changes for all other runways are one minute or less. Taxi-out time changes from construction phase 2 to phase 3 are expected to be larger, with increases of about one minute for several runways, over six additional minutes for Runway 36L departures and over 11 additional minutes for Runway 18R departures. The taxi-out time for Runway 31L departures is expected to decrease by over 6 minutes.

Table 9. Proposed Action Alternative Construction Period Taxi Times, by Runway End

Scenario	Runway End	Taxi-In Time	Taxi-Out Time
Proposed Action Phase 2 (Partial Closure)	13L	11.2	16.0
	13R	13.5	16.0
	17C	13.0	8.3
	17L	14.8	16.4
	17R	7.0	18.4
	18L*	N/A	16.5
	18R	10.1	9.8
	31L	14.2	24.6
	31R	11.2	40.1
	35C	12.5	16.7
	35L	8.4	19.2
	35R	15.4	17.8
	36L	11.4	16.5
	36R*	N/A	15.7
Proposed Action Phase 3 (Full Closure)	13L	11.2	16.0
	13R	17.7	16.0
	17C	13.0	9.6
	17L	14.6	16.4
	17R	7.0	19.6
	18L**	N/A	N/A
	18R	10.4	21.0
	31L	14.2	18.3
	31R	12.2	40.1
	35C	12.6	17.3
	35L	8.4	20.5
	35R	15.0	17.8
	36L	10.4	22.8
	36R**	N/A	N/A

Notes: * Departures only during partial runway closure.
**Not available during full runway closure.
Sources: DFW DCC, FAA Aviation System Performance Metrics (ASPM), accessed on July 14, 2025, HMMH analysis 2025

2.4 Aircraft-Related Operational Emissions

2.4.1 No Action Alternative

As was done for the Existing Conditions analysis, AEDT default data for APU and GSE equipment and duration were used in the modeling for the No Action Alternative and the pollutant inventory calculations include

aircraft emissions associated with taxi-in, taxi-out, and in-flight operations below mixing height. **Table 10** provides the calculated operational emissions for the No Action Alternative, based on the operations in **Table 7** and the same assumptions for runway use and taxi times as the existing condition.

Table 10. Total Operational Emissions for Construction Years, No Action Alternative

Year	Operational Category	Pollutant (tons per year)						
		NO_x	CO	$PM_{2.5}$	PM_{10}	SO_x	VOC	CO_2
2026	Aircraft	4,580.71	4,614.51	40.906	40.906	497.53	501.73	1,651,241.75
	GSE LTO	32.57	805.45	1.788	1.903	0.24	24.58	18,096.52
	APU	131.40	118.39	18.159	18.159	17.88	9.99	64,895.18
	Total	**4,744.68**	**5,538.34**	**60.85**	**60.97**	**515.65**	**536.29**	**1,734,233.44**
2027	Aircraft	4,713.17	4,721.09	41.201	41.201	509.08	508.72	1,690,187.25
	GSE LTO	28.63	779.51	1.374	1.492	0.25	21.17	16,428.47
	APU	133.23	121.87	18.734	18.734	18.24	10.34	66,002.95
	Total	**4,875.03**	**5,622.48**	**61.31**	**61.43**	**527.57**	**540.22**	**1,772,618.67**

Source: HMMH AEDT analysis, 2025

2.4.2 Proposed Action Alternative

As was done for the Existing Conditions analysis, AEDT default data for APU and GSE equipment and duration were used in the modeling for the Proposed Action Alternative and the pollutant inventory calculations include aircraft emissions associated with taxi-in, taxi-out, and in-flight operations below mixing height. **Table 11** provides the calculated operational emissions for the Proposed Action Alternative, based on the operations in **Table 7** and the construction-phase runway use and taxi times applicable to portions of each forecast year described in Sections 2.2 and 2.3.

Table 11. Total Operational Emissions for Construction Years, Proposed Action Alternative

Year	Operational Category	Pollutant (tons per year)						
		NO_x	CO	$PM_{2.5}$	PM_{10}	SO_x	VOC	CO_2
2026	Aircraft	4,610.97	4,765.44	41.533	41.533	506.58	513.17	1,672,612.50
	GSE LTO	32.57	805.45	1.788	1.903	0.24	24.58	18,096.52
	APU	131.40	118.39	18.159	18.159	17.88	9.99	64,895.18
	Total	**4,774.94**	**5,689.27**	**61.48**	**61.59**	**524.71**	**547.73**	**1,755,604.19**
2027	Aircraft	4,746.06	4,881.88	41.874	41.874	518.85	520.40	1,713,091.00
	GSE LTO	28.63	779.51	1.374	1.492	0.25	21.17	16,428.47
	APU	133.23	121.87	18.734	18.734	18.24	10.34	66,002.95
	Total	**4,907.92**	**5,783.26**	**61.98**	**62.10**	**537.33**	**551.91**	**1,795,522.42**

Source: HMMH AEDT analysis, 2025

2.4.3 Difference between No Action and Proposed Action Alternatives

Table 12 presents the calculation of the differences in emissions between the No Action and Proposed Action Alternatives. Because the modeling for each of the scenarios assumes no change to the number and mix of

aircraft flight operations in the year, the differences stem from the runway use changes and the associated taxi times changes.

Table 12 . Difference in Aircraft-Related Operational Emissions for Construction Years

Year	Alternative	Pollutant (tons per year)						
		NO_x	CO	$PM_{2.5}$	PM_{10}	SO_x	VOC	CO_2
2026	Proposed Action	4,774.94	5,689.27	61.48	61.59	524.71	547.73	1,755,604.19
	No Action	4,744.68	5,538.34	60.85	60.97	515.65	536.29	1,734,233.44
	Difference	**30.26**	**150.93**	**0.63**	**0.63**	**9.05**	**11.44**	**21,370.75**
2027	Proposed Action	4,907.92	5,783.26	61.98	62.10	537.33	551.91	1,795,522.42
	No Action	4,875.03	5,622.48	61.31	61.43	527.57	540.22	1,772,618.67
	Difference	**32.89**	**160.78**	**0.67**	**0.67**	**9.76**	**11.69**	**22,903.75**

Source: HMMH AEDT analysis, 2025