

APPENDIX C

Air Quality & Greenhouse Gas Emissions

Air Quality & Greenhouse Gas Technical Report

References

APPENDIX C

Air Quality & Greenhouse Gas Emissions

Air Quality & Greenhouse Gas Technical Report Attachments

Attachment 1: Aircraft

Attachment 2: Auxiliary Power Usage

Attachment 3: Ground Support Equipment

Attachment 4: Stationary Sources

Attachment 5: Mobile Sources

Attachment 6: Construction

Attachment 7: NEPA Air Quality Protocol and NEPA Climate Protocol

After the publication of the Draft EA, Executive Order 13990, which was relied upon for the January 2023 CEQ draft GHG guidance, was revoked and CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA, 42 U.S.C. 4321 et seq., as amended, in response to Executive Order 14154. In addition, the Supreme Court issued the *Seven County Infrastructure Coalition v. Eagle County*, 605 U. S. 975 (2025) ruling on May 29, 2025. As a result of these changes, the references to climate, qualitative climate evaluation that discussed the level of preparedness with respect to the impacts of climate change, the extent to which the alternatives could be affected by future climate conditions, and if the alternatives are consistent with national, state, and local climate goals, and the cumulative impact analysis were removed from the Final EA. Though the NEPA Climate Protocol included methodology for both a climate change and cumulative impact analysis, FAA's final decision will only rely upon the GHG emissions disclosed in the Final EA.



Sustainable Airport Master Plan – Near-Term Projects

Air Quality and Greenhouse Gas Technical Report

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PREPARED FOR

PORT OF SEATTLE

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1. Introduction

Landrum & Brown completed an air quality and greenhouse gas (GHG)¹ assessment to determine the potential construction and operational impacts to air quality and GHG emissions resulting from the Sustainable Airport Master Plan (SAMP) – Near-Term Projects (NTPs) at the Seattle-Tacoma International Airport (SEA or Airport). This technical report documents the overall approach, methods, and results of the air quality and GHG assessment to demonstrate compliance with the National Environmental Policy Act (NEPA).

This air quality and GHG technical report is organized in the following manner:

- **Air quality** is provided in Sections 2 through 15 which includes the regulatory setting, methodology, emissions inventories, and summary of impacts for criteria pollutants.
- **GHG Emissions** is provided in Section 16 through 22 which includes the regulatory setting, methodology, emissions inventories, and summary of impacts for greenhouse gases.
- Due to the size of the tables and exhibits that substantiate the analysis, they are provided at the end of this technical report as **Attachments**, which are organized in the following order.
 - Attachment 1, Aircraft
 - Attachment 2, Auxiliary Power Unit Usage
 - Attachment 3, Ground Support Equipment
 - Attachment 4, Stationary Sources
 - Attachment 5, Mobile Sources
 - Attachment 6, Construction
 - Attachment 7, NEPA Air Quality Protocol and NEPA Climate Protocol

The approach, methods, and models used in the technical report are consistent with the NEPA Air Quality Protocol and NEPA Climate Protocol (Attachment 7 of this Air Quality and Greenhouse Gas Report) approved by the Federal Aviation Administration (FAA) and the Puget Sound Clean Air Agency (PSCAA).^{2,3}

1.1 Description of the Proposed Action

The Port identified a set of NTPs to address the near-term activity levels projected to occur at the Airport. The NTPs include more than 30 projects that would improve efficiency, safety of the Airport, access to the Airport, and support facilities for airlines and the Airport. The NTPs (as a whole) are referred to as the Proposed Action. The elements of the Proposed Action are shown on **Exhibit 1, Proposed Action**. The Proposed Action is anticipated to cause emissions from construction and operational activities which necessitates the need for this analysis. Construction refers to the process of building or putting in place the proposed improvements. Operational emissions refer to the emissions emitted once the proposed improvements are operational.

¹ After the publication of the draft EA, Executive Order (EO) 13990, which was relied upon for the January 2023 CEQ draft GHG guidance, was revoked. In addition, CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA, 42 U.S.C. 4321 et seq., as amended, in response to EO 14154. As a result of these changes, all references to climate and the qualitative climate evaluation that discussed the level of preparedness with respect to the impacts of climate change, the extent to which the alternatives could be affected by future climate conditions, and if the alternatives are consistent with national, state, and local climate goals has been removed from this Technical Report.

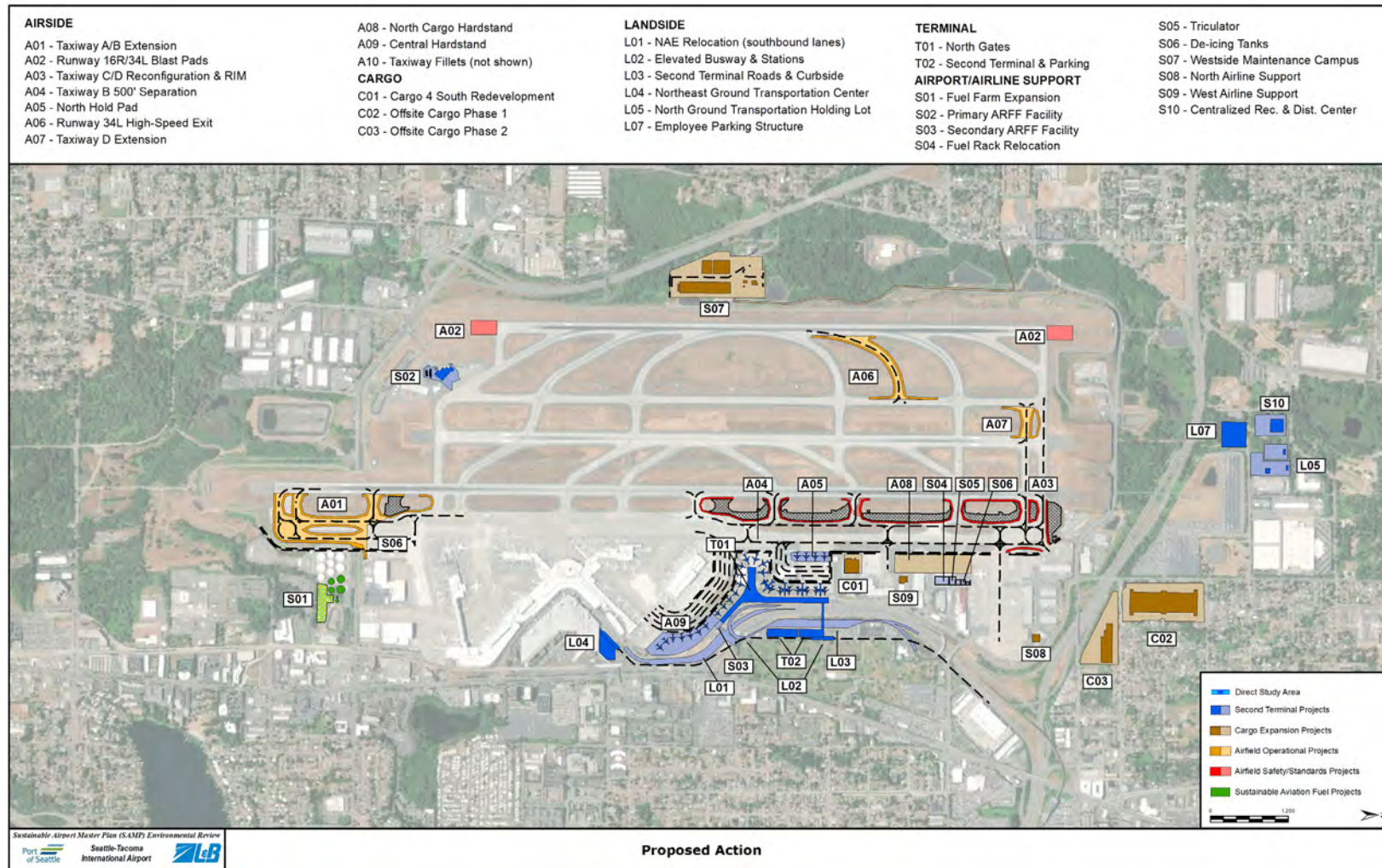
² Erik Saganić, PSCAA, Email to Kandice Krull, FAA, RE: SEA SAMP NTP EA NEPA AQ Protocol, July 26, 2023.

³ Erik Saganić, PSCAA, Email to Kandice Krull, FAA, RE: Sea-Tac Int'l Airport: Sustainable Airport Master Plan Near-Term Projects Environmental Review - Climate Assessment Protocol - PLEASE REVIEW, November 21, 2023.



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EXHIBIT 1, PROPOSED ACTION



Note: NAE = North Airport Expressway; GT = ground transportation; ARFF = aircraft rescue and firefighting



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1.2 Alternatives to the Proposed Action

In addition to the Proposed Action, a No Action Alternative was also considered as required under NEPA. The No Action Alternative would include no physical improvements to the Airport, but includes projects that have recently been constructed, or will be constructed by 2037.

The passenger and aircraft operations from the Constrained Operating Growth Scenarios were used for this analysis. The Constrained Operating Growth Scenario is provided in Appendix A, Forecast and Operational Assumptions, of the Environmental Assessment for the SAMP NTPs. Overall, there are more aircraft operations forecast with the Proposed Action as compared to the No Action Alternative. Implementation of the Proposed Action would increase the Airport's ability to accommodate increased aircraft operations and passenger activity by adding aircraft gates and passenger processing facilities.

The analysis also includes an assessment of a Hybrid Terminal Option. This alternative includes the same elements as the Proposed Action but connects the new concourse to the existing Concourse D.

2. Regulatory Setting for Air Quality

2.1 Federal Regulatory Setting

The Clean Air Act (CAA) established the standards and programs used to evaluate, achieve, and maintain acceptable air quality in the United States. Under the CAA, the U.S. Environmental Protection Agency (USEPA) established a set of standards, the National Ambient Air Quality Standards (NAAQS), for six pollutants determined to be potentially harmful to human health and welfare.⁴

- Carbon monoxide (CO);
- Ozone (O₃);
- Nitrogen dioxide (NO₂);
- Sulfur dioxide (SO₂);
- Particulate matter (PM₁₀ and PM_{2.5}); and
- Lead (Pb).

For each of the criteria pollutants, the USEPA established primary standards intended to protect public health, and secondary standards for the protection of public welfare, which captures factors such as preventing materials damage, preventing crop and vegetation damage, and assuring good visibility. The NAAQS are summarized in **Table 1**.

⁴ USEPA, Code of Federal Regulations, Title 40, Part 50 (40 C.F.R. Part 50) National Primary and Secondary Ambient Air Quality Standards (NAAQS), July 2011.



TABLE 1: NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Primary/ Secondary	Averaging Time	Level	Form Of Measurement
Carbon Monoxide	Primary	8 hour	9 ppm	Not to be exceeded more than once per year
Carbon Monoxide	Primary	1 hour	35 ppm	Not to be exceeded more than once per year
Lead	Primary and Secondary	Rolling 3-month average	0.15 µg/m ³ ⁽¹⁾	Not to be exceeded
Nitrogen Dioxide	Primary	1 hour	100 ppb	98 th percentile of 1-hour daily maximum concentrations, averaged over 3 years
Nitrogen Dioxide	Primary and Secondary	1 year	53 ppb ⁽²⁾	Annual Mean
Ozone	Primary and Secondary	8 hours	0.070 ppm ⁽³⁾	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particulate Matter (PM _{2.5})	Primary	1 year	9.0 µg/m ³	Annual mean, averaged over 3 years
Particulate Matter (PM _{2.5})	Secondary	1 year	15.0 µg/m ³	Annual mean, averaged over 3 years
Particulate Matter (PM _{2.5})	Primary and Secondary	24 hours	35 µg/m ³	98 th percentile, averaged over 3 years
Particulate Matter (PM ₁₀)	Primary and Secondary	24 hours	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide	Primary	1 hour	75 ppb ⁽⁴⁾	99 th percentile of 1-hour daily maximum concentrations, averaged over 3 years
Sulfur Dioxide	Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m³ as a calendar quarter average) also remain in effect.

(2) The level of the annual NO₂ standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O₃ standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O₃ standards.

(4) The previous SO₂ standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO₂ standards or is not meeting the requirements of a SIP call under the previous SO₂ standards (40 C.F.R. 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Notes: ppm is parts per million; ppb is parts per billion, and µg/m³ is micrograms per cubic meter.

Source: EPA, <https://www.epa.gov/criteria-air-pollutants/naaqs-table>, Accessed March 2024.

After EPA sets a new NAAQS or revises an existing standard for a criteria air pollutant, the CAA requires EPA to determine if areas of the country meet the new standards. If the air quality in a geographic area meets or is cleaner than the national standard, it is called an attainment area (designated "attainment/unclassifiable"); areas that don't meet the national standard are called nonattainment areas. In some cases, EPA is not able to determine an area's status after evaluating the available information and those areas are designated "unclassifiable." A maintenance area is an area previously designated nonattainment that subsequently meets the requirements in the CAA Section 107(d)(3). Such an area remains designated as maintenance for a period of up to 20 years provided that the NAAQS were sufficiently maintained throughout the maintenance period. Once designations take effect, state and local governments with nonattainment areas must develop State Implementation Plans (SIPs) outlining how areas will attain and maintain the standards by reducing air pollutant emissions.

Section 176(c) of the CAA requires federal actions to conform to the appropriate SIPs in order to attain the CAA's air quality goals. To address this, EPA promulgated a Transportation Conformity Rule (40 Code of Federal Regulations [C.F.R.] Part 93, subpart A) and a General Conformity Rule (40 C.F.R. Part 93, subpart B). The Transportation Conformity Rule does not apply for this analysis because the Proposed Action will not be funded through U.S.C. Title 23 or the Federal Transit Act.

Most actions by the FAA fall under the General Conformity provisions of the CAA.⁵ The General Conformity Rule under the CAA is conducted in three phases, depending on the extent of the proposed federal action: (1) applicability, (2) evaluation, and (3) determination. The applicability phase has two parts. The first part is to determine if the Proposed Action is located in a USEPA-designated nonattainment or maintenance area for one or more of the regulated criteria pollutants. If it is not, then the General Conformity Rule does not apply. Since the Proposed Action is not located in a USEPA-designated nonattainment or maintenance area for one or more of the regulated criteria pollutants, the General Conformity Rule does not apply.

2.2 State Regulations

In addition to federal requirements, the Airport is subject to state and local air quality regulations that the Washington State Department of Ecology and PSCAA enforce, respectively. Based on the Air Quality Data Summary for 2022 prepared by the PSCAA, the State of Washington and the Puget Sound region have adopted the EPA's NAAQS.^{6,7}

2.3 King County Air Quality Status

The Airport is located within King County, Washington, which is included in the Puget Sound Intrastate Air Quality Control Region. As previously stated, the Proposed Action would occur in areas that are currently in attainment for all criteria pollutants.

⁵ General Conformity ensures that the actions taken by federal agencies, such as airport construction, do not interfere with a state's plans to attain and maintain national standards for air quality. Additional information for General Conformity can be found on-line: <https://www.epa.gov/general-conformity>

⁶ Puget Sound Clean Air Agency. 2022 Air Quality Data Summary, December 2023. Available on-line: <https://pscaneair.gov/DocumentCenter/View/5360/Air-Quality-Data-Summary-2022-PDF?bidId=>

⁷ The Puget Sound Clean Air Agency has developed an air quality health goal for daily PM_{2.5} concentrations. The health goal of 25 µg/m³ for a daily average is more protective than the current federal standard of 35 µg/m³. However, the State of Washington has not approved this health goal as an ambient air quality standard. The goal is not enforced by regulation but a standard the state is voluntarily trying to achieve beyond the federal standard.

For background information, the area was previously designated maintenance for ozone under the 1-hour 1979 ozone standard; however, the 1-hour standard was revoked by the EPA effective June 15, 2005. The maintenance period for ozone ended on October 25, 2016.⁸ The region is currently designated as in attainment for both the 2015 and 2008 8-hour ozone standard. The region is not subject to a maintenance plan for ozone, although ozone has been considered an important pollutant tracked by the state and local agencies.

In the past, King County was also designated as nonattainment for carbon monoxide (CO); however, on October 11, 1996, the EPA determined the area had attained the standard and the region was re-designated to attainment. The maintenance period for CO ended on October 11, 2016.⁹ Several areas within King County are classified as maintenance for the PM₁₀ (coarse particles) standard, including Kent, Duwamish and Tacoma. Neither the Proposed Action nor any part of the Airport is within any of these areas. Therefore, the Proposed Action would occur in an area considered in attainment for all criteria pollutants.

3. Overall Approach for Air Quality Assessment

The overall approach to conducting this air quality analysis follows FAA guidelines for preparing NEPA documents, which includes FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures (including the Desk Reference)*; FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*; and FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*. In accordance with these orders, the overall approach and goal of the air quality impact analysis is to meet the requirements of NEPA and the CAA.

- NEPA: Compliance with NEPA is accomplished by disclosing the potential emissions associated with the Proposed Action. This includes preparation of emission inventories of both construction activities and operational conditions for the Proposed Action, any development alternatives, and the No Action Alternative. NEPA also requires that the project is shown qualitatively or quantitatively as to not cause, or contribute to, violations of the NAAQS.
- CAA: The CAA requires that project emissions do not cause or contribute to violations of the NAAQS. In nonattainment and maintenance areas, a project's compliance with this requirement can be demonstrated by showing that the project emissions are *de minimis* or that they conform to the SIP for achieving and maintaining the NAAQS.

As previously discussed, the Proposed Action would occur in areas that are currently in attainment for all criteria pollutants; therefore, conformity does not apply. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, when an action is not located in an EPA-designated nonattainment or maintenance area, the comparison of the emission inventories is used for disclosure purposes. Comments received during scoping were taken into consideration by the FAA in the development of the methodology and protocol document for this air quality and GHG analysis.

⁸ Washington State Department of Ecology. Plans for Maintaining Air Quality. Website accessed December 2023 at <https://ecology.wa.gov/Regulations-Permits/Plans-policies/State-implementation-plans/Maintenance-SIPs>

⁹ Ibid.

4. Air Quality Methodology

The air quality assessment included an evaluation of operational activities for the Existing (2022) Condition; and the Proposed Action, No Action Alternative, and the Hybrid Terminal Option for the projected future conditions in 2032 and 2037. The year 2032 will be used as a basis for analysis because 2032 is the projected opening year of the Proposed Action. In addition, 2037 will be used as a basis for analysis, because it represents a condition five years beyond the opening year.¹⁰ The air quality analysis will also disclose the potential air quality impacts due to construction activities during the years 2025 to 2032. Because the area of the Proposed Action is in attainment and conformity does not apply, no potential SIP milestone years will be analyzed.

4.1 Models Used in the Emissions Analysis

Operational emissions were evaluated using the FAA's Aviation Environmental Design Tool (AEDT) Version 3f.¹¹ AEDT models aircraft performance in space and time to estimate fuel consumption, air quality emissions, and noise consequences at airports. The EPA's Motor Vehicle Emissions Simulator version 4 (MOVES4) was used to develop the emissions inventory for motor vehicles on roadways that may be affected by the Proposed Action.¹² MOVES is an emission modeling system that estimates emissions for mobile sources at the national, county, and project level for criteria air pollutants, greenhouse gases, and air toxics.

Construction emissions were evaluated using the Airport Construction Emissions Inventory Tool (ACEIT) to estimate the type of construction equipment, horsepower, load factor, and operating hours for each project element and phase. The EPA's MOVES4 was used to identify the emission factor of each criteria and greenhouse gas pollutant for each construction equipment type.

4.2 Criteria Pollutants

The analysis included the following EPA criteria air pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), coarse particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), and sulfur dioxide (SO₂). Ozone is not directly emitted from a source. Rather, ozone is formed through photochemical reactions involving emissions of the precursor pollutants nitrogen oxides (NO_x) and volatile organic compounds (VOCs) in the presence of abundant sunlight, and heat. Therefore, emissions of ozone are not directly provided; however, emissions are disclosed for the ozone precursor pollutants, NO_x and VOCs.

While some active general aviation airports prepare lead emissions inventories due to use of leaded Avgas, this is not warranted for SEA because: 1) the area is in attainment for lead, 2) Avgas (the only aviation fuel containing lead) fueling ceased at SEA in 2018, and 3) the Proposed Action does not involve any potentially significant source of lead emissions.

¹⁰ The FAA's Desk Reference Section 11.3 states "The environmental consequences section of the NEPA document will include the analysis of the potential noise impacts of the proposed action and alternative(s) for each timeframe evaluated... Timeframes usually selected are the year of anticipated project implementation and 5 to 10 years after implementation." The FAA's Desk Reference Section 1.3.2 for air quality states, "the emissions inventory usually is calculated for the year(s) of project implementation, the planning horizon year(s) in the EA or EIS, and sometimes for intermediate years, if appropriate due to project phasing or if requested by a reviewing agency." The air quality analysis would be conducted consistent with the noise analysis and therefore include an assessment of the implementation year and of the project five years after implementation.

¹¹ The latest version of the FAA's AEDT is version 3f, which was released on December 15, 2023.

¹² The EPA released MOVES4 in August 2023. (FR Vol. 88, No. 175 September 12, 2023).

4.2.1 Pollutants Not Included

4.2.1.1 Hazardous Air Pollutants

Hazardous air pollutants (HAPs) are pollutants for which there are no NAAQS but are still regulated under the federal CAA because of their potentially adverse effects on human health and the environment. Per FAA guidance provided in the *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, a HAPs emissions inventory should be considered if the Proposed Action is considered “major” (e.g., new airport, new runway, major runway extension, etc.); if the Proposed Action is located in a nonattainment or maintenance area; and/or if a criteria air pollutant emissions inventory is also prepared. A HAPs inventory analysis will not be conducted as part of the NEPA assessment because the Proposed Action is not considered a “major” action (e.g., new airport, new runway, major runway extension, etc.) and is not located in a nonattainment or maintenance area.

4.2.1.2 Ultrafine Particles

Ultrafine particles (UFPs) are defined as particles with a diameter less than 0.1 micrometers (PM_{0.1}). The existing science is not fully mature, and the measurement and understanding of UFPs and their related health risks has not been clearly defined. Currently UFPs are not regulated by the EPA or the state either through rate of emissions or concentrations (other than being a subset component of PM_{2.5}) and are therefore not typically considered in formal reviews. Furthermore, since UFPs are not specifically listed as a criteria pollutant, air toxic, or HAP, an analysis of UFPs is not a requirement of NEPA or the CAA. Therefore, no analysis or discussion of UFPs was included in the NEPA evaluation.

4.3 Sources of Emissions

The following sources of emissions are included in this analysis.

- Aircraft
 - Landing and Take-off Cycles (Engine Start-Up, Approach, Climb, and Taxi)
 - Auxiliary Power Units (APUs)
 - Aircraft Run-Ups
- Ground Support Equipment (GSE)
 - Airline/Tenant-owned GSE
 - Port-owned airfield vehicles and equipment
- Stationary Sources
 - Natural Gas Boilers and Heaters
 - Diesel Generators
 - Fuel Farm Tanks
- Motor Vehicles
 - On and Off-Airport roadways and Parking Lots (including Port-owned roadway vehicles)
 - Airside Contractor and Delivery Vehicles
- Construction Activity
 - On-road activity including construction employee vehicle trips and material delivery/hauling trips
 - Off-road activity including use of construction equipment such as excavators, graders, and pavers

4.4 Data Used in the Analysis

A wide range of data is needed for input into the models previously identified. Sources of information on operation of the Airport and the Proposed Action are:

- FAA's Air Traffic Activity System (ATADS) was used to identify the total aircraft operations by FAA categories of activity in 2022. The ATADS data are available to the public on FAA's website.¹³
- The Port's Constrained Operating Growth Scenarios represents the best projection of how aviation activity growth will occur over time with and without the NTPs.¹⁴ This was used to identify the total number of operations for the No Action and Proposed Action in 2032 and 2037.
- The Port's EnvironmentalVue Flight Track Monitoring System¹⁵ data for the period January 2022 through December 2022 was used to identify information about each flight, time of day, airline, and aircraft type. Data from the EnvironmentalVue Flight Track Monitoring System is available to the public by specific request to the Port.
- Diio Mi¹⁶ was used to identify the engine type for the various airline/operator for the specific aircraft type. The Diio Mi database is available by paid subscription only.
- The tenant-owned GSE was determined by conducting a GSE survey (i.e., field verification and Port of Seattle data) to identify equipment types and usage for passenger and cargo aircraft. The AEDT model's default GSE were used to assign GSE defaults for general aviation aircraft operations. Usage for the future conditions was based on the increases in aircraft levels.
- Port-owned airfield vehicles and equipment usage was obtained from the Port. Usage for future conditions was adjusted based on the increases in aircraft levels.
- The AEDT database was used to assign the APU equipment type for each aircraft type. The APU usage for Existing (2022) Condition and for future conditions was based on the Port of Seattle's Rules and Regulations.
- For off-Airport roadways, existing and future conditions information from the surface transportation study developed for the NEPA Environmental Assessment (EA) was used. Where data was not collected for roadway segments within the study area, Washington Department of Transportation (WSDOT) data was utilized. For on-Airport roadways in the Existing (2022) Condition, Port information on the number and types of airside delivery vehicles accessing the airfield through security gates was used. For future conditions, the vehicles were increases based on the increase in passenger levels.
- Emissions factors from AEDT and Motor Vehicle Emission Simulator (MOVES) were used for the respective time periods (2022, 2032, and 2037).
- Construction information including the phasing schedule was provided by the Port and is included in Attachment 6.

¹³ FAA's website <https://aspm.faa.gov/opsnet/sys/Main.asp>. Accessed July 2023.

¹⁴ Constrained Operating Growth Scenario, prepared by Port of Seattle/Landrum & Brown, 2023.

¹⁵ EnvironmentalVue is a secure, web-based application that provides flight track information to the Port of Seattle.

¹⁶ Diio Mi is a comprehensive web-based collection of critical data sources designed for aviation professionals used to analyze the airline market. This tool available by paid subscription only includes worldwide schedule data, both historical and future; U.S. Departments of Transportation traffic, fare, load factor, financial, and on-time performance data; and industry fleet information.

5. Existing (2022) Condition

The Existing (2022) Condition is provided for background and context only.

5.1 Aircraft

5.1.1 Aircraft Fleet Mix and Activity Level

The number and type of aircraft operations directly affect emissions. Aircraft emissions depend partly on the physical characteristics and performance parameters of each aircraft. This includes the airframe type and the type and number of engines. In order to calculate emissions from aircraft, information concerning aircraft operations was collected from FAA's ATADS. According to FAA data, there were 401,351 total annual operations at the Airport during 2022.

ATADS data only provides annual operations by FAA general category (air carrier, air taxi,¹⁷ general aviation, and military). The Port's EnvironmentalVue Flight Track Monitoring System was used to identify the specific aircraft types, operation type, and the aircraft operators. From this information, the types of operations and a specific aircraft code were determined. Specific airframe and engine combinations were developed from the Diio Mi database. Annual operational totals derived from EnvironmentalVue for each airframe engine combination were scaled to match the ATADS annual operational total of 401,351. The scaling was based on each airframe engine combination's percentage of total operations reported in EnvironmentalVue. This scaling results in fractional annual operational totals for each of the airframe engine combinations. Table 1-1 in Attachment 1 presents the annual operations with the AEDT airframe and engine code modeled for the Existing (2022) Condition.

5.1.2 Aircraft Approach and Climb

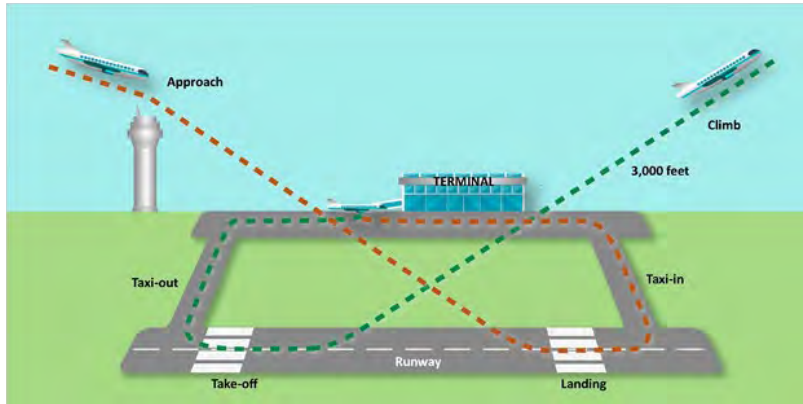
In addition to the physical characteristics of the aircraft operating at the Airport, emissions further depend on the time that each aircraft type operates in the various modes that define a landing and take-off cycle (LTO). According to the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, an LTO generally consists of the approach, landing, taxi into the gate/terminal/or parking area, start-up, taxi out, take-off, and climb. **Exhibit 2, Landing and Take-Off Cycle** provides an illustration of the LTO. The approach and climb portions of the LTO only go from or to the mixing height, or 3,084 feet AFE.¹⁸ Emissions that occur within the LTO are quantified by adding the AEDT Climb Below Mixing Height and Descend Below Mixing Height values.¹⁹

¹⁷ FAA defines air taxi as an aircraft designed to have a maximum seating capacity of 60 seats or less or a maximum payload capacity of 18,000 pounds or less carrying passengers or cargo for hire or compensation. Definition available at: <https://aspm.faa.gov/aspmhelp/index/Glossary.html>

¹⁸ The mixing height used in this assessment is defined as 3,084 feet in altitude above field elevation, which is the recommendation by the FAA based on the USPEA's *Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States*. Available on-line: <https://nepis.epa.gov/Exe/ZyNET.exe/20013CDS.TXT?ZyActionD=ZyDocument&Client=EPA&Index=Prior+to+1976&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C70thru75%5CTxt%5C00000005%5C20013CDS.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150q16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL>

¹⁹ For more detailed information and definition of AEDT terms, the AEDT user's guide may be accessed at <https://aedt.faa.gov/>

EXHIBIT 2, LANDING AND TAKE-OFF CYCLE



Source: Landrum & Brown, 2023.

5.1.3 Aircraft Taxi Time

The amount of time an aircraft spends taxiing affects emissions. The taxi in and taxi out time is dependent on the airfield configuration, annual operating levels, and available facilities. The average taxi in and taxi out time for the existing conditions was based on the FAA's operations and performance data for SEA including Aviation System Performance Metrics (ASPM) in 2022. The average taxi in time was ten minutes and 16 seconds and the average taxi out time was 18 minutes and 53 seconds for the Existing (2022) condition, for a total of 29 minutes and ten seconds.

5.1.4 APUs

Most of the larger jet aircraft use APUs (turbine engines in the tails of aircraft that burn jet fuel) to operate the heating, air conditioning, and electric systems when the main aircraft engines are not running. The APU is also used to 'start-up' or restart the aircraft engines before departing from the gate or cargo area.

APUs typically remain in use while the aircraft is parked and serviced, unless an alternative source of electricity and pre-conditioned air (PC Air) is made available. The Port has installed PC Air and a fixed power supply at most of the passenger terminal gates. These features allow pilots to avoid using the APU while the aircraft are parked at the gate. However, APU usage is within the control of the pilot; therefore, APU use and emissions can vary greatly from one airline/operator to another and even one aircraft to another.

Furthermore, the use of hardstand and cargo operations (when aircraft are not using gates and jet bridges) impacts the usage of APUs. In addition to PC Air and a fixed power supply being installed at the terminal gates, there are portable ground power units (GPUs) that are used for cargo and hardstand operations. Emissions from portable GPUs are disclosed in the GSE section.

For the existing conditions analysis, the AEDT database was used to assign the specific types of APU used for each aircraft type and the Port of Seattle's Rules and Regulations will be used to assign APU usage for passenger and cargo operations. In June 2020, the Port updated their rules and regulations for airfield operations.²⁰ Effective January 1, 2021, aircraft operators are required to use 400Hz ground power and PC Air sources where available and practicable. Operators are required to connect to those sources and discontinue APUs promptly (within seven minutes) after chocking the aircraft wheels upon

²⁰ The Port of Seattle has the ability to enforce the rules and regulations on tenants through lease agreements.



parking. In addition, the Port requires aircraft operators to limit APU use to 15 minutes for International Civil Aviation Organization (ICAO) type Code C²¹ aircraft; or to 25 minutes for ICAO type Code D²² or above aircraft prior to departure.²³

General aviation operations were assigned the AEDT default APU equipment and usage as there is no single operator for these operations and the Port of Seattle's Rules and Regulations do not have any requirements for general aviation aircraft. In addition, some of the smaller aircraft in the general aviation operation category do not have or use APUs. See Table 2-1 in Attachment 2 for the estimated annual APU usage for the Existing (2022) Condition.

5.1.5 Aircraft Run-Ups

Emissions from aircraft run-up operations were included for the Existing (2022) Condition. Aircraft engine ground run-ups are routine aircraft engine maintenance tests performed to test engines and diagnose engine issues. Aircraft run-up activity logs were provided by the Port to determine the amount of run-up operations, the location of the run-up, average duration, and the associated airframe and engine. A total of 477 run-up operations were reported in the run-up activity logs for the Airport in 2022.

5.2 Ground Support Equipment (GSE)

5.2.1 Tenant-Owned GSE

Most of the GSE at the Airport is owned and operated by the individual airlines and service providers contracted by the airlines, not the Port. Typical tenant-owned GSE includes baggage tractors, belt loaders, and catering vehicles that support aircraft operations.

The Port has installed over 400 charging points/stations for electric ground support equipment (eGSE) throughout the Airport across all terminals. As such, a GSE survey was conducted to inform the modeling of tenant-owned GSE to account for the use of eGSE. The survey included the field verification and review of Port data to identify the most commonly used GSE types and duration of usage for a select group of representative aircraft by airline operating at the Airport. The results of the survey were used to develop the AEDT inputs for GSE by aircraft operation. Operational emissions from vehicles such as catering trucks that operate on airport roadways beyond the immediate vicinity of the aircraft were quantified in the motor vehicle emissions inventory.

Table 3-1 in Attachment 3 provides the tenant-owned GSE modeled for the Existing (2022) Condition.

5.2.2 Port-Owned Airfield Vehicles and Equipment

The Port owns and operates various vehicles and equipment for airfield maintenance purposes and to support hardstand operations at the Airport. These vehicles include pickup trucks, snowplows, belt loaders, forklifts, shuttle buses, trimmers, and pressure washers. Data was obtained from the Port on the use of Port-owned airfield vehicles and equipment to develop the emissions inventory for the Existing (2022) Condition. Only the vehicles used primarily on the airfield were included in this portion of the inventory, while the Port-owned airfield vehicles that primarily operate on roadways were included in the motor vehicle emissions inventory later in this report. In order to determine emissions,

²¹ ICAO Annex 14, Seventh Edition – July 2016 define Code C aircraft as having a wingspan of 24 meters up to but not including 36 meters. The outer main gear wheel span is 6 meters up to but not including 9 meters.

²² ICAO Annex 14, Seventh Edition – July 2016 define Code D aircraft as having a wingspan of 36 meters up to but not including 52 meters. The outer main gear wheel span is 9 meters up to but not including 14 meters.

²³ Port of Seattle, Schedule of Rules and Regulations No. 5, Effective February 12, 2015. Updated June 9, 2020. <https://www.airportprojects.net/sampenvironmentalreview/rules-and-regs-9-1-23/>.

all of the various types of Port-owned airfield vehicles and equipment were grouped to representative AEDT equipment types to be modeled. For example, all of the gasoline Ford F150 pickup trucks were included in the gasoline F250/F350 Service Trucks AEDT equipment category. Table 3-2 in Attachment 3 provides the estimated fuel consumption for the Port-owned airfield vehicles and equipment for the Existing (2022) Condition.

5.3 Stationary Sources

Stationary sources of emissions include generators, boilers and heaters, and fuel tanks located on airport property which may be affected by the Proposed Action. Emissions from purchased electricity generated off-site are not included in the criteria pollutant emissions inventory per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*. Data was obtained from the Port on the existing use of stationary sources to develop an inventory of boilers and heaters, generators, and fuel tanks for the Existing (2022) Condition.

5.3.1 Natural Gas Boilers and Heaters

Table 4-1 in Attachment 4 provides the location, equipment type, and usage of the natural gas boilers and heaters modeled for the Existing (2022) Condition. The Port collects the data in therms, which were converted to 1000s of meters cubed for input into the AEDT model.

5.3.2 Diesel Generators

The Airport operated 31 diesel generators in 2022 to supply standby and emergency power. Emissions from the use of the generators were based on how many hours a year each generator was operated. The annual hours of operation for each diesel generator were provided by the Port. Table 4-2 in Attachment 4 provides the location, description, horsepower, and annual usage (hours) of diesel-powered generators for the Existing (2022) Condition.

5.3.3 Fuel Farm Tanks

According to data from the Port, the total volume of aviation fuel (Jet A) that was supplied to aircraft at the Airport in 2022 was 595,696,138 gallons, which was stored among eight fuel tanks located at the Airport's fuel farm. Fuel storage in the fuel tanks was modeled in AEDT as a stationary source and therefore was a source of evaporative emissions resulting in VOC emissions.

5.4 Motor Vehicles

Motor vehicles include airport passenger vehicles; vehicles transporting airport and tenant employees; and vehicles transporting cargo to and from the Airport. The consideration of motor vehicle emissions typically focuses on identifying where and how a Proposed Action and its alternatives may affect surface travel (including the number and types of vehicles). For this analysis, the study area is the same as the surface transportation study developed for this EA. The study area boundary is shown in Exhibits 5-1 through 5-11 in Attachment 5. The following section describes the data used to estimate the number and types of vehicles occurring in the study area.

5.4.1 Motor Vehicles (On- and Off-Airport Roadways)

Emissions from motor vehicles traveling on and off-airport roadways are a function of the vehicle-miles-traveled (VMT) within a specific roadway segment by a specific type of vehicle and the emission factor. Vehicle types such as passenger cars and long-haul trucks, have different emission factors. In addition, vehicles traveling at different rates of speed have different emission factors. The following provides a



summary of the approach taken to document emissions from motor vehicles on roadways. The approach taken for vehicles in parking facilities is discussed separately.

1. Roadway segments were defined for both on- and off-airport roadways. These included roadway segments where it is reasonable to anticipate changes in vehicle traffic from the Proposed Action. Distances for each roadway segment were calculated. The speeds in miles per hour (mph) on these roadway segments were based on the surface transportation study where data was available and, where data was not available, posted speed limits were used.
2. Average annual daily traffic data on the roadway segments was collected from the surface transportation study, the Port, and the Washington State Department of Transportation.²⁴ The data obtained was utilized to estimate VMTs. The distance of the roadway segment was multiplied by the traffic volume to determine the daily VMT for each segment, which was then converted to annual VMT by multiplying the daily VMT by 365. See Attachment 5 for the VMTs on each roadway segment.
3. Emission factors were determined for various speeds for different vehicle groups using EPA MOVES4.
4. All vehicle types were grouped into four main categories based on similar engine and operating characteristics in order to assign an emission factor. The vehicle distribution (vehicle mix) on each roadway segment was developed based on King County data contained in MOVES4.
5. Emissions were calculated by multiplying the annual VMT of each roadway segment by the emission factor using the specific vehicle distribution.

5.4.1.1 Roadway Segments

For the Existing (2022) Condition, the roadway segments were grouped together into ten areas where it is reasonable to anticipate changes in vehicle traffic due to the Proposed Action. The roadway segments are shown in Exhibits 5-1 through 5-11 in Attachment 5. The following provides a general description of each area.

- **Area 1** is located north and northwest of the Airport. This area contains State Route 518, Des Moines Memorial Drive S, and 24th Avenue S., and was included to capture traffic accessing the Airport from the north.
- **Area 2** is located north and east of the Airport. This area contains Air Cargo Road, Airport Expressway, State Route 99, Southcenter Boulevard, and Military Road S. These roads were selected to capture traffic accessing the Airport from the north and the east.

²⁴ Peak hour average day data provided specifically from the Port were converted to average annual daily traffic volumes (AADT). Based on 2022 vehicle traffic data and the conversion of peak hour average day to average annual day provided by the Port of Seattle, peak hour was multiplied by 316.5 instead of 365 to get an average annual day.

- **Area 3** is located east of the Airport, including the main terminal and parking facilities. This area contains the curb front roads used to access the Airport from the north, including Airport Expressway, Arrivals Dr, Departures Dr, Air Cargo Road, S. 170th Street, and State Route 99/Tukwila International Boulevard. These roads were selected to capture traffic accessing the Airport from the north and south.
- **Area 4** is located south of the Airport. This area contains South 188th Street, 28th Avenue, South 192nd Street, and State Route 99. These roads were selected to capture traffic accessing the Airport from the east and south.
- **Area 5** is located west of the Airport, including State Route 509/Des Moines Memorial Drive S, S Normandy Rd, and South 186th Street. These roads were selected to capture traffic accessing the Airport from the west.
- **Area 6** is located west of the Airport, including State Route 509/Des Moines Memorial Dr S, S Normandy Rd, and S 156th Street, and S 156th Way/154th Street. These roads were selected to capture traffic accessing the Airport from State Route 509.
- **Area 7** is located east of the Airport, including S 189th St, Military Rd S, and S 176th St. This also includes a segment of Interstate 5 south of SR 518. These roads were selected to capture traffic accessing the Airport from Interstate 5.
- **Area 8** is located southeast of the Airport, including State Route 99, S 200th St, and 28th Ave S. These roads were selected to capture traffic accessing the Airport from the south and from Interstate 5.
- **Area 9** is located south of the Airport, including S 200th St, S 216th St, and Des Moines Memorial Drive S. These roads were selected to capture traffic accessing the Airport from Des Moines Memorial Drive S.
- **Area 10** is located east of the Airport, including Interstate 405, State Route 518, and Southcenter Blvd. These roads were selected to capture traffic accessing the Airport from Interstate 405 and Southcenter Blvd.

5.4.1.2 Vehicle Classification

In order to determine emissions, all of the various types of vehicles operating on and off-airport roadways were grouped into four main vehicle classifications according to MOVES in order to assign an appropriate emission factor. **Table 2** provides the vehicle classifications used in the Existing (2022) Condition.

TABLE 2: VEHICLE CLASSIFICATIONS

MOVES Database Classification	General Vehicle Description
Passenger Car (PC)	Includes passenger cars, rental cars, employee cars, taxis, motorcycles
Passenger Truck (PT)	Includes light duty pickup trucks, vans
Short-Haul Truck (SHT)	Includes buses, shuttle buses, hotel shuttle buses, box trucks, refuse trucks, single unit trucks, medium duty trucks
Long-Haul Truck (LHT)	Includes heavy duty trucks, fueling trucks, tractor trailers

Source: L&B 2023 and MOVES4 database classifications.



5.4.1.3 Vehicle Distribution

The EPA's MOVES model was used to estimate vehicle distribution of the different vehicle classifications on roadways specific to King County.²⁵ **Table 3** provides the vehicle distribution that was used for the Existing (2022) Condition.

TABLE 3: VEHICLE DISTRIBUTION ON KING COUNTY ROADWAYS

County	Passenger Car (%)	Passenger Truck (%)	Single Unit Short-Haul Truck (%)	Long-Haul Truck (%)
King County	44.6	44.6	5.4	5.4

Note: See Table 2 for description of vehicle classifications.
Source: MOVES4, 2024.

There are several roadways that are known by the Port to have a different vehicle distribution than the King County average because of passenger and cargo operations supporting aircraft activity. The Port collects specific data concerning vehicles on these roadways. The Port collected data on the types of and number of vehicles operating on Airport Drives, S. 170th Street, and Air Cargo Road. **Table 4** provides the vehicle distribution as a percentage, used for these specific roadway segments.

TABLE 4: VEHICLE DISTRIBUTION ON AIRPORT-SPECIFIC ROADWAYS

Roadway Description	Passenger Car (%)	Passenger Truck (%)	Single Unit Short-Haul Truck (%)	Long-Haul Truck (%)
Airport Drives (South of 170th)	46.0	46.0	6.9	1.1
S. 170 th St. (Between Air Cargo Road and the Expressway)	39.0	39.0	21.0	1.0
Air Cargo Road (Between S 170 th St and the Expressway)	38.5	38.5	22.0	1.0
Air Cargo Road (Between the Expressway and S. 166 th St.)	41.0	41.0	17.0	1.0
Airside Deliveries	0.0	63.1	36.0	0.9

Note: See Table 2 for description of vehicle classifications.
Source: Port of Seattle, 2023.

5.4.1.4 Traffic Volumes

Data was collected on the traffic volumes for the roadway segments in the Existing (2022) Condition from the Port and the Washington State Department of Transportation. The distance of the roadway segment, as measured using a geographic information system (GIS) mapping tool, was multiplied by the traffic volume to determine the daily VMT, which was converted to annual VMT by multiplying by 365 for each segment. The traffic volumes for each roadway segment are provided in Table 5-1 in Attachment 5. Approximately 1,004,717,456 annual VMTs were estimated for the Existing (2022) Condition.

²⁵ The vehicle distribution for air quality utilized specific Port data and King County averages from MOVES4. The surface transportation analysis also presented in this EA utilized peak hour values for the Synchro analysis, which was based on the 2022 intersection counts and was not applicable for this purpose.

5.4.1.5 Airside Delivery Vehicles

Information on the number and types of airside delivery vehicles accessing the airfield through security gates was obtained from the Port. There were three main access points for deliveries, with negligible travel differences between them. A distance of two miles, as measured with GIS, was applied to all the airside delivery vehicles. An average speed of 15 mph was assumed for vehicles making airside deliveries.

5.4.1.6 Emission Factors

The EPA's MOVES4 was used to compute motor vehicle emissions rates in grams of pollutant per vehicle mile traveled (g/VMT). The emission factors are unique to King County and are different for each criteria pollutant, speed, and vehicle type. The emission factors for each pollutant by speed and vehicle type are provided Table 5-2 in Attachment 5.

5.4.2 Motor Vehicles (Parking Facilities)

Emissions from parking facilities where it is reasonable to anticipate changes in vehicle traffic due to the Proposed Action are included in the Existing (2022) Condition emissions inventory. Emissions are based on volumes of vehicles in the parking facilities, distance traveled within the parking facility, and speed of vehicles. Volumes for the Doug Fox Lot were estimated assuming the lot operated at full capacity meaning there are vehicles in all of the stalls.²⁶ For the main parking garage and the North Employee Parking Lot, parking lot transaction data was obtained from the Port. The volume data for the main parking garage contained information on employee traffic (identified as Corporate) and passenger vehicles (identified as Terminal and Direct). Distance for a vehicle to travel was mapped using GIS on the length from the first parking stall from the entrance to the last stall using every aisle and floor if applicable. The main parking garage is eight stories, with employee parking on floors one (ground level) and two and passenger parking on floors one through eight. The average calculated distance traveled for vehicles in the main parking garage was 0.96 miles, the average distance traveled by vehicles in the Doug Fox Lot was 0.80 miles, and the average distance traveled by vehicles in the North Employee Parking Lot was 4.24 miles. In order to determine emissions, an average speed of 5 mph was assumed for vehicles in the main parking garage, the Doug Fox Lot, and the North Employee Parking Lot.

5.5 Existing (2022) Condition Criteria Pollutant Emissions Inventory

The emissions inventory for the Existing (2022) Condition is shown in **Table 5** and provides the total annual pollutant emissions as short tons per year.²⁷ The Existing (2022) Condition emissions inventory shows the pollutants with the greatest emissions are CO and NO_x. There were approximately 5,178 tons of CO and 2,537 tons of NO_x emitted in 2022. These pollutants are produced from the incomplete combustion of aircraft and motor vehicle engines. Motor vehicles produce the greatest contribution to CO emissions (61.2 percent) while aircraft produce the greatest contribution to NO_x emissions (82.0 percent).

²⁶ A daily turnover rate of 1.0 means a car is there all day long. A daily turnover rate of 4.0 is used for quick turn-overs experienced at grocery stores and banks. No specific turnover rate was available, therefore for this analysis, a daily turnover rate of 2.5 was applied based on professional judgment.

²⁷ A short ton in the United States is commonly just called a ton. One short ton equals 2,000 pounds.



TABLE 5: ANNUAL OPERATIONAL EMISSIONS INVENTORY - EXISTING (2022) CONDITION

Emission Source	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)
Aircraft	1,798	255	2,081	186	21	21
LTO (includes Start-Up, Approach, Climb, and Taxiing)	1,681	244	1,977	175	12	12
Aircraft Run-Ups	1	0	44	2	0	0
APUs	116	10	60	9	9	9
GSE	196	6	17	0	1	1
Tenant-Owned GSE	193	6	13	0	1	1
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
Stationary Sources	15	10	25	33	1	1
Natural Gas Boilers and Heaters	13	1	16	0	0	0
Diesel Generators	2	0	10	33	0	0
Fuel Farm Tanks	0	9	0	0	0	0
Motor Vehicles	3,169	60	413	2	8	8
Parking Facilities	52	2	6	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	3,117	58	408	2	8	8
Total	5,178	332	2,537	221	31	31

Note: Totals may not sum due to rounding. CO = carbon monoxide, VOC = Volatile Organic Compounds, NO_x = nitrogen oxides, SO_x = sulfur oxides, PM₁₀ = coarse particulate matter, PM_{2.5} = fine particulate matter, ST = short tons.
Source: Port of Seattle and L&B, 2024.

6. Construction Emissions Inventories

Temporary air quality impacts would result from construction activities associated with the Proposed Action and the Hybrid Terminal Option. Air pollutants would be emitted by construction equipment and fugitive dust generated during demolition and construction of the proposed development. There would be no construction related emissions resulting from the No Action Alternative.

6.1 Construction Schedule

Subject to FAA and Port Commission approval, construction would start in 2025 and would continue through 2032 for the Proposed Action and the Hybrid Terminal Option. The detailed construction phasing schedule for the Proposed Action and the Hybrid Terminal Option are provided in Attachment 6.

6.2 On-Road Construction Vehicles

Potential sources of construction emissions include construction vehicles and equipment. Potential on-road construction emissions were estimated using the following formula as provided in the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*.

- *Emission Rate (tons/year) for on-road vehicles = Emission Factor (grams/mile) x miles per day x # of days/year x (1 pound/453.59 grams) x (1 ton/2,000 pounds)*

Emission factors for on-road construction vehicles were developed using the MOVES4 model. For employee vehicle trips related to construction activities, the model was run using gasoline passenger vehicles including cars and light duty pickup trucks. For material delivery and off-site haul vehicle trips, diesel combination short-haul trucks were assumed as they are the most common type of vehicle for this service.

Total VMT for vehicles operating during each Proposed Action element and for each type of on-road construction activity during each construction year was estimated. This includes construction employee vehicle trips to and from the job site. The analysis also included material delivery trips and off-site hauling trips using heavy duty trucks. Potential on-road construction emissions were estimated by multiplying the VMT data by the appropriate emission factors and the necessary conversion factors to present the criteria air pollutant emissions in tons. The detailed assumptions for on-road construction vehicles and the emission factors for the Proposed Action and Hybrid Terminal Option are provided in Attachment 6 of this technical report.

6.3 Non-Road Construction Equipment

Potential non-road construction emissions were estimated using the following formula as provided in the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*.

- *Equipment Emission Rate (tons/year) = Full Throttle Emission Factor (grams/hp-hour) x size (hp) x hours per year x Load Factor x usage Factor x (1 pound/453.59 grams) x (1 ton/2,000 pounds)*

The construction phasing schedule and the dimensions of the Proposed Action elements including building dimension in square feet were obtained from the Port. Each proposed element was input into the ACEIT to estimate the type of construction equipment, horsepower, load factor, and operating hours for each project element and phase. The ACEIT was developed by the Airport Cooperative Research Program (ACRP) and the equipment and assumptions used in the program are drawn from ACRP

Report 102, Guidance for Estimating Airport Construction Emissions. The EPA's MOVES model was used to identify the emission factor of each criteria air pollutant for each equipment type. Non-road construction equipment emissions were calculated based on the number of operating hours of equipment use and the emission factors. The detailed assumptions of non-road construction equipment and the emission factors for the Proposed Action and Hybrid Terminal Option are provided in Attachment 6 of this technical report.

6.4 Proposed Action - Criteria Pollutant Construction Emissions Inventory

A summary of the construction emissions inventory with both on-road and non-road construction equipment for each year of construction of the Proposed Action is shown in **Table 6**. Peak construction emissions are expected to occur in 2028 for NO_x (40 tons) and 2029 for CO (239 tons). Fugitive dust from grading, moving soil, and digging, loading/unloading of trucks, movement of trucks on unpaved surfaces, and wind erosion of stockpiles is included in PM₁₀ and PM_{2.5} totals.

TABLE 6: ANNUAL CONSTRUCTION EMISSIONS INVENTORY - PROPOSED ACTION

Year	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)
2025	17	1	8	0	8	1
2026	124	3	24	0	8	2
2027	204	4	36	0	9	2
2028	214	5	40	0	9	2
2029	239	5	36	0	9	2
2030	181	3	24	0	8	2
2031	143	2	18	0	8	1
2032	40	1	9	0	8	1

Note: CO = carbon monoxide, VOC = Volatile Organic Compounds, NO_x = nitrogen oxides, SO_x = sulfur oxides, PM₁₀ = coarse particulate matter, PM_{2.5} = fine particulate matter, ST = short tons.

Source: Port of Seattle and L&B, 2024.

6.5 Hybrid Option - Criteria Pollutant Construction Emissions Inventory

A summary of the construction emissions inventory for the Hybrid Terminal Option is shown in **Table 7**. Like the Proposed Action, peak construction emissions are expected to occur in 2028 for NO_x (47 tons) and 2029 for CO (242 tons), and would be equal to or slightly greater than the Proposed Action due to changes to the phasing schedule and the additional elements that must be constructed such as the proposed connection to Concourse D.



TABLE 7: ANNUAL CONSTRUCTION EMISSIONS INVENTORY - HYBRID TERMINAL OPTION

Year	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)
2025	17	1	8	0	8	1
2026	124	3	24	0	8	2
2027	201	5	39	0	9	2
2028	211	5	47	0	10	3
2029	242	5	44	0	9	3
2030	188	4	37	0	9	2
2031	149	3	31	0	9	2
2032	42	1	15	0	8	1

Note: Minor differences from the Proposed Action may not be evident due to rounding and the number of significant digits displayed. CO = carbon monoxide, VOC = Volatile Organic Compounds, NO_x = nitrogen oxides, SO_x = sulfur oxides, PM₁₀ = coarse particulate matter, PM_{2.5} = fine particulate matter, ST = short tons.
Source: Port of Seattle and L&B, 2024.

7.Future (2032) No Action Alternative

7.1 Aircraft

7.1.1 Aircraft Fleet Mix and Activity Levels

Based on the aircraft activity forecast, there would be an increase in operations from the Existing (2022) Condition to the Future (2032) No Action Alternative. The No Action Alternative would include none of the federal actions and no additional physical improvements to the Airport that are included in the Proposed Action, but includes projects that have recently been constructed, or will be constructed by 2032.²⁸ Even with no facility improvements there would be a total of 466,900 aircraft operations forecast for the Future (2032) No Action Alternative. This would be 65,549 annual operations more than the Existing (2022) Condition. Table 1-2 in Attachment 1 presents the average annual operations for specific aircraft types with the AEDT engine code modeled in AEDT for the Future (2032) No Action Alternative.

7.1.2 Aircraft Taxi Time

The airfield configuration (the layout of the runways and taxiways) identified for the Existing (2022) Condition would remain the same for the Future (2032) No Action Alternative. The average taxi in and taxi out time for the Future (2032) No Action Alternative was determined by using the delay analysis developed with the Total Airspace and Airport Modeler (TAAM) tool normalized to the ASPM data.^{29,30} The average taxi in time was nine minutes and 26 seconds and the average taxi out time was 21 minutes and 28 seconds for the Future (2032) No Action Alternative, for a total of 30 minutes and 54 seconds. These taxi in and taxi out times were applied to each operation in AEDT to develop the emissions inventory. The overall average taxi time increased one minute and 44 seconds for the Future (2032) No Action Alternative as compared to the Existing (2022) Condition. A summary of the taxi times for each scenario is provided in Table 1-6 in Attachment 1.

²⁸ These future actions were established in August 2023 and include the North Satellite Redevelopment program, International Arrivals Facility, Terminal Renovations, C Concourse Expansion, A Concourse Building Expansion, Widen Arrivals Drive project, and Runway Renumbering. These projects are independent from the Proposed Action in this EA and have received or will receive separate environmental review and approval. These future actions are included in both, the future No Action and Proposed Action scenarios.

²⁹ Leigh Fisher. Environmental Review Airside Modeling, June 2020.

³⁰ Kandice Krull, FAA, Email to Sarah Potter, L&B, RE: SAMP NTP Env Review Normalized Taxi Times, July 10, 2023.

7.1.3 APUs

The APU durations per aircraft type identified for the Existing (2022) Condition would remain the same for the Future (2032) No Action Alternative. As previously discussed, regional and narrow body aircraft were considered Code C aircraft and assigned a total APU duration of 22 minutes per operation and wide body aircraft were considered Code D or above and assigned a total APU duration of 32 minutes per operation. The AEDT database was used to assign the specific types of APU equipment used for each aircraft type. General Aviation operations were assigned the AEDT default APU equipment and usage per operation because data on specific general aviation equipment and usage were not available. The Future (2032) No Action Alternative would have greater APU usage as compared to the Existing (2022) Condition because of the increase in overall aircraft operations. See Table 2-2 in Attachment 2 for the estimated annual APU usage for the Future (2032) No Action Alternative.

7.1.4 Aircraft Run-Ups

The increase in overall aircraft operations in the Future (2032) No Action Alternative from the Existing (2022) Condition is anticipated to result in an increase the number of run-ups. Therefore, the number of aircraft run-ups was increased proportional to the forecast increase in aircraft operations. This resulted in a total of 555 run-up operations estimated for the Future (2032) No Action Alternative. This is an increase of 78 additional aircraft engine run-up operations over the Existing (2022) Condition.

7.2 Ground Support Equipment

7.2.1 Tenant-Owned GSE

The analysis assumed that tenant-owned GSE usage would increase commensurate with the forecast in aircraft activity and that the same types of vehicles would be used.³¹ Therefore, the type of tenant-owned GSE identified for the Existing (2022) Condition would remain the same for the Future (2032) No Action Alternative. As such, no new pieces of equipment were added for the analysis; it was estimated that there would only be an increase in usage in those same pieces of equipment. Table 3-3 in Attachment 3 provides the tenant-owned GSE and estimated hours of annual usage for the Future (2032) No Action Alternative.

7.2.2 Port-Owned Airfield Vehicles and Equipment

The analysis assumed that Port-owned airfield vehicles and equipment usage would increase commensurate with the forecast in aircraft activity and that the same types of vehicles would be used.³² Therefore, the type of Port-owned airfield vehicles and equipment identified for the Existing (2022) Condition would remain the same for the Future (2032) No Action Alternative. This means no new pieces of Port-owned airfield vehicles and equipment were added for the analysis; it was estimated that there would only be an increase in usage in those same pieces of equipment. This includes Port vehicles and equipment used for airfield maintenance purposes and to support hardstand operations at the Airport. Table 3-4 in Attachment 3 provides the Port-owned airfield vehicles and equipment and estimated annual usage for the Future (2032) No Action Alternative.

³¹ No future assumptions could be made on potential new equipment purchased by tenants operating at the Airport. While these tenants would need to buy new equipment as older equipment reaches its end-of-life cycle, there are no known existing agreements or contracts for the purchase of any future equipment.

³² No future assumptions could be made on potential new equipment purchased by the Port. While the Port would need to buy new equipment as older equipment reaches its end-of-life cycle, there are no existing agreements or contracts for the purchase of any future Port equipment.

7.3 Stationary Sources

7.3.1 Natural Gas Boilers and Heaters

The Future (2032) No Action Alternative would have additional natural gas boiler and heater usage for the Terminal Renovation, A Concourse Building Expansion, and C Concourse Expansion. Table 4-3 in Attachment 4 provides the location, equipment type, and usage of the natural gas boilers and heaters used for the Future (2032) No Action Alternative. It is assumed that there would be no other changes to the existing facilities or natural gas usage with the Future (2032) No Action Alternative. While there would be more passengers in the terminal facilities as compared to the Existing (2022) Condition, it was assumed there would be no change to the natural gas usage because natural gas usage is based on the area of the facility, not the number of passengers.

7.3.2 Diesel Generators

The Port would continue to conduct routine testing to make sure the generators are performing as they should and would be available if needed. The Future (2032) No Action Alternative would have additional diesel generators for the Terminal Renovation, A Concourse Building Expansion, and C Concourse Expansion that were not included in the Existing (2022) Condition. The location, name, horsepower, and annual usage of diesel-powered generators identified for the Future (2032) No Action Alternative are provided in Table 4-4 in Attachment 4. Table 4-7 in Attachment 4 provides a summary comparison of the diesel generator usage under the various alternatives.

7.3.3 Fuel Farm Tanks

There would be no change to the number or type of fuel tanks in the fuel farm with the Future (2032) No Action Alternative relative to the Existing (2022) Condition. The total volume of aviation fuel (Jet A) would be stored among eight existing fuel tanks located at the Airport's fuel farm. Therefore, the only change from the baseline conditions would be the potential increase in Jet A fuel use throughput based on the forecast increase in aircraft operations. It is estimated that the total volume of aviation fuel (Jet A) that would be supplied to aircraft would be 692,985,758 gallons for the Future (2032) No Action Alternative.

7.4 Motor Vehicles

7.4.1 Motor Vehicles (On- and Off-Airport Roadways)

The roadway segment identifier, segment length, vehicle classification, vehicle distribution, and speed for each roadway segment identified for the Existing (2022) Condition would remain the same for the Future (2032) No Action Alternative. Traffic volumes would be anticipated to change as would the emission factors, as described in the following sections.

7.4.1.1 Traffic Volumes

Surface traffic levels would be expected to increase in the future with the Future (2032) No Action Alternative as compared to the Existing (2022) Condition. Traffic volumes were provided by the Port for this scenario to account for employee and cargo growth. Roadways for which only WSDOT data was available, traffic volumes were increased proportional to the forecast increase in passengers. The traffic volume on each roadway segment and the annual VMT per roadway segment are provided in Table 5-3 in Attachment 5. For the Future (2032) No Action Alternative there are anticipated to be 1,218,311,481 annual VMTs, an increase of 213,594,025 as compared to the Existing (2022) Condition.



7.4.1.2 Emissions Factors

The EPA's MOVES4 was used to generate emissions rates in grams of pollutant per vehicle mile traveled (g/VMT). The emission factors are unique to the year 2032 and King County and are different for each criteria pollutant, speed, and vehicle type. The emission factors for each pollutant by speed and vehicle type for the Future (2032) No Action Alternative are provided in Table 5-4 in Attachment 5. Emission factors for the Future (2032) No Action Alternative are lower as compared to the Existing (2022) Condition emissions factors. This is because EPA assumes in MOVES that older vehicles are gradually replaced by newer vehicles.³³ Newer vehicles would have lower emission rates according to newer emission standards as compared to older vehicles. Therefore, while there are more vehicles on- and off-roadways traveling more miles in the future, because the emission factors are lower, total emissions for motor vehicles would be less as compared to the Existing (2022) Condition.

7.4.2 Motor Vehicles (Parking Facilities)

The parking lots identified for the Existing (2022) Condition would remain the same for the Future (2032) No Action Alternative meaning there would be no new lots, change in vehicle speed or distance, or any increase in the number of parking stalls in the lots. The potential volume increase in motor vehicles using the Doug Fox Lot and the Terminal Parking Lot for the Future (2032) No Action Alternative was based on the forecast increase in passengers. The number of motor vehicles in those parking lots would increase commensurate with the increase in passengers. The potential volume increase in motor vehicles using the North Employee Parking Lot for the Future (2032) No Action Alternative was based on the forecast increase in aircraft operations. It was assumed that as aircraft operations increase so would the number of employees. Therefore, the number of motor vehicles estimated for the Future (2032) No Action Alternative in the North Employee Parking Lot was increased proportional to the forecast increase in aircraft operations.

7.5 Future (2032) No Action Alternative Criteria Pollutant Emissions Inventory

The criteria pollutant emissions inventory provides the total annual pollutant emissions as short tons per year. The emissions inventory for the Future (2032) No Action Alternative is shown in **Table 8**. The Future (2032) No Action Alternative emissions inventory shows the pollutants with the greatest emissions are CO and NO_x. There were approximately 4,447 tons of CO and 2,923 tons of NO_x potentially emitted for the Future (2032) No Action Alternative. Aircraft produce the greatest contribution to CO emissions (48.4 percent) and NO_x emissions (94.4 percent).

³³ For EPA's guidance on emission factors see the following technical reports, Exhaust Emission Rates for Heavy-Duty Onroad Vehicles in MOVES4 (EPA-420-R-23-027 dated August 2023 and Exhaust Emission Rates for Light-Duty Onroad Vehicles in MOVES4 (EPA-420-R-23-028 dated August 2023) available online at <https://www.epa.gov/moves/moves-onroad-technical-reports>.

TABLE 8: ANNUAL OPERATIONAL EMISSIONS INVENTORY - FUTURE (2032) NO ACTION ALTERNATIVE

Emission Source	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)
Aircraft	2,152	249	2,761	236	27	27
LTO (includes Start-Up, Approach, Climb, and Taxiing)	2,042	233	2,631	222	14	14
APUs	109	16	73	11	13	13
Aircraft Run-Ups	1	0	57	2	0	0
GSE	190	6	14	0	1	1
Tenant-Owned GSE	187	6	9	0	1	0
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
Stationary Sources	16	11	27	37	1	1
Natural Gas Boilers and Heaters	13	1	16	0	0	0
Diesel Generators	2	0	11	37	0	0
Fuel Farm Tanks	0	10	0	0	0	0
Motor Vehicles	2,089	18	122	2	4	3
Parking Facilities	35	1	3	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	2,054	17	119	2	4	3
Total	4,447	283	2,923	275	32	32

Note: Totals may not sum due to rounding. CO = carbon monoxide, VOC = Volatile Organic Compounds, NO_x = nitrogen oxides, SO_x = sulfur oxides, PM₁₀ = coarse particulate matter, PM_{2.5} = fine particulate matter, ST = short tons.

Source: Port of Seattle and L&B, 2024.

8. Future (2032) Proposed Action

8.1 Aircraft

8.1.1 Aircraft Fleet Mix and Activity Levels

A total of 475,655 aircraft operations were forecast for the Future (2032) Proposed Action. This would be 8,755 annual operations more than the Future (2032) No Action Alternative. Table 1-3 in Attachment 1 presents the average annual operations with the specific airframe and AEDT engine code used for emissions modeling in AEDT for the Future (2032) Proposed Action.

8.1.2 Aircraft Taxi Time

The Proposed Action includes improvements to the existing airfield, which would potentially change the aircraft taxi time. The average taxi in and taxi out time for the Future (2032) Proposed Action was determined by using the delay analysis developed with the TAAM tool normalized to the ASPM data.^{34,35} The average taxi in time was nine minutes and 12 seconds and the average taxi out time was 21 minutes and 18 seconds for the Future (2032) Proposed Action, for a total of 30 minutes and 30 seconds. These taxi in and taxi out times were applied to each operation in AEDT to develop the emissions inventory. The overall average taxi time decreased 24 seconds for the Future (2032) Proposed Action as compared to the Future (2032) No Action Alternative. While the Proposed Action has more aircraft operations than the No Action Alternative, the proposed improvements would increase the Airport's ability to accommodate increased aircraft operations and passenger activity by enhancing the efficiency of the overall taxiway layout and adding aircraft gates and passenger

³⁴ Leigh Fisher. Environmental Review Airside Modeling, June 2020.

³⁵ Kandice Krull, FAA, Email to Sarah Potter, L&B, RE: SAMP NTP Env Review Normalized Taxi Times, July 10, 2023.

processing facilities, reducing congestion in the terminal area. These improvements would reduce congestion on the taxiways and at the terminal. A summary of the taxi times for each scenario is provided in Table 1-6 in Attachment 1.

8.1.3 APU's

The APU durations per aircraft type identified for the Existing (2022) Condition would remain the same for the Future (2032) Proposed Action. As previously discussed, regional and narrow body aircraft were considered Code C aircraft and assigned a total APU duration of 22 minutes per operation and wide body aircraft were considered Code D or above and assigned a total APU duration of 32 minutes per operation. The AEDT database was used to assign the specific types of APU equipment used for each aircraft type. General Aviation operations were assigned the AEDT default APU equipment and usage per operation because data on specific general aviation equipment and usage were not available. The Future (2032) Proposed Action would have greater APU usage as compared to the Future (2032) No Action Alternative because of the increase in overall aircraft operations. See Table 2-3 in Attachment 2 for the estimated annual APU usage for the Future (2032) Proposed Action.

8.1.4 Aircraft Run-Ups

The increase in overall aircraft operations in the Future (2032) Proposed Action from the Existing (2022) Condition is anticipated to result in an increase the number of run-ups. Therefore, the number of aircraft run-ups was increased proportional to the forecast increase in aircraft operations. Therefore, a total of 565 run-up operations are estimated for the Future (2032) Proposed Action. This is an increase of ten additional run-up operations over the Future (2032) No Action Alternative.

8.2 Ground Support Equipment

8.2.1 Tenant-Owned GSE

The analysis assumed that tenant-owned GSE usage would increase commensurate with the forecast in aircraft activity and that the same types of vehicles would be used.³⁶ Therefore, the type of tenant-owned GSE identified for the Existing (2022) Condition would remain the same for the Future (2032) Proposed Action. As such, no new pieces of equipment were added for the analysis; it was estimated that there would only be an increase in usage in those same pieces of equipment. Table 3-5 in Attachment 3 provides the tenant-owned GSE and estimated hours of annual usage for the Future (2032) Proposed Action.

8.2.2 Port-Owned Airfield Vehicles and Equipment

The analysis assumed that Port-owned airfield vehicles and equipment usage would increase commensurate with the forecast in aircraft activity and that the same types of vehicles would be used.³⁷ The annual usage was increased proportional to the forecasted increase in aircraft operations. This includes Port vehicles and equipment used for airfield maintenance purposes and to support hardstand operations at the Airport. Table 3-6 in Attachment 3 provides the Port-owned airfield vehicles and equipment and estimated annual usage for the Future (2032) Proposed Action.

³⁶ No future assumptions could be made on potential new equipment purchased by the tenants operating at the Airport. While these tenants would need to buy new equipment as older equipment reaches its end-of-life cycle, there are no known existing agreements or contracts for the purchase of any future equipment.

³⁷ No future assumptions could be made on potential new equipment purchased by the Port. While the Port would need to buy new equipment as older equipment reaches its end-of-life cycle, there are no existing agreements or contracts for the purchase of any future Port equipment.

8.3 Stationary Sources

8.3.1 Natural Gas Boilers and Heaters

In addition to the Future (2032) No Action Alternative natural gas boilers and heaters, the Future (2032) Proposed Action includes new facilities that would use potentially new natural gas boilers. Table 4-5 in Attachment 4 provides the location, equipment type, and estimated usage of only the potential new natural gas boilers and heaters used for the Future (2032) Proposed Action. The number of potential new natural gas boilers and heaters were based on the proposed new facilities and the usage was based on how the Port uses the current natural gas boilers and heaters. All proposed new facilities were assumed to require natural gas usage to provide heat. While the Port would attempt to purchase more energy-efficient equipment, there are no existing agreements, contracts, or new energy code legislation that would require the Port to purchase higher efficiency boilers in the future. Therefore, the existing type of boilers were assumed to operate in the proposed new facilities.

8.3.2 Diesel Generators

In addition to the location, description, horsepower, and estimated annual usage of diesel-powered generators identified for the Future (2032) No Action Alternative, the Future (2032) Proposed Action includes potential new facilities that would require the use of new diesel-powered generators for standby and emergency power. The number of potential new generators was based on the proposed new facilities and the usage was based on how the Port uses and tests the current generators. Table 4-6 in Attachment 4 provides the location, description, horsepower, and estimated annual usage of the new diesel-powered generators for the Future (2032) Proposed Action. Table 4-7 in Attachment 4 provides a summary comparison of diesel generator usage under the various alternatives.

8.3.3 Fuel Farm Tanks

The Future (2032) Proposed Action includes four new fuel farm tanks to be able to meet future fuel demands. The potential increase in Jet A fuel throughput for the Future (2032) Proposed Action was based on the forecast increase in aircraft operations and the additional tanks. It is estimated that the total volume of aviation fuel (Jet A) that would be supplied to aircraft would be 705,980,168 gallons for the Future (2032) Proposed Action. This is 12,994,411 gallons of Jet A fuel throughput more than the Future (2032) No Action Alternative. The total volume of aviation fuel (Jet A) would be stored among 12 total fuel tanks, including eight existing fuel tanks and four new fuel tanks to be located at the Airport's fuel farm as part of the Proposed Action.

8.4 Motor Vehicles

8.4.1 Motor Vehicles (On- and Off-Airport Roadways)

The vehicle classifications and vehicle distribution identified for the Future (2032) No Action Alternative would remain the same for the Future (2032) Proposed Action. The emission factors identified for the Future (2032) No Action Alternative would also remain the same for the Future (2032) Proposed Action as emission factors are a function of year/age of the vehicle and vehicle classification. Roadway segments and traffic volumes would be anticipated to change due to the Proposed Action, as described in the following sections.



8.4.1.1 Roadway Segments

The Proposed Action would result in elimination of several existing roadway segments and construction and operation of several new roadways to accommodate the new proposed facilities. The roadway segments that were eliminated and constructed are identified in Table 5-5 in Attachment 5. The roadway segments identified for the Proposed Action are provided in Exhibits 5-12 through 5-22 in Attachment 5.

8.4.1.2 Traffic Volumes

Traffic volumes were provided by the Port for this scenario to account for employee and cargo growth. Roadways for which only WSDOT data was available, traffic volumes were increased proportionally to the forecast increase in passengers. The traffic volume on each roadway segment and the annual VMT per roadway segment are provided in Table 5-5 in Attachment 5. For the Future (2032) Proposed Action there are anticipated to be 1,247,969,250 annual VMTs, an increase of 29,657,769 annual VMTs as compared to the Future (2032) No Action Alternative.

8.4.2 Motor Vehicles (Parking Facilities)

Emissions are based on volumes of vehicles in the parking facilities, distance traveled within the parking facility, and speed of vehicles. The potential volume increase in passenger traffic in the terminal parking lot for the Future (2032) Proposed Action was based on the forecasted increase in passengers. The total forecast of passengers was used to represent the potential increase in traffic volumes. The potential volume increase in motor vehicles using the North Employee Parking Lot for the Future (2032) Proposed Action was based on the forecast increase in aircraft operations. It was assumed that as aircraft operations increase, and new facilities are constructed, the number of employees would also grow. Therefore, the number of motor vehicles estimated for the Future (2032) Proposed Action in the North Employee Parking Lot was increased proportional to the forecast increase in aircraft operations. There would be no change in vehicle speed or distance in these parking lots from the Future (2032) No Action Alternative.

The Proposed Action includes the removal of the Doug Fox Lot and the addition of new parking lots. For the new employee parking structure (L07), new north holding lot (L05), and the new terminal parking structure (T02), volumes were estimated by assuming the lots would operate at full capacity, meaning it was estimated there would be vehicles in all of the stalls.³⁸ Distance for a vehicle to travel was based on the length from the first parking stall from the entrance to the last stall using every aisle and floor if applicable. It was calculated that the average distance traveled for vehicles in the new employee parking structure (L07) was 0.38 miles, the average distance traveled by vehicles in the new north holding lot (L05) was 0.42 miles, and the average distance traveled by vehicles in the new terminal parking structure (T02) was 0.48 miles. In order to determine emissions, an average speed of five (5) mph was assumed for vehicles in these new parking lots.

³⁸ A daily turnover rate of 2.5 was applied on the terminal parking and daily turnover rate of 3 was applied to the employee parking based on professional judgment.



8.5 Future (2032) Proposed Action Criteria Pollutant Emissions Inventory

The criteria pollutant emissions inventory provides the total annual pollutant emissions as short tons per year. The emissions inventory for the Future (2032) Proposed Action is shown in **Table 9**. The Future (2032) Proposed Action emissions inventory shows the pollutants with the greatest emissions are CO and NO_x. There were approximately 4,517 tons of CO and 2,984 tons of NO_x potentially emitted for the Future (2032) Proposed Action. Aircraft produce the greatest contribution to CO emissions (48.7 percent) and NO_x emissions (96 percent). A summary comparison of the Future (2032) No Action Alternative and the Future (2032) Proposed Action is provided in Section 10.1 of this technical report.

TABLE 9: ANNUAL OPERATIONAL EMISSIONS INVENTORY - FUTURE (2032) PROPOSED ACTION

Emission Source	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)
Aircraft	2,166	251	2,807	239	28	28
LTO (includes Start-Up, Approach, Climb, and Taxiing)	2,054	235	2,675	225	14	14
APUs	111	16	74	11	13	13
Aircraft Run-Ups	1	0	58	2	0	0
GSE	194	6	14	0	1	1
Tenant-Owned GSE	191	6	9	0	1	0
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
Stationary Sources	23	15	39	54	1	1
Natural Gas Boilers and Heaters	19	1	23	0	0	0
Diesel Generators	4	0	16	54	0	0
Fuel Farm Tanks	0	13	0	0	0	0
Motor Vehicles	2,135	18	124	2	4	3
Parking Facilities	39	1	3	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	2,096	17	121	2	4	3
Total	4,517	290	2,984	295	33	33

Note: Totals may not sum due to rounding. CO = carbon monoxide, VOC = Volatile Organic Compounds, NO_x = nitrogen oxides, SO_x = sulfur oxides, PM₁₀ = coarse particulate matter, PM_{2.5} = fine particulate matter, ST = short tons.
Source: Port of Seattle and L&B, 2024.

9.Future (2032) Hybrid Option

The Future (2032) Hybrid Terminal Option would have the same operational impacts as the Future (2032) Proposed Action because the only differences in the two alternatives would be related to the location of passenger loading bridges and aircraft hardstands. The number of future aircraft operations would be the same. Therefore, the criteria pollutant emissions inventory for the Future (2032) Hybrid Terminal Option would be the same as the Future (2032) Proposed Action.

10. Comparison of 2032 Alternatives

The results of the emission inventories prepared for the Future (2032) Proposed Action and the Future (2032) Hybrid Terminal Option were compared to the results of the emission inventories prepared for the Future (2032) No Action Alternative to disclose the potential increase in emissions.

10.1 Future (2032) Proposed Action

The results of the comparison between the Future (2032) Proposed Action and the Future (2032) No Action Alternative are shown in **Table 10**.

TABLE 10: SUMMARY OF ANNUAL CRITERIA POLLUTANT EMISSIONS, PROPOSED ACTION COMPARED TO THE NO ACTION ALTERNATIVE IN 2032

Emission Source	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)
2032 No Action Alternative	4,447	283	2,923	275	32	32
2032 Proposed Action	4,557	291	2,993	295	41	34
<i>Construction</i>	40	1	9	0	8	1
<i>Operational</i>	4,517	290	2,984	295	33	33
2032 Increase in Emissions	110	8	70	20	9	2

Note: Totals may not sum due to rounding. CO = carbon monoxide, VOC = Volatile Organic Compounds, NO_x = nitrogen oxides, SO_x = sulfur oxides, PM₁₀ = coarse particulate matter, PM_{2.5} = fine particulate matter.
Source: Port of Seattle and L&B, 2024.

Emissions of all pollutants are expected to be greater with the Future (2032) Proposed Action than the Future (2032) No Action Alternative, mainly due to the higher level of airport activity that the Future (2032) Proposed Action would serve. Overall, there are more aircraft operations forecast with the Proposed Action as compared to the No Action Alternative in future years. Implementation of the NTPs would increase the Airport's ability to accommodate increased aircraft operations and passenger activity by adding aircraft gates and passenger processing facilities. Annual aircraft operations for the Future (2032) Proposed Action are forecast to increase to 475,655 aircraft operations. The Future (2032) Proposed Action would serve 8,755 more operations (1.9 percent) than the Future (2032) No Action Alternative, which would result in a potential increase in emissions. While operational efficiencies would be achieved with the Proposed Action, emissions would be greater due to the higher level of operations.



10.2 Future (2032) Hybrid Option

The results of the comparison between the Future (2032) Hybrid Terminal Option and the Future (2032) No Action Alternative are shown in **Table 11**.

TABLE 11: SUMMARY OF ANNUAL CRITERIA POLLUTANT EMISSIONS, HYBRID TERMINAL OPTION COMPARED TO THE NO ACTION ALTERNATIVE IN 2032

Emission Source	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)
2032 No Action Alternative	4,447	283	2,923	275	32	32
2032 Hybrid Terminal Option	4,559	291	2,999	295	41	34
Construction	42	1	15	0	8	1
Operational	4,517	290	2,984	295	33	33
2032 Increase in Emissions	112	8	76	20	9	2

Note: Totals may not sum due to rounding. CO = carbon monoxide, VOC = Volatile Organic Compounds, NO_x = nitrogen oxides, SO_x = sulfur oxides, PM₁₀ = coarse particulate matter, PM_{2.5} = fine particulate matter, ST = short tons.
Source: Port of Seattle and L&B, 2024.

The Future (2032) Hybrid Terminal Option would have the same operational impacts as the Future (2032) Proposed Action because the only differences in the two alternatives would be related to the location of passenger loading bridges and aircraft hardstands. The number of future aircraft operations would be the same. Minor differences in construction activities for Future (2032) Hybrid Terminal Option would result in the Future (2032) Hybrid Terminal Option having slightly greater overall emissions as compared to those for the Future (2032) Proposed Action.

11. Future (2037) No Action Alternative

11.1 Aircraft

11.1.1 Aircraft Fleet Mix and Activity Levels

Based on the aircraft activity forecast, there would be an increase in operations from the Future (2032) No Action Alternative to the Future (2037) No Action Alternative. There would be a total of 474,874 aircraft operations forecast for the Future (2037) No Action Alternative. Table 1-4 in Attachment 1 presents the average annual operations with the specific airframe type and AEDT engine code used for AEDT modeling for the Future (2037) No Action Alternative.

11.1.2 Aircraft Taxi Time

The airfield configuration (runway layout and taxiways) identified for the Future (2032) Condition would remain the same for the Future (2037) No Action Alternative. The average taxi in and taxi out time for the Future (2037) No Action Alternative was determined by using the delay analysis developed with the TAAM tool normalized to the ASPM data.^{39,40} The average taxi in time was nine minutes and 41 seconds and the average taxi out time was 21 minutes and 42 seconds for the Future (2037) No Action Alternative for a total of 31 minutes and 23 seconds. These taxi in and taxi out times were applied to each operation in AEDT to develop the emissions inventory. The additional aircraft created additional taxi time on the taxiways. A summary of the taxi times for each scenario is provided in Table 1-6 in Attachment 1.

³⁹ Leigh Fisher. Environmental Review Airside Modeling, June 2020.

⁴⁰ Kandice Krull, FAA, Email to Sarah Potter, L&B, RE: SAMP NTP Env Review Normalized Taxi Times, July 10, 2023.



11.1.3 APUs

The APU durations per aircraft type identified for the Future (2032) No Action Alternative would remain the same for the Future (2037) No Action Alternative. As previously discussed, regional and narrow body aircraft were considered Code C aircraft and assigned a total APU duration of 22 minutes per operation and wide body aircraft were considered Code D or above and assigned a total APU duration of 32 minutes per operation. The AEDT database was used to assign the specific types of APU equipment used for each aircraft type. General Aviation operations were assigned the AEDT default APU equipment and usage per operation because data on specific general aviation equipment and usage were not available. The Future (2037) No Action Alternative would have greater APU usage as compared to the Future (2032) No Action Alternative because of the increase in overall aircraft operations. See Table 2-4 in Attachment 2 for the estimated annual APU usage for the Future (2037) No Action Alternative.

11.1.4 Aircraft Run-Ups

The number of aircraft run-ups was increased proportional to the forecast increase in aircraft operations. Therefore, a total of 564 run-up operations are estimated for the Future (2037) No Action Alternative.

11.2 Ground Support Equipment

11.2.1 Tenant-Owned GSE

The analysis assumed that tenant-owned GSE usage would increase commensurate with the forecast in aircraft activity and that the same types of vehicles would be used.⁴¹ Therefore, the type of tenant-owned GSE identified for the Existing (2022) Condition would remain the same for the Future (2037) No Action Alternative. As such, no new pieces of equipment were added for the analysis; it was estimated that there would only be an increase in usage in those same pieces of equipment. Table 3-7 in Attachment 3 provides the tenant-owned GSE and estimated hours of annual usage modeled for the Future (2037) No Action Alternative.

11.2.2 Port-Owned Airfield Vehicles and Equipment

The type of Port-owned airfield vehicles and equipment identified for the Future (2037) No Action Alternative would remain the same as for the Future (2032) No Action Alternative. As with the Future (2032) No Action Alternative, the analysis assumed that Port-owned airfield vehicles and equipment usage would increase commensurate with the forecast in aircraft activity and that the same types of vehicles would be used.⁴² The annual usage was increased proportional to the forecast increase in aircraft operations. This includes Port vehicles and equipment used for airfield maintenance purposes and to support hardstand operations at the Airport. Table 3-8 in Attachment 3 provides the Port-owned airfield vehicles and equipment and estimated annual usage for the Future (2037) No Action Alternative.

⁴¹ No future assumptions could be made on potential new equipment purchased by the tenants operating at the Airport. While these tenants would need to buy new equipment as older equipment reaches its end-of-life cycle, there are no known existing agreements or contracts for the purchase of any future equipment.

⁴² No future assumptions could be made on potential new equipment purchased by the Port. While the Port would need to buy new equipment as older equipment reaches its end-of-life cycle, there are no existing agreements or contracts for the purchase of any future Port equipment.

11.3 Stationary Sources

11.3.1 Natural Gas Boilers and Heaters

The location, equipment type, and usage of natural gas boilers and heaters identified for the Future (2032) No Action Alternative would remain the same for the Future (2037) No Action Alternative.

11.3.2 Diesel Generators

The location, name, horsepower, and annual usage of diesel-powered generators identified for the Future (2032) No Action Alternative would remain the same for the Future (2037) No Action Alternative.

11.3.3 Fuel Farm Tanks

The potential increase in Jet A fuel throughput for the Future (2037) No Action Alternative was based on the forecast increase in aircraft operations. It is estimated that the total volume of aviation fuel (Jet A) that would be supplied to aircraft would be 704,820,987 gallons for the Future (2037) No Action Alternative. The total volume of aviation fuel (Jet A) would be stored among eight existing fuel tanks located at the Airport's fuel farm.

11.4 Motor Vehicles

11.4.1 Motor Vehicles (On- and Off-Airport Roadways)

The roadway segment identifier, segment length, vehicle classification, vehicle distribution, and speed for each roadway segment identified for the Future (2032) No Action Alternative would remain the same for the Future (2037) No Action Alternative. Traffic volumes would be anticipated to change as would the emission factors, as described in the following sections.

11.4.1.1 *Traffic Volumes*

The forecasted traffic volume on each roadway segment and the annual VMT per roadway segment are provided in Table 5-6 in Attachment 5. The table notes the length of the segment and the average daily traffic, which is then multiplied by 365 to provide an annual total. Traffic volumes were provided by the Port for this scenario to account for employee and cargo growth. Roadways for which only WSDOT data was available, traffic volumes were increased proportional to the forecast increase in passengers. For the Future (2037) No Action Alternative there are anticipated to be 1,295,066,721 annual VMTs.

11.4.1.2 *Emissions Factors*

The EPA's MOVES4 was used to generate emissions rates in grams of pollutant per vehicle mile traveled (g/VMT). The emission factors are unique to the year 2037 and King County and are different for each criteria pollutant, speed, and vehicle type. The emission factors for each pollutant by speed and vehicle type for the Future (2037) No Action Alternative are provided in Table 5-7 in Attachment 5. Emission factors for the Future (2037) No Action Alternative are lower as compared to the Existing (2022) Condition and the Future (2032) No Action Alternative emissions factors. As previously stated, EPA assumes in MOVES that older vehicles are gradually replaced by newer vehicles.⁴³ Therefore, while there are more vehicles on- and off-roadways traveling more miles in the future, because the

⁴³ For EPA's guidance on emission factors see the following technical reports, Exhaust Emission Rates for Heavy-Duty Onroad Vehicles in MOVES4 (EPA-420-R-23-027 dated August 2023 and Exhaust Emission Rates for Light-Duty Onroad Vehicles in MOVES4 (EPA-420-R-23-028 dated August 2023) available online at <https://www.epa.gov/moves/moves-onroad-technical-reports>.



emission factors are lower, total emissions for motor vehicles for the Future (2037) No Action Alternative would be less as compared to the Future (2032) No Action Alternative.

11.4.2 Motor Vehicles (Parking Facilities)

The parking lots identified for the Future (2032) No Action Alternative would remain the same for the Future (2037) No Action Alternative meaning there would be no new lots, change in vehicle speed or distance within the lots, or any increase in the number of parking stalls in the lots. The potential volume increase in motor vehicles using the Doug Fox Lot and the Terminal Parking Lot for the Future (2037) No Action Alternative was based on the forecast increase in total passengers. The number of motor vehicles in those parking lots would increase commensurate with the increase in total passengers. The potential volume increase in motor vehicles using the North Employee Parking Lot for the Future (2037) No Action Alternative was based on the forecast increase in aircraft operations. It was assumed that as aircraft operations increase so would the number of employees. Therefore, the number of motor vehicles estimated for the Future (2037) No Action Alternative in the North Employee Parking Lot was increased proportional to the forecast increase in aircraft operations.

11.5 Future (2037) No Action Alternative Criteria Pollutant Emissions Inventory

The criteria pollutant emissions inventory provides the total annual pollutant emissions as short tons per year. The emissions inventory for the Future (2037) No Action Alternative is shown in **Table 12**. The Future (2037) No Action Alternative emissions inventory shows the pollutants with the greatest emissions are CO and NO_x. There were approximately 3,982 tons of CO and 3,088 tons of NO_x potentially emitted for the Future (2037) No Action Alternative. Aircraft produce the greatest contribution to CO emissions (52.5 percent) and NO_x emissions (96.3 percent).

TABLE 12: ANNUAL OPERATIONAL EMISSIONS INVENTORY - FUTURE (2037) NO ACTION ALTERNATIVE

Emission Source	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)
Aircraft	2,089	238	2,975	242	29	29
LTO (includes Start-Up, Approach, Climb, and Taxiing)	1,972	222	2,842	227	13	13
APUs	117	16	77	12	15	15
Aircraft Run-Ups	1	0	56	2	0	0
GSE	194	6	13	0	1	1
Tenant-Owned GSE	191	6	9	0	0	0
Port-Owned Airfield Vehicles and Equipment	3	0	4	0	0	0
Stationary Sources	16	11	27	37	1	1
Natural Gas Boilers and Heaters	13	1	16	0	0	0
Diesel Generators	2	0	11	37	0	0
Fuel Farm Tanks	0	10	0	0	0	0
Motor Vehicles	1,682	14	72	2	2	2
Parking Facilities	27	1	2	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	1,655	13	71	2	2	2
Total	3,982	268	3,088	281	32	32

Note: Totals may not sum due to rounding. CO = carbon monoxide, VOC = Volatile Organic Compounds, NO_x = nitrogen oxides, SO_x = sulfur oxides, PM₁₀ = coarse particulate matter, PM_{2.5} = fine particulate matter, ST = short tons.

Source: Port of Seattle and L&B, 2024.

12. Future (2037) Proposed Action

12.1 Aircraft

12.1.1 Aircraft Fleet Mix and Activity Levels

There would be a total of 509,892 aircraft operations forecast for the Future (2037) Proposed Action. This would be an increase of 35,018 annual operations more than the Future (2037) No Action Alternative. Table 1-5 in Attachment 1 presents the average annual operations for the specific airframe type with the AEDT engine code modeled in AEDT for the Future (2037) Proposed Action.

12.1.2 Aircraft Taxi Time

The same airfield configuration used for the Future (2032) Proposed Action was used for the Future (2037) Proposed Action. The average taxi in and taxi out time for the Future (2037) Proposed Action was determined by using the delay analysis developed with the TAAM tool normalized to the ASPM data.^{44,45} The average taxi in time was nine minutes and 45 seconds and the average taxi out time was 23 minutes and 32 seconds for the Future (2037) Proposed Action, for a total of 33 minutes and 17 seconds. These taxi in and taxi out times were applied to each operation in AEDT to develop the emissions inventory. The overall average taxi time increased one minute and 54 seconds for the Future (2037) Proposed Action as compared to the Future (2037) No Action Alternative. While the Proposed Action includes proposed facility improvements which would increase the Airport's ability to accommodate an increase in operations in 2037, airfield constraints would result in the Airport still experiencing increases in taxi times due to the higher number of total aircraft operating on the runways and taxiways, as well as the location of the proposed gates in relationship to the end of the runways. A summary of the taxi times for each scenario is provided in Table 1-6 in Attachment 1.

12.1.3 APUs

The APU durations per aircraft type identified for the Future (2037) No Action Alternative would remain the same for the Future (2037) Proposed Action. As previously discussed, regional and narrow body aircraft were considered Code C aircraft and assigned a total APU duration of 22 minutes per operation and wide body aircraft were considered Code D or above and assigned a total APU duration of 32 minutes per operation. The AEDT database was used to assign the specific types of APU equipment used for each aircraft type. General Aviation operations were assigned the AEDT default APU equipment and usage per operation because data on specific general aviation equipment and usage were not available. The Future (2037) Proposed Action would have greater APU usage as compared to the Future (2037) No Action Alternative because of the increase in overall aircraft operations. See Table 2-5 in Attachment 2 for the estimated annual APU usage for the Future (2037) Proposed Action.

12.1.4 Aircraft Run-Ups

The increase in overall aircraft operations in the Future (2037) Proposed Action from the Future (2037) No Action Alternative is anticipated to result in an increase in the number of run-ups. The number of aircraft run-ups was increased proportional to the forecast increase in aircraft operations. Therefore, a total of 606 aircraft run-up operations are estimated for the Future (2037) Proposed Action. This is an increase of 42 additional run-up operations over the Future (2037) No Action Alternative.

⁴⁴ Leigh Fisher. Environmental Review Airside Modeling, June 2020.

⁴⁵ Kandice Krull, FAA, Email to Sarah Potter, L&B, RE: SAMP NTP Env Review Normalized Taxi Times, July 10, 2023.

12.2 Ground Support Equipment

12.2.1 Tenant-Owned GSE

The analysis assumed that tenant-owned GSE usage would increase commensurate with the forecast in aircraft activity and that the same types of vehicles would be used.⁴⁶ Therefore, the type of tenant-owned GSE identified for the Existing (2022) Condition would remain the same for the Future (2037) Proposed Action Alternative. As such, no new pieces of equipment were added for the analysis; it was estimated that there would only be an increase in usage in those same pieces of equipment. Table 3-9 in Attachment 3 provides the tenant-owned GSE and estimated hours of annual usage modeled for the Future (2037) Proposed Action.

12.2.2 Port-Owned Airfield Vehicles and Equipment

The analysis assumed that Port-owned airfield vehicles and equipment usage would increase commensurate with the forecast in aircraft activity and that the same types of vehicles would be used.⁴⁷ The annual usage was increased proportional to the forecasted increase in aircraft operations. This includes Port vehicles and equipment used for airfield maintenance purposes and to support hardstand operations at the Airport. Table 3-10 in Attachment 3 provides the Port-owned airfield vehicles and equipment and estimated annual usage for the Future (2037) Proposed Action.

12.3 Stationary Sources

12.3.1 Natural Gas Boilers and Heaters

The location, equipment type, and usage of natural gas boilers and heaters identified for the Future (2032) Proposed Action would remain the same for the Future (2037) Proposed Action. There would be no change in square footage of new facilities from 2032 to 2037 with the Proposed Action. While the total number of passengers would increase, natural gas usage is based on the area of the facility not the number of passengers.

12.3.2 Diesel Generators

The location, description, horsepower, and estimated annual usage of diesel-powered generators identified for the Future (2032) Proposed Action would remain the same for the Future (2037) Proposed Action.

12.3.3 Fuel Farm Tanks

The potential increase in Jet A fuel throughput for the Future (2037) Proposed Action was based on the forecast increase in aircraft operations. It is estimated that the total volume of aviation fuel (Jet A) that would be supplied to aircraft would be 756,795,661 gallons for the Future (2037) Proposed Action. This is an increase of 51,974,674 gallons of fuel throughput compared to the Future (2037) No Action Alternative. The total volume of aviation fuel (Jet A) would be stored among 12 fuel tanks, including eight existing fuel tanks and four new fuel tanks to be located at the Airport's fuel farm as part of the Proposed Action.

⁴⁶ No future assumptions could be made on potential new equipment purchased by the tenants operating at the Airport. While these tenants would need to buy new equipment as older equipment reaches its end-of-life cycle, there are no known existing agreements or contracts for the purchase of any future equipment.

⁴⁷ No future assumptions could be made on potential new equipment purchased by the Port. While the Port would need to buy new equipment as older equipment reaches its end-of-life cycle, there are no existing agreements or contracts for the purchase of any future Port equipment.

12.4 Motor Vehicles

12.4.1 Motor Vehicles (On- and Off-Airport Roadways)

The roadway segment identifier, segment length, vehicle classification, vehicle distribution, and speed for each roadway segment identified for the Future (2032) Proposed Action would remain the same for the Future (2037) Proposed Action. The emission factors identified for the Future (2037) No Action Alternative would remain the same for the Future (2037) Proposed Action as emission factors are based upon the year/vehicle age and vehicle classification and would not be changed by the Proposed Action. Traffic volumes would be anticipated to change as described in the following section.

12.4.1.1 *Traffic Volumes*

The forecasted traffic volume on each roadway segment and the annual VMT per roadway segment are provided in Table 5-8 in Attachment 5. Traffic volumes were provided by the Port for this scenario to account for employee and cargo growth. Roadways for which only WSDOT data was available, traffic volumes were increased proportional to the forecast increase in passengers. For the Future (2037) Proposed Action there are anticipated to be 1,377,374,995 annual VMTs, an increase of 82,308,275 annual VMTs as compared to the Future (2037) No Action Alternative.

12.4.2 Motor Vehicles (Parking Facilities)

The parking lots identified for the Future (2032) Proposed Action would remain the same for the Future (2037) Proposed Action. The potential increase in passenger traffic in the parking lots for the Future (2037) Proposed Action was based on the forecast increase in passengers as parking lot use was increased in proportion to the change in passengers. The total forecast passengers were used to represent the potential increase in traffic volumes.

12.5 Future (2037) Proposed Action Criteria Pollutant Emissions Inventory

The criteria pollutant emissions inventory provides the total annual pollutant emissions as short tons per year. The emissions inventory for the Future (2037) Proposed Action is shown in **Table 13**. The Future (2037) Proposed Action emissions inventory shows the pollutants with the greatest emissions are CO and NO_x. There were approximately 4,245 tons of CO and 3,314 tons of NO_x potentially emitted for the Future (2037) Proposed Action. Aircraft produce the greatest contribution to CO emissions (52.6 percent) and NO_x emissions (96.1 percent). A summary comparison of the Future (2037) No Action Alternative and the Future (2037) Proposed Action is provided in Section 14.1 of this technical report.

TABLE 13: ANNUAL OPERATIONAL EMISSIONS INVENTORY - FUTURE (2037) PROPOSED ACTION

Emission Source	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)
Aircraft	2,231	252	3,184	259	31	31
LTO (includes Start-Up, Approach, Climb, and Taxiing)	2,104	235	3,041	243	14	14
APUs	126	17	82	13	16	16
Aircraft Run-Ups	1	0	60	2	0	0
GSE	208	6	14	0	1	1
Tenant-Owned GSE	204	6	10	0	1	0
Port-Owned Airfield Vehicles and Equipment	3	0	5	0	0	0
Stationary Sources	23	15	39	54	1	1
Natural Gas Boilers and Heaters	19	1	23	0	0	0
Diesel Generators	4	0	16	54	0	0
Fuel Farm Tanks	0	13	0	0	0	0
Motor Vehicles	1,784	14	76	2	2	2
Parking Facilities	32	1	2	0	0	0
On and Off-Airport Roadways (includes Airside Deliveries)	1,752	14	74	2	2	2
Total	4,245	288	3,314	315	35	34

Note: Totals may not sum due to rounding. CO =carbon monoxide, VOC=Volatile Organic Compounds, NO_x = nitrogen oxides, SO_x= sulfur oxides, PM₁₀ = coarse particulate matter, PM_{2.5} = fine particulate matter, ST = short tons.
Source: Port of Seattle and L&B, 2024.

13. Future (2037) Hybrid Option

The Future (2037) Hybrid Terminal Option would have the same operational impacts as Future (2037) Proposed Action because the only differences in the two alternatives would be related to the location of passenger loading bridges and aircraft hardstands. The number of future aircraft operations would be the same. Therefore, the criteria pollutant emissions inventory for the Future (2037) Hybrid Terminal Option would be the same as the Future (2037) Proposed Action.

14. Comparison of 2037 Alternatives

The results of the emission inventories prepared for the Future (2037) Proposed Action and the Future (2037) Hybrid Terminal Option were compared to the results of the emission inventories prepared for the Future (2037) No Action Alternative to disclose the potential increase in emissions.

14.1 Future (2037) Proposed Action

The results of the comparison between the Future (2037) Proposed Action and the Future (2037) No Action Alternative are shown in **Table 14**.



TABLE 14: SUMMARY OF ANNUAL CRITERIA POLLUTANT EMISSIONS, PROPOSED ACTION COMPARED TO THE NO ACTION ALTERNATIVE IN 2037

Emission Source	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)
2037 No Action Alternative	3,982	268	3,088	281	32	32
2037 Proposed Action (Operational Only)	4,245	288	3,314	315	35	34
2037 Increase in Emissions	263	20	225	34	3	2

Note: Totals may not sum due to rounding. CO =carbon monoxide, VOC=Volatile Organic Compounds, NO_x = nitrogen oxides, SO_x= sulfur oxides, PM₁₀=coarse particulate matter, PM_{2.5}= fine particulate matter, ST = short tons.
Source: Port of Seattle and L&B, 2024.

Emissions of all pollutants are expected to be greater with the Proposed Action than the No Action Alternative, mainly due to the higher level of airport activity that the Proposed Action would serve. Implementation of the NTPs would increase the Airport's ability to accommodate increased aircraft operations and passenger activity by adding aircraft gates and passenger processing facilities. Annual aircraft operations for the Future Proposed Action are forecast to increase to 509,892 in 2037. The Proposed Action would serve 35,018 more operations in 2037 (7.4 percent) than the No Action Alternative, which would result in a potential increase in emissions. While operational efficiencies would be achieved with the Proposed Action, emissions would be greater due to the higher level of operations.

The largest change to emissions with the Proposed Action would occur in 2037 when the activity difference is the greatest relative to the No Action. CO emissions would increase from 3,982 tons (No Action) to 4,245 tons (Proposed Action) or 263 tons (a 6.6 percent change). VOC emissions in 2037 would be 7.3 percent higher with the Proposed Action, NO_x emissions would be 7.3 percent higher, SO_x emissions would be 12.3 percent higher, and PM₁₀ and PM_{2.5} emissions would be 7.8 percent higher due to the Proposed Action.⁴⁸

14.2 Future (2037) Hybrid Option

The results of the comparison between the Hybrid Terminal Option and the No Action Alternative are shown in **Table 15**.

TABLE 15: SUMMARY OF ANNUAL CRITERIA POLLUTANT EMISSIONS, HYBRID TERMINAL OPTION COMPARED TO THE NO ACTION ALTERNATIVE IN 2037

Emission Source	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)
2037 No Action Alternative	3,982	268	3,088	281	32	32
2037 Hybrid Terminal Option (Operational Only)	4,245	288	3,314	315	35	34
2037 Increase in Emissions	263	20	225	34	3	2

Note: Totals may not sum due to rounding. CO =carbon monoxide, VOC=Volatile Organic Compounds, NO_x = nitrogen oxides, SO_x= sulfur oxides, PM₁₀=coarse particulate matter, PM_{2.5}= fine particulate matter, ST = short tons.
Source: Port of Seattle and L&B, 2024.

The Hybrid Terminal Option would have the same operational impacts as the Proposed Action because the only differences in the two alternatives would be related to the location of passenger loading bridges and aircraft hardstands.

⁴⁸ The reported percent increases were estimated using derived results prior to rounding.

15. Air Quality Significance Determination

An emissions inventory is a summary in tons per year of the total pollutants generated by an alternative. Pollutant concentrations in the NAAQS are measured in micrograms per cubic meter or parts per million/billion and describe concentrations of the pollutants in the air. An emissions inventory is not directly comparable to the NAAQS.

Of the projected pollutant increases, the largest increase would be to CO and NO_x. The Port worked with PSCAA in developing the region's most recent air quality plan and prior SIPs and has kept the region abreast of activity levels at the Airport as the region came into attainment. The Washington State Department of Ecology has established an air monitoring network around the state that measures air pollution. The air quality monitoring stations in King County are maintained by the PSCAA. The air quality monitoring stations closest to the Airport are Seattle South Park, Kent, Allentown, and Beacon Hill. CO levels have decreased significantly in the Puget Sound region primarily due to emissions controls on car engines. The most recent publicly available data on CO and NO_x from the air quality monitors indicate that not only the air quality complies with the NAAQS but concentrations are below the NAAQS for CO and NO_x.⁴⁹ Therefore, the potential increase in criteria pollutant emissions, as shown in the emissions inventory for the Proposed Action or the Hybrid Terminal Option as compared to the No Action Alternative, would not be expected to create any new violation of the NAAQS.⁵⁰

16. Federal Regulatory Setting for GHG

On January 9, 2023, Council on Environmental Quality (CEQ) issued the *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change*, which is interim guidance to assist agencies in analyzing greenhouse gas and climate change effects of their proposed actions under NEPA. Per FAA Order 1050.1F Desk Reference, there are no federal significance thresholds for greenhouse gas (GHG) emissions, nor has the FAA identified specific factors to consider in making a significance determination for GHG emissions. After the publication of the Draft EA, Executive Order (EO) 13990, which was relied upon for the January 2023 CEQ draft GHG guidance, was revoked. In addition, CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA, 42 U.S.C. 4321 *et seq.*, as amended, in response to EO 14154. As a result of these changes, all references to climate and the qualitative climate evaluation that discussed the level of preparedness with respect to the impacts of climate change, the extent to which the alternatives could be affected by future climate conditions, and if the alternatives are consistent with national, state, and local climate goals has been removed from this Technical Report.

17. Overall Approach to GHG Assessment

Per FAA Order 1050.1F, the discussion of potential GHG emissions should be documented in a separate section of the NEPA document, distinct from air quality.⁵¹ FAA guidance notes that if a project might increase criteria pollutants and/or fuel use, it could increase GHG emissions, warranting an emissions inventory.

⁴⁹ Puget Sound Clean Air Agency. 2022 Air Quality Data Summary, December 2023.

⁵⁰ Erik Saganić, PSCAA, Email to Kandice Krull, FAA, RE: Sea-Tac International Airport Preliminary Air Results, December 14, 2023.

⁵¹ FAA, April 2015, Order 1050.1F Paragraph 4-1. Climate is considered a separate section from Air Quality.

GHG emissions inventories were conducted to provide the estimate of the annual rate (metric tons per year) of GHG emissions attributable to airport sources for the No Action Alternative and the Proposed Action. The GHG emissions inventories were conducted in accordance with the guidelines provided in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures (including the Desk Reference)*; FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*; FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*; and the CEQ's *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change*. Per these guidelines, the GHG assessment was developed to include a NEPA GHG emissions inventory and disclosure of estimated GHG emissions as detailed below.

18. GHG Methodology

18.1 Pollutants

GHGs are gases that trap heat in the earth's atmosphere. GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFC), and perfluorocarbons (PFCs). Of these GHGs, only CO₂, CH₄ and N₂O are potentially emitted directly or indirectly as a consequence of the Proposed Action and are included in this analysis.⁵²

18.2 Global Warming Potential

GHGs differ from each other in their ability to absorb energy and how long they stay in the atmosphere. The Global Warming Potential (GWP) was developed to allow comparisons of global warming impacts of different gases by converting each gas amount to a carbon dioxide equivalent (CO₂e).⁵³ GWPs provide a common unit of measure, which allows for one emission estimate of these different gases.

For this analysis, GWPs were based on a 100-year period (GWP 100) provided in the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1* and based on the Intergovernmental Panel on Climate Change (IPCC), Fifth Assessment Report (AR5).⁵⁴ CO₂ has a GWP of one (1) because it is the gas used as the reference point. Methane does not last as long in the atmosphere as CO₂ however it absorbs much more energy. Therefore, one ton of methane has 34 times more heat capturing potential than one ton of carbon dioxide. The amount of methane emissions would be multiplied by 34 to determine its CO₂e value. Nitrous oxides last in the atmosphere far longer than CO₂. The amount of nitrous oxides emissions would be multiplied by 298 to determine its CO₂e value.

⁵² Per EPA, fluorinated gases are generally emitted as refrigerants and through industrial processes such as aluminum and semiconductor manufacturing. Additional information from the EPA on fluorinated gases can be found at <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>

⁵³ EPA, 2017, Understanding Global Warming Potentials. <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>, Accessed August 2017.

⁵⁴ There are also 20-year GWP values which prioritizes gases with shorter lifetimes. For example, the GWP 20 value for methane is 86, according to IPCC AR5, as compared to the GWP 100 value of 34. There is no difference between GWP 100 and GWP 20 for CO₂ and only a minor difference for nitrous oxides (GWP 100 is 298 and GWP 20 is 268). It is acknowledged that GHG emissions, especially for methane, would be higher using the GWP 20 instead of the GWP 100. However, methane emissions represent a small fraction of the total GHG emissions at SEA. This analysis used FAA guidance specifically provided in the FAA's *Aviation Emissions and Air Quality Handbook* to determine potential GHG emissions.

18.3 Scope/Categories of Emissions

GHG emissions inventories are presented in a different manner than air quality criteria pollutant emissions inventories. GHG emissions inventories are categorized into three groups, Scope 1, 2, and 3 emissions, as described below.

- Scope 1 – GHG emissions from sources owned or controlled by the Port at the Airport, including Port-owned vehicles, equipment, and stationary sources such as natural gas boilers and diesel generators. These GHGs are primarily limited to the project site.
- Scope 2 – GHG emissions from off-Airport generation of electricity purchased by the Port and consumed at the Airport. It is recognized that the estimation of GHG emissions from electricity generation is a widely accepted methodology according to international and FAA guidelines on preparing GHG emissions inventories.
- Scope 3 – GHG emissions caused by airport operations that are not under the direct control of the Port, including sources like aircraft and passenger-related motor vehicle emissions.

Furthermore, GHG emissions are categorized by the degrees of control that an airport operator may have over them. These categories are defined as follows:

- Category 1 – GHG emissions from sources that are controlled by the reporting entity, such as Port-owned GSE or vehicles and electrical consumption by the Port. In the case of an airport operator these include Scope 1 emissions but can also include some Scope 2 and Scope 3 sources over which the entity can exert some control. Examples of the latter can include personal vehicle use for business purposes that is reimbursed by the airport operator.
- Category 2 – This category comprises Scope 3 emissions associated with sources owned and controlled by airlines and airport tenants. Examples include aircraft, APUs, tenant-owned GSE, electrical consumption, and other stationary sources controlled by tenants.
- Category 3 – This category generally comprises Scope 3 emissions associated with public sources associated with the airport. Examples include private automobiles, taxis used for drop-off, limousines, buses, and shuttle vans traveling to and from the airport.

18.4 Scope 1

Port-owned vehicles used primarily on the airfield, including GSE, are considered Scope 1, Category 1.^{55,56} Stationary sources used by the Port are located on Airport property and are also included in Scope 1, Category 1.

18.4.1 Port-Owned Airfield Vehicles and Equipment

The same Port-owned airfield vehicles and equipment data and assumptions developed for the air quality criteria pollutant emissions inventory was used to prepare the GHG emissions inventory. The annual GHG emissions were estimated using the following formula from the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*.

⁵⁵ The use of Port-owned vehicles that primarily operate on roadways, such as cars and trucks, are considered Scope 3

⁵⁶ It is acknowledged that this results in fewer Scope 1 emissions and more Scope 3 emissions; however, all of the potential Port-owned vehicle GHG emissions are included in the analysis. GHG emissions from motor vehicles operating on roadways were based on vehicle miles traveled. For reference, the Port's 2022 GHG emissions inventory for mobile sources, which is based on specific gasoline or diesel usage, accounted for approximately 1,300 tons of CO₂.



- *Equipment Emission Rate (tons/year) = Full Throttle Emission Factor (grams/hp-hour) x size (hp) x hours per year x Load Factor x Usage Factor x (1 pound/453.59 grams) x (1 ton/2,000 pounds)*

The full throttle emission factors for diesel, gasoline, and propane equipment used to estimate GHG emissions from Port-owned airfield vehicles and equipment were developed from MOVES4 and are provided in Table 3-11 in Attachment 3.⁵⁷

The Port-owned airfield vehicles and equipment for the Existing (2022) Condition and each of the alternatives are provided in **Table 16**. Attachment 3 provides the annual usage in hours by each Port-owned GSE for the Existing (2022) Condition and each of the alternatives. As stated in Section 12.2, the annual usage was increased proportional to the forecasted increase in aircraft operations. Energy usage from Port-owned electric vehicles are discussed in Section 18.5.1.

TABLE 16: PORT-OWNED GSE - SUMMARY COMPARISON OF ANNUAL USAGE

Scenario	Fuel Type	Annual Usage (gallons)
Existing Condition	Diesel	29,608
Existing Condition	Gasoline	57,224
Existing Condition	Propane	24
Future (2032) No Action	Diesel	34,443
Future (2032) No Action	Gasoline	66,570
Future (2032) No Action	Propane	27
Future (2032) Proposed Action	Diesel	35,089
Future (2032) Proposed Action	Gasoline	67,818
Future (2032) Proposed Action	Propane	28
Future (2037) No Action	Diesel	35,031
Future (2037) No Action	Gasoline	67,707
Future (2037) No Action	Propane	28
Future (2037) Proposed Action	Diesel	37,615
Future (2037) Proposed Action	Gasoline	72,700
Future (2037) Proposed Action	Propane	30

Source: Port of Seattle and L&B, 2023.

18.4.2 Stationary Sources

GHGs for stationary sources are determined by multiplying the emission factor by the annual usage. In order to determine GHG emissions, the emission factors shown in **Table 17** were used.

TABLE 17: GHG EMISSION FACTORS FOR STATIONARY SOURCES

Fuel	CO ₂	N ₂ O	CH ₄
Natural Gas	0.05444 kg/ standard cubic foot (scf)	0.00010 g/scf	0.00103 g/scf
Diesel	10.21 kg/gallon	0.08 g/gallon	0.41 g/gallon

Note: tonnes denotes metric tons, kg denotes kilogram, g denotes gram, mmBtu denotes million British thermal units; GHG emission factors presented in the table were converted to tonnes/therm: 0.005306 tonnes CO₂/therm, 0.0000001 tonnes CH₄/therm, and 0.00000001 tonnes N₂O/therm

Source: US EPA, Emission Factors for Greenhouse Gas Inventories, Center for Corporate Climate Leadership, April 2022, https://www.epa.gov/system/files/documents/2022-04/ghg_emission_factors_hub.pdf

⁵⁷ The Airport Support Equipment available in MOVES4 was be used for Ground Support Equipment



Natural Gas Boilers

Table 18 provides the total natural gas usage by scenario for the boilers and heaters. Specific boilers and heaters with their annual consumption are provided in Attachment 4.

TABLE 18: NATURAL GAS BOILERS AND HEATERS - SUMMARY COMPARISON OF ANNUAL USAGE

Scenario	Annual Consumption (Therms)
Existing (2022) Condition	3,170,725
2032 & 2037 No Action Alternative	3,322,066
2032 & 2037 Proposed Action	4,686,321

Source: Port of Seattle and L&B, 2024.

The No Action Alternative is anticipated to consume more natural gas than the Existing (2022) Condition because the No Action Alternative includes projects that have recently been constructed or will be constructed by 2032, including: Terminal Renovation, A Concourse Building Expansion, and C Concourse Expansion that were not included in the Existing (2022) Condition. These facilities are also included in the Proposed Action. The Proposed Action is anticipated to consume more natural gas than the No Action Alternative because the Proposed Action includes potential new facilities that would use new natural gas boilers and heaters.

Diesel Generators

In order to determine GHG emissions from generators, hours of use were converted to an annual amount of consumption in gallons. The fuel rate in gallons per hour was provided by the Port for each of the generators depending on the horsepower and the type of generator. The fuel rate was used to develop the total annual amount of diesel fuel consumed. **Table 19** provides the total diesel generators usage by scenario. Table 4-8 in Attachment 4 provides the fuel rate per generator.

The No Action Alternative is anticipated to consume more gallons of diesel than the Existing (2022) Condition because the No Action includes projects that have recently been constructed or will be constructed by 2032 that will include new diesel-powered backup generators. The Proposed Action is anticipated to consume more diesel from generators than the No Action Alternative because the Proposed Action includes potential new facilities that would require additional generators.

TABLE 19: DIESEL GENERATORS - SUMMARY COMPARISON OF ANNUAL USAGE

Scenario	Annual Usage (Hours)
Existing (2022) Condition	509.2
2032 & 2037 No Action Alternative	554.2
2032 & 2037 Proposed Action	772.4

Source: Port of Seattle and L&B, 2024.

Fuel Tanks

No GHG emissions were estimated for Jet A fuel throughput due to storage in the fuel tanks. While the storage of fuel is a potential source of evaporative hydrocarbon emissions, it does not produce the type of hydrocarbon emissions from the combustion of fuel that contribute directly to global climate change.



18.5 Scope 2

Scope 2 includes GHG emissions associated with the off-Airport generation of electricity purchased and consumed at the Airport by the Port.

18.5.1 Port of Seattle Electricity Consumption

Scope 2 GHG emissions are created as a result of electricity use in Airport buildings (e.g., Airport terminals, distribution center, bus maintenance facility, and other miscellaneous sources) and the airfield lighting which are generated from off-site power plant locations. Port electricity consumption is considered Category 2. This does not include GHG emissions associated with the generation of electricity that was provided by the Port directly to tenants. GHG emissions associated with tenant electricity consumption are considered Scope 3 and are disclosed in Section 18.6.5. GHG emissions are calculated by multiplying the emission factors and the total electrical consumption on an annual basis.

Electricity is provided to the Port by Bonneville Power Administration (BPA), Puget Sound Energy (PSE), and Seattle City Light (SCL). Emission factors per kilowatt-hour of electricity consumption are provided in **Table 20**.

TABLE 20: GHG EMISSION FACTORS FOR OFF-SITE (PURCHASED) ELECTRICITY GENERATION

Fuel	CO ₂ (tonnes/kWh)
BPA Electricity Purchased	0.00001250
PSE Electricity Purchased	0.00041594
SCL Electricity Purchased	0.00000891

Note: Tonnes refers to metric tons. KWh denotes kilowatt-hour.
Source: Port of Seattle, 2023.

Table 21 provides the total electricity usage by the Port for the Existing (2022) Condition and each future scenario. The No Action Alternative includes projects that have recently been constructed or will be constructed by 2032. It is assumed that there would be no other projects that would change electricity usage between the Future (2032) No Action Alternative and the Future (2037) No Action Alternative; therefore, those projections are the same. The Future (2032) Proposed Action and the Future (2037) Proposed Action GHG emissions inventory for Port electricity consumption was based on anticipated energy use per square foot. Average electricity use per square foot for baseline conditions by each provider were used to determine the potential increase in electricity consumption that would correlate with the potential increase in square footage with the proposed new facilities. It is assumed for purposes of modeling GHG emissions that all elements of the Proposed Action would be completed by 2032.⁵⁸ There would be no known additional square footage that would change electricity usage between the Future (2032) Proposed Action and the Future (2037) Proposed Action, therefore those projections are the same.

⁵⁸ The Proposed Action could begin construction as soon as 2025 and if started then, be complete by 2032.

TABLE 21: PORT OF SEATTLE ELECTRICITY CONSUMPTION - SUMMARY COMPARISON OF ANNUAL CONSUMPTION

Scenario	Total BPA Electricity Consumption (MWH):	Total SCL Electricity Consumption (MWH):	Total PSE Electricity Consumption (MWH):	Total Electricity Consumption (MWH):
Existing (2022) Condition	117,000	2,100	2,207	121,307
2032 & 2037 No Action Alternative	122,121	2,100	2,207	126,428
2032 & 2037 Proposed Action	166,273	2,900	3,083	172,256

Note: MWh denotes megawatt-hour
Source: Port of Seattle, 2024.

18.6 Scope 3

Scope 3 includes indirect GHG emissions caused by airport operations that are not under the direct control of the Port, including sources like aircraft and motor vehicle emissions.

18.6.1 Aircraft Landing and Take-off (Includes Start-Up, Approach, Climb, and Taxiing), APU's, and Aircraft Run-Up Activity

Aircraft landing and take-off, including start-up, approach, climb, and taxiing, APU's, and aircraft run-up activity are considered Scope 3, Category 2. For all scenarios, the GHG emissions inventory was prepared by estimating the emission related to the consumption of the total fuel that was dispensed, or supplied, to aircraft at the Airport. The emission factors for Jet A LTO shown in **Table 22** will be used to determine GHG emissions from the fuel dispensed at the Airport.

TABLE 22: GHG EMISSION FACTORS FOR AIRCRAFT ENGINE FUEL

Fuel	CO ₂	N ₂ O	CH ₄
Jet A	9.75 kg/gallon	0.30 g/gallon	0.0 g/gallon

Note: CO₂ = carbon dioxide, N₂O = nitrous oxides, CH₄ = methane, kg = kilogram, g = gram.
Source: US EPA, Emission Factors for Greenhouse Gas Inventories, Center for Corporate Climate Leadership, April 2022, https://www.epa.gov/system/files/documents/2022-04/ghg_emission_factors_hub.pdf

Because aircraft operations, the use of APU's, and aircraft run-ups are expected to increase each year, the amount of fuel dispensed for the Future (2032) No Action and the Future (2037) No Action, and the Future (2032) Proposed Action and the Future (2037) Proposed Action, will be higher as compared to the Existing (2022) Condition.

18.6.2 Tenant-Owned GSE

Tenant-owned GSE are considered Scope 3, Category 2. For tenant-owned GSEs, the same data and assumptions for GSE equipment, number of operations, and operating time as developed for the criteria emissions inventory were used. Horsepower, operating time per unit and number of operations, and load factor were obtained from AEDT.

Emission factors developed in MOVES4 by fuel type and horsepower group are provided in Table 3-11 in Attachment 3. Emissions for GSEs assigned to aircraft operations were determined using the following formula.

- *Equipment Emission Rate (tons/year) = Size (hp) x Load Factor x Hours per Year x Emission Factor (g/hp-hr) x (1 pound/453.59 grams) x (1 ton/2,000 pounds)*

The tenant-owned airfield vehicles and equipment for the Existing (2022) Condition and each of the alternatives are provided in **Table 23**. Attachment 3 provides the annual usage in hours by each tenant-owned GSE for the Existing (2022) Condition and each of the alternatives.

TABLE 23: TENANT-OWNED GSE - SUMMARY COMPARISON OF ANNUAL USAGE

Scenario	Annual Usage (hours)
Existing Condition	755,174
Future (2032) No Action	893,153
Future (2032) Proposed Action	909,451
Future (2037) No Action	910,188
Future (2037) Proposed Action	975,374

Source: Port of Seattle and L&B, 2024.

18.6.3 Tenant Electricity Consumption

Tenant electricity consumption is considered Scope 3, Category 2. The GHG emissions inventory includes emissions associated with the generation of electricity provided by the Port directly to tenants, which are considered Scope 3. Electricity is used by tenant facilities including electricity for charging electrified GSE. Electricity provided by the Port and consumed by tenants is only provided by BPA. **Table 24** provides the tenant electricity usage for the Existing (2022) Condition and the future conditions.

TABLE 24: TENANT ELECTRICITY CONSUMPTION-SUMMARY COMPARISON OF ANNUAL USAGE

Scenario	Tenant BPA Electricity Consumption (MWH):
Existing (2022) Condition	26,637
No Action Alternative (2032 and 2037)	26,637
Proposed Action (2032 and 2037)	36,967

Note: MWh denotes megawatt-hour
Source: Port of Seattle, 2023.

The Proposed Action tenant electricity consumption was based on anticipated energy use per square foot. Average electricity use for baseline conditions was used to determine the potential increase in electricity consumption with the potential increase in square footage with the proposed new facilities. The Future (2032) Proposed Action and the Future (2037) Proposed Action are estimated to consume higher electricity due to the increased electricity usage to support the additional square footage in the Proposed Action scenarios.

Emission factors per kilowatt-hour of electricity were previously provided in Table 22. Emissions are calculated by multiplying the emission factors by the total annual electrical consumption by tenants and then converted using the GWP 100 values.

18.6.4 Motor Vehicles on- and off-Airport Roadways and Parking Lots (Including Airside Deliveries)

GHG emissions from motor vehicles operating on- and off-airport roadways and within select parking lots are considered Scope 3, Category 3. The GHG emissions inventory was prepared based on the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*. The GHG emissions inventory for motor vehicles was prepared using the same data and assumptions including number and type of vehicles by roadway segment, VMTs by vehicle type, and average speed as developed for the criteria emissions inventory. The EPA's MOVES4 was used to develop emission factors for use with the VMTs to determine the GHG emissions inventory provided in Attachment 5.

19. GHG Construction Emissions Inventories

The GHG construction emissions inventories were prepared using the same data and assumptions as developed for the criteria pollutant construction emissions inventories. The detailed construction phasing schedule, the assumptions of on-road and non-road construction vehicles, and the emission factors for the Proposed Action and the Hybrid Terminal Option are provided in Attachment 6.

19.1 Proposed Action - GHG Construction Emissions Inventory

The construction emissions inventory for the Proposed Action is shown in **Table 25**. As the table shows, peak construction GHG emissions are expected to occur in 2028 and produce 44,111 metric tons of CO₂e.

TABLE 25: CONSTRUCTION GHG EMISSIONS INVENTORY - PROPOSED ACTION

Year	CO ₂ (CO ₂ e MT)	CH ₄ (CO ₂ e MT)	N ₂ O (CO ₂ e MT)	Total CO ₂ e (MT)
2025	6,055	2	16	6,073
2026	25,761	14	79	25,854
2027	40,154	22	114	40,290
2028	43,967	23	121	44,111
2029	41,593	25	105	41,722
2030	29,633	19	73	29,725
2031	22,899	15	58	22,972
2032	8,458	5	20	8,482

Note: Totals may not sum due to rounding. CO₂ = carbon dioxide, CH₄ = methane, N₂O = nitrous oxide, CO₂e = carbon dioxide equivalent, MT = metric tons.

Source: Port of Seattle and L&B, 2024.

19.2 Hybrid Terminal Option - GHG Construction Emissions Inventory

The construction emissions inventory for the Hybrid Terminal Option is shown in **Table 26**. Peak construction GHG emissions are expected to occur in 2029 and produce 48,347 metric tons of CO₂e. In 2025 and 2026, there is no difference in GHG construction emissions between the Hybrid Terminal Option and the Proposed Action. From 2027 through 2032, the Hybrid Terminal Option results in greater GHG emissions than the Proposed Action due to the change in construction phasing and the additional elements that must be constructed such as the connection to Concourse D.

TABLE 26: CONSTRUCTION GHG EMISSIONS INVENTORY - HYBRID TERMINAL OPTION

Year	CO ₂ (CO ₂ e MT)	CH ₄ (CO ₂ e MT)	N ₂ O (CO ₂ e MT)	Total CO ₂ e (MT)
2025	6,055	2	16	6,073
2026	25,761	14	79	25,854
2027	41,730	22	111	41,862
2028	48,048	24	118	48,191
2029	48,211	26	109	48,347
2030	39,235	21	81	39,337
2031	32,633	17	65	32,715
2032	12,362	5	22	12,390

Note: Totals may not sum due to rounding. CO₂ = carbon dioxide, CH₄ = methane, N₂O = nitrous oxide, CO₂e = carbon dioxide equivalent, MT = metric tons.

Source: Port of Seattle and L&B, 2024.

20. GHG Operational Emissions Inventories

20.1 Existing (2022) Condition

The estimated annual rate (metric tons per year) of GHG emissions is provided in **Table 27**.

TABLE 27: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY - EXISTING (2022) CONDITION

Emissions Source	CO ₂ (CO ₂ e MT)	CH ₄ (CO ₂ e MT)	N ₂ O (CO ₂ e MT)	Total CO ₂ e (MT)
Scope 1				
Port-Owned Airfield Vehicles/Equipment	3,717	5	0	3,722
Natural Gas Boilers and Heaters	16,824	11	9	16,844
Diesel Generators	279	0	1	281
Fuel Farm Tanks ¹	0	0	0	0
Total - Scope 1	20,820	16	10	20,846
Scope 2				
Port of Seattle Electricity Consumption	2,399	0	0	2,399
Total – Scope 2	2,399	0	0	2,399
Scope 3				
Aircraft LTOs (includes Start-Up, Approach, Climb, and Taxiing), APUs, and Aircraft Run-Ups ²	5,700,743	6,275	0	5,707,018
Tenant-Owned GSE	27,891	4	0	27,895
Tenant Electricity Consumption	330	0	0	330
Airside Deliveries	512	1	10	523
Roadways	391,333	406	3,668	395,406
Parking Facilities	6,547	10	66	6,623
Total - Scope 3	6,127,355	6,695	3,744	6,137,795
Total	6,150,575	6,712	3,754	6,161,040
			CO₂e Total	6,161,040

¹ CO₂, CH₄, and N₂O, are by-products of fuel combustion. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.

² Based on FAA guidance, the estimated GHG emissions for aircraft operations, APUs, and aircraft engine ground run-ups were developed using the approximate fuel dispensed at the Airport to calculate emissions for the full flight.

Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value. Totals may not sum due to rounding. CO₂ = carbon dioxide, CH₄ = methane, N₂O = nitrous oxide, CO₂e = carbon dioxide equivalent, MT = metric tons. Source: Port of Seattle, L&B, 2024.

20.2 Future (2032) No Action Alternative

The estimated annual rate (metric tons per year) of operational GHG emissions for the Future (2032) No Action Alternative is provided in **Table 28**.

TABLE 28: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY - FUTURE (2032) NO ACTION ALTERNATIVE

Emissions Source	CO ₂ (CO ₂ e MT)	CH ₄ (CO ₂ e MT)	N ₂ O (CO ₂ e MT)	Total CO ₂ e (MT)
Scope 1				
Port-Owned Airfield Vehicles/Equipment	4,324	5	0	4,330
Natural Gas Boilers and Heaters	17,627	11	10	17,648
Diesel Generators	327	0	1	328
Fuel Farm Tanks ¹	0	0	0	0
<i>Total - Scope 1</i>	<i>22,278</i>	<i>17</i>	<i>11</i>	<i>22,306</i>
Scope 2				
Port of Seattle Electricity Consumption	2,463	0	0	2,463
<i>Total - Scope 2</i>	<i>2,463</i>	<i>0</i>	<i>0</i>	<i>2,463</i>
Scope 3				
Aircraft LTOs (includes Start-Up, Approach, Climb, and Taxiing), APUs, and Aircraft Run-Ups ²	6,631,793	0	63,977	6,695,771
Tenant-Owned GSE	32,691	47	0	32,737
Tenant Electricity Consumption	330	0	0	330
Airside Deliveries	496	0	12	509
Roadways	408,362	222	4,339	412,923
Parking Facilities	6,786	6	66	6,858
<i>Total - Scope 3</i>	<i>7,080,457</i>	<i>276</i>	<i>68,394</i>	<i>7,149,127</i>
Total	7,105,199	293	68,405	7,173,897
			CO₂e Total	7,173,897

¹ CO₂, CH₄, and N₂O, are by-products of fuel combustion. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.

² Based on FAA guidance, the estimated GHG emissions for aircraft operations, APUs, and aircraft engine ground run-ups were developed using the approximate fuel dispensed at the Airport to calculate emissions for the full flight.

Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value. Totals may not sum due to rounding. CO₂ = carbon dioxide, CH₄ = methane, N₂O = nitrous oxide, CO₂e = carbon dioxide equivalent, MT = metric tons. Source: Port of Seattle, L&B, 2024.



20.3 Future (2032) Proposed Action

The estimated annual rate (metric tons per year) of GHG emissions for the Future (2032) Proposed Action is provided in **Table 29**. A summary comparison of the Future (2032) No Action Alternative and the Future (2032) Proposed Action GHG emissions is provided in Section 20.5.1 of this technical report.

**TABLE 29: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY - FUTURE (2032)
PROPOSED ACTION**

Emissions Source	CO ₂ (CO ₂ e MT)	CH ₄ (CO ₂ e MT)	N ₂ O (CO ₂ e MT)	Total CO ₂ e (MT)
Scope 1				
Port-Owned Airfield Vehicles/Equipment	4,405	6	0	4,411
Natural Gas Boilers and Heaters	24,866	16	14	24,896
Diesel Generators	550	1	1	552
Fuel Farm Tanks ¹	0	0	0	0
<i>Total - Scope 1</i>	29,821	22	15	29,859
Scope 2				
Port of Seattle Electricity Consumption	3,386	48	0	3,434
<i>Total – Scope 2</i>	3,386	48	0	3,434
Scope 3				
Aircraft LTOs (includes Start-Up, Approach, Climb, and Taxiing), APUs, and Aircraft Run-Ups ²	6,756,148	0	65,177	6,821,325
Tenant-Owned GSE	33,291	48	0	33,338
Tenant Electricity Consumption	462	6		468
Airside Deliveries	505	0	12	518
Roadways	416,812	227	4,422	421,461
Parking Facilities	7,634	7	74	7,714
<i>Total - Scope 3</i>	7,214,852	287	69,685	7,284,825
<i>Total</i>	7,248,060	357	69,700	7,318,118
			CO₂eTotal	7,318,118

¹ CO₂, CH₄, and N₂O, are by-products of fuel combustion. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.

² Based on FAA guidance, the estimated GHG emissions for aircraft operations, APUs, and aircraft engine ground run-ups were developed using the approximate fuel dispensed at the Airport to calculate emissions for the full flight.

Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value. Totals may not sum due to rounding. CO₂ = carbon dioxide, CH₄ = methane, N₂O = nitrous oxide, CO₂e = carbon dioxide equivalent, MT = metric tons. Source: Port of Seattle, L&B, 2024.

20.4 Future (2032) Hybrid Terminal Option

The Future (2032) Hybrid Terminal Option would have the same operational GHG emissions as the Future (2032) Proposed Action because the only differences in the two alternatives would be related to the location of passenger loading bridges and aircraft hardstands. The number of future aircraft operations would be the same.



20.5 Comparison of 2032 Alternatives

The results of the GHG emission inventories prepared for the Future (2032) Proposed Action and the Future (2032) Hybrid Terminal Option were compared to the results of the emission inventories prepared for the Future (2032) No Action Alternative to disclose the potential increase in GHG emissions.

20.5.1 Future (2032) Proposed Action

The results of the comparison between the Future (2032) Proposed Action and the Future (2032) No Action Alternative are shown in **Table 30**. Relative to the No Action, the Proposed Action would increase operational GHG emissions by 2.1 percent in 2032. As noted earlier in this technical report, the Future (2032) Proposed Action is expected to serve more aircraft operations relative to the Future (2032) No Action. The Future (2032) Proposed Action would serve 8,755 more operations (1.9 percent) than the Future (2032) No Action Alternative. Thus, the increase in GHG emissions with the Future (2032) Proposed Action relative to the Future (2032) No Action is largely due to the higher level of airport activity that the Future (2032) Proposed Action would serve.

TABLE 30: SUMMARY OF GHG EMISSIONS, PROPOSED ACTION COMPARED TO THE NO ACTION ALTERNATIVE IN 2032

Emissions Source	CO ₂ (CO ₂ e MT)	CH ₄ (CO ₂ e MT)	N ₂ O (CO ₂ e MT)	Total CO ₂ e (MT)
2032 No Action Alternative	7,105,199	293	68,405	7,173,897
2032 Proposed Action	7,256,518	362	69,720	7,326,600
<i>Construction</i>	<i>8,458</i>	<i>5</i>	<i>20</i>	<i>8,482</i>
<i>Operational</i>	<i>7,248,060</i>	<i>357</i>	<i>69,700</i>	<i>7,318,118</i>
<i>2032 Increase in Emissions</i>	<i>151,319</i>	<i>69</i>	<i>1,316</i>	<i>152,703</i>

Note: Totals may not sum due to rounding. CO₂ = carbon dioxide, CH₄ = methane, N₂O = nitrous oxide, CO₂e = carbon dioxide equivalent, MT = metric tons.

Source: Port of Seattle and L&B, 2024.

20.5.2 Future (2032) Hybrid Terminal Option

The results of the comparison between the Future (2032) Hybrid Terminal Option and the Future (2032) No Action Alternative are shown in **Table 31**. The Future (2032) Hybrid Terminal Option would have the same operational GHG emissions as the Future (2032) Proposed Action in the same years because the only differences in the two alternatives would be related to the location of passenger loading bridges and aircraft hardstands. The number of future aircraft operations would be the same. Minor differences in construction activities for Future (2032) Hybrid Terminal Option would result in the Future (2032) Hybrid Terminal Option having slightly greater overall GHG emissions as compared to those for the Future (2032) Proposed Action.

TABLE 31: SUMMARY OF GHG EMISSIONS, HYBRID TERMINAL OPTION COMPARED TO THE NO ACTION ALTERNATIVE IN 2032

Emissions Source	CO ₂ (CO ₂ e MT)	CH ₄ (CO ₂ e MT)	N ₂ O (CO ₂ e MT)	Total CO ₂ e (MT)
2032 No Action Alternative	7,105,199	293	68,405	7,173,897
2032 Hybrid Terminal Option	7,260,422	363	69,723	7,330,507
<i>Construction</i>	<i>12,362</i>	<i>5</i>	<i>22</i>	<i>12,390</i>
<i>Operational</i>	<i>7,248,060</i>	<i>357</i>	<i>69,700</i>	<i>7,318,118</i>
<i>2032 Increase in Emissions</i>	<i>155,223</i>	<i>70</i>	<i>1,318</i>	<i>156,611</i>

Note: Totals may not sum due to rounding. CO₂ = carbon dioxide, CH₄ = methane, N₂O = nitrous oxide, CO₂e = carbon dioxide equivalent, MT = metric tons.

Source: Port of Seattle and L&B, 2024.

20.6 Future (2037) No Action Alternative

The estimated annual rate (metric tons per year) of GHG emissions for the Future (2037) No Action Alternative is provided in **Table 32**.

TABLE 32: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY - FUTURE (2037) NO ACTION ALTERNATIVE

Emissions Source	CO ₂ (CO ₂ e MT)	CH ₄ (CO ₂ e MT)	N ₂ O (CO ₂ e MT)	Total CO ₂ e (MT)
Scope 1				
Port-Owned Airfield Vehicles/Equipment	4,398	6	0	4,404
Natural Gas Boilers and Heaters	17,627	11	10	17,648
Diesel Generators	327	0	1	328
Fuel Farm Tanks ¹	0	0	0	0
<i>Total - Scope 1</i>	<i>22,352</i>	<i>17</i>	<i>11</i>	<i>22,380</i>
Scope 2				
Port of Seattle Electricity Consumption	2,463	0	0	2,463
<i>Total - Scope 2</i>	<i>2,463</i>	<i>0</i>	<i>0</i>	<i>2,463</i>
Scope 3				
Aircraft LTOs (includes Start-Up, Approach, Climb, and Taxiing), APUs, and Aircraft Run-Ups ²	6,745,055	0	65,070	6,810,125
Tenant-Owned GSE	33,300	48	0	33,347
Tenant Electricity Consumption	330	0	0	330
Airside Deliveries	480	0	12	492
Roadways	412,215	211	4,394	416,820
Parking Facilities	6,669	6	67	6,742
<i>Total - Scope 3</i>	<i>7,198,049</i>	<i>265</i>	<i>69,543</i>	<i>7,267,857</i>
Total	7,222,864	283	69,554	7,292,700
			CO₂eTotal	7,292,700

¹ CO₂, CH₄, and N₂O, are by-products of fuel combustion. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.

² Based on FAA guidance, the estimated GHG emissions for aircraft operations, APUs, and aircraft engine ground run-ups were developed using the approximate fuel dispensed at the Airport to calculate emissions for the full flight.

Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value. Totals may not sum due to rounding. CO₂ = carbon dioxide, CH₄ = methane, N₂O = nitrous oxide, CO₂e = carbon dioxide equivalent, MT = metric tons. Source: Port of Seattle, L&B, 2024.

20.7 Future (2037) Proposed Action Alternative

The estimated annual rate (metric tons per year) of GHG emissions for the Future (2037) Proposed Action is provided in **Table 33**. A summary comparison of the Future (2037) No Action Alternative and the Future (2037) Proposed Action GHG emissions is provided in Section 20.9.1 of this technical report.

**TABLE 33: ANNUAL OPERATIONAL GHG EMISSIONS INVENTORY - FUTURE (2037)
PROPOSED ACTION**

Emissions Source	CO ₂ (CO ₂ e MT)	CH ₄ (CO ₂ e MT)	N ₂ O (CO ₂ e MT)	Total CO ₂ e (MT)
Scope 1				
Port-Owned Airfield Vehicles/Equipment	4,722	6	0	4,728
Natural Gas Boilers and Heaters	24,866	16	14	24,896
Diesel Generators	550	1	1	552
Fuel Farm Tanks ¹	0	0	0	0
<i>Total - Scope 1</i>	<i>30,138</i>	<i>23</i>	<i>15</i>	<i>30,176</i>
Scope 2				
Port of Seattle Electricity Consumption	3,386	48	0	3,434
<i>Total - Scope 2</i>	<i>3,386</i>	<i>48</i>	<i>0</i>	<i>3,434</i>
Scope 3				
Aircraft LTOs (includes Start-Up, Approach, Climb, and Taxiing), APUs, and Aircraft Run-Ups ²	7,242,447	0	69,868	7,312,315
Tenant-Owned GSE	35,700	51	0	35,751
Tenant Electricity Consumption	462	6	0	468
Airside Deliveries	515	0	13	529
Roadways	436,738	223	4,644	441,606
Parking Facilities	7,904	7	79	7,990
<i>Total - Scope 3</i>	<i>7,723,767</i>	<i>287</i>	<i>74,605</i>	<i>7,798,659</i>
Total	7,757,291	358	74,620	7,832,269
			CO₂eTotal	7,832,269

¹ CO₂, CH₄, and N₂O, are by-products of fuel combustion. Per the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*, the storage of fuel is a potential source of evaporative hydrocarbons but does not produce the type of hydrocarbons that contribute directly to global climate change.

² Based on FAA guidance, the estimated GHG emissions for aircraft operations, APUs, and aircraft engine ground run-ups were developed using the approximate fuel dispensed at the Airport to calculate emissions for the full flight.

Note: Totals may not sum due to rounding. Zeros may not indicate an absolute zero value. Totals may not sum due to rounding. CO₂ = carbon dioxide, CH₄ = methane, N₂O = nitrous oxide, CO₂e = carbon dioxide equivalent, MT = metric tons. Source: Port of Seattle, L&B, 2024.

20.8 Future (2037) Hybrid Terminal Option

As previously discussed, the Future (2037) Hybrid Terminal Option would have the same operational GHG emissions as the Future (2037) Proposed Action because the only differences in the two alternatives would be related to the location of passenger loading bridges and aircraft hardstands. The number of future aircraft operations would be the same.

20.9 Comparison of 2037 Alternatives

The results of the GHG emission inventories prepared for the Future (2037) Proposed Action and the Future (2037) Hybrid Terminal Option were compared to the results of the emission inventories prepared for the Future (2037) No Action Alternative to disclose the potential increase in GHG emissions.



20.9.1 Future (2037) Proposed Action

The results of the comparison between the Future (2037) Proposed Action and the Future (2037) No Action Alternative are shown in **Table 34**. Relative to the Future (2037) No Action, the Future (2037) Proposed Action would increase operational GHG emissions by 7.4 percent. As noted earlier in this technical report, the Proposed Action is expected to serve more aircraft operations relative to the No Action. The Future (2037) Proposed Action would serve 35,018 more operations (7.4 percent) than the Future (2037) No Action Alternative. Thus, the increase in GHG emissions with the Future (2037) Proposed Action relative to the Future (2037) No Action Alternative is largely due to the higher level of airport activity that the Proposed Action would serve.

TABLE 34: SUMMARY OF GHG EMISSIONS, PROPOSED ACTION COMPARED TO THE NO ACTION ALTERNATIVE IN 2037

Emissions Source	CO ₂ (CO ₂ e MT)	CH ₄ (CO ₂ e MT)	N ₂ O (CO ₂ e MT)	Total CO ₂ e (MT)
2037 No Action Alternative	7,222,864	283	69,554	7,292,700
2037 Proposed Action	7,757,291	358	74,620	7,832,269
<i>2037 Increase in Emissions</i>	<i>534,427</i>	<i>75</i>	<i>5,066</i>	<i>539,569</i>

Note: Totals may not sum due to rounding. CO₂ = carbon dioxide, CH₄ = methane, N₂O = nitrous oxide, CO₂e = carbon dioxide equivalent, MT = metric tons.

Source: Port of Seattle and L&B, 2024.

20.9.2 Future (2037) Hybrid Terminal Option

The results of the comparison between the Future (2037) Hybrid Terminal Option and the Future (2037) No Action Alternative are shown in **Table 35**. The Future (2037) Hybrid Terminal Option would have the same operational GHG emissions as the Future (2037) Proposed Action because the only differences in the two alternatives would be related to the location of passenger loading bridges and aircraft hardstands. The number of future aircraft operations would be the same.

TABLE 35: SUMMARY OF GHG EMISSIONS, HYBRID TERMINAL OPTION COMPARED TO THE NO ACTION ALTERNATIVE IN 2037

Emissions Source	CO ₂ (CO ₂ e MT)	CH ₄ (CO ₂ e MT)	N ₂ O (CO ₂ e MT)	Total CO ₂ e (MT)
2037 No Action Alternative	7,222,864	283	69,554	7,292,700
2037 Hybrid Terminal Option	7,757,291	358	74,620	7,832,269
<i>2037 Increase in Emissions</i>	<i>534,427</i>	<i>75</i>	<i>5,066</i>	<i>539,569</i>

Note: Totals may not sum due to rounding. CO₂ = carbon dioxide, CH₄ = methane, N₂O = nitrous oxide, CO₂e = carbon dioxide equivalent, MT = metric tons.

Source: Port of Seattle and L&B, 2024.

Air Quality and Greenhouse Gas Technical Report

Attachment 1 Aircraft

This attachment contains the following tables:

Existing (2022) Condition

- Table 1-1 Annual Operations – Existing (2022) Condition

Future (2032) No Action Alternative

- Table 1-2 Annual Operations – Future (2032) No Action Alternative

Future (2032) Proposed Action

- Table 1-3 Annual Operations – Future (2032) Proposed Action

Future (2037) No Action Alternative

- Table 1-4 Annual Operations – Future (2037) No Action Alternative

Future (2037) Proposed Action

- Table 1-5 Annual Operations – Future (2037) Proposed Action

Comparison of Taxi Times (Minutes Seconds)

- Table 1-6 Comparison of Taxi Times (Minutes Seconds)



TABLE 1-1: ANNUAL OPERATIONS – EXISTING (2022) CONDITION

Airframe	Engine Code	Annual Operations
Commercial Jets		
Airbus A319-100 Series	01P10IA020	10
Airbus A319-100 Series	3CM028	88
Airbus A319-100 Series	3IA006	1,977
Airbus A319-100 Series	3IA007	1,059
Airbus A319-100 Series	4CM035	79
Airbus A319-100 Series	8IA09	36
Airbus A320-200 Series	01P08CM105	13,637
Airbus A320-200 Series	01P10IA021	1,224
Airbus A320-200 Series	01P10IA022	264
Airbus A320-200 Series	1CM008	333
Airbus A320-200 Series	1CM009	1,351
Airbus A320-200 Series	1IA003	2,576
Airbus A320-200 Series	3CM026	1,466
Airbus A320-200 Series	8IA010	2
Airbus A320-NEO	01P20CM128	679
Airbus A320-NEO	01P22PW163	1,078
Airbus A321-200 Series	01P08CM104	994
Airbus A321-200 Series	01P10IA025	6,031
Airbus A321-200 Series	3CM025	1,026
Airbus A321-NEO	01P18PW157	1,613
Airbus A321-NEO	01P20CM132	4,784
Airbus A330-200 Series	2RR023	1,835
Airbus A330-200 Series	9PW094	26
Airbus A330-300 Series	2RR023	486
Airbus A330-300 Series	4GE080	494
Airbus A330-300 Series	7PW082	67
Airbus A330-300 Series	9PW094	1,394
Airbus A330-300 Series	9PW095	327
Airbus A330-900N Series (Neo)	02P23RR141	2,659
Airbus A340-300 Series	2CM015	53
Airbus A350-1000 Series	18RR080	4
Airbus A350-900 series	01P18RR124	764
Boeing 717-200 Series	4BR002	1
Boeing 737-300 Series	1CM004	6
Boeing 737-300 Series	1CM005	8
Boeing 737-700 Series	3CM030	425
Boeing 737-700 Series	3CM031	14,351
Boeing 737-700 Series	3CM032	2,612
Boeing 737-700 Series	8CM051	10
Boeing 737-700 Series	8CM062	104
Boeing 737-700 Series	8CM063	2,434
Boeing 737-8	01P20CM135	41
Boeing 737-8	01P20CM136	1,340
Boeing 737-8	01P20CM140	1,236
Boeing 737-800 Series	01P11CM114	400
Boeing 737-800 Series	01P11CM116	5,440
Boeing 737-800 Series	01P11CM122	2,968
Boeing 737-800 Series	01P11CM125	660
Boeing 737-800 Series	01P11CM126	63

TABLE 1-1: ANNUAL OPERATIONS– EXISTING (2022) CONDITION (CONTINUED)

Airframe	Engine Code	Annual Operations
Boeing 737-800 Series	3CM032	16,653
Boeing 737-800 Series	3CM034	1,608
Boeing 737-800 Series	8CM051	22,796
Boeing 737-800 Series	8CM064	166
Boeing 737-800 Series	8CM065	2,129
Boeing 737-800 Series	8CM066	9,997
Boeing 737-800BCF	3CM034	137
Boeing 737-9	01P20CM136	518
Boeing 737-9	01P20CM140	20,410
Boeing 737-900 Series	01P11CM114	806
Boeing 737-900 Series	8CM051	9,115
Boeing 737-900-ER	01P11CM116	19,205
Boeing 737-900-ER	01P11CM121	54,527
Boeing 737-900-ER	01P11CM125	168
Boeing 737-900-ER	3CM034	773
Boeing 737-900-ER	8CM065	862
Boeing 737-900-ER_MA	01P11CM121_MA	1,555
Boeing 757-200 Series	4PW072	5,722
Boeing 757-200 Series	4PW073	198
Boeing 757-200 Series	5RR038	567
Boeing 757-200 Series	5RR039	37
Boeing 757-300 Series	3RR028	2
Boeing 757-300 Series	5RR039	10
Boeing 757-300 Series	XPW204	1,741
Boeing 767-300 ER	12PW102	12
Boeing 767-300 ER	1GE029	76
Boeing 767-300 ER	1GE030	753
Boeing 767-300 ER	1PW043	543
Boeing 767-300 ER	1RR011	1
Boeing 767-300 ER	2GE055	304
Boeing 767-400 ER	8GE101	263
Boeing 777-200-ER	10PW099	82
Boeing 777-200-ER	2RR027	288
Boeing 777-200-ER	3GE060	127
Boeing 777-200-ER	3GE064	2
Boeing 777-200-ER	8GE100	132
Boeing 777-200-LR	01P21GE216	50
Boeing 777-200-LR	01P21GE217	189
Boeing 777-300 ER	01P21GE217	1,390
Boeing 787-10 Dreamliner	01P17GE211	132
Boeing 787-10 Dreamliner	01P17GE213	286
Boeing 787-10 Dreamliner	02P23RR134	144
Boeing 787-8 Dreamliner	01P17GE206	120
Boeing 787-8 Dreamliner	01P17GE210	4
Boeing 787-8 Dreamliner	11GE137	190
Boeing 787-8 Dreamliner	11GE138	466
Boeing 787-9 Dreamliner	01P17GE211	890
Boeing 787-9 Dreamliner	01P17GE214	6
Boeing 787-9 Dreamliner	02P23RR131	201
Boeing 787-9 Dreamliner	12RR067	919
Boeing 787-9 Dreamliner	12RR068	388



TABLE 1-1: ANNUAL OPERATIONS– EXISTING (2022) CONDITION (CONTINUED)

Airframe	Engine Code	Annual Operations
Bombardier CRJ-900-ER	01P08GE190	22
Bombardier CS100	04P20PW196	9,771
Bombardier CS300	04P20PW196	98
Bombardier CS300	04P20PW197	2,180
Bombardier Global Express	01P04BR013	4
Embraer ERJ175-LR	01P08GE197	67,694
Embraer ERJ175-LR_MA	01P08GE197_MA	839
Sub-Total		338,783
Cargo Jets		
Airbus A300F4-600 Series	1GE020	3
Airbus A300F4-600 Series	1PW048	86
Airbus A300F4-600 Series	3GE056	155
Boeing 747-400 ERF	12PW102	89
Boeing 747-400 Series	1GE024	790
Boeing 747-400 Series Freighter	01P03GE187	77
Boeing 747-400 Series Freighter	1GE024	6
Boeing 747-400 Series Freighter	1PW041	7
Boeing 747-400 Series Freighter	4RR037	75
Boeing 747-400BCF	1GE024	249
Boeing 747-400BCF	1PW041	10
Boeing 747-8F	01P17GE215	281
Boeing 747-8F	13GE156	75
Boeing 747-8F	8GENX1	242
Boeing 757-200 Series Freighter	3RR028	102
Boeing 757-200 Series Freighter	4PW072	48
Boeing 757-200 Series Freighter	4PW073	49
Boeing 757-200 Series Freighter	5RR039	2
Boeing 767-200 Series Freighter	1GE010	259
Boeing 767-200 Series Freighter	1GE012	129
Boeing 767-200 Series Freighter	1PW026	23
Boeing 767-300 ER Freighter	1GE030	5,679
Boeing 767-300 ER Freighter	2GE055	559
Boeing 767-300BCF	2GE055	58
Boeing 777 Freighter	01P21GE216	1,016
Boeing 777 Freighter	01P21GE217	24
Boeing 777-200-LR_C	01P21GE216_C	40
Boeing MD-10-30	3GE074	65
Boeing MD-11 Freighter	12PW102	297
Boeing MD-11 Freighter	1GE031	1,490
Boeing MD-11 Freighter	1PW052	484
Sub-Total		12,470
Regional Jets		
Bombardier CRJ-200-LR	01P05GE189	6
Bombardier CRJ-700	01P08GE192	6
Bombardier CRJ-700-ER	01P08GE190	12
Bombardier CRJ-700-ER	01P08GE192	95
Bombardier CRJ-700-ER	5GE083	47
Sub-Total		167
Turboprops		
Bombardier de Havilland Dash 8 Q400	PW150A	44,588
Raytheon Beech 99	PT6A27	11

TABLE 1-1: ANNUAL OPERATIONS – EXISTING (2022) CONDITION (CONTINUED)

Airframe	Engine Code	Annual Operations
Raytheon Beech 99	PT6A36	596
Raytheon C-12 Huron	PT660A	18
Raytheon Super King Air 200	PT6A42	2
Sub-Total		45,215
Cargo Props		
Cessna 208 Caravan	P6114A	1,162
Cessna 208 Caravan	PT6A14	1,146
Raytheon Super King Air 300	PT660A	72
Sub-Total		2,381
General Aviation Jets		
Bombardier Challenger 300	01P14HN011	37
Bombardier Challenger 300	11HN003	38
Bombardier Challenger 350	01P14HN011	142
Bombardier Challenger 600	01P05GE189	38
Bombardier Challenger 600	1GE034	26
Bombardier Global 5000	01P04BR013	28
Bombardier Global 5500	01P20BR015	2
Bombardier Learjet 35A/36A (C-21A)	1AS001	3
Bombardier Learjet 40	TFE731	5
Bombardier Learjet 45	1AS001	14
Bombardier Learjet 45	TFE731	37
Bombardier Learjet 60	7PW077	23
Bombardier Learjet 70	1AS002	2
Cessna 560 Citation Encore	PW530	11
Cessna 560 Citation Excel	PW530	37
Cessna 560 Citation Ultra	1PW038	9
Cessna 560 Citation XLS	PW530	60
Cessna 680 Citation Sovereign	03P14PW194	16
Cessna 680 Citation Sovereign	7PW078	32
Cessna 680-A Citation Latitude	7PW078	84
Cessna 700 Citation Longitude	01P18HN013	15
Cessna 750 Citation X	6AL024	83
Cessna CitationJet CJ2 (Cessna 525A)	1PW036	31
Cessna CitationJet CJ3 (Cessna 525B)	1PW038	67
Dassault Falcon 2000	CF700D	58
Dassault Falcon 50	1AS002	196
Embraer Legacy 450 (EMB-545)	01P14HN014	50
Embraer Phenom 300 (EMB-505)	PW530	82
Gulfstream G200	7PW077	25
Gulfstream G450	11RR048	29
Gulfstream G650	01P11BR016	24
Gulfstream G650ER	01P11BR016	15
Gulfstream IV-SP	11RR048	8
Gulfstream V-SP	01P06BR014	29
Honda HA-420 Hondajet	PW610F	19
Raytheon Beechjet 400	1PW037	24
Raytheon Hawker 800	1AS002	36
Sub-Total		1,431
General Aviation Props		
Beechcraft Bonanza 35 (FAS)	TIO540	22
Cessna 150 Series	O200	18



TABLE 1-1: ANNUAL OPERATIONS – EXISTING (2022) CONDITION *(CONTINUED)*

Airframe	Engine Code	Annual Operations
Cessna 152 (FAS)	O200	71
Cessna 172 Skyhawk	IO320	463
Cessna 182	IO360	97
Cessna 206	TIO540	15
Cirrus SR22 Turbo (FAS)	TIO540	69
Mooney M20-K	TSIO36	17
Pilatus PC-12	PT6A67	55
Piper PA-28 Cherokee Series	IO320	60
Raytheon Beech Bonanza 36	TIO540	19
Sub-Total		905
Grand Total:		401,351

*Missed approach operational totals are included in this table only.

Source: SEA EnvironmentalVue Monitoring System data, January 2022-December 2022; Landrum & Brown, 2024

TABLE 1-2: ANNUAL OPERATIONS – FUTURE (2032) NO ACTION ALTERNATIVE

Airframe	Engine Code	Annual Operations
Commercial Jets		
Airbus A220-100	16PW111	19,114
Airbus A220-300	16PW111	5,508
Airbus A220-300	16PW112	2,713
Airbus A319-100 Series	01P10IA020	4
Airbus A319-100 Series	3CM028	34
Airbus A319-100 Series	3IA006	760
Airbus A319-100 Series	3IA007	407
Airbus A319-100 Series	4CM035	30
Airbus A319-100 Series	8IA09	14
Airbus A320-200 Series	01P08CM105	5,826
Airbus A320-200 Series	01P10IA021	523
Airbus A320-200 Series	01P10IA022	113
Airbus A320-200 Series	1CM008	142
Airbus A320-200 Series	1CM009	577
Airbus A320-200 Series	1IA003	1,100
Airbus A320-200 Series	3CM026	627
Airbus A320-200 Series	8IA010	1
Airbus A320-NEO	01P20CM128	3,390
Airbus A320-NEO	01P22PW163	5,379
Airbus A321-200 Series	01P08CM104	1,035
Airbus A321-200 Series	01P10IA025	6,279
Airbus A321-200 Series	3CM025	1,069
Airbus A321-NEO	01P18PW157	5,185
Airbus A321-NEO	01P20CM132	15,380
Airbus A330-200 Series	2RR023	2,478
Airbus A330-200 Series	9PW094	35
Airbus A330-300 Series	2RR023	537
Airbus A330-300 Series	4GE080	545
Airbus A330-300 Series	7PW082	74
Airbus A330-300 Series	9PW094	1,538
Airbus A330-300 Series	9PW095	361
Airbus A330-900N Series (Neo)	02P23RR141	5,007
Airbus A350-900 series	01P18RR124	1,874
Boeing 737-7	01P20CM136	1,090

TABLE 1-2: ANNUAL OPERATIONS – FUTURE (2032) NO ACTION ALTERNATIVE

Airframe	Engine Code	Annual Operations
Boeing 737-700 Series	3CM030	95
Boeing 737-700 Series	3CM031	3,195
Boeing 737-700 Series	3CM032	582
Boeing 737-700 Series	8CM051	2
Boeing 737-700 Series	8CM062	23
Boeing 737-700 Series	8CM063	542
Boeing 737-8	01P20CM135	282
Boeing 737-8	01P20CM136	9,144
Boeing 737-8	01P20CM140	8,435
Boeing 737-800 Series	01P11CM114	425
Boeing 737-800 Series	01P11CM116	5,786
Boeing 737-800 Series	01P11CM122	3,157
Boeing 737-800 Series	01P11CM125	702
Boeing 737-800 Series	01P11CM126	67
Boeing 737-800 Series	3CM032	17,712
Boeing 737-800 Series	3CM034	1,710
Boeing 737-800 Series	8CM051	24,246
Boeing 737-800 Series	8CM064	176
Boeing 737-800 Series	8CM065	2,264
Boeing 737-800 Series	8CM066	10,633
Boeing 737-9	01P20CM136	441
Boeing 737-9	01P20CM140	17,383
Boeing 737-900-ER	01P11CM116	29,580
Boeing 737-900-ER	01P11CM121	84,572
Boeing 737-900-ER	01P11CM125	258
Boeing 737-900-ER	3CM034	1,191
Boeing 737-900-ER	8CM065	1,328
Boeing 737-900-ER_MA	01P11CM121_MA	1,808
Boeing 767-400ER	8GE101	358
Boeing 777-200-ER	10PW099	120
Boeing 777-200-ER	2RR027	423
Boeing 777-200-ER	3GE060	187
Boeing 777-200-ER	3GE064	3
Boeing 777-200-ER	8GE100	195
Boeing 777-300ER	01P21GE217	1,259
Boeing 787-10 Dreamliner	01P17GE211	334
Boeing 787-10 Dreamliner	01P17GE213	722
Boeing 787-10 Dreamliner	02P23RR134	365
Boeing 787-8 Dreamliner	01P17GE206	1,055
Boeing 787-8 Dreamliner	01P17GE210	35
Boeing 787-8 Dreamliner	11GE137	1,667
Boeing 787-8 Dreamliner	11GE138	4,096
Boeing 787-9 Dreamliner	01P17GE211	2,081
Boeing 787-9 Dreamliner	01P17GE214	14
Boeing 787-9 Dreamliner	02P23RR131	470
Boeing 787-9 Dreamliner	12RR067	2,150
Boeing 787-9 Dreamliner	12RR068	906
Sub-Total		330,927
Cargo Jets		
Airbus A300F4-600 Series	1GE020	5
Airbus A300F4-600 Series	1PW048	133



TABLE 1-2: ANNUAL OPERATIONS – FUTURE (2032) NO ACTION ALTERNATIVE (CONTINUED)

Airframe	Engine Code	Annual Operations
Airbus A300F4-600 Series	3GE056	241
Boeing 747-400 ERF	12PW102	590
Boeing 747-400 BCF	01P03GE187	590
Boeing 747-8F	01P17GE215	289
Boeing 747-8F	13GE156	77
Boeing 747-8F	8GENX1	249
Boeing 767-200 Series Freighter	1GE010	2,866
Boeing 767-200 Series Freighter	1GE012	1,427
Boeing 767-200 Series Freighter	1PW026	256
Boeing 767-300 ER Freighter	1GE030	4,142
Boeing 767-300 ER Freighter	2GE055	408
Boeing 777 Freighter	01P21GE216	2,415
Boeing 777 Freighter	01P21GE217	58
Boeing MD-11 Freighter	12PW102	249
Boeing MD-11 Freighter	1GE031	1,252
Boeing MD-11 Freighter	1PW052	407
Sub-Total		15,655
Regional Jets		
Embraer ERJ175-LR	01P08GE197	113,895
Embraer ERJ175-LR_MA	01P08GE197_MA	977
Sub-Total		114,871
Cargo Props		
ATR 72-600 Freighter	PW127F	204
Cessna 208 Caravan	P6114A	1,163
Cessna 208 Caravan	PT6A14	1,146
Cessna 408 SkyCourier	PT6A6B	204
Raytheon Beech 99	PT6A27	3
Raytheon Beech 99	PT6A36	182
Sub-Total		2,902
General Aviation		
Bombardier Challenger 350	01P14HN011	554
Cessna 172 Skyhawk	IO320	132
Dassault Falcon 50	1AS002	554
Embraer Phenom 300 (EMB-505)	PW530	126
Piper PA-31 Navajo	TIO540	17
Raytheon C-12 Huron	PT660A	61
Sub-Total		1,445
Other		
Boeing 737-900-ER_O1	01P11CM121_O1	436
Boeing 737-900-ER_O2	01P11CM125_O2	1
Boeing 737-900-ER_O3	3CM034_O3	6
Boeing 737-900-ER_O4	8CM065_O4	7
Boeing 737-900-ER_O7	01P11CM116_O7	149
Cessna 208 Caravan_O5	P6114A_O5	201
Cessna 208 Caravan_O6	PT6A14_O6	199
Sub-Total		1,000

TABLE 1-2: ANNUAL OPERATIONS – FUTURE (2032) NO ACTION ALTERNATIVE (CONTINUED)

Airframe	Engine Code	Annual Operations
Military		
Cessna 172 Skyhawk_M2	IO320_M2	2
Embraer Phenom 300 (EMB-505)_M1	PW530_M1	72
Raytheon C-12 Huron_M	PT660A_M	26
Sub-Total		100
Grand Total		466,900

Note: Day = 7:00 a.m. to 9:59 p.m., Night = 10:00 p.m. to 6:59 a.m.
Source: Aviation Forecast Update, prepared by Port of Seattle/LeighFisher, 2023;
Constrained Operating Growth Scenario, prepared by Port of Seattle/Landrum & Brown, 2023;
Environmental Review Airside Modeling Analysis, prepared by the Port of Seattle/LeighFisher, 2020.

TABLE 1-3: ANNUAL OPERATIONS – FUTURE (2032) PROPOSED ACTION

Airframe	Engine Code	Annual Operations
Commercial Jets		
Airbus A220-100	16PW111	19,489
Airbus A220-300	16PW111	5,616
Airbus A220-300	16PW112	2,766
Airbus A319-100 Series	01P10IA020	4
Airbus A319-100 Series	3CM028	34
Airbus A319-100 Series	3IA006	775
Airbus A319-100 Series	3IA007	415
Airbus A319-100 Series	4CM035	31
Airbus A319-100 Series	8IA09	14
Airbus A320-200 Series	01P08CM105	5,941
Airbus A320-200 Series	01P10IA021	533
Airbus A320-200 Series	01P10IA022	115
Airbus A320-200 Series	1CM008	145
Airbus A320-200 Series	1CM009	589
Airbus A320-200 Series	1IA003	1,122
Airbus A320-200 Series	3CM026	639
Airbus A320-200 Series	8IA010	1
Airbus A320-NEO	01P20CM128	3,456
Airbus A320-NEO	01P22PW163	5,485
Airbus A321-200 Series	01P08CM104	1,055
Airbus A321-200 Series	01P10IA025	6,402
Airbus A321-200 Series	3CM025	1,090
Airbus A321-NEO	01P18PW157	5,287
Airbus A321-NEO	01P20CM132	15,682
Airbus A330-200 Series	2RR023	2,527
Airbus A330-200 Series	9PW094	36
Airbus A330-300 Series	2RR023	547
Airbus A330-300 Series	4GE080	555
Airbus A330-300 Series	7PW082	75
Airbus A330-300 Series	9PW094	1,568
Airbus A330-300 Series	9PW095	368
Airbus A330-900N Series (Neo)	02P23RR141	5,106
Airbus A350-900 series	01P18RR124	1,911
Boeing 737-7	01P20CM136	1,111
Boeing 737-700 Series	3CM030	96
Boeing 737-700 Series	3CM031	3,258



TABLE 1-3: ANNUAL OPERATIONS – FUTURE (2032) PROPOSED ACTION (CONTINUED)

Airframe	Engine Code	Annual Operations
Boeing 737-700 Series	3CM032	593
Boeing 737-700 Series	8CM051	2
Boeing 737-700 Series	8CM062	24
Boeing 737-700 Series	8CM063	553
Boeing 737-8	01P20CM135	288
Boeing 737-8	01P20CM136	9,323
Boeing 737-8	01P20CM140	8,600
Boeing 737-800 Series	01P11CM114	433
Boeing 737-800 Series	01P11CM116	5,900
Boeing 737-800 Series	01P11CM122	3,219
Boeing 737-800 Series	01P11CM125	716
Boeing 737-800 Series	01P11CM126	68
Boeing 737-800 Series	3CM032	18,060
Boeing 737-800 Series	3CM034	1,744
Boeing 737-800 Series	8CM051	24,723
Boeing 737-800 Series	8CM064	180
Boeing 737-800 Series	8CM065	2,308
Boeing 737-800 Series	8CM066	10,841
Boeing 737-9	01P20CM136	450
Boeing 737-9	01P20CM140	17,724
Boeing 737-900-ER	01P11CM116	30,161
Boeing 737-900-ER	01P11CM121	86,234
Boeing 737-900-ER	01P11CM125	263
Boeing 737-900-ER	3CM034	1,214
Boeing 737-900-ER	8CM065	1,354
Boeing 737-900-ER_MA	01P11CM121_MA	1,842
Boeing 767-400 ER	8GE101	365
Boeing 777-200-ER	10PW099	123
Boeing 777-200-ER	2RR027	431
Boeing 777-200-ER	3GE060	191
Boeing 777-200-ER	3GE064	3
Boeing 777-200-ER	8GE100	198
Boeing 777-300 ER	01P21GE217	1,284
Boeing 787-10 Dreamliner	01P17GE211	341
Boeing 787-10 Dreamliner	01P17GE213	736
Boeing 787-10 Dreamliner	02P23RR134	372
Boeing 787-8 Dreamliner	01P17GE206	1,076
Boeing 787-8 Dreamliner	01P17GE210	36
Boeing 787-8 Dreamliner	11GE137	1,700
Boeing 787-8 Dreamliner	11GE138	4,177
Boeing 787-9 Dreamliner	01P17GE211	2,122
Boeing 787-9 Dreamliner	01P17GE214	14
Boeing 787-9 Dreamliner	02P23RR131	479
Boeing 787-9 Dreamliner	12RR067	2,192
Boeing 787-9 Dreamliner	12RR068	924
Sub-Total		337,426
Cargo Jets		
Airbus A300F4-600 Series	1GE020	5
Airbus A300F4-600 Series	1PW048	133
Airbus A300F4-600 Series	3GE056	241
Boeing 747-400 ERF	12PW102	590

TABLE 1-3: ANNUAL OPERATIONS – FUTURE (2032) PROPOSED ACTION (CONTINUED)

Airframe	Engine Code	Annual Operations
Boeing 747-400BCF	01P03GE187	590
Boeing 747-8F	01P17GE215	289
Boeing 747-8F	13GE156	77
Boeing 747-8F	8GENX1	249
Boeing 767-200 Series Freighter	1GE010	2,866
Boeing 767-200 Series Freighter	1GE012	1,427
Boeing 767-200 Series Freighter	1PW026	256
Boeing 767-300 ER Freighter	1GE030	4,142
Boeing 767-300 ER Freighter	2GE055	408
Boeing 777 Freighter	01P21GE216	2,415
Boeing 777 Freighter	01P21GE217	58
Boeing MD-11 Freighter	12PW102	249
Boeing MD-11 Freighter	1GE031	1,252
Boeing MD-11 Freighter	1PW052	407
Sub-Total		15,655
Regional Jets		
Embraer ERJ175-LR	01P08GE197	116,132
Embraer ERJ175-LR_MA	01P08GE197_MA	995
Sub-Total		117,127
Cargo Props		
ATR 72-600 Freighter	PW127F	204
Cessna 208 Caravan	P6114A	1,163
Cessna 208 Caravan	PT6A14	1,146
Cessna 408 SkyCourier	PT6A6B	204
Raytheon Beech 99	PT6A27	3
Raytheon Beech 99	PT6A36	182
Sub-Total		2,902
General Aviation		
Bombardier Challenger 350	01P14HN011	554
Cessna 172 Skyhawk	IO320	132
Dassault Falcon 50	1AS002	554
Embraer Phenom 300 (EMB-505)	PW530	126
Piper PA-31 Navajo	TIO540	17
Raytheon C-12 Huron	PT660A	61
Sub-Total		1,445
Other		
Boeing 737-900-ER_O1	01P11CM121_O1	436
Boeing 737-900-ER_O2	01P11CM125_O2	1
Boeing 737-900-ER_O3	3CM034_O3	6
Boeing 737-900-ER_O4	8CM065_O4	7
Boeing 737-900-ER_O7	01P11CM116_O7	149
Cessna 208 Caravan_O5	P6114A_O5	201
Cessna 208 Caravan_O6	PT6A14_O6	199
Sub-Total		1,000



TABLE 1-3: ANNUAL OPERATIONS – FUTURE (2032) PROPOSED ACTION (CONTINUED)

Airframe	Engine Code	Annual Operations
Military		
Cessna 172 Skyhawk_M2	IO320_M2	2
Embraer Phenom 300 (EMB-505)_M1	PW530_M1	72
Raytheon C-12 Huron_M	PT660A_M	26
Sub-Total		100
Grand Total		475,655

Note: Day = 7:00 a.m. to 9:59 p.m., Night = 10:00 p.m. to 6:59 a.m.
Source: Aviation Forecast Update, prepared by Port of Seattle/LeighFisher, 2023;
Constrained Operating Growth Scenario, prepared by Port of Seattle/Landrum & Brown, 2023;
Environmental Review Airside Modeling Analysis, prepared by the Port of Seattle/LeighFisher, 2020.

TABLE 1-4: ANNUAL OPERATIONS – FUTURE (2037) NO ACTION ALTERNATIVE

Airframe	Engine Code	Annual Operations
Commercial Jets		
Airbus A220-100	16PW111	25,279
Airbus A220-300	16PW111	8,743
Airbus A220-300	16PW112	4,306
Airbus A320-200 Series	01P08CM105	2,009
Airbus A320-200 Series	01P10IA021	180
Airbus A320-200 Series	01P10IA022	39
Airbus A320-200 Series	1CM008	49
Airbus A320-200 Series	1CM009	199
Airbus A320-200 Series	1IA003	379
Airbus A320-200 Series	3CM026	216
Airbus A320-200 Series	8IA010	0
Airbus A320-NEO	01P20CM128	5,744
Airbus A320-NEO	01P22PW163	9,116
Airbus A321-200 Series	01P08CM104	324
Airbus A321-200 Series	01P10IA025	1,968
Airbus A321-200 Series	3CM025	335
Airbus A321-NEO	01P18PW157	7,082
Airbus A321-NEO	01P20CM132	21,007
Airbus A330-200 Series	2RR023	2,514
Airbus A330-200 Series	9PW094	36
Airbus A330-300 Series	2RR023	545
Airbus A330-300 Series	4GE080	552
Airbus A330-300 Series	7PW082	75
Airbus A330-300 Series	9PW094	1,560
Airbus A330-300 Series	9PW095	366
Airbus A330-900N Series (Neo)	02P23RR141	5,503
Airbus A350-900 series	01P18RR124	3,247
Boeing 737-7	01P20CM136	1,691
Boeing 737-700 Series	3CM030	19
Boeing 737-700 Series	3CM031	651
Boeing 737-700 Series	3CM032	118
Boeing 737-700 Series	8CM051	0
Boeing 737-700 Series	8CM062	5
Boeing 737-700 Series	8CM063	110
Boeing 737-8	01P20CM135	643
Boeing 737-8	01P20CM136	20,835

TABLE 1-4: ANNUAL OPERATIONS – FUTURE (2037) NO ACTION ALTERNATIVE (CONTINUED)

Airframe	Engine Code	Annual Operations
Boeing 737-8	01P20CM140	19,219
Boeing 737-800 Series	01P11CM114	284
Boeing 737-800 Series	01P11CM116	3,861
Boeing 737-800 Series	01P11CM122	2,107
Boeing 737-800 Series	01P11CM125	468
Boeing 737-800 Series	01P11CM126	44
Boeing 737-800 Series	3CM032	11,820
Boeing 737-800 Series	3CM034	1,141
Boeing 737-800 Series	8CM051	16,180
Boeing 737-800 Series	8CM064	117
Boeing 737-800 Series	8CM065	1,511
Boeing 737-800 Series	8CM066	7,095
Boeing 737-9	01P20CM136	959
Boeing 737-9	01P20CM140	37,795
Boeing 737-900-ER	01P11CM116	25,142
Boeing 737-900-ER	01P11CM121	71,579
Boeing 737-900-ER	01P11CM125	219
Boeing 737-900-ER	3CM034	1,012
Boeing 737-900-ER	8CM065	1,128
Boeing 737-900-ER_MA	01P11CM121_MA	1,839
Boeing 787-10 Dreamliner	01P17GE211	445
Boeing 787-10 Dreamliner	01P17GE213	962
Boeing 787-10 Dreamliner	02P23RR134	486
Boeing 787-8 Dreamliner	01P17GE206	1,418
Boeing 787-8 Dreamliner	01P17GE210	48
Boeing 787-8 Dreamliner	11GE137	2,240
Boeing 787-8 Dreamliner	11GE138	5,506
Boeing 787-9 Dreamliner	01P17GE211	3,449
Boeing 787-9 Dreamliner	01P17GE214	23
Boeing 787-9 Dreamliner	02P23RR131	778
Boeing 787-9 Dreamliner	12RR067	3,563
Boeing 787-9 Dreamliner	12RR068	1,502
Sub-Total		349,389
Cargo Jets		
Boeing 747-400 ERF	12PW102	577
Boeing 747-400BCF	01P03GE187	577
Boeing 747-8F	01P17GE215	315
Boeing 747-8F	13GE156	84
Boeing 747-8F	8GENX1	272
Boeing 767-200 Series Freighter	1GE010	3,719
Boeing 767-200 Series Freighter	1GE012	1,852
Boeing 767-200 Series Freighter	1PW026	333
Boeing 767-300 ER Freighter	1GE030	5,221
Boeing 767-300 ER Freighter	2GE055	514
Boeing 777 Freighter	01P21GE216	3,690
Boeing 777 Freighter	01P21GE217	88
Sub-Total		17,242
Regional Jets		
Embraer ERJ175-LR	01P08GE197	101,506
Embraer ERJ175-LR_MA	01P08GE197_MA	993
Sub-Total		102,499



TABLE 1-4: ANNUAL OPERATIONS – FUTURE (2037) NO ACTION ALTERNATIVE (CONTINUED)

Airframe	Engine Code	Annual Operations
Cargo Props		
ATR 72-600 Freighter	PW127F	323
Cessna 208 Caravan	P6114A	1,147
Cessna 208 Caravan	PT6A14	1,131
Cessna 408 SkyCourier	PT6A6B	323
Raytheon Beech 99	PT6A27	4
Raytheon Beech 99	PT6A36	235
Sub-Total		3,163
General Aviation		
Bombardier Challenger 350	01P14HN011	572
Cessna 172 Skyhawk	IO320	120
Dassault Falcon 50	1AS002	572
Embraer Phenom 300 (EMB-505)	PW530	136
Piper PA-31 Navajo	TIO540	14
Raytheon C-12 Huron	PT660A	67
Sub-Total		1,481
Other		
Boeing 737-900-ER_O1	01P11CM121_O1	436
Boeing 737-900-ER_O2	01P11CM125_O2	1
Boeing 737-900-ER_O3	3CM034_O3	6
Boeing 737-900-ER_O4	8CM065_O4	7
Boeing 737-900-ER_O7	01P11CM116_O7	149
Cessna 208 Caravan_O5	P6114A_O5	201
Cessna 208 Caravan_O6	PT6A14_O6	199
Sub-Total		1,000
Military		
Cessna 172 Skyhawk_M2	IO320_M2	2
Embraer Phenom 300 (EMB-505)_M1	PW530_M1	72
Raytheon C-12 Huron_M	PT660A_M	26
Sub-Total		100
Grand Total		474,874

Note: Day = 7:00 a.m. to 9:59 p.m., Night = 10:00 p.m. to 6:59 a.m.

Source: Aviation Forecast Update, prepared by Port of Seattle/LeighFisher, 2023; Constrained Operating Growth Scenario, prepared by Port of Seattle/Landrum & Brown, 2023; Environmental Review Airside Modeling Analysis, prepared by the Port of Seattle/LeighFisher, 2020.

TABLE 1-5: ANNUAL OPERATIONS – FUTURE (2037) PROPOSED ACTION

Airframe	Engine Code	Annual Operations
Commercial Jets		
Airbus A220-100	16PW111	27,238
Airbus A220-300	16PW111	9,421
Airbus A220-300	16PW112	4,640
Airbus A320-200 Series	01P08CM105	2,164
Airbus A320-200 Series	01P10IA021	194
Airbus A320-200 Series	01P10IA022	42
Airbus A320-200 Series	1CM008	53
Airbus A320-200 Series	1CM009	214
Airbus A320-200 Series	1IA003	409
Airbus A320-200 Series	3CM026	233
Airbus A320-200 Series	8IA010	0

TABLE 1-5: ANNUAL OPERATIONS – FUTURE (2037) PROPOSED ACTION (CONTINUED)

Airframe	Engine Code	Annual Operations
Airbus A320-NEO	01P20CM128	6,189
Airbus A320-NEO	01P22PW163	9,822
Airbus A321-200 Series	01P08CM104	349
Airbus A321-200 Series	01P10IA025	2,120
Airbus A321-200 Series	3CM025	361
Airbus A321-NEO	01P18PW157	7,631
Airbus A321-NEO	01P20CM132	22,635
Airbus A330-200 Series	2RR023	2,709
Airbus A330-200 Series	9PW094	39
Airbus A330-300 Series	2RR023	587
Airbus A330-300 Series	4GE080	595
Airbus A330-300 Series	7PW082	80
Airbus A330-300 Series	9PW094	1,681
Airbus A330-300 Series	9PW095	394
Airbus A330-900N Series (Neo)	02P23RR141	5,930
Airbus A350-900 series	01P18RR124	3,499
Boeing 737-7	01P20CM136	1,822
Boeing 737-700 Series	3CM030	21
Boeing 737-700 Series	3CM031	701
Boeing 737-700 Series	3CM032	128
Boeing 737-700 Series	8CM051	0
Boeing 737-700 Series	8CM062	5
Boeing 737-700 Series	8CM063	119
Boeing 737-8	01P20CM135	693
Boeing 737-8	01P20CM136	22,449
Boeing 737-8	01P20CM140	20,708
Boeing 737-800 Series	01P11CM114	306
Boeing 737-800 Series	01P11CM116	4,160
Boeing 737-800 Series	01P11CM122	2,270
Boeing 737-800 Series	01P11CM125	505
Boeing 737-800 Series	01P11CM126	48
Boeing 737-800 Series	3CM032	12,736
Boeing 737-800 Series	3CM034	1,230
Boeing 737-800 Series	8CM051	17,434
Boeing 737-800 Series	8CM064	127
Boeing 737-800 Series	8CM065	1,628
Boeing 737-800 Series	8CM066	7,645
Boeing 737-9	01P20CM136	1,033
Boeing 737-9	01P20CM140	40,724
Boeing 737-900-ER	01P11CM116	27,090
Boeing 737-900-ER	01P11CM121	77,133
Boeing 737-900-ER	01P11CM125	236
Boeing 737-900-ER	3CM034	1,090
Boeing 737-900-ER	8CM065	1,216
Boeing 737-900-ER_MA	01P11CM121_MA	1,975
Boeing 787-10 Dreamliner	01P17GE211	480
Boeing 787-10 Dreamliner	01P17GE213	1,036
Boeing 787-10 Dreamliner	02P23RR134	524
Boeing 787-8 Dreamliner	01P17GE206	1,528
Boeing 787-8 Dreamliner	01P17GE210	51
Boeing 787-8 Dreamliner	11GE137	2,414



TABLE 1-5: ANNUAL OPERATIONS – FUTURE (2037) PROPOSED ACTION (CONTINUED)

Airframe	Engine Code	Annual Operations
Boeing 787-8 Dreamliner	11GE138	5,933
Boeing 787-9 Dreamliner	01P17GE211	3,717
Boeing 787-9 Dreamliner	01P17GE214	25
Boeing 787-9 Dreamliner	02P23RR131	839
Boeing 787-9 Dreamliner	12RR067	3,839
Boeing 787-9 Dreamliner	12RR068	1,618
Sub-Total		376,465
Cargo Jets		
Boeing 747-400 ERF	12PW102	577
Boeing 747-400BCF	01P03GE187	577
Boeing 747-8F	01P17GE215	315
Boeing 747-8F	13GE156	84
Boeing 747-8F	8GENX1	272
Boeing 767-200 Series Freighter	1GE010	3,719
Boeing 767-200 Series Freighter	1GE012	1,852
Boeing 767-200 Series Freighter	1PW026	333
Boeing 767-300 ER Freighter	1GE030	5,221
Boeing 767-300 ER Freighter	2GE055	514
Boeing 777 Freighter	01P21GE216	3,690
Boeing 777 Freighter	01P21GE217	88
Sub-Total		17,242
Regional Jets		
Embraer ERJ175-LR	01P08GE197	109,375
Embraer ERJ175-LR_MA	01P08GE197_MA	1,066
Sub-Total		110,442
Cargo Prop		
ATR 72-600 Freighter	PW127F	323
Cessna 208 Caravan	P6114A	1,147
Cessna 208 Caravan	PT6A14	1,131
Cessna 408 SkyCourier	PT6A6B	323
Raytheon Beech 99	PT6A27	4
Raytheon Beech 99	PT6A36	235
Sub-Total		3,163
General Aviation		
Bombardier Challenger 350	01P14HN011	572
Cessna 172 Skyhawk	IO320	120
Dassault Falcon 50	1AS002	572
Embraer Phenom 300 (EMB-505)	PW530	136
Piper PA-31 Navajo	TIO540	14
Raytheon C-12 Huron	PT660A	67
Sub-Total		1,481
Other		
Boeing 737-900-ER_O1	01P11CM121_O1	436
Boeing 737-900-ER_O2	01P11CM125_O2	1
Boeing 737-900-ER_O3	3CM034_O3	6
Boeing 737-900-ER_O4	8CM065_O4	7
Boeing 737-900-ER_O7	01P11CM116_O7	149
Cessna 208 Caravan_O5	P6114A_O5	201
Cessna 208 Caravan_O6	PT6A14_O6	199
Sub-Total		1,000

TABLE 1-5: ANNUAL OPERATIONS – FUTURE (2037) PROPOSED ACTION (CONTINUED)

Airframe	Engine Code	Annual Operations
Military		
Cessna 172 Skyhawk_M2	IO320_M2	2
Embraer Phenom 300 (EMB-505)_M1	PW530_M1	72
Raytheon C-12 Huron_M	PT660A_M	26
Sub-Total		100
Grand Total		509,892

Note: Day = 7:00 a.m. to 9:59 p.m., Night = 10:00 p.m. to 6:59 a.m.

Source: Aviation Forecast Update, prepared by Port of Seattle/LeighFisher, 2023; Constrained Operating Growth Scenario, prepared by Port of Seattle/Landrum & Brown, 2023; Environmental Review Airside Modeling Analysis, prepared by the Port of Seattle/LeighFisher, 2020.

TABLE 1-6: COMPARISON OF TAXI TIMES (MINUTES SECONDS)

Year / Alternative	Taxi-in	Taxi-Out	Total
Existing (2022)	10 min, 16 sec	18 min, 53 sec	29 min, 9 sec
2032 No Action Alternative	9 min, 26 sec	21 min, 28 sec	30 min, 54 sec
2032 Proposed Action	9 min, 12 sec	21 min, 18 sec	30 min, 30 sec
2037 No Action Alternative	9 min, 41 sec	21 min, 42 sec	31 min, 23 sec
2037 Proposed Action	9 min, 45 sec	23 min, 32 sec	33 min, 17 sec

Source: FAA's Aviation System Performance Metrics (ASPM) for Existing (2022) Condition. Taxi times for the future conditions were estimated using LFA delay modeling data developed with the Total Airspace and Airport Modeler (TAAM) tool (June 2020) normalized to the ASPM data.



Attachment 2 Auxiliary Power Unit Usage

This attachment contains the following tables:

APU Annual Usage

- Table 2-1 Existing (2022) Condition APU Annual Usage
- Table 2-2 Future (2032) No Action Alternative APU Annual Usage
- Table 2-3 Future (2032) Proposed Action APU Annual Usage
- Table 2-4 Future (2037) No Action Alternative APU Annual Usage
- Table 2-5 Future (2037) Proposed Action APU Annual Usage

TABLE 2-1: EXISTING (2022) APU ANNUAL USAGE

APU Type	Annual Usage (Hours)
APU 131-9	2,849,478
APU GTC 85	3,633
APU GTCP 331 (143 HP)	50,233
APU GTCP 331-350	35,238
APU GTCP 36 (80HP)	1,882
APU GTCP 36-100	643
APU GTCP 36-150[]	209
APU GTCP 36-300 (80HP)	228,573
APU GTCP 85 (200 HP)	495
APU GTCP100-544 (400 HP)	956
APU GTCP331-200ER (143 HP)	82,744
APU GTCP331-500 (143 HP)	11,898
APU GTCP85-129 (200 HP)	10
APU PW901A	31,454
APU T-62T-27 (100 HP)	126,701
APU T-62T-47C1	136,060
APU TSCP700-4B (142 HP)	30
Total	3,560,237

Source: AEDT 3f; Port of Seattle and Landrum & Brown, 2024

TABLE 2-2: FUTURE (2032) NO ACTION ALTERNATIVE APU ANNUAL USAGE

APU Type	Annual Usage (Hours)
APU 131-9	3,938,697
APU GTC 85	461
APU GTCP 331 (143 HP)	30,210
APU GTCP 331-350	205,351
APU GTCP 36 (80HP)	3,404
APU GTCP 36-100	4
APU GTCP 36-300 (80HP)	611,869
APU GTCP100-544 (400 HP)	9,549
APU GTCP331-200ER (143 HP)	7,362
APU GTCP331-500 (143 HP)	12,775
APU PW901A	53,579
APU T-62T-27 (100 HP)	112
APU T-62T-47C1	593
Total	4,873,967

Source: AEDT 3f; Port of Seattle and Landrum & Brown, 2024



TABLE 2-3: FUTURE (2032) PROPOSED ACTION APU ANNUAL USAGE

APU Type	Annual Usage (Hours)
APU 131-9	4,013,427
APU GTC 85	465
APU GTCP 331 (143 HP)	30,589
APU GTCP 331-350	209,389
APU GTCP 36 (80HP)	3,404
APU GTCP 36-100	5
APU GTCP 36-300 (80HP)	623,884
APU GTCP100-544 (400 HP)	9,690
APU GTCP331-200ER (143 HP)	7,506
APU GTCP331-500 (143 HP)	13,005
APU PW901A	54,178
APU T-62T-27 (100 HP)	113
APU T-62T-47C1	604
Total	4,966,256

Source: AEDT 3f; Port of Seattle and Landrum & Brown, 2024

TABLE 2-4: FUTURE (2037) NO ACTION ALTERNATIVE APU ANNUAL USAGE

APU Type	Annual Usage (Hours)
APU 131-9	5,322,083
APU GTCP 331 (143 HP)	28,676
APU GTCP 331-350	71,596
APU GTCP 36 (80HP)	1,327
APU GTCP 36-100	41
APU GTCP 36-300 (80HP)	316,483
APU GTCP100-544 (400 HP)	2,639
APU GTCP331-500 (143 HP)	584
APU PW901A	44,053
APU T-62T-27 (100 HP)	101
APU T-62T-47C1	120
Total	5,787,704

Source: AEDT 3f; Port of Seattle and Landrum & Brown, 2024

TABLE 2-5: FUTURE (2037) PROPOSED ACTION APU ANNUAL USAGE

APU Type	Annual Usage (Hours)
APU 131-9	5,717,310
APU GTCP 331 (143 HP)	29,710
APU GTCP 331-350	77,016
APU GTCP 36 (80HP)	1,422
APU GTCP 36-100	44
APU GTCP 36-300 (80HP)	341,009
APU GTCP100-544 (400 HP)	2,836
APU GTCP331-500 (143 HP)	628
APU PW901A	46,612
APU T-62T-27 (100 HP)	102
APU T-62T-47C1	125
Total	6,216,814

Source: AEDT 3f; Port of Seattle and Landrum & Brown, 2024

Attachment 3 Ground Support Equipment

This attachment contains the following tables:

Existing (2022) Condition

- Table 3-1 Tenant-Owned GSE Annual Usage – Existing (2022) Condition
- Table 3-2 Port-Owned Airfield Vehicles and Equipment Fuel Consumption – Existing (2022) Condition

Future (2032) No Action Alternative

- Table 3-3 Tenant-Owned GSE Annual Usage – Future (2032) No Action Alternative
- Table 3-4 Port-Owned Airfield Vehicles and Equipment Fuel Consumption – Future (2032) No Action Alternative

Future (2032) Proposed Action

- Table 3-5 Tenant-Owned GSE Annual Usage – Future (2032) Proposed Action
- Table 3-6 Port-Owned Airfield Vehicles and Equipment Fuel Consumption – Future (2032) Proposed Action

Future (2037) No Action Alternative

- Table 3-7 Tenant-Owned GSE Annual Usage – Future (2037) No Action Alternative
- Table 3-8 Port-owned Airfield Vehicles and Equipment Fuel Consumption – Future (2037) No Action Alternative

Future (2037) Proposed Action

- Table 3-9 Tenant-Owned GSE Annual Usage – Future (2037) Proposed Action
- Table 3-10 Port-Owned Airfield Vehicles and Equipment Fuel Consumption – Future (2037) Proposed Action

Emission Factors

- Table 3-11 2022 Emission Factors for GSE
- Table 3-12 2032 Emission Factors for GSE
- Table 3-13 2037 Emission Factors for GSE



TABLE 3-1: TENANT-OWNED GSE ANNUAL USAGE - EXISTING (2022) CONDITION

General Description	AEDT Equipment Name	Annual Usage (Hours)
Aircraft Tractor	Diesel - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	11,018.3
Aircraft Tractor	Diesel - Stewart & Stevenson TUG MC - Aircraft Tractor	37.3
Aircraft Tractor	Electric - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	8,159.6
Aircraft Tractor	Gasoline - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	5,164.8
Baggage Tractor	Diesel - Stewart & Stevenson TUG MA 50 - Baggage Tractor	36,613.0
Baggage Tractor	Electric - Stewart & Stevenson TUG MA 50 - Baggage Tractor	111,509.5
Baggage Tractor	Gasoline - Stewart & Stevenson TUG MA 50 - Baggage Tractor	90,863.7
Belt Loader	Diesel - Stewart & Stevenson TUG 660 - Belt Loader	2,367.0
Belt Loader	Electric - Stewart & Stevenson TUG 660 - Belt Loader	78,062.0
Belt Loader	Gasoline - Stewart & Stevenson TUG 660 - Belt Loader	45,341.9
Cabin Service Truck	Diesel - Hi-Way F650 - Cabin Service Truck	946.0
Cabin Service Truck	Gasoline - Hi-Way F650 - Cabin Service Truck	80,841.0
Cargo Loader	Diesel - FMC Commander 30 - Cargo Loader	35,879.5
Catering Truck	Diesel - Hi-Way / TUG 660 chasis - Catering Truck	18.3
Catering Truck	Diesel - Hi-Way F650 - Catering Truck	76,956.7
Catering Truck	Gasoline - Hi-Way F650 - Catering Truck	4,788.8
Fuel Truck	Diesel - F750, Dukes Transportation Services, DART 3000 to 6000 gallon - Fuel Truck	9,726.2
Generator	Diesel - (None specified. EPA default data used.) - Generator	18.3
Ground Power Unit	Diesel - TLD, 28 VDC - Ground Power Unit	34,139.0
Ground Power Unit	Diesel - TLD, 400 Hz AC - Ground Power Unit	57.4
Ground Power Unit	Gasoline - TLD - Ground Power Unit	141.3
Hydrant Truck	Diesel - F250 / F350 - Hydrant Truck	28,896.3
Hydrant Truck	Gasoline - F250 / F350 - Hydrant Truck	3,580.4
Lavatory Truck	Diesel - TLD 1410 - Lavatory Truck	25,448.0
Lavatory Truck	Gasoline - TLD 1410 - Lavatory Truck	20,041.4
Lift	Diesel - (None specified. EPA default data used.) - Lift	1.5
Passenger Stand	Diesel - Wollard CMPS170 / CMPS228 - Passenger Stand	931.1
Service Truck	Diesel - F250 / F350 - Service Truck	5,820.3
Service Truck	Electric - F250 / F350 - Service Truck	2,037.2
Service Truck	Gasoline - F250 / F350 - Service Truck	35,768.3
	Total	755,173.9

Source: AEDT 3f; Port of Seattle and Landrum & Brown, 2024.

TABLE 3-2: PORT-OWNED AIRFIELD VEHICLES AND EQUIPMENT ANNUAL FUEL CONSUMPTION - EXISTING (2022) CONDITION

Category / Description	AEDT Equipment Name	Fuel Type	Total Annual Consumption Per Category (Gallons)
Airfield Maintenance			
Airfield Vehicles including Ford Escapes, Chevrolet pickup trucks, Ford 150 trucks, and vans	F250 / F350 - Service Truck	Gasoline	55,461
Trimmers, pressure washers, airfield lighting	Other ¹	Gasoline	1,684
Belt Loaders	Stewart & Stevenson TUG 660 - Belt Loader	Gasoline	44
Airfield Vehicles including Ford and International trucks	F250 / F350 - Service Truck	Diesel	19,178
Snowplows including Oshkosh and International trucks	F250 / F350 - Service Truck	Diesel	5,580
Mower and snow blower equipment	Other ²	Diesel	990
Aircraft Tractors	Douglas TBL-400 - Aircraft Tractor	Diesel	223
Forklift	Toyota 5,000 lb - Fork Lift	Propane	24
Support Hardstand Operations			
Air Conditioners	ACE 802 - Air Conditioner	Diesel	834
Shuttle Buses	COBUS ³	Diesel	1,762
Belt Loaders	Stewart & Stevenson TUG 660 - Belt Loader	Diesel	646
Ground Power Units	TLD, 400 Hz AC - Ground Power Unit	Diesel	394
Ford 550 Service Truck	F250 / F350 - Service Truck	Gasoline	35

1 Gasoline equipment which was not available in AEDT was grouped into AEDT's "Other" equipment type. This included trimmers, pressure washers, and airfield lighting equipment. An AEDT user specified equipment type was developed with a horsepower of 126 and load factor of 0.5.

2 Diesel equipment which was not available in AEDT was grouped into AEDT's "Other" equipment type. This included mower and snow blower equipment. An AEDT user specified equipment type was developed with a horsepower of 140 and load factor of 0.5.

3 This includes the Port of Seattle 45-foot COBUS 3000 activity. An AEDT user specified equipment type was developed with a horsepower of 300 and load factor of 0.5.

Note: Hz denotes Hertz; AC denotes Air Conditioner.

Source: Port of Seattle and Landrum & Brown, 2023.



**TABLE 3-3: TENANT-OWNED GSE ANNUAL USAGE – FUTURE (2032) NO ACTION
ALTERNATIVE**

General Description	AEDT Equipment Name	Annual Usage (Hours)
Aircraft Tractor	Diesel - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	13,231.6
Aircraft Tractor	Diesel - Stewart & Stevenson TUG MC - Aircraft Tractor	30.8
Aircraft Tractor	Electric - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	9,523.8
Aircraft Tractor	Gasoline - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	6,078.6
Baggage Tractor	Diesel - Stewart & Stevenson TUG MA 50 - Baggage Tractor	43,915.3
Baggage Tractor	Electric - Stewart & Stevenson TUG MA 50 - Baggage Tractor	130,151.6
Baggage Tractor	Gasoline - Stewart & Stevenson TUG MA 50 - Baggage Tractor	109,556.0
Belt Loader	Diesel - Stewart & Stevenson TUG 660 - Belt Loader	2,762.7
Belt Loader	Electric - Stewart & Stevenson TUG 660 - Belt Loader	91,112.2
Belt Loader	Gasoline - Stewart & Stevenson TUG 660 - Belt Loader	54,647.4
Cabin Service Truck	Diesel - Hi-Way F650 - Cabin Service Truck	1,176.8
Cabin Service Truck	Gasoline - Hi-Way F650 - Cabin Service Truck	94,574.0
Cargo Loader	Diesel - FMC Commander 30 - Cargo Loader	43,411.5
Cart	Gasoline - Taylor Dunn - Cart	5.1
Catering Truck	Diesel - Hi-Way F650 - Catering Truck	90,728.6
Catering Truck	Gasoline - Hi-Way F650 - Catering Truck	5,788.3
Fuel Truck	Diesel - F750, Dukes Transportation Services, DART 3000 to 6000 gallon - Fuel Truck	123.2
Fuel Truck	Diesel - F750, Dukes Transportation Services, DART 3000 to 6000 gallon - Fuel Truck"	11,427.0
Generator	Diesel - (None specified. EPA default data used.) - Generator	61.0
Ground Power Unit	Diesel - TLD, 28 VDC - Ground Power Unit	246.5
Ground Power Unit	Diesel - TLD, 28 VDC - Ground Power Unit"	39,768.8
Hydrant Truck	Diesel - F250 / F350 - Hydrant Truck	34,216.9
Hydrant Truck	Gasoline - F250 / F350 - Hydrant Truck	4,239.5
Lavatory Truck	Diesel - TLD 1410 - Lavatory Truck	30,342.9
Lavatory Truck	Gasoline - TLD 1410 - Lavatory Truck	23,391.9
Lift	Diesel - (None specified. EPA default data used.) - Lift	5.1
Passenger Stand	Diesel - Wollard CMPS170 / CMPS228 - Passenger Stand	1,086.8
Service Truck	Diesel - F250 / F350 - Service Truck	6,784.0
Service Truck	Electric - F250 / F350 - Service Truck	2,377.8
Service Truck	Gasoline - F250 / F350 - Service Truck	42,387.1
	Total	893,153.0

Source: AEDT 3f; Port of Seattle and Landrum & Brown, 2024.

TABLE 3-4: PORT-OWNED AIRFIELD VEHICLES AND EQUIPMENT FUEL CONSUMPTION – FUTURE (2032) NO ACTION ALTERNATIVE

Category / Description	AEDT Equipment Name	Fuel Type	Total Annual Consumption Per Category (Gallons)
Airfield Maintenance			
Airfield Vehicles including Ford Escapes, Chevrolet pickup trucks, Ford 150 trucks, and vans	F250 / F350 - Service Truck	Gasoline	64,519
Trimmers, pressure washers, airfield lighting	Other ¹	Gasoline	1,959
Belt Loaders	Stewart & Stevenson TUG 660 - Belt Loader	Gasoline	51
Airfield Vehicles including Ford and International trucks	F250 / F350 - Service Truck	Diesel	22,310
Snowplows including Oshkosh and International trucks	F250 / F350 - Service Truck	Diesel	6,491
Mower and snow blower equipment	Other ²	Diesel	1,152
Aircraft Tractors	Douglas TBL-400 - Aircraft Tractor	Diesel	260
Forklift	Toyota 5,000 lb - Fork Lift	Propane	27
Support Hardstand Operations			
Air Conditioners	ACE 802 - Air Conditioner	Diesel	970
Shuttle Buses	COBUS ³	Diesel	2,050
Belt Loaders	Stewart & Stevenson TUG 660 - Belt Loader	Diesel	752
Ground Power Units	TLD, 400 Hz AC - Ground Power Unit	Diesel	458
Ford 550 Service Truck	F250 / F350 - Service Truck	Gasoline	41

1 Gasoline equipment which was not available in AEDT was grouped into AEDT's "Other" equipment type. This included trimmers, pressure washers, and airfield lighting equipment. An AEDT user specified equipment type was developed with a horsepower of 126 and load factor of 0.5.

2 Diesel equipment which was not available in AEDT was grouped into AEDT's "Other" equipment type. This included mower and snow blower equipment. An AEDT user specified equipment type was developed with a horsepower of 140 and load factor of 0.5.

3 This includes the Port of Seattle 45-foot COBUS 3000 activity. An AEDT user specified equipment type was developed with a horsepower of 300 and load factor of 0.5.

Note: Hz denotes Hertz; AC denotes Air Conditioner.

Source: Port of Seattle and Landrum & Brown, 2023.



TABLE 3-5: TENANT-OWNED GSE ANNUAL USAGE – FUTURE (2032) PROPOSED ACTION

General Description	AEDT Equipment Name	Annual Usage (Hours)
Aircraft Tractor	Diesel - Stewart & Stevenson TUG MC - Aircraft Tractor	30.8
Aircraft Tractor	Diesel - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	13,470.5
Aircraft Tractor	Electric - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	9,710.5
Aircraft Tractor	Gasoline - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	6,183.9
Baggage Tractor	Diesel - Stewart & Stevenson TUG MA 50 - Baggage Tractor	44,450.1
Baggage Tractor	Electric - Stewart & Stevenson TUG MA 50 - Baggage Tractor	132,703.1
Baggage Tractor	Gasoline - Stewart & Stevenson TUG MA 50 - Baggage Tractor	111,376.8
Belt Loader	Diesel - Stewart & Stevenson TUG 660 - Belt Loader	2,816.9
Belt Loader	Electric - Stewart & Stevenson TUG 660 - Belt Loader	92,898.3
Belt Loader	Gasoline - Stewart & Stevenson TUG 660 - Belt Loader	55,617.9
Cabin Service Truck	Diesel - Hi-Way F650 - Cabin Service Truck	1,199.9
Cabin Service Truck	Gasoline - Hi-Way F650 - Cabin Service Truck	96,428.0
Cargo Loader	Diesel - FMC Commander 30 - Cargo Loader	43,955.5
Cart	Gasoline - Taylor Dunn - Cart	5.1
Catering Truck	Diesel - Hi-Way F650 - Catering Truck	92,507.3
Catering Truck	Gasoline - Hi-Way F650 - Catering Truck	5,901.8
Fuel Truck	Diesel - F750, Dukes Transportation Services, DART 3000 to 6000 gallon - Fuel Truck	11,705.6
Generator	Diesel - (None specified. EPA default data used.) - Generator	61.0
Ground Power Unit	Diesel - TLD, 28 VDC - Ground Power Unit	40,794.9
Hydrant Truck	Diesel - F250 / F350 - Hydrant Truck	34,887.8
Hydrant Truck	Gasoline - F250 / F350 - Hydrant Truck	4,322.6
Lavatory Truck	Diesel - TLD 1410 - Lavatory Truck	30,937.8
Lavatory Truck	Gasoline - TLD 1410 - Lavatory Truck	23,850.5
Lift	Diesel - (None specified. EPA default data used.) - Lift	5.1
Passenger Stand	Diesel - Wollard CMPS170 / CMPS228 - Passenger Stand	1,108.1
Service Truck	Diesel - F250 / F350 - Service Truck	6,916.6
Service Truck	Electric - F250 / F350 - Service Truck	2,424.4
Service Truck	Gasoline - F250 / F350 - Service Truck	43,179.7
	Total	909,450.5

Source: AEDT 3f; Port of Seattle and Landrum & Brown, 2024.

TABLE 3-6: PORT-OWNED AIRFIELD VEHICLES AND EQUIPMENT FUEL CONSUMPTION – FUTURE (2032) PROPOSED ACTION

Category / Description	AEDT Equipment Name	Fuel Type	Total Annual Consumption Per Category (Gallons)
Airfield Maintenance			
Airfield Vehicles including Ford Escapes, Chevrolet pickup trucks, Ford 150 trucks, and vans	F250 / F350 - Service Truck	Gasoline	65,729
Trimmers, pressure washers, airfield lighting	Other ¹	Gasoline	1,996
Belt Loaders	Stewart & Stevenson TUG 660 - Belt Loader	Gasoline	52
Airfield Vehicles including Ford and International trucks	F250 / F350 - Service Truck	Diesel	22,729
Snowplows including Oshkosh and International trucks	F250 / F350 - Service Truck	Diesel	6,613
Mower and snow blower equipment	Other ²	Diesel	1,173
Aircraft Tractors	Douglas TBL-400 - Aircraft Tractor	Diesel	265
Forklift	Toyota 5,000 lb - Fork Lift	Propane	28
Support Hardstand Operations			
Air Conditioners	ACE 802 - Air Conditioner	Diesel	988
Shuttle Buses	COBUS ³	Diesel	2,088
Belt Loaders	Stewart & Stevenson TUG 660 - Belt Loader	Diesel	766
Ground Power Units	TLD, 400 Hz AC - Ground Power Unit	Diesel	467
Ford 550 Service Truck	F250 / F350 - Service Truck	Gasoline	41

1 Gasoline equipment which was not available in AEDT was grouped into AEDT's "Other" equipment type. This included trimmers, pressure washers, and airfield lighting equipment. An AEDT user specified equipment type was developed with a horsepower of 126 and load factor of 0.5.

2 Diesel equipment which was not available in AEDT was grouped into AEDT's "Other" equipment type. This included mower and snow blower equipment. An AEDT user specified equipment type was developed with a horsepower of 140 and load factor of 0.5.

3 This includes the Port of Seattle 45-foot COBUS 3000 activity. An AEDT user specified equipment type was developed with a horsepower of 300 and load factor of 0.5.

Note: Hz denotes Hertz; AC denotes Air Conditioner.

Source: Port of Seattle and Landrum & Brown, 2023.



**TABLE 3-7: TENANT-OWNED GSE ANNUAL USAGE – FUTURE (2037) NO ACTION
ALTERNATIVE**

General Description	AEDT Equipment Name	Annual Usage (Hours)
Aircraft Tractor	Diesel - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	13,493.4
Aircraft Tractor	Diesel - Stewart & Stevenson TUG MC - Aircraft Tractor	33.8
Aircraft Tractor	Electric - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	9,654.8
Aircraft Tractor	Gasoline - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	6,216.3
Baggage Tractor	Diesel - Stewart & Stevenson TUG MA 50 - Baggage Tractor	45,791.1
Baggage Tractor	Electric - Stewart & Stevenson TUG MA 50 - Baggage Tractor	131,942.4
Baggage Tractor	Gasoline - Stewart & Stevenson TUG MA 50 - Baggage Tractor	112,349.7
Belt Loader	Diesel - Stewart & Stevenson TUG 660 - Belt Loader	2,800.7
Belt Loader	Electric - Stewart & Stevenson TUG 660 - Belt Loader	92,366.0
Belt Loader	Gasoline - Stewart & Stevenson TUG 660 - Belt Loader	55,792.7
Cabin Service Truck	Diesel - Hi-Way F650 - Cabin Service Truck	1,193.0
Cabin Service Truck	Gasoline - Hi-Way F650 - Cabin Service Truck	95,875.1
Cargo Loader	Diesel - FMC Commander 30 - Cargo Loader	45,206.4
Cart	Gasoline - Taylor Dunn - Cart	5.6
Catering Truck	Diesel - Hi-Way F650 - Catering Truck	91,976.8
Catering Truck	Gasoline - Hi-Way F650 - Catering Truck	5,868.0
Fuel Truck	Diesel - F750, Dukes Transportation Services, DART 3000 to 6000 gallon - Fuel Truck	11,987.4
Generator	Diesel - (None specified. EPA default data used.) - Generator	67.0
Ground Power Unit	Diesel - TLD, 28 VDC - Ground Power Unit	40,586.6
Hydrant Truck	Diesel - F250 / F350 - Hydrant Truck	34,687.5
Hydrant Truck	Gasoline - F250 / F350 - Hydrant Truck	4,297.8
Lavatory Truck	Diesel - TLD 1410 - Lavatory Truck	30,760.3
Lavatory Truck	Gasoline - TLD 1410 - Lavatory Truck	23,713.8
Lift	Diesel - (None specified. EPA default data used.) - Lift	5.6
Passenger Stand	Diesel - Wollard CMPS170 / CMPS228 - Passenger Stand	1,101.7
Service Truck	Diesel - F250 / F350 - Service Truck	6,883.7
Service Truck	Electric - F250 / F350 - Service Truck	2,410.5
Service Truck	Gasoline - F250 / F350 - Service Truck	43,120.0
	Total	910,187.7

Source: AEDT 3f; Port of Seattle and Landrum & Brown, 2024.

**TABLE 3-8: PORT-OWNED AIRFIELD VEHICLES AND EQUIPMENT FUEL CONSUMPTION –
FUTURE (2037) NO ACTION ALTERNATIVE**

Category / Description	AEDT Equipment Name	Fuel Type	Total Annual Consumption Per Category (Gallons)
Airfield Maintenance			
Airfield Vehicles including Ford Escapes, Chevrolet pickup trucks, Ford 150 trucks, and vans	F250 / F350 - Service Truck	Gasoline	65,621
Trimmers, pressure washers, airfield lighting	Other ¹	Gasoline	1,993
Belt Loaders	Stewart & Stevenson TUG 660 - Belt Loader	Gasoline	52
Airfield Vehicles including Ford and International trucks	F250 / F350 - Service Truck	Diesel	22,691
Snowplows including Oshkosh and International trucks	F250 / F350 - Service Truck	Diesel	6,602
Mower and snow blower equipment	Other ²	Diesel	1,171
Aircraft Tractors	Douglas TBL-400 - Aircraft Tractor	Diesel	264
Forklift	Toyota 5,000 lb - Fork Lift	Propane	28
Support Hardstand Operations			
Air Conditioners	ACE 802 - Air Conditioner	Diesel	987
Shuttle Buses	COBUS ³	Diesel	2,085
Belt Loaders	Stewart & Stevenson TUG 660 - Belt Loader	Diesel	765
Ground Power Units	TLD, 400 Hz AC - Ground Power Unit	Diesel	466
Ford 550 Service Truck	F250 / F350 - Service Truck	Gasoline	41

1 Gasoline equipment which was not available in AEDT was grouped into AEDT's "Other" equipment type. This included trimmers, pressure washers, and airfield lighting equipment. An AEDT user specified equipment type was developed with a horsepower of 126 and load factor of 0.5.

2 Diesel equipment which was not available in AEDT was grouped into AEDT's "Other" equipment type. This included mower and snow blower equipment. An AEDT user specified equipment type was developed with a horsepower of 140 and load factor of 0.5.

3 This includes the Port of Seattle 45-foot COBUS 3000 activity. An AEDT user specified equipment type was developed with a horsepower of 300 and load factor of 0.5.

Note: Hz denotes Hertz; AC denotes Air Conditioner.

Source: Port of Seattle and Landrum & Brown, 2023.



TABLE 3-9: TENANT-OWNED GSE ANNUAL USAGE – FUTURE (2037) PROPOSED ACTION

General Description	AEDT Equipment Name	Annual Usage (Hours)
Aircraft Tractor	Diesel - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	14,449.1
Aircraft Tractor	Diesel - Stewart & Stevenson TUG MC - Aircraft Tractor	33.8
Aircraft Tractor	Electric - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	10,401.6
Aircraft Tractor	Gasoline - Stewart & Stevenson TUG GT-35, Douglas TBL-180 - Aircraft Tractor	6,637.5
Baggage Tractor	Diesel - Stewart & Stevenson TUG MA 50 - Baggage Tractor	47,930.4
Baggage Tractor	Electric - Stewart & Stevenson TUG MA 50 - Baggage Tractor	142,147.9
Baggage Tractor	Gasoline - Stewart & Stevenson TUG MA 50 - Baggage Tractor	119,632.2
Belt Loader	Diesel - Stewart & Stevenson TUG 660 - Belt Loader	3,017.4
Belt Loader	Electric - Stewart & Stevenson TUG 660 - Belt Loader	99,510.2
Belt Loader	Gasoline - Stewart & Stevenson TUG 660 - Belt Loader	59,674.3
Cabin Service Truck	Diesel - Hi-Way F650 - Cabin Service Truck	1,285.3
Cabin Service Truck	Gasoline - Hi-Way F650 - Cabin Service Truck	103,291.0
Cargo Loader	Diesel - FMC Commander 30 - Cargo Loader	47,382.1
Cart	Gasoline - Taylor Dunn - Cart	5.6
Catering Truck	Diesel - Hi-Way F650 - Catering Truck	99,091.3
Catering Truck	Gasoline - Hi-Way F650 - Catering Truck	6,321.9
Fuel Truck	Diesel - F750, Dukes Transportation Services, DART 3000 to 6000 gallon - Fuel Truck	12,608.5
Generator	Diesel - (None specified. EPA default data used.) - Generator	67.0
Ground Power Unit	Diesel - TLD, 28 VDC - Ground Power Unit	43,704.7
Hydrant Truck	Diesel - F250 / F350 - Hydrant Truck	37,370.8
Hydrant Truck	Gasoline - F250 / F350 - Hydrant Truck	4,630.3
Lavatory Truck	Diesel - TLD 1410 - Lavatory Truck	33,139.7
Lavatory Truck	Gasoline - TLD 1410 - Lavatory Truck	25,548.0
Lift	Diesel - (None specified. EPA default data used.) - Lift	5.6
Passenger Stand	Diesel - Wollard CMPS170 / CMPS228 - Passenger Stand	1,187.0
Service Truck	Diesel - F250 / F350 - Service Truck	7,413.9
Service Truck	Electric - F250 / F350 - Service Truck	2,597.0
Service Truck	Gasoline - F250 / F350 - Service Truck	46,290.2
	Total	975,374.0

Source: AEDT 3f; Port of Seattle and Landrum & Brown, 2024.

TABLE 3-10: PORT-OWNED AIRFIELD VEHICLES AND EQUIPMENT FUEL CONSUMPTION – FUTURE (2037) PROPOSED ACTION

Category / Description	AEDT Equipment Name	Fuel Type	Total Annual Consumption Per Category (Gallons)
Airfield Maintenance			
Airfield Vehicles including Ford Escapes, Chevrolet pickup trucks, Ford 150 trucks, and vans	F250 / F350 - Service Truck	Gasoline	70,460
Trimmers, pressure washers, airfield lighting	Other ¹	Gasoline	2,140
Belt Loaders	Stewart & Stevenson TUG 660 - Belt Loader	Gasoline	56
Airfield Vehicles including Ford and International trucks	F250 / F350 - Service Truck	Diesel	24,365
Snowplows including Oshkosh and International trucks	F250 / F350 - Service Truck	Diesel	7,089
Mower and snow blower equipment	Other ²	Diesel	1,258
Aircraft Tractors	Douglas TBL-400 - Aircraft Tractor	Diesel	284
Forklift	Toyota 5,000 lb - Fork Lift	Propane	30
Support Hardstand Operations			
Air Conditioners	ACE 802 - Air Conditioner	Diesel	1,060
Shuttle Buses	COBUS ³	Diesel	2,239
Belt Loaders	Stewart & Stevenson TUG 660 - Belt Loader	Diesel	821
Ground Power Units	TLD, 400 Hz AC - Ground Power Unit	Diesel	501
Ford 550 Service Truck	F250 / F350 - Service Truck	Gasoline	44

1 Gasoline equipment which was not available in AEDT was grouped into AEDT's "Other" equipment type. This included trimmers, pressure washers, and airfield lighting equipment. An AEDT user specified equipment type was developed with a horsepower of 126 and load factor of 0.5.

2 Diesel equipment which was not available in AEDT was grouped into AEDT's "Other" equipment type. This included mower and snow blower equipment. An AEDT user specified equipment type was developed with a horsepower of 140 and load factor of 0.5.

3 This includes the Port of Seattle 45-foot COBUS 3000 activity. An AEDT user specified equipment type was developed with a horsepower of 300 and load factor of 0.5.

Note: Hz denotes Hertz; AC denotes Air Conditioner.

Source: Port of Seattle and Landrum & Brown, 2023.



TABLE 3-11: 2022 EMISSION FACTORS FOR GSE

Fuel	Horsepower Group	CO ₂ (g/hp-hr)	N ₂ O (g/hp-hr)	CH ₄ (g/hp-hr)
Diesel	50 < hp <= 75	595.85	0.000	0.01263
Diesel	75 < hp <= 100	595.99	0.000	0.00508
Diesel	100 < hp <= 175	536.69	0.000	0.00417
Diesel	175 < hp <= 300	536.71	0.000	0.00353
Diesel	600 < hp <= 750	536.62	0.000	0.00602
Gasoline	16 < hp <= 25	1045.90	0.000	0.72560
Gasoline	75 < hp <= 100	699.14	0.000	0.04952
Gasoline	100 < hp <= 175	699.14	0.000	0.04952
LPG	50 < hp <= 75	551.27	0.000	0.02528

Note: hp denotes horsepower, g denotes grams, hr denotes hour, LPG denotes liquefied petroleum gas
Source: MOVES4. Landrum & Brown, 2024.

TABLE 3-12: 2032 EMISSION FACTORS FOR GSE

Fuel	Horsepower Group	CO ₂ (g/hp-hr)	N ₂ O (g/hp-hr)	CH ₄ (g/hp-hr)
Diesel	50 < hp <= 75	595.99	0.000	0.00904
Diesel	75 < hp <= 100	596.13	0.000	0.00074
Diesel	100 < hp <= 175	536.80	0.000	0.00074
Diesel	175 < hp <= 300	536.80	0.000	0.00048
Diesel	600 < hp <= 750	536.77	0.000	0.00132
Gasoline	16 < hp <= 25	1045.89	0.000	0.72595
Gasoline	75 < hp <= 100	699.16	0.000	0.04877
Gasoline	100 < hp <= 175	699.15	0.000	0.04877
LPG	50 < hp <= 75	551.27	0.000	0.02490

Note: hp denotes horsepower, g denotes grams, hr denotes hour, LPG denotes liquefied petroleum gas
Source: MOVES4. Landrum & Brown, 2024.

TABLE 3-13: 2037 EMISSION FACTORS FOR GSE

Fuel	Horsepower Group	CO ₂ (g/hp-hr)	N ₂ O (g/hp-hr)	CH ₄ (g/hp-hr)
Diesel	50 < hp <= 75	596.00	0.000	0.00889
Diesel	75 < hp <= 100	596.14	0.000	0.00054
Diesel	100 < hp <= 175	536.81	0.000	0.00058
Diesel	175 < hp <= 300	536.80	0.000	0.00037
Diesel	600 < hp <= 750	536.79	0.000	0.00066
Gasoline	16 < hp <= 25	1045.90	0.000	0.72594
Gasoline	75 < hp <= 100	699.15	0.000	0.04896
Gasoline	100 < hp <= 175	699.15	0.000	0.04896
LPG	50 < hp <= 75	551.27	0.000	0.02500

Note: hp denotes horsepower, g denotes grams, hr denotes hour, LPG denotes liquefied petroleum gas
Source: MOVES4. Landrum & Brown, 2024.

Attachment 4 Stationary Sources

This attachment contains the following tables:

Existing (2022) Condition

- Table 4-1 Natural Gas Boilers and Heaters – Existing (2022) Condition
- Table 4-2 Diesel Generators – Existing (2022) Condition

Future (2032) No Action Alternative

- Table 4-3 Natural Gas Boilers and Heaters – Future (2032) No Action Alternative
- Table 4-4 Diesel Generators – Future (2032) No Action Alternative

Future (2032) Proposed Action

- Table 4-5 Natural Gas Boilers and Heaters – Future (2032) Proposed Action
- Table 4-6 Diesel Generators – Future (2032) Proposed Action

Diesel Generators – Summary Comparison of Annual Usage (Hours)

- Table 4-7 Diesel Generators – Summary Comparison of Annual Usage (Hours)

Diesel Generator Fuel Rates

- Table 4-8 Diesel Generator Fuel Rate and Consumption



TABLE 4-1: NATURAL GAS BOILERS AND HEATERS – EXISTING (2022) CONDITION

Location	AEDT Equipment Type	Annual Consumption (Therms)
Central Plant Boiler	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	2,980,291
Pumphouse	Natural Gas: Residential Furnace, Uncontrolled	6,890
Fleet Maintenance (AC2 Bldg)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	15,087
Fire Department	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	27,354
Learning Center Building	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	6,882
Bus Maintenance Facility	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	36,771
Distribution Center	Natural Gas: Residential Furnace, Uncontrolled	9,448
Cargo Building 161E	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	8,981
Fire Station 2021	Natural Gas: Residential Furnace, Uncontrolled	1,840
Cargo Building 166B-2380 S 166th St	Natural Gas: Residential Furnace, Uncontrolled	75,214
Airfield Security Gate	Natural Gas: Residential Furnace, Uncontrolled	1,967
Total		3,170,725

Note: BTU denotes British thermal units, hr denotes hour.

Source: Port of Seattle, and Landrum & Brown, 2023.

TABLE 4-2: DIESEL GENERATORS – EXISTING (2022) CONDITION

Location	Name	Horsepower	Annual Usage (Hours)
Building Lights Generators	Building Lights (1 & 2): Gen 1	2400	1.4
Building Lights Generators	Building Lights (1 & 2): Gen 2	2400	11.0
Concourse A	Concourse "A": Fire Pump	240	51.3
Concourse A	Concourse "A": Gen C-4	1341	39.0
Concourse A	Concourse "A": Gen Step	2012	9.0
South Parking Garage	Parking Garage: Gen	235	14.0
Toll Plaza	Toll Plaza: Gen 1	503	4.7
Pumphouse	Pumphouse: New Gen	1135	4.9
Pumphouse	Pumphouse: Pump 1	412	0.6
Pumphouse	Pumphouse: Pump 2	412	4.6
Pumphouse	Pumphouse: Pump 3	412	4.0
Pumphouse	Pumphouse: Pump 4	412	3.8
Pumphouse	Pumphouse: Pump 5	380	13.5
Pumphouse	Pumphouse: Pump 6	380	15.0
Pumphouse	Pumphouse: Pump 7	380	16.6
Pumphouse	Pumphouse: Pump 8	380	14.6
Third Runway Generator	Third Runway: Gen 1	2012	103.1
Third Runway Generator	Third Runway: Gen 2	2012	135.6
Waste Treatment Plant	Wastewater Treatment Plant: Lagoon 3 Gen	380	7.4
AUF Generator 1	Generator 1	4351	3.0
AUF Generator 2	Generator 2	4351	3.4
AUF Generator 3	Generator 3	4351	3.4
AUF Generator 4	Generator 4	4351	3.4
AUF Generator 5	Generator 5	4351	3.3
AUF Generator 6	Generator 6	4351	3.9
AUF Generator 7	Generator 7	4351	4.2
AUF Generator 8	Generator 8	4351	3.3
AUF Generator 9	Generator 9	4351	3.1
AUF Generator 10	Generator 10	4351	1.5
Fire Station 2021	Generator 550kW	738	1.6
North Satellite	NSAT Generator	1910	21.0

Source: Port of Seattle and Landrum & Brown, 2023.



**TABLE 4-3: NATURAL GAS BOILERS AND HEATERS – FUTURE (2032) NO ACTION
ALTERNATIVE**

Location	AEDT Equipment Type	Annual Consumption (Therms)
Central Plant Boiler	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	2,980,291
Pumphouse	Natural Gas: Residential Furnace, Uncontrolled	6,890
Fleet Maintenance (AC2 Bldg)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	15,087
Fire Department	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	27,354
Learning Center Building	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	6,882
Bus Maintenance Facility	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	36,771
Distribution Center	Natural Gas: Residential Furnace, Uncontrolled	9,448
Cargo Building 161E	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	8,981
Fire Station 2021	Natural Gas: Residential Furnace, Uncontrolled	1,840
Cargo Building 166B-2380 S 166th St	Natural Gas: Residential Furnace, Uncontrolled	75,214
Airfield Security Gate	Natural Gas: Residential Furnace, Uncontrolled	1,967
Central Terminal Renovation Project	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	9,172
Concourse A Expansion Project For Lounges	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	43,109
C1 Building Expansion	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	99,060
Total		3,322,066

Note: BTU denotes British thermal units, hr denotes hour.
Source: Port of Seattle, and Landrum & Brown, 2024.

TABLE 4-4: DIESEL GENERATORS – FUTURE (2032) NO ACTION ALTERNATIVE

Location	Name	Horsepower	Annual Usage (Hours)
Building Lights Generators	Building Lights (1 & 2): Gen 1	2400	1.4
Building Lights Generators	Building Lights (1 & 2): Gen 2	2400	11.0
Concourse A	Concourse "A": Fire Pump	240	51.3
Concourse A	Concourse "A": Gen C-4	1341	39.0
Concourse A	Concourse "A": Gen Step	2012	9.0
South Parking Garage	Parking Garage: Gen	235	14.0
Toll Plaza	Toll Plaza: Gen 1	503	4.7
Pumphouse	Pumphouse: New Gen	1135	4.9
Pumphouse	Pumphouse: Pump 1	412	0.6
Pumphouse	Pumphouse: Pump 2	412	4.6
Pumphouse	Pumphouse: Pump 3	412	4.0
Pumphouse	Pumphouse: Pump 4	412	3.8
Pumphouse	Pumphouse: Pump 5	380	13.5
Pumphouse	Pumphouse: Pump 6	380	15.0
Pumphouse	Pumphouse: Pump 7	380	16.6
Pumphouse	Pumphouse: Pump 8	380	14.6
Third Runway Generator	Third Runway: Gen 1	2012	103.1
Third Runway Generator	Third Runway: Gen 2	2012	135.6
Waste Treatment Plant	Wastewater Treatment Plant: Lagoon 3 Gen	380	7.4
AUF Generator 1	Generator 1	4351	3.0
AUF Generator 2	Generator 2	4351	3.4
AUF Generator 3	Generator 3	4351	3.4
AUF Generator 4	Generator 4	4351	3.4
AUF Generator 5	Generator 5	4351	3.3
AUF Generator 6	Generator 6	4351	3.9
AUF Generator 7	Generator 7	4351	4.2
AUF Generator 8	Generator 8	4351	3.3
AUF Generator 9	Generator 9	4351	3.1
AUF Generator 10	Generator 10	4351	1.5
Fire Station 2021	Generator 550kW	738	1.6
North Satellite	NSAT Generator	1910	21.0
Central Terminal Renovation Project	Generator	2012	15.0
Concourse A Expansion Project For Lounges	Generator	2012	15.0
C1 Building Expansion	Generator	2012	15.0

Source: Port of Seattle and Landrum & Brown, 2024.



TABLE 4-5: NATURAL GAS BOILERS - FUTURE (2032) PROPOSED ACTION

Location	AEDT Equipment Type	Annual Consumption (Therms)
Central Plant Boiler	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	2,980,291
Pumphouse	Natural Gas: Residential Furnace, Uncontrolled	6,890
Fleet Maintenance (AC2 Bldg)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	15,087
Fire Department	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	27,354
Learning Center Building	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	6,882
Bus Maintenance Facility	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	36,771
Distribution Center	Natural Gas: Residential Furnace, Uncontrolled	9,448
Cargo Building 161E	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	8,981
Fire Station 2021	Natural Gas: Residential Furnace, Uncontrolled	1,840
Cargo Building 166B-2380 S 166th St	Natural Gas: Residential Furnace, Uncontrolled	75,214
Airfield Security Gate	Natural Gas: Residential Furnace, Uncontrolled	1,967
Central Terminal Renovation Project	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	9,172
Concourse A Expansion Project For Lounges	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	43,109
C1 Building Expansion	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	99,060
North Gates (T1)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	558,587
Second Terminal and Parking (T2)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	527,401
Cargo 4 South Redevelopment (C01)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	14,644
Cargo Warehousing (C02)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	60,404
Cargo Warehousing (C03)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	16,474
Elevated Busway and Stations (L02)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	60,537
Main Terminal North GT Lot (L04)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	14,827
Primary ARFF (S02)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	21,233
Secondary ARFF (S03)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	1,830
Westside Maintenance Campus (S07)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	73,218
Airline Support North (S08)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	2,746
Airline Support West (S09)	Natural Gas: Wall Fired Boiler, <100 Million BTU/hr, Uncontrolled	2,288
Total		4,686,321

Note: BTU denotes British thermal units, hr denotes hour.

Source: Port of Seattle and Landrum & Brown, 2024.

TABLE 4-6: DIESEL GENERATORS - FUTURE (2032) PROPOSED ACTION

Location	Name	Horsepower	Annual Usage (Hours)
Building Lights Generators	Building Lights (1 & 2): Gen 1	2400	1.4
Building Lights Generators	Building Lights (1 & 2): Gen 2	2400	11.0
Concourse A	Concourse "A": Fire Pump	240	51.3
Concourse A	Concourse "A": Gen C-4	1341	39.0
Concourse A	Concourse "A": Gen Step	2012	9.0
South Parking Garage	Parking Garage: Gen	235	14.0
Toll Plaza	Toll Plaza: Gen 1	503	4.7
Pumphouse	Pumphouse: New Gen	1135	4.9
Pumphouse	Pumphouse: Pump 1	412	0.6
Pumphouse	Pumphouse: Pump 2	412	4.6
Pumphouse	Pumphouse: Pump 3	412	4.0
Pumphouse	Pumphouse: Pump 4	412	3.8
Pumphouse	Pumphouse: Pump 5	380	13.5
Pumphouse	Pumphouse: Pump 6	380	15.0
Pumphouse	Pumphouse: Pump 7	380	16.6
Pumphouse	Pumphouse: Pump 8	380	14.6
Third Runway Generator	Third Runway: Gen 1	2012	103.1
Third Runway Generator	Third Runway: Gen 2	2012	135.6
Waste Treatment Plant	Wastewater Treatment Plant: Lagoon 3 Gen	380	7.4
AUF Generator 1	Generator 1	4351	3.0
AUF Generator 2	Generator 2	4351	3.4
AUF Generator 3	Generator 3	4351	3.4
AUF Generator 4	Generator 4	4351	3.4
AUF Generator 5	Generator 5	4351	3.3
AUF Generator 6	Generator 6	4351	3.9
AUF Generator 7	Generator 7	4351	4.2
AUF Generator 8	Generator 8	4351	3.3
AUF Generator 9	Generator 9	4351	3.1
AUF Generator 10	Generator 10	4351	1.5
Fire Station 2021	Generator 550kW	738	1.6
North Satellite	NSAT Generator	1910	21.0
Central Terminal Renovation Project	Generator	2012	15.0
Concourse A Expansion Project For Lounges	Generator	2012	15.0
C1 Building Expansion	Generator	2012	15.0
Employee Parking Structure (L07)	Generator	235	4.7
Westside Maintenance Campus (S07)	Generator	2012	15.0
Primary ARFF (S02)	Generator	738	4.5
North Gates (T1)	Generator	2012	74.5
Second Terminal and Parking (T2)	Generator	2012	74.5
Centralized Receiving and Distribution Center (S10)	Generator	2012	15.0
Cargo Warehousing (C02)	Generator	2012	15.0
Cargo Warehousing (C03)	Generator	2012	15.0

Source: Port of Seattle and Landrum & Brown, 2023.



TABLE 4-7: DIESEL GENERATORS – SUMMARY COMPARISON OF ANNUAL USAGE (HOURS)

Location	Name	HP	Existing (2022) Condition	2032 & 2037 No Action	2032 & 2037 Proposed Action
Building Lights Generators	Building Lights (1 & 2): Gen 1	2400	1.4	1.4	1.4
Building Lights Generators	Building Lights (1 & 2): Gen 2	2400	11.0	11.0	11.0
Concourse A	Concourse "A": Fire Pump	240	51.3	51.3	51.3
Concourse A	Concourse "A": Gen C-4	1341	39.0	39.0	39.0
Concourse A	Concourse "A": Gen Step	2012	9.0	9.0	9.0
South Parking Garage	Parking Garage: Gen	235	14.0	14.0	14.0
Toll Plaza	Toll Plaza: Gen 1	503	4.7	4.7	4.7
Pumphouse	Pumphouse: New Gen	1135	4.9	4.9	4.9
Pumphouse	Pumphouse: Pump 1	412	0.6	0.6	0.6
Pumphouse	Pumphouse: Pump 2	412	4.6	4.6	4.6
Pumphouse	Pumphouse: Pump 3	412	4.0	4.0	4.0
Pumphouse	Pumphouse: Pump 4	412	3.8	3.8	3.8
Pumphouse	Pumphouse: Pump 5	380	13.5	13.5	13.5
Pumphouse	Pumphouse: Pump 6	380	15.0	15.0	15.0
Pumphouse	Pumphouse: Pump 7	380	16.6	16.6	16.6
Pumphouse	Pumphouse: Pump 8	380	14.6	14.6	14.6
Third Runway Generator	Third Runway: Gen 1	2012	103.1	103.1	103.1
Third Runway Generator	Third Runway: Gen 2	2012	135.6	135.6	135.6
Waste Treatment Plant	Wastewater Treatment Plant: Lagoon 3 Gen	380	7.4	7.4	7.4
AUF Generator 1	Generator 1	4351	3.0	3.0	3.0
AUF Generator 2	Generator 2	4351	3.4	3.4	3.4
AUF Generator 3	Generator 3	4351	3.4	3.4	3.4
AUF Generator 4	Generator 4	4351	3.4	3.4	3.4
AUF Generator 5	Generator 5	4351	3.3	3.3	3.3
AUF Generator 6	Generator 6	4351	3.9	3.9	3.9
AUF Generator 7	Generator 7	4351	4.2	4.2	4.2
AUF Generator 8	Generator 8	4351	3.3	3.3	3.3
AUF Generator 9	Generator 9	4351	3.1	3.1	3.1
AUF Generator 10	Generator 10	4351	1.5	1.5	1.5
Fire Station 2021	Generator 550kW	738	1.6	1.6	1.6
North Satellite	NSAT Generator	1910	21.0	21.0	21.0
Central Terminal Renovation	Generator	2012	N/A	15.0	15.0
Concourse A Expansion	Generator	2012	N/A	15.0	15.0
C1 Building Expansion	Generator	2012	N/A	15.0	15.0

TABLE 4-7: DIESEL GENERATORS – SUMMARY COMPARISON OF ANNUAL USAGE (HOURS) (CONTINUED)

Location	Name	HP	Existing (2022) Condition	2032 & 2037 No Action	2032 & 2037 Proposed Action
Interim Fire Station	Generator	2012	N/A	15.0	15.0
Employee Parking Structure (L07)	Generator	235	N/A	N/A	4.7
Westside Maintenance Campus (S07)	Generator	2012	N/A	N/A	15.0
Primary ARFF (S02)	Generator	738	N/A	N/A	4.5
North Gates (T1)	Generator	2012	N/A	N/A	74.5
Second Terminal and Parking (T2)	Step Generator	2012	N/A	N/A	74.5
Centralized Receiving and Distribution Center (S10)	Generator	2012	N/A	N/A	15.0
Cargo Warehousing (C02)	Concourse A	2012	N/A	N/A	15.0
Cargo Warehousing (C03)	Generator	2012	N/A	N/A	15.0
		Total	509.2	554.2	772.4

Note: Totals may not sum due to rounding.
Source: Port of Seattle and Landrum & Brown, 2023.



TABLE 4-8: DIESEL GENERATOR FUEL RATE

Location	Name	Fuel Rate (gallons per hour)
Building Lights Generators	Building Lights (1 & 2): Gen 1	20
Building Lights Generators	Building Lights (1 & 2): Gen 2	20
Concourse A	Concourse "A": Fire Pump	10.3
Concourse A	Concourse "A": Gen C-4	73.1
Concourse A	Concourse "A": Gen Step	103.9
South Parking Garage	Parking Garage: Gen	13
Toll Plaza	Toll Plaza: Gen 1	25
Pumphouse	Pumphouse: New Gen	20
Pumphouse	Pumphouse: Pump 1	20
Pumphouse	Pumphouse: Pump 2	20
Pumphouse	Pumphouse: Pump 3	20
Pumphouse	Pumphouse: Pump 4	20
Pumphouse	Pumphouse: Pump 5	20
Pumphouse	Pumphouse: Pump 6	20
Pumphouse	Pumphouse: Pump 7	20
Pumphouse	Pumphouse: Pump 8	20
Third Runway Generator	Third Runway: Gen 1	50
Third Runway Generator	Third Runway: Gen 2	50
Waste Treatment Plant	Wastewater Treatment Plant: Lagoon 3 Gen	20
AUF Generator 1	Generator 1	205
AUF Generator 2	Generator 2	205
AUF Generator 3	Generator 3	205
AUF Generator 4	Generator 4	205
AUF Generator 5	Generator 5	205
AUF Generator 6	Generator 6	205
AUF Generator 7	Generator 7	205
AUF Generator 8	Generator 8	205
AUF Generator 9	Generator 9	205
AUF Generator 10	Generator 10	205
Fire Station 2021	Generator 550kW	20
North Satellite Modernization Phase 2	NSAT Generator	103.9
Central Terminal Renovation Project	Central Terminal Renovation Project	103.9
Concourse A Expansion Project for Lounges	Concourse A Expansion Project for Lounges	103.9
C1 Building Expansion	C1 Building Expansion	103.9
Employee Parking Structure (L07)	Employee Parking Structure (L07)	13
Westside Maintenance Campus (S07)	Westside Maintenance Campus (S07)	103.9
Primary ARFF (S02)	Primary ARFF (S02)	103.9
North Gates (T1)	North Gates (T1)	103.9
Second Terminal and Parking (T2)	Second Terminal and Parking (T2)	103.9
Centralized Receiving and Distribution Center (S10)	Centralized Receiving and Distribution Center (S10)	103.9
Cargo Warehousing (C02)	Cargo Warehousing (C02)	103.9
Cargo Warehousing (C03)	Cargo Warehousing (C03)	103.9

Source: Port of Seattle and Landrum & Brown, 2024.

Attachment 5 Mobile Sources

This attachment contains the following exhibits and tables:

Existing (2022) Condition

- Exhibit 5-1 Roadway Areas – Existing (2022) Condition
- Exhibit 5-2 Area 1 – Existing (2022) Condition
- Exhibit 5-3 Area 2 – Existing (2022) Condition
- Exhibit 5-4 Area 3 – Existing (2022) Condition
- Exhibit 5-5 Area 4 – Existing (2022) Condition
- Exhibit 5-6 Area 5 – Existing (2022) Condition
- Exhibit 5-7 Area 6 – Existing (2022) Condition
- Exhibit 5-8 Area 7 – Existing (2022) Condition
- Exhibit 5-9 Area 8 – Existing (2022) Condition
- Exhibit 5-10 Area 9 – Existing (2022) Condition
- Exhibit 5-11 Area 10 – Existing (2022) Condition
- Table 5-1 Roadway Segments – Existing (2022) Condition
- Table 5-2 2022 Emission Factors for Motor Vehicles

Future (2032) No Action Alternative

- Table 5-3 Roadway Segments – Future (2032) No Action Alternative
- Table 5-4 2032 Emission Factors for Motor Vehicles

Future (2032) Proposed Action

- Table 5-5 Roadway Segments – Future (2032) Proposed Action
- Exhibit 5-12 Roadway Areas – Proposed Action
- Exhibit 5-13 Area 1 – Proposed Action
- Exhibit 5-14 Area 2 – Proposed Action
- Exhibit 5-15 Area 3 – Proposed Action
- Exhibit 5-16 Area 4 – Proposed Action
- Exhibit 5-17 Area 5 – Proposed Action
- Exhibit 5-18 Area 6 – Proposed Action
- Exhibit 5-19 Area 7 – Proposed Action
- Exhibit 5-20 Area 8 – Proposed Action
- Exhibit 5-21 Area 9 – Proposed Action
- Exhibit 5-22 Area 10 – Proposed Action

Future (2037) No Action Alternative

- Table 5-6 Roadway Segments – Future (2037) No Action Alternative
- Table 5-7 2037 Emission Factors for Motor Vehicles

Future (2037) Proposed Action

- Table 5-8 Roadway Segments – Future (2037) Proposed Action

Legend:

- Segment Node
- Roadway Segment
- ▭ Area Boundary

Scale: 0 to 2,000 feet

North Arrow: Indicated by an arrow pointing towards the top right of the map.

Map Labels: AREA 1, AREA 2, AREA 3, AREA 4, AREA 5, AREA 6, AREA 7, AREA 8, AREA 9, AREA 10. Major roads include I-5, I-90, SR-520, and various local streets like 1st Ave S, 2nd Ave S, etc.

EXHIBIT 5-2: AREA 1 – EXISTING (2022) CONDITION





EXHIBIT 5-3: AREA 2 – EXISTING (2022) CONDITION

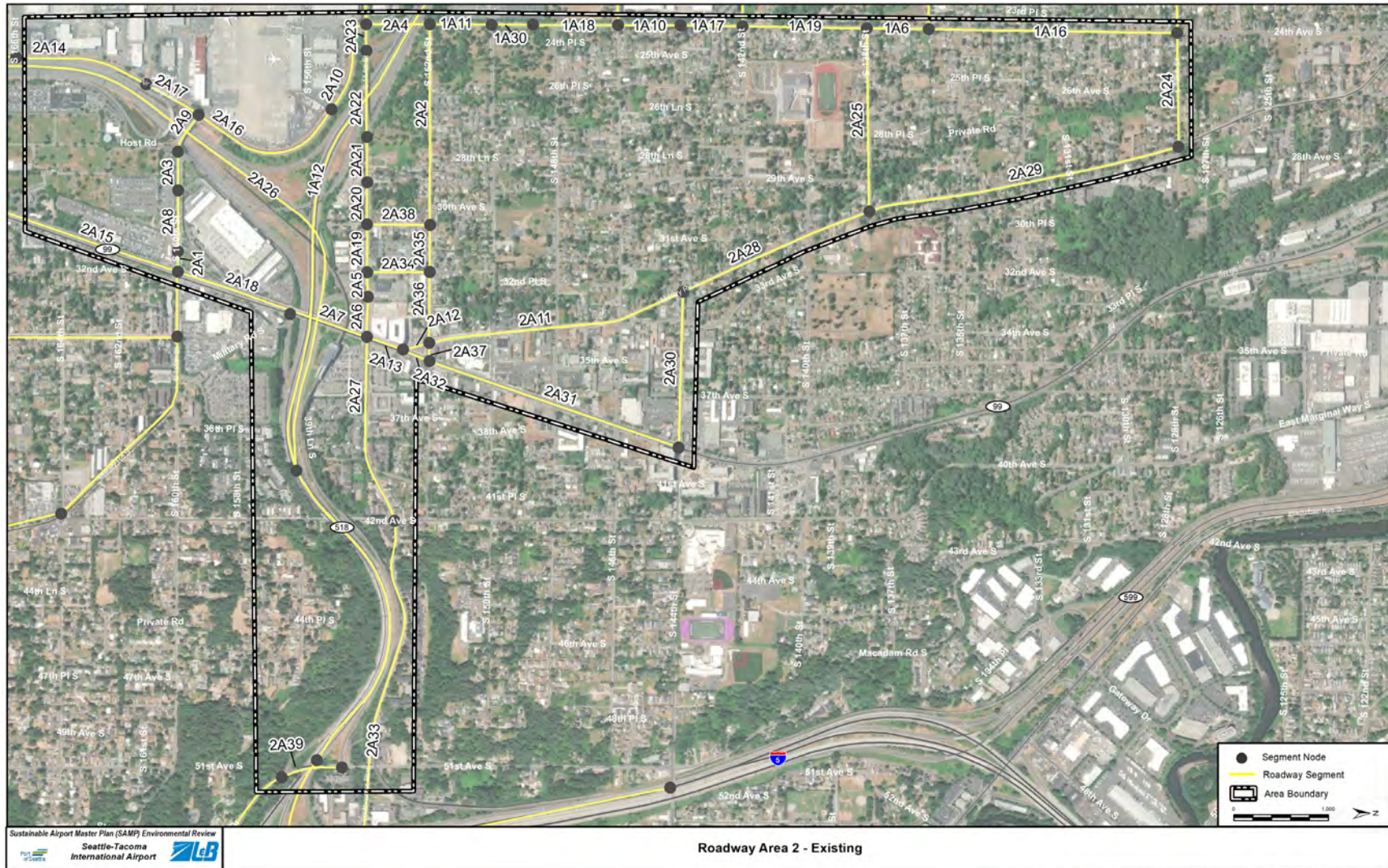


EXHIBIT 5-4: AREA 3 – EXISTING (2022) CONDITION



EXHIBIT 5-5: AREA 4 – EXISTING (2022) CONDITION

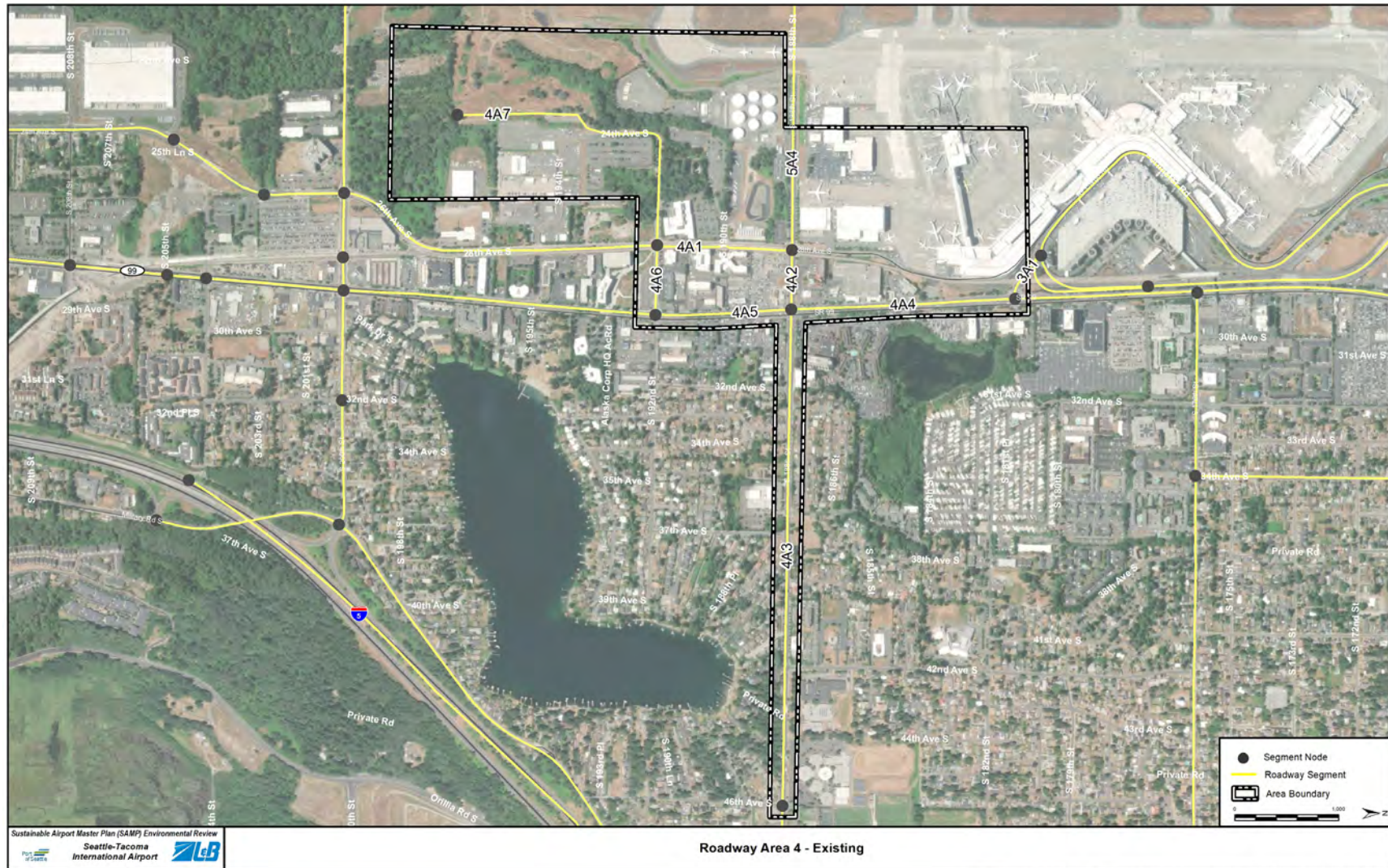


EXHIBIT 5-6: AREA 5 – EXISTING (2022) CONDITION

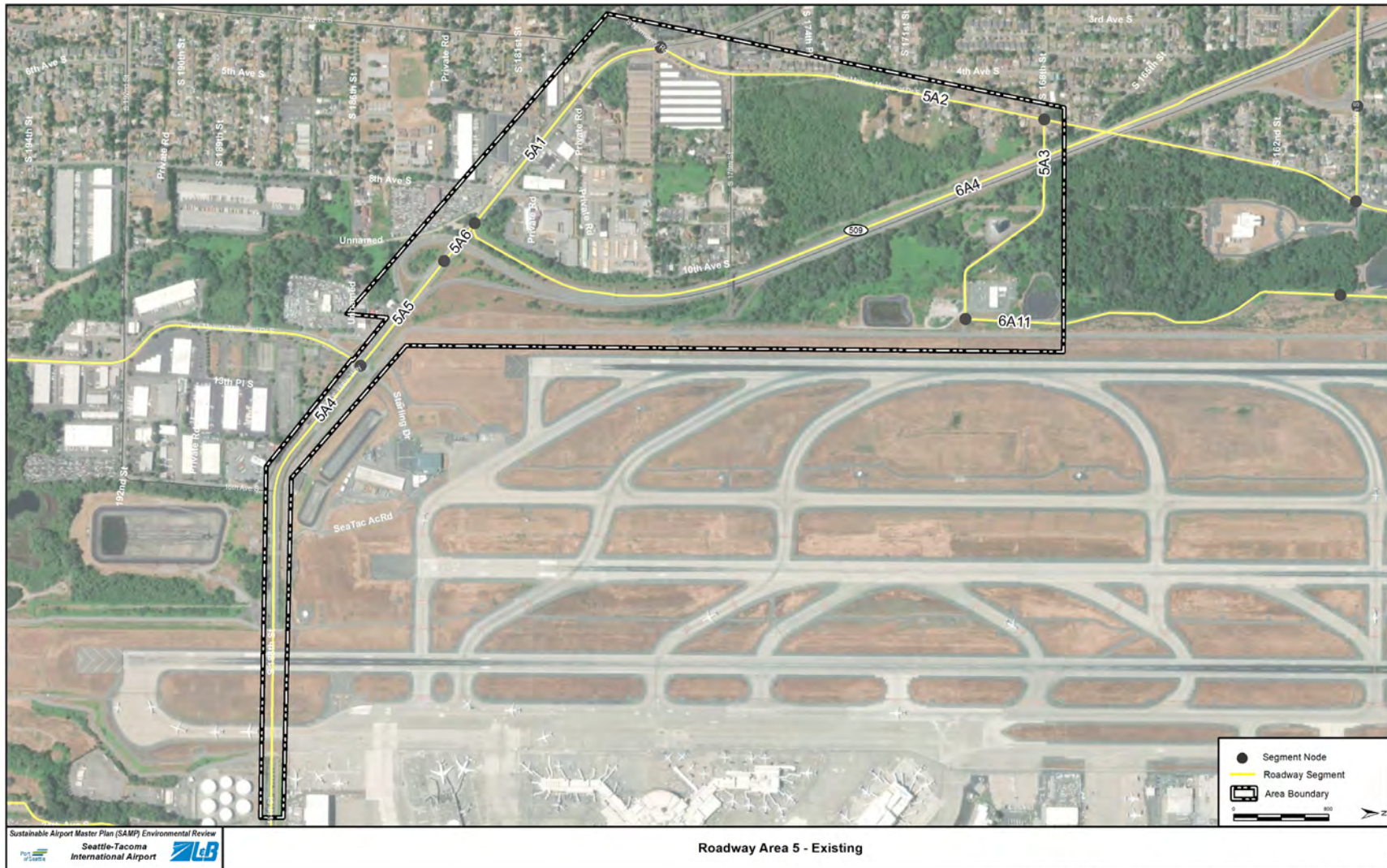




EXHIBIT 5-7: AREA 6 – EXISTING (2022) CONDITION

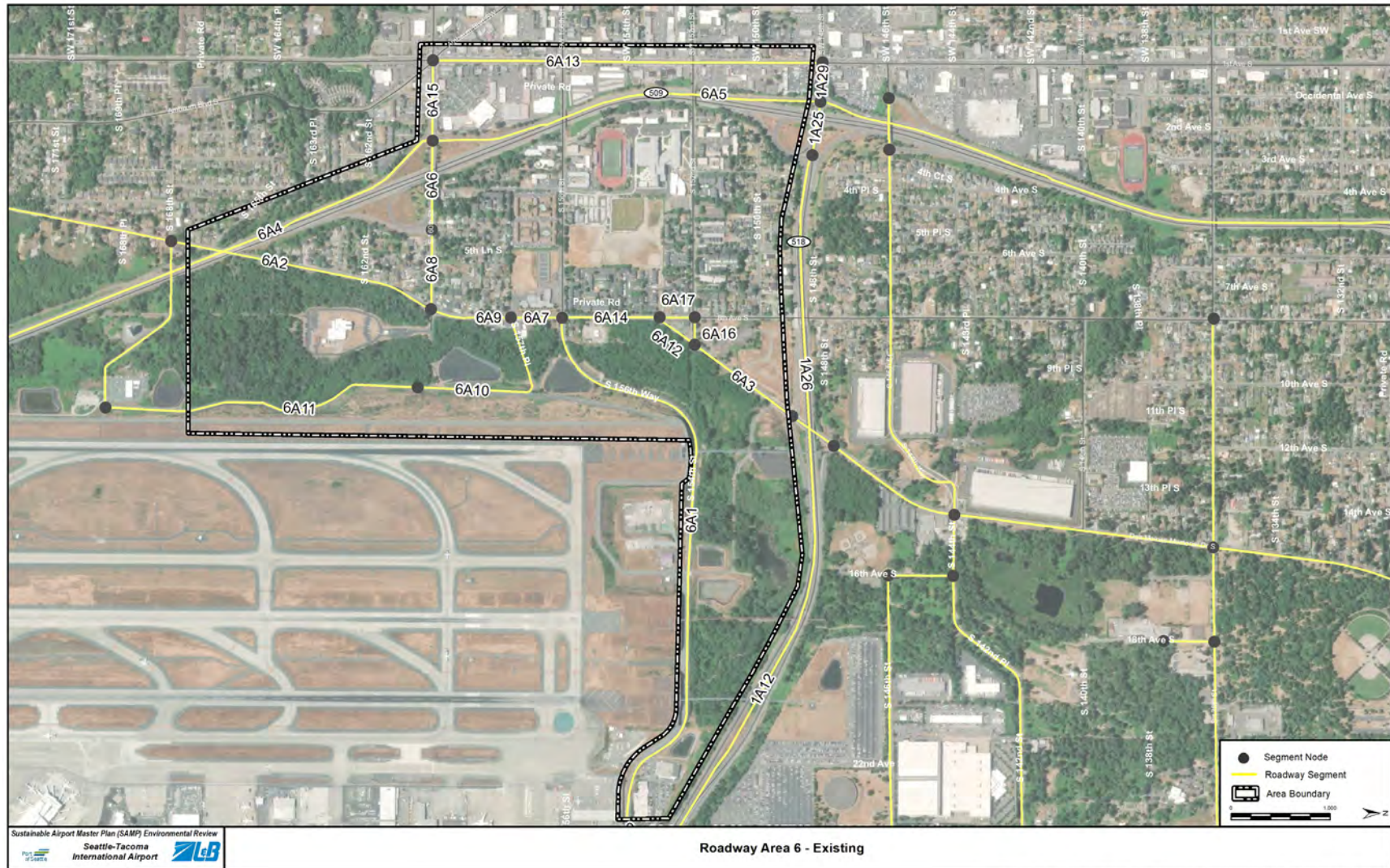


EXHIBIT 5-8: AREA 7 – EXISTING (2022) CONDITION





EXHIBIT 5-9: AREA 8 – EXISTING (2022) CONDITION



EXHIBIT 5-10: AREA 9 – EXISTING (2022) CONDITION

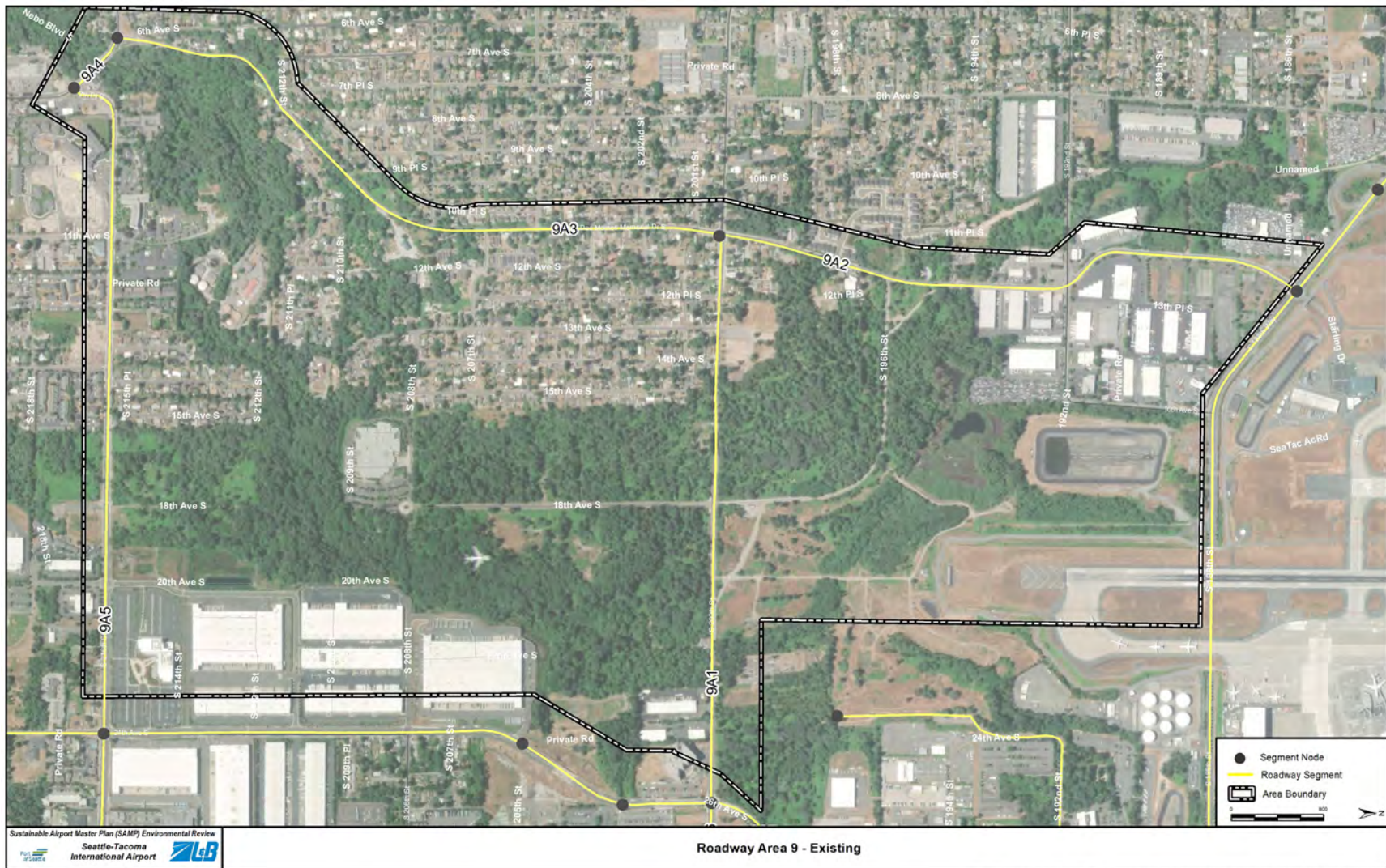




EXHIBIT 5-11: AREA 10 – EXISTING (2022) CONDITION



TABLE 5-1: ROADWAY SEGMENTS – EXISTING (2022) CONDITION

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
Airside Deliveries	2.000	876.662	0%	63%	36%	1%	15	639,963
1A1	0.362	19220	45%	45%	5%	5%	35	2,540,647
1A2	0.500	17560	45%	45%	5%	5%	35	3,206,001
1A3	0.181	8700	45%	45%	5%	5%	35	573,622
1A4	0.097	380	45%	45%	5%	5%	25	13,434
1A5	0.370	7350	45%	45%	5%	5%	35	992,996
1A6	0.124	11100	45%	45%	5%	5%	35	504,177
1A7	0.550	4980	45%	45%	5%	5%	30	999,895
1A8	0.118	7460	45%	45%	5%	5%	30	319,990
1A9	0.492	3340	45%	45%	5%	5%	25	600,314
1A10	0.126	10320	45%	45%	5%	5%	20	472,993
1A11	0.125	13540	45%	45%	5%	5%	20	616,250
1A12	2.486	121644	45%	45%	5%	5%	60	110,387,474
1A13	0.124	3340	45%	45%	5%	5%	25	150,711
1A14	0.096	18440	45%	45%	5%	5%	30	645,209
1A15	0.505	16220	45%	45%	5%	5%	35	2,991,326
1A16	0.499	7310	45%	45%	5%	5%	35	1,331,546
1A17	0.124	11550	45%	45%	5%	5%	20	524,772
1A18	0.170	13600	45%	45%	5%	5%	20	846,089
1A19	0.249	11150	45%	45%	5%	5%	35	1,015,207
1A20	0.061	30920	45%	45%	5%	5%	35	684,348
1A21	0.437	12130	45%	45%	5%	5%	35	1,936,562
1A22	0.097	12640	45%	45%	5%	5%	25	449,148
1A23	0.766	8490	45%	45%	5%	5%	25	2,372,291
1A24	0.676	18850	45%	45%	5%	5%	35	4,652,686
1A25	0.104	67040	45%	45%	5%	5%	10	2,536,029
1A26 (east)	0.522	60822	45%	45%	5%	5%	60	11,584,975
1A26 (west)	0.522	60822	45%	45%	5%	5%	55	11,584,975
1A27	1.286	75234	45%	45%	5%	5%	60	35,308,485
1A28	0.441	11280	45%	45%	5%	5%	35	1,817,126
1A29	0.076	48180	45%	45%	5%	5%	10	1,340,980
1A30	0.083	13100	45%	45%	5%	5%	20	397,687
2A1	0.041	17380	45%	45%	5%	5%	35	262,750
2A2	0.402	2090	45%	45%	5%	5%	25	306,861
2A3	0.081	17540	45%	45%	5%	5%	35	519,217
2A4	0.127	13360	45%	45%	5%	5%	25	620,512
2A5	0.049	23820	45%	45%	5%	5%	35	427,673
2A6	0.081	24080	45%	45%	5%	5%	35	709,455
2A7	0.160	41310	45%	45%	5%	5%	15	2,417,103
2A8	0.118	17800	45%	45%	5%	5%	35	767,653
2A9	0.086	15660	45%	45%	5%	5%	35	492,573
2A10	0.200	6690	45%	45%	5%	5%	30	487,349
2A11	0.525	9300	45%	45%	5%	5%	35	1,782,099
2A12	0.054	17470	45%	45%	5%	5%	35	345,635
2A13	0.077	34210	45%	45%	5%	5%	15	958,051
2A14	0.272	12560	41%	41%	17%	1%	30	1,249,148
2A15	0.654	34980	45%	45%	5%	5%	40	8,347,956
2A16	0.325	8770	45%	45%	5%	5%	30	1,039,768



TABLE 5-1: ROADWAY SEGMENTS – EXISTING (2022) CONDITION *(CONTINUED)*

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
2A17	0.122	12560	45%	45%	5%	5%	30	559,595
2A18	0.241	47050	45%	45%	5%	5%	40	4,138,204
2A19	0.095	22380	45%	45%	5%	5%	35	779,049
2A20	0.086	22120	45%	45%	5%	5%	35	692,240
2A21	0.090	22140	45%	45%	5%	5%	35	724,261
2A22	0.174	16540	45%	45%	5%	5%	25	1,049,248
2A23	0.053	15040	45%	45%	5%	5%	20	290,971
2A24	0.230	6080	45%	45%	5%	5%	35	509,821
2A25	0.367	1380	45%	45%	5%	5%	25	184,687
2A26	1.251	20213	46%	46%	7%	1%	60	9,229,758
2A27	0.384	18390	45%	45%	5%	5%	60	2,575,173
2A28	0.407	12410	45%	45%	5%	5%	35	1,844,256
2A29	0.635	11830	45%	45%	5%	5%	35	2,741,099
2A30	0.312	11700	45%	45%	5%	5%	35	1,332,622
2A31	0.531	26060	45%	45%	5%	5%	35	5,054,633
2A32	0.062	33480	45%	45%	5%	5%	35	760,096
2A33	0.985	37250	45%	45%	5%	5%	35	13,394,618
2A34	0.125	3690	45%	45%	5%	5%	25	168,861
2A35	0.096	2430	45%	45%	5%	5%	25	84,905
2A36	0.141	4320	45%	45%	5%	5%	25	221,739
2A37	0.037	9720	45%	45%	5%	5%	25	131,244
2A38	0.126	1430	45%	45%	5%	5%	25	65,882
3A1	0.093	20213	46%	46%	7%	1%	20	687,960
3A2	0.756	20213	46%	46%	7%	1%	40	5,579,346
3A3	1.151	20213	46%	46%	7%	1%	20	8,493,504
3A4	0.234	20213	46%	46%	7%	1%	30	1,727,772
3A5	0.263	20213	46%	46%	7%	1%	30	1,943,608
3A6	0.187	10740	41%	41%	17%	1%	30	732,157
3A7	0.115	17520	39%	39%	22%	1%	30	738,286
3A8	0.070	17140	39%	39%	21%	1%	35	437,508
3A9	0.046	19460	39%	39%	21%	1%	35	325,746
3A10	0.048	19260	39%	39%	21%	1%	35	335,319
3A11	0.079	21860	39%	39%	21%	1%	15	629,360
3A12	0.332	37100	45%	45%	5%	5%	15	4,495,643
3A13	0.377	38910	45%	45%	5%	5%	15	5,354,310
4A1	0.248	20740	45%	45%	5%	5%	35	1,875,008
4A2	0.108	41860	45%	45%	5%	5%	35	1,657,012
4A3	0.906	41190	45%	45%	5%	5%	35	13,625,872
4A4	0.409	43100	45%	45%	5%	5%	15	6,436,339
4A5	0.248	45750	45%	45%	5%	5%	40	4,139,386
4A6	0.127	5610	45%	45%	5%	5%	35	260,664
4A7	0.581	300	45%	45%	5%	5%	15	63,569
5A1	0.422	30340	45%	45%	5%	5%	40	4,676,393
5A2	0.629	14850	45%	45%	5%	5%	35	3,406,898
5A3	0.380	160	45%	45%	5%	5%	15	22,187
5A4	0.991	44670	45%	45%	5%	5%	40	16,154,157
5A5	0.216	41430	45%	45%	5%	5%	40	3,270,243
5A6	0.075	41430	45%	45%	5%	5%	40	1,134,192
6A1	1.180	14310	45%	45%	5%	5%	35	6,162,951

TABLE 5-1: ROADWAY SEGMENTS – EXISTING (2022) CONDITION (CONTINUED)

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
6A2	0.519	15450	45%	45%	5%	5%	35	2,923,996
6A3	0.231	19900	45%	45%	5%	5%	35	1,677,622
6A4	1.560	35130	45%	45%	5%	5%	60	20,002,791
6A5	0.759	35130	45%	45%	5%	5%	60	9,734,753
6A6	0.176	20640	45%	45%	5%	5%	15	1,328,490
6A7	0.099	20460	45%	45%	5%	5%	35	740,263
6A8	0.152	9260	45%	45%	5%	5%	15	514,113
6A9	0.155	20460	45%	45%	5%	5%	35	1,156,442
6A10	0.364	160	45%	45%	5%	5%	15	21,243
6A11	0.618	160	45%	45%	5%	5%	15	36,069
6A12	0.086	14110	45%	45%	5%	5%	35	442,985
6A13	0.750	32710	45%	45%	5%	5%	35	8,948,488
6A15	0.158	32570	45%	45%	5%	5%	15	1,873,509
6A16	0.053	6390	45%	45%	5%	5%	25	123,038
6A17	0.067	8310	45%	45%	5%	5%	35	202,008
6A18	0.186	21510	45%	45%	5%	5%	35	1,462,316
7A1	0.190	40700	45%	45%	5%	5%	35	2,827,061
7A2	0.066	29440	45%	45%	5%	5%	35	706,620
7A3	0.143	46780	45%	45%	5%	5%	35	2,444,721
7A4	0.934	23160	45%	45%	5%	5%	35	7,894,402
7A5	0.331	13540	45%	45%	5%	5%	30	1,634,550
7A6	0.664	13540	45%	45%	5%	5%	30	3,281,465
7A7	0.411	1710	45%	45%	5%	5%	25	256,648
7A8	0.826	23110	45%	45%	5%	5%	35	6,970,673
7A9	0.339	9050	39%	39%	22%	1%	30	1,121,120
7A10	0.451	12230	45%	45%	5%	5%	35	2,014,540
7A11	0.129	16120	45%	45%	5%	5%	35	760,516
7A12	0.584	2830	45%	45%	5%	5%	30	603,001
7A13 (north)	4.248	136339	45%	45%	5%	5%	60	211,375,645
7A13 (south)	4.248	111634	45%	45%	5%	5%	30	173,073,799
8A1	1.011	13810	45%	45%	5%	5%	35	5,094,540
8A2	0.342	19520	45%	45%	5%	5%	35	2,435,919
8A3	0.201	27860	45%	45%	5%	5%	25	2,039,963
8A4	0.570	43560	45%	45%	5%	5%	40	9,069,892
8A5	0.060	22540	45%	45%	5%	5%	35	495,239
8A6	0.118	21590	45%	45%	5%	5%	35	931,481
8A7	0.606	19480	45%	45%	5%	5%	35	4,308,340
8A8	0.149	21090	45%	45%	5%	5%	35	1,144,563
8A9	0.192	21090	45%	45%	5%	5%	35	1,481,343
8A10	0.251	41230	45%	45%	5%	5%	40	3,772,621
8A11	0.071	41620	45%	45%	5%	5%	40	1,076,288
8A12	0.178	41620	45%	45%	5%	5%	40	2,698,415
8A13	0.505	41910	45%	45%	5%	5%	40	7,725,290
8A14	0.252	47930	45%	45%	5%	5%	40	4,415,529
8A15	0.257	50410	45%	45%	5%	5%	40	4,723,632
8A16	0.518	51280	45%	45%	5%	5%	40	9,701,031
8A17	0.162	54240	45%	45%	5%	5%	10	3,209,132
8A18	0.236	54320	45%	45%	5%	5%	10	4,670,242



TABLE 5-1: ROADWAY SEGMENTS – EXISTING (2022) CONDITION *(CONTINUED)*

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
8A19	0.229	28020	45%	45%	5%	5%	25	2,342,011
8A20	0.383	22180	45%	45%	5%	5%	35	3,098,516
8A21	0.311	23450	45%	45%	5%	5%	35	2,660,335
8A22	0.886	17270	45%	45%	5%	5%	30	5,587,196
8A23	0.200	25550	45%	45%	5%	5%	35	1,861,849
8A24	0.689	21090	45%	45%	5%	5%	35	5,300,339
9A1	0.936	16790	45%	45%	5%	5%	35	5,739,077
9A2	0.991	21220	45%	45%	5%	5%	35	7,677,149
9A3	1.115	20840	45%	45%	5%	5%	35	8,481,511
9A4	0.109	32090	45%	45%	5%	5%	35	1,276,572
9A5	1.105	13770	45%	45%	5%	5%	35	5,556,288
10A1	0.355	33750	45%	45%	5%	5%	30	4,371,296
10A2	0.208	39820	45%	45%	5%	5%	30	3,024,559
10A3	0.063	21580	45%	45%	5%	5%	35	496,744
10A4	0.111	24680	45%	45%	5%	5%	35	1,001,171
10A5 (east)	0.758	83203	45%	45%	5%	5%	35	23,033,197
10A5 (west)	0.758	83203	45%	45%	5%	5%	35	23,033,197

Note: AADT: average annual daily traffic; PC: passenger car, PT passenger truck, SHT: single unit short-haul truck, LHT: single unit long-haul truck; mph denotes miles per hour; VMTs denotes vehicle-miles-traveled; the Airside Deliveries segment is not shown on the maps.

Source: Port of Seattle and WSDOT, 2023. Landrum & Brown, 2024

TABLE 5-2: 2022 EMISSION FACTORS FOR MOTOR VEHICLES

Vehicle Type	Speed (mph)	CO (g/VMT)	NO _x (g/VMT)	SO _x (g/VMT)	VOC (g/VMT)	PM _{2.5} (g/VMT)	PM ₁₀ (g/VMT)	CO ₂ (g/VMT)	CH ₄ (g/VMT)	N ₂ O (g/VMT)
PC	5	7.79	0.24	0.00	0.12	0.01	0.01	949.05	0.03	0.01
PT	5	7.19	0.35	0.01	0.15	0.01	0.01	1,164.79	0.04	0.02
SHT	5	4.60	7.35	0.01	0.61	0.17	0.19	2,143.45	0.08	0.24
LHT	5	4.56	7.36	0.01	0.59	0.17	0.18	2,090.10	0.07	0.25
PC	10	5.74	0.22	0.00	0.08	0.00	0.00	580.32	0.02	0.01
PT	10	5.43	0.31	0.00	0.11	0.00	0.01	719.04	0.03	0.01
SHT	10	2.65	4.41	0.00	0.33	0.11	0.12	1,407.72	0.04	0.16
LHT	10	2.64	4.41	0.00	0.32	0.10	0.11	1,369.27	0.04	0.16
PC	15	5.06	0.21	0.00	0.07	0.00	0.00	457.41	0.02	0.00
PT	15	4.84	0.30	0.00	0.09	0.00	0.01	570.45	0.02	0.01
SHT	15	2.01	3.44	0.00	0.23	0.08	0.09	1,194.91	0.03	0.14
LHT	15	1.99	3.43	0.00	0.23	0.08	0.09	1,156.49	0.03	0.14
PC	20	4.51	0.20	0.00	0.06	0.00	0.00	393.47	0.02	0.00
PT	20	4.37	0.29	0.00	0.09	0.00	0.00	493.85	0.02	0.00
SHT	20	1.61	2.82	0.00	0.18	0.07	0.07	1,065.09	0.02	0.12
LHT	20	1.60	2.81	0.00	0.18	0.07	0.07	1,030.37	0.02	0.12
PC	25	1.32	2.39	0.00	0.14	0.06	0.06	350.09	0.02	0.00
PT	25	3.76	0.19	0.00	0.06	0.00	0.00	443.25	0.02	0.00
SHT	25	1.33	2.40	0.00	0.15	0.06	0.06	964.94	0.02	0.11
LHT	25	1.32	2.39	0.00	0.14	0.06	0.06	929.81	0.02	0.11
PC	30	3.56	0.17	0.00	0.05	0.00	0.00	313.08	0.01	0.00
PT	30	3.50	0.25	0.00	0.07	0.00	0.00	395.59	0.02	0.00
SHT	30	1.19	2.18	0.00	0.13	0.06	0.06	948.32	0.02	0.11
LHT	30	1.17	2.15	0.00	0.13	0.05	0.06	910.15	0.02	0.11
PC	35	3.15	0.17	0.00	0.04	0.00	0.00	295.22	0.01	0.00
PT	35	3.17	0.25	0.00	0.06	0.00	0.00	375.91	0.01	0.00
SHT	35	1.04	1.80	0.00	0.12	0.05	0.05	835.07	0.01	0.10
LHT	35	1.02	1.77	0.00	0.11	0.04	0.05	798.09	0.01	0.09
PC	40	2.78	0.16	0.00	0.04	0.00	0.00	283.89	0.01	0.00
PT	40	2.88	0.24	0.00	0.05	0.00	0.00	364.61	0.01	0.00
SHT	40	0.96	1.60	0.00	0.10	0.04	0.05	817.37	0.01	0.09
LHT	40	0.94	1.56	0.00	0.10	0.04	0.04	777.40	0.01	0.09
PC	55	2.39	0.16	0.00	0.03	0.00	0.00	266.46	0.01	0.00
PT	55	2.58	0.25	0.00	0.04	0.00	0.00	346.97	0.01	0.00
SHT	55	0.80	1.23	0.00	0.08	0.03	0.04	796.82	0.01	0.09
LHT	55	0.78	1.17	0.00	0.08	0.03	0.04	751.69	0.01	0.09
PC	60	2.41	0.17	0.00	0.03	0.00	0.00	265.28	0.01	0.00
PT	60	2.65	0.26	0.00	0.04	0.00	0.00	348.51	0.01	0.00
SHT	60	0.76	1.13	0.00	0.08	0.03	0.04	774.79	0.01	0.09
LHT	60	0.74	1.06	0.00	0.08	0.03	0.03	729.87	0.01	0.09

Note: mph denotes miles per hour; g/VMT denotes grams per vehicle-miles-traveled; PC denotes passenger car; PT denotes passenger truck; SHT denotes short-haul truck; LHT denotes long-haul truck; CO denotes carbon monoxide, NO_x denotes nitrogen oxides, SO_x denotes sulfur oxides, VOC denotes volatile organic compounds, PM_{2.5} denotes fine particulate matter, PM₁₀ denotes coarse particulate matter, CO₂ denotes carbon dioxide, CH₄ denotes methane, N₂O denotes nitrous oxide.

Source: MOVES4; Landrum & Brown, 2024.



TABLE 5-3: ROADWAY SEGMENTS – FUTURE (2032) NO ACTION ALTERNATIVE

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
Airside Deliveries	2.000	1,020	0%	63%	36%	1%	15	744,482
1A1	0.362	22,000	45%	45%	5%	5%	35	2,908,129
1A2	0.500	22,250	45%	45%	5%	5%	35	4,062,274
1A3	0.181	11,100	45%	45%	5%	5%	35	731,863
1A4	0.097	550	45%	45%	5%	5%	25	19,443
1A5	0.370	9,500	45%	45%	5%	5%	35	1,283,464
1A6	0.124	15,000	45%	45%	5%	5%	35	681,320
1A7	0.550	6,750	45%	45%	5%	5%	30	1,355,279
1A8	0.118	10,200	45%	45%	5%	5%	30	437,520
1A9	0.492	4,150	45%	45%	5%	5%	25	745,899
1A10	0.126	14,500	45%	45%	5%	5%	20	664,574
1A11	0.125	17,400	45%	45%	5%	5%	20	791,932
1A12	2.486	151,187	45%	45%	5%	5%	60	137,196,396
1A13	0.124	4,150	45%	45%	5%	5%	25	187,261
1A14	0.096	20,700	45%	45%	5%	5%	30	724,285
1A15	0.505	20,450	45%	45%	5%	5%	35	3,771,432
1A16	0.499	10,500	45%	45%	5%	5%	35	1,912,617
1A17	0.124	15,800	45%	45%	5%	5%	20	717,870
1A18	0.170	16,750	45%	45%	5%	5%	20	1,042,058
1A19	0.249	14,800	45%	45%	5%	5%	35	1,347,540
1A20	0.061	33,500	45%	45%	5%	5%	35	741,451
1A21	0.437	12,500	45%	45%	5%	5%	35	1,995,633
1A22	0.097	14,200	45%	45%	5%	5%	25	504,581
1A23	0.766	9,800	45%	45%	5%	5%	25	2,738,333
1A24	0.676	22,250	45%	45%	5%	5%	35	5,491,898
1A25	0.104	78,600	45%	45%	5%	5%	10	2,973,328
1A26 (east)	0.522	75,593	45%	45%	5%	5%	60	14,398,525
1A26 (west)	0.522	75,593	45%	45%	5%	5%	55	14,398,525
1A27	1.286	93,505	45%	45%	5%	5%	60	43,883,575
1A28	0.441	14,700	45%	45%	5%	5%	35	2,368,063
1A29	0.076	58,300	45%	45%	5%	5%	10	1,622,647
1A30	0.083	16,700	45%	45%	5%	5%	20	506,975
2A1	0.041	22,400	45%	45%	5%	5%	35	338,642
2A2	0.402	3,200	45%	45%	5%	5%	25	469,835
2A3	0.081	23,400	45%	45%	5%	5%	35	692,684
2A4	0.127	17,000	45%	45%	5%	5%	25	789,574
2A5	0.049	34,200	45%	45%	5%	5%	35	614,039
2A6	0.081	34,700	45%	45%	5%	5%	35	1,022,346
2A7	0.160	61,250	45%	45%	5%	5%	15	3,583,819
2A8	0.118	22,800	45%	45%	5%	5%	35	983,286
2A9	0.086	20,300	45%	45%	5%	5%	35	638,521
2A10	0.200	7,150	45%	45%	5%	5%	30	520,859
2A11	0.525	14,800	45%	45%	5%	5%	35	2,836,028
2A12	0.054	26,450	45%	45%	5%	5%	35	523,299
2A13	0.077	51,750	45%	45%	5%	5%	15	1,449,258
2A14	0.272	16,800	41%	41%	17%	1%	30	1,670,835

TABLE 5-3: ROADWAY SEGMENTS – FUTURE (2032) NO ACTION ALTERNATIVE (CONTINUED)

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
2A15	0.654	43,350	45%	45%	5%	5%	40	10,345,452
2A16	0.325	10,050	45%	45%	5%	5%	30	1,191,525
2A17	0.122	16,800	45%	45%	5%	5%	30	748,503
2A18	0.241	61,250	45%	45%	5%	5%	40	5,387,141
2A19	0.095	32,400	45%	45%	5%	5%	35	1,127,846
2A20	0.086	32,500	45%	45%	5%	5%	35	1,017,079
2A21	0.090	32,800	45%	45%	5%	5%	35	1,072,979
2A22	0.174	23,900	45%	45%	5%	5%	25	1,516,144
2A23	0.053	22,500	45%	45%	5%	5%	20	435,295
2A24	0.230	7,900	45%	45%	5%	5%	35	662,432
2A25	0.367	1,700	45%	45%	5%	5%	25	227,513
2A26	1.251	25,122	46%	46%	7%	1%	60	11,471,316
2A27	0.384	24,250	45%	45%	5%	5%	60	3,395,756
2A28	0.407	18,350	45%	45%	5%	5%	35	2,727,002
2A29	0.635	18,850	45%	45%	5%	5%	35	4,367,686
2A30	0.312	19,000	45%	45%	5%	5%	35	2,164,088
2A31	0.531	38,600	45%	45%	5%	5%	35	7,486,909
2A32	0.062	50,600	45%	45%	5%	5%	35	1,148,772
2A33	0.985	39,650	45%	45%	5%	5%	35	14,257,627
2A34	0.125	4,800	45%	45%	5%	5%	25	219,657
2A35	0.096	4,200	45%	45%	5%	5%	25	146,749
2A36	0.141	5,950	45%	45%	5%	5%	25	305,405
2A37	0.037	16,700	45%	45%	5%	5%	25	225,491
2A38	0.126	1,750	45%	45%	5%	5%	25	80,625
2A39	0.126	23,100	45%	45%	5%	5%	20	1,058,617
2A40	0.000	-	45%	45%	5%	5%	30	-
2A41	0.000	-	45%	45%	5%	5%	30	-
3A1	0.093	25,122	46%	46%	7%	1%	20	855,039
3A2	0.756	25,122	46%	46%	7%	1%	40	6,934,357
3A3	1.151	25,122	46%	46%	7%	1%	20	10,556,253
3A4	0.234	25,122	46%	46%	7%	1%	30	2,147,382
3A5	0.263	25,122	46%	46%	7%	1%	30	2,415,636
3A6	0.187	15,150	41%	41%	17%	1%	30	1,032,791
3A7	0.115	22,100	39%	39%	22%	1%	30	931,285
3A8	0.070	21,600	39%	39%	21%	1%	35	551,352
3A9	0.046	23,800	39%	39%	21%	1%	35	398,395
3A10	0.048	23,800	39%	39%	21%	1%	35	414,361
3A11	0.079	26,600	39%	39%	21%	1%	15	765,827
3A12	0.332	41,450	45%	45%	5%	5%	15	5,022,760
3A13	0.377	45,050	45%	45%	5%	5%	15	6,199,220
3A14	0.768	-	45%	45%	5%	5%	35	-
3A15	1.012	-	45%	45%	5%	5%	35	-
4A1	0.248	19,400	45%	45%	5%	5%	35	1,753,865
4A2	0.108	44,850	45%	45%	5%	5%	35	1,775,370
4A3	0.906	44,350	45%	45%	5%	5%	35	14,671,217
4A4	0.409	52,000	45%	45%	5%	5%	15	7,765,420
4A5	0.248	45,400	45%	45%	5%	5%	40	4,107,719
4A6	0.127	6,450	45%	45%	5%	5%	35	299,694
4A7	0.581	600	45%	45%	5%	5%	15	127,138



TABLE 5-3: ROADWAY SEGMENTS – FUTURE (2032) NO ACTION ALTERNATIVE *(CONTINUED)*

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
5A1	0.422	35,300	45%	45%	5%	5%	40	5,440,892
5A2	0.629	18,450	45%	45%	5%	5%	35	4,232,813
5A3	0.380	450	45%	45%	5%	5%	15	62,401
5A4	0.991	39,750	45%	45%	5%	5%	40	14,374,921
5A5	0.216	52,700	45%	45%	5%	5%	40	4,159,831
5A6	0.075	47,400	45%	45%	5%	5%	40	1,297,627
5A7	0.309	-	45%	45%	5%	5%	15	-
5A8	0.142	-	45%	45%	5%	5%	60	-
5A9	0.567	-	45%	45%	5%	5%	60	-
5A10	0.268	-	45%	45%	5%	5%	15	-
6A1	1.180	20,850	45%	45%	5%	5%	35	8,979,562
6A2	0.519	19,300	45%	45%	5%	5%	35	3,652,630
6A3	0.231	20,900	45%	45%	5%	5%	35	1,761,924
6A4	1.560	43,662	45%	45%	5%	5%	60	24,860,709
6A5	0.759	43,662	45%	45%	5%	5%	60	12,098,954
6A6	0.176	27,400	45%	45%	5%	5%	15	1,763,596
6A7	0.099	24,500	45%	45%	5%	5%	35	886,434
6A8	0.152	12,300	45%	45%	5%	5%	15	682,893
6A9	0.155	24,500	45%	45%	5%	5%	35	1,384,791
6A10	0.364	450	45%	45%	5%	5%	15	59,747
6A11	0.618	450	45%	45%	5%	5%	15	101,444
6A12	0.086	16,300	45%	45%	5%	5%	35	511,740
6A13	0.750	40,250	45%	45%	5%	5%	35	11,011,209
6A14	0.186	27,000	45%	45%	5%	5%	35	1,835,543
6A15	0.158	38,950	45%	45%	5%	5%	15	2,240,503
6A16	0.053	6,200	45%	45%	5%	5%	25	119,380
6A17	0.067	12,600	45%	45%	5%	5%	35	306,293
6A18	0.160	-	45%	45%	5%	5%	15	-
6A19	0.849	-	45%	45%	5%	5%	60	-
7A1	0.190	41,750	45%	45%	5%	5%	35	2,899,995
7A2	0.066	28,850	45%	45%	5%	5%	35	692,459
7A3	0.143	56,200	45%	45%	5%	5%	35	2,937,010
7A4	0.934	23,900	45%	45%	5%	5%	35	8,146,641
7A5	0.331	16,300	45%	45%	5%	5%	30	1,967,738
7A6	0.664	16,300	45%	45%	5%	5%	30	3,950,361
7A7	0.411	8,500	45%	45%	5%	5%	25	1,275,736
7A8	0.826	23,550	45%	45%	5%	5%	35	7,103,390
7A9	0.339	14,050	39%	39%	22%	1%	30	1,740,523
7A10	0.451	15,800	45%	45%	5%	5%	35	2,602,595
7A11	0.129	25,150	45%	45%	5%	5%	35	1,186,538
7A12	0.584	12,400	45%	45%	5%	5%	30	2,642,125
7A13 (north)	4.248	169,451	45%	45%	5%	5%	60	262,710,756
7A13 (south)	4.248	138,746	45%	45%	5%	5%	30	215,106,848
8A1	1.011	14,550	45%	45%	5%	5%	35	5,367,527
8A2	0.342	23,750	45%	45%	5%	5%	35	2,963,785
8A3	0.201	29,500	45%	45%	5%	5%	25	2,160,047
8A4	0.570	43,250	45%	45%	5%	5%	40	9,005,345

TABLE 5-3: ROADWAY SEGMENTS – FUTURE (2032) NO ACTION ALTERNATIVE (CONTINUED)

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
8A5	0.060	28,950	45%	45%	5%	5%	35	636,076
8A6	0.118	24,650	45%	45%	5%	5%	35	1,063,502
8A7	0.606	21,350	45%	45%	5%	5%	35	4,721,923
8A8	0.149	23,100	45%	45%	5%	5%	35	1,253,646
8A9	0.192	20,500	45%	45%	5%	5%	35	1,439,902
8A10	0.251	42,850	45%	45%	5%	5%	40	3,920,854
8A11	0.071	40,950	45%	45%	5%	5%	40	1,058,962
8A12	0.178	40,800	45%	45%	5%	5%	40	2,645,251
8A13	0.505	38,400	45%	45%	5%	5%	40	7,078,290
8A14	0.252	46,250	45%	45%	5%	5%	40	4,260,760
8A15	0.257	48,150	45%	45%	5%	5%	40	4,511,860
8A16	0.518	49,850	45%	45%	5%	5%	40	9,430,507
8A17	0.162	64,600	45%	45%	5%	5%	10	3,822,085
8A18	0.236	69,100	45%	45%	5%	5%	10	5,940,975
8A19	0.229	30,700	45%	45%	5%	5%	25	2,566,015
8A20	0.383	23,300	45%	45%	5%	5%	35	3,254,978
8A21	0.311	25,400	45%	45%	5%	5%	35	2,881,557
8A22	0.886	16,050	45%	45%	5%	5%	30	5,192,501
8A23	0.200	26,250	45%	45%	5%	5%	35	1,912,858
8A24	0.689	20,200	45%	45%	5%	5%	35	5,076,664
8A25	0.135	36,500	45%	45%	5%	5%	35	1,801,482
8A26	0.198	16,000	45%	45%	5%	5%	35	1,157,465
9A1	0.936	19,000	45%	45%	5%	5%	35	6,494,489
9A2	0.991	22,100	45%	45%	5%	5%	35	7,995,523
9A3	1.115	22,150	45%	45%	5%	5%	35	9,014,658
9A4	0.109	32,850	45%	45%	5%	5%	35	1,306,805
9A5	1.105	16,450	45%	45%	5%	5%	35	6,637,686
10A1	0.355	33,950	45%	45%	5%	5%	30	4,397,200
10A2	0.208	42,900	45%	45%	5%	5%	30	3,258,503
10A3	0.063	22,200	45%	45%	5%	5%	35	511,016
10A4	0.111	18,150	45%	45%	5%	5%	35	736,275
10A5 (east)	0.758	103,410	45%	45%	5%	5%	35	28,627,085
10A5 (west)	0.758	103,410	45%	45%	5%	5%	35	28,627,085

Note: AADT denotes average annual daily traffic; PC denotes passenger car; PT denotes passenger truck; SHT denotes single unit short-haul truck; LHT denotes single unit long-haul truck; mph denotes miles per hour; VMTs denotes vehicle-miles-traveled; the Airside Deliveries segment is not shown on the maps.

Source: Port of Seattle and WSDOT, 2023. Landrum & Brown, 2024



TABLE 5-4: 2032 EMISSION FACTORS FOR MOTOR VEHICLES

Vehicle Type	Speed (mph)	CO (g/VMT)	NO _x (g/VMT)	SO _x (g/VMT)	VOC (g/VMT)	PM _{2.5} (g/VMT)	PM ₁₀ (g/VMT)	CO ₂ (g/VMT)	CH ₄ (g/VMT)	N ₂ O (g/VMT)
PC	5	4.46	0.03	0.004	0.026	0.00	0.00	826.61	0.01	0.01
PT	5	3.68	0.04	0.005	0.030	0.00	0.00	1,010.87	0.01	0.01
SHT	5	3.19	3.26	0.006	0.149	0.03	0.03	1,732.23	0.05	0.26
LHT	5	3.44	3.50	0.006	0.251	0.05	0.06	1,721.13	0.05	0.25
PC	10	3.28	0.03	0.00	0.02	0.00	0.00	504.77	0.01	0.00
PT	10	2.73	0.03	0.00	0.02	0.00	0.00	623.05	0.01	0.00
SHT	10	1.87	1.88	0.00	0.08	0.02	0.02	1135.12	0.03	0.17
LHT	10	2.00	2.03	0.00	0.13	0.03	0.04	1124.16	0.03	0.16
PC	15	2.89	0.03	0.00	0.02	0.00	0.00	397.49	0.01	0.00
PT	15	2.41	0.03	0.00	0.02	0.00	0.00	493.78	0.01	0.00
SHT	15	1.42	1.41	0.00	0.06	0.01	0.01	962.49	0.02	0.14
LHT	15	1.51	1.53	0.00	0.10	0.03	0.03	950.17	0.02	0.14
PC	20	2.57	0.02	0.00	0.01	0.00	0.00	341.75	0.01	0.00
PT	20	2.16	0.03	0.00	0.02	0.00	0.00	427.18	0.01	0.00
SHT	20	1.14	1.12	0.00	0.04	0.01	0.01	861.29	0.02	0.13
LHT	20	1.22	1.23	0.00	0.07	0.02	0.02	849.40	0.02	0.12
PC	25	2.12	0.02	0.00	0.01	0.00	0.00	304.09	0.01	0.00
PT	25	1.82	0.03	0.00	0.02	0.00	0.00	383.29	0.01	0.00
SHT	25	0.94	0.92	0.00	0.04	0.01	0.01	778.26	0.01	0.12
LHT	25	1.01	1.02	0.00	0.06	0.02	0.02	765.81	0.01	0.11
PC	30	2.02	0.02	0.00	0.01	0.00	0.00	271.99	0.01	0.00
PT	30	1.72	0.03	0.00	0.01	0.00	0.00	342.16	0.01	0.00
SHT	30	0.85	0.81	0.00	0.03	0.01	0.01	769.76	0.01	0.11
LHT	30	0.90	0.90	0.00	0.05	0.02	0.02	752.63	0.01	0.11
PC	35	1.79	0.02	0.00	0.01	0.00	0.00	256.63	0.01	0.00
PT	35	1.56	0.03	0.00	0.01	0.00	0.00	325.41	0.01	0.00
SHT	35	0.74	0.65	0.00	0.03	0.01	0.01	681.43	0.01	0.10
LHT	35	0.79	0.73	0.00	0.05	0.01	0.02	662.08	0.01	0.10
PC	40	1.59	0.02	0.00	0.01	0.00	0.00	246.92	0.00	0.00
PT	40	1.42	0.03	0.00	0.01	0.00	0.00	315.87	0.00	0.00
SHT	40	0.69	0.55	0.00	0.02	0.01	0.01	672.26	0.01	0.10
LHT	40	0.73	0.63	0.00	0.04	0.01	0.01	648.12	0.01	0.09
PC	55	1.39	0.02	0.00	0.01	0.00	0.00	231.92	0.00	0.00
PT	55	1.28	0.03	0.00	0.01	0.00	0.00	301.04	0.00	0.00
SHT	55	0.60	0.37	0.00	0.01	0.01	0.01	668.01	0.00	0.10
LHT	55	0.62	0.44	0.00	0.03	0.01	0.01	635.37	0.00	0.09
PC	60	1.41	0.02	0.00	0.01	0.00	0.00	230.92	0.00	0.00
PT	60	1.33	0.03	0.00	0.01	0.00	0.00	302.48	0.00	0.00
SHT	60	0.57	0.32	0.00	0.01	0.01	0.01	652.96	0.00	0.10
LHT	60	0.59	0.40	0.00	0.03	0.01	0.01	619.19	0.00	0.09

Note: mph denotes miles per hour; g/VMT denotes grams per vehicle-miles-traveled; PC denotes passenger car; PT denotes passenger truck; SHT denotes short-haul truck; LHT denotes long-haul truck, CO denotes carbon monoxide, NO_x denotes nitrogen oxides, SO_x denotes sulfur oxides, VOC denotes volatile organic compounds, PM_{2.5} denotes fine particulate matter, PM₁₀ denotes coarse particulate matter, CO₂ denotes carbon dioxide, CH₄ denotes methane, N₂O denotes nitrous oxide.

Source: MOVES4; Landrum & Brown, 2024.

TABLE 5-5: ROADWAY SEGMENTS – FUTURE (2032) PROPOSED ACTION

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
Airside Deliveries	2.000	1,039	0%	63%	36%	1%	15	758,442
1A1	0.362	31,250	45%	45%	5%	5%	35	4,130,865
1A2	0.500	22,550	45%	45%	5%	5%	35	4,117,046
1A3	0.181	11,100	45%	45%	5%	5%	35	731,863
1A4	0.097	550	45%	45%	5%	5%	25	19,443
1A5	0.370	9,500	45%	45%	5%	5%	35	1,283,464
1A6	0.124	14,900	45%	45%	5%	5%	35	676,778
1A7	0.550	6,900	45%	45%	5%	5%	30	1,385,397
1A8	0.118	21,950	45%	45%	5%	5%	30	941,525
1A9	0.492	13,350	45%	45%	5%	5%	25	2,399,459
1A10	0.126	14,600	45%	45%	5%	5%	20	669,157
1A11	0.125	22,000	45%	45%	5%	5%	20	1,001,293
1A12	2.486	154,156	45%	45%	5%	5%	60	139,890,657
1A13	0.124	13,350	45%	45%	5%	5%	25	602,394
1A14	0.096	24,800	45%	45%	5%	5%	30	867,743
1A15	0.505	20,650	45%	45%	5%	5%	35	3,808,316
1A16	0.499	10,400	45%	45%	5%	5%	35	1,894,401
1A17	0.124	15,700	45%	45%	5%	5%	20	713,327
1A18	0.170	23,400	45%	45%	5%	5%	20	1,455,771
1A19	0.249	14,700	45%	45%	5%	5%	35	1,338,435
1A20	0.061	33,700	45%	45%	5%	5%	35	745,878
1A21	0.437	12,600	45%	45%	5%	5%	35	2,011,598
1A22	0.097	15,600	45%	45%	5%	5%	25	554,328
1A23	0.766	11,900	45%	45%	5%	5%	25	3,325,119
1A24	0.676	22,300	45%	45%	5%	5%	35	5,504,239
1A25	0.104	81,400	45%	45%	5%	5%	10	3,079,248
1A26 (east)	0.522	77,078	45%	45%	5%	5%	60	14,681,283
1A26 (west)	0.522	77,078	45%	45%	5%	5%	55	14,681,283
1A27	1.286	95,342	45%	45%	5%	5%	60	44,745,360
1A28	0.441	14,600	45%	45%	5%	5%	35	2,351,954
1A29	0.076	59,300	45%	45%	5%	5%	10	1,650,480
1A30	0.083	23,300	45%	45%	5%	5%	20	707,336
2A1	0.041	21,300	45%	45%	5%	5%	35	322,012
2A2	0.402	5,450	45%	45%	5%	5%	25	800,188
2A3	0.081	20,600	45%	45%	5%	5%	35	609,798
2A4	0.127	23,400	45%	45%	5%	5%	25	1,086,825
2A5	0.049	35,100	45%	45%	5%	5%	35	630,198
2A6	0.081	35,000	45%	45%	5%	5%	35	1,031,185
2A7	0.160	61,650	45%	45%	5%	5%	15	3,607,223
2A8	0.118	21,900	45%	45%	5%	5%	35	944,472
2A9	0.086	18,600	45%	45%	5%	5%	35	585,049
2A10	0.200	9,500	45%	45%	5%	5%	30	692,051
2A11	0.525	14,850	45%	45%	5%	5%	35	2,845,610
2A12	0.054	27,050	45%	45%	5%	5%	35	535,170
2A13	0.077	52,950	45%	45%	5%	5%	15	1,482,864
2A14	0.272	-	41%	41%	17%	1%	30	-
2A15	0.654	43,100	45%	45%	5%	5%	40	10,285,790
2A16	0.325	-	45%	45%	5%	5%	30	-



TABLE 5-5: ROADWAY SEGMENTS – FUTURE (2032) PROPOSED ACTION (*CONTINUED*)

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
2A17	0.122	10,950	45%	45%	5%	5%	30	487,863
2A18	0.241	58,450	45%	45%	5%	5%	40	5,140,872
2A19	0.095	33,300	45%	45%	5%	5%	35	1,159,175
2A20	0.086	33,400	45%	45%	5%	5%	35	1,045,244
2A21	0.090	33,700	45%	45%	5%	5%	35	1,102,420
2A22	0.174	24,200	45%	45%	5%	5%	25	1,535,175
2A23	0.053	22,600	45%	45%	5%	5%	20	437,230
2A24	0.230	7,900	45%	45%	5%	5%	35	662,432
2A25	0.367	1,700	45%	45%	5%	5%	25	227,513
2A26	1.251	25,615	46%	46%	7%	1%	60	11,696,589
2A27	0.384	24,500	45%	45%	5%	5%	60	3,430,763
2A28	0.407	18,350	45%	45%	5%	5%	35	2,727,002
2A29	0.635	18,850	45%	45%	5%	5%	35	4,367,686
2A30	0.312	19,200	45%	45%	5%	5%	35	2,186,867
2A31	0.531	39,100	45%	45%	5%	5%	35	7,583,889
2A32	0.062	51,800	45%	45%	5%	5%	35	1,176,015
2A33	0.985	40,450	45%	45%	5%	5%	35	14,545,296
2A34	0.125	4,800	45%	45%	5%	5%	25	219,657
2A35	0.096	5,200	45%	45%	5%	5%	25	181,690
2A36	0.141	6,950	45%	45%	5%	5%	25	356,733
2A37	0.037	17,800	45%	45%	5%	5%	25	240,344
2A38	0.126	3,400	45%	45%	5%	5%	25	156,643
2A39	0.126	23,300	45%	45%	5%	5%	20	1,067,782
2A40	0.000	24,200	45%	45%	5%	5%	30	1,608,233
2A41	0.000	12,400	45%	45%	5%	5%	30	644,195
3A1	0.093	25,615	46%	46%	7%	1%	20	871,831
3A2	0.756	25,615	46%	46%	7%	1%	40	7,070,534
3A3	1.151	-	46%	46%	7%	1%	20	-
3A4	0.234	25,615	46%	46%	7%	1%	30	2,189,552
3A5	0.263	25,615	46%	46%	7%	1%	30	2,463,075
3A6	0.187	-	41%	41%	17%	1%	30	-
3A7	0.115	-	39%	39%	22%	1%	30	-
3A8	0.070	-	39%	39%	21%	1%	35	-
3A9	0.046	-	39%	39%	21%	1%	35	-
3A10	0.048	4,750	39%	39%	21%	1%	35	82,698
3A11	0.079	13,500	39%	39%	21%	1%	15	388,671
3A12	0.332	40,650	45%	45%	5%	5%	15	4,925,819
3A13	0.377	38,700	45%	45%	5%	5%	15	5,325,412
3A14	0.768	25,615	45%	45%	5%	5%	35	7,180,223
3A15	1.012	25,615	45%	45%	5%	5%	35	9,458,410
4A1	0.248	19,400	45%	45%	5%	5%	35	1,753,865
4A2	0.108	45,150	45%	45%	5%	5%	35	1,787,245
4A3	0.906	44,350	45%	45%	5%	5%	35	14,671,217
4A4	0.409	50,700	45%	45%	5%	5%	15	7,571,285
4A5	0.248	44,300	45%	45%	5%	5%	40	4,008,193
4A6	0.127	6,650	45%	45%	5%	5%	35	308,986
4A7	0.581	600	45%	45%	5%	5%	15	127,138
5A1	0.422	35,950	45%	45%	5%	5%	40	5,541,079
5A2	0.629	19,700	45%	45%	5%	5%	35	4,519,589
5A3	0.380	1,450	45%	45%	5%	5%	15	201,069

TABLE 5-5: ROADWAY SEGMENTS – FUTURE (2032) PROPOSED ACTION (CONTINUED)

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
5A4	0.991	40,050	45%	45%	5%	5%	40	14,483,411
5A5	0.216	53,400	45%	45%	5%	5%	40	4,215,085
5A6	0.075	47,900	45%	45%	5%	5%	40	1,311,315
5A7	0.309	1,450	45%	45%	5%	5%	15	163,397
5A8	0.142	44,519	45%	45%	5%	5%	60	2,303,789
5A9	0.567	44,519	45%	45%	5%	5%	60	9,215,480
5A10	0.268	1,450	45%	45%	5%	5%	15	141,771
6A1	1.180	20,900	45%	45%	5%	5%	35	9,001,096
6A2	0.519	21,250	45%	45%	5%	5%	35	4,021,678
6A3	0.231	23,900	45%	45%	5%	5%	35	2,014,832
6A4	1.560	-	45%	45%	5%	5%	60	-
6A5	0.759	44,519	45%	45%	5%	5%	60	12,336,553
6A6	0.176	29,700	45%	45%	5%	5%	15	1,911,635
6A7	0.099	27,700	45%	45%	5%	5%	35	1,002,213
6A8	0.152	14,800	45%	45%	5%	5%	15	821,693
6A9	0.155	27,700	45%	45%	5%	5%	35	1,565,661
6A10	0.364	-	45%	45%	5%	5%	15	-
6A11	0.618	1,450	45%	45%	5%	5%	15	326,874
6A12	0.086	19,300	45%	45%	5%	5%	35	605,926
6A13	0.750	40,250	45%	45%	5%	5%	35	11,011,209
6A14	0.186	30,050	45%	45%	5%	5%	35	2,042,891
6A15	0.158	39,450	45%	45%	5%	5%	15	2,269,264
6A16	0.053	6,200	45%	45%	5%	5%	25	119,380
6A17	0.067	12,700	45%	45%	5%	5%	35	308,724
6A18	0.160	1,450	45%	45%	5%	5%	15	84,864
6A19	0.849	44,519	45%	45%	5%	5%	60	13,802,583
7A1	0.190	41,250	45%	45%	5%	5%	35	2,865,265
7A2	0.066	29,000	45%	45%	5%	5%	35	696,059
7A3	0.143	56,500	45%	45%	5%	5%	35	2,952,688
7A4	0.934	24,250	45%	45%	5%	5%	35	8,265,943
7A5	0.331	16,800	45%	45%	5%	5%	30	2,028,098
7A6	0.664	16,800	45%	45%	5%	5%	30	4,071,538
7A7	0.411	7,950	45%	45%	5%	5%	25	1,193,188
7A8	0.826	25,000	45%	45%	5%	5%	35	7,540,754
7A9	0.339	13,550	39%	39%	22%	1%	30	1,678,583
7A10	0.451	16,850	45%	45%	5%	5%	35	2,775,552
7A11	0.129	26,250	45%	45%	5%	5%	35	1,238,434
7A12	0.584	12,400	45%	45%	5%	5%	30	2,642,125
7A13 (north)	4.248	172,778	45%	45%	5%	5%	60	267,869,866
7A13 (south)	4.248	141,470	45%	45%	5%	5%	30	219,331,113
8A1	1.011	14,600	45%	45%	5%	5%	35	5,385,972
8A2	0.342	20,450	45%	45%	5%	5%	35	2,551,975
8A3	0.201	30,150	45%	45%	5%	5%	25	2,207,641
8A4	0.570	43,000	45%	45%	5%	5%	40	8,953,291
8A5	0.060	28,950	45%	45%	5%	5%	35	636,076
8A6	0.118	24,650	45%	45%	5%	5%	35	1,063,502
8A7	0.606	21,950	45%	45%	5%	5%	35	4,854,624
8A8	0.149	24,100	45%	45%	5%	5%	35	1,307,916



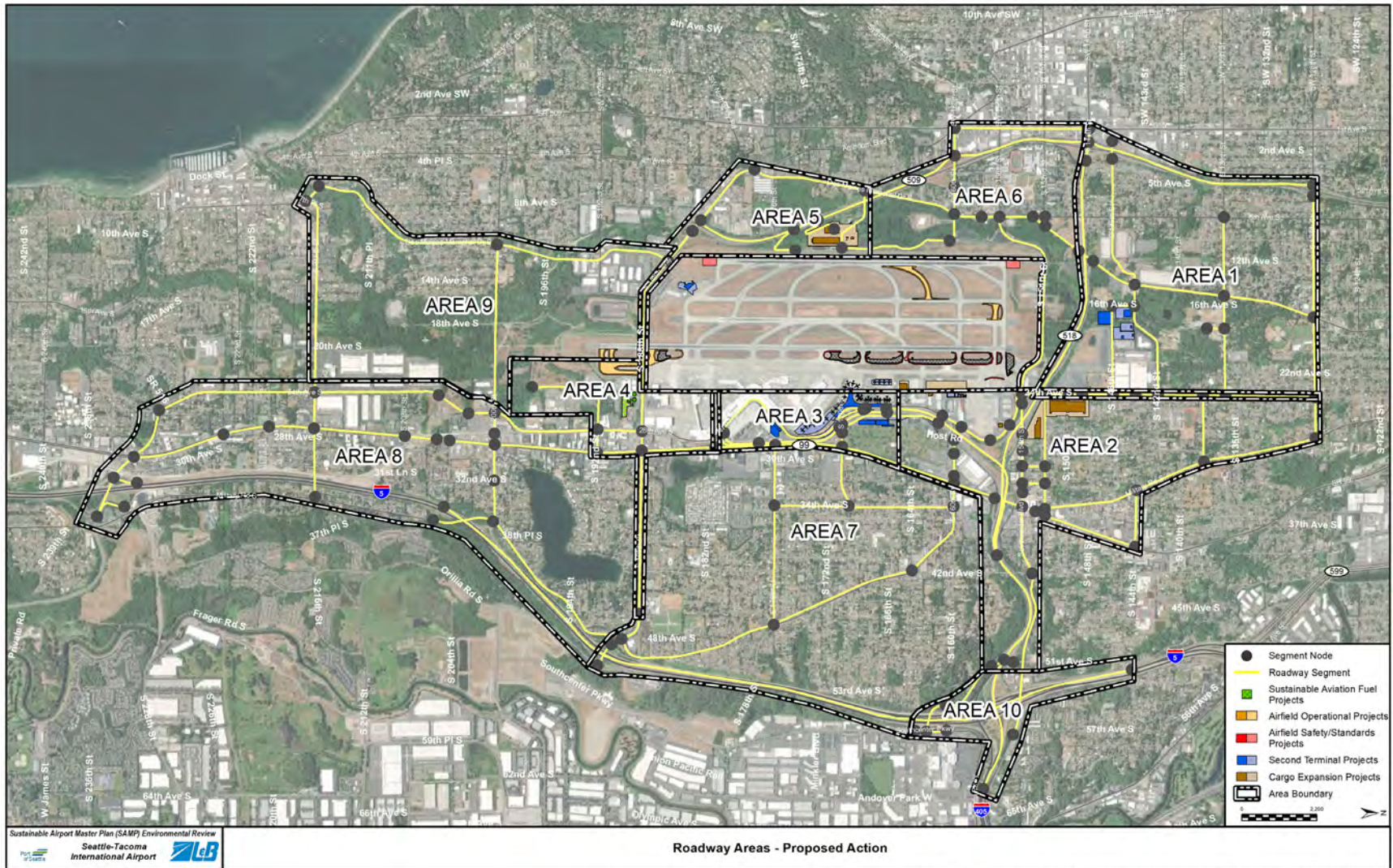
TABLE 5-5: ROADWAY SEGMENTS – FUTURE (2032) PROPOSED ACTION (CONTINUED)

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
8A9	0.192	21,500	45%	45%	5%	5%	35	1,510,142
8A10	0.251	42,950	45%	45%	5%	5%	40	3,930,004
8A11	0.071	41,250	45%	45%	5%	5%	40	1,066,720
8A12	0.178	41,100	45%	45%	5%	5%	40	2,664,701
8A13	0.505	39,050	45%	45%	5%	5%	40	7,198,105
8A14	0.252	46,950	45%	45%	5%	5%	40	4,325,247
8A15	0.257	49,150	45%	45%	5%	5%	40	4,605,564
8A16	0.518	51,050	45%	45%	5%	5%	40	9,657,520
8A17	0.162	66,050	45%	45%	5%	5%	10	3,907,875
8A18	0.236	71,600	45%	45%	5%	5%	10	6,155,916
8A19	0.229	31,900	45%	45%	5%	5%	25	2,666,315
8A20	0.383	23,500	45%	45%	5%	5%	35	3,282,918
8A21	0.311	25,700	45%	45%	5%	5%	35	2,915,591
8A22	0.886	16,350	45%	45%	5%	5%	30	5,289,557
8A23	0.200	26,450	45%	45%	5%	5%	35	1,927,432
8A24	0.689	20,850	45%	45%	5%	5%	35	5,240,022
8A25	0.135	39,000	45%	45%	5%	5%	35	1,924,871
8A26	0.198	17,800	45%	45%	5%	5%	35	1,287,679
9A1	0.936	19,000	45%	45%	5%	5%	35	6,494,489
9A2	0.991	22,400	45%	45%	5%	5%	35	8,104,059
9A3	1.115	22,600	45%	45%	5%	5%	35	9,197,800
9A4	0.109	32,950	45%	45%	5%	5%	35	1,310,783
9A5	1.105	16,600	45%	45%	5%	5%	35	6,698,212
10A1	0.355	35,200	45%	45%	5%	5%	30	4,559,100
10A2	0.208	44,100	45%	45%	5%	5%	30	3,349,649
10A3	0.063	22,650	45%	45%	5%	5%	35	521,374
10A4	0.111	18,500	45%	45%	5%	5%	35	750,473
10A5 (east)	0.758	105,441	45%	45%	5%	5%	35	29,189,264
10A5 (west)	0.758	105,441	45%	45%	5%	5%	35	29,189,264

Note: mph denotes miles per hour; PC denotes passenger car; PT denotes passenger truck; SHT denotes short-haul truck; LHT denotes long-haul truck; VMT denotes vehicle-miles-traveled; the Airside Deliveries segment is not shown on the maps.

Source: Port of Seattle and WSDOT, 2023. Landrum & Brown, 2024

EXHIBIT 5-12: ROADWAY AREAS – PROPOSED ACTION





Roadway Area 1 - Proposed Action

Legend:

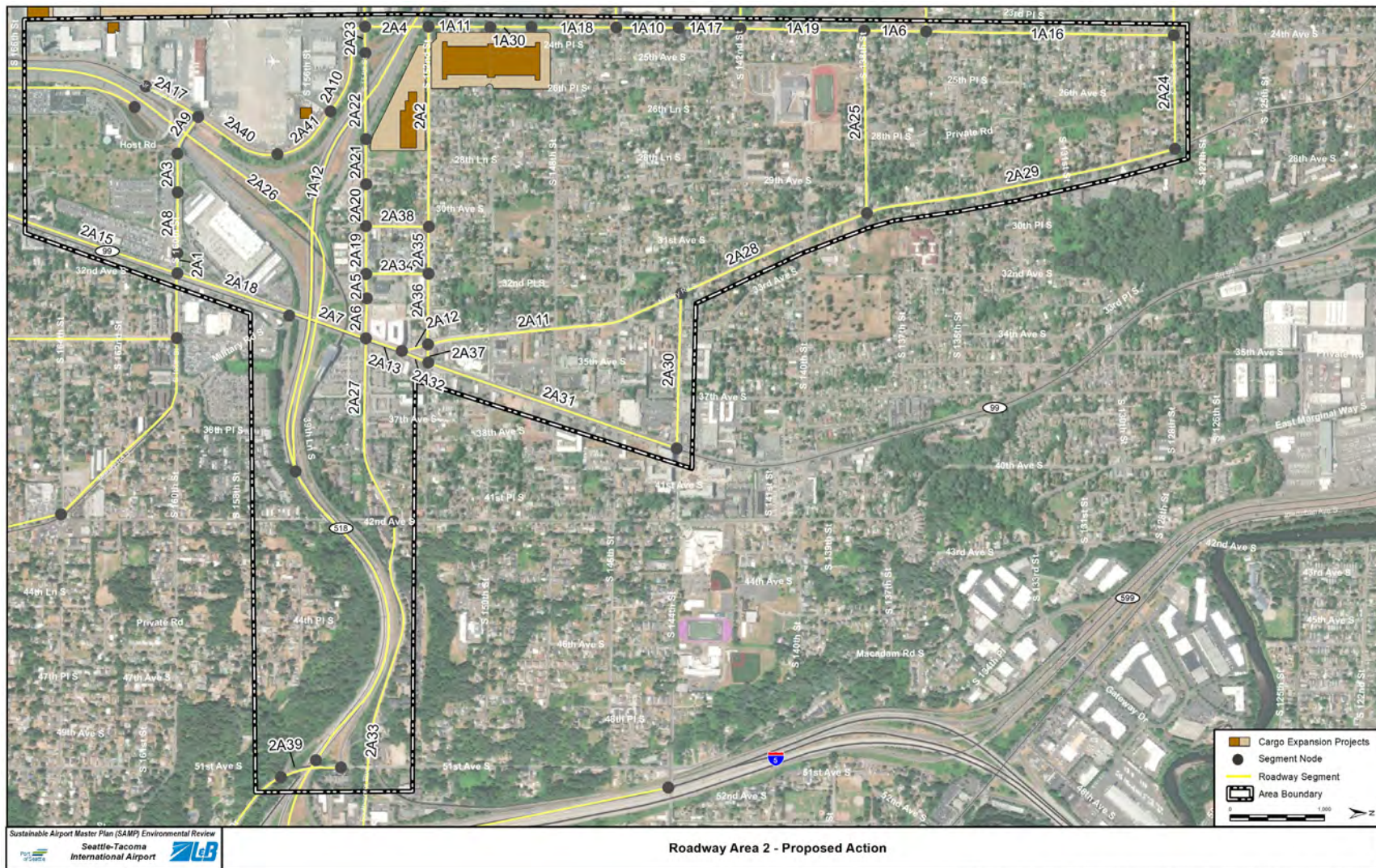
- Second Terminal Projects (Blue squares)
- Segment Node (Black dots)
- Roadway Segment (Yellow line)
- Area Boundary (Dashed line)

Scale: 0 to 1200 feet

North Arrow

Map Title: Roadway Area 1 - Proposed Action

EXHIBIT 5-14: AREA 2 – PROPOSED ACTION



12/29/2023 Y:\SEA\NEPA\LEB Work Product\GIS\SEA 2019\MXD\ROADWAY\07-2023\13_ROADWAY AREA 2_PROPOSED.mxd



EXHIBIT 5-15: AREA 3 – PROPOSED ACTION



[illegible]

EXHIBIT 5-17: AREA 5 – PROPOSED ACTION



EXHIBIT 5-18: AREA 6 – PROPOSED ACTION



12/29/2023 Y:\SEA\NEP\IE-L&B Work Product\2-GIS\SEA 2019MXD\ROADWAY\07-2023\17_ROADWAY AREA 6_PROPOSED



EXHIBIT 5-19: AREA 7 – PROPOSED ACTION



EXHIBIT 5-20: AREA 8 – PROPOSED ACTION

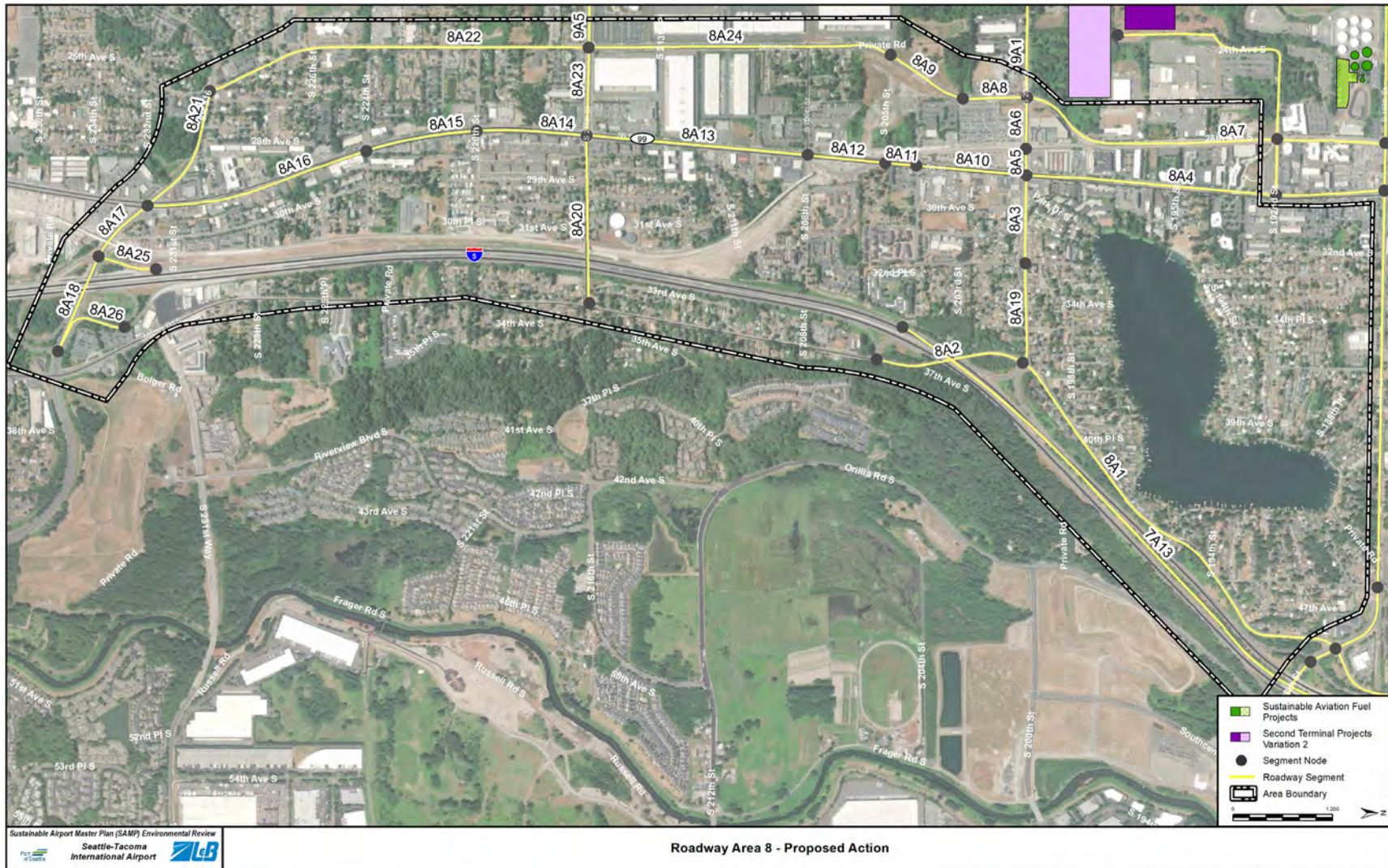




EXHIBIT 5-21: AREA 9 – PROPOSED ACTION

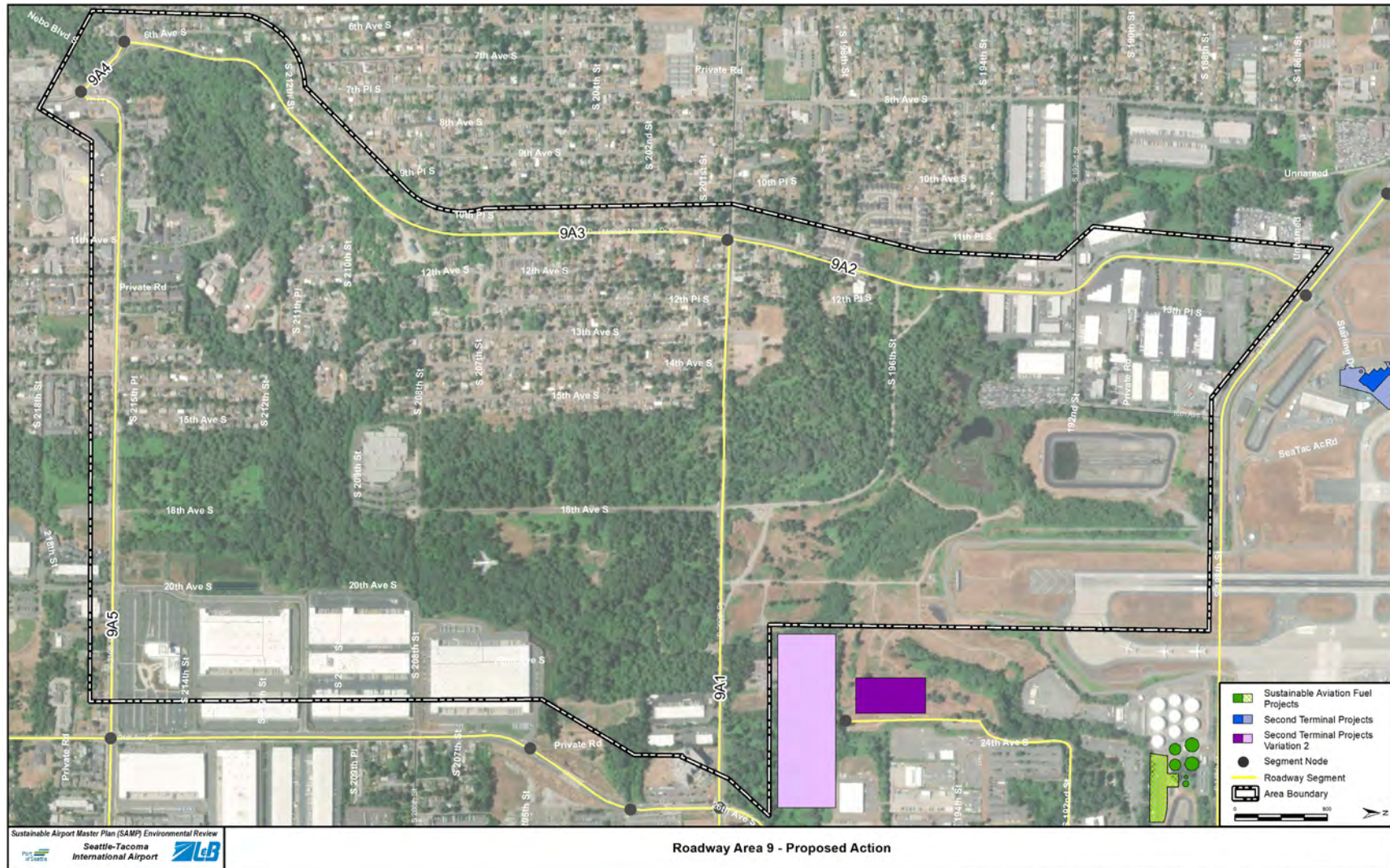


EXHIBIT 5-22: AREA 10 – PROPOSED ACTION

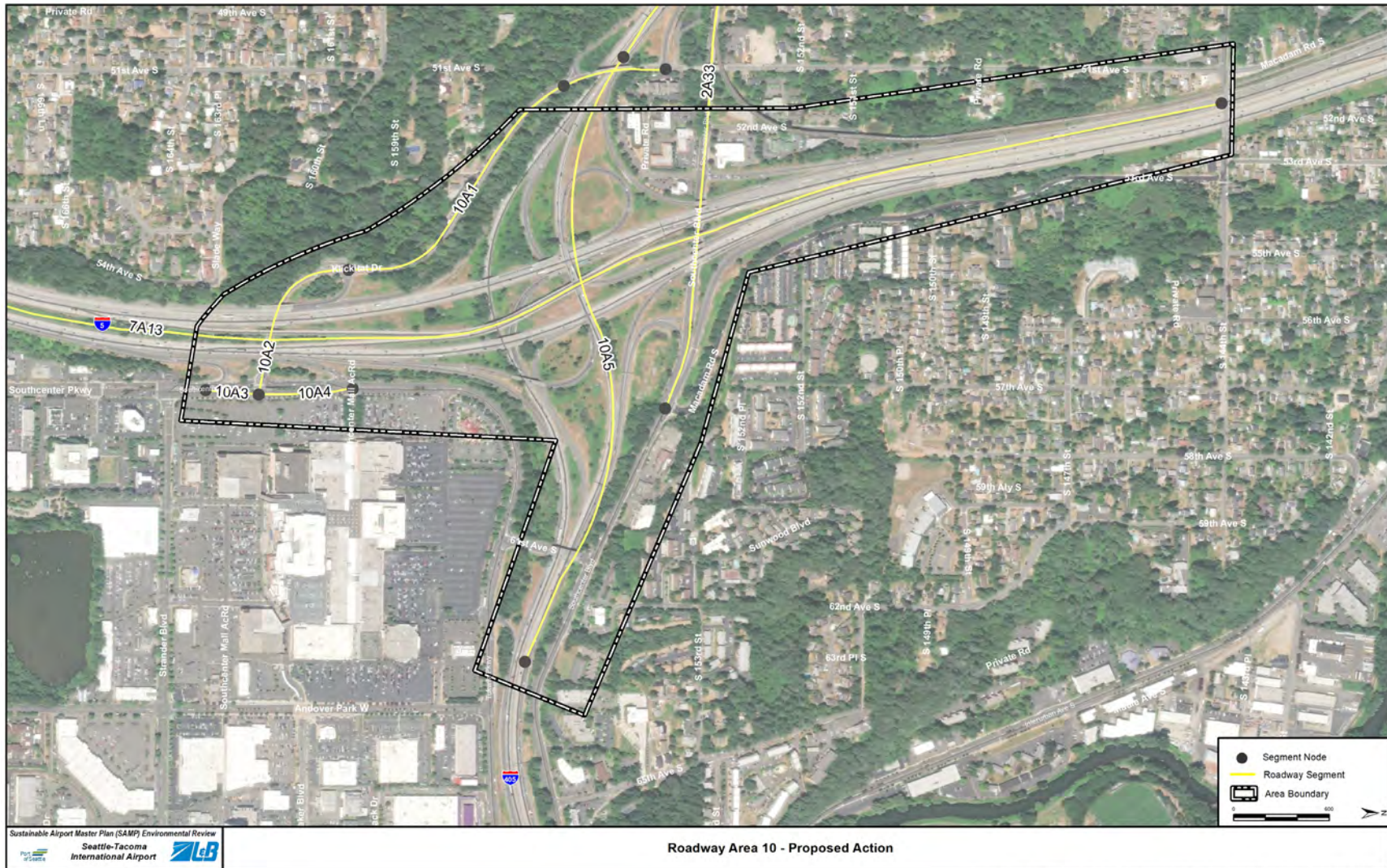




TABLE 5-6: ROADWAY SEGMENTS – FUTURE (2037) NO ACTION ALTERNATIVE

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
Airside Deliveries	2.000	1,037	0%	63%	36%	1%	15	757,197
1A1	0.362	24,450	45%	45%	5%	5%	35	3,231,989
1A2	0.500	24,700	45%	45%	5%	5%	35	4,509,580
1A3	0.181	12,400	45%	45%	5%	5%	35	817,577
1A4	0.097	550	45%	45%	5%	5%	25	19,443
1A5	0.370	10,550	45%	45%	5%	5%	35	1,425,320
1A6	0.124	16,700	45%	45%	5%	5%	35	758,536
1A7	0.550	7,450	45%	45%	5%	5%	30	1,495,827
1A8	0.118	11,350	45%	45%	5%	5%	30	486,848
1A9	0.492	4,550	45%	45%	5%	5%	25	817,793
1A10	0.126	16,100	45%	45%	5%	5%	20	737,906
1A11	0.125	19,400	45%	45%	5%	5%	20	882,958
1A12	2.486	157,301	45%	45%	5%	5%	60	142,744,963
1A13	0.124	4,550	45%	45%	5%	5%	25	205,310
1A14	0.096	23,000	45%	45%	5%	5%	30	804,761
1A15	0.505	22,700	45%	45%	5%	5%	35	4,186,381
1A16	0.499	11,750	45%	45%	5%	5%	35	2,140,309
1A17	0.124	17,500	45%	45%	5%	5%	20	795,110
1A18	0.170	18,600	45%	45%	5%	5%	20	1,157,151
1A19	0.249	16,400	45%	45%	5%	5%	35	1,493,220
1A20	0.061	37,200	45%	45%	5%	5%	35	823,343
1A21	0.437	13,900	45%	45%	5%	5%	35	2,219,144
1A22	0.097	15,800	45%	45%	5%	5%	25	561,435
1A23	0.766	10,900	45%	45%	5%	5%	25	3,045,697
1A24	0.676	24,700	45%	45%	5%	5%	35	6,096,624
1A25	0.104	86,400	45%	45%	5%	5%	10	3,268,391
1A26 (east)	0.522	78,651	45%	45%	5%	5%	60	14,980,837
1A26 (west)	0.522	78,651	45%	45%	5%	5%	55	14,980,837
1A27	1.286	97,287	45%	45%	5%	5%	60	45,658,337
1A28	0.441	16,300	45%	45%	5%	5%	35	2,625,812
1A29	0.076	64,400	45%	45%	5%	5%	10	1,792,427
1A30	0.083	18,500	45%	45%	5%	5%	20	561,619
2A1	0.041	24,800	45%	45%	5%	5%	35	374,925
2A2	0.402	3,600	45%	45%	5%	5%	25	528,564
2A3	0.081	25,900	45%	45%	5%	5%	35	766,688
2A4	0.127	18,900	45%	45%	5%	5%	25	877,820
2A5	0.049	38,100	45%	45%	5%	5%	35	684,061
2A6	0.081	38,600	45%	45%	5%	5%	35	1,137,250
2A7	0.160	67,700	45%	45%	5%	5%	15	3,961,217
2A8	0.118	25,100	45%	45%	5%	5%	35	1,082,477
2A9	0.086	22,600	45%	45%	5%	5%	35	710,866
2A10	0.200	7,950	45%	45%	5%	5%	30	579,137
2A11	0.525	16,450	45%	45%	5%	5%	35	3,152,207
2A12	0.054	29,250	45%	45%	5%	5%	35	578,695
2A13	0.077	57,250	45%	45%	5%	5%	15	1,603,286

TABLE 5-6: ROADWAY SEGMENTS – FUTURE (2037) NO ACTION ALTERNATIVE (CONTINUED)

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
2A14	0.272	18,800	41%	41%	17%	1%	30	1,869,744
2A15	0.654	47,850	45%	45%	5%	5%	40	11,419,374
2A16	0.325	11,200	45%	45%	5%	5%	30	1,327,868
2A17	0.122	18,800	45%	45%	5%	5%	30	837,610
2A18	0.241	67,800	45%	45%	5%	5%	40	5,963,235
2A19	0.095	36,000	45%	45%	5%	5%	35	1,253,162
2A20	0.086	36,100	45%	45%	5%	5%	35	1,129,740
2A21	0.090	36,400	45%	45%	5%	5%	35	1,190,744
2A22	0.174	26,500	45%	45%	5%	5%	25	1,681,081
2A23	0.053	25,000	45%	45%	5%	5%	20	483,662
2A24	0.230	8,800	45%	45%	5%	5%	35	737,899
2A25	0.367	1,900	45%	45%	5%	5%	25	254,279
2A26	1.251	26,138	46%	46%	7%	1%	60	11,935,245
2A27	0.384	26,800	45%	45%	5%	5%	60	3,752,835
2A28	0.407	20,400	45%	45%	5%	5%	35	3,031,654
2A29	0.635	20,950	45%	45%	5%	5%	35	4,854,272
2A30	0.312	21,100	45%	45%	5%	5%	35	2,403,276
2A31	0.531	42,750	45%	45%	5%	5%	35	8,291,848
2A32	0.062	56,000	45%	45%	5%	5%	35	1,271,368
2A33	0.985	43,800	45%	45%	5%	5%	35	15,749,913
2A34	0.125	5,350	45%	45%	5%	5%	25	244,826
2A35	0.096	4,650	45%	45%	5%	5%	25	162,473
2A36	0.141	6,600	45%	45%	5%	5%	25	338,768
2A37	0.037	18,600	45%	45%	5%	5%	25	251,145
2A38	0.126	1,950	45%	45%	5%	5%	25	89,839
2A39	0.126	25,600	45%	45%	5%	5%	20	1,173,186
2A40	0.000	-	45%	45%	5%	5%	30	-
2A41	0.000	-	45%	45%	5%	5%	30	-
3A1	0.093	26,138	46%	46%	7%	1%	20	889,619
3A2	0.756	26,138	46%	46%	7%	1%	40	7,214,800
3A3	1.151	26,138	46%	46%	7%	1%	20	10,983,174
3A4	0.234	26,138	46%	46%	7%	1%	30	2,234,228
3A5	0.263	26,138	46%	46%	7%	1%	30	2,513,331
3A6	0.187	17,000	41%	41%	17%	1%	30	1,158,908
3A7	0.115	24,000	39%	39%	22%	1%	30	1,011,351
3A8	0.070	23,400	39%	39%	21%	1%	35	597,298
3A9	0.046	25,900	39%	39%	21%	1%	35	433,547
3A10	0.048	25,900	39%	39%	21%	1%	35	450,922
3A11	0.079	28,900	39%	39%	21%	1%	15	832,045
3A12	0.332	45,600	45%	45%	5%	5%	15	5,525,642
3A13	0.377	49,650	45%	45%	5%	5%	15	6,832,215
3A14	0.768	-	45%	45%	5%	5%	35	-
3A15	1.012	-	45%	45%	5%	5%	35	-
4A1	0.248	21,400	45%	45%	5%	5%	35	1,934,675
4A2	0.108	49,750	45%	45%	5%	5%	35	1,969,335
4A3	0.906	49,050	45%	45%	5%	5%	35	16,226,002
4A4	0.409	56,300	45%	45%	5%	5%	15	8,407,561
4A5	0.248	49,150	45%	45%	5%	5%	40	4,447,013



TABLE 5-6: ROADWAY SEGMENTS – FUTURE (2037) NO ACTION ALTERNATIVE (CONTINUED)

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
4A6	0.127	7,050	45%	45%	5%	5%	35	327,572
4A7	0.581	600	45%	45%	5%	5%	15	127,138
5A1	0.422	39,200	45%	45%	5%	5%	40	6,042,011
5A2	0.629	20,500	45%	45%	5%	5%	35	4,703,125
5A3	0.380	450	45%	45%	5%	5%	15	62,401
5A4	0.991	44,000	45%	45%	5%	5%	40	15,911,863
5A5	0.216	58,400	45%	45%	5%	5%	40	4,609,756
5A6	0.075	52,600	45%	45%	5%	5%	40	1,439,983
5A7	0.309	-	45%	45%	5%	5%	15	-
5A8	0.142	-	45%	45%	5%	5%	60	-
5A9	0.567	-	45%	45%	5%	5%	60	-
5A10	0.268	-	45%	45%	5%	5%	15	-
6A1	1.180	23,100	45%	45%	5%	5%	35	9,948,580
6A2	0.519	21,450	45%	45%	5%	5%	35	4,059,529
6A3	0.231	23,150	45%	45%	5%	5%	35	1,951,605
6A4	1.560	45,428	45%	45%	5%	5%	60	25,866,138
6A5	0.759	45,428	45%	45%	5%	5%	60	12,588,266
6A6	0.176	30,200	45%	45%	5%	5%	15	1,943,818
6A7	0.099	27,200	45%	45%	5%	5%	35	984,123
6A8	0.152	13,600	45%	45%	5%	5%	15	755,069
6A9	0.155	27,200	45%	45%	5%	5%	35	1,537,400
6A10	0.364	450	45%	45%	5%	5%	15	59,747
6A11	0.618	450	45%	45%	5%	5%	15	101,444
6A12	0.086	18,100	45%	45%	5%	5%	35	568,251
6A13	0.750	44,700	45%	45%	5%	5%	35	12,228,598
6A14	0.186	30,000	45%	45%	5%	5%	35	2,039,492
6A15	0.158	43,050	45%	45%	5%	5%	15	2,476,345
6A16	0.053	6,700	45%	45%	5%	5%	25	129,007
6A17	0.067	14,000	45%	45%	5%	5%	35	340,326
6A18	0.160	-	45%	45%	5%	5%	15	-
6A19	0.849	-	45%	45%	5%	5%	60	-
7A1	0.190	46,100	45%	45%	5%	5%	35	3,202,150
7A2	0.066	31,950	45%	45%	5%	5%	35	766,865
7A3	0.143	62,200	45%	45%	5%	5%	35	3,250,570
7A4	0.934	26,450	45%	45%	5%	5%	35	9,015,843
7A5	0.331	17,800	45%	45%	5%	5%	30	2,148,818
7A6	0.664	17,800	45%	45%	5%	5%	30	4,313,891
7A7	0.411	9,350	45%	45%	5%	5%	25	1,403,309
7A8	0.826	26,350	45%	45%	5%	5%	35	7,947,955
7A9	0.339	15,400	39%	39%	22%	1%	30	1,907,762
7A10	0.451	17,900	45%	45%	5%	5%	35	2,948,510
7A11	0.129	27,700	45%	45%	5%	5%	35	1,306,843
7A12	0.584	13,650	45%	45%	5%	5%	30	2,908,468
7A13 (north)	4.248	176,304	45%	45%	5%	5%	60	273,335,438
7A13 (south)	4.248	144,357	45%	45%	5%	5%	30	223,806,309
8A1	1.011	16,150	45%	45%	5%	5%	35	5,957,771
8A2	0.342	26,450	45%	45%	5%	5%	35	3,300,720
8A3	0.201	32,500	45%	45%	5%	5%	25	2,379,712

TABLE 5-6: ROADWAY SEGMENTS – FUTURE (2037) NO ACTION ALTERNATIVE (CONTINUED)

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
8A4	0.570	47,100	45%	45%	5%	5%	40	9,806,977
8A5	0.060	32,000	45%	45%	5%	5%	35	703,089
8A6	0.118	27,250	45%	45%	5%	5%	35	1,175,677
8A7	0.606	23,600	45%	45%	5%	5%	35	5,219,550
8A8	0.149	25,600	45%	45%	5%	5%	35	1,389,322
8A9	0.192	22,750	45%	45%	5%	5%	35	1,597,940
8A10	0.251	46,900	45%	45%	5%	5%	40	4,291,437
8A11	0.071	44,950	45%	45%	5%	5%	40	1,162,402
8A12	0.178	44,700	45%	45%	5%	5%	40	2,898,106
8A13	0.505	42,300	45%	45%	5%	5%	40	7,797,179
8A14	0.252	50,900	45%	45%	5%	5%	40	4,689,139
8A15	0.257	53,050	45%	45%	5%	5%	40	4,971,011
8A16	0.518	54,950	45%	45%	5%	5%	40	10,395,313
8A17	0.162	71,600	45%	45%	5%	5%	10	4,236,243
8A18	0.236	76,700	45%	45%	5%	5%	10	6,594,396
8A19	0.229	33,850	45%	45%	5%	5%	25	2,829,303
8A20	0.383	25,850	45%	45%	5%	5%	35	3,611,210
8A21	0.311	28,150	45%	45%	5%	5%	35	3,193,536
8A22	0.886	17,800	45%	45%	5%	5%	30	5,758,661
8A23	0.200	29,200	45%	45%	5%	5%	35	2,127,827
8A24	0.689	22,500	45%	45%	5%	5%	35	5,654,700
8A25	0.135	40,500	45%	45%	5%	5%	35	1,998,904
8A26	0.198	17,700	45%	45%	5%	5%	35	1,280,445
9A1	0.936	21,050	45%	45%	5%	5%	35	7,195,210
9A2	0.991	24,550	45%	45%	5%	5%	35	8,881,904
9A3	1.115	24,600	45%	45%	5%	5%	35	10,011,765
9A4	0.109	36,450	45%	45%	5%	5%	35	1,450,017
9A5	1.105	18,400	45%	45%	5%	5%	35	7,424,525
10A1	0.355	36,900	45%	45%	5%	5%	30	4,779,284
10A2	0.208	46,950	45%	45%	5%	5%	30	3,566,123
10A3	0.063	24,350	45%	45%	5%	5%	35	560,506
10A4	0.111	20,200	45%	45%	5%	5%	35	819,435
10A5 (east)	0.758	107,592	45%	45%	5%	5%	35	29,784,837
10A5 (west)	0.758	107,592	45%	45%	5%	5%	35	29,784,837

Note: mph denotes miles per hour; PC denotes passenger car; PT denotes passenger truck; SHT denotes short-haul truck; LHT denotes long-haul truck; VMT denotes vehicle-miles-traveled; the Airside Deliveries segment is not shown on the maps.

Source: Port of Seattle and WSDOT, 2023. Landrum & Brown, 2024



TABLE 5-7: 2037 EMISSION FACTORS FOR MOTOR VEHICLES

Vehicle Type	Speed (mph)	CO (g/VMT)	NO _x (g/VMT)	SO _x (g/VMT)	VOC (g/VMT)	PM _{2.5} (g/VMT)	PM ₁₀ (g/VMT)	CO ₂ (g/VMT)	CH ₄ (g/VMT)	N ₂ O (g/VMT)
PC	5	3.18	0.01	0.00	0.02	0.00	0.00	789.66	0.01	0.01
PT	5	2.89	0.02	0.00	0.03	0.00	0.00	965.76	0.01	0.01
SHT	5	2.92	2.41	0.01	0.08	0.01	0.01	1646.15	0.05	0.26
LHT	5	2.87	2.42	0.01	0.08	0.01	0.01	1641.73	0.06	0.25
PC	10	2.34	0.01	0.00	0.02	0.00	0.00	482.21	0.01	0.00
PT	10	2.14	0.01	0.00	0.02	0.00	0.00	595.18	0.01	0.00
SHT	10	1.71	1.32	0.00	0.04	0.01	0.01	1075.67	0.03	0.17
LHT	10	1.68	1.34	0.00	0.05	0.01	0.01	1069.10	0.03	0.16
PC	15	2.06	0.01	0.00	0.01	0.00	0.00	379.72	0.01	0.00
PT	15	1.89	0.01	0.00	0.02	0.00	0.00	471.65	0.01	0.00
SHT	15	1.30	0.95	0.00	0.03	0.00	0.01	911.55	0.02	0.14
LHT	15	1.27	0.96	0.00	0.03	0.01	0.01	903.85	0.02	0.14
PC	20	1.83	0.01	0.00	0.01	0.00	0.00	326.47	0.01	0.00
PT	20	1.69	0.01	0.00	0.01	0.00	0.00	408.01	0.01	0.00
SHT	20	1.05	0.75	0.00	0.02	0.00	0.00	816.53	0.02	0.13
LHT	20	1.02	0.77	0.00	0.02	0.00	0.00	808.37	0.02	0.12
PC	25	1.51	0.01	0.00	0.01	0.00	0.00	290.50	0.01	0.00
PT	25	1.43	0.01	0.00	0.01	0.00	0.00	366.07	0.01	0.00
SHT	25	0.86	0.61	0.00	0.02	0.00	0.00	737.74	0.01	0.11
LHT	25	0.84	0.63	0.00	0.02	0.00	0.00	728.93	0.01	0.11
PC	30	1.44	0.01	0.00	0.01	0.00	0.00	259.83	0.01	0.00
PT	30	1.35	0.01	0.00	0.01	0.00	0.00	326.79	0.01	0.00
SHT	30	0.78	0.53	0.00	0.02	0.00	0.00	731.00	0.01	0.11
LHT	30	0.76	0.55	0.00	0.02	0.00	0.00	717.44	0.01	0.11
PC	35	1.28	0.01	0.00	0.01	0.00	0.00	245.16	0.00	0.00
PT	35	1.22	0.01	0.00	0.01	0.00	0.00	310.81	0.00	0.00
SHT	35	0.68	0.42	0.00	0.01	0.00	0.00	648.84	0.01	0.10
LHT	35	0.66	0.44	0.00	0.01	0.00	0.00	632.72	0.01	0.10
PC	40	1.14	0.01	0.00	0.01	0.00	0.00	235.88	0.00	0.00
PT	40	1.11	0.01	0.00	0.01	0.00	0.00	301.72	0.00	0.00
SHT	40	0.64	0.36	0.00	0.01	0.00	0.00	641.67	0.01	0.10
LHT	40	0.61	0.37	0.00	0.01	0.00	0.00	620.76	0.01	0.09
PC	55	1.00	0.01	0.00	0.01	0.00	0.00	221.55	0.00	0.00
PT	55	1.01	0.01	0.00	0.01	0.00	0.00	287.61	0.00	0.00
SHT	55	0.56	0.22	0.00	0.01	0.00	0.00	641.06	0.00	0.10
LHT	55	0.53	0.24	0.00	0.01	0.00	0.00	611.70	0.00	0.09
PC	60	1.01	0.01	0.00	0.01	0.00	0.00	220.60	0.00	0.00
PT	60	1.04	0.01	0.00	0.01	0.00	0.00	289.00	0.00	0.00
SHT	60	0.54	0.19	0.00	0.00	0.00	0.00	627.81	0.00	0.10
LHT	60	0.51	0.21	0.00	0.00	0.00	0.00	597.24	0.00	0.09

Note: mph denotes miles per hour; g/VMT denotes grams per vehicle miles traveled; PC denotes passenger car; PT denotes passenger truck; SHT denotes short-haul truck; LHT denotes long-haul truck; CO denotes carbon monoxide, NO_x denotes nitrogen oxides, SO_x denotes sulfur oxides, VOC denotes volatile organic compounds, PM_{2.5} denotes fine particulate matter, PM₁₀ denotes coarse particulate matter, CO₂ denotes carbon dioxide, CH₄ denotes methane, N₂O denotes nitrous oxide.

Source: MOVES4; Landrum & Brown, 2024.

TABLE 5-8: ROADWAY SEGMENTS – FUTURE (2037) PROPOSED ACTION

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
Airside Deliveries	2.000	1,114	0%	63%	36%	1%	15	813,034
1A1	0.362	35,050	45%	45%	5%	5%	35	4,633,178
1A2	0.500	25,000	45%	45%	5%	5%	35	4,564,352
1A3	0.181	12,400	45%	45%	5%	5%	35	817,577
1A4	0.097	550	45%	45%	5%	5%	25	19,443
1A5	0.370	10,550	45%	45%	5%	5%	35	1,425,320
1A6	0.124	16,700	45%	45%	5%	5%	35	758,536
1A7	0.550	7,600	45%	45%	5%	5%	30	1,525,944
1A8	0.118	24,650	45%	45%	5%	5%	30	1,057,339
1A9	0.492	14,850	45%	45%	5%	5%	25	2,669,061
1A10	0.126	16,300	45%	45%	5%	5%	20	747,073
1A11	0.125	24,800	45%	45%	5%	5%	20	1,128,730
1A12	2.486	169,491	45%	45%	5%	5%	60	153,806,735
1A13	0.124	14,850	45%	45%	5%	5%	25	670,078
1A14	0.096	28,000	45%	45%	5%	5%	30	979,710
1A15	0.505	22,900	45%	45%	5%	5%	35	4,223,266
1A16	0.499	11,750	45%	45%	5%	5%	35	2,140,309
1A17	0.124	17,500	45%	45%	5%	5%	20	795,110
1A18	0.170	25,900	45%	45%	5%	5%	20	1,611,302
1A19	0.249	16,400	45%	45%	5%	5%	35	1,493,220
1A20	0.061	37,500	45%	45%	5%	5%	35	829,983
1A21	0.437	14,000	45%	45%	5%	5%	35	2,235,109
1A22	0.097	17,400	45%	45%	5%	5%	25	618,289
1A23	0.766	13,250	45%	45%	5%	5%	25	3,702,338
1A24	0.676	24,800	45%	45%	5%	5%	35	6,121,306
1A25	0.104	90,300	45%	45%	5%	5%	10	3,415,923
1A26 (east)	0.522	84,745	45%	45%	5%	5%	60	16,141,751
1A26 (west)	0.522	84,745	45%	45%	5%	5%	55	16,141,751
1A27	1.286	104,826	45%	45%	5%	5%	60	49,196,550
1A28	0.441	16,250	45%	45%	5%	5%	35	2,617,757
1A29	0.076	66,000	45%	45%	5%	5%	10	1,836,959
1A30	0.083	25,900	45%	45%	5%	5%	20	786,267
2A1	0.041	24,500	45%	45%	5%	5%	35	370,389
2A2	0.402	5,800	45%	45%	5%	5%	25	851,576
2A3	0.081	23,700	45%	45%	5%	5%	35	701,564
2A4	0.127	26,000	45%	45%	5%	5%	25	1,207,584
2A5	0.049	39,100	45%	45%	5%	5%	35	702,015
2A6	0.081	39,000	45%	45%	5%	5%	35	1,149,035
2A7	0.160	68,500	45%	45%	5%	5%	15	4,008,026
2A8	0.118	25,100	45%	45%	5%	5%	35	1,082,477
2A9	0.086	21,600	45%	45%	5%	5%	35	679,412
2A10	0.200	10,700	45%	45%	5%	5%	30	779,468
2A11	0.525	16,500	45%	45%	5%	5%	35	3,161,788
2A12	0.054	30,000	45%	45%	5%	5%	35	593,534
2A13	0.077	58,750	45%	45%	5%	5%	15	1,645,293
2A14	0.272	-	41%	41%	17%	1%	30	-
2A15	0.654	47,900	45%	45%	5%	5%	40	11,431,307



TABLE 5-8: ROADWAY SEGMENTS – FUTURE (2037) PROPOSED ACTION (CONTINUED)

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
2A16	0.325	-	45%	45%	5%	5%	30	-
2A17	0.122	13,400	45%	45%	5%	5%	30	597,020
2A18	0.241	65,500	45%	45%	5%	5%	40	5,760,942
2A19	0.095	36,900	45%	45%	5%	5%	35	1,284,491
2A20	0.086	37,100	45%	45%	5%	5%	35	1,161,035
2A21	0.090	37,400	45%	45%	5%	5%	35	1,223,457
2A22	0.174	26,800	45%	45%	5%	5%	25	1,700,112
2A23	0.053	25,000	45%	45%	5%	5%	20	483,662
2A24	0.230	8,800	45%	45%	5%	5%	35	737,899
2A25	0.367	1,850	45%	45%	5%	5%	25	247,588
2A26	1.251	28,163	46%	46%	7%	1%	60	12,860,146
2A27	0.384	27,250	45%	45%	5%	5%	60	3,815,849
2A28	0.407	20,400	45%	45%	5%	5%	35	3,031,654
2A29	0.635	20,950	45%	45%	5%	5%	35	4,854,272
2A30	0.312	21,300	45%	45%	5%	5%	35	2,426,056
2A31	0.531	43,450	45%	45%	5%	5%	35	8,427,621
2A32	0.062	57,500	45%	45%	5%	5%	35	1,305,423
2A33	0.985	44,900	45%	45%	5%	5%	35	16,145,459
2A34	0.125	5,300	45%	45%	5%	5%	25	242,538
2A35	0.096	5,650	45%	45%	5%	5%	25	197,413
2A36	0.141	7,600	45%	45%	5%	5%	25	390,097
2A37	0.037	19,700	45%	45%	5%	5%	25	265,998
2A38	0.126	3,600	45%	45%	5%	5%	25	165,857
2A39	0.126	25,800	45%	45%	5%	5%	20	1,182,351
2A40	0.000	24,200	45%	45%	5%	5%	30	1,608,233
2A41	0.000	12,400	45%	45%	5%	5%	30	644,195
3A1	0.093	28,163	46%	46%	7%	1%	20	958,559
3A2	0.756	28,163	46%	46%	7%	1%	40	7,773,898
3A3	1.151	-	46%	46%	7%	1%	20	-
3A4	0.234	28,163	46%	46%	7%	1%	30	2,407,365
3A5	0.263	28,163	46%	46%	7%	1%	30	2,708,097
3A6	0.187	-	41%	41%	17%	1%	30	-
3A7	0.115	-	39%	39%	22%	1%	30	-
3A8	0.070	-	39%	39%	21%	1%	35	-
3A9	0.046	-	39%	39%	21%	1%	35	-
3A10	0.048	5,300	39%	39%	21%	1%	35	92,274
3A11	0.079	15,200	39%	39%	21%	1%	15	437,615
3A12	0.332	45,050	45%	45%	5%	5%	15	5,458,995
3A13	0.377	43,400	45%	45%	5%	5%	15	5,972,168
3A14	0.768	28,163	45%	45%	5%	5%	35	7,894,499
3A15	1.012	28,163	45%	45%	5%	5%	35	10,399,316
4A1	0.248	21,500	45%	45%	5%	5%	35	1,943,716
4A2	0.108	50,300	45%	45%	5%	5%	35	1,991,106
4A3	0.906	49,500	45%	45%	5%	5%	35	16,374,864
4A4	0.409	56,250	45%	45%	5%	5%	15	8,400,094
4A5	0.248	49,000	45%	45%	5%	5%	40	4,433,441
4A6	0.127	7,350	45%	45%	5%	5%	35	341,511
4A7	0.581	600	45%	45%	5%	5%	15	127,138
5A1	0.422	40,050	45%	45%	5%	5%	40	6,173,024
5A2	0.629	53,300	45%	45%	5%	5%	40	1,459,146

TABLE 5-8: ROADWAY SEGMENTS – FUTURE (2037) PROPOSED ACTION (CONTINUED)

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
5A3	0.380	22,300	45%	45%	5%	5%	35	5,116,083
5A4	0.991	1,850	45%	45%	5%	5%	15	256,537
5A5	0.216	44,800	45%	45%	5%	5%	40	16,201,169
5A6	0.075	59,500	45%	45%	5%	5%	40	4,696,583
5A7	0.309	1,850	45%	45%	5%	5%	15	208,472
5A8	0.142	48,948	45%	45%	5%	5%	60	2,532,966
5A9	0.567	48,948	45%	45%	5%	5%	60	10,132,220
5A10	0.268	1,850	45%	45%	5%	5%	15	180,881
6A1	1.180	23,300	45%	45%	5%	5%	35	10,034,715
6A2	0.519	24,000	45%	45%	5%	5%	35	4,542,130
6A3	0.231	26,850	45%	45%	5%	5%	35	2,263,525
6A4	1.560	-	45%	45%	5%	5%	60	-
6A5	0.759	48,948	45%	45%	5%	5%	60	13,563,772
6A6	0.176	33,200	45%	45%	5%	5%	15	2,136,912
6A7	0.099	31,200	45%	45%	5%	5%	35	1,128,847
6A8	0.152	16,600	45%	45%	5%	5%	15	921,628
6A9	0.155	31,200	45%	45%	5%	5%	35	1,763,489
6A10	0.364	-	45%	45%	5%	5%	15	-
6A11	0.618	1,850	45%	45%	5%	5%	15	417,046
6A12	0.086	21,800	45%	45%	5%	5%	35	684,413
6A13	0.750	44,650	45%	45%	5%	5%	35	12,214,919
6A14	0.186	44,150	45%	45%	5%	5%	15	2,539,620
6A15	0.158	6,800	45%	45%	5%	5%	25	130,933
6A16	0.053	14,100	45%	45%	5%	5%	35	342,757
6A17	0.067	33,800	45%	45%	5%	5%	35	2,297,828
6A18	0.160	1,850	45%	45%	5%	5%	15	108,275
6A19	0.849	48,948	45%	45%	5%	5%	60	15,175,640
7A1	0.190	45,900	45%	45%	5%	5%	35	3,188,258
7A2	0.066	32,250	45%	45%	5%	5%	35	774,066
7A3	0.143	62,800	45%	45%	5%	5%	35	3,281,926
7A4	0.934	26,850	45%	45%	5%	5%	35	9,152,189
7A5	0.331	18,650	45%	45%	5%	5%	30	2,251,430
7A6	0.664	18,650	45%	45%	5%	5%	30	4,519,891
7A7	0.411	8,800	45%	45%	5%	5%	25	1,320,762
7A8	0.826	27,750	45%	45%	5%	5%	35	8,370,237
7A9	0.339	14,950	39%	39%	22%	1%	30	1,852,015
7A10	0.451	19,000	45%	45%	5%	5%	35	3,129,703
7A11	0.129	28,900	45%	45%	5%	5%	35	1,363,457
7A12	0.584	13,650	45%	45%	5%	5%	30	2,908,468
7A13 (north)	4.248	155,544	45%	45%	5%	5%	30	241,149,789
7A13 (south)	4.248	189,966	45%	45%	5%	5%	60	294,517,093
8A1	1.011	16,300	45%	45%	5%	5%	35	6,013,106
8A2	0.342	23,200	45%	45%	5%	5%	35	2,895,150
8A3	0.201	33,400	45%	45%	5%	5%	25	2,445,612
8A4	0.570	47,700	45%	45%	5%	5%	40	9,931,907
8A5	0.060	32,100	45%	45%	5%	5%	35	705,286
8A6	0.118	27,350	45%	45%	5%	5%	35	1,179,991
8A7	0.606	24,450	45%	45%	5%	5%	35	5,407,542



TABLE 5-8: ROADWAY SEGMENTS – FUTURE (2037) PROPOSED ACTION (CONTINUED)

Segment ID	Length (miles)	AADT	PC (%)	PT (%)	SHT (%)	LHT (%)	Speed (mph)	Annual VMTs
8A8	0.149	26,900	45%	45%	5%	5%	35	1,459,873
8A9	0.192	23,950	45%	45%	5%	5%	35	1,682,227
8A10	0.251	47,550	45%	45%	5%	5%	40	4,350,913
8A11	0.071	45,750	45%	45%	5%	5%	40	1,183,090
8A12	0.178	45,500	45%	45%	5%	5%	40	2,949,974
8A13	0.505	43,400	45%	45%	5%	5%	40	7,999,943
8A14	0.252	52,000	45%	45%	5%	5%	40	4,790,476
8A15	0.257	54,450	45%	45%	5%	5%	40	5,102,197
8A16	0.518	56,450	45%	45%	5%	5%	40	10,679,080
8A17	0.162	73,400	45%	45%	5%	5%	10	4,342,741
8A18	0.236	79,600	45%	45%	5%	5%	10	6,843,728
8A19	0.229	35,300	45%	45%	5%	5%	25	2,950,499
8A20	0.383	26,050	45%	45%	5%	5%	35	3,639,150
8A21	0.311	28,600	45%	45%	5%	5%	35	3,244,587
8A22	0.886	18,100	45%	45%	5%	5%	30	5,855,718
8A23	0.200	29,450	45%	45%	5%	5%	35	2,146,045
8A24	0.689	23,250	45%	45%	5%	5%	35	5,843,190
8A25	0.135	43,400	45%	45%	5%	5%	35	2,142,036
8A26	0.198	19,700	45%	45%	5%	5%	35	1,425,128
9A1	0.936	21,050	45%	45%	5%	5%	35	7,195,210
9A2	0.991	24,900	45%	45%	5%	5%	35	9,008,530
9A3	1.115	25,050	45%	45%	5%	5%	35	10,194,907
9A4	0.109	36,550	45%	45%	5%	5%	35	1,453,995
9A5	1.105	18,550	45%	45%	5%	5%	35	7,485,051
10A1	0.355	38,450	45%	45%	5%	5%	30	4,980,040
10A2	0.208	48,650	45%	45%	5%	5%	30	3,695,248
10A3	0.063	25,050	45%	45%	5%	5%	35	576,619
10A4	0.111	20,700	45%	45%	5%	5%	35	839,718
10A5 (east)	0.758	115,930	45%	45%	5%	5%	35	32,092,961
10A5 (west)	0.758	115,930	45%	45%	5%	5%	35	32,092,961

Note: mph denotes miles per hour; PC denotes passenger car; PT denotes passenger truck; SHT denotes short-haul truck; LHT denotes long-haul truck; VMT denotes vehicle-miles-traveled; the Airside Deliveries segment is not shown on the maps.

Source: Port of Seattle and WSDOT, 2023. Landrum & Brown, 2024

Attachment 6 Construction

This attachment contains the following exhibits and tables:

Proposed Action

- Exhibit 6-1 Construction Schedule – Proposed Action
- Table 6-1 On-Road Construction Equipment Emission Factors
- Table 6-2 Non-Road Construction Equipment Emission Factors
- Table 6-3 On-Road Construction Emissions Inventory – Proposed Action
- Table 6-4 Non-Road Construction Emissions Inventory – Proposed Action

Hybrid Terminal Option

- Exhibit 6-2 Construction Schedule – Hybrid Terminal Option
- Table 6-5 On-Road Construction Emissions Inventory – Hybrid Terminal Option
- Table 6-6 Non-Road Construction Emissions Inventory – Hybrid Terminal Option



EXHIBIT 6-1: CONSTRUCTION SCHEDULE - PROPOSED ACTION

ID	Description	2025				2026				2027				2028				2029				2030				2031				2032			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
AIRSIDE																																	
A01	Taxiway A/B Extension																																
A02	Runway 16R-34L Blast Pads																																
A04	Taxiway B 500' Separation & RIM Mitigation																																
A05	North Hold Pad																																
A06	Runway 34L Highspeed Exit																																
A07	Taxiway D Extension																																
A08	Hardstand (north)																																
A09	Hardstand (central)																																
A10	Taxiway Fillets																																
CARGO																																	
C01	Cargo 4 South Redevelopment																																
C02	Off-site Cargo PH 1																																
C03	Off-site Cargo PH 2																																
LANDSIDE																																	
L01	NAE Relocation (southbound lanes)																																
L02	Elevated Busway & Stations																																
L03	Second Terminal Roads/Curbside																																
L04	Main Terminal North GT Lot																																
L05	North GT Holding Lot																																
L07	Employee Parking Structure																																
TERMINAL																																	
T01	North Gates																																
T02	Second Terminal & Parking																																
AIRPORT/AIRLINE SUPPORT																																	
S01	Fuel Farm Expansion																																
S02	Primary ARFF																																
S03	Secondary ARFF																																
S04	Fuel Rack Relocation																																
S05	Triculator																																
S06	Consolidated De-Icing Tanks																																
S07	Westside Maintenance Campus																																
S08	Airline Support (north)																																
S09	Airline Support (west)																																
S10	Centralized Rec. & Dist. Center																																

TABLE 6-1: ON-ROAD CONSTRUCTION EQUIPMENT EMISSIONS FACTORS

Activity	CO (g/VMT)	VO (g/VMT)	NO _x (g/VMT)	SO _x (g/VMT)	PM ₁₀ (g/VMT)	PM _{2.5} (g/VMT)	CO ₂ (g/VMT)	CH ₄ (g/VMT)	N ₂ O (g/VMT)
Employee Commute	3.20	0.0309	0.112	0.00160	0.00241	0.00213	319	0.00988	0.00174
Material Delivery	2.00	0.0835	3.63	0.00548	0.0478	0.0440	1,636	0.0178	0.219

Note: Construction would start in 2025 and would continue through 2032 for the Proposed Action and the Hybrid Terminal Option. For the purpose of this analysis, emission factors for the first year of construction (2025) were used. g/VMT denotes grams per vehicle-miles-traveled; CO denotes carbon monoxide, NO_x denotes nitrogen oxides, SO_x denotes sulfur oxides, VOC denotes volatile organic compounds, PM_{2.5} denotes fine particulate matter, PM₁₀ denotes coarse particulate matter, CO₂ denotes carbon dioxide, CH₄ denotes methane, N₂O denotes nitrous oxide.

Source: MOVES4, Landrum & Brown 2024

TABLE 6-2: NON-ROAD CONSTRUCTION EQUIPMENT EMISSIONS FACTORS

Equipment Type	HP	Load Factor	CO (g/hp-hr)	VOC (g/hp-hr)	NO _x (g/hp-hr)	SO _x (g/hp-hr)	PM ₁₀ (g/hp-hr)	PM _{2.5} (g/hp-hr)	CO ₂ (g/hp-hr)	CH ₄ (g/hp-hr)
Aerial Lifts	50 < hp <= 75	0.21	2.195	0.418	3.653	0.00212	0.260	0.253	694.77	0.0250
Aerial Lifts	75 < hp <= 100	0.59	2.500	0.395	2.714	0.00210	0.317	0.307	694.84	0.0203
Air Compressors	100 < hp <= 175	0.43	0.179	0.043	0.733	0.00147	0.044	0.043	530.92	0.0035
Air Compressors	75 < hp <= 100	0.43	0.433	0.053	1.395	0.00164	0.073	0.070	590.22	0.0042
Bore/Drill Rigs	100 < hp <= 175	0.43	1.146	0.385	4.491	0.00191	0.262	0.254	529.92	0.0225
Cement & Mortar Mixers	300 < hp <= 600	0.59	1.225	0.262	4.617	0.00194	0.168	0.163	530.28	0.0136
Chain Saws > 6 HP	6 < hp <= 11	0.70	133.015	30.771	0.764	0.00207	4.874	4.484	343.00	0.0000
Chippers/Stump Grinders	75 < hp <= 100	0.43	1.234	0.229	2.739	0.00181	0.217	0.211	589.70	0.0100
Concrete/Industrial Saws	25 < hp <= 40	0.59	0.311	0.095	2.556	0.00158	0.028	0.027	595.87	0.0126
Concrete/Industrial Saws	6 < hp <= 11	0.70	2.467	0.837	4.183	0.00218	0.239	0.232	593.76	0.0738
Cranes	175 < hp <= 300	0.43	0.070	0.024	0.297	0.00143	0.016	0.016	530.97	0.0016
Crawler Tractor/Dozers	100 < hp <= 175	0.59	0.097	0.015	0.276	0.00143	0.024	0.023	536.79	0.0012
Excavators	100 < hp <= 175	0.59	0.078	0.012	0.259	0.00142	0.019	0.018	536.79	0.0010
Forklifts	75 < hp <= 100	0.59	0.052	0.008	0.857	0.00157	0.012	0.012	596.14	0.0005
Generator Sets	25 < hp <= 40	0.43	0.688	0.192	3.067	0.00173	0.112	0.109	589.81	0.0179
Graders	175 < hp <= 300	0.59	0.049	0.014	0.171	0.00143	0.012	0.012	536.79	0.0008
Graders	40 < hp <= 50	0.59	0.280	0.093	2.529	0.00157	0.021	0.020	595.88	0.0124
Irrigation Sets	300 < hp <= 600	0.59	0.745	0.160	2.663	0.00179	0.125	0.122	530.58	0.0114
Off-highway Trucks	175 < hp <= 300	0.43	0.021	0.010	0.115	0.00141	0.007	0.007	536.80	0.0004
Off-highway Trucks	300 < hp <= 600	0.59	0.042	0.012	0.160	0.00142	0.010	0.010	536.79	0.0007
Other Construction Equipment	100 < hp <= 175	0.43	0.231	0.054	0.656	0.00148	0.051	0.049	536.67	0.0040
Other Construction Equipment	300 < hp <= 600	0.59	0.997	0.136	2.292	0.00172	0.148	0.143	536.43	0.0083



TABLE 6-2: NON-ROAD CONSTRUCTION EQUIPMENT EMISSIONS FACTORS (CONTINUED)

Equipment Type	HP	LF	CO (g/hp-hr)	VOC (g/hp-hr)	NO _x (g/hp-hr)	SO _x (g/hp-hr)	PM ₁₀ (g/hp-hr)	PM _{2.5} (g/hp-hr)	CO ₂ (g/hp-hr)	CH ₄ (g/hp-hr)
Pavers	100 < hp ≤ 175	0.59	0.128	0.020	0.300	0.00144	0.033	0.032	536.77	0.0016
Paving Equipment	100 < hp ≤ 175	0.59	0.211	0.049	0.598	0.00148	0.046	0.045	536.69	0.0036
Plate Compactors	3 < hp ≤ 6	0.43	2.612	0.827	4.238	0.00216	0.270	0.261	588.00	0.0712
Pumps	6 < hp ≤ 11	0.43	2.580	0.821	4.237	0.00216	0.265	0.257	588.01	0.0706
Rollers	75 < hp ≤ 100	0.59	0.265	0.025	1.052	0.00160	0.040	0.038	596.09	0.0019
Rubber Tire Loaders	75 < hp ≤ 100	0.21	0.266	0.025	1.053	0.00160	0.040	0.039	596.09	0.0019
Scrapers	300 < hp ≤ 600	0.59	0.208	0.033	0.565	0.00148	0.034	0.033	536.73	0.0024
Skid Steer Loaders	50 < hp ≤ 75	0.21	7.134	1.332	6.018	0.00254	0.987	0.957	692.09	0.0539
Surfacing Equipment	16 < hp ≤ 25	0.59	1.491	0.352	3.763	0.00219	0.170	0.165	595.15	0.0310
Surfacing Equipment	300 < hp ≤ 600	0.59	1.373	0.187	3.197	0.00183	0.198	0.192	536.29	0.0111
Surfacing Equipment	75 < hp ≤ 100	0.43	0.724	0.092	1.536	0.00168	0.097	0.094	595.89	0.0054
Tractors/Loaders/Backhoes	100 < hp ≤ 175	0.21	1.642	0.495	2.878	0.00201	0.341	0.331	625.11	0.0308
Tractors/Loaders/Backhoes	100 < hp ≤ 175	0.59	1.642	0.495	2.878	0.00201	0.341	0.331	625.11	0.0308
Tractors/Loaders/Backhoes	50 < hp ≤ 75	0.21	4.009	0.703	4.358	0.00223	0.527	0.511	693.94	0.0380
Tractors/Loaders/Backhoes	75 < hp ≤ 100	0.21	3.953	0.684	3.614	0.00223	0.525	0.510	694.00	0.0344
Trenchers	50 < hp ≤ 75	0.59	0.714	0.112	2.857	0.00166	0.084	0.081	595.82	0.0118

Note: Construction would start in 2025 and would continue through 2032 for the Proposed Action and the Hybrid Terminal Option. For the purpose of this analysis, emission factors for the first year of construction (2025) were used. Note, MOVES4 does not model N₂O for nonroad equipment; as such, emission factors for N₂O were not included in this analysis. HP denotes horsepower; LF denotes load factor; g/hp-hr denotes grams per horsepower-hour. CO denotes carbon monoxide, NO_x denotes nitrogen oxides, SO_x denotes sulfur oxides, VOC denotes volatile organic compounds, PM_{2.5} denotes fine particulate matter, PM₁₀ denotes coarse particulate matter, CO₂ denotes carbon dioxide, CH₄ denotes methane.

Source: MOVES4, Landrum & Brown 2024

TABLE 6-3: ON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION

Year	Task ID	Activity	Annual VMT	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (ST)	CH ₄ (ST)	N ₂ O (ST)
2025	C01	Employee Commute	109,825	0.4	0.00	0.01	0.0002	0.0003	0.0003	35.0	0.001	0.000
2025	C01	Material Delivery	76,293	0.2	0.01	0.31	0.0005	0.0040	0.0037	124.8	0.001	0.017
2025	L01	Employee Commute	250,770	0.9	0.01	0.03	0.0004	0.0007	0.0006	79.9	0.002	0.000
2025	L01	Material Delivery	9,812	0.0	0.00	0.04	0.0001	0.0005	0.0005	16.0	0.000	0.002
2025	L02	Employee Commute	491,394	1.7	0.02	0.06	0.0009	0.0013	0.0012	156.5	0.005	0.001
2025	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2025	S07	Employee Commute	3,248,191	11.5	0.11	0.40	0.0057	0.0086	0.0076	1034.6	0.032	0.006
2025	S07	Material Delivery	85,324	0.2	0.01	0.34	0.0005	0.0045	0.0041	139.6	0.002	0.019
2026	A01	Employee Commute	1,651,716	5.8	0.06	0.20	0.0029	0.0044	0.0039	526.1	0.016	0.003
2026	A01	Material Delivery	66,908	0.1	0.01	0.27	0.0004	0.0035	0.0032	109.4	0.001	0.015
2026	A02	Employee Commute	1,936,176	6.8	0.07	0.24	0.0034	0.0051	0.0046	616.7	0.019	0.003
2026	A02	Material Delivery	16,204	0.0	0.00	0.06	0.0001	0.0009	0.0008	26.5	0.000	0.004
2026	A06	Employee Commute	1,936,176	6.8	0.07	0.24	0.0034	0.0051	0.0046	616.7	0.019	0.003
2026	A06	Material Delivery	103,397	0.2	0.01	0.41	0.0006	0.0054	0.0050	169.1	0.002	0.023
2026	A07	Employee Commute	163,020	0.6	0.01	0.02	0.0003	0.0004	0.0004	51.9	0.002	0.000
2026	A07	Material Delivery	13,924	0.0	0.00	0.06	0.0001	0.0007	0.0007	22.8	0.000	0.003
2026	A08	Employee Commute	148,590	0.5	0.01	0.02	0.0003	0.0004	0.0003	47.3	0.001	0.000
2026	A08	Material Delivery	100,765	0.2	0.01	0.40	0.0006	0.0053	0.0049	164.8	0.002	0.022
2026	A10	Employee Commute	936,540	3.3	0.03	0.12	0.0017	0.0025	0.0022	298.3	0.009	0.002
2026	A10	Material Delivery	2,394	0.0	0.00	0.01	0.0000	0.0001	0.0001	3.9	0.000	0.001
2026	C01	Employee Commute	1,736,856	6.1	0.06	0.21	0.0031	0.0046	0.0041	553.2	0.017	0.003
2026	C01	Material Delivery	268,684	0.6	0.02	1.07	0.0016	0.0142	0.0130	439.5	0.005	0.059
2026	C02	Employee Commute	181,253	0.6	0.01	0.02	0.0003	0.0005	0.0004	57.7	0.002	0.000
2026	C02	Material Delivery	41,244	0.1	0.00	0.16	0.0002	0.0022	0.0020	67.5	0.001	0.009
2026	L01	Employee Commute	3,116,124	11.0	0.11	0.38	0.0055	0.0083	0.0073	992.5	0.031	0.005
2026	L01	Material Delivery	39,630	0.1	0.00	0.16	0.0002	0.0021	0.0019	64.8	0.001	0.009
2026	L02	Employee Commute	1,965,578	6.9	0.07	0.24	0.0035	0.0052	0.0046	626.1	0.019	0.003
2026	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2026	L04	Employee Commute	1,204,731	4.3	0.04	0.15	0.0021	0.0032	0.0028	383.7	0.012	0.002
2026	L04	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2026	S02	Employee Commute	1,273,800	4.5	0.04	0.16	0.0022	0.0034	0.0030	405.7	0.013	0.002
2026	S02	Material Delivery	113,948	0.3	0.01	0.46	0.0007	0.0060	0.0055	186.4	0.002	0.025
2026	S04	Employee Commute	4,282,542	15.1	0.15	0.53	0.0076	0.0114	0.0101	1364.0	0.042	0.007



TABLE 6-3: ON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Activity	Annual VMT	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (ST)	CH ₄ (ST)	N ₂ O (ST)
2026	S04	Material Delivery	4,319	0.0	0.00	0.02	0.0000	0.0002	0.0002	7.1	0.000	0.001
2026	S05	Employee Commute	3,392,297	12.0	0.12	0.42	0.0060	0.0090	0.0080	1080.5	0.034	0.006
2026	S05	Material Delivery	3,297	0.0	0.00	0.01	0.0000	0.0002	0.0002	5.4	0.000	0.001
2026	S06	Employee Commute	3,154,437	11.1	0.11	0.39	0.0056	0.0084	0.0074	1004.7	0.031	0.005
2026	S06	Material Delivery	4,519	0.0	0.00	0.02	0.0000	0.0002	0.0002	7.4	0.000	0.001
2026	S07	Employee Commute	5,789,520	20.4	0.20	0.71	0.0102	0.0154	0.0136	1844.0	0.057	0.010
2026	S07	Material Delivery	100,695	0.2	0.01	0.40	0.0006	0.0053	0.0049	164.7	0.002	0.022
2027	A01	Employee Commute	6,589,836	23.3	0.22	0.81	0.0116	0.0175	0.0155	2098.9	0.065	0.011
2027	A01	Material Delivery	129,672	0.3	0.01	0.52	0.0008	0.0068	0.0063	212.1	0.002	0.028
2027	A07	Employee Commute	1,452,132	5.1	0.05	0.18	0.0026	0.0039	0.0034	462.5	0.014	0.003
2027	A07	Material Delivery	40,954	0.1	0.00	0.16	0.0002	0.0022	0.0020	67.0	0.001	0.009
2027	A08	Employee Commute	1,047,222	3.7	0.04	0.13	0.0018	0.0028	0.0025	333.5	0.010	0.002
2027	A08	Material Delivery	371,148	0.8	0.03	1.48	0.0022	0.0196	0.0180	607.1	0.007	0.081
2027	A09	Employee Commute	1,149,390	4.1	0.04	0.14	0.0020	0.0031	0.0027	366.1	0.011	0.002
2027	A09	Material Delivery	46,273	0.1	0.00	0.19	0.0003	0.0024	0.0022	75.7	0.001	0.010
2027	A10	Employee Commute	936,540	3.3	0.03	0.12	0.0017	0.0025	0.0022	298.3	0.009	0.002
2027	A10	Material Delivery	2,394	0.0	0.00	0.01	0.0000	0.0001	0.0001	3.9	0.000	0.001
2027	C02	Employee Commute	2,894,760	10.2	0.10	0.36	0.0051	0.0077	0.0068	922.0	0.029	0.005
2027	C02	Material Delivery	41,244	0.1	0.00	0.16	0.0002	0.0022	0.0020	67.5	0.001	0.009
2027	L01	Employee Commute	3,116,124	11.0	0.11	0.38	0.0055	0.0083	0.0073	992.5	0.031	0.005
2027	L01	Material Delivery	39,630	0.1	0.00	0.16	0.0002	0.0021	0.0019	64.8	0.001	0.009
2027	L02	Employee Commute	1,965,578	6.9	0.07	0.24	0.0035	0.0052	0.0046	626.1	0.019	0.003
2027	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2027	L04	Employee Commute	4,827,438	17.0	0.16	0.59	0.0085	0.0128	0.0114	1537.6	0.048	0.008
2027	L04	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2027	L05	Employee Commute	2,652,111	9.4	0.09	0.33	0.0047	0.0071	0.0062	844.7	0.026	0.005
2027	L05	Material Delivery	1,353	0.0	0.00	0.01	0.0000	0.0001	0.0001	2.2	0.000	0.000
2027	S02	Employee Commute	2,281,752	8.1	0.08	0.28	0.0040	0.0061	0.0054	726.8	0.023	0.004
2027	S02	Material Delivery	150,059	0.3	0.01	0.60	0.0009	0.0079	0.0073	245.4	0.003	0.033
2027	S03	Employee Commute	1,019,040	3.6	0.03	0.13	0.0018	0.0027	0.0024	324.6	0.010	0.002
2027	S03	Material Delivery	5,059	0.0	0.00	0.02	0.0000	0.0003	0.0002	8.3	0.000	0.001
2027	S04	Employee Commute	4,282,542	15.1	0.15	0.53	0.0076	0.0114	0.0101	1364.0	0.042	0.007
2027	S04	Material Delivery	4,319	0.0	0.00	0.02	0.0000	0.0002	0.0002	7.1	0.000	0.001

TABLE 6-3: ON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Activity	Annual VMT	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (ST)	CH ₄ (ST)	N ₂ O (ST)
2027	S05	Employee Commute	845,883	3.0	0.03	0.10	0.0015	0.0022	0.0020	269.4	0.008	0.001
2027	S05	Material Delivery	2,853	0.0	0.00	0.01	0.0000	0.0002	0.0001	4.7	0.000	0.001
2027	S06	Employee Commute	4,407,348	15.6	0.15	0.54	0.0078	0.0117	0.0104	1403.8	0.044	0.008
2027	S06	Material Delivery	3,853	0.0	0.00	0.02	0.0000	0.0002	0.0002	6.3	0.000	0.001
2027	S07	Employee Commute	3,248,191	11.5	0.11	0.40	0.0057	0.0086	0.0076	1034.6	0.032	0.006
2027	S07	Material Delivery	85,324	0.2	0.01	0.34	0.0005	0.0045	0.0041	139.6	0.002	0.019
2027	S08	Employee Commute	904,613	3.2	0.03	0.11	0.0016	0.0024	0.0021	288.1	0.009	0.002
2027	S08	Material Delivery	40,058	0.1	0.00	0.16	0.0002	0.0021	0.0019	65.5	0.001	0.009
2027	S09	Employee Commute	904,613	3.2	0.03	0.11	0.0016	0.0024	0.0021	288.1	0.009	0.002
2027	S09	Material Delivery	40,058	0.1	0.00	0.16	0.0002	0.0021	0.0019	65.5	0.001	0.009
2027	T01	Employee Commute	10,131,66	35.8	0.34	1.25	0.0179	0.0269	0.0238	3227.0	0.100	0.018
2027	T01	Material Delivery	239,615	0.5	0.02	0.96	0.0014	0.0126	0.0116	391.9	0.004	0.052
2028	A01	Employee Commute	6,589,836	23.3	0.22	0.81	0.0116	0.0175	0.0155	2098.9	0.065	0.011
2028	A01	Material Delivery	129,672	0.3	0.01	0.52	0.0008	0.0068	0.0063	212.1	0.002	0.028
2028	A04	Employee Commute	2,394,744	8.5	0.08	0.30	0.0042	0.0064	0.0056	762.7	0.024	0.004
2028	A04	Material Delivery	100,575	0.2	0.01	0.40	0.0006	0.0053	0.0049	164.5	0.002	0.022
2028	A08	Employee Commute	1,047,222	3.7	0.04	0.13	0.0018	0.0028	0.0025	333.5	0.010	0.002
2028	A08	Material Delivery	403,060	0.9	0.04	1.61	0.0024	0.0212	0.0195	659.3	0.007	0.088
2028	A09	Employee Commute	1,149,390	4.1	0.04	0.14	0.0020	0.0031	0.0027	366.1	0.011	0.002
2028	A09	Material Delivery	46,273	0.1	0.00	0.19	0.0003	0.0024	0.0022	75.7	0.001	0.010
2028	A10	Employee Commute	528,627	1.9	0.02	0.07	0.0009	0.0014	0.0012	168.4	0.005	0.001
2028	A10	Material Delivery	1,862	0.0	0.00	0.01	0.0000	0.0001	0.0001	3.0	0.000	0.000
2028	C02	Employee Commute	116,903	0.4	0.00	0.01	0.0002	0.0003	0.0003	37.2	0.001	0.000
2028	C02	Material Delivery	41,244	0.1	0.00	0.16	0.0002	0.0022	0.0020	67.5	0.001	0.009
2028	C03	Employee Commute	216,645	0.8	0.01	0.03	0.0004	0.0006	0.0005	69.0	0.002	0.000
2028	C03	Material Delivery	41,244	0.1	0.00	0.16	0.0002	0.0022	0.0020	67.5	0.001	0.009
2028	L01	Employee Commute	3,116,124	11.0	0.11	0.38	0.0055	0.0083	0.0073	992.5	0.031	0.005
2028	L01	Material Delivery	39,630	0.1	0.00	0.16	0.0002	0.0021	0.0019	64.8	0.001	0.009
2028	L02	Employee Commute	1,965,578	6.9	0.07	0.24	0.0035	0.0052	0.0046	626.1	0.019	0.003
2028	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2028	L03	Employee Commute	418,275	1.5	0.01	0.05	0.0007	0.0011	0.0010	133.2	0.004	0.001
2028	L03	Material Delivery	12,176	0.0	0.00	0.05	0.0001	0.0006	0.0006	19.9	0.000	0.003
2028	L04	Employee Commute	4,827,438	17.0	0.16	0.59	0.0085	0.0128	0.0114	1537.6	0.048	0.008



TABLE 6-3: ON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Activity	Annual VMT	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (ST)	CH ₄ (ST)	N ₂ O (ST)
2028	L04	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2028	L05	Employee Commute	5,955,015	21.0	0.20	0.73	0.0105	0.0158	0.0140	1896.7	0.059	0.010
2028	L05	Material Delivery	1,353	0.0	0.00	0.01	0.0000	0.0001	0.0001	2.2	0.000	0.000
2028	S01	Employee Commute	386,685	1.4	0.01	0.05	0.0007	0.0010	0.0009	123.2	0.004	0.001
2028	S01	Material Delivery	13,537	0.0	0.00	0.05	0.0001	0.0007	0.0007	22.1	0.000	0.003
2028	S02	Employee Commute	145,860	0.5	0.00	0.02	0.0003	0.0004	0.0003	46.5	0.001	0.000
2028	S02	Material Delivery	41,309	0.1	0.00	0.17	0.0002	0.0022	0.0020	67.6	0.001	0.009
2028	S03	Employee Commute	1,813,482	6.4	0.06	0.22	0.0032	0.0048	0.0043	577.6	0.018	0.003
2028	S03	Material Delivery	5,059	0.0	0.00	0.02	0.0000	0.0003	0.0002	8.3	0.000	0.001
2028	S04	Employee Commute	2,401,113	8.5	0.08	0.30	0.0042	0.0064	0.0056	764.8	0.024	0.004
2028	S04	Material Delivery	3,608	0.0	0.00	0.01	0.0000	0.0002	0.0002	5.9	0.000	0.001
2028	S08	Employee Commute	2,034,896	7.2	0.07	0.25	0.0036	0.0054	0.0048	648.1	0.020	0.004
2028	S08	Material Delivery	41,525	0.1	0.00	0.17	0.0003	0.0022	0.0020	67.9	0.001	0.009
2028	S09	Employee Commute	2,034,896	7.2	0.07	0.25	0.0036	0.0054	0.0048	648.1	0.020	0.004
2028	S09	Material Delivery	41,525	0.1	0.00	0.17	0.0003	0.0022	0.0020	67.9	0.001	0.009
2028	T01	Employee Commute	10,131,66	35.8	0.34	1.25	0.0179	0.0269	0.0238	3227.0	0.100	0.018
2028	T01	Material Delivery	239,615	0.5	0.02	0.96	0.0014	0.0126	0.0116	391.9	0.004	0.052
2028	T02	Employee Commute	9,508,917	33.6	0.32	1.17	0.0168	0.0253	0.0224	3028.7	0.094	0.017
2028	T02	Material Delivery	117,474	0.3	0.01	0.47	0.0007	0.0062	0.0057	192.1	0.002	0.026
2029	A01	Employee Commute	416,130	1.5	0.01	0.05	0.0007	0.0011	0.0010	132.5	0.004	0.001
2029	A01	Material Delivery	33,493	0.1	0.00	0.13	0.0002	0.0018	0.0016	54.8	0.001	0.007
2029	A04	Employee Commute	4,257,000	15.0	0.14	0.52	0.0075	0.0113	0.0100	1355.9	0.042	0.007
2029	A04	Material Delivery	134,544	0.3	0.01	0.54	0.0008	0.0071	0.0065	220.1	0.002	0.029
2029	A05	Employee Commute	130,845	0.5	0.00	0.02	0.0002	0.0003	0.0003	41.7	0.001	0.000
2029	A05	Material Delivery	2,220	0.0	0.00	0.01	0.0000	0.0001	0.0001	3.6	0.000	0.000
2029	A08	Employee Commute	148,590	0.5	0.01	0.02	0.0003	0.0004	0.0003	47.3	0.001	0.000
2029	A08	Material Delivery	100,765	0.2	0.01	0.40	0.0006	0.0053	0.0049	164.8	0.002	0.022
2029	A09	Employee Commute	122,850	0.4	0.00	0.02	0.0002	0.0003	0.0003	39.1	0.001	0.000
2029	A09	Material Delivery	11,968	0.0	0.00	0.05	0.0001	0.0006	0.0006	19.6	0.000	0.003
2029	C03	Employee Commute	3,473,712	12.3	0.12	0.43	0.0061	0.0092	0.0082	1106.4	0.034	0.006
2029	C03	Material Delivery	41,244	0.1	0.00	0.16	0.0002	0.0022	0.0020	67.5	0.001	0.009
2029	L01	Employee Commute	3,116,124	11.0	0.11	0.38	0.0055	0.0083	0.0073	992.5	0.031	0.005
2029	L01	Material Delivery	39,630	0.1	0.00	0.16	0.0002	0.0021	0.0019	64.8	0.001	0.009

TABLE 6-3: ON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Activity	Annual VMT	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (ST)	CH ₄ (ST)	N ₂ O (ST)
2029	L02	Employee Commute	1,965,578	6.9	0.07	0.24	0.0035	0.0052	0.0046	626.1	0.019	0.003
2029	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2029	L03	Employee Commute	6,632,406	23.4	0.23	0.82	0.0117	0.0176	0.0156	2112.5	0.066	0.012
2029	L03	Material Delivery	48,706	0.1	0.00	0.19	0.0003	0.0026	0.0024	79.7	0.001	0.011
2029	L04	Employee Commute	304,590	1.1	0.01	0.04	0.0005	0.0008	0.0007	97.0	0.003	0.001
2029	L04	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2029	L07	Employee Commute	1,894,365	6.7	0.06	0.23	0.0033	0.0050	0.0045	603.4	0.019	0.003
2029	L07	Material Delivery	87,092	0.2	0.01	0.35	0.0005	0.0046	0.0042	142.5	0.002	0.019
2029	S01	Employee Commute	5,585,184	19.7	0.19	0.69	0.0098	0.0148	0.0131	1778.9	0.055	0.010
2029	S01	Material Delivery	48,368	0.1	0.00	0.19	0.0003	0.0025	0.0023	79.1	0.001	0.011
2029	S03	Employee Commute	1,019,040	3.6	0.03	0.13	0.0018	0.0027	0.0024	324.6	0.010	0.002
2029	S03	Material Delivery	5,059	0.0	0.00	0.02	0.0000	0.0003	0.0002	8.3	0.000	0.001
2029	S10	Employee Commute	8,275,608	29.2	0.28	1.02	0.0146	0.0220	0.0195	2635.8	0.082	0.014
2029	S10	Material Delivery	98,224	0.2	0.01	0.39	0.0006	0.0052	0.0048	160.7	0.002	0.022
2029	T01	Employee Commute	10,131,66	35.8	0.34	1.25	0.0179	0.0269	0.0238	3227.0	0.100	0.018
2029	T01	Material Delivery	239,615	0.5	0.02	0.96	0.0014	0.0126	0.0116	391.9	0.004	0.052
2029	T02	Employee Commute	17,028,00	60.1	0.58	2.10	0.0300	0.0453	0.0400	5423.5	0.168	0.030
2029	T02	Material Delivery	124,124	0.3	0.01	0.50	0.0007	0.0065	0.0060	203.0	0.002	0.027
2030	A04	Employee Commute	4,257,000	15.0	0.14	0.52	0.0075	0.0113	0.0100	1355.9	0.042	0.007
2030	A04	Material Delivery	134,544	0.3	0.01	0.54	0.0008	0.0071	0.0065	220.1	0.002	0.029
2030	A05	Employee Commute	2,068,902	7.3	0.07	0.25	0.0036	0.0055	0.0049	659.0	0.020	0.004
2030	A05	Material Delivery	8,880	0.0	0.00	0.04	0.0001	0.0005	0.0004	14.5	0.000	0.002
2030	L02	Employee Commute	1,965,578	6.9	0.07	0.24	0.0035	0.0052	0.0046	626.1	0.019	0.003
2030	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2030	L03	Employee Commute	3,725,865	13.2	0.13	0.46	0.0066	0.0099	0.0088	1186.7	0.037	0.006
2030	L03	Material Delivery	36,530	0.1	0.00	0.15	0.0002	0.0019	0.0018	59.8	0.001	0.008
2030	L07	Employee Commute	7,577,460	26.8	0.26	0.93	0.0134	0.0201	0.0178	2413.5	0.075	0.013
2030	L07	Material Delivery	87,092	0.2	0.01	0.35	0.0005	0.0046	0.0042	142.5	0.002	0.019
2030	S01	Employee Commute	5,585,184	19.7	0.19	0.69	0.0098	0.0148	0.0131	1778.9	0.055	0.010
2030	S01	Material Delivery	48,368	0.1	0.00	0.19	0.0003	0.0025	0.0023	79.1	0.001	0.011
2030	S10	Employee Commute	4,643,001	16.4	0.16	0.57	0.0082	0.0123	0.0109	1478.8	0.046	0.008
2030	S10	Material Delivery	98,224	0.2	0.01	0.39	0.0006	0.0052	0.0048	160.7	0.002	0.022
2030	T01	Employee Commute	10,131,66	35.8	0.34	1.25	0.0179	0.0269	0.0238	3227.0	0.100	0.018



TABLE 6-3: ON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (*CONTINUED*)

Year	Task ID	Activity	Annual VMT	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (ST)	CH ₄ (ST)	N ₂ O (ST)
2030	T01	Material Delivery	239,615	0.5	0.02	0.96	0.0014	0.0126	0.0116	391.9	0.004	0.052
2030	T02	Employee Commute	17,028,00	60.1	0.58	2.10	0.0300	0.0453	0.0400	5423.5	0.168	0.030
2030	T02	Material Delivery	124,124	0.3	0.01	0.50	0.0007	0.0065	0.0060	203.0	0.002	0.027
2031	A04	Employee Commute	4,257,000	15.0	0.14	0.52	0.0075	0.0113	0.0100	1355.9	0.042	0.007
2031	A04	Material Delivery	134,544	0.3	0.01	0.54	0.0008	0.0071	0.0065	220.1	0.002	0.029
2031	L02	Employee Commute	1,965,578	6.9	0.07	0.24	0.0035	0.0052	0.0046	626.1	0.019	0.003
2031	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2031	L07	Employee Commute	478,335	1.7	0.02	0.06	0.0008	0.0013	0.0011	152.4	0.005	0.001
2031	L07	Material Delivery	87,092	0.2	0.01	0.35	0.0005	0.0046	0.0042	142.5	0.002	0.019
2031	S01	Employee Commute	5,585,184	19.7	0.19	0.69	0.0098	0.0148	0.0131	1778.9	0.055	0.010
2031	S01	Material Delivery	48,368	0.1	0.00	0.19	0.0003	0.0025	0.0023	79.1	0.001	0.011
2031	T01	Employee Commute	10,131,66	35.8	0.34	1.25	0.0179	0.0269	0.0238	3227.0	0.100	0.018
2031	T01	Material Delivery	239,615	0.5	0.02	0.96	0.0014	0.0126	0.0116	391.9	0.004	0.052
2031	T02	Employee Commute	17,028,00	60.1	0.58	2.10	0.0300	0.0453	0.0400	5423.5	0.168	0.030
2031	T02	Material Delivery	124,124	0.3	0.01	0.50	0.0007	0.0065	0.0060	203.0	0.002	0.027
2032	A04	Employee Commute	1,064,250	3.8	0.04	0.13	0.0019	0.0028	0.0025	339.0	0.011	0.002
2032	A04	Material Delivery	67,115	0.1	0.01	0.27	0.0004	0.0035	0.0033	109.8	0.001	0.015
2032	L02	Employee Commute	123,801	0.4	0.00	0.02	0.0002	0.0003	0.0003	39.4	0.001	0.000
2032	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2032	T02	Employee Commute	9,470,703	33.4	0.32	1.17	0.0167	0.0252	0.0223	3016.5	0.094	0.016
2032	T02	Material Delivery	117,474	0.3	0.01	0.47	0.0007	0.0062	0.0057	192.1	0.002	0.026

Note: VMT denotes vehicle miles traveled; ST denotes short tons; CO denotes carbon monoxide, NO_x denotes nitrogen oxides, SO_x denotes sulfur oxides, VOC denotes volatile organic compounds, PM_{2.5} denotes fine particulate matter, PM₁₀ denotes coarse particulate matter, CO₂ denotes carbon dioxide, CH₄ denotes methane, N₂O denotes nitrous oxide.

Source: MOVES4, Landrum & Brown 2024

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2025	C01	Aerial Lifts	50 < hp <= 75	0.21	3,024.0	0.1152	0.0219	0.1918	0.0001	0.0137	0.0133	33.1	0.00119
2025	C01	Aerial Lifts	75 < hp <= 100	0.59	936.1	0.1522	0.0241	0.1652	0.0001	0.0193	0.0187	38.4	0.00112
2025	C01	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2025	C01	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2025	C01	Chippers/Stump Grinders	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2025	C01	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2025	C01	Cranes	175 < hp <= 300	0.43	336.1	0.0033	0.0012	0.0142	0.0001	0.0008	0.0007	23.0	0.00007
2025	C01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	22.6	0.0003	0.0000	0.0007	0.0000	0.0001	0.0001	1.3	0.00000
2025	C01	Excavators	100 < hp <= 175	0.59	119.4	0.0011	0.0002	0.0035	0.0000	0.0003	0.0002	6.6	0.00001
2025	C01	Forklifts	75 < hp <= 100	0.59	3,424.2	0.0115	0.0017	0.1909	0.0003	0.0027	0.0026	120.4	0.00011
2025	C01	Generator Sets	25 < hp <= 40	0.43	412.8	0.0054	0.0015	0.0240	0.0000	0.0009	0.0009	4.2	0.00013
2025	C01	Off-highway Trucks	300 < hp <= 600	0.59	2,240.3	0.0365	0.0106	0.1396	0.0012	0.0088	0.0086	425.7	0.00053
2025	C01	Other Construction Equipment	300 < hp <= 600	0.59	12.0	0.0047	0.0006	0.0107	0.0000	0.0007	0.0007	2.3	0.00004
2025	C01	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2025	C01	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2025	C01	Pumps	6 < hp <= 11	0.43	12.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2025	C01	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2025	C01	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2025	C01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2025	C01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	249.6	0.0174	0.0030	0.0189	0.0000	0.0023	0.0022	2.7	0.00015



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2025	C01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.1	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2025	L01	Chippers/Stump Grinders	75 < hp <= 100	0.43	4.8	0.0003	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00000
2025	L01	Concrete/Industrial Saws	6 < hp <= 11	0.7	4.8	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2025	L01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	51.7	0.0006	0.0001	0.0016	0.0000	0.0001	0.0001	2.9	0.00001
2025	L01	Excavators	100 < hp <= 175	0.59	28.3	0.0003	0.0000	0.0008	0.0000	0.0001	0.0001	1.6	0.00000
2025	L01	Graders	175 < hp <= 300	0.59	2.0	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.2	0.00000
2025	L01	Irrigation Sets	300 < hp <= 600	0.59	1.8	0.0005	0.0001	0.0019	0.0000	0.0001	0.0001	0.3	0.00001
2025	L01	Off-highway Trucks	300 < hp <= 600	0.59	1,014.0	0.0165	0.0048	0.0632	0.0006	0.0040	0.0039	192.7	0.00024
2025	L01	Other Construction Equipment	100 < hp <= 175	0.43	65.5	0.0013	0.0003	0.0036	0.0000	0.0003	0.0003	2.6	0.00002
2025	L01	Pavers	100 < hp <= 175	0.59	8.2	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2025	L01	Plate Compactors	3 < hp <= 6	0.43	12.2	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2025	L01	Pumps	6 < hp <= 11	0.43	1.6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.00000
2025	L01	Rollers	75 < hp <= 100	0.59	22.7	0.0004	0.0000	0.0016	0.0000	0.0001	0.0001	0.8	0.00000
2025	L01	Scrapers	300 < hp <= 600	0.59	7.0	0.0006	0.0001	0.0015	0.0000	0.0001	0.0001	1.3	0.00001
2025	L01	Skid Steer Loaders	50 < hp <= 75	0.21	12.9	0.0016	0.0003	0.0013	0.0000	0.0002	0.0002	0.1	0.00001
2025	L01	Surfacing Equipment	16 < hp <= 25	0.59	2.7	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2025	L01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	12.1	0.0023	0.0007	0.0040	0.0000	0.0005	0.0005	0.8	0.00004
2025	L01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	27.4	0.0025	0.0004	0.0023	0.0000	0.0003	0.0003	0.4	0.00002
2025	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2025	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2025	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2025	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2025	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2025	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2025	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2025	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2025	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2025	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2025	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2025	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2025	S07	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2025	S07	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2025	S07	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2025	S07	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2025	S07	Chippers/Stump Grinders	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2025	S07	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2025	S07	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2025	S07	Crawler Tractor/Dozers	100 < hp <= 175	0.59	61.5	0.0007	0.0001	0.0019	0.0000	0.0002	0.0002	3.4	0.00001
2025	S07	Excavators	100 < hp <= 175	0.59	270.3	0.0024	0.0004	0.0080	0.0000	0.0006	0.0006	15.0	0.00003

**TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)**

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2025	S07	Forklifts	75 < hp <= 100	0.59	3,584.0	0.0121	0.0018	0.1998	0.0004	0.0028	0.0027	126.1	0.00012
2025	S07	Generator Sets	25 < hp <= 40	0.43	144.8	0.0019	0.0005	0.0084	0.0000	0.0003	0.0003	1.5	0.00004
2025	S07	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2025	S07	Off-highway Trucks	300 < hp <= 600	0.59	6,930.2	0.1129	0.0328	0.4318	0.0038	0.0273	0.0265	1,316.9	0.00164
2025	S07	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2025	S07	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2025	S07	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2025	S07	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2025	S07	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2025	S07	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2025	S07	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2025	S07	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	153.6	0.0107	0.0019	0.0116	0.0000	0.0014	0.0014	1.7	0.00009
2025	S07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	600.0	0.0549	0.0095	0.0502	0.0000	0.0073	0.0071	8.7	0.00043
2026	A01	Air Compressors	75 < hp <= 100	0.43	58.3	0.0012	0.0001	0.0039	0.0000	0.0002	0.0002	1.5	0.00001
2026	A01	Chippers/Stump Grinders	75 < hp <= 100	0.43	50.4	0.0029	0.0005	0.0065	0.0000	0.0005	0.0005	1.3	0.00002
2026	A01	Concrete/Industrial Saws	25 < hp <= 40	0.59	58.3	0.0005	0.0001	0.0039	0.0000	0.0000	0.0000	0.8	0.00002
2026	A01	Concrete/Industrial Saws	6 < hp <= 11	0.7	50.4	0.0011	0.0004	0.0018	0.0000	0.0001	0.0001	0.2	0.00003
2026	A01	Cranes	175 < hp <= 300	0.43	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-	0.00000
2026	A01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	386.6	0.0043	0.0007	0.0121	0.0001	0.0011	0.0010	21.4	0.00005
2026	A01	Excavators	100 < hp <= 175	0.59	476.0	0.0042	0.0007	0.0140	0.0001	0.0010	0.0010	26.4	0.00005

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	A01	Graders	175 < hp <= 300	0.59	20.1	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.9	0.00000
2026	A01	Irrigation Sets	300 < hp <= 600	0.59	18.1	0.0053	0.0011	0.0188	0.0000	0.0009	0.0009	3.4	0.00007
2026	A01	Off-highway Trucks	300 < hp <= 600	0.59	4,176.0	0.0680	0.0198	0.2602	0.0023	0.0165	0.0160	793.5	0.00099
2026	A01	Other Construction Equipment	100 < hp <= 175	0.43	636.8	0.0122	0.0029	0.0346	0.0001	0.0027	0.0026	25.7	0.00019
2026	A01	Pavers	100 < hp <= 175	0.59	58.3	0.0009	0.0001	0.0020	0.0000	0.0002	0.0002	3.2	0.00001
2026	A01	Pumps	6 < hp <= 11	0.43	16.8	0.0002	0.0001	0.0004	0.0000	0.0000	0.0000	0.0	0.00001
2026	A01	Rollers	75 < hp <= 100	0.59	231.4	0.0040	0.0004	0.0158	0.0000	0.0006	0.0006	8.1	0.00003
2026	A01	Scrapers	300 < hp <= 600	0.59	72.8	0.0059	0.0010	0.0160	0.0000	0.0010	0.0009	13.8	0.00006
2026	A01	Skid Steer Loaders	50 < hp <= 75	0.21	30.9	0.0038	0.0007	0.0032	0.0000	0.0005	0.0005	0.3	0.00003
2026	A01	Surfacing Equipment	16 < hp <= 25	0.59	58.3	0.0014	0.0003	0.0036	0.0000	0.0002	0.0002	0.5	0.00003
2026	A01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	201.7	0.0377	0.0114	0.0661	0.0000	0.0078	0.0076	13.0	0.00064
2026	A01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	87.9	0.0080	0.0014	0.0074	0.0000	0.0011	0.0010	1.3	0.00006
2026	A02	Chippers/Stump Grinders	75 < hp <= 100	0.43	30.0	0.0018	0.0003	0.0039	0.0000	0.0003	0.0003	0.8	0.00001
2026	A02	Concrete/Industrial Saws	6 < hp <= 11	0.7	30.0	0.0006	0.0002	0.0011	0.0000	0.0001	0.0001	0.1	0.00002
2026	A02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	206.4	0.0023	0.0004	0.0065	0.0000	0.0006	0.0005	11.4	0.00003
2026	A02	Excavators	100 < hp <= 175	0.59	53.1	0.0005	0.0001	0.0016	0.0000	0.0001	0.0001	2.9	0.00001
2026	A02	Graders	175 < hp <= 300	0.59	12.1	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	1.2	0.00000
2026	A02	Irrigation Sets	300 < hp <= 600	0.59	10.9	0.0032	0.0007	0.0114	0.0000	0.0005	0.0005	2.1	0.00004
2026	A02	Off-highway Trucks	300 < hp <= 600	0.59	3,365.7	0.0548	0.0159	0.2097	0.0019	0.0133	0.0129	639.6	0.00080



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	A02	Other Construction Equipment	100 < hp <= 175	0.43	305.0	0.0058	0.0014	0.0166	0.0000	0.0013	0.0012	12.3	0.00009
2026	A02	Pavers	100 < hp <= 175	0.59	14.2	0.0002	0.0000	0.0005	0.0000	0.0001	0.0001	0.8	0.00000
2026	A02	Pumps	6 < hp <= 11	0.43	10.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2026	A02	Rollers	75 < hp <= 100	0.59	131.8	0.0023	0.0002	0.0090	0.0000	0.0003	0.0003	4.6	0.00002
2026	A02	Scrapers	300 < hp <= 600	0.59	47.3	0.0038	0.0006	0.0104	0.0000	0.0006	0.0006	9.0	0.00004
2026	A02	Skid Steer Loaders	50 < hp <= 75	0.21	23.3	0.0029	0.0005	0.0024	0.0000	0.0004	0.0004	0.3	0.00002
2026	A02	Surfacing Equipment	16 < hp <= 25	0.59	18.2	0.0004	0.0001	0.0011	0.0000	0.0001	0.0000	0.2	0.00001
2026	A02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	32.8	0.0061	0.0018	0.0107	0.0000	0.0013	0.0012	2.1	0.00010
2026	A02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	27.6	0.0025	0.0004	0.0023	0.0000	0.0003	0.0003	0.4	0.00002
2026	A06	Air Compressors	75 < hp <= 100	0.43	107.9	0.0022	0.0003	0.0071	0.0000	0.0004	0.0004	2.7	0.00002
2026	A06	Chippers/Stump Grinders	75 < hp <= 100	0.43	86.4	0.0051	0.0009	0.0112	0.0000	0.0009	0.0009	2.2	0.00004
2026	A06	Concrete/Industrial Saws	25 < hp <= 40	0.59	107.9	0.0009	0.0003	0.0072	0.0000	0.0001	0.0001	1.5	0.00003
2026	A06	Concrete/Industrial Saws	6 < hp <= 11	0.7	86.4	0.0018	0.0006	0.0031	0.0000	0.0002	0.0002	0.4	0.00005
2026	A06	Crawler Tractor/Dozers	100 < hp <= 175	0.59	602.9	0.0067	0.0010	0.0189	0.0001	0.0017	0.0016	33.4	0.00007
2026	A06	Excavators	100 < hp <= 175	0.59	165.8	0.0015	0.0002	0.0049	0.0000	0.0004	0.0003	9.2	0.00002
2026	A06	Graders	175 < hp <= 300	0.59	34.6	0.0003	0.0001	0.0012	0.0000	0.0001	0.0001	3.3	0.00000
2026	A06	Irrigation Sets	300 < hp <= 600	0.59	31.1	0.0091	0.0019	0.0324	0.0000	0.0015	0.0015	5.8	0.00013
2026	A06	Off-highway Trucks	300 < hp <= 600	0.59	6,231.1	0.1015	0.0295	0.3882	0.0035	0.0246	0.0238	1,184.1	0.00147
2026	A06	Other Construction Equipment	100 < hp <= 175	0.43	1,027.4	0.0197	0.0046	0.0559	0.0001	0.0043	0.0042	41.5	0.00031

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	A06	Pavers	100 < hp <= 175	0.59	107.9	0.0016	0.0002	0.0037	0.0000	0.0004	0.0004	6.0	0.00002
2026	A06	Pumps	6 < hp <= 11	0.43	28.8	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2026	A06	Rollers	75 < hp <= 100	0.59	349.8	0.0060	0.0006	0.0239	0.0000	0.0009	0.0009	12.3	0.00004
2026	A06	Scrapers	300 < hp <= 600	0.59	134.9	0.0110	0.0018	0.0297	0.0001	0.0018	0.0017	25.6	0.00011
2026	A06	Skid Steer Loaders	50 < hp <= 75	0.21	26.2	0.0032	0.0006	0.0027	0.0000	0.0004	0.0004	0.3	0.00002
2026	A06	Surfacing Equipment	16 < hp <= 25	0.59	107.9	0.0026	0.0006	0.0066	0.0000	0.0003	0.0003	0.9	0.00005
2026	A06	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	224.1	0.0419	0.0126	0.0734	0.0001	0.0087	0.0084	14.5	0.00071
2026	A06	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	87.1	0.0080	0.0014	0.0073	0.0000	0.0011	0.0010	1.3	0.00006
2026	A07	Air Compressors	75 < hp <= 100	0.43	14.5	0.0003	0.0000	0.0010	0.0000	0.0001	0.0000	0.4	0.00000
2026	A07	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	12.0	0.0007	0.0001	0.0016	0.0000	0.0001	0.0001	0.3	0.00001
2026	A07	Concrete/Industrial Saws	25 < hp <= 40	0.59	14.5	0.0001	0.0000	0.0010	0.0000	0.0000	0.0000	0.2	0.00000
2026	A07	Concrete/Industrial Saws	6 < hp <= 11	0.7	12.0	0.0003	0.0001	0.0004	0.0000	0.0000	0.0000	0.1	0.00001
2026	A07	Crawler Tractor/Dozers	100 < hp <= 175	0.59	79.7	0.0009	0.0001	0.0025	0.0000	0.0002	0.0002	4.4	0.00001
2026	A07	Excavators	100 < hp <= 175	0.59	20.3	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.1	0.00000
2026	A07	Graders	175 < hp <= 300	0.59	4.8	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.5	0.00000
2026	A07	Irrigation Sets	300 < hp <= 600	0.59	4.3	0.0013	0.0003	0.0045	0.0000	0.0002	0.0002	0.8	0.00002
2026	A07	Off-highway Trucks	300 < hp <= 600	0.59	1,267.1	0.0206	0.0060	0.0790	0.0007	0.0050	0.0048	240.8	0.00030
2026	A07	Other Construction Equipment	100 < hp <= 175	0.43	137.1	0.0026	0.0006	0.0075	0.0000	0.0006	0.0006	5.5	0.00004
2026	A07	Pavers	100 < hp <= 175	0.59	14.5	0.0002	0.0000	0.0005	0.0000	0.0001	0.0001	0.8	0.00000
2026	A07	Pumps	6 < hp <= 11	0.43	4.0	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	A07	Rollers	75 < hp <= 100	0.59	45.2	0.0008	0.0001	0.0031	0.0000	0.0001	0.0001	1.6	0.00001
2026	A07	Scrapers	300 < hp <= 600	0.59	18.2	0.0015	0.0002	0.0040	0.0000	0.0002	0.0002	3.5	0.00002
2026	A07	Skid Steer Loaders	50 < hp <= 75	0.21	5.3	0.0007	0.0001	0.0006	0.0000	0.0001	0.0001	0.1	0.00000
2026	A07	Surfacing Equipment	16 < hp <= 25	0.59	14.5	0.0004	0.0001	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2026	A07	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	28.8	0.0054	0.0016	0.0094	0.0000	0.0011	0.0011	1.9	0.00009
2026	A07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	12.5	0.0011	0.0002	0.0010	0.0000	0.0002	0.0001	0.2	0.00001
2026	A08	Air Compressors	75 < hp <= 100	0.43	13.3	0.0003	0.0000	0.0009	0.0000	0.0000	0.0000	0.3	0.00000
2026	A08	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	10.8	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.3	0.00000
2026	A08	Concrete/Industrial Saws	25 < hp <= 40	0.59	13.3	0.0001	0.0000	0.0009	0.0000	0.0000	0.0000	0.2	0.00000
2026	A08	Concrete/Industrial Saws	6 < hp <= 11	0.7	10.8	0.0002	0.0001	0.0004	0.0000	0.0000	0.0000	0.0	0.00001
2026	A08	Crawler Tractor/Dozers	100 < hp <= 175	0.59	108.1	0.0012	0.0002	0.0034	0.0000	0.0003	0.0003	6.0	0.00001
2026	A08	Excavators	100 < hp <= 175	0.59	197.5	0.0017	0.0003	0.0058	0.0000	0.0004	0.0004	10.9	0.00002
2026	A08	Generator Sets	25 < hp <= 40	0.43	144.0	0.0019	0.0005	0.0084	0.0000	0.0003	0.0003	1.5	0.00004
2026	A08	Graders	175 < hp <= 300	0.59	4.5	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.4	0.00000
2026	A08	Irrigation Sets	300 < hp <= 600	0.59	4.0	0.0012	0.0003	0.0042	0.0000	0.0002	0.0002	0.8	0.00002
2026	A08	Off-highway Trucks	300 < hp <= 600	0.59	1,768.7	0.0288	0.0084	0.1102	0.0010	0.0070	0.0068	336.1	0.00042
2026	A08	Other Construction Equipment	100 < hp <= 175	0.43	135.3	0.0026	0.0006	0.0074	0.0000	0.0006	0.0006	5.5	0.00004
2026	A08	Pavers	100 < hp <= 175	0.59	13.3	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.7	0.00000
2026	A08	Pumps	6 < hp <= 11	0.43	3.6	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	A08	Rollers	75 < hp <= 100	0.59	40.4	0.0007	0.0001	0.0028	0.0000	0.0001	0.0001	1.4	0.00000
2026	A08	Scrapers	300 < hp <= 600	0.59	16.7	0.0014	0.0002	0.0037	0.0000	0.0002	0.0002	3.2	0.00001
2026	A08	Skid Steer Loaders	50 < hp <= 75	0.21	5.6	0.0007	0.0001	0.0006	0.0000	0.0001	0.0001	0.1	0.00000
2026	A08	Surfacing Equipment	16 < hp <= 25	0.59	13.3	0.0003	0.0001	0.0008	0.0000	0.0000	0.0000	0.1	0.00001
2026	A08	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	25.4	0.0047	0.0014	0.0083	0.0000	0.0010	0.0010	1.6	0.00008
2026	A08	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	288.0	0.0200	0.0035	0.0218	0.0000	0.0026	0.0026	3.1	0.00017
2026	A08	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	11.5	0.0011	0.0002	0.0010	0.0000	0.0001	0.0001	0.2	0.00001
2026	A10	Air Compressors	75 < hp <= 100	0.43	2.5	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.1	0.00000
2026	A10	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	3.6	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.1	0.00000
2026	A10	Concrete/Industrial Saws	25 < hp <= 40	0.59	2.5	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2026	A10	Concrete/Industrial Saws	6 < hp <= 11	0.7	3.6	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2026	A10	Crawler Tractor/Dozers	100 < hp <= 175	0.59	28.9	0.0003	0.0000	0.0009	0.0000	0.0001	0.0001	1.6	0.00000
2026	A10	Excavators	100 < hp <= 175	0.59	17.2	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	1.0	0.00000
2026	A10	Graders	175 < hp <= 300	0.59	1.3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.00000
2026	A10	Irrigation Sets	300 < hp <= 600	0.59	1.2	0.0003	0.0001	0.0012	0.0000	0.0001	0.0001	0.2	0.00000
2026	A10	Off-highway Trucks	300 < hp <= 600	0.59	3,032.8	0.0494	0.0143	0.1890	0.0017	0.0120	0.0116	576.3	0.00072
2026	A10	Other Construction Equipment	100 < hp <= 175	0.43	50.7	0.0010	0.0002	0.0028	0.0000	0.0002	0.0002	2.0	0.00002
2026	A10	Pavers	100 < hp <= 175	0.59	2.5	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.1	0.00000
2026	A10	Pumps	6 < hp <= 11	0.43	1.2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.00000



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	A10	Rollers	75 < hp <= 100	0.59	22.0	0.0004	0.0000	0.0015	0.0000	0.0001	0.0001	0.8	0.00000
2026	A10	Scrapers	300 < hp <= 600	0.59	3.1	0.0003	0.0000	0.0007	0.0000	0.0000	0.0000	0.6	0.00000
2026	A10	Skid Steer Loaders	50 < hp <= 75	0.21	6.2	0.0008	0.0001	0.0006	0.0000	0.0001	0.0001	0.1	0.00001
2026	A10	Surfacing Equipment	16 < hp <= 25	0.59	2.5	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2026	A10	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	31.6	0.0059	0.0018	0.0104	0.0000	0.0012	0.0012	2.0	0.00010
2026	A10	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	15.6	0.0014	0.0002	0.0013	0.0000	0.0002	0.0002	0.2	0.00001
2026	C01	Aerial Lifts	50 < hp <= 75	0.21	3,024.0	0.1152	0.0219	0.1918	0.0001	0.0137	0.0133	33.1	0.00119
2026	C01	Aerial Lifts	75 < hp <= 100	0.59	936.1	0.1522	0.0241	0.1652	0.0001	0.0193	0.0187	38.4	0.00112
2026	C01	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2026	C01	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2026	C01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2026	C01	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2026	C01	Cranes	175 < hp <= 300	0.43	336.1	0.0033	0.0012	0.0142	0.0001	0.0008	0.0007	23.0	0.00007
2026	C01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	42.4	0.0005	0.0001	0.0013	0.0000	0.0001	0.0001	2.3	0.00001
2026	C01	Excavators	100 < hp <= 175	0.59	477.6	0.0042	0.0007	0.0141	0.0001	0.0010	0.0010	26.5	0.00005
2026	C01	Forklifts	75 < hp <= 100	0.59	3,424.2	0.0115	0.0017	0.1909	0.0003	0.0027	0.0026	120.4	0.00011
2026	C01	Generator Sets	25 < hp <= 40	0.43	751.2	0.0098	0.0027	0.0437	0.0000	0.0016	0.0016	7.6	0.00023
2026	C01	Off-highway Trucks	300 < hp <= 600	0.59	3,351.4	0.0546	0.0159	0.2088	0.0019	0.0132	0.0128	636.9	0.00079
2026	C01	Other Construction Equipment	300 < hp <= 600	0.59	12.0	0.0047	0.0006	0.0107	0.0000	0.0007	0.0007	2.3	0.00004

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	C01	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2026	C01	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2026	C01	Pumps	6 < hp <= 11	0.43	12.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2026	C01	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2026	C01	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2026	C01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2026	C01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	926.4	0.0645	0.0113	0.0701	0.0000	0.0085	0.0082	10.1	0.00055
2026	C01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.1	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2026	C02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2026	C02	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2026	C02	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2026	C02	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2026	C02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	64.0	0.0037	0.0007	0.0083	0.0000	0.0007	0.0006	1.6	0.00003
2026	C02	Concrete/Industrial Saws	6 < hp <= 11	0.7	64.0	0.0013	0.0005	0.0023	0.0000	0.0001	0.0001	0.3	0.00004
2026	C02	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2026	C02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	40.0	0.0004	0.0001	0.0013	0.0000	0.0001	0.0001	2.2	0.00000
2026	C02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2026	C02	Forklifts	75 < hp <= 100	0.59	3,724.0	0.0125	0.0018	0.2076	0.0004	0.0029	0.0029	131.0	0.00012
2026	C02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2026	C02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001

**TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)**

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	C02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2026	C02	Off-highway Trucks	300 < hp <= 600	0.59	6,864.0	0.1118	0.0325	0.4277	0.0038	0.0271	0.0263	1,304.3	0.00162
2026	C02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2026	C02	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2026	C02	Plate Compactors	3 < hp <= 6	0.43	40.0	0.0003	0.0001	0.0005	0.0000	0.0000	0.0000	0.1	0.00001
2026	C02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2026	C02	Rollers	75 < hp <= 100	0.59	56.0	0.0010	0.0001	0.0038	0.0000	0.0001	0.0001	2.0	0.00001
2026	C02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2026	C02	Surfacing Equipment	75 < hp <= 100	0.43	64.0	0.0022	0.0003	0.0047	0.0000	0.0003	0.0003	1.6	0.00001
2026	C02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2026	C02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2026	C02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	840.0	0.0769	0.0133	0.0703	0.0000	0.0102	0.0099	12.2	0.00061
2026	L01	Air Compressors	75 < hp <= 100	0.43	22.8	0.0005	0.0001	0.0015	0.0000	0.0001	0.0001	0.6	0.00000
2026	L01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	19.2	0.0011	0.0002	0.0025	0.0000	0.0002	0.0002	0.5	0.00001
2026	L01	Concrete/Industrial Saws	25 < hp <= 40	0.59	22.8	0.0002	0.0001	0.0015	0.0000	0.0000	0.0000	0.3	0.00001
2026	L01	Concrete/Industrial Saws	6 < hp <= 11	0.7	19.2	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2026	L01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	206.5	0.0023	0.0004	0.0065	0.0000	0.0006	0.0005	11.4	0.00003
2026	L01	Excavators	100 < hp <= 175	0.59	113.3	0.0010	0.0002	0.0033	0.0000	0.0002	0.0002	6.3	0.00001
2026	L01	Graders	175 < hp <= 300	0.59	7.6	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.7	0.00000
2026	L01	Irrigation Sets	300 < hp <= 600	0.59	6.9	0.0020	0.0004	0.0071	0.0000	0.0003	0.0003	1.3	0.00003

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	L01	Off-highway Trucks	300 < hp <= 600	0.59	4,227.2	0.0688	0.0200	0.2634	0.0023	0.0167	0.0162	803.3	0.00100
2026	L01	Other Construction Equipment	100 < hp <= 175	0.43	309.1	0.0059	0.0014	0.0168	0.0000	0.0013	0.0013	12.5	0.00009
2026	L01	Pavers	100 < hp <= 175	0.59	55.9	0.0008	0.0001	0.0019	0.0000	0.0002	0.0002	3.1	0.00001
2026	L01	Plate Compactors	3 < hp <= 6	0.43	49.2	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2026	L01	Pumps	6 < hp <= 11	0.43	6.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2026	L01	Rollers	75 < hp <= 100	0.59	90.4	0.0016	0.0001	0.0062	0.0000	0.0002	0.0002	3.2	0.00001
2026	L01	Scrapers	300 < hp <= 600	0.59	28.4	0.0023	0.0004	0.0063	0.0000	0.0004	0.0004	5.4	0.00002
2026	L01	Skid Steer Loaders	50 < hp <= 75	0.21	52.4	0.0065	0.0012	0.0055	0.0000	0.0009	0.0009	0.6	0.00004
2026	L01	Surfacing Equipment	16 < hp <= 25	0.59	33.7	0.0008	0.0002	0.0021	0.0000	0.0001	0.0001	0.3	0.00002
2026	L01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	70.4	0.0132	0.0040	0.0231	0.0000	0.0027	0.0027	4.5	0.00022
2026	L01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	110.6	0.0101	0.0018	0.0093	0.0000	0.0013	0.0013	1.6	0.00008
2026	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2026	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2026	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2026	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2026	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2026	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2026	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2026	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2026	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2026	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2026	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2026	L04	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2026	L04	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2026	L04	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2026	L04	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2026	L04	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2026	L04	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2026	L04	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2026	L04	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2026	L04	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2026	L04	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2026	L04	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2026	L04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2026	S02	Aerial Lifts	50 < hp <= 75	0.21	1,320.0	0.0503	0.0096	0.0837	0.0000	0.0060	0.0058	14.4	0.00052
2026	S02	Aerial Lifts	75 < hp <= 100	0.59	456.0	0.0742	0.0117	0.0805	0.0001	0.0094	0.0091	18.7	0.00055
2026	S02	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	S02	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2026	S02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2026	S02	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2026	S02	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2026	S02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	78.5	0.0009	0.0001	0.0025	0.0000	0.0002	0.0002	4.4	0.00001
2026	S02	Excavators	100 < hp <= 175	0.59	233.5	0.0021	0.0003	0.0069	0.0000	0.0005	0.0005	12.9	0.00002
2026	S02	Forklifts	75 < hp <= 100	0.59	1,664.0	0.0056	0.0008	0.0928	0.0002	0.0013	0.0013	58.5	0.00005
2026	S02	Generator Sets	25 < hp <= 40	0.43	171.0	0.0022	0.0006	0.0099	0.0000	0.0004	0.0004	1.7	0.00005
2026	S02	Off-highway Trucks	175 < hp <= 300	0.43	240.0	0.0007	0.0003	0.0039	0.0000	0.0002	0.0002	16.6	0.00001
2026	S02	Off-highway Trucks	300 < hp <= 600	0.59	1,268.5	0.0207	0.0060	0.0790	0.0007	0.0050	0.0049	241.0	0.00030
2026	S02	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2026	S02	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2026	S02	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2026	S02	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2026	S02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2026	S02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	366.0	0.0255	0.0045	0.0277	0.0000	0.0034	0.0033	4.0	0.00022
2026	S02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.0	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2026	S04	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001
2026	S04	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	S04	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077
2026	S04	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2026	S04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	13.6	0.0002	0.0000	0.0004	0.0000	0.0000	0.0000	0.8	0.00000
2026	S04	Excavators	100 < hp <= 175	0.59	13.6	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.8	0.00000
2026	S04	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2026	S04	Off-highway Trucks	300 < hp <= 600	0.59	323.2	0.0053	0.0015	0.0201	0.0002	0.0013	0.0012	61.4	0.00008
2026	S04	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000
2026	S04	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2026	S04		75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2026	S05	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001
2026	S05	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010
2026	S05	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077
2026	S05	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2026	S05	Crawler Tractor/Dozers	100 < hp <= 175	0.59	9.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2026	S05	Excavators	100 < hp <= 175	0.59	9.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2026	S05	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2026	S05	Off-highway Trucks	300 < hp <= 600	0.59	314.0	0.0051	0.0015	0.0196	0.0002	0.0012	0.0012	59.7	0.00007
2026	S05	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	S05	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2026	S05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2026	S06	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001
2026	S06	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010
2026	S06	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077
2026	S06	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2026	S06	Crawler Tractor/Dozers	100 < hp <= 175	0.59	14.5	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.8	0.00000
2026	S06	Excavators	100 < hp <= 175	0.59	14.5	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.8	0.00000
2026	S06	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2026	S06	Off-highway Trucks	300 < hp <= 600	0.59	325.0	0.0053	0.0015	0.0202	0.0002	0.0013	0.0012	61.8	0.00008
2026	S06	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000
2026	S06	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2026	S06	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2026	S07	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2026	S07	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2026	S07	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2026	S07	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2026	S07	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2026	S07	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	S07	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2026	S07	Crawler Tractor/Dozers	100 < hp <= 175	0.59	76.7	0.0009	0.0001	0.0024	0.0000	0.0002	0.0002	4.2	0.00001
2026	S07	Excavators	100 < hp <= 175	0.59	307.1	0.0027	0.0004	0.0091	0.0000	0.0007	0.0006	17.0	0.00003
2026	S07	Forklifts	75 < hp <= 100	0.59	3,584.0	0.0121	0.0018	0.1998	0.0004	0.0028	0.0027	126.1	0.00012
2026	S07	Generator Sets	25 < hp <= 40	0.43	166.4	0.0022	0.0006	0.0097	0.0000	0.0004	0.0003	1.7	0.00005
2026	S07	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2026	S07	Off-highway Trucks	300 < hp <= 600	0.59	7,029.0	0.1145	0.0333	0.4379	0.0039	0.0277	0.0269	1,335.7	0.00166
2026	S07	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2026	S07	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2026	S07	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2026	S07	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2026	S07	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2026	S07	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2026	S07	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2026	S07	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	196.8	0.0137	0.0024	0.0149	0.0000	0.0018	0.0017	2.2	0.00012
2026	S07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	600.0	0.0549	0.0095	0.0502	0.0000	0.0073	0.0071	8.7	0.00043
2027	A01	Air Compressors	75 < hp <= 100	0.43	120.4	0.0025	0.0003	0.0080	0.0000	0.0004	0.0004	3.1	0.00002
2027	A01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	90.0	0.0053	0.0010	0.0117	0.0000	0.0009	0.0009	2.3	0.00004
2027	A01	Concrete/Industrial Saws	25 < hp <= 40	0.59	112.4	0.0009	0.0003	0.0075	0.0000	0.0001	0.0001	1.6	0.00003
2027	A01	Concrete/Industrial Saws	6 < hp <= 11	0.7	90.0	0.0019	0.0006	0.0032	0.0000	0.0002	0.0002	0.4	0.00005

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	A01	Cranes	175 < hp <= 300	0.43	8.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2027	A01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	687.3	0.0076	0.0012	0.0216	0.0001	0.0019	0.0018	38.1	0.00009
2027	A01	Excavators	100 < hp <= 175	0.59	882.8	0.0078	0.0012	0.0260	0.0001	0.0019	0.0018	48.9	0.00009
2027	A01	Graders	175 < hp <= 300	0.59	36.4	0.0003	0.0001	0.0012	0.0000	0.0001	0.0001	3.5	0.00001
2027	A01	Irrigation Sets	300 < hp <= 600	0.59	32.8	0.0095	0.0020	0.0341	0.0000	0.0016	0.0016	6.2	0.00013
2027	A01	Off-highway Trucks	300 < hp <= 600	0.59	7,913.4	0.1289	0.0374	0.4930	0.0044	0.0312	0.0303	1,503.7	0.00187
2027	A01	Other Construction Equipment	100 < hp <= 175	0.43	1,117.4	0.0214	0.0050	0.0608	0.0001	0.0047	0.0046	45.1	0.00033
2027	A01	Pavers	100 < hp <= 175	0.59	112.4	0.0016	0.0003	0.0038	0.0000	0.0004	0.0004	6.2	0.00002
2027	A01	Pumps	6 < hp <= 11	0.43	30.0	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2027	A01	Rollers	75 < hp <= 100	0.59	376.7	0.0065	0.0006	0.0258	0.0000	0.0010	0.0009	13.2	0.00004
2027	A01	Scrapers	300 < hp <= 600	0.59	140.5	0.0114	0.0018	0.0310	0.0001	0.0019	0.0018	26.7	0.00012
2027	A01	Skid Steer Loaders	50 < hp <= 75	0.21	55.8	0.0069	0.0013	0.0058	0.0000	0.0010	0.0009	0.6	0.00005
2027	A01	Surfacing Equipment	16 < hp <= 25	0.59	112.4	0.0027	0.0006	0.0069	0.0000	0.0003	0.0003	1.0	0.00005
2027	A01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	256.7	0.0480	0.0145	0.0841	0.0001	0.0100	0.0097	16.6	0.00082
2027	A01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	126.0	0.0115	0.0020	0.0105	0.0000	0.0015	0.0015	1.8	0.00009
2027	A07	Air Compressors	75 < hp <= 100	0.43	42.7	0.0009	0.0001	0.0028	0.0000	0.0001	0.0001	1.1	0.00001
2027	A07	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	33.6	0.0020	0.0004	0.0044	0.0000	0.0003	0.0003	0.9	0.00001
2027	A07	Concrete/Industrial Saws	25 < hp <= 40	0.59	42.7	0.0003	0.0001	0.0028	0.0000	0.0000	0.0000	0.6	0.00001
2027	A07	Concrete/Industrial Saws	6 < hp <= 11	0.7	33.6	0.0007	0.0002	0.0012	0.0000	0.0001	0.0001	0.2	0.00002



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (*CONTINUED*)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	A07	Crawler Tractor/Dozers	100 < hp <= 175	0.59	232.0	0.0026	0.0004	0.0073	0.0000	0.0006	0.0006	12.9	0.00003
2027	A07	Excavators	100 < hp <= 175	0.59	59.1	0.0005	0.0001	0.0017	0.0000	0.0001	0.0001	3.3	0.00001
2027	A07	Graders	175 < hp <= 300	0.59	13.6	0.0001	0.0000	0.0005	0.0000	0.0000	0.0000	1.3	0.00000
2027	A07	Irrigation Sets	300 < hp <= 600	0.59	12.3	0.0036	0.0008	0.0128	0.0000	0.0006	0.0006	2.3	0.00005
2027	A07	Off-highway Trucks	300 < hp <= 600	0.59	3,749.2	0.0611	0.0177	0.2336	0.0021	0.0148	0.0143	712.4	0.00089
2027	A07	Other Construction Equipment	100 < hp <= 175	0.43	395.8	0.0076	0.0018	0.0215	0.0000	0.0017	0.0016	16.0	0.00012
2027	A07	Pavers	100 < hp <= 175	0.59	42.7	0.0006	0.0001	0.0015	0.0000	0.0002	0.0002	2.4	0.00001
2027	A07	Pumps	6 < hp <= 11	0.43	11.2	0.0002	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	A07	Rollers	75 < hp <= 100	0.59	131.9	0.0023	0.0002	0.0090	0.0000	0.0003	0.0003	4.6	0.00002
2027	A07	Scrapers	300 < hp <= 600	0.59	53.4	0.0043	0.0007	0.0118	0.0000	0.0007	0.0007	10.1	0.00004
2027	A07	Skid Steer Loaders	50 < hp <= 75	0.21	9.7	0.0012	0.0002	0.0010	0.0000	0.0002	0.0002	0.1	0.00001
2027	A07	Surfacing Equipment	16 < hp <= 25	0.59	42.7	0.0010	0.0002	0.0026	0.0000	0.0001	0.0001	0.4	0.00002
2027	A07	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	77.9	0.0146	0.0044	0.0255	0.0000	0.0030	0.0029	5.0	0.00025
2027	A07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	30.0	0.0027	0.0005	0.0025	0.0000	0.0004	0.0004	0.4	0.00002
2027	A08	Air Compressors	75 < hp <= 100	0.43	20.0	0.0004	0.0001	0.0013	0.0000	0.0001	0.0001	0.5	0.00000
2027	A08	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	16.8	0.0010	0.0002	0.0022	0.0000	0.0002	0.0002	0.4	0.00001
2027	A08	Concrete/Industrial Saws	25 < hp <= 40	0.59	20.0	0.0002	0.0000	0.0013	0.0000	0.0000	0.0000	0.3	0.00001
2027	A08	Concrete/Industrial Saws	6 < hp <= 11	0.7	16.8	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2027	A08	Crawler Tractor/Dozers	100 < hp <= 175	0.59	251.4	0.0028	0.0004	0.0079	0.0000	0.0007	0.0007	13.9	0.00003

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	A08	Excavators	100 < hp <= 175	0.59	746.1	0.0066	0.0010	0.0220	0.0001	0.0016	0.0015	41.3	0.00007
2027	A08	Generator Sets	25 < hp <= 40	0.43	576.0	0.0075	0.0021	0.0335	0.0000	0.0012	0.0012	5.8	0.00018
2027	A08	Graders	175 < hp <= 300	0.59	6.5	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.6	0.00000
2027	A08	Irrigation Sets	300 < hp <= 600	0.59	5.9	0.0017	0.0004	0.0061	0.0000	0.0003	0.0003	1.1	0.00002
2027	A08	Off-highway Trucks	300 < hp <= 600	0.59	5,768.9	0.0939	0.0273	0.3594	0.0032	0.0227	0.0221	1,096.2	0.00136
2027	A08	Other Construction Equipment	100 < hp <= 175	0.43	200.8	0.0038	0.0009	0.0109	0.0000	0.0008	0.0008	8.1	0.00006
2027	A08	Pavers	100 < hp <= 175	0.59	20.0	0.0003	0.0000	0.0007	0.0000	0.0001	0.0001	1.1	0.00000
2027	A08	Pumps	6 < hp <= 11	0.43	5.6	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2027	A08	Rollers	75 < hp <= 100	0.59	60.3	0.0010	0.0001	0.0041	0.0000	0.0002	0.0002	2.1	0.00001
2027	A08	Scrapers	300 < hp <= 600	0.59	25.0	0.0020	0.0003	0.0055	0.0000	0.0003	0.0003	4.7	0.00002
2027	A08	Skid Steer Loaders	50 < hp <= 75	0.21	6.4	0.0008	0.0001	0.0007	0.0000	0.0001	0.0001	0.1	0.00001
2027	A08	Surfacing Equipment	16 < hp <= 25	0.59	20.0	0.0005	0.0001	0.0012	0.0000	0.0001	0.0001	0.2	0.00001
2027	A08	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	35.8	0.0067	0.0020	0.0117	0.0000	0.0014	0.0013	2.3	0.00011
2027	A08	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	1,152.0	0.0802	0.0141	0.0872	0.0000	0.0105	0.0102	12.6	0.00069
2027	A08	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	15.4	0.0014	0.0002	0.0013	0.0000	0.0002	0.0002	0.2	0.00001
2027	A09	Air Compressors	75 < hp <= 100	0.43	48.3	0.0010	0.0001	0.0032	0.0000	0.0002	0.0002	1.2	0.00001
2027	A09	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	38.4	0.0022	0.0004	0.0050	0.0000	0.0004	0.0004	1.0	0.00002
2027	A09	Concrete/Industrial Saws	25 < hp <= 40	0.59	48.3	0.0004	0.0001	0.0032	0.0000	0.0000	0.0000	0.7	0.00001
2027	A09	Concrete/Industrial Saws	6 < hp <= 11	0.7	38.4	0.0008	0.0003	0.0014	0.0000	0.0001	0.0001	0.2	0.00002



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	A09	Crawler Tractor/Dozers	100 < hp <= 175	0.59	253.0	0.0028	0.0004	0.0079	0.0000	0.0007	0.0007	14.0	0.00003
2027	A09	Excavators	100 < hp <= 175	0.59	57.9	0.0005	0.0001	0.0017	0.0000	0.0001	0.0001	3.2	0.00001
2027	A09	Graders	175 < hp <= 300	0.59	15.3	0.0001	0.0000	0.0005	0.0000	0.0000	0.0000	1.5	0.00000
2027	A09	Irrigation Sets	300 < hp <= 600	0.59	13.8	0.0040	0.0009	0.0143	0.0000	0.0007	0.0007	2.6	0.00006
2027	A09	Off-highway Trucks	300 < hp <= 600	0.59	4,723.4	0.0769	0.0223	0.2943	0.0026	0.0186	0.0181	897.6	0.00112
2027	A09	Other Construction Equipment	100 < hp <= 175	0.43	471.1	0.0090	0.0021	0.0256	0.0001	0.0020	0.0019	19.0	0.00014
2027	A09	Pavers	100 < hp <= 175	0.59	48.3	0.0007	0.0001	0.0017	0.0000	0.0002	0.0002	2.7	0.00001
2027	A09	Pumps	6 < hp <= 11	0.43	12.8	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2027	A09	Rollers	75 < hp <= 100	0.59	140.1	0.0024	0.0002	0.0096	0.0000	0.0004	0.0003	4.9	0.00002
2027	A09	Scrapers	300 < hp <= 600	0.59	60.4	0.0049	0.0008	0.0133	0.0000	0.0008	0.0008	11.5	0.00005
2027	A09	Skid Steer Loaders	50 < hp <= 75	0.21	9.9	0.0012	0.0002	0.0010	0.0000	0.0002	0.0002	0.1	0.00001
2027	A09	Surfacing Equipment	16 < hp <= 25	0.59	48.3	0.0012	0.0003	0.0030	0.0000	0.0001	0.0001	0.4	0.00002
2027	A09	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	73.1	0.0137	0.0041	0.0239	0.0000	0.0028	0.0028	4.7	0.00023
2027	A09	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	28.0	0.0026	0.0004	0.0023	0.0000	0.0003	0.0003	0.4	0.00002
2027	A10	Air Compressors	75 < hp <= 100	0.43	2.5	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.1	0.00000
2027	A10	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	3.6	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.1	0.00000
2027	A10	Concrete/Industrial Saws	25 < hp <= 40	0.59	2.5	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	A10	Concrete/Industrial Saws	6 < hp <= 11	0.7	3.6	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2027	A10	Crawler Tractor/Dozers	100 < hp <= 175	0.59	28.9	0.0003	0.0000	0.0009	0.0000	0.0001	0.0001	1.6	0.00000

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	A10	Excavators	100 < hp <= 175	0.59	17.2	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	1.0	0.00000
2027	A10	Graders	175 < hp <= 300	0.59	1.3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.00000
2027	A10	Irrigation Sets	300 < hp <= 600	0.59	1.2	0.0003	0.0001	0.0012	0.0000	0.0001	0.0001	0.2	0.00000
2027	A10	Off-highway Trucks	300 < hp <= 600	0.59	3,032.8	0.0494	0.0143	0.1890	0.0017	0.0120	0.0116	576.3	0.00072
2027	A10	Other Construction Equipment	100 < hp <= 175	0.43	50.7	0.0010	0.0002	0.0028	0.0000	0.0002	0.0002	2.0	0.00002
2027	A10	Pavers	100 < hp <= 175	0.59	2.5	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.1	0.00000
2027	A10	Pumps	6 < hp <= 11	0.43	1.2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.00000
2027	A10	Rollers	75 < hp <= 100	0.59	22.0	0.0004	0.0000	0.0015	0.0000	0.0001	0.0001	0.8	0.00000
2027	A10	Scrapers	300 < hp <= 600	0.59	3.1	0.0003	0.0000	0.0007	0.0000	0.0000	0.0000	0.6	0.00000
2027	A10	Skid Steer Loaders	50 < hp <= 75	0.21	6.2	0.0008	0.0001	0.0006	0.0000	0.0001	0.0001	0.1	0.00001
2027	A10	Surfacing Equipment	16 < hp <= 25	0.59	2.5	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	A10	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	31.6	0.0059	0.0018	0.0104	0.0000	0.0012	0.0012	2.0	0.00010
2027	A10	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	15.6	0.0014	0.0002	0.0013	0.0000	0.0002	0.0002	0.2	0.00001
2027	C02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	C02	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2027	C02	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2027	C02	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2027	C02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	64.0	0.0037	0.0007	0.0083	0.0000	0.0007	0.0006	1.6	0.00003
2027	C02	Concrete/Industrial Saws	6 < hp <= 11	0.7	64.0	0.0013	0.0005	0.0023	0.0000	0.0001	0.0001	0.3	0.00004



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (*CONTINUED*)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	C02	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2027	C02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	40.0	0.0004	0.0001	0.0013	0.0000	0.0001	0.0001	2.2	0.00000
2027	C02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2027	C02	Forklifts	75 < hp <= 100	0.59	3,724.0	0.0125	0.0018	0.2076	0.0004	0.0029	0.0029	131.0	0.00012
2027	C02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2027	C02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2027	C02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2027	C02	Off-highway Trucks	300 < hp <= 600	0.59	6,864.0	0.1118	0.0325	0.4277	0.0038	0.0271	0.0263	1,304.3	0.00162
2027	C02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2027	C02	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2027	C02	Plate Compactors	3 < hp <= 6	0.43	40.0	0.0003	0.0001	0.0005	0.0000	0.0000	0.0000	0.1	0.00001
2027	C02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2027	C02	Rollers	75 < hp <= 100	0.59	56.0	0.0010	0.0001	0.0038	0.0000	0.0001	0.0001	2.0	0.00001
2027	C02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2027	C02	Surfacing Equipment	75 < hp <= 100	0.43	64.0	0.0022	0.0003	0.0047	0.0000	0.0003	0.0003	1.6	0.00001
2027	C02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2027	C02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2027	C02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	840.0	0.0769	0.0133	0.0703	0.0000	0.0102	0.0099	12.2	0.00061
2027	L01	Air Compressors	75 < hp <= 100	0.43	22.8	0.0005	0.0001	0.0015	0.0000	0.0001	0.0001	0.6	0.00000

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	L01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	19.2	0.0011	0.0002	0.0025	0.0000	0.0002	0.0002	0.5	0.00001
2027	L01	Concrete/Industrial Saws	25 < hp <= 40	0.59	22.8	0.0002	0.0001	0.0015	0.0000	0.0000	0.0000	0.3	0.00001
2027	L01	Concrete/Industrial Saws	6 < hp <= 11	0.7	19.2	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2027	L01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	206.5	0.0023	0.0004	0.0065	0.0000	0.0006	0.0005	11.4	0.00003
2027	L01	Excavators	100 < hp <= 175	0.59	113.3	0.0010	0.0002	0.0033	0.0000	0.0002	0.0002	6.3	0.00001
2027	L01	Graders	175 < hp <= 300	0.59	7.6	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.7	0.00000
2027	L01	Irrigation Sets	300 < hp <= 600	0.59	6.9	0.0020	0.0004	0.0071	0.0000	0.0003	0.0003	1.3	0.00003
2027	L01	Off-highway Trucks	300 < hp <= 600	0.59	4,227.2	0.0688	0.0200	0.2634	0.0023	0.0167	0.0162	803.3	0.00100
2027	L01	Other Construction Equipment	100 < hp <= 175	0.43	309.1	0.0059	0.0014	0.0168	0.0000	0.0013	0.0013	12.5	0.00009
2027	L01	Pavers	100 < hp <= 175	0.59	55.9	0.0008	0.0001	0.0019	0.0000	0.0002	0.0002	3.1	0.00001
2027	L01	Plate Compactors	3 < hp <= 6	0.43	49.2	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2027	L01	Pumps	6 < hp <= 11	0.43	6.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2027	L01	Rollers	75 < hp <= 100	0.59	90.4	0.0016	0.0001	0.0062	0.0000	0.0002	0.0002	3.2	0.00001
2027	L01	Scrapers	300 < hp <= 600	0.59	28.4	0.0023	0.0004	0.0063	0.0000	0.0004	0.0004	5.4	0.00002
2027	L01	Skid Steer Loaders	50 < hp <= 75	0.21	52.4	0.0065	0.0012	0.0055	0.0000	0.0009	0.0009	0.6	0.00004
2027	L01	Surfacing Equipment	16 < hp <= 25	0.59	33.7	0.0008	0.0002	0.0021	0.0000	0.0001	0.0001	0.3	0.00002
2027	L01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	70.4	0.0132	0.0040	0.0231	0.0000	0.0027	0.0027	4.5	0.00022
2027	L01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	110.6	0.0101	0.0018	0.0093	0.0000	0.0013	0.0013	1.6	0.00008
2027	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (*CONTINUED*)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2027	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2027	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2027	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2027	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2027	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2027	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2027	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2027	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2027	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2027	L04	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	L04	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2027	L04	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2027	L04	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2027	L04	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2027	L04	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2027	L04	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2027	L04	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2027	L04	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	L04	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2027	L04	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2027	L04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2027	L05	Aerial Lifts	75 < hp <= 100	0.59	16.0	0.0026	0.0004	0.0028	0.0000	0.0003	0.0003	0.7	0.00002
2027	L05	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2027	L05	Cement & Mortar Mixers	300 < hp <= 600	0.59	24.0	0.0115	0.0024	0.0432	0.0000	0.0016	0.0015	4.5	0.00012
2027	L05	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2027	L05	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2027	L05	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2027	L05	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000
2027	L05	Forklifts	75 < hp <= 100	0.59	24.0	0.0001	0.0000	0.0013	0.0000	0.0000	0.0000	0.8	0.00000
2027	L05	Off-highway Trucks	300 < hp <= 600	0.59	164.0	0.0027	0.0008	0.0102	0.0001	0.0006	0.0006	31.2	0.00004
2027	L05	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2027	L05	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	L05	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2027	L05	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2027	L05	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2027	L05	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2027	L05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	120.0	0.0110	0.0019	0.0100	0.0000	0.0015	0.0014	1.7	0.00009
2027	S02	Aerial Lifts	50 < hp <= 75	0.21	1,320.0	0.0503	0.0096	0.0837	0.0000	0.0060	0.0058	14.4	0.00052



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	S02	Aerial Lifts	75 < hp <= 100	0.59	456.0	0.0742	0.0117	0.0805	0.0001	0.0094	0.0091	18.7	0.00055
2027	S02	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2027	S02	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2027	S02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2027	S02	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2027	S02	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2027	S02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	98.5	0.0011	0.0002	0.0031	0.0000	0.0003	0.0003	5.5	0.00001
2027	S02	Excavators	100 < hp <= 175	0.59	310.5	0.0027	0.0004	0.0092	0.0001	0.0007	0.0006	17.2	0.00003
2027	S02	Forklifts	75 < hp <= 100	0.59	1,664.0	0.0056	0.0008	0.0928	0.0002	0.0013	0.0013	58.5	0.00005
2027	S02	Generator Sets	25 < hp <= 40	0.43	228.0	0.0030	0.0008	0.0133	0.0000	0.0005	0.0005	2.3	0.00007
2027	S02	Off-highway Trucks	175 < hp <= 300	0.43	240.0	0.0007	0.0003	0.0039	0.0000	0.0002	0.0002	16.6	0.00001
2027	S02	Off-highway Trucks	300 < hp <= 600	0.59	1,489.0	0.0242	0.0070	0.0928	0.0008	0.0059	0.0057	282.9	0.00035
2027	S02	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2027	S02	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	S02	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2027	S02	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2027	S02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2027	S02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	480.0	0.0334	0.0059	0.0363	0.0000	0.0044	0.0043	5.2	0.00029
2027	S02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.0	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	S03	Aerial Lifts	50 < hp <= 75	0.21	1,320.0	0.0503	0.0096	0.0837	0.0000	0.0060	0.0058	14.4	0.00052
2027	S03	Aerial Lifts	75 < hp <= 100	0.59	456.0	0.0742	0.0117	0.0805	0.0001	0.0094	0.0091	18.7	0.00055
2027	S03	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2027	S03	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2027	S03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2027	S03	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2027	S03	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2027	S03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000
2027	S03	Forklifts	75 < hp <= 100	0.59	1,664.0	0.0056	0.0008	0.0928	0.0002	0.0013	0.0013	58.5	0.00005
2027	S03	Off-highway Trucks	175 < hp <= 300	0.43	240.0	0.0007	0.0003	0.0039	0.0000	0.0002	0.0002	16.6	0.00001
2027	S03	Off-highway Trucks	300 < hp <= 600	0.59	602.0	0.0098	0.0028	0.0375	0.0003	0.0024	0.0023	114.4	0.00014
2027	S03	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2027	S03	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	S03	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2027	S03	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2027	S03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2027	S03	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2027	S03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.0	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2027	S04	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	S04	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010
2027	S04	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077
2027	S04	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2027	S04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	13.6	0.0002	0.0000	0.0004	0.0000	0.0000	0.0000	0.8	0.00000
2027	S04	Excavators	100 < hp <= 175	0.59	13.6	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.8	0.00000
2027	S04	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2027	S04	Off-highway Trucks	300 < hp <= 600	0.59	323.2	0.0053	0.0015	0.0201	0.0002	0.0013	0.0012	61.4	0.00008
2027	S04	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000
2027	S04	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2027	S04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2027	S05	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001
2027	S05	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010
2027	S05	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077
2027	S05	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2027	S05	Crawler Tractor/Dozers	100 < hp <= 175	0.59	7.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.4	0.00000
2027	S05	Excavators	100 < hp <= 175	0.59	7.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.4	0.00000
2027	S05	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2027	S05	Off-highway Trucks	300 < hp <= 600	0.59	310.0	0.0050	0.0015	0.0193	0.0002	0.0012	0.0012	58.9	0.00007

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	S05	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000
2027	S05	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2027	S05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2027	S06	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001
2027	S06	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010
2027	S06	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077
2027	S06	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2027	S06	Crawler Tractor/Dozers	100 < hp <= 175	0.59	11.5	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.6	0.00000
2027	S06	Excavators	100 < hp <= 175	0.59	11.5	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.6	0.00000
2027	S06	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2027	S06	Off-highway Trucks	300 < hp <= 600	0.59	319.0	0.0052	0.0015	0.0199	0.0002	0.0013	0.0012	60.6	0.00008
2027	S06	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000
2027	S06	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2027	S06	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2027	S07	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	S07	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2027	S07	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2027	S07	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	S07	Chippers/Stump Grinders	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2027	S07	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2027	S07	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2027	S07	Crawler Tractor/Dozers	100 < hp <= 175	0.59	61.5	0.0007	0.0001	0.0019	0.0000	0.0002	0.0002	3.4	0.00001
2027	S07	Excavators	100 < hp <= 175	0.59	270.3	0.0024	0.0004	0.0080	0.0000	0.0006	0.0006	15.0	0.00003
2027	S07	Forklifts	75 < hp <= 100	0.59	3,584.0	0.0121	0.0018	0.1998	0.0004	0.0028	0.0027	126.1	0.00012
2027	S07	Generator Sets	25 < hp <= 40	0.43	144.8	0.0019	0.0005	0.0084	0.0000	0.0003	0.0003	1.5	0.00004
2027	S07	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2027	S07	Off-highway Trucks	300 < hp <= 600	0.59	6,930.2	0.1129	0.0328	0.4318	0.0038	0.0273	0.0265	1,316.9	0.00164
2027	S07	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2027	S07	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2027	S07	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	S07	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2027	S07	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2027	S07	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2027	S07	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2027	S07	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	153.6	0.0107	0.0019	0.0116	0.0000	0.0014	0.0014	1.7	0.00009
2027	S07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	600.0	0.0549	0.0095	0.0502	0.0000	0.0073	0.0071	8.7	0.00043
2027	S08	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	S08	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	S08	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2027	S08	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2027	S08	Crawler Tractor/Dozers	100 < hp <= 175	0.59	9.9	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2027	S08	Excavators	100 < hp <= 175	0.59	169.9	0.0015	0.0002	0.0050	0.0000	0.0004	0.0003	9.4	0.00002
2027	S08	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2027	S08	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2027	S08	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2027	S08	Off-highway Trucks	300 < hp <= 600	0.59	6,493.8	0.1057	0.0307	0.4046	0.0036	0.0256	0.0248	1,234.0	0.00154
2027	S08	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2027	S08	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2027	S08	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2027	S09	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	S09	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2027	S09	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2027	S09	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2027	S09	Crawler Tractor/Dozers	100 < hp <= 175	0.59	9.9	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2027	S09	Excavators	100 < hp <= 175	0.59	169.9	0.0015	0.0002	0.0050	0.0000	0.0004	0.0003	9.4	0.00002
2027	S09	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2027	S09	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	S09	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2027	S09	Off-highway Trucks	300 < hp <= 600	0.59	6,493.8	0.1057	0.0307	0.4046	0.0036	0.0256	0.0248	1,234.0	0.00154
2027	S09	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2027	S09	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2027	S09	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2027	T01	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	T01	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2027	T01	Air Compressors	75 < hp <= 100	0.43	51.8	0.0011	0.0001	0.0034	0.0000	0.0002	0.0002	1.3	0.00001
2027	T01	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2027	T01	Chain Saws > 6 HP	6 < hp <= 11	0.7	82.0	0.0926	0.0214	0.0005	0.0000	0.0034	0.0031	0.2	0.00000
2027	T01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	82.0	0.0048	0.0009	0.0106	0.0000	0.0008	0.0008	2.1	0.00004
2027	T01	Concrete/Industrial Saws	25 < hp <= 40	0.59	51.8	0.0004	0.0001	0.0034	0.0000	0.0000	0.0000	0.7	0.00002
2027	T01	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2027	T01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	412.7	0.0046	0.0007	0.0130	0.0001	0.0011	0.0011	22.9	0.00005
2027	T01	Excavators	100 < hp <= 175	0.59	558.8	0.0049	0.0008	0.0165	0.0001	0.0012	0.0011	31.0	0.00006
2027	T01	Forklifts	75 < hp <= 100	0.59	3,700.0	0.0125	0.0018	0.2062	0.0004	0.0029	0.0028	130.1	0.00012
2027	T01	Generator Sets	25 < hp <= 40	0.43	301.0	0.0039	0.0011	0.0175	0.0000	0.0006	0.0006	3.1	0.00009
2027	T01	Graders	175 < hp <= 300	0.59	16.9	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000
2027	T01	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	T01	Irrigation Sets	300 < hp <= 600	0.59	15.2	0.0044	0.0009	0.0158	0.0000	0.0007	0.0007	2.9	0.00006
2027	T01	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2027	T01	Off-highway Trucks	300 < hp <= 600	0.59	12,536.6	0.2042	0.0593	0.7811	0.0070	0.0494	0.0480	2,382.3	0.00297
2027	T01	Other Construction Equipment	100 < hp <= 175	0.43	516.6	0.0099	0.0023	0.0281	0.0001	0.0022	0.0021	20.9	0.00015
2027	T01	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2027	T01	Pavers	100 < hp <= 175	0.59	51.8	0.0008	0.0001	0.0018	0.0000	0.0002	0.0002	2.9	0.00001
2027	T01	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2027	T01	Pumps	6 < hp <= 11	0.43	254.0	0.0034	0.0011	0.0056	0.0000	0.0004	0.0003	0.7	0.00008
2027	T01	Rollers	75 < hp <= 100	0.59	194.3	0.0033	0.0003	0.0133	0.0000	0.0005	0.0005	6.8	0.00002
2027	T01	Scrapers	300 < hp <= 600	0.59	64.8	0.0053	0.0008	0.0143	0.0000	0.0009	0.0008	12.3	0.00005
2027	T01	Skid Steer Loaders	50 < hp <= 75	0.21	15.9	0.0020	0.0004	0.0017	0.0000	0.0003	0.0003	0.2	0.00001
2027	T01	Surfacing Equipment	16 < hp <= 25	0.59	51.8	0.0013	0.0003	0.0032	0.0000	0.0001	0.0001	0.5	0.00002
2027	T01	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2027	T01	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2027	T01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	129.1	0.0241	0.0073	0.0423	0.0000	0.0050	0.0049	8.3	0.00041
2027	T01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	466.1	0.0324	0.0057	0.0353	0.0000	0.0043	0.0041	5.1	0.00028
2027	T01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	757.5	0.0693	0.0120	0.0634	0.0000	0.0092	0.0089	11.0	0.00055
2028	A01	Air Compressors	75 < hp <= 100	0.43	120.4	0.0025	0.0003	0.0080	0.0000	0.0004	0.0004	3.1	0.00002
2028	A01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	90.0	0.0053	0.0010	0.0117	0.0000	0.0009	0.0009	2.3	0.00004



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	A01	Concrete/Industrial Saws	25 < hp <= 40	0.59	112.4	0.0009	0.0003	0.0075	0.0000	0.0001	0.0001	1.6	0.00003
2028	A01	Concrete/Industrial Saws	6 < hp <= 11	0.7	90.0	0.0019	0.0006	0.0032	0.0000	0.0002	0.0002	0.4	0.00005
2028	A01	Cranes	175 < hp <= 300	0.43	8.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2028	A01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	687.3	0.0076	0.0012	0.0216	0.0001	0.0019	0.0018	38.1	0.00009
2028	A01	Excavators	100 < hp <= 175	0.59	882.8	0.0078	0.0012	0.0260	0.0001	0.0019	0.0018	48.9	0.00009
2028	A01	Graders	175 < hp <= 300	0.59	36.4	0.0003	0.0001	0.0012	0.0000	0.0001	0.0001	3.5	0.00001
2028	A01	Irrigation Sets	300 < hp <= 600	0.59	32.8	0.0095	0.0020	0.0341	0.0000	0.0016	0.0016	6.2	0.00013
2028	A01	Off-highway Trucks	300 < hp <= 600	0.59	7,913.4	0.1289	0.0374	0.4930	0.0044	0.0312	0.0303	1,503.7	0.00187
2028	A01	Other Construction Equipment	100 < hp <= 175	0.43	1,117.4	0.0214	0.0050	0.0608	0.0001	0.0047	0.0046	45.1	0.00033
2028	A01	Pavers	100 < hp <= 175	0.59	112.4	0.0016	0.0003	0.0038	0.0000	0.0004	0.0004	6.2	0.00002
2028	A01	Pumps	6 < hp <= 11	0.43	30.0	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2028	A01	Rollers	75 < hp <= 100	0.59	376.7	0.0065	0.0006	0.0258	0.0000	0.0010	0.0009	13.2	0.00004
2028	A01	Scrapers	300 < hp <= 600	0.59	140.5	0.0114	0.0018	0.0310	0.0001	0.0019	0.0018	26.7	0.00012
2028	A01	Skid Steer Loaders	50 < hp <= 75	0.21	55.8	0.0069	0.0013	0.0058	0.0000	0.0010	0.0009	0.6	0.00005
2028	A01	Surfacing Equipment	16 < hp <= 25	0.59	112.4	0.0027	0.0006	0.0069	0.0000	0.0003	0.0003	1.0	0.00005
2028	A01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	256.7	0.0480	0.0145	0.0841	0.0001	0.0100	0.0097	16.6	0.00082
2028	A01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	126.0	0.0115	0.0020	0.0105	0.0000	0.0015	0.0015	1.8	0.00009
2028	A04	Air Compressors	75 < hp <= 100	0.43	22.8	0.0005	0.0001	0.0015	0.0000	0.0001	0.0001	0.6	0.00000
2028	A04	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	20.4	0.0012	0.0002	0.0026	0.0000	0.0002	0.0002	0.5	0.00001

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	A04	Concrete/Industrial Saws	25 < hp <= 40	0.59	22.8	0.0002	0.0001	0.0015	0.0000	0.0000	0.0000	0.3	0.00001
2028	A04	Concrete/Industrial Saws	6 < hp <= 11	0.7	20.4	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2028	A04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	147.7	0.0016	0.0003	0.0046	0.0000	0.0004	0.0004	8.2	0.00002
2028	A04	Excavators	100 < hp <= 175	0.59	375.7	0.0033	0.0005	0.0111	0.0001	0.0008	0.0008	20.8	0.00004
2028	A04	Graders	175 < hp <= 300	0.59	8.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.8	0.00000
2028	A04	Irrigation Sets	300 < hp <= 600	0.59	7.2	0.0021	0.0004	0.0075	0.0000	0.0004	0.0003	1.3	0.00003
2028	A04	Off-highway Trucks	300 < hp <= 600	0.59	5,798.9	0.0944	0.0274	0.3613	0.0032	0.0229	0.0222	1,101.9	0.00137
2028	A04	Other Construction Equipment	100 < hp <= 175	0.43	1,441.6	0.0276	0.0065	0.0784	0.0002	0.0061	0.0059	58.2	0.00043
2028	A04	Pavers	100 < hp <= 175	0.59	22.8	0.0003	0.0001	0.0008	0.0000	0.0001	0.0001	1.3	0.00000
2028	A04	Pumps	6 < hp <= 11	0.43	6.8	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2028	A04	Rollers	75 < hp <= 100	0.59	92.7	0.0016	0.0001	0.0063	0.0000	0.0002	0.0002	3.3	0.00001
2028	A04	Scrapers	300 < hp <= 600	0.59	28.5	0.0023	0.0004	0.0063	0.0000	0.0004	0.0004	5.4	0.00002
2028	A04	Skid Steer Loaders	50 < hp <= 75	0.21	22.1	0.0027	0.0005	0.0023	0.0000	0.0004	0.0004	0.2	0.00002
2028	A04	Surfacing Equipment	16 < hp <= 25	0.59	22.8	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.2	0.00001
2028	A04	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	91.9	0.0172	0.0052	0.0301	0.0000	0.0036	0.0035	5.9	0.00029
2028	A04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	45.7	0.0042	0.0007	0.0038	0.0000	0.0006	0.0005	0.7	0.00003
2028	A08	Air Compressors	75 < hp <= 100	0.43	53.3	0.0011	0.0001	0.0035	0.0000	0.0002	0.0002	1.4	0.00001
2028	A08	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	42.0	0.0025	0.0005	0.0055	0.0000	0.0004	0.0004	1.1	0.00002
2028	A08	Concrete/Industrial Saws	25 < hp <= 40	0.59	53.3	0.0004	0.0001	0.0035	0.0000	0.0000	0.0000	0.7	0.00002
2028	A08	Concrete/Industrial Saws	6 < hp <= 11	0.7	42.0	0.0009	0.0003	0.0015	0.0000	0.0001	0.0001	0.2	0.00002



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	A08	Crawler Tractor/Dozers	100 < hp <= 175	0.59	428.1	0.0048	0.0007	0.0134	0.0001	0.0012	0.0011	23.7	0.00005
2028	A08	Excavators	100 < hp <= 175	0.59	789.0	0.0070	0.0011	0.0233	0.0001	0.0017	0.0016	43.7	0.00008
2028	A08	Generator Sets	25 < hp <= 40	0.43	576.0	0.0075	0.0021	0.0335	0.0000	0.0012	0.0012	5.8	0.00018
2028	A08	Graders	175 < hp <= 300	0.59	16.9	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000
2028	A08	Irrigation Sets	300 < hp <= 600	0.59	15.2	0.0044	0.0009	0.0158	0.0000	0.0007	0.0007	2.9	0.00006
2028	A08	Off-highway Trucks	300 < hp <= 600	0.59	7,040.0	0.1146	0.0333	0.4386	0.0039	0.0278	0.0269	1,337.8	0.00167
2028	A08	Other Construction Equipment	100 < hp <= 175	0.43	527.1	0.0101	0.0024	0.0287	0.0001	0.0022	0.0021	21.3	0.00016
2028	A08	Pavers	100 < hp <= 175	0.59	53.3	0.0008	0.0001	0.0018	0.0000	0.0002	0.0002	3.0	0.00001
2028	A08	Pumps	6 < hp <= 11	0.43	14.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2028	A08	Rollers	75 < hp <= 100	0.59	159.6	0.0028	0.0003	0.0109	0.0000	0.0004	0.0004	5.6	0.00002
2028	A08	Scrapers	300 < hp <= 600	0.59	66.6	0.0054	0.0009	0.0147	0.0000	0.0009	0.0009	12.7	0.00006
2028	A08	Skid Steer Loaders	50 < hp <= 75	0.21	10.4	0.0013	0.0002	0.0011	0.0000	0.0002	0.0002	0.1	0.00001
2028	A08	Surfacing Equipment	16 < hp <= 25	0.59	53.3	0.0013	0.0003	0.0033	0.0000	0.0001	0.0001	0.5	0.00002
2028	A08	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	88.1	0.0165	0.0050	0.0289	0.0000	0.0034	0.0033	5.7	0.00028
2028	A08	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	1,152.0	0.0802	0.0141	0.0872	0.0000	0.0105	0.0102	12.6	0.00069
2028	A08	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	33.1	0.0030	0.0005	0.0028	0.0000	0.0004	0.0004	0.5	0.00002
2028	A09	Air Compressors	75 < hp <= 100	0.43	48.3	0.0010	0.0001	0.0032	0.0000	0.0002	0.0002	1.2	0.00001
2028	A09	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	38.4	0.0022	0.0004	0.0050	0.0000	0.0004	0.0004	1.0	0.00002
2028	A09	Concrete/Industrial Saws	25 < hp <= 40	0.59	48.3	0.0004	0.0001	0.0032	0.0000	0.0000	0.0000	0.7	0.00001

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	A09	Concrete/Industrial Saws	6 < hp <= 11	0.7	38.4	0.0008	0.0003	0.0014	0.0000	0.0001	0.0001	0.2	0.00002
2028	A09	Crawler Tractor/Dozers	100 < hp <= 175	0.59	253.0	0.0028	0.0004	0.0079	0.0000	0.0007	0.0007	14.0	0.00003
2028	A09	Excavators	100 < hp <= 175	0.59	57.9	0.0005	0.0001	0.0017	0.0000	0.0001	0.0001	3.2	0.00001
2028	A09	Graders	175 < hp <= 300	0.59	15.3	0.0001	0.0000	0.0005	0.0000	0.0000	0.0000	1.5	0.00000
2028	A09	Irrigation Sets	300 < hp <= 600	0.59	13.8	0.0040	0.0009	0.0143	0.0000	0.0007	0.0007	2.6	0.00006
2028	A09	Off-highway Trucks	300 < hp <= 600	0.59	4,723.4	0.0769	0.0223	0.2943	0.0026	0.0186	0.0181	897.6	0.00112
2028	A09	Other Construction Equipment	100 < hp <= 175	0.43	471.1	0.0090	0.0021	0.0256	0.0001	0.0020	0.0019	19.0	0.00014
2028	A09	Pavers	100 < hp <= 175	0.59	48.3	0.0007	0.0001	0.0017	0.0000	0.0002	0.0002	2.7	0.00001
2028	A09	Pumps	6 < hp <= 11	0.43	12.8	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2028	A09	Rollers	75 < hp <= 100	0.59	140.1	0.0024	0.0002	0.0096	0.0000	0.0004	0.0003	4.9	0.00002
2028	A09	Scrapers	300 < hp <= 600	0.59	60.4	0.0049	0.0008	0.0133	0.0000	0.0008	0.0008	11.5	0.00005
2028	A09	Skid Steer Loaders	50 < hp <= 75	0.21	9.9	0.0012	0.0002	0.0010	0.0000	0.0002	0.0002	0.1	0.00001
2028	A09	Surfacing Equipment	16 < hp <= 25	0.59	48.3	0.0012	0.0003	0.0030	0.0000	0.0001	0.0001	0.4	0.00002
2028	A09	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	73.1	0.0137	0.0041	0.0239	0.0000	0.0028	0.0028	4.7	0.00023
2028	A09	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	28.0	0.0026	0.0004	0.0023	0.0000	0.0003	0.0003	0.4	0.00002
2028	A10	Air Compressors	75 < hp <= 100	0.43	1.9	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	A10	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	2.4	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2028	A10	Concrete/Industrial Saws	25 < hp <= 40	0.59	1.9	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	A10	Concrete/Industrial Saws	6 < hp <= 11	0.7	2.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	A10	Crawler Tractor/Dozers	100 < hp <= 175	0.59	22.5	0.0003	0.0000	0.0007	0.0000	0.0001	0.0001	1.2	0.00000



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	A10	Excavators	100 < hp <= 175	0.59	13.5	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.7	0.00000
2028	A10	Graders	175 < hp <= 300	0.59	1.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.00000
2028	A10	Irrigation Sets	300 < hp <= 600	0.59	0.9	0.0003	0.0001	0.0009	0.0000	0.0000	0.0000	0.2	0.00000
2028	A10	Off-highway Trucks	300 < hp <= 600	0.59	2,278.4	0.0371	0.0108	0.1420	0.0013	0.0090	0.0087	433.0	0.00054
2028	A10	Other Construction Equipment	100 < hp <= 175	0.43	39.5	0.0008	0.0002	0.0021	0.0000	0.0002	0.0002	1.6	0.00001
2028	A10	Pavers	100 < hp <= 175	0.59	1.9	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.1	0.00000
2028	A10	Pumps	6 < hp <= 11	0.43	0.8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.00000
2028	A10	Rollers	75 < hp <= 100	0.59	17.2	0.0003	0.0000	0.0012	0.0000	0.0000	0.0000	0.6	0.00000
2028	A10	Scrapers	300 < hp <= 600	0.59	2.4	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.5	0.00000
2028	A10	Skid Steer Loaders	50 < hp <= 75	0.21	4.9	0.0006	0.0001	0.0005	0.0000	0.0001	0.0001	0.1	0.00000
2028	A10	Surfacing Equipment	16 < hp <= 25	0.59	1.9	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	A10	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	24.7	0.0046	0.0014	0.0081	0.0000	0.0010	0.0009	1.6	0.00008
2028	A10	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	12.1	0.0011	0.0002	0.0010	0.0000	0.0001	0.0001	0.2	0.00001
2028	C02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2028	C02	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2028	C02	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2028	C02	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2028	C02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	64.0	0.0037	0.0007	0.0083	0.0000	0.0007	0.0006	1.6	0.00003
2028	C02	Concrete/Industrial Saws	6 < hp <= 11	0.7	64.0	0.0013	0.0005	0.0023	0.0000	0.0001	0.0001	0.3	0.00004

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	C02	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2028	C02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	40.0	0.0004	0.0001	0.0013	0.0000	0.0001	0.0001	2.2	0.00000
2028	C02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2028	C02	Forklifts	75 < hp <= 100	0.59	3,724.0	0.0125	0.0018	0.2076	0.0004	0.0029	0.0029	131.0	0.00012
2028	C02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2028	C02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2028	C02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	C02	Off-highway Trucks	300 < hp <= 600	0.59	6,864.0	0.1118	0.0325	0.4277	0.0038	0.0271	0.0263	1,304.3	0.00162
2028	C02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	C02	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2028	C02	Plate Compactors	3 < hp <= 6	0.43	40.0	0.0003	0.0001	0.0005	0.0000	0.0000	0.0000	0.1	0.00001
2028	C02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2028	C02	Rollers	75 < hp <= 100	0.59	56.0	0.0010	0.0001	0.0038	0.0000	0.0001	0.0001	2.0	0.00001
2028	C02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2028	C02	Surfacing Equipment	75 < hp <= 100	0.43	64.0	0.0022	0.0003	0.0047	0.0000	0.0003	0.0003	1.6	0.00001
2028	C02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2028	C02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2028	C02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	840.0	0.0769	0.0133	0.0703	0.0000	0.0102	0.0099	12.2	0.00061
2028	C03	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	C03	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2028	C03	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2028	C03	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2028	C03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	64.0	0.0037	0.0007	0.0083	0.0000	0.0007	0.0006	1.6	0.00003
2028	C03	Concrete/Industrial Saws	6 < hp <= 11	0.7	64.0	0.0013	0.0005	0.0023	0.0000	0.0001	0.0001	0.3	0.00004
2028	C03	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2028	C03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	40.0	0.0004	0.0001	0.0013	0.0000	0.0001	0.0001	2.2	0.00000
2028	C03	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2028	C03	Forklifts	75 < hp <= 100	0.59	3,724.0	0.0125	0.0018	0.2076	0.0004	0.0029	0.0029	131.0	0.00012
2028	C03	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2028	C03	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2028	C03	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	C03	Off-highway Trucks	300 < hp <= 600	0.59	6,864.0	0.1118	0.0325	0.4277	0.0038	0.0271	0.0263	1,304.3	0.00162
2028	C03	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	C03	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2028	C03	Plate Compactors	3 < hp <= 6	0.43	40.0	0.0003	0.0001	0.0005	0.0000	0.0000	0.0000	0.1	0.00001
2028	C03	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2028	C03	Rollers	75 < hp <= 100	0.59	56.0	0.0010	0.0001	0.0038	0.0000	0.0001	0.0001	2.0	0.00001
2028	C03	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2028	C03	Surfacing Equipment	75 < hp <= 100	0.43	64.0	0.0022	0.0003	0.0047	0.0000	0.0003	0.0003	1.6	0.00001

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	C03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2028	C03	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2028	C03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	840.0	0.0769	0.0133	0.0703	0.0000	0.0102	0.0099	12.2	0.00061
2028	L01	Air Compressors	75 < hp <= 100	0.43	22.8	0.0005	0.0001	0.0015	0.0000	0.0001	0.0001	0.6	0.00000
2028	L01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	19.2	0.0011	0.0002	0.0025	0.0000	0.0002	0.0002	0.5	0.00001
2028	L01	Concrete/Industrial Saws	25 < hp <= 40	0.59	22.8	0.0002	0.0001	0.0015	0.0000	0.0000	0.0000	0.3	0.00001
2028	L01	Concrete/Industrial Saws	6 < hp <= 11	0.7	19.2	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2028	L01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	206.5	0.0023	0.0004	0.0065	0.0000	0.0006	0.0005	11.4	0.00003
2028	L01	Excavators	100 < hp <= 175	0.59	113.3	0.0010	0.0002	0.0033	0.0000	0.0002	0.0002	6.3	0.00001
2028	L01	Graders	175 < hp <= 300	0.59	7.6	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.7	0.00000
2028	L01	Irrigation Sets	300 < hp <= 600	0.59	6.9	0.0020	0.0004	0.0071	0.0000	0.0003	0.0003	1.3	0.00003
2028	L01	Off-highway Trucks	300 < hp <= 600	0.59	4,227.2	0.0688	0.0200	0.2634	0.0023	0.0167	0.0162	803.3	0.00100
2028	L01	Other Construction Equipment	100 < hp <= 175	0.43	309.1	0.0059	0.0014	0.0168	0.0000	0.0013	0.0013	12.5	0.00009
2028	L01	Pavers	100 < hp <= 175	0.59	55.9	0.0008	0.0001	0.0019	0.0000	0.0002	0.0002	3.1	0.00001
2028	L01	Plate Compactors	3 < hp <= 6	0.43	49.2	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2028	L01	Pumps	6 < hp <= 11	0.43	6.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	L01	Rollers	75 < hp <= 100	0.59	90.4	0.0016	0.0001	0.0062	0.0000	0.0002	0.0002	3.2	0.00001
2028	L01	Scrapers	300 < hp <= 600	0.59	28.4	0.0023	0.0004	0.0063	0.0000	0.0004	0.0004	5.4	0.00002
2028	L01	Skid Steer Loaders	50 < hp <= 75	0.21	52.4	0.0065	0.0012	0.0055	0.0000	0.0009	0.0009	0.6	0.00004
2028	L01	Surfacing Equipment	16 < hp <= 25	0.59	33.7	0.0008	0.0002	0.0021	0.0000	0.0001	0.0001	0.3	0.00002



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	L01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	70.4	0.0132	0.0040	0.0231	0.0000	0.0027	0.0027	4.5	0.00022
2028	L01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	110.6	0.0101	0.0018	0.0093	0.0000	0.0013	0.0013	1.6	0.00008
2028	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2028	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2028	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2028	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2028	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2028	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2028	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2028	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2028	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2028	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2028	L03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	10.8	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.3	0.00000
2028	L03	Concrete/Industrial Saws	6 < hp <= 11	0.7	10.8	0.0002	0.0001	0.0004	0.0000	0.0000	0.0000	0.0	0.00001
2028	L03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	80.4	0.0009	0.0001	0.0025	0.0000	0.0002	0.0002	4.5	0.00001
2028	L03	Excavators	100 < hp <= 175	0.59	31.9	0.0003	0.0000	0.0009	0.0000	0.0001	0.0001	1.8	0.00000
2028	L03	Graders	175 < hp <= 300	0.59	4.2	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.4	0.00000

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	L03	Irrigation Sets	300 < hp <= 600	0.59	3.8	0.0011	0.0002	0.0040	0.0000	0.0002	0.0002	0.7	0.00002
2028	L03	Off-highway Trucks	300 < hp <= 600	0.59	1,433.7	0.0233	0.0068	0.0893	0.0008	0.0057	0.0055	272.4	0.00034
2028	L03	Other Construction Equipment	100 < hp <= 175	0.43	184.9	0.0035	0.0008	0.0101	0.0000	0.0008	0.0008	7.5	0.00006
2028	L03	Pavers	100 < hp <= 175	0.59	29.3	0.0004	0.0001	0.0010	0.0000	0.0001	0.0001	1.6	0.00000
2028	L03	Plate Compactors	3 < hp <= 6	0.43	50.0	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2028	L03	Pumps	6 < hp <= 11	0.43	3.6	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	L03	Rollers	75 < hp <= 100	0.59	56.5	0.0010	0.0001	0.0039	0.0000	0.0001	0.0001	2.0	0.00001
2028	L03	Scrapers	300 < hp <= 600	0.59	14.5	0.0012	0.0002	0.0032	0.0000	0.0002	0.0002	2.7	0.00001
2028	L03	Skid Steer Loaders	50 < hp <= 75	0.21	48.9	0.0061	0.0011	0.0051	0.0000	0.0008	0.0008	0.5	0.00004
2028	L03	Surfacing Equipment	16 < hp <= 25	0.59	5.6	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2028	L03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	48.4	0.0090	0.0027	0.0159	0.0000	0.0019	0.0018	3.1	0.00015
2028	L03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	109.5	0.0100	0.0017	0.0092	0.0000	0.0013	0.0013	1.6	0.00008
2028	L04	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2028	L04	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2028	L04	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2028	L04	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2028	L04	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2028	L04	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2028	L04	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	L04	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	L04	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2028	L04	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	L04	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2028	L04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2028	L05	Aerial Lifts	75 < hp <= 100	0.59	16.0	0.0026	0.0004	0.0028	0.0000	0.0003	0.0003	0.7	0.00002
2028	L05	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2028	L05	Cement & Mortar Mixers	300 < hp <= 600	0.59	24.0	0.0115	0.0024	0.0432	0.0000	0.0016	0.0015	4.5	0.00012
2028	L05	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2028	L05	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2028	L05	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2028	L05	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000
2028	L05	Forklifts	75 < hp <= 100	0.59	24.0	0.0001	0.0000	0.0013	0.0000	0.0000	0.0000	0.8	0.00000
2028	L05	Off-highway Trucks	300 < hp <= 600	0.59	164.0	0.0027	0.0008	0.0102	0.0001	0.0006	0.0006	31.2	0.00004
2028	L05	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2028	L05	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2028	L05	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2028	L05	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2028	L05	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2028	L05	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	L05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	120.0	0.0110	0.0019	0.0100	0.0000	0.0015	0.0014	1.7	0.00009
2028	S01	Aerial Lifts	75 < hp <= 100	0.59	16.0	0.0026	0.0004	0.0028	0.0000	0.0003	0.0003	0.7	0.00002
2028	S01	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2028	S01	Cement & Mortar Mixers	300 < hp <= 600	0.59	24.0	0.0115	0.0024	0.0432	0.0000	0.0016	0.0015	4.5	0.00012
2028	S01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	28.8	0.0017	0.0003	0.0037	0.0000	0.0003	0.0003	0.7	0.00001
2028	S01	Concrete/Industrial Saws	6 < hp <= 11	0.7	28.8	0.0006	0.0002	0.0010	0.0000	0.0001	0.0001	0.1	0.00002
2028	S01	Cranes	175 < hp <= 300	0.43	19.0	0.0002	0.0001	0.0008	0.0000	0.0000	0.0000	1.3	0.00000
2028	S01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	158.8	0.0018	0.0003	0.0050	0.0000	0.0004	0.0004	8.8	0.00002
2028	S01	Excavators	100 < hp <= 175	0.59	72.1	0.0006	0.0001	0.0021	0.0000	0.0002	0.0001	4.0	0.00001
2028	S01	Forklifts	75 < hp <= 100	0.59	24.0	0.0001	0.0000	0.0013	0.0000	0.0000	0.0000	0.8	0.00000
2028	S01	Generator Sets	25 < hp <= 40	0.43	7.4	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.1	0.00000
2028	S01	Graders	175 < hp <= 300	0.59	1.8	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.2	0.00000
2028	S01	Irrigation Sets	300 < hp <= 600	0.59	1.6	0.0005	0.0001	0.0017	0.0000	0.0001	0.0001	0.3	0.00001
2028	S01	Off-highway Trucks	300 < hp <= 600	0.59	1,353.5	0.0220	0.0064	0.0843	0.0008	0.0053	0.0052	257.2	0.00032
2028	S01	Other Construction Equipment	100 < hp <= 175	0.43	74.0	0.0014	0.0003	0.0040	0.0000	0.0003	0.0003	3.0	0.00002
2028	S01	Pavers	100 < hp <= 175	0.59	1.6	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.1	0.00000
2028	S01	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2028	S01	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2028	S01	Pumps	6 < hp <= 11	0.43	1.6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.00000
2028	S01	Rollers	75 < hp <= 100	0.59	95.5	0.0016	0.0002	0.0065	0.0000	0.0002	0.0002	3.4	0.00001



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	S01	Scrapers	300 < hp <= 600	0.59	41.6	0.0034	0.0005	0.0092	0.0000	0.0006	0.0005	7.9	0.00003
2028	S01	Skid Steer Loaders	50 < hp <= 75	0.21	22.4	0.0028	0.0005	0.0023	0.0000	0.0004	0.0004	0.2	0.00002
2028	S01	Surfacing Equipment	16 < hp <= 25	0.59	2.0	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	S01	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2028	S01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	71.5	0.0134	0.0040	0.0234	0.0000	0.0028	0.0027	4.6	0.00023
2028	S01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	38.8	0.0027	0.0005	0.0029	0.0000	0.0004	0.0003	0.4	0.00002
2028	S01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	142.4	0.0130	0.0023	0.0119	0.0000	0.0017	0.0017	2.1	0.00010
2028	S02	Aerial Lifts	50 < hp <= 75	0.21	1,320.0	0.0503	0.0096	0.0837	0.0000	0.0060	0.0058	14.4	0.00052
2028	S02	Aerial Lifts	75 < hp <= 100	0.59	456.0	0.0742	0.0117	0.0805	0.0001	0.0094	0.0091	18.7	0.00055
2028	S02	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2028	S02	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2028	S02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2028	S02	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2028	S02	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2028	S02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	36.6	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	2.0	0.00000
2028	S02	Excavators	100 < hp <= 175	0.59	77.6	0.0007	0.0001	0.0023	0.0000	0.0002	0.0002	4.3	0.00001
2028	S02	Forklifts	75 < hp <= 100	0.59	1,664.0	0.0056	0.0008	0.0928	0.0002	0.0013	0.0013	58.5	0.00005
2028	S02	Generator Sets	25 < hp <= 40	0.43	57.0	0.0007	0.0002	0.0033	0.0000	0.0001	0.0001	0.6	0.00002
2028	S02	Off-highway Trucks	175 < hp <= 300	0.43	240.0	0.0007	0.0003	0.0039	0.0000	0.0002	0.0002	16.6	0.00001

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	S02	Off-highway Trucks	300 < hp <= 600	0.59	823.8	0.0134	0.0039	0.0513	0.0005	0.0032	0.0032	156.5	0.00019
2028	S02	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2028	S02	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2028	S02	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2028	S02	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2028	S02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2028	S02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	138.0	0.0096	0.0017	0.0104	0.0000	0.0013	0.0012	1.5	0.00008
2028	S02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.0	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2028	S03	Aerial Lifts	50 < hp <= 75	0.21	1,320.0	0.0503	0.0096	0.0837	0.0000	0.0060	0.0058	14.4	0.00052
2028	S03	Aerial Lifts	75 < hp <= 100	0.59	456.0	0.0742	0.0117	0.0805	0.0001	0.0094	0.0091	18.7	0.00055
2028	S03	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2028	S03	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2028	S03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2028	S03	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2028	S03	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2028	S03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000
2028	S03	Forklifts	75 < hp <= 100	0.59	1,664.0	0.0056	0.0008	0.0928	0.0002	0.0013	0.0013	58.5	0.00005
2028	S03	Off-highway Trucks	175 < hp <= 300	0.43	240.0	0.0007	0.0003	0.0039	0.0000	0.0002	0.0002	16.6	0.00001
2028	S03	Off-highway Trucks	300 < hp <= 600	0.59	602.0	0.0098	0.0028	0.0375	0.0003	0.0024	0.0023	114.4	0.00014

**TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)**

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	S03	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2028	S03	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2028	S03	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2028	S03	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2028	S03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2028	S03	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2028	S03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.0	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2028	S04	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001
2028	S04	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010
2028	S04	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077
2028	S04	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2028	S04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	10.4	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.6	0.00000
2028	S04	Excavators	100 < hp <= 175	0.59	10.4	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.6	0.00000
2028	S04	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2028	S04	Off-highway Trucks	300 < hp <= 600	0.59	316.8	0.0052	0.0015	0.0197	0.0002	0.0012	0.0012	60.2	0.00007
2028	S04	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000
2028	S04	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2028	S04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2028	S08	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	S08	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2028	S08	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2028	S08	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2028	S08	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.5	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000
2028	S08	Excavators	100 < hp <= 175	0.59	176.5	0.0016	0.0002	0.0052	0.0000	0.0004	0.0004	9.8	0.00002
2028	S08	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2028	S08	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2028	S08	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	S08	Off-highway Trucks	300 < hp <= 600	0.59	6,507.0	0.1060	0.0308	0.4054	0.0036	0.0257	0.0249	1,236.5	0.00154
2028	S08	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	S08	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2028	S08	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2028	S09	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2028	S09	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2028	S09	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2028	S09	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2028	S09	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.5	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000
2028	S09	Excavators	100 < hp <= 175	0.59	176.5	0.0016	0.0002	0.0052	0.0000	0.0004	0.0004	9.8	0.00002
2028	S09	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	S09	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2028	S09	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	S09	Off-highway Trucks	300 < hp <= 600	0.59	6,507.0	0.1060	0.0308	0.4054	0.0036	0.0257	0.0249	1,236.5	0.00154
2028	S09	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	S09	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2028	S09	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2028	T01	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2028	T01	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2028	T01	Air Compressors	75 < hp <= 100	0.43	51.8	0.0011	0.0001	0.0034	0.0000	0.0002	0.0002	1.3	0.00001
2028	T01	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2028	T01	Chain Saws > 6 HP	6 < hp <= 11	0.7	82.0	0.0926	0.0214	0.0005	0.0000	0.0034	0.0031	0.2	0.00000
2028	T01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	82.0	0.0048	0.0009	0.0106	0.0000	0.0008	0.0008	2.1	0.00004
2028	T01	Concrete/Industrial Saws	25 < hp <= 40	0.59	51.8	0.0004	0.0001	0.0034	0.0000	0.0000	0.0000	0.7	0.00002
2028	T01	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2028	T01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	412.7	0.0046	0.0007	0.0130	0.0001	0.0011	0.0011	22.9	0.00005
2028	T01	Excavators	100 < hp <= 175	0.59	558.8	0.0049	0.0008	0.0165	0.0001	0.0012	0.0011	31.0	0.00006
2028	T01	Forklifts	75 < hp <= 100	0.59	3,700.0	0.0125	0.0018	0.2062	0.0004	0.0029	0.0028	130.1	0.00012
2028	T01	Generator Sets	25 < hp <= 40	0.43	301.0	0.0039	0.0011	0.0175	0.0000	0.0006	0.0006	3.1	0.00009
2028	T01	Graders	175 < hp <= 300	0.59	16.9	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	T01	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2028	T01	Irrigation Sets	300 < hp <= 600	0.59	15.2	0.0044	0.0009	0.0158	0.0000	0.0007	0.0007	2.9	0.00006
2028	T01	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	T01	Off-highway Trucks	300 < hp <= 600	0.59	12,536.6	0.2042	0.0593	0.7811	0.0070	0.0494	0.0480	2,382.3	0.00297
2028	T01	Other Construction Equipment	100 < hp <= 175	0.43	516.6	0.0099	0.0023	0.0281	0.0001	0.0022	0.0021	20.9	0.00015
2028	T01	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	T01	Pavers	100 < hp <= 175	0.59	51.8	0.0008	0.0001	0.0018	0.0000	0.0002	0.0002	2.9	0.00001
2028	T01	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2028	T01	Pumps	6 < hp <= 11	0.43	254.0	0.0034	0.0011	0.0056	0.0000	0.0004	0.0003	0.7	0.00008
2028	T01	Rollers	75 < hp <= 100	0.59	194.3	0.0033	0.0003	0.0133	0.0000	0.0005	0.0005	6.8	0.00002
2028	T01	Scrapers	300 < hp <= 600	0.59	64.8	0.0053	0.0008	0.0143	0.0000	0.0009	0.0008	12.3	0.00005
2028	T01	Skid Steer Loaders	50 < hp <= 75	0.21	15.9	0.0020	0.0004	0.0017	0.0000	0.0003	0.0003	0.2	0.00001
2028	T01	Surfacing Equipment	16 < hp <= 25	0.59	51.8	0.0013	0.0003	0.0032	0.0000	0.0001	0.0001	0.5	0.00002
2028	T01	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2028	T01	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2028	T01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	129.1	0.0241	0.0073	0.0423	0.0000	0.0050	0.0049	8.3	0.00041
2028	T01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	466.1	0.0324	0.0057	0.0353	0.0000	0.0043	0.0041	5.1	0.00028
2028	T01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	757.5	0.0693	0.0120	0.0634	0.0000	0.0092	0.0089	11.0	0.00055
2028	T02	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	T02	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144
2028	T02	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2028	T02	Chain Saws > 6 HP	6 < hp <= 11	0.7	40.0	0.0452	0.0104	0.0003	0.0000	0.0017	0.0015	0.1	0.00000
2028	T02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2028	T02	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2028	T02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	110.6	0.0012	0.0002	0.0035	0.0000	0.0003	0.0003	6.1	0.00001
2028	T02	Excavators	100 < hp <= 175	0.59	246.6	0.0022	0.0003	0.0073	0.0000	0.0005	0.0005	13.7	0.00002
2028	T02	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014
2028	T02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2028	T02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2028	T02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	T02	Off-highway Trucks	300 < hp <= 600	0.59	8,061.3	0.1313	0.0381	0.5023	0.0045	0.0318	0.0308	1,531.8	0.00191
2028	T02	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021
2028	T02	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2028	T02	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2028	T02	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2028	T02	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2028	T02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2028	T02	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2028	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.21	80.0	0.0030	0.0009	0.0053	0.0000	0.0006	0.0006	1.1	0.00005

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013
2028	T02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2028	T02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2028	T02	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021
2029	A01	Air Compressors	75 < hp <= 100	0.43	29.1	0.0006	0.0001	0.0019	0.0000	0.0001	0.0001	0.7	0.00001
2029	A01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	27.6	0.0016	0.0003	0.0036	0.0000	0.0003	0.0003	0.7	0.00001
2029	A01	Concrete/Industrial Saws	25 < hp <= 40	0.59	29.1	0.0002	0.0001	0.0019	0.0000	0.0000	0.0000	0.4	0.00001
2029	A01	Concrete/Industrial Saws	6 < hp <= 11	0.7	27.6	0.0006	0.0002	0.0010	0.0000	0.0001	0.0001	0.1	0.00002
2029	A01	Cranes	175 < hp <= 300	0.43	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-	0.00000
2029	A01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	233.4	0.0026	0.0004	0.0073	0.0000	0.0006	0.0006	12.9	0.00003
2029	A01	Excavators	100 < hp <= 175	0.59	277.0	0.0025	0.0004	0.0082	0.0000	0.0006	0.0006	15.4	0.00003
2029	A01	Graders	175 < hp <= 300	0.59	11.3	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	1.1	0.00000
2029	A01	Irrigation Sets	300 < hp <= 600	0.59	10.2	0.0030	0.0006	0.0106	0.0000	0.0005	0.0005	1.9	0.00004
2029	A01	Off-highway Trucks	300 < hp <= 600	0.59	2,244.7	0.0366	0.0106	0.1399	0.0012	0.0089	0.0086	426.6	0.00053
2029	A01	Other Construction Equipment	100 < hp <= 175	0.43	390.4	0.0075	0.0017	0.0212	0.0000	0.0016	0.0016	15.8	0.00012
2029	A01	Pavers	100 < hp <= 175	0.59	29.1	0.0004	0.0001	0.0010	0.0000	0.0001	0.0001	1.6	0.00000
2029	A01	Pumps	6 < hp <= 11	0.43	9.2	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2029	A01	Rollers	75 < hp <= 100	0.59	153.1	0.0026	0.0002	0.0105	0.0000	0.0004	0.0004	5.4	0.00002
2029	A01	Scrapers	300 < hp <= 600	0.59	36.4	0.0030	0.0005	0.0080	0.0000	0.0005	0.0005	6.9	0.00003



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	A01	Skid Steer Loaders	50 < hp <= 75	0.21	30.5	0.0038	0.0007	0.0032	0.0000	0.0005	0.0005	0.3	0.00003
2029	A01	Surfacing Equipment	16 < hp <= 25	0.59	29.1	0.0007	0.0002	0.0018	0.0000	0.0001	0.0001	0.3	0.00001
2029	A01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	172.1	0.0322	0.0097	0.0564	0.0000	0.0067	0.0065	11.1	0.00055
2029	A01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	79.8	0.0073	0.0013	0.0067	0.0000	0.0010	0.0009	1.2	0.00006
2029	A04	Air Compressors	75 < hp <= 100	0.43	30.5	0.0006	0.0001	0.0020	0.0000	0.0001	0.0001	0.8	0.00001
2029	A04	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	26.4	0.0015	0.0003	0.0034	0.0000	0.0003	0.0003	0.7	0.00001
2029	A04	Concrete/Industrial Saws	25 < hp <= 40	0.59	30.5	0.0002	0.0001	0.0020	0.0000	0.0000	0.0000	0.4	0.00001
2029	A04	Concrete/Industrial Saws	6 < hp <= 11	0.7	26.4	0.0006	0.0002	0.0009	0.0000	0.0001	0.0001	0.1	0.00001
2029	A04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	196.8	0.0022	0.0003	0.0062	0.0000	0.0005	0.0005	10.9	0.00002
2029	A04	Excavators	100 < hp <= 175	0.59	493.1	0.0044	0.0007	0.0145	0.0001	0.0010	0.0010	27.3	0.00005
2029	A04	Graders	175 < hp <= 300	0.59	10.6	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	1.0	0.00000
2029	A04	Irrigation Sets	300 < hp <= 600	0.59	9.6	0.0028	0.0006	0.0099	0.0000	0.0005	0.0005	1.8	0.00004
2029	A04	Off-highway Trucks	300 < hp <= 600	0.59	7,740.8	0.1261	0.0366	0.4823	0.0043	0.0305	0.0296	1,471.0	0.00183
2029	A04	Other Construction Equipment	100 < hp <= 175	0.43	1,931.0	0.0370	0.0086	0.1050	0.0002	0.0081	0.0079	78.0	0.00058
2029	A04	Pavers	100 < hp <= 175	0.59	30.5	0.0004	0.0001	0.0010	0.0000	0.0001	0.0001	1.7	0.00000
2029	A04	Pumps	6 < hp <= 11	0.43	8.8	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2029	A04	Rollers	75 < hp <= 100	0.59	123.4	0.0021	0.0002	0.0084	0.0000	0.0003	0.0003	4.3	0.00001
2029	A04	Scrapers	300 < hp <= 600	0.59	38.1	0.0031	0.0005	0.0084	0.0000	0.0005	0.0005	7.2	0.00003
2029	A04	Skid Steer Loaders	50 < hp <= 75	0.21	27.3	0.0034	0.0006	0.0029	0.0000	0.0005	0.0005	0.3	0.00002

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	A04	Surfacing Equipment	16 < hp <= 25	0.59	30.5	0.0007	0.0002	0.0019	0.0000	0.0001	0.0001	0.3	0.00001
2029	A04	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	120.4	0.0225	0.0068	0.0394	0.0000	0.0047	0.0045	7.8	0.00038
2029	A04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	58.5	0.0054	0.0009	0.0049	0.0000	0.0007	0.0007	0.9	0.00004
2029	A05	Off-highway Trucks	300 < hp <= 600	0.59	95.4	0.0016	0.0005	0.0059	0.0001	0.0004	0.0004	18.1	0.00002
2029	A05	Other Construction Equipment	100 < hp <= 175	0.43	47.7	0.0009	0.0002	0.0026	0.0000	0.0002	0.0002	1.9	0.00001
2029	A05	Skid Steer Loaders	50 < hp <= 75	0.21	6.5	0.0008	0.0002	0.0007	0.0000	0.0001	0.0001	0.1	0.00001
2029	A05	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	6.5	0.0012	0.0004	0.0021	0.0000	0.0003	0.0002	0.4	0.00002
2029	A05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	6.5	0.0006	0.0001	0.0005	0.0000	0.0001	0.0001	0.1	0.00000
2029	A08	Air Compressors	75 < hp <= 100	0.43	13.3	0.0003	0.0000	0.0009	0.0000	0.0000	0.0000	0.3	0.00000
2029	A08	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	10.8	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.3	0.00000
2029	A08	Concrete/Industrial Saws	25 < hp <= 40	0.59	13.3	0.0001	0.0000	0.0009	0.0000	0.0000	0.0000	0.2	0.00000
2029	A08	Concrete/Industrial Saws	6 < hp <= 11	0.7	10.8	0.0002	0.0001	0.0004	0.0000	0.0000	0.0000	0.0	0.00001
2029	A08	Crawler Tractor/Dozers	100 < hp <= 175	0.59	108.1	0.0012	0.0002	0.0034	0.0000	0.0003	0.0003	6.0	0.00001
2029	A08	Excavators	100 < hp <= 175	0.59	197.5	0.0017	0.0003	0.0058	0.0000	0.0004	0.0004	10.9	0.00002
2029	A08	Generator Sets	25 < hp <= 40	0.43	144.0	0.0019	0.0005	0.0084	0.0000	0.0003	0.0003	1.5	0.00004
2029	A08	Graders	175 < hp <= 300	0.59	4.5	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.4	0.00000
2029	A08	Irrigation Sets	300 < hp <= 600	0.59	4.0	0.0012	0.0003	0.0042	0.0000	0.0002	0.0002	0.8	0.00002
2029	A08	Off-highway Trucks	300 < hp <= 600	0.59	1,768.7	0.0288	0.0084	0.1102	0.0010	0.0070	0.0068	336.1	0.00042
2029	A08	Other Construction Equipment	100 < hp <= 175	0.43	135.3	0.0026	0.0006	0.0074	0.0000	0.0006	0.0006	5.5	0.00004



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	A08	Pavers	100 < hp <= 175	0.59	13.3	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.7	0.00000
2029	A08	Pumps	6 < hp <= 11	0.43	3.6	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2029	A08	Rollers	75 < hp <= 100	0.59	40.4	0.0007	0.0001	0.0028	0.0000	0.0001	0.0001	1.4	0.00000
2029	A08	Scrapers	300 < hp <= 600	0.59	16.7	0.0014	0.0002	0.0037	0.0000	0.0002	0.0002	3.2	0.00001
2029	A08	Skid Steer Loaders	50 < hp <= 75	0.21	5.6	0.0007	0.0001	0.0006	0.0000	0.0001	0.0001	0.1	0.00000
2029	A08	Surfacing Equipment	16 < hp <= 25	0.59	13.3	0.0003	0.0001	0.0008	0.0000	0.0000	0.0000	0.1	0.00001
2029	A08	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	25.4	0.0047	0.0014	0.0083	0.0000	0.0010	0.0010	1.6	0.00008
2029	A08	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	288.0	0.0200	0.0035	0.0218	0.0000	0.0026	0.0026	3.1	0.00017
2029	A08	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	11.5	0.0011	0.0002	0.0010	0.0000	0.0001	0.0001	0.2	0.00001
2029	A09	Air Compressors	75 < hp <= 100	0.43	12.5	0.0003	0.0000	0.0008	0.0000	0.0000	0.0000	0.3	0.00000
2029	A09	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	10.8	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.3	0.00000
2029	A09	Concrete/Industrial Saws	25 < hp <= 40	0.59	12.5	0.0001	0.0000	0.0008	0.0000	0.0000	0.0000	0.2	0.00000
2029	A09	Concrete/Industrial Saws	6 < hp <= 11	0.7	10.8	0.0002	0.0001	0.0004	0.0000	0.0000	0.0000	0.0	0.00001
2029	A09	Crawler Tractor/Dozers	100 < hp <= 175	0.59	66.9	0.0007	0.0001	0.0021	0.0000	0.0002	0.0002	3.7	0.00001
2029	A09	Excavators	100 < hp <= 175	0.59	15.2	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.8	0.00000
2029	A09	Graders	175 < hp <= 300	0.59	4.3	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.4	0.00000
2029	A09	Irrigation Sets	300 < hp <= 600	0.59	3.9	0.0011	0.0002	0.0041	0.0000	0.0002	0.0002	0.7	0.00002
2029	A09	Off-highway Trucks	300 < hp <= 600	0.59	1,210.1	0.0197	0.0057	0.0754	0.0007	0.0048	0.0046	230.0	0.00029
2029	A09	Other Construction Equipment	100 < hp <= 175	0.43	126.9	0.0024	0.0006	0.0069	0.0000	0.0005	0.0005	5.1	0.00004

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	A09	Pavers	100 < hp <= 175	0.59	12.5	0.0002	0.0000	0.0004	0.0000	0.0000	0.0000	0.7	0.00000
2029	A09	Pumps	6 < hp <= 11	0.43	3.6	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2029	A09	Rollers	75 < hp <= 100	0.59	36.8	0.0006	0.0001	0.0025	0.0000	0.0001	0.0001	1.3	0.00000
2029	A09	Scrapers	300 < hp <= 600	0.59	15.6	0.0013	0.0002	0.0034	0.0000	0.0002	0.0002	3.0	0.00001
2029	A09	Skid Steer Loaders	50 < hp <= 75	0.21	7.0	0.0009	0.0002	0.0007	0.0000	0.0001	0.0001	0.1	0.00001
2029	A09	Surfacing Equipment	16 < hp <= 25	0.59	12.5	0.0003	0.0001	0.0008	0.0000	0.0000	0.0000	0.1	0.00001
2029	A09	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	23.7	0.0044	0.0013	0.0078	0.0000	0.0009	0.0009	1.5	0.00008
2029	A09	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	12.1	0.0011	0.0002	0.0010	0.0000	0.0001	0.0001	0.2	0.00001
2029	C03	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2029	C03	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2029	C03	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2029	C03	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2029	C03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	64.0	0.0037	0.0007	0.0083	0.0000	0.0007	0.0006	1.6	0.00003
2029	C03	Concrete/Industrial Saws	6 < hp <= 11	0.7	64.0	0.0013	0.0005	0.0023	0.0000	0.0001	0.0001	0.3	0.00004
2029	C03	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2029	C03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	40.0	0.0004	0.0001	0.0013	0.0000	0.0001	0.0001	2.2	0.00000
2029	C03	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2029	C03	Forklifts	75 < hp <= 100	0.59	3,724.0	0.0125	0.0018	0.2076	0.0004	0.0029	0.0029	131.0	0.00012
2029	C03	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	C03	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2029	C03	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2029	C03	Off-highway Trucks	300 < hp <= 600	0.59	6,864.0	0.1118	0.0325	0.4277	0.0038	0.0271	0.0263	1,304.3	0.00162
2029	C03	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2029	C03	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2029	C03	Plate Compactors	3 < hp <= 6	0.43	40.0	0.0003	0.0001	0.0005	0.0000	0.0000	0.0000	0.1	0.00001
2029	C03	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2029	C03	Rollers	75 < hp <= 100	0.59	56.0	0.0010	0.0001	0.0038	0.0000	0.0001	0.0001	2.0	0.00001
2029	C03	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2029	C03	Surfacing Equipment	75 < hp <= 100	0.43	64.0	0.0022	0.0003	0.0047	0.0000	0.0003	0.0003	1.6	0.00001
2029	C03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2029	C03	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2029	C03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	840.0	0.0769	0.0133	0.0703	0.0000	0.0102	0.0099	12.2	0.00061
2029	L01	Air Compressors	75 < hp <= 100	0.43	22.8	0.0005	0.0001	0.0015	0.0000	0.0001	0.0001	0.6	0.00000
2029	L01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	19.2	0.0011	0.0002	0.0025	0.0000	0.0002	0.0002	0.5	0.00001
2029	L01	Concrete/Industrial Saws	25 < hp <= 40	0.59	22.8	0.0002	0.0001	0.0015	0.0000	0.0000	0.0000	0.3	0.00001
2029	L01	Concrete/Industrial Saws	6 < hp <= 11	0.7	19.2	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2029	L01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	206.5	0.0023	0.0004	0.0065	0.0000	0.0006	0.0005	11.4	0.00003
2029	L01	Excavators	100 < hp <= 175	0.59	113.3	0.0010	0.0002	0.0033	0.0000	0.0002	0.0002	6.3	0.00001
2029	L01	Graders	175 < hp <= 300	0.59	7.6	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.7	0.00000

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	L01	Irrigation Sets	300 < hp <= 600	0.59	6.9	0.0020	0.0004	0.0071	0.0000	0.0003	0.0003	1.3	0.00003
2029	L01	Off-highway Trucks	300 < hp <= 600	0.59	4,227.2	0.0688	0.0200	0.2634	0.0023	0.0167	0.0162	803.3	0.00100
2029	L01	Other Construction Equipment	100 < hp <= 175	0.43	309.1	0.0059	0.0014	0.0168	0.0000	0.0013	0.0013	12.5	0.00009
2029	L01	Pavers	100 < hp <= 175	0.59	55.9	0.0008	0.0001	0.0019	0.0000	0.0002	0.0002	3.1	0.00001
2029	L01	Plate Compactors	3 < hp <= 6	0.43	49.2	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2029	L01	Pumps	6 < hp <= 11	0.43	6.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2029	L01	Rollers	75 < hp <= 100	0.59	90.4	0.0016	0.0001	0.0062	0.0000	0.0002	0.0002	3.2	0.00001
2029	L01	Scrapers	300 < hp <= 600	0.59	28.4	0.0023	0.0004	0.0063	0.0000	0.0004	0.0004	5.4	0.00002
2029	L01	Skid Steer Loaders	50 < hp <= 75	0.21	52.4	0.0065	0.0012	0.0055	0.0000	0.0009	0.0009	0.6	0.00004
2029	L01	Surfacing Equipment	16 < hp <= 25	0.59	33.7	0.0008	0.0002	0.0021	0.0000	0.0001	0.0001	0.3	0.00002
2029	L01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	70.4	0.0132	0.0040	0.0231	0.0000	0.0027	0.0027	4.5	0.00022
2029	L01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	110.6	0.0101	0.0018	0.0093	0.0000	0.0013	0.0013	1.6	0.00008
2029	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2029	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2029	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2029	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2029	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2029	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2029	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2029	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2029	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2029	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2029	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2029	L03	Air Compressors	75 < hp <= 100	0.43	46.3	0.0009	0.0001	0.0031	0.0000	0.0002	0.0002	1.2	0.00001
2029	L03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	42.0	0.0025	0.0005	0.0055	0.0000	0.0004	0.0004	1.1	0.00002
2029	L03	Concrete/Industrial Saws	25 < hp <= 40	0.59	46.3	0.0004	0.0001	0.0031	0.0000	0.0000	0.0000	0.7	0.00001
2029	L03	Concrete/Industrial Saws	6 < hp <= 11	0.7	42.0	0.0009	0.0003	0.0015	0.0000	0.0001	0.0001	0.2	0.00002
2029	L03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	320.1	0.0036	0.0005	0.0100	0.0001	0.0009	0.0009	17.7	0.00004
2029	L03	Excavators	100 < hp <= 175	0.59	126.6	0.0011	0.0002	0.0037	0.0000	0.0003	0.0003	7.0	0.00001
2029	L03	Graders	175 < hp <= 300	0.59	16.7	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000
2029	L03	Irrigation Sets	300 < hp <= 600	0.59	15.1	0.0044	0.0009	0.0157	0.0000	0.0007	0.0007	2.8	0.00006
2029	L03	Off-highway Trucks	300 < hp <= 600	0.59	6,058.6	0.0987	0.0287	0.3775	0.0034	0.0239	0.0232	1,151.3	0.00143
2029	L03	Other Construction Equipment	100 < hp <= 175	0.43	829.6	0.0159	0.0037	0.0451	0.0001	0.0035	0.0034	33.5	0.00025
2029	L03	Pavers	100 < hp <= 175	0.59	163.6	0.0024	0.0004	0.0056	0.0000	0.0006	0.0006	9.1	0.00003
2029	L03	Plate Compactors	3 < hp <= 6	0.43	200.0	0.0015	0.0005	0.0024	0.0000	0.0002	0.0001	0.3	0.00004
2029	L03	Pumps	6 < hp <= 11	0.43	14.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2029	L03	Rollers	75 < hp <= 100	0.59	224.7	0.0039	0.0004	0.0154	0.0000	0.0006	0.0006	7.9	0.00003
2029	L03	Scrapers	300 < hp <= 600	0.59	57.8	0.0047	0.0008	0.0127	0.0000	0.0008	0.0007	11.0	0.00005

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	L03	Skid Steer Loaders	50 < hp <= 75	0.21	195.1	0.0242	0.0045	0.0204	0.0000	0.0033	0.0032	2.1	0.00017
2029	L03	Surfacing Equipment	16 < hp <= 25	0.59	68.5	0.0017	0.0004	0.0042	0.0000	0.0002	0.0002	0.6	0.00003
2029	L03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	237.9	0.0445	0.0134	0.0779	0.0001	0.0092	0.0090	15.4	0.00076
2029	L03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	436.4	0.0399	0.0069	0.0365	0.0000	0.0053	0.0051	6.4	0.00032
2029	L04	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2029	L04	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2029	L04	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2029	L04	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2029	L04	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2029	L04	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2029	L04	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2029	L04	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2029	L04	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2029	L04	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2029	L04	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2029	L04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2029	L07	Aerial Lifts	75 < hp <= 100	0.59	400.8	0.0652	0.0103	0.0707	0.0001	0.0083	0.0080	16.4	0.00048
2029	L07	Bore/Drill Rigs	100 < hp <= 175	0.43	120.0	0.0114	0.0038	0.0447	0.0000	0.0026	0.0025	4.8	0.00020
2029	L07	Cement & Mortar Mixers	300 < hp <= 600	0.59	660.0	0.3154	0.0674	1.1890	0.0005	0.0432	0.0419	123.9	0.00317



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	L07	Cranes	175 < hp <= 300	0.43	600.0	0.0060	0.0021	0.0253	0.0001	0.0014	0.0013	41.1	0.00012
2029	L07	Excavators	100 < hp <= 175	0.59	160.8	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2029	L07	Forklifts	75 < hp <= 100	0.59	801.6	0.0027	0.0004	0.0447	0.0001	0.0006	0.0006	28.2	0.00003
2029	L07	Off-highway Trucks	175 < hp <= 300	0.43	160.8	0.0005	0.0002	0.0026	0.0000	0.0002	0.0001	11.1	0.00001
2029	L07	Off-highway Trucks	300 < hp <= 600	0.59	1,536.0	0.0250	0.0073	0.0957	0.0009	0.0061	0.0059	291.9	0.00036
2029	L07	Pavers	100 < hp <= 175	0.59	79.2	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2029	L07	Pumps	6 < hp <= 11	0.43	450.0	0.0061	0.0019	0.0099	0.0000	0.0006	0.0006	1.3	0.00015
2029	L07	Rubber Tire Loaders	75 < hp <= 100	0.21	79.2	0.0005	0.0000	0.0019	0.0000	0.0001	0.0001	1.0	0.00000
2029	L07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	679.2	0.0621	0.0108	0.0568	0.0000	0.0083	0.0080	9.9	0.00049
2029	L07	Trenchers	50 < hp <= 75	0.59	319.2	0.0111	0.0017	0.0445	0.0000	0.0013	0.0013	8.4	0.00017
2029	S01	Aerial Lifts	75 < hp <= 100	0.59	16.0	0.0026	0.0004	0.0028	0.0000	0.0003	0.0003	0.7	0.00002
2029	S01	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2029	S01	Air Compressors	75 < hp <= 100	0.43	15.8	0.0003	0.0000	0.0010	0.0000	0.0001	0.0001	0.4	0.00000
2029	S01	Cement & Mortar Mixers	300 < hp <= 600	0.59	24.0	0.0115	0.0024	0.0432	0.0000	0.0016	0.0015	4.5	0.00012
2029	S01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	37.2	0.0022	0.0004	0.0048	0.0000	0.0004	0.0004	0.9	0.00002
2029	S01	Concrete/Industrial Saws	25 < hp <= 40	0.59	15.8	0.0001	0.0000	0.0011	0.0000	0.0000	0.0000	0.2	0.00000
2029	S01	Concrete/Industrial Saws	6 < hp <= 11	0.7	37.2	0.0008	0.0003	0.0013	0.0000	0.0001	0.0001	0.2	0.00002
2029	S01	Cranes	175 < hp <= 300	0.43	19.0	0.0002	0.0001	0.0008	0.0000	0.0000	0.0000	1.3	0.00000
2029	S01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	508.0	0.0056	0.0009	0.0159	0.0001	0.0014	0.0014	28.2	0.00006

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	S01	Excavators	100 < hp <= 175	0.59	232.9	0.0021	0.0003	0.0069	0.0000	0.0005	0.0005	12.9	0.00002
2029	S01	Forklifts	75 < hp <= 100	0.59	24.0	0.0001	0.0000	0.0013	0.0000	0.0000	0.0000	0.8	0.00000
2029	S01	Generator Sets	25 < hp <= 40	0.43	30.0	0.0004	0.0001	0.0017	0.0000	0.0001	0.0001	0.3	0.00001
2029	S01	Graders	175 < hp <= 300	0.59	5.4	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.5	0.00000
2029	S01	Irrigation Sets	300 < hp <= 600	0.59	4.8	0.0014	0.0003	0.0050	0.0000	0.0002	0.0002	0.9	0.00002
2029	S01	Off-highway Trucks	300 < hp <= 600	0.59	4,815.9	0.0784	0.0228	0.3001	0.0027	0.0190	0.0184	915.1	0.00114
2029	S01	Other Construction Equipment	100 < hp <= 175	0.43	191.3	0.0037	0.0009	0.0104	0.0000	0.0008	0.0008	7.7	0.00006
2029	S01	Pavers	100 < hp <= 175	0.59	21.7	0.0003	0.0000	0.0007	0.0000	0.0001	0.0001	1.2	0.00000
2029	S01	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2029	S01	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2029	S01	Pumps	6 < hp <= 11	0.43	4.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2029	S01	Rollers	75 < hp <= 100	0.59	275.6	0.0048	0.0004	0.0189	0.0000	0.0007	0.0007	9.7	0.00003
2029	S01	Scrapers	300 < hp <= 600	0.59	158.2	0.0129	0.0021	0.0348	0.0001	0.0021	0.0020	30.1	0.00013
2029	S01	Skid Steer Loaders	50 < hp <= 75	0.21	28.9	0.0036	0.0007	0.0030	0.0000	0.0005	0.0005	0.3	0.00002
2029	S01	Surfacing Equipment	16 < hp <= 25	0.59	23.4	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.2	0.00001
2029	S01	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2029	S01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	89.5	0.0167	0.0050	0.0293	0.0000	0.0035	0.0034	5.8	0.00028
2029	S01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	84.0	0.0058	0.0010	0.0064	0.0000	0.0008	0.0007	0.9	0.00005
2029	S01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	147.3	0.0135	0.0023	0.0123	0.0000	0.0018	0.0017	2.1	0.00011



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	S03	Aerial Lifts	50 < hp <= 75	0.21	1,320.0	0.0503	0.0096	0.0837	0.0000	0.0060	0.0058	14.4	0.00052
2029	S03	Aerial Lifts	75 < hp <= 100	0.59	456.0	0.0742	0.0117	0.0805	0.0001	0.0094	0.0091	18.7	0.00055
2029	S03	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2029	S03	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2029	S03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2029	S03	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2029	S03	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2029	S03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000
2029	S03	Forklifts	75 < hp <= 100	0.59	1,664.0	0.0056	0.0008	0.0928	0.0002	0.0013	0.0013	58.5	0.00005
2029	S03	Off-highway Trucks	175 < hp <= 300	0.43	240.0	0.0007	0.0003	0.0039	0.0000	0.0002	0.0002	16.6	0.00001
2029	S03	Off-highway Trucks	300 < hp <= 600	0.59	602.0	0.0098	0.0028	0.0375	0.0003	0.0024	0.0023	114.4	0.00014
2029	S03	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2029	S03	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2029	S03	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2029	S03	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2029	S03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2029	S03	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2029	S03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.0	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2029	S10	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	S10	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144
2029	S10	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2029	S10	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2029	S10	Concrete/Industrial Saws	6 < hp <= 11	0.7	40.0	0.0008	0.0003	0.0014	0.0000	0.0001	0.0001	0.2	0.00002
2029	S10	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2029	S10	Crawler Tractor/Dozers	100 < hp <= 175	0.59	24.0	0.0003	0.0000	0.0008	0.0000	0.0001	0.0001	1.3	0.00000
2029	S10	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2029	S10	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014
2029	S10	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2029	S10	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2029	S10	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2029	S10	Off-highway Trucks	300 < hp <= 600	0.59	7,888.0	0.1285	0.0373	0.4915	0.0044	0.0311	0.0302	1,498.9	0.00187
2029	S10	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021
2029	S10	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2029	S10	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2029	S10	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2029	S10	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2029	S10	Rubber Tire Loaders	75 < hp <= 100	0.21	80.0	0.0005	0.0000	0.0019	0.0000	0.0001	0.0001	1.0	0.00000
2029	S10	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2029	S10	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	S10	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013
2029	S10	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2029	S10	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2029	S10	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021
2029	T01	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2029	T01	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2029	T01	Air Compressors	75 < hp <= 100	0.43	51.8	0.0011	0.0001	0.0034	0.0000	0.0002	0.0002	1.3	0.00001
2029	T01	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2029	T01	Chain Saws > 6 HP	6 < hp <= 11	0.7	82.0	0.0926	0.0214	0.0005	0.0000	0.0034	0.0031	0.2	0.00000
2029	T01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	82.0	0.0048	0.0009	0.0106	0.0000	0.0008	0.0008	2.1	0.00004
2029	T01	Concrete/Industrial Saws	25 < hp <= 40	0.59	51.8	0.0004	0.0001	0.0034	0.0000	0.0000	0.0000	0.7	0.00002
2029	T01	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2029	T01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	412.7	0.0046	0.0007	0.0130	0.0001	0.0011	0.0011	22.9	0.00005
2029	T01	Excavators	100 < hp <= 175	0.59	558.8	0.0049	0.0008	0.0165	0.0001	0.0012	0.0011	31.0	0.00006
2029	T01	Forklifts	75 < hp <= 100	0.59	3,700.0	0.0125	0.0018	0.2062	0.0004	0.0029	0.0028	130.1	0.00012
2029	T01	Generator Sets	25 < hp <= 40	0.43	301.0	0.0039	0.0011	0.0175	0.0000	0.0006	0.0006	3.1	0.00009
2029	T01	Graders	175 < hp <= 300	0.59	16.9	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000
2029	T01	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2029	T01	Irrigation Sets	300 < hp <= 600	0.59	15.2	0.0044	0.0009	0.0158	0.0000	0.0007	0.0007	2.9	0.00006

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	T01	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2029	T01	Off-highway Trucks	300 < hp <= 600	0.59	12,536.6	0.2042	0.0593	0.7811	0.0070	0.0494	0.0480	2,382.3	0.00297
2029	T01	Other Construction Equipment	100 < hp <= 175	0.43	516.6	0.0099	0.0023	0.0281	0.0001	0.0022	0.0021	20.9	0.00015
2029	T01	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2029	T01	Pavers	100 < hp <= 175	0.59	51.8	0.0008	0.0001	0.0018	0.0000	0.0002	0.0002	2.9	0.00001
2029	T01	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2029	T01	Pumps	6 < hp <= 11	0.43	254.0	0.0034	0.0011	0.0056	0.0000	0.0004	0.0003	0.7	0.00008
2029	T01	Rollers	75 < hp <= 100	0.59	194.3	0.0033	0.0003	0.0133	0.0000	0.0005	0.0005	6.8	0.00002
2029	T01	Scrapers	300 < hp <= 600	0.59	64.8	0.0053	0.0008	0.0143	0.0000	0.0009	0.0008	12.3	0.00005
2029	T01	Skid Steer Loaders	50 < hp <= 75	0.21	15.9	0.0020	0.0004	0.0017	0.0000	0.0003	0.0003	0.2	0.00001
2029	T01	Surfacing Equipment	16 < hp <= 25	0.59	51.8	0.0013	0.0003	0.0032	0.0000	0.0001	0.0001	0.5	0.00002
2029	T01	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2029	T01	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2029	T01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	129.1	0.0241	0.0073	0.0423	0.0000	0.0050	0.0049	8.3	0.00041
2029	T01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	466.1	0.0324	0.0057	0.0353	0.0000	0.0043	0.0041	5.1	0.00028
2029	T01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	757.5	0.0693	0.0120	0.0634	0.0000	0.0092	0.0089	11.0	0.00055
2029	T02	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198
2029	T02	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144
2029	T02	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2029	T02	Chain Saws > 6 HP	6 < hp <= 11	0.7	40.0	0.0452	0.0104	0.0003	0.0000	0.0017	0.0015	0.1	0.00000



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	T02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2029	T02	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2029	T02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	140.6	0.0016	0.0002	0.0044	0.0000	0.0004	0.0004	7.8	0.00002
2029	T02	Excavators	100 < hp <= 175	0.59	276.6	0.0024	0.0004	0.0082	0.0000	0.0006	0.0006	15.3	0.00003
2029	T02	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014
2029	T02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2029	T02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2029	T02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2029	T02	Off-highway Trucks	300 < hp <= 600	0.59	8,121.1	0.1322	0.0384	0.5060	0.0045	0.0320	0.0311	1,543.2	0.00192
2029	T02	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021
2029	T02	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2029	T02	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2029	T02	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2029	T02	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2029	T02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2029	T02	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2029	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.21	80.0	0.0030	0.0009	0.0053	0.0000	0.0006	0.0006	1.1	0.00005
2029	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013
2029	T02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	T02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2029	T02	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021
2030	A04	Air Compressors	75 < hp <= 100	0.43	30.5	0.0006	0.0001	0.0020	0.0000	0.0001	0.0001	0.8	0.00001
2030	A04	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	26.4	0.0015	0.0003	0.0034	0.0000	0.0003	0.0003	0.7	0.00001
2030	A04	Concrete/Industrial Saws	25 < hp <= 40	0.59	30.5	0.0002	0.0001	0.0020	0.0000	0.0000	0.0000	0.4	0.00001
2030	A04	Concrete/Industrial Saws	6 < hp <= 11	0.7	26.4	0.0006	0.0002	0.0009	0.0000	0.0001	0.0001	0.1	0.00001
2030	A04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	196.8	0.0022	0.0003	0.0062	0.0000	0.0005	0.0005	10.9	0.00002
2030	A04	Excavators	100 < hp <= 175	0.59	493.1	0.0044	0.0007	0.0145	0.0001	0.0010	0.0010	27.3	0.00005
2030	A04	Graders	175 < hp <= 300	0.59	10.6	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	1.0	0.00000
2030	A04	Irrigation Sets	300 < hp <= 600	0.59	9.6	0.0028	0.0006	0.0099	0.0000	0.0005	0.0005	1.8	0.00004
2030	A04	Off-highway Trucks	300 < hp <= 600	0.59	7,740.8	0.1261	0.0366	0.4823	0.0043	0.0305	0.0296	1,471.0	0.00183
2030	A04	Other Construction Equipment	100 < hp <= 175	0.43	1,931.0	0.0370	0.0086	0.1050	0.0002	0.0081	0.0079	78.0	0.00058
2030	A04	Pavers	100 < hp <= 175	0.59	30.5	0.0004	0.0001	0.0010	0.0000	0.0001	0.0001	1.7	0.00000
2030	A04	Pumps	6 < hp <= 11	0.43	8.8	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2030	A04	Rollers	75 < hp <= 100	0.59	123.4	0.0021	0.0002	0.0084	0.0000	0.0003	0.0003	4.3	0.00001
2030	A04	Scrapers	300 < hp <= 600	0.59	38.1	0.0031	0.0005	0.0084	0.0000	0.0005	0.0005	7.2	0.00003
2030	A04	Skid Steer Loaders	50 < hp <= 75	0.21	27.3	0.0034	0.0006	0.0029	0.0000	0.0005	0.0005	0.3	0.00002
2030	A04	Surfacing Equipment	16 < hp <= 25	0.59	30.5	0.0007	0.0002	0.0019	0.0000	0.0001	0.0001	0.3	0.00001
2030	A04	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	120.4	0.0225	0.0068	0.0394	0.0000	0.0047	0.0045	7.8	0.00038



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	A04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	58.5	0.0054	0.0009	0.0049	0.0000	0.0007	0.0007	0.9	0.00004
2030	A05	Off-highway Trucks	300 < hp <= 600	0.59	345.4	0.0056	0.0016	0.0215	0.0002	0.0014	0.0013	65.6	0.00008
2030	A05	Other Construction Equipment	100 < hp <= 175	0.43	172.7	0.0033	0.0008	0.0094	0.0000	0.0007	0.0007	7.0	0.00005
2030	A05	Skid Steer Loaders	50 < hp <= 75	0.21	8.1	0.0010	0.0002	0.0008	0.0000	0.0001	0.0001	0.1	0.00001
2030	A05	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	8.1	0.0015	0.0005	0.0027	0.0000	0.0003	0.0003	0.5	0.00003
2030	A05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	8.1	0.0007	0.0001	0.0007	0.0000	0.0001	0.0001	0.1	0.00001
2030	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2030	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2030	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2030	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2030	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2030	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2030	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2030	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2030	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2030	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2030	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2030	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2030	L03	Air Compressors	75 < hp <= 100	0.43	34.7	0.0007	0.0001	0.0023	0.0000	0.0001	0.0001	0.9	0.00001

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	L03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	31.2	0.0018	0.0003	0.0041	0.0000	0.0003	0.0003	0.8	0.00001
2030	L03	Concrete/Industrial Saws	25 < hp <= 40	0.59	34.7	0.0003	0.0001	0.0023	0.0000	0.0000	0.0000	0.5	0.00001
2030	L03	Concrete/Industrial Saws	6 < hp <= 11	0.7	31.2	0.0007	0.0002	0.0011	0.0000	0.0001	0.0001	0.1	0.00002
2030	L03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	240.2	0.0027	0.0004	0.0075	0.0000	0.0007	0.0006	13.3	0.00003
2030	L03	Excavators	100 < hp <= 175	0.59	95.0	0.0008	0.0001	0.0028	0.0000	0.0002	0.0002	5.3	0.00001
2030	L03	Graders	175 < hp <= 300	0.59	12.6	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	1.2	0.00000
2030	L03	Irrigation Sets	300 < hp <= 600	0.59	11.3	0.0033	0.0007	0.0118	0.0000	0.0006	0.0005	2.1	0.00005
2030	L03	Off-highway Trucks	300 < hp <= 600	0.59	4,544.0	0.0740	0.0215	0.2831	0.0025	0.0179	0.0174	863.5	0.00107
2030	L03	Other Construction Equipment	100 < hp <= 175	0.43	622.4	0.0119	0.0028	0.0338	0.0001	0.0026	0.0025	25.1	0.00019
2030	L03	Pavers	100 < hp <= 175	0.59	122.7	0.0018	0.0003	0.0042	0.0000	0.0005	0.0004	6.8	0.00002
2030	L03	Plate Compactors	3 < hp <= 6	0.43	150.0	0.0011	0.0004	0.0018	0.0000	0.0001	0.0001	0.2	0.00003
2030	L03	Pumps	6 < hp <= 11	0.43	10.4	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2030	L03	Rollers	75 < hp <= 100	0.59	168.6	0.0029	0.0003	0.0115	0.0000	0.0004	0.0004	5.9	0.00002
2030	L03	Scrapers	300 < hp <= 600	0.59	43.4	0.0035	0.0006	0.0096	0.0000	0.0006	0.0006	8.2	0.00004
2030	L03	Skid Steer Loaders	50 < hp <= 75	0.21	146.5	0.0181	0.0034	0.0153	0.0000	0.0025	0.0024	1.6	0.00012
2030	L03	Surfacing Equipment	16 < hp <= 25	0.59	51.3	0.0012	0.0003	0.0031	0.0000	0.0001	0.0001	0.5	0.00002
2030	L03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	178.7	0.0334	0.0101	0.0585	0.0000	0.0069	0.0067	11.5	0.00057
2030	L03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	327.4	0.0300	0.0052	0.0274	0.0000	0.0040	0.0039	4.8	0.00024
2030	L07	Aerial Lifts	75 < hp <= 100	0.59	400.8	0.0652	0.0103	0.0707	0.0001	0.0083	0.0080	16.4	0.00048
2030	L07	Bore/Drill Rigs	100 < hp <= 175	0.43	120.0	0.0114	0.0038	0.0447	0.0000	0.0026	0.0025	4.8	0.00020



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (*CONTINUED*)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	L07	Cement & Mortar Mixers	300 < hp <= 600	0.59	660.0	0.3154	0.0674	1.1890	0.0005	0.0432	0.0419	123.9	0.00317
2030	L07	Cranes	175 < hp <= 300	0.43	600.0	0.0060	0.0021	0.0253	0.0001	0.0014	0.0013	41.1	0.00012
2030	L07	Excavators	100 < hp <= 175	0.59	160.8	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2030	L07	Forklifts	75 < hp <= 100	0.59	801.6	0.0027	0.0004	0.0447	0.0001	0.0006	0.0006	28.2	0.00003
2030	L07	Off-highway Trucks	175 < hp <= 300	0.43	160.8	0.0005	0.0002	0.0026	0.0000	0.0002	0.0001	11.1	0.00001
2030	L07	Off-highway Trucks	300 < hp <= 600	0.59	1,536.0	0.0250	0.0073	0.0957	0.0009	0.0061	0.0059	291.9	0.00036
2030	L07	Pavers	100 < hp <= 175	0.59	79.2	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2030	L07	Pumps	6 < hp <= 11	0.43	450.0	0.0061	0.0019	0.0099	0.0000	0.0006	0.0006	1.3	0.00015
2030	L07	Rubber Tire Loaders	75 < hp <= 100	0.21	79.2	0.0005	0.0000	0.0019	0.0000	0.0001	0.0001	1.0	0.00000
2030	L07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	679.2	0.0621	0.0108	0.0568	0.0000	0.0083	0.0080	9.9	0.00049
2030	L07	Trenchers	50 < hp <= 75	0.59	319.2	0.0111	0.0017	0.0445	0.0000	0.0013	0.0013	8.4	0.00017
2030	S01	Aerial Lifts	75 < hp <= 100	0.59	16.0	0.0026	0.0004	0.0028	0.0000	0.0003	0.0003	0.7	0.00002
2030	S01	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2030	S01	Air Compressors	75 < hp <= 100	0.43	15.8	0.0003	0.0000	0.0010	0.0000	0.0001	0.0001	0.4	0.00000
2030	S01	Cement & Mortar Mixers	300 < hp <= 600	0.59	24.0	0.0115	0.0024	0.0432	0.0000	0.0016	0.0015	4.5	0.00012
2030	S01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	37.2	0.0022	0.0004	0.0048	0.0000	0.0004	0.0004	0.9	0.00002
2030	S01	Concrete/Industrial Saws	25 < hp <= 40	0.59	15.8	0.0001	0.0000	0.0011	0.0000	0.0000	0.0000	0.2	0.00000
2030	S01	Concrete/Industrial Saws	6 < hp <= 11	0.7	37.2	0.0008	0.0003	0.0013	0.0000	0.0001	0.0001	0.2	0.00002
2030	S01	Cranes	175 < hp <= 300	0.43	19.0	0.0002	0.0001	0.0008	0.0000	0.0000	0.0000	1.3	0.00000

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	S01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	508.0	0.0056	0.0009	0.0159	0.0001	0.0014	0.0014	28.2	0.00006
2030	S01	Excavators	100 < hp <= 175	0.59	232.9	0.0021	0.0003	0.0069	0.0000	0.0005	0.0005	12.9	0.00002
2030	S01	Forklifts	75 < hp <= 100	0.59	24.0	0.0001	0.0000	0.0013	0.0000	0.0000	0.0000	0.8	0.00000
2030	S01	Generator Sets	25 < hp <= 40	0.43	30.0	0.0004	0.0001	0.0017	0.0000	0.0001	0.0001	0.3	0.00001
2030	S01	Graders	175 < hp <= 300	0.59	5.4	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.5	0.00000
2030	S01	Irrigation Sets	300 < hp <= 600	0.59	4.8	0.0014	0.0003	0.0050	0.0000	0.0002	0.0002	0.9	0.00002
2030	S01	Off-highway Trucks	300 < hp <= 600	0.59	4,815.9	0.0784	0.0228	0.3001	0.0027	0.0190	0.0184	915.1	0.00114
2030	S01	Other Construction Equipment	100 < hp <= 175	0.43	191.3	0.0037	0.0009	0.0104	0.0000	0.0008	0.0008	7.7	0.00006
2030	S01	Pavers	100 < hp <= 175	0.59	21.7	0.0003	0.0000	0.0007	0.0000	0.0001	0.0001	1.2	0.00000
2030	S01	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2030	S01	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2030	S01	Pumps	6 < hp <= 11	0.43	4.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2030	S01	Rollers	75 < hp <= 100	0.59	275.6	0.0048	0.0004	0.0189	0.0000	0.0007	0.0007	9.7	0.00003
2030	S01	Scrapers	300 < hp <= 600	0.59	158.2	0.0129	0.0021	0.0348	0.0001	0.0021	0.0020	30.1	0.00013
2030	S01	Skid Steer Loaders	50 < hp <= 75	0.21	28.9	0.0036	0.0007	0.0030	0.0000	0.0005	0.0005	0.3	0.00002
2030	S01	Surfacing Equipment	16 < hp <= 25	0.59	23.4	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.2	0.00001
2030	S01	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2030	S01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	89.5	0.0167	0.0050	0.0293	0.0000	0.0035	0.0034	5.8	0.00028
2030	S01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	84.0	0.0058	0.0010	0.0064	0.0000	0.0008	0.0007	0.9	0.00005



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (*CONTINUED*)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	S01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	147.3	0.0135	0.0023	0.0123	0.0000	0.0018	0.0017	2.1	0.00011
2030	S10	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198
2030	S10	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144
2030	S10	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2030	S10	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2030	S10	Concrete/Industrial Saws	6 < hp <= 11	0.7	40.0	0.0008	0.0003	0.0014	0.0000	0.0001	0.0001	0.2	0.00002
2030	S10	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2030	S10	Crawler Tractor/Dozers	100 < hp <= 175	0.59	24.0	0.0003	0.0000	0.0008	0.0000	0.0001	0.0001	1.3	0.00000
2030	S10	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2030	S10	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014
2030	S10	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2030	S10	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2030	S10	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2030	S10	Off-highway Trucks	300 < hp <= 600	0.59	7,888.0	0.1285	0.0373	0.4915	0.0044	0.0311	0.0302	1,498.9	0.00187
2030	S10	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021
2030	S10	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2030	S10	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2030	S10	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2030	S10	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2030	S10	Rubber Tire Loaders	75 < hp <= 100	0.21	80.0	0.0005	0.0000	0.0019	0.0000	0.0001	0.0001	1.0	0.00000

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	S10	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2030	S10	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2030	S10	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013
2030	S10	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2030	S10	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2030	S10	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021
2030	T01	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2030	T01	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2030	T01	Air Compressors	75 < hp <= 100	0.43	51.8	0.0011	0.0001	0.0034	0.0000	0.0002	0.0002	1.3	0.00001
2030	T01	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2030	T01	Chain Saws > 6 HP	6 < hp <= 11	0.7	82.0	0.0926	0.0214	0.0005	0.0000	0.0034	0.0031	0.2	0.00000
2030	T01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	82.0	0.0048	0.0009	0.0106	0.0000	0.0008	0.0008	2.1	0.00004
2030	T01	Concrete/Industrial Saws	25 < hp <= 40	0.59	51.8	0.0004	0.0001	0.0034	0.0000	0.0000	0.0000	0.7	0.00002
2030	T01	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2030	T01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	412.7	0.0046	0.0007	0.0130	0.0001	0.0011	0.0011	22.9	0.00005
2030	T01	Excavators	100 < hp <= 175	0.59	558.8	0.0049	0.0008	0.0165	0.0001	0.0012	0.0011	31.0	0.00006
2030	T01	Forklifts	75 < hp <= 100	0.59	3,700.0	0.0125	0.0018	0.2062	0.0004	0.0029	0.0028	130.1	0.00012
2030	T01	Generator Sets	25 < hp <= 40	0.43	301.0	0.0039	0.0011	0.0175	0.0000	0.0006	0.0006	3.1	0.00009
2030	T01	Graders	175 < hp <= 300	0.59	16.9	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	T01	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2030	T01	Irrigation Sets	300 < hp <= 600	0.59	15.2	0.0044	0.0009	0.0158	0.0000	0.0007	0.0007	2.9	0.00006
2030	T01	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2030	T01	Off-highway Trucks	300 < hp <= 600	0.59	12,536.6	0.2042	0.0593	0.7811	0.0070	0.0494	0.0480	2,382.3	0.00297
2030	T01	Other Construction Equipment	100 < hp <= 175	0.43	516.6	0.0099	0.0023	0.0281	0.0001	0.0022	0.0021	20.9	0.00015
2030	T01	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2030	T01	Pavers	100 < hp <= 175	0.59	51.8	0.0008	0.0001	0.0018	0.0000	0.0002	0.0002	2.9	0.00001
2030	T01	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2030	T01	Pumps	6 < hp <= 11	0.43	254.0	0.0034	0.0011	0.0056	0.0000	0.0004	0.0003	0.7	0.00008
2030	T01	Rollers	75 < hp <= 100	0.59	194.3	0.0033	0.0003	0.0133	0.0000	0.0005	0.0005	6.8	0.00002
2030	T01	Scrapers	300 < hp <= 600	0.59	64.8	0.0053	0.0008	0.0143	0.0000	0.0009	0.0008	12.3	0.00005
2030	T01	Skid Steer Loaders	50 < hp <= 75	0.21	15.9	0.0020	0.0004	0.0017	0.0000	0.0003	0.0003	0.2	0.00001
2030	T01	Surfacing Equipment	16 < hp <= 25	0.59	51.8	0.0013	0.0003	0.0032	0.0000	0.0001	0.0001	0.5	0.00002
2030	T01	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2030	T01	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2030	T01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	129.1	0.0241	0.0073	0.0423	0.0000	0.0050	0.0049	8.3	0.00041
2030	T01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	466.1	0.0324	0.0057	0.0353	0.0000	0.0043	0.0041	5.1	0.00028
2030	T01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	757.5	0.0693	0.0120	0.0634	0.0000	0.0092	0.0089	11.0	0.00055
2030	T02	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	T02	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144
2030	T02	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2030	T02	Chain Saws > 6 HP	6 < hp <= 11	0.7	40.0	0.0452	0.0104	0.0003	0.0000	0.0017	0.0015	0.1	0.00000
2030	T02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2030	T02	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2030	T02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	140.6	0.0016	0.0002	0.0044	0.0000	0.0004	0.0004	7.8	0.00002
2030	T02	Excavators	100 < hp <= 175	0.59	276.6	0.0024	0.0004	0.0082	0.0000	0.0006	0.0006	15.3	0.00003
2030	T02	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014
2030	T02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2030	T02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2030	T02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2030	T02	Off-highway Trucks	300 < hp <= 600	0.59	8,121.1	0.1322	0.0384	0.5060	0.0045	0.0320	0.0311	1,543.2	0.00192
2030	T02	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021
2030	T02	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2030	T02	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2030	T02	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2030	T02	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2030	T02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2030	T02	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2030	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.21	80.0	0.0030	0.0009	0.0053	0.0000	0.0006	0.0006	1.1	0.00005



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013
2030	T02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2030	T02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2030	T02	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021
2031	A04	Air Compressors	75 < hp <= 100	0.43	30.5	0.0006	0.0001	0.0020	0.0000	0.0001	0.0001	0.8	0.00001
2031	A04	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	26.4	0.0015	0.0003	0.0034	0.0000	0.0003	0.0003	0.7	0.00001
2031	A04	Concrete/Industrial Saws	25 < hp <= 40	0.59	30.5	0.0002	0.0001	0.0020	0.0000	0.0000	0.0000	0.4	0.00001
2031	A04	Concrete/Industrial Saws	6 < hp <= 11	0.7	26.4	0.0006	0.0002	0.0009	0.0000	0.0001	0.0001	0.1	0.00001
2031	A04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	196.8	0.0022	0.0003	0.0062	0.0000	0.0005	0.0005	10.9	0.00002
2031	A04	Excavators	100 < hp <= 175	0.59	493.1	0.0044	0.0007	0.0145	0.0001	0.0010	0.0010	27.3	0.00005
2031	A04	Graders	175 < hp <= 300	0.59	10.6	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	1.0	0.00000
2031	A04	Irrigation Sets	300 < hp <= 600	0.59	9.6	0.0028	0.0006	0.0099	0.0000	0.0005	0.0005	1.8	0.00004
2031	A04	Off-highway Trucks	300 < hp <= 600	0.59	7,740.8	0.1261	0.0366	0.4823	0.0043	0.0305	0.0296	1,471.0	0.00183
2031	A04	Other Construction Equipment	100 < hp <= 175	0.43	1,931.0	0.0370	0.0086	0.1050	0.0002	0.0081	0.0079	78.0	0.00058
2031	A04	Pavers	100 < hp <= 175	0.59	30.5	0.0004	0.0001	0.0010	0.0000	0.0001	0.0001	1.7	0.00000
2031	A04	Pumps	6 < hp <= 11	0.43	8.8	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2031	A04	Rollers	75 < hp <= 100	0.59	123.4	0.0021	0.0002	0.0084	0.0000	0.0003	0.0003	4.3	0.00001
2031	A04	Scrapers	300 < hp <= 600	0.59	38.1	0.0031	0.0005	0.0084	0.0000	0.0005	0.0005	7.2	0.00003
2031	A04	Skid Steer Loaders	50 < hp <= 75	0.21	27.3	0.0034	0.0006	0.0029	0.0000	0.0005	0.0005	0.3	0.00002

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	A04	Surfacing Equipment	16 < hp <= 25	0.59	30.5	0.0007	0.0002	0.0019	0.0000	0.0001	0.0001	0.3	0.00001
2031	A04	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	120.4	0.0225	0.0068	0.0394	0.0000	0.0047	0.0045	7.8	0.00038
2031	A04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	58.5	0.0054	0.0009	0.0049	0.0000	0.0007	0.0007	0.9	0.00004
2031	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2031	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2031	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2031	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2031	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2031	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2031	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2031	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2031	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2031	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2031	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2031	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2031	L07	Aerial Lifts	75 < hp <= 100	0.59	400.8	0.0652	0.0103	0.0707	0.0001	0.0083	0.0080	16.4	0.00048
2031	L07	Bore/Drill Rigs	100 < hp <= 175	0.43	120.0	0.0114	0.0038	0.0447	0.0000	0.0026	0.0025	4.8	0.00020
2031	L07	Cement & Mortar Mixers	300 < hp <= 600	0.59	660.0	0.3154	0.0674	1.1890	0.0005	0.0432	0.0419	123.9	0.00317
2031	L07	Cranes	175 < hp <= 300	0.43	600.0	0.0060	0.0021	0.0253	0.0001	0.0014	0.0013	41.1	0.00012



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	L07	Excavators	100 < hp <= 175	0.59	160.8	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2031	L07	Forklifts	75 < hp <= 100	0.59	801.6	0.0027	0.0004	0.0447	0.0001	0.0006	0.0006	28.2	0.00003
2031	L07	Off-highway Trucks	175 < hp <= 300	0.43	160.8	0.0005	0.0002	0.0026	0.0000	0.0002	0.0001	11.1	0.00001
2031	L07	Off-highway Trucks	300 < hp <= 600	0.59	1,536.0	0.0250	0.0073	0.0957	0.0009	0.0061	0.0059	291.9	0.00036
2031	L07	Pavers	100 < hp <= 175	0.59	79.2	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2031	L07	Pumps	6 < hp <= 11	0.43	450.0	0.0061	0.0019	0.0099	0.0000	0.0006	0.0006	1.3	0.00015
2031	L07	Rubber Tire Loaders	75 < hp <= 100	0.21	79.2	0.0005	0.0000	0.0019	0.0000	0.0001	0.0001	1.0	0.00000
2031	L07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	679.2	0.0621	0.0108	0.0568	0.0000	0.0083	0.0080	9.9	0.00049
2031	L07	Trenchers	50 < hp <= 75	0.59	319.2	0.0111	0.0017	0.0445	0.0000	0.0013	0.0013	8.4	0.00017
2031	S01	Aerial Lifts	75 < hp <= 100	0.59	16.0	0.0026	0.0004	0.0028	0.0000	0.0003	0.0003	0.7	0.00002
2031	S01	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2031	S01	Air Compressors	75 < hp <= 100	0.43	15.8	0.0003	0.0000	0.0010	0.0000	0.0001	0.0001	0.4	0.00000
2031	S01	Cement & Mortar Mixers	300 < hp <= 600	0.59	24.0	0.0115	0.0024	0.0432	0.0000	0.0016	0.0015	4.5	0.00012
2031	S01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	37.2	0.0022	0.0004	0.0048	0.0000	0.0004	0.0004	0.9	0.00002
2031	S01	Concrete/Industrial Saws	25 < hp <= 40	0.59	15.8	0.0001	0.0000	0.0011	0.0000	0.0000	0.0000	0.2	0.00000
2031	S01	Concrete/Industrial Saws	6 < hp <= 11	0.7	37.2	0.0008	0.0003	0.0013	0.0000	0.0001	0.0001	0.2	0.00002
2031	S01	Cranes	175 < hp <= 300	0.43	19.0	0.0002	0.0001	0.0008	0.0000	0.0000	0.0000	1.3	0.00000
2031	S01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	508.0	0.0056	0.0009	0.0159	0.0001	0.0014	0.0014	28.2	0.00006
2031	S01	Excavators	100 < hp <= 175	0.59	232.9	0.0021	0.0003	0.0069	0.0000	0.0005	0.0005	12.9	0.00002

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	S01	Forklifts	75 < hp <= 100	0.59	24.0	0.0001	0.0000	0.0013	0.0000	0.0000	0.0000	0.8	0.00000
2031	S01	Generator Sets	25 < hp <= 40	0.43	30.0	0.0004	0.0001	0.0017	0.0000	0.0001	0.0001	0.3	0.00001
2031	S01	Graders	175 < hp <= 300	0.59	5.4	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.5	0.00000
2031	S01	Irrigation Sets	300 < hp <= 600	0.59	4.8	0.0014	0.0003	0.0050	0.0000	0.0002	0.0002	0.9	0.00002
2031	S01	Off-highway Trucks	300 < hp <= 600	0.59	4,815.9	0.0784	0.0228	0.3001	0.0027	0.0190	0.0184	915.1	0.00114
2031	S01	Other Construction Equipment	100 < hp <= 175	0.43	191.3	0.0037	0.0009	0.0104	0.0000	0.0008	0.0008	7.7	0.00006
2031	S01	Pavers	100 < hp <= 175	0.59	21.7	0.0003	0.0000	0.0007	0.0000	0.0001	0.0001	1.2	0.00000
2031	S01	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2031	S01	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2031	S01	Pumps	6 < hp <= 11	0.43	4.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2031	S01	Rollers	75 < hp <= 100	0.59	275.6	0.0048	0.0004	0.0189	0.0000	0.0007	0.0007	9.7	0.00003
2031	S01	Scrapers	300 < hp <= 600	0.59	158.2	0.0129	0.0021	0.0348	0.0001	0.0021	0.0020	30.1	0.00013
2031	S01	Skid Steer Loaders	50 < hp <= 75	0.21	28.9	0.0036	0.0007	0.0030	0.0000	0.0005	0.0005	0.3	0.00002
2031	S01	Surfacing Equipment	16 < hp <= 25	0.59	23.4	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.2	0.00001
2031	S01	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2031	S01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	89.5	0.0167	0.0050	0.0293	0.0000	0.0035	0.0034	5.8	0.00028
2031	S01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	84.0	0.0058	0.0010	0.0064	0.0000	0.0008	0.0007	0.9	0.00005
2031	S01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	147.3	0.0135	0.0023	0.0123	0.0000	0.0018	0.0017	2.1	0.00011
2031	T01	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	T01	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2031	T01	Air Compressors	75 < hp <= 100	0.43	51.8	0.0011	0.0001	0.0034	0.0000	0.0002	0.0002	1.3	0.00001
2031	T01	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2031	T01	Chain Saws > 6 HP	6 < hp <= 11	0.7	82.0	0.0926	0.0214	0.0005	0.0000	0.0034	0.0031	0.2	0.00000
2031	T01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	82.0	0.0048	0.0009	0.0106	0.0000	0.0008	0.0008	2.1	0.00004
2031	T01	Concrete/Industrial Saws	25 < hp <= 40	0.59	51.8	0.0004	0.0001	0.0034	0.0000	0.0000	0.0000	0.7	0.00002
2031	T01	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2031	T01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	412.7	0.0046	0.0007	0.0130	0.0001	0.0011	0.0011	22.9	0.00005
2031	T01	Excavators	100 < hp <= 175	0.59	558.8	0.0049	0.0008	0.0165	0.0001	0.0012	0.0011	31.0	0.00006
2031	T01	Forklifts	75 < hp <= 100	0.59	3,700.0	0.0125	0.0018	0.2062	0.0004	0.0029	0.0028	130.1	0.00012
2031	T01	Generator Sets	25 < hp <= 40	0.43	301.0	0.0039	0.0011	0.0175	0.0000	0.0006	0.0006	3.1	0.00009
2031	T01	Graders	175 < hp <= 300	0.59	16.9	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000
2031	T01	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2031	T01	Irrigation Sets	300 < hp <= 600	0.59	15.2	0.0044	0.0009	0.0158	0.0000	0.0007	0.0007	2.9	0.00006
2031	T01	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2031	T01	Off-highway Trucks	300 < hp <= 600	0.59	12,536.6	0.2042	0.0593	0.7811	0.0070	0.0494	0.0480	2,382.3	0.00297
2031	T01	Other Construction Equipment	100 < hp <= 175	0.43	516.6	0.0099	0.0023	0.0281	0.0001	0.0022	0.0021	20.9	0.00015
2031	T01	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2031	T01	Pavers	100 < hp <= 175	0.59	51.8	0.0008	0.0001	0.0018	0.0000	0.0002	0.0002	2.9	0.00001

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	T01	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2031	T01	Pumps	6 < hp <= 11	0.43	254.0	0.0034	0.0011	0.0056	0.0000	0.0004	0.0003	0.7	0.00008
2031	T01	Rollers	75 < hp <= 100	0.59	194.3	0.0033	0.0003	0.0133	0.0000	0.0005	0.0005	6.8	0.00002
2031	T01	Scrapers	300 < hp <= 600	0.59	64.8	0.0053	0.0008	0.0143	0.0000	0.0009	0.0008	12.3	0.00005
2031	T01	Skid Steer Loaders	50 < hp <= 75	0.21	15.9	0.0020	0.0004	0.0017	0.0000	0.0003	0.0003	0.2	0.00001
2031	T01	Surfacing Equipment	16 < hp <= 25	0.59	51.8	0.0013	0.0003	0.0032	0.0000	0.0001	0.0001	0.5	0.00002
2031	T01	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2031	T01	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2031	T01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	129.1	0.0241	0.0073	0.0423	0.0000	0.0050	0.0049	8.3	0.00041
2031	T01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	466.1	0.0324	0.0057	0.0353	0.0000	0.0043	0.0041	5.1	0.00028
2031	T01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	757.5	0.0693	0.0120	0.0634	0.0000	0.0092	0.0089	11.0	0.00055
2031	T02	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198
2031	T02	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144
2031	T02	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2031	T02	Chain Saws > 6 HP	6 < hp <= 11	0.7	40.0	0.0452	0.0104	0.0003	0.0000	0.0017	0.0015	0.1	0.00000
2031	T02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2031	T02	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2031	T02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	140.6	0.0016	0.0002	0.0044	0.0000	0.0004	0.0004	7.8	0.00002
2031	T02	Excavators	100 < hp <= 175	0.59	276.6	0.0024	0.0004	0.0082	0.0000	0.0006	0.0006	15.3	0.00003
2031	T02	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	T02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2031	T02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2031	T02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2031	T02	Off-highway Trucks	300 < hp <= 600	0.59	8,121.1	0.1322	0.0384	0.5060	0.0045	0.0320	0.0311	1,543.2	0.00192
2031	T02	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021
2031	T02	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2031	T02	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2031	T02	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2031	T02	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2031	T02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2031	T02	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2031	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.21	80.0	0.0030	0.0009	0.0053	0.0000	0.0006	0.0006	1.1	0.00005
2031	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013
2031	T02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2031	T02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2031	T02	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021
2032	A04	Air Compressors	75 < hp <= 100	0.43	15.4	0.0003	0.0000	0.0010	0.0000	0.0001	0.0001	0.4	0.00000
2032	A04	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	13.2	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.3	0.00001
2032	A04	Concrete/Industrial Saws	25 < hp <= 40	0.59	15.4	0.0001	0.0000	0.0010	0.0000	0.0000	0.0000	0.2	0.00000
2032	A04	Concrete/Industrial Saws	6 < hp <= 11	0.7	13.2	0.0003	0.0001	0.0005	0.0000	0.0000	0.0000	0.1	0.00001

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2032	A04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	99.7	0.0011	0.0002	0.0031	0.0000	0.0003	0.0003	5.5	0.00001
2032	A04	Excavators	100 < hp <= 175	0.59	247.1	0.0022	0.0003	0.0073	0.0000	0.0005	0.0005	13.7	0.00002
2032	A04	Graders	175 < hp <= 300	0.59	5.4	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.5	0.00000
2032	A04	Irrigation Sets	300 < hp <= 600	0.59	4.9	0.0014	0.0003	0.0051	0.0000	0.0002	0.0002	0.9	0.00002
2032	A04	Off-highway Trucks	300 < hp <= 600	0.59	3,870.3	0.0630	0.0183	0.2411	0.0021	0.0153	0.0148	735.5	0.00092
2032	A04	Other Construction Equipment	100 < hp <= 175	0.43	964.0	0.0185	0.0043	0.0524	0.0001	0.0040	0.0039	38.9	0.00029
2032	A04	Pavers	100 < hp <= 175	0.59	15.4	0.0002	0.0000	0.0005	0.0000	0.0001	0.0001	0.9	0.00000
2032	A04	Pumps	6 < hp <= 11	0.43	4.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2032	A04	Rollers	75 < hp <= 100	0.59	62.6	0.0011	0.0001	0.0043	0.0000	0.0002	0.0002	2.2	0.00001
2032	A04	Scrapers	300 < hp <= 600	0.59	19.2	0.0016	0.0003	0.0042	0.0000	0.0003	0.0002	3.7	0.00002
2032	A04	Skid Steer Loaders	50 < hp <= 75	0.21	16.9	0.0021	0.0004	0.0018	0.0000	0.0003	0.0003	0.2	0.00001
2032	A04	Surfacing Equipment	16 < hp <= 25	0.59	15.4	0.0004	0.0001	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2032	A04	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	64.2	0.0120	0.0036	0.0210	0.0000	0.0025	0.0024	4.1	0.00020
2032	A04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	32.7	0.0030	0.0005	0.0027	0.0000	0.0004	0.0004	0.5	0.00002
2032	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2032	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2032	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2032	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2032	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002



TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2032	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2032	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2032	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2032	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2032	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2032	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2032	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2032	T02	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198
2032	T02	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144
2032	T02	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2032	T02	Chain Saws > 6 HP	6 < hp <= 11	0.7	40.0	0.0452	0.0104	0.0003	0.0000	0.0017	0.0015	0.1	0.00000
2032	T02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2032	T02	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2032	T02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	110.6	0.0012	0.0002	0.0035	0.0000	0.0003	0.0003	6.1	0.00001
2032	T02	Excavators	100 < hp <= 175	0.59	246.6	0.0022	0.0003	0.0073	0.0000	0.0005	0.0005	13.7	0.00002
2032	T02	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014
2032	T02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2032	T02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2032	T02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005

TABLE 6-4: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – PROPOSED ACTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2032	T02	Off-highway Trucks	300 < hp <= 600	0.59	8,061.3	0.1313	0.0381	0.5023	0.0045	0.0318	0.0308	1,531.8	0.00191
2032	T02	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021
2032	T02	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2032	T02	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2032	T02	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2032	T02	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2032	T02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2032	T02	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2032	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.21	80.0	0.0030	0.0009	0.0053	0.0000	0.0006	0.0006	1.1	0.00005
2032	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013
2032	T02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2032	T02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2032	T02	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021

Note: HP denotes horsepower; LF denotes load factor; hrs denotes hours; ST denotes short tons; MT denotes metric tons; CO denotes carbon monoxide, NO_x denotes nitrogen oxides, SO_x denotes sulfur oxides, VOC denotes volatile organic compounds, PM_{2.5} denotes fine particulate matter, PM₁₀ denotes coarse particulate matter, CO₂ denotes carbon dioxide, CH₄ denotes methane, N₂O denotes nitrous oxide.

Source: MOVES 4, Landrum & Brown 2024



EXHIBIT 6-2: CONSTRUCTION SCHEDULE - HYBRID TERMINAL OPTION

ID	DESCRIPTION	2025				2026				2027				2028				2029				2030				2031				2032			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
AIRSIDE																																	
A01	Taxiway A/B Extension																																
A02	Runway 16R-34L Blast Pads																																
A04	Taxiway B 500' Separation & RIM Mitigation																																
A05	North Hold Pad																																
A06	Runway 34L Highspeed Exit																																
A07	Taxiway D Extension																																
A08	Hardstand (north)																																
A10	Taxiway Fillets																																
CARGO																																	
C01	Cargo 4 South Redevelopment																																
C02	Off-site Cargo PH 1																																
C03	Off-site Cargo PH 2																																
LANDSIDE																																	
L01	NAE Relocation (southbound lanes)																																
L02	Elevated Busway & Stations																																
L03	Second Terminal Roads/Curbside																																
L04	Main Terminal North GT Lot																																
L05	North GT Holding Lot																																
L07	Employee Parking Structure																																
TERMINAL																																	
T01	North Gates																																
T02	Second Terminal & Parking																																
AIRPORT/AIRLINE SUPPORT																																	
S01	Fuel Farm Expansion																																
S02	Primary ARFF																																
S03	Secondary ARFF																																
S04	Fuel Rack Relocation																																
S05	Triculator																																
S06	Consolidated De-icing Tanks																																
S07	Westside Maintenance Campus																																
S08	Airline Support (north)																																
S09	Airline Support (west)																																
S10	Centralized Rec. & Dist. Center																																
CONCOURSE D EXTENSION - HYBRID ALT																																	
AS	Hardstand (central) (Ph. 1 - Partial A09)																																
AS	Conc. D Hardstand Replacement (Ph. 2)																																
AS	Demo Conc. D Hardstand (Ph. 3)																																
AS	Conc. D Widening - (Ph. 4 - 7)																																
AS	Conc. D Extension - (completes A09 with Concourse)																																

TABLE 6-5: ON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION

Year	Task ID	Activity	Annual VMT	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (ST)	CH ₄ (ST)	N ₂ O (ST)
2025	C01	Employee Commute	109,825	0.4	0.00	0.01	0.0002	0.0003	0.0003	35.0	0.001	0.000
2025	C01	Material Delivery	76,293	0.2	0.01	0.31	0.0005	0.0040	0.0037	124.8	0.001	0.017
2025	L01	Employee Commute	250,770	0.9	0.01	0.03	0.0004	0.0007	0.0006	79.9	0.002	0.000
2025	L01	Material Delivery	9,812	0.0	0.00	0.04	0.0001	0.0005	0.0005	16.0	0.000	0.002
2025	L02	Employee Commute	491,394	1.7	0.02	0.06	0.0009	0.0013	0.0012	156.5	0.005	0.001
2025	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2025	S07	Employee Commute	3,248,191	11.5	0.11	0.40	0.0057	0.0086	0.0076	1034.6	0.032	0.006
2025	S07	Material Delivery	85,324	0.2	0.01	0.34	0.0005	0.0045	0.0041	139.6	0.002	0.019
2026	A01	Employee Commute	1,651,716	5.8	0.06	0.20	0.0029	0.0044	0.0039	526.1	0.016	0.003
2026	A01	Material Delivery	66,908	0.1	0.01	0.27	0.0004	0.0035	0.0032	109.4	0.001	0.015
2026	A02	Employee Commute	1,936,176	6.8	0.07	0.24	0.0034	0.0051	0.0046	616.7	0.019	0.003
2026	A02	Material Delivery	16,204	0.0	0.00	0.06	0.0001	0.0009	0.0008	26.5	0.000	0.004
2026	A06	Employee Commute	1,936,176	6.8	0.07	0.24	0.0034	0.0051	0.0046	616.7	0.019	0.003
2026	A06	Material Delivery	103,397	0.2	0.01	0.41	0.0006	0.0054	0.0050	169.1	0.002	0.023
2026	A07	Employee Commute	163,020	0.6	0.01	0.02	0.0003	0.0004	0.0004	51.9	0.002	0.000
2026	A07	Material Delivery	13,924	0.0	0.00	0.06	0.0001	0.0007	0.0007	22.8	0.000	0.003
2026	A08	Employee Commute	148,590	0.5	0.01	0.02	0.0003	0.0004	0.0003	47.3	0.001	0.000
2026	A08	Material Delivery	100,765	0.2	0.01	0.40	0.0006	0.0053	0.0049	164.8	0.002	0.022
2026	A10	Employee Commute	936,540	3.3	0.03	0.12	0.0017	0.0025	0.0022	298.3	0.009	0.002
2026	A10	Material Delivery	2,394	0.0	0.00	0.01	0.0000	0.0001	0.0001	3.9	0.000	0.001
2026	C01	Employee Commute	1,736,856	6.1	0.06	0.21	0.0031	0.0046	0.0041	553.2	0.017	0.003
2026	C01	Material Delivery	268,684	0.6	0.02	1.07	0.0016	0.0142	0.0130	439.5	0.005	0.059
2026	C02	Employee Commute	181,253	0.6	0.01	0.02	0.0003	0.0005	0.0004	57.7	0.002	0.000
2026	C02	Material Delivery	41,244	0.1	0.00	0.16	0.0002	0.0022	0.0020	67.5	0.001	0.009
2026	L01	Employee Commute	3,116,124	11.0	0.11	0.38	0.0055	0.0083	0.0073	992.5	0.031	0.005
2026	L01	Material Delivery	39,630	0.1	0.00	0.16	0.0002	0.0021	0.0019	64.8	0.001	0.009
2026	L02	Employee Commute	1,965,578	6.9	0.07	0.24	0.0035	0.0052	0.0046	626.1	0.019	0.003
2026	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2026	L04	Employee Commute	1,204,731	4.3	0.04	0.15	0.0021	0.0032	0.0028	383.7	0.012	0.002
2026	L04	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2026	S02	Employee Commute	1,273,800	4.5	0.04	0.16	0.0022	0.0034	0.0030	405.7	0.013	0.002
2026	S02	Material Delivery	113,948	0.3	0.01	0.46	0.0007	0.0060	0.0055	186.4	0.002	0.025
2026	S04	Employee Commute	4,282,542	15.1	0.15	0.53	0.0076	0.0114	0.0101	1364.0	0.042	0.007
2026	S04	Material Delivery	4,319	0.0	0.00	0.02	0.0000	0.0002	0.0002	7.1	0.000	0.001
2026	S05	Employee Commute	3,392,297	12.0	0.12	0.42	0.0060	0.0090	0.0080	1080.5	0.034	0.006
2026	S05	Material Delivery	3,297	0.0	0.00	0.01	0.0000	0.0002	0.0002	5.4	0.000	0.001



TABLE 6-5: ON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Activity	Annual VMT	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (ST)	CH ₄ (ST)	N ₂ O (ST)
2026	S06	Employee Commute	3,154,437	11.1	0.11	0.39	0.0056	0.0084	0.0074	1004.7	0.031	0.005
2026	S06	Material Delivery	4,519	0.0	0.00	0.02	0.0000	0.0002	0.0002	7.4	0.000	0.001
2026	S07	Employee Commute	5,789,520	20.4	0.20	0.71	0.0102	0.0154	0.0136	1844.0	0.057	0.010
2026	S07	Material Delivery	100,695	0.2	0.01	0.40	0.0006	0.0053	0.0049	164.7	0.002	0.022
2027	A01	Employee Commute	6,589,836	23.3	0.22	0.81	0.0116	0.0175	0.0155	2098.9	0.065	0.011
2027	A01	Material Delivery	129,672	0.3	0.01	0.52	0.0008	0.0068	0.0063	212.1	0.002	0.028
2027	A07	Employee Commute	1,452,132	5.1	0.05	0.18	0.0026	0.0039	0.0034	462.5	0.014	0.003
2027	A07	Material Delivery	40,954	0.1	0.00	0.16	0.0002	0.0022	0.0020	67.0	0.001	0.009
2027	A08	Employee Commute	1,047,222	3.7	0.04	0.13	0.0018	0.0028	0.0025	333.5	0.010	0.002
2027	A08	Material Delivery	371,148	0.8	0.03	1.48	0.0022	0.0196	0.0180	607.1	0.007	0.081
2027	A10	Employee Commute	936,540	3.3	0.03	0.12	0.0017	0.0025	0.0022	298.3	0.009	0.002
2027	A10	Material Delivery	2,394	0.0	0.00	0.01	0.0000	0.0001	0.0001	3.9	0.000	0.001
2027	C02	Employee Commute	2,894,760	10.2	0.10	0.36	0.0051	0.0077	0.0068	922.0	0.029	0.005
2027	C02	Material Delivery	41,244	0.1	0.00	0.16	0.0002	0.0022	0.0020	67.5	0.001	0.009
2027	L01	Employee Commute	3,116,124	11.0	0.11	0.38	0.0055	0.0083	0.0073	992.5	0.031	0.005
2027	L01	Material Delivery	39,630	0.1	0.00	0.16	0.0002	0.0021	0.0019	64.8	0.001	0.009
2027	L02	Employee Commute	1,965,578	6.9	0.07	0.24	0.0035	0.0052	0.0046	626.1	0.019	0.003
2027	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2027	L04	Employee Commute	4,827,438	17.0	0.16	0.59	0.0085	0.0128	0.0114	1537.6	0.048	0.008
2027	L04	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2027	L05	Employee Commute	2,652,111	9.4	0.09	0.33	0.0047	0.0071	0.0062	844.7	0.026	0.005
2027	L05	Material Delivery	1,353	0.0	0.00	0.01	0.0000	0.0001	0.0001	2.2	0.000	0.000
2027	S02	Employee Commute	2,281,752	8.1	0.08	0.28	0.0040	0.0061	0.0054	726.8	0.023	0.004
2027	S02	Material Delivery	150,059	0.3	0.01	0.60	0.0009	0.0079	0.0073	245.4	0.003	0.033
2027	S03	Employee Commute	1,019,040	3.6	0.03	0.13	0.0018	0.0027	0.0024	324.6	0.010	0.002
2027	S03	Material Delivery	5,059	0.0	0.00	0.02	0.0000	0.0003	0.0002	8.3	0.000	0.001
2027	S04	Employee Commute	4,282,542	15.1	0.15	0.53	0.0076	0.0114	0.0101	1364.0	0.042	0.007
2027	S04	Material Delivery	4,319	0.0	0.00	0.02	0.0000	0.0002	0.0002	7.1	0.000	0.001
2027	S05	Employee Commute	845,883	3.0	0.03	0.10	0.0015	0.0022	0.0020	269.4	0.008	0.001
2027	S05	Material Delivery	2,853	0.0	0.00	0.01	0.0000	0.0002	0.0001	4.7	0.000	0.001
2027	S06	Employee Commute	4,407,348	15.6	0.15	0.54	0.0078	0.0117	0.0104	1403.8	0.044	0.008
2027	S06	Material Delivery	3,853	0.0	0.00	0.02	0.0000	0.0002	0.0002	6.3	0.000	0.001
2027	S07	Employee Commute	3,248,191	11.5	0.11	0.40	0.0057	0.0086	0.0076	1034.6	0.032	0.006
2027	S07	Material Delivery	85,324	0.2	0.01	0.34	0.0005	0.0045	0.0041	139.6	0.002	0.019
2027	S08	Employee Commute	904,613	3.2	0.03	0.11	0.0016	0.0024	0.0021	288.1	0.009	0.002
2027	S08	Material Delivery	40,058	0.1	0.00	0.16	0.0002	0.0021	0.0019	65.5	0.001	0.009

TABLE 6-5: ON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Activity	Annual VMT	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (ST)	CH ₄ (ST)	N ₂ O (ST)
2027	S09	Employee Commute	904,613	3.2	0.03	0.11	0.0016	0.0024	0.0021	288.1	0.009	0.002
2027	S09	Material Delivery	40,058	0.1	0.00	0.16	0.0002	0.0021	0.0019	65.5	0.001	0.009
2027	T01	Employee Commute	10,131,660	35.8	0.34	1.25	0.0179	0.0269	0.0238	3227.0	0.100	0.018
2027	T01	Material Delivery	239,615	0.5	0.02	0.96	0.0014	0.0126	0.0116	391.9	0.004	0.052
2028	A01	Employee Commute	6,589,836	23.3	0.22	0.81	0.0116	0.0175	0.0155	2098.9	0.065	0.011
2028	A01	Material Delivery	129,672	0.3	0.01	0.52	0.0008	0.0068	0.0063	212.1	0.002	0.028
2028	A04	Employee Commute	2,394,744	8.5	0.08	0.30	0.0042	0.0064	0.0056	762.7	0.024	0.004
2028	A04	Material Delivery	100,575	0.2	0.01	0.40	0.0006	0.0053	0.0049	164.5	0.002	0.022
2028	A08	Employee Commute	1,047,222	3.7	0.04	0.13	0.0018	0.0028	0.0025	333.5	0.010	0.002
2028	A08	Material Delivery	403,060	0.9	0.04	1.61	0.0024	0.0212	0.0195	659.3	0.007	0.088
2028	A10	Employee Commute	528,627	1.9	0.02	0.07	0.0009	0.0014	0.0012	168.4	0.005	0.001
2028	A10	Material Delivery	1,862	0.0	0.00	0.01	0.0000	0.0001	0.0001	3.0	0.000	0.000
2028	C02	Employee Commute	116,903	0.4	0.00	0.01	0.0002	0.0003	0.0003	37.2	0.001	0.000
2028	C02	Material Delivery	41,244	0.1	0.00	0.16	0.0002	0.0022	0.0020	67.5	0.001	0.009
2028	C03	Employee Commute	216,645	0.8	0.01	0.03	0.0004	0.0006	0.0005	69.0	0.002	0.000
2028	C03	Material Delivery	41,244	0.1	0.00	0.16	0.0002	0.0022	0.0020	67.5	0.001	0.009
2028	H01	Employee Commute	134,550	0.5	0.00	0.02	0.0002	0.0004	0.0003	42.9	0.001	0.000
2028	H01	Material Delivery	25,929	0.1	0.00	0.10	0.0002	0.0014	0.0013	42.4	0.000	0.006
2028	L01	Employee Commute	3,116,124	11.0	0.11	0.38	0.0055	0.0083	0.0073	992.5	0.031	0.005
2028	L01	Material Delivery	39,630	0.1	0.00	0.16	0.0002	0.0021	0.0019	64.8	0.001	0.009
2028	L02	Employee Commute	1,965,578	6.9	0.07	0.24	0.0035	0.0052	0.0046	626.1	0.019	0.003
2028	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2028	L03	Employee Commute	418,275	1.5	0.01	0.05	0.0007	0.0011	0.0010	133.2	0.004	0.001
2028	L03	Material Delivery	12,176	0.0	0.00	0.05	0.0001	0.0006	0.0006	19.9	0.000	0.003
2028	L04	Employee Commute	4,827,438	17.0	0.16	0.59	0.0085	0.0128	0.0114	1537.6	0.048	0.008
2028	L04	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2028	L05	Employee Commute	5,955,015	21.0	0.20	0.73	0.0105	0.0158	0.0140	1896.7	0.059	0.010
2028	L05	Material Delivery	1,353	0.0	0.00	0.01	0.0000	0.0001	0.0001	2.2	0.000	0.000
2028	S01	Employee Commute	386,685	1.4	0.01	0.05	0.0007	0.0010	0.0009	123.2	0.004	0.001
2028	S01	Material Delivery	13,537	0.0	0.00	0.05	0.0001	0.0007	0.0007	22.1	0.000	0.003
2028	S02	Employee Commute	145,860	0.5	0.00	0.02	0.0003	0.0004	0.0003	46.5	0.001	0.000
2028	S02	Material Delivery	41,309	0.1	0.00	0.17	0.0002	0.0022	0.0020	67.6	0.001	0.009
2028	S03	Employee Commute	1,813,482	6.4	0.06	0.22	0.0032	0.0048	0.0043	577.6	0.018	0.003
2028	S03	Material Delivery	5,059	0.0	0.00	0.02	0.0000	0.0003	0.0002	8.3	0.000	0.001
2028	S04	Employee Commute	2,401,113	8.5	0.08	0.30	0.0042	0.0064	0.0056	764.8	0.024	0.004
2028	S04	Material Delivery	3,608	0.0	0.00	0.01	0.0000	0.0002	0.0002	5.9	0.000	0.001



TABLE 6-5: ON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Activity	Annual VMT	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (ST)	CH ₄ (ST)	N ₂ O (ST)
2028	S08	Employee Commute	2,034,896	7.2	0.07	0.25	0.0036	0.0054	0.0048	648.1	0.020	0.004
2028	S08	Material Delivery	41,525	0.1	0.00	0.17	0.0003	0.0022	0.0020	67.9	0.001	0.009
2028	S09	Employee Commute	2,034,896	7.2	0.07	0.25	0.0036	0.0054	0.0048	648.1	0.020	0.004
2028	S09	Material Delivery	41,525	0.1	0.00	0.17	0.0003	0.0022	0.0020	67.9	0.001	0.009
2028	T01	Employee Commute	10,131,660	35.8	0.34	1.25	0.0179	0.0269	0.0238	3227.0	0.100	0.018
2028	T01	Material Delivery	239,615	0.5	0.02	0.96	0.0014	0.0126	0.0116	391.9	0.004	0.052
2028	T02	Employee Commute	9,000,176	31.8	0.31	1.11	0.0159	0.0239	0.0212	2866.6	0.089	0.016
2028	T02	Material Delivery	117,474	0.3	0.01	0.47	0.0007	0.0062	0.0057	192.1	0.002	0.026
2029	A01	Employee Commute	416,130	1.5	0.01	0.05	0.0007	0.0011	0.0010	132.5	0.004	0.001
2029	A01	Material Delivery	33,493	0.1	0.00	0.13	0.0002	0.0018	0.0016	54.8	0.001	0.007
2029	A04	Employee Commute	4,257,000	15.0	0.14	0.52	0.0075	0.0113	0.0100	1355.9	0.042	0.007
2029	A04	Material Delivery	134,544	0.3	0.01	0.54	0.0008	0.0071	0.0065	220.1	0.002	0.029
2029	A05	Employee Commute	130,845	0.5	0.00	0.02	0.0002	0.0003	0.0003	41.7	0.001	0.000
2029	A05	Material Delivery	2,220	0.0	0.00	0.01	0.0000	0.0001	0.0001	3.6	0.000	0.000
2029	A08	Employee Commute	148,590	0.5	0.01	0.02	0.0003	0.0004	0.0003	47.3	0.001	0.000
2029	A08	Material Delivery	100,765	0.2	0.01	0.40	0.0006	0.0053	0.0049	164.8	0.002	0.022
2029	C03	Employee Commute	3,473,712	12.3	0.12	0.43	0.0061	0.0092	0.0082	1106.4	0.034	0.006
2029	C03	Material Delivery	41,244	0.1	0.00	0.16	0.0002	0.0022	0.0020	67.5	0.001	0.009
2029	H01	Employee Commute	430,854	1.5	0.01	0.05	0.0008	0.0011	0.0010	137.2	0.004	0.001
2029	H01	Material Delivery	25,929	0.1	0.00	0.10	0.0002	0.0014	0.0013	42.4	0.000	0.006
2029	H02	Employee Commute	948,599	3.3	0.03	0.12	0.0017	0.0025	0.0022	302.1	0.009	0.002
2029	H02	Material Delivery	56,259	0.1	0.01	0.23	0.0003	0.0030	0.0027	92.0	0.001	0.012
2029	L01	Employee Commute	3,116,124	11.0	0.11	0.38	0.0055	0.0083	0.0073	992.5	0.031	0.005
2029	L01	Material Delivery	39,630	0.1	0.00	0.16	0.0002	0.0021	0.0019	64.8	0.001	0.009
2029	L02	Employee Commute	1,965,578	6.9	0.07	0.24	0.0035	0.0052	0.0046	626.1	0.019	0.003
2029	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2029	L03	Employee Commute	6,632,406	23.4	0.23	0.82	0.0117	0.0176	0.0156	2112.5	0.066	0.012
2029	L03	Material Delivery	48,706	0.1	0.00	0.19	0.0003	0.0026	0.0024	79.7	0.001	0.011
2029	L04	Employee Commute	304,590	1.1	0.01	0.04	0.0005	0.0008	0.0007	97.0	0.003	0.001
2029	L04	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2029	L07	Employee Commute	1,894,365	6.7	0.06	0.23	0.0033	0.0050	0.0045	603.4	0.019	0.003
2029	L07	Material Delivery	87,092	0.2	0.01	0.35	0.0005	0.0046	0.0042	142.5	0.002	0.019
2029	S01	Employee Commute	5,585,184	19.7	0.19	0.69	0.0098	0.0148	0.0131	1778.9	0.055	0.010
2029	S01	Material Delivery	48,368	0.1	0.00	0.19	0.0003	0.0025	0.0023	79.1	0.001	0.011
2029	S03	Employee Commute	1,019,040	3.6	0.03	0.13	0.0018	0.0027	0.0024	324.6	0.010	0.002
2029	S03	Material Delivery	5,059	0.0	0.00	0.02	0.0000	0.0003	0.0002	8.3	0.000	0.001

TABLE 6-5: ON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Activity	Annual VMT	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (ST)	CH ₄ (ST)	N ₂ O (ST)
2029	S10	Employee Commute	8,275,608	29.2	0.28	1.02	0.0146	0.0220	0.0195	2635.8	0.082	0.014
2029	S10	Material Delivery	98,224	0.2	0.01	0.39	0.0006	0.0052	0.0048	160.7	0.002	0.022
2029	T01	Employee Commute	10,131,660	35.8	0.34	1.25	0.0179	0.0269	0.0238	3227.0	0.100	0.018
2029	T01	Material Delivery	239,615	0.5	0.02	0.96	0.0014	0.0126	0.0116	391.9	0.004	0.052
2029	T02	Employee Commute	16,041,705	56.6	0.55	1.98	0.0283	0.0426	0.0377	5109.4	0.158	0.028
2029	T02	Material Delivery	124,124	0.3	0.01	0.50	0.0007	0.0065	0.0060	203.0	0.002	0.027
2030	A04	Employee Commute	4,257,000	15.0	0.14	0.52	0.0075	0.0113	0.0100	1355.9	0.042	0.007
2030	A04	Material Delivery	134,544	0.3	0.01	0.54	0.0008	0.0071	0.0065	220.1	0.002	0.029
2030	A05	Employee Commute	2,068,902	7.3	0.07	0.25	0.0036	0.0055	0.0049	659.0	0.020	0.004
2030	A05	Material Delivery	8,880	0.0	0.00	0.04	0.0001	0.0005	0.0004	14.5	0.000	0.002
2030	H03	Employee Commute	633,229	2.2	0.02	0.08	0.0011	0.0017	0.0015	201.7	0.006	0.001
2030	H03	Material Delivery	11,110	0.0	0.00	0.04	0.0001	0.0006	0.0005	18.2	0.000	0.002
2030	H04	Employee Commute	140,718	0.5	0.00	0.02	0.0002	0.0004	0.0003	44.8	0.001	0.000
2030	H04	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2030	H05	Employee Commute	648,146	2.3	0.02	0.08	0.0011	0.0017	0.0015	206.4	0.006	0.001
2030	H05	Material Delivery	63,787	0.1	0.01	0.26	0.0004	0.0034	0.0031	104.3	0.001	0.014
2030	L02	Employee Commute	1,965,578	6.9	0.07	0.24	0.0035	0.0052	0.0046	626.1	0.019	0.003
2030	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2030	L03	Employee Commute	3,725,865	13.2	0.13	0.46	0.0066	0.0099	0.0088	1186.7	0.037	0.006
2030	L03	Material Delivery	36,530	0.1	0.00	0.15	0.0002	0.0019	0.0018	59.8	0.001	0.008
2030	L07	Employee Commute	7,577,460	26.8	0.26	0.93	0.0134	0.0201	0.0178	2413.5	0.075	0.013
2030	L07	Material Delivery	87,092	0.2	0.01	0.35	0.0005	0.0046	0.0042	142.5	0.002	0.019
2030	S01	Employee Commute	5,585,184	19.7	0.19	0.69	0.0098	0.0148	0.0131	1778.9	0.055	0.010
2030	S01	Material Delivery	48,368	0.1	0.00	0.19	0.0003	0.0025	0.0023	79.1	0.001	0.011
2030	S10	Employee Commute	4,643,001	16.4	0.16	0.57	0.0082	0.0123	0.0109	1478.8	0.046	0.008
2030	S10	Material Delivery	98,224	0.2	0.01	0.39	0.0006	0.0052	0.0048	160.7	0.002	0.022
2030	T01	Employee Commute	10,131,660	35.8	0.34	1.25	0.0179	0.0269	0.0238	3227.0	0.100	0.018
2030	T01	Material Delivery	239,615	0.5	0.02	0.96	0.0014	0.0126	0.0116	391.9	0.004	0.052
2030	T02	Employee Commute	16,041,705	56.6	0.55	1.98	0.0283	0.0426	0.0377	5109.4	0.158	0.028
2030	T02	Material Delivery	124,124	0.3	0.01	0.50	0.0007	0.0065	0.0060	203.0	0.002	0.027
2031	A04	Employee Commute	4,257,000	15.0	0.14	0.52	0.0075	0.0113	0.0100	1355.9	0.042	0.007
2031	A04	Material Delivery	134,544	0.3	0.01	0.54	0.0008	0.0071	0.0065	220.1	0.002	0.029
2031	H04	Employee Commute	562,870	2.0	0.02	0.07	0.0010	0.0015	0.0013	179.3	0.006	0.001
2031	H04	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2031	H05	Employee Commute	977,224	3.4	0.03	0.12	0.0017	0.0026	0.0023	311.3	0.010	0.002
2031	H05	Material Delivery	63,787	0.1	0.01	0.26	0.0004	0.0034	0.0031	104.3	0.001	0.014



TABLE 6-5: ON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Activity	Annual VMT	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (ST)	CH ₄ (ST)	N ₂ O (ST)
2031	L02	Employee Commute	1,965,578	6.9	0.07	0.24	0.0035	0.0052	0.0046	626.1	0.019	0.003
2031	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2031	L07	Employee Commute	478,335	1.7	0.02	0.06	0.0008	0.0013	0.0011	152.4	0.005	0.001
2031	L07	Material Delivery	87,092	0.2	0.01	0.35	0.0005	0.0046	0.0042	142.5	0.002	0.019
2031	S01	Employee Commute	5,585,184	19.7	0.19	0.69	0.0098	0.0148	0.0131	1778.9	0.055	0.010
2031	S01	Material Delivery	48,368	0.1	0.00	0.19	0.0003	0.0025	0.0023	79.1	0.001	0.011
2031	T01	Employee Commute	10,131,660	35.8	0.34	1.25	0.0179	0.0269	0.0238	3227.0	0.100	0.018
2031	T01	Material Delivery	239,615	0.5	0.02	0.96	0.0014	0.0126	0.0116	391.9	0.004	0.052
2031	T02	Employee Commute	16,041,705	56.6	0.55	1.98	0.0283	0.0426	0.0377	5109.4	0.158	0.028
2031	T02	Material Delivery	124,124	0.3	0.01	0.50	0.0007	0.0065	0.0060	203.0	0.002	0.027
2032	A04	Employee Commute	1,064,250	3.8	0.04	0.13	0.0019	0.0028	0.0025	339.0	0.011	0.002
2032	A04	Material Delivery	67,115	0.1	0.01	0.27	0.0004	0.0035	0.0033	109.8	0.001	0.015
2032	H04	Employee Commute	315,796	1.1	0.01	0.04	0.0006	0.0008	0.0007	100.6	0.003	0.001
2032	H04	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2032	L02	Employee Commute	123,801	0.4	0.00	0.02	0.0002	0.0003	0.0003	39.4	0.001	0.000
2032	L02	Material Delivery	37,858	0.1	0.00	0.15	0.0002	0.0020	0.0018	61.9	0.001	0.008
2032	T02	Employee Commute	9,000,160	31.8	0.31	1.11	0.0159	0.0239	0.0212	2866.6	0.089	0.016
2032	T02	Material Delivery	117,474	0.3	0.01	0.47	0.0007	0.0062	0.0057	192.1	0.002	0.026

Note: VMT denotes vehicle miles traveled; ST denotes short tons; CO denotes carbon monoxide, NO_x denotes nitrogen oxides, SO_x denotes sulfur oxides, VOC denotes volatile organic compounds, PM_{2.5} denotes fine particulate matter, PM₁₀ denotes coarse particulate matter, CO₂ denotes carbon dioxide, CH₄ denotes methane, N₂O denotes nitrous oxide.

Source: MOVES 4, Landrum & Brown 2024

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2025	C01	Aerial Lifts	50 < hp <= 75	0.21	3,024.0	0.1152	0.0219	0.1918	0.0001	0.0137	0.0133	33.1	0.00119
2025	C01	Aerial Lifts	75 < hp <= 100	0.59	936.1	0.1522	0.0241	0.1652	0.0001	0.0193	0.0187	38.4	0.00112
2025	C01	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2025	C01	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2025	C01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2025	C01	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2025	C01	Cranes	175 < hp <= 300	0.43	336.1	0.0033	0.0012	0.0142	0.0001	0.0008	0.0007	23.0	0.00007
2025	C01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	22.6	0.0003	0.0000	0.0007	0.0000	0.0001	0.0001	1.3	0.00000
2025	C01	Excavators	100 < hp <= 175	0.59	119.4	0.0011	0.0002	0.0035	0.0000	0.0003	0.0002	6.6	0.00001
2025	C01	Forklifts	75 < hp <= 100	0.59	3,424.2	0.0115	0.0017	0.1909	0.0003	0.0027	0.0026	120.4	0.00011
2025	C01	Generator Sets	25 < hp <= 40	0.43	412.8	0.0054	0.0015	0.0240	0.0000	0.0009	0.0009	4.2	0.00013
2025	C01	Off-highway Trucks	300 < hp <= 600	0.59	2,240.3	0.0365	0.0106	0.1396	0.0012	0.0088	0.0086	425.7	0.00053
2025	C01	Other Construction Equipment	300 < hp <= 600	0.59	12.0	0.0047	0.0006	0.0107	0.0000	0.0007	0.0007	2.3	0.00004
2025	C01	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2025	C01	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2025	C01	Pumps	6 < hp <= 11	0.43	12.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2025	C01	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2025	C01	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2025	C01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTIONN (*CONTINUED*)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2025	C01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	249.6	0.0174	0.0030	0.0189	0.0000	0.0023	0.0022	2.7	0.00015
2025	C01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.1	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2025	L01	Chippers/Stump Grinders	75 < hp <= 100	0.43	4.8	0.0003	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00000
2025	L01	Concrete/Industrial Saws	6 < hp <= 11	0.7	4.8	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2025	L01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	51.7	0.0006	0.0001	0.0016	0.0000	0.0001	0.0001	2.9	0.00001
2025	L01	Excavators	100 < hp <= 175	0.59	28.3	0.0003	0.0000	0.0008	0.0000	0.0001	0.0001	1.6	0.00000
2025	L01	Graders	175 < hp <= 300	0.59	2.0	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.2	0.00000
2025	L01	Irrigation Sets	300 < hp <= 600	0.59	1.8	0.0005	0.0001	0.0019	0.0000	0.0001	0.0001	0.3	0.00001
2025	L01	Off-highway Trucks	300 < hp <= 600	0.59	1,014.0	0.0165	0.0048	0.0632	0.0006	0.0040	0.0039	192.7	0.00024
2025	L01	Other Construction Equipment	100 < hp <= 175	0.43	65.5	0.0013	0.0003	0.0036	0.0000	0.0003	0.0003	2.6	0.00002
2025	L01	Pavers	100 < hp <= 175	0.59	8.2	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2025	L01	Plate Compactors	3 < hp <= 6	0.43	12.2	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2025	L01	Pumps	6 < hp <= 11	0.43	1.6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.00000
2025	L01	Rollers	75 < hp <= 100	0.59	22.7	0.0004	0.0000	0.0016	0.0000	0.0001	0.0001	0.8	0.00000
2025	L01	Scrapers	300 < hp <= 600	0.59	7.0	0.0006	0.0001	0.0015	0.0000	0.0001	0.0001	1.3	0.00001
2025	L01	Skid Steer Loaders	50 < hp <= 75	0.21	12.9	0.0016	0.0003	0.0013	0.0000	0.0002	0.0002	0.1	0.00001
2025	L01	Surfacing Equipment	16 < hp <= 25	0.59	2.7	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2025	L01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	12.1	0.0023	0.0007	0.0040	0.0000	0.0005	0.0005	0.8	0.00004
2025	L01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	27.4	0.0025	0.0004	0.0023	0.0000	0.0003	0.0003	0.4	0.00002

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2025	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2025	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2025	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2025	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2025	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2025	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2025	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2025	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2025	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2025	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2025	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2025	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2025	S07	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2025	S07	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2025	S07	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2025	S07	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2025	S07	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2025	S07	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2025	S07	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2025	S07	Crawler Tractor/Dozers	100 < hp <= 175	0.59	61.5	0.0007	0.0001	0.0019	0.0000	0.0002	0.0002	3.4	0.00001
2025	S07	Excavators	100 < hp <= 175	0.59	270.3	0.0024	0.0004	0.0080	0.0000	0.0006	0.0006	15.0	0.00003
2025	S07	Forklifts	75 < hp <= 100	0.59	3,584.0	0.0121	0.0018	0.1998	0.0004	0.0028	0.0027	126.1	0.00012
2025	S07	Generator Sets	25 < hp <= 40	0.43	144.8	0.0019	0.0005	0.0084	0.0000	0.0003	0.0003	1.5	0.00004
2025	S07	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2025	S07	Off-highway Trucks	300 < hp <= 600	0.59	6,930.2	0.1129	0.0328	0.4318	0.0038	0.0273	0.0265	1,316.9	0.00164
2025	S07	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2025	S07	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2025	S07	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2025	S07	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2025	S07	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2025	S07	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2025	S07	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2025	S07	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	153.6	0.0107	0.0019	0.0116	0.0000	0.0014	0.0014	1.7	0.00009
2025	S07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	600.0	0.0549	0.0095	0.0502	0.0000	0.0073	0.0071	8.7	0.00043
2026	A01	Air Compressors	75 < hp <= 100	0.43	58.3	0.0012	0.0001	0.0039	0.0000	0.0002	0.0002	1.5	0.00001
2026	A01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	50.4	0.0029	0.0005	0.0065	0.0000	0.0005	0.0005	1.3	0.00002
2026	A01	Concrete/Industrial Saws	25 < hp <= 40	0.59	58.3	0.0005	0.0001	0.0039	0.0000	0.0000	0.0000	0.8	0.00002
2026	A01	Concrete/Industrial Saws	6 < hp <= 11	0.7	50.4	0.0011	0.0004	0.0018	0.0000	0.0001	0.0001	0.2	0.00003

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	A01	Cranes	175 < hp <= 300	0.43	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-	0.00000
2026	A01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	386.6	0.0043	0.0007	0.0121	0.0001	0.0011	0.0010	21.4	0.00005
2026	A01	Excavators	100 < hp <= 175	0.59	476.0	0.0042	0.0007	0.0140	0.0001	0.0010	0.0010	26.4	0.00005
2026	A01	Graders	175 < hp <= 300	0.59	20.1	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.9	0.00000
2026	A01	Irrigation Sets	300 < hp <= 600	0.59	18.1	0.0053	0.0011	0.0188	0.0000	0.0009	0.0009	3.4	0.00007
2026	A01	Off-highway Trucks	300 < hp <= 600	0.59	4,176.0	0.0680	0.0198	0.2602	0.0023	0.0165	0.0160	793.5	0.00099
2026	A01	Other Construction Equipment	100 < hp <= 175	0.43	636.8	0.0122	0.0029	0.0346	0.0001	0.0027	0.0026	25.7	0.00019
2026	A01	Pavers	100 < hp <= 175	0.59	58.3	0.0009	0.0001	0.0020	0.0000	0.0002	0.0002	3.2	0.00001
2026	A01	Pumps	6 < hp <= 11	0.43	16.8	0.0002	0.0001	0.0004	0.0000	0.0000	0.0000	0.0	0.00001
2026	A01	Rollers	75 < hp <= 100	0.59	231.4	0.0040	0.0004	0.0158	0.0000	0.0006	0.0006	8.1	0.00003
2026	A01	Scrapers	300 < hp <= 600	0.59	72.8	0.0059	0.0010	0.0160	0.0000	0.0010	0.0009	13.8	0.00006
2026	A01	Skid Steer Loaders	50 < hp <= 75	0.21	30.9	0.0038	0.0007	0.0032	0.0000	0.0005	0.0005	0.3	0.00003
2026	A01	Surfacing Equipment	16 < hp <= 25	0.59	58.3	0.0014	0.0003	0.0036	0.0000	0.0002	0.0002	0.5	0.00003
2026	A01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	201.7	0.0377	0.0114	0.0661	0.0000	0.0078	0.0076	13.0	0.00064
2026	A01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	87.9	0.0080	0.0014	0.0074	0.0000	0.0011	0.0010	1.3	0.00006
2026	A02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	30.0	0.0018	0.0003	0.0039	0.0000	0.0003	0.0003	0.8	0.00001
2026	A02	Concrete/Industrial Saws	6 < hp <= 11	0.7	30.0	0.0006	0.0002	0.0011	0.0000	0.0001	0.0001	0.1	0.00002
2026	A02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	206.4	0.0023	0.0004	0.0065	0.0000	0.0006	0.0005	11.4	0.00003
2026	A02	Excavators	100 < hp <= 175	0.59	53.1	0.0005	0.0001	0.0016	0.0000	0.0001	0.0001	2.9	0.00001



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	A02	Graders	175 < hp <= 300	0.59	12.1	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	1.2	0.00000
2026	A02	Irrigation Sets	300 < hp <= 600	0.59	10.9	0.0032	0.0007	0.0114	0.0000	0.0005	0.0005	2.1	0.00004
2026	A02	Off-highway Trucks	300 < hp <= 600	0.59	3,365.7	0.0548	0.0159	0.2097	0.0019	0.0133	0.0129	639.6	0.00080
2026	A02	Other Construction Equipment	100 < hp <= 175	0.43	305.0	0.0058	0.0014	0.0166	0.0000	0.0013	0.0012	12.3	0.00009
2026	A02	Pavers	100 < hp <= 175	0.59	14.2	0.0002	0.0000	0.0005	0.0000	0.0001	0.0001	0.8	0.00000
2026	A02	Pumps	6 < hp <= 11	0.43	10.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2026	A02	Rollers	75 < hp <= 100	0.59	131.8	0.0023	0.0002	0.0090	0.0000	0.0003	0.0003	4.6	0.00002
2026	A02	Scrapers	300 < hp <= 600	0.59	47.3	0.0038	0.0006	0.0104	0.0000	0.0006	0.0006	9.0	0.00004
2026	A02	Skid Steer Loaders	50 < hp <= 75	0.21	23.3	0.0029	0.0005	0.0024	0.0000	0.0004	0.0004	0.3	0.00002
2026	A02	Surfacing Equipment	16 < hp <= 25	0.59	18.2	0.0004	0.0001	0.0011	0.0000	0.0001	0.0000	0.2	0.00001
2026	A02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	32.8	0.0061	0.0018	0.0107	0.0000	0.0013	0.0012	2.1	0.00010
2026	A02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	27.6	0.0025	0.0004	0.0023	0.0000	0.0003	0.0003	0.4	0.00002
2026	A06	Air Compressors	75 < hp <= 100	0.43	107.9	0.0022	0.0003	0.0071	0.0000	0.0004	0.0004	2.7	0.00002
2026	A06	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	86.4	0.0051	0.0009	0.0112	0.0000	0.0009	0.0009	2.2	0.00004
2026	A06	Concrete/Industrial Saws	25 < hp <= 40	0.59	107.9	0.0009	0.0003	0.0072	0.0000	0.0001	0.0001	1.5	0.00003
2026	A06	Concrete/Industrial Saws	6 < hp <= 11	0.7	86.4	0.0018	0.0006	0.0031	0.0000	0.0002	0.0002	0.4	0.00005
2026	A06	Crawler Tractor/Dozers	100 < hp <= 175	0.59	602.9	0.0067	0.0010	0.0189	0.0001	0.0017	0.0016	33.4	0.00007
2026	A06	Excavators	100 < hp <= 175	0.59	165.8	0.0015	0.0002	0.0049	0.0000	0.0004	0.0003	9.2	0.00002
2026	A06	Graders	175 < hp <= 300	0.59	34.6	0.0003	0.0001	0.0012	0.0000	0.0001	0.0001	3.3	0.00000

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	A06	Irrigation Sets	300 < hp <= 600	0.59	31.1	0.0091	0.0019	0.0324	0.0000	0.0015	0.0015	5.8	0.00013
2026	A06	Off-highway Trucks	300 < hp <= 600	0.59	6,231.1	0.1015	0.0295	0.3882	0.0035	0.0246	0.0238	1,184.1	0.00147
2026	A06	Other Construction Equipment	100 < hp <= 175	0.43	1,027.4	0.0197	0.0046	0.0559	0.0001	0.0043	0.0042	41.5	0.00031
2026	A06	Pavers	100 < hp <= 175	0.59	107.9	0.0016	0.0002	0.0037	0.0000	0.0004	0.0004	6.0	0.00002
2026	A06	Pumps	6 < hp <= 11	0.43	28.8	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2026	A06	Rollers	75 < hp <= 100	0.59	349.8	0.0060	0.0006	0.0239	0.0000	0.0009	0.0009	12.3	0.00004
2026	A06	Scrapers	300 < hp <= 600	0.59	134.9	0.0110	0.0018	0.0297	0.0001	0.0018	0.0017	25.6	0.00011
2026	A06	Skid Steer Loaders	50 < hp <= 75	0.21	26.2	0.0032	0.0006	0.0027	0.0000	0.0004	0.0004	0.3	0.00002
2026	A06	Surfacing Equipment	16 < hp <= 25	0.59	107.9	0.0026	0.0006	0.0066	0.0000	0.0003	0.0003	0.9	0.00005
2026	A06	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	224.1	0.0419	0.0126	0.0734	0.0001	0.0087	0.0084	14.5	0.00071
2026	A06	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	87.1	0.0080	0.0014	0.0073	0.0000	0.0011	0.0010	1.3	0.00006
2026	A07	Air Compressors	75 < hp <= 100	0.43	14.5	0.0003	0.0000	0.0010	0.0000	0.0001	0.0000	0.4	0.00000
2026	A07	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	12.0	0.0007	0.0001	0.0016	0.0000	0.0001	0.0001	0.3	0.00001
2026	A07	Concrete/Industrial Saws	25 < hp <= 40	0.59	14.5	0.0001	0.0000	0.0010	0.0000	0.0000	0.0000	0.2	0.00000
2026	A07	Concrete/Industrial Saws	6 < hp <= 11	0.7	12.0	0.0003	0.0001	0.0004	0.0000	0.0000	0.0000	0.1	0.00001
2026	A07	Crawler Tractor/Dozers	100 < hp <= 175	0.59	79.7	0.0009	0.0001	0.0025	0.0000	0.0002	0.0002	4.4	0.00001
2026	A07	Excavators	100 < hp <= 175	0.59	20.3	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.1	0.00000
2026	A07	Graders	175 < hp <= 300	0.59	4.8	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.5	0.00000
2026	A07	Irrigation Sets	300 < hp <= 600	0.59	4.3	0.0013	0.0003	0.0045	0.0000	0.0002	0.0002	0.8	0.00002



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	A07	Off-highway Trucks	300 < hp <= 600	0.59	1,267.1	0.0206	0.0060	0.0790	0.0007	0.0050	0.0048	240.8	0.00030
2026	A07	Other Construction Equipment	100 < hp <= 175	0.43	137.1	0.0026	0.0006	0.0075	0.0000	0.0006	0.0006	5.5	0.00004
2026	A07	Pavers	100 < hp <= 175	0.59	14.5	0.0002	0.0000	0.0005	0.0000	0.0001	0.0001	0.8	0.00000
2026	A07	Pumps	6 < hp <= 11	0.43	4.0	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2026	A07	Rollers	75 < hp <= 100	0.59	45.2	0.0008	0.0001	0.0031	0.0000	0.0001	0.0001	1.6	0.00001
2026	A07	Scrapers	300 < hp <= 600	0.59	18.2	0.0015	0.0002	0.0040	0.0000	0.0002	0.0002	3.5	0.00002
2026	A07	Skid Steer Loaders	50 < hp <= 75	0.21	5.3	0.0007	0.0001	0.0006	0.0000	0.0001	0.0001	0.1	0.00000
2026	A07	Surfacing Equipment	16 < hp <= 25	0.59	14.5	0.0004	0.0001	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2026	A07	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	28.8	0.0054	0.0016	0.0094	0.0000	0.0011	0.0011	1.9	0.00009
2026	A07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	12.5	0.0011	0.0002	0.0010	0.0000	0.0002	0.0001	0.2	0.00001
2026	A08	Air Compressors	75 < hp <= 100	0.43	13.3	0.0003	0.0000	0.0009	0.0000	0.0000	0.0000	0.3	0.00000
2026	A08	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	10.8	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.3	0.00000
2026	A08	Concrete/Industrial Saws	25 < hp <= 40	0.59	13.3	0.0001	0.0000	0.0009	0.0000	0.0000	0.0000	0.2	0.00000
2026	A08	Concrete/Industrial Saws	6 < hp <= 11	0.7	10.8	0.0002	0.0001	0.0004	0.0000	0.0000	0.0000	0.0	0.00001
2026	A08	Crawler Tractor/Dozers	100 < hp <= 175	0.59	108.1	0.0012	0.0002	0.0034	0.0000	0.0003	0.0003	6.0	0.00001
2026	A08	Excavators	100 < hp <= 175	0.59	197.5	0.0017	0.0003	0.0058	0.0000	0.0004	0.0004	10.9	0.00002
2026	A08	Generator Sets	25 < hp <= 40	0.43	144.0	0.0019	0.0005	0.0084	0.0000	0.0003	0.0003	1.5	0.00004
2026	A08	Graders	175 < hp <= 300	0.59	4.5	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.4	0.00000
2026	A08	Irrigation Sets	300 < hp <= 600	0.59	4.0	0.0012	0.0003	0.0042	0.0000	0.0002	0.0002	0.8	0.00002

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	A08	Off-highway Trucks	300 < hp <= 600	0.59	1,768.7	0.0288	0.0084	0.1102	0.0010	0.0070	0.0068	336.1	0.00042
2026	A08	Other Construction Equipment	100 < hp <= 175	0.43	135.3	0.0026	0.0006	0.0074	0.0000	0.0006	0.0006	5.5	0.00004
2026	A08	Pavers	100 < hp <= 175	0.59	13.3	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.7	0.00000
2026	A08	Pumps	6 < hp <= 11	0.43	3.6	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2026	A08	Rollers	75 < hp <= 100	0.59	40.4	0.0007	0.0001	0.0028	0.0000	0.0001	0.0001	1.4	0.00000
2026	A08	Scrapers	300 < hp <= 600	0.59	16.7	0.0014	0.0002	0.0037	0.0000	0.0002	0.0002	3.2	0.00001
2026	A08	Skid Steer Loaders	50 < hp <= 75	0.21	5.6	0.0007	0.0001	0.0006	0.0000	0.0001	0.0001	0.1	0.00000
2026	A08	Surfacing Equipment	16 < hp <= 25	0.59	13.3	0.0003	0.0001	0.0008	0.0000	0.0000	0.0000	0.1	0.00001
2026	A08	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	25.4	0.0047	0.0014	0.0083	0.0000	0.0010	0.0010	1.6	0.00008
2026	A08	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	288.0	0.0200	0.0035	0.0218	0.0000	0.0026	0.0026	3.1	0.00017
2026	A08	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	11.5	0.0011	0.0002	0.0010	0.0000	0.0001	0.0001	0.2	0.00001
2026	A10	Air Compressors	75 < hp <= 100	0.43	2.5	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.1	0.00000
2026	A10	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	3.6	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.1	0.00000
2026	A10	Concrete/Industrial Saws	25 < hp <= 40	0.59	2.5	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2026	A10	Concrete/Industrial Saws	6 < hp <= 11	0.7	3.6	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2026	A10	Crawler Tractor/Dozers	100 < hp <= 175	0.59	28.9	0.0003	0.0000	0.0009	0.0000	0.0001	0.0001	1.6	0.00000
2026	A10	Excavators	100 < hp <= 175	0.59	17.2	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	1.0	0.00000
2026	A10	Graders	175 < hp <= 300	0.59	1.3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.00000
2026	A10	Irrigation Sets	300 < hp <= 600	0.59	1.2	0.0003	0.0001	0.0012	0.0000	0.0001	0.0001	0.2	0.00000



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION *(CONTINUED)*

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	A10	Off-highway Trucks	300 < hp <= 600	0.59	3,032.8	0.0494	0.0143	0.1890	0.0017	0.0120	0.0116	576.3	0.00072
2026	A10	Other Construction Equipment	100 < hp <= 175	0.43	50.7	0.0010	0.0002	0.0028	0.0000	0.0002	0.0002	2.0	0.00002
2026	A10	Pavers	100 < hp <= 175	0.59	2.5	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.1	0.00000
2026	A10	Pumps	6 < hp <= 11	0.43	1.2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.00000
2026	A10	Rollers	75 < hp <= 100	0.59	22.0	0.0004	0.0000	0.0015	0.0000	0.0001	0.0001	0.8	0.00000
2026	A10	Scrapers	300 < hp <= 600	0.59	3.1	0.0003	0.0000	0.0007	0.0000	0.0000	0.0000	0.6	0.00000
2026	A10	Skid Steer Loaders	50 < hp <= 75	0.21	6.2	0.0008	0.0001	0.0006	0.0000	0.0001	0.0001	0.1	0.00001
2026	A10	Surfacing Equipment	16 < hp <= 25	0.59	2.5	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2026	A10	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	31.6	0.0059	0.0018	0.0104	0.0000	0.0012	0.0012	2.0	0.00010
2026	A10	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	15.6	0.0014	0.0002	0.0013	0.0000	0.0002	0.0002	0.2	0.00001
2026	C01	Aerial Lifts	50 < hp <= 75	0.21	3,024.0	0.1152	0.0219	0.1918	0.0001	0.0137	0.0133	33.1	0.00119
2026	C01	Aerial Lifts	75 < hp <= 100	0.59	936.1	0.1522	0.0241	0.1652	0.0001	0.0193	0.0187	38.4	0.00112
2026	C01	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2026	C01	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2026	C01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2026	C01	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2026	C01	Cranes	175 < hp <= 300	0.43	336.1	0.0033	0.0012	0.0142	0.0001	0.0008	0.0007	23.0	0.00007
2026	C01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	42.4	0.0005	0.0001	0.0013	0.0000	0.0001	0.0001	2.3	0.00001
2026	C01	Excavators	100 < hp <= 175	0.59	477.6	0.0042	0.0007	0.0141	0.0001	0.0010	0.0010	26.5	0.00005

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	C01	Forklifts	75 < hp <= 100	0.59	3,424.2	0.0115	0.0017	0.1909	0.0003	0.0027	0.0026	120.4	0.00011
2026	C01	Generator Sets	25 < hp <= 40	0.43	751.2	0.0098	0.0027	0.0437	0.0000	0.0016	0.0016	7.6	0.00023
2026	C01	Off-highway Trucks	300 < hp <= 600	0.59	3,351.4	0.0546	0.0159	0.2088	0.0019	0.0132	0.0128	636.9	0.00079
2026	C01	Other Construction Equipment	300 < hp <= 600	0.59	12.0	0.0047	0.0006	0.0107	0.0000	0.0007	0.0007	2.3	0.00004
2026	C01	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2026	C01	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2026	C01	Pumps	6 < hp <= 11	0.43	12.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2026	C01	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2026	C01	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2026	C01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2026	C01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	926.4	0.0645	0.0113	0.0701	0.0000	0.0085	0.0082	10.1	0.00055
2026	C01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.1	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2026	C02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2026	C02	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2026	C02	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2026	C02	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2026	C02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	64.0	0.0037	0.0007	0.0083	0.0000	0.0007	0.0006	1.6	0.00003
2026	C02	Concrete/Industrial Saws	6 < hp <= 11	0.7	64.0	0.0013	0.0005	0.0023	0.0000	0.0001	0.0001	0.3	0.00004
2026	C02	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	C02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	40.0	0.0004	0.0001	0.0013	0.0000	0.0001	0.0001	2.2	0.00000
2026	C02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2026	C02	Forklifts	75 < hp <= 100	0.59	3,724.0	0.0125	0.0018	0.2076	0.0004	0.0029	0.0029	131.0	0.00012
2026	C02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2026	C02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2026	C02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2026	C02	Off-highway Trucks	300 < hp <= 600	0.59	6,864.0	0.1118	0.0325	0.4277	0.0038	0.0271	0.0263	1,304.3	0.00162
2026	C02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2026	C02	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2026	C02	Plate Compactors	3 < hp <= 6	0.43	40.0	0.0003	0.0001	0.0005	0.0000	0.0000	0.0000	0.1	0.00001
2026	C02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2026	C02	Rollers	75 < hp <= 100	0.59	56.0	0.0010	0.0001	0.0038	0.0000	0.0001	0.0001	2.0	0.00001
2026	C02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2026	C02	Surfacing Equipment	75 < hp <= 100	0.43	64.0	0.0022	0.0003	0.0047	0.0000	0.0003	0.0003	1.6	0.00001
2026	C02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2026	C02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2026	C02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	840.0	0.0769	0.0133	0.0703	0.0000	0.0102	0.0099	12.2	0.00061
2026	L01	Air Compressors	75 < hp <= 100	0.43	22.8	0.0005	0.0001	0.0015	0.0000	0.0001	0.0001	0.6	0.00000
2026	L01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	19.2	0.0011	0.0002	0.0025	0.0000	0.0002	0.0002	0.5	0.00001

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	L01	Concrete/Industrial Saws	25 < hp <= 40	0.59	22.8	0.0002	0.0001	0.0015	0.0000	0.0000	0.0000	0.3	0.00001
2026	L01	Concrete/Industrial Saws	6 < hp <= 11	0.7	19.2	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2026	L01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	206.5	0.0023	0.0004	0.0065	0.0000	0.0006	0.0005	11.4	0.00003
2026	L01	Excavators	100 < hp <= 175	0.59	113.3	0.0010	0.0002	0.0033	0.0000	0.0002	0.0002	6.3	0.00001
2026	L01	Graders	175 < hp <= 300	0.59	7.6	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.7	0.00000
2026	L01	Irrigation Sets	300 < hp <= 600	0.59	6.9	0.0020	0.0004	0.0071	0.0000	0.0003	0.0003	1.3	0.00003
2026	L01	Off-highway Trucks	300 < hp <= 600	0.59	4,227.2	0.0688	0.0200	0.2634	0.0023	0.0167	0.0162	803.3	0.00100
2026	L01	Other Construction Equipment	100 < hp <= 175	0.43	309.1	0.0059	0.0014	0.0168	0.0000	0.0013	0.0013	12.5	0.00009
2026	L01	Pavers	100 < hp <= 175	0.59	55.9	0.0008	0.0001	0.0019	0.0000	0.0002	0.0002	3.1	0.00001
2026	L01	Plate Compactors	3 < hp <= 6	0.43	49.2	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2026	L01	Pumps	6 < hp <= 11	0.43	6.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2026	L01	Rollers	75 < hp <= 100	0.59	90.4	0.0016	0.0001	0.0062	0.0000	0.0002	0.0002	3.2	0.00001
2026	L01	Scrapers	300 < hp <= 600	0.59	28.4	0.0023	0.0004	0.0063	0.0000	0.0004	0.0004	5.4	0.00002
2026	L01	Skid Steer Loaders	50 < hp <= 75	0.21	52.4	0.0065	0.0012	0.0055	0.0000	0.0009	0.0009	0.6	0.00004
2026	L01	Surfacing Equipment	16 < hp <= 25	0.59	33.7	0.0008	0.0002	0.0021	0.0000	0.0001	0.0001	0.3	0.00002
2026	L01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	70.4	0.0132	0.0040	0.0231	0.0000	0.0027	0.0027	4.5	0.00022
2026	L01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	110.6	0.0101	0.0018	0.0093	0.0000	0.0013	0.0013	1.6	0.00008
2026	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2026	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2026	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2026	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2026	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2026	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2026	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2026	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2026	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2026	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2026	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2026	L04	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2026	L04	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2026	L04	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2026	L04	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2026	L04	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2026	L04	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2026	L04	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2026	L04	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2026	L04	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	L04	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2026	L04	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2026	L04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2026	S02	Aerial Lifts	50 < hp <= 75	0.21	1,320.0	0.0503	0.0096	0.0837	0.0000	0.0060	0.0058	14.4	0.00052
2026	S02	Aerial Lifts	75 < hp <= 100	0.59	456.0	0.0742	0.0117	0.0805	0.0001	0.0094	0.0091	18.7	0.00055
2026	S02	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2026	S02	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2026	S02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2026	S02	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2026	S02	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2026	S02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	78.5	0.0009	0.0001	0.0025	0.0000	0.0002	0.0002	4.4	0.00001
2026	S02	Excavators	100 < hp <= 175	0.59	233.5	0.0021	0.0003	0.0069	0.0000	0.0005	0.0005	12.9	0.00002
2026	S02	Forklifts	75 < hp <= 100	0.59	1,664.0	0.0056	0.0008	0.0928	0.0002	0.0013	0.0013	58.5	0.00005
2026	S02	Generator Sets	25 < hp <= 40	0.43	171.0	0.0022	0.0006	0.0099	0.0000	0.0004	0.0004	1.7	0.00005
2026	S02	Off-highway Trucks	175 < hp <= 300	0.43	240.0	0.0007	0.0003	0.0039	0.0000	0.0002	0.0002	16.6	0.00001
2026	S02	Off-highway Trucks	300 < hp <= 600	0.59	1,268.5	0.0207	0.0060	0.0790	0.0007	0.0050	0.0049	241.0	0.00030
2026	S02	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2026	S02	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2026	S02	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	S02	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2026	S02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2026	S02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	366.0	0.0255	0.0045	0.0277	0.0000	0.0034	0.0033	4.0	0.00022
2026	S02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.0	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2026	S04	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001
2026	S04	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010
2026	S04	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077
2026	S04	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2026	S04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	13.6	0.0002	0.0000	0.0004	0.0000	0.0000	0.0000	0.8	0.00000
2026	S04	Excavators	100 < hp <= 175	0.59	13.6	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.8	0.00000
2026	S04	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2026	S04	Off-highway Trucks	300 < hp <= 600	0.59	323.2	0.0053	0.0015	0.0201	0.0002	0.0013	0.0012	61.4	0.00008
2026	S04	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000
2026	S04	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2026	S04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2026	S05	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001
2026	S05	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010
2026	S05	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	S05	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2026	S05	Crawler Tractor/Dozers	100 < hp <= 175	0.59	9.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2026	S05	Excavators	100 < hp <= 175	0.59	9.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2026	S05	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2026	S05	Off-highway Trucks	300 < hp <= 600	0.59	314.0	0.0051	0.0015	0.0196	0.0002	0.0012	0.0012	59.7	0.00007
2026	S05	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000
2026	S05	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2026	S05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2026	S06	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001
2026	S06	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010
2026	S06	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077
2026	S06	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2026	S06	Crawler Tractor/Dozers	100 < hp <= 175	0.59	14.5	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.8	0.00000
2026	S06	Excavators	100 < hp <= 175	0.59	14.5	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.8	0.00000
2026	S06	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2026	S06	Off-highway Trucks	300 < hp <= 600	0.59	325.0	0.0053	0.0015	0.0202	0.0002	0.0013	0.0012	61.8	0.00008
2026	S06	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000
2026	S06	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	S06	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2026	S07	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2026	S07	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2026	S07	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2026	S07	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2026	S07	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2026	S07	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2026	S07	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2026	S07	Crawler Tractor/Dozers	100 < hp <= 175	0.59	76.7	0.0009	0.0001	0.0024	0.0000	0.0002	0.0002	4.2	0.00001
2026	S07	Excavators	100 < hp <= 175	0.59	307.1	0.0027	0.0004	0.0091	0.0000	0.0007	0.0006	17.0	0.00003
2026	S07	Forklifts	75 < hp <= 100	0.59	3,584.0	0.0121	0.0018	0.1998	0.0004	0.0028	0.0027	126.1	0.00012
2026	S07	Generator Sets	25 < hp <= 40	0.43	166.4	0.0022	0.0006	0.0097	0.0000	0.0004	0.0003	1.7	0.00005
2026	S07	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2026	S07	Off-highway Trucks	300 < hp <= 600	0.59	7,029.0	0.1145	0.0333	0.4379	0.0039	0.0277	0.0269	1,335.7	0.00166
2026	S07	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2026	S07	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2026	S07	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2026	S07	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2026	S07	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2026	S07	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2026	S07	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2026	S07	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	196.8	0.0137	0.0024	0.0149	0.0000	0.0018	0.0017	2.2	0.00012
2026	S07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	600.0	0.0549	0.0095	0.0502	0.0000	0.0073	0.0071	8.7	0.00043
2027	A01	Air Compressors	75 < hp <= 100	0.43	120.4	0.0025	0.0003	0.0080	0.0000	0.0004	0.0004	3.1	0.00002
2027	A01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	90.0	0.0053	0.0010	0.0117	0.0000	0.0009	0.0009	2.3	0.00004
2027	A01	Concrete/Industrial Saws	25 < hp <= 40	0.59	112.4	0.0009	0.0003	0.0075	0.0000	0.0001	0.0001	1.6	0.00003
2027	A01	Concrete/Industrial Saws	6 < hp <= 11	0.7	90.0	0.0019	0.0006	0.0032	0.0000	0.0002	0.0002	0.4	0.00005
2027	A01	Cranes	175 < hp <= 300	0.43	8.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2027	A01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	687.3	0.0076	0.0012	0.0216	0.0001	0.0019	0.0018	38.1	0.00009
2027	A01	Excavators	100 < hp <= 175	0.59	882.8	0.0078	0.0012	0.0260	0.0001	0.0019	0.0018	48.9	0.00009
2027	A01	Graders	175 < hp <= 300	0.59	36.4	0.0003	0.0001	0.0012	0.0000	0.0001	0.0001	3.5	0.00001
2027	A01	Irrigation Sets	300 < hp <= 600	0.59	32.8	0.0095	0.0020	0.0341	0.0000	0.0016	0.0016	6.2	0.00013
2027	A01	Off-highway Trucks	300 < hp <= 600	0.59	7,913.4	0.1289	0.0374	0.4930	0.0044	0.0312	0.0303	1,503.7	0.00187
2027	A01	Other Construction Equipment	100 < hp <= 175	0.43	1,117.4	0.0214	0.0050	0.0608	0.0001	0.0047	0.0046	45.1	0.00033
2027	A01	Pavers	100 < hp <= 175	0.59	112.4	0.0016	0.0003	0.0038	0.0000	0.0004	0.0004	6.2	0.00002
2027	A01	Pumps	6 < hp <= 11	0.43	30.0	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2027	A01	Rollers	75 < hp <= 100	0.59	376.7	0.0065	0.0006	0.0258	0.0000	0.0010	0.0009	13.2	0.00004
2027	A01	Scrapers	300 < hp <= 600	0.59	140.5	0.0114	0.0018	0.0310	0.0001	0.0019	0.0018	26.7	0.00012



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	A01	Skid Steer Loaders	50 < hp <= 75	0.21	55.8	0.0069	0.0013	0.0058	0.0000	0.0010	0.0009	0.6	0.00005
2027	A01	Surfacing Equipment	16 < hp <= 25	0.59	112.4	0.0027	0.0006	0.0069	0.0000	0.0003	0.0003	1.0	0.00005
2027	A01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	256.7	0.0480	0.0145	0.0841	0.0001	0.0100	0.0097	16.6	0.00082
2027	A01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	126.0	0.0115	0.0020	0.0105	0.0000	0.0015	0.0015	1.8	0.00009
2027	A07	Air Compressors	75 < hp <= 100	0.43	42.7	0.0009	0.0001	0.0028	0.0000	0.0001	0.0001	1.1	0.00001
2027	A07	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	33.6	0.0020	0.0004	0.0044	0.0000	0.0003	0.0003	0.9	0.00001
2027	A07	Concrete/Industrial Saws	25 < hp <= 40	0.59	42.7	0.0003	0.0001	0.0028	0.0000	0.0000	0.0000	0.6	0.00001
2027	A07	Concrete/Industrial Saws	6 < hp <= 11	0.7	33.6	0.0007	0.0002	0.0012	0.0000	0.0001	0.0001	0.2	0.00002
2027	A07	Crawler Tractor/Dozers	100 < hp <= 175	0.59	232.0	0.0026	0.0004	0.0073	0.0000	0.0006	0.0006	12.9	0.00003
2027	A07	Excavators	100 < hp <= 175	0.59	59.1	0.0005	0.0001	0.0017	0.0000	0.0001	0.0001	3.3	0.00001
2027	A07	Graders	175 < hp <= 300	0.59	13.6	0.0001	0.0000	0.0005	0.0000	0.0000	0.0000	1.3	0.00000
2027	A07	Irrigation Sets	300 < hp <= 600	0.59	12.3	0.0036	0.0008	0.0128	0.0000	0.0006	0.0006	2.3	0.00005
2027	A07	Off-highway Trucks	300 < hp <= 600	0.59	3,749.2	0.0611	0.0177	0.2336	0.0021	0.0148	0.0143	712.4	0.00089
2027	A07	Other Construction Equipment	100 < hp <= 175	0.43	395.8	0.0076	0.0018	0.0215	0.0000	0.0017	0.0016	16.0	0.00012
2027	A07	Pavers	100 < hp <= 175	0.59	42.7	0.0006	0.0001	0.0015	0.0000	0.0002	0.0002	2.4	0.00001
2027	A07	Pumps	6 < hp <= 11	0.43	11.2	0.0002	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	A07	Rollers	75 < hp <= 100	0.59	131.9	0.0023	0.0002	0.0090	0.0000	0.0003	0.0003	4.6	0.00002
2027	A07	Scrapers	300 < hp <= 600	0.59	53.4	0.0043	0.0007	0.0118	0.0000	0.0007	0.0007	10.1	0.00004
2027	A07	Skid Steer Loaders	50 < hp <= 75	0.21	9.7	0.0012	0.0002	0.0010	0.0000	0.0002	0.0002	0.1	0.00001

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	A07	Surfacing Equipment	16 < hp <= 25	0.59	42.7	0.0010	0.0002	0.0026	0.0000	0.0001	0.0001	0.4	0.00002
2027	A07	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	77.9	0.0146	0.0044	0.0255	0.0000	0.0030	0.0029	5.0	0.00025
2027	A07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	30.0	0.0027	0.0005	0.0025	0.0000	0.0004	0.0004	0.4	0.00002
2027	A08	Air Compressors	75 < hp <= 100	0.43	20.0	0.0004	0.0001	0.0013	0.0000	0.0001	0.0001	0.5	0.00000
2027	A08	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	16.8	0.0010	0.0002	0.0022	0.0000	0.0002	0.0002	0.4	0.00001
2027	A08	Concrete/Industrial Saws	25 < hp <= 40	0.59	20.0	0.0002	0.0000	0.0013	0.0000	0.0000	0.0000	0.3	0.00001
2027	A08	Concrete/Industrial Saws	6 < hp <= 11	0.7	16.8	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2027	A08	Crawler Tractor/Dozers	100 < hp <= 175	0.59	251.4	0.0028	0.0004	0.0079	0.0000	0.0007	0.0007	13.9	0.00003
2027	A08	Excavators	100 < hp <= 175	0.59	746.1	0.0066	0.0010	0.0220	0.0001	0.0016	0.0015	41.3	0.00007
2027	A08	Generator Sets	25 < hp <= 40	0.43	576.0	0.0075	0.0021	0.0335	0.0000	0.0012	0.0012	5.8	0.00018
2027	A08	Graders	175 < hp <= 300	0.59	6.5	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.6	0.00000
2027	A08	Irrigation Sets	300 < hp <= 600	0.59	5.9	0.0017	0.0004	0.0061	0.0000	0.0003	0.0003	1.1	0.00002
2027	A08	Off-highway Trucks	300 < hp <= 600	0.59	5,768.9	0.0939	0.0273	0.3594	0.0032	0.0227	0.0221	1,096.2	0.00136
2027	A08	Other Construction Equipment	100 < hp <= 175	0.43	200.8	0.0038	0.0009	0.0109	0.0000	0.0008	0.0008	8.1	0.00006
2027	A08	Pavers	100 < hp <= 175	0.59	20.0	0.0003	0.0000	0.0007	0.0000	0.0001	0.0001	1.1	0.00000
2027	A08	Pumps	6 < hp <= 11	0.43	5.6	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2027	A08	Rollers	75 < hp <= 100	0.59	60.3	0.0010	0.0001	0.0041	0.0000	0.0002	0.0002	2.1	0.00001
2027	A08	Scrapers	300 < hp <= 600	0.59	25.0	0.0020	0.0003	0.0055	0.0000	0.0003	0.0003	4.7	0.00002
2027	A08	Skid Steer Loaders	50 < hp <= 75	0.21	6.4	0.0008	0.0001	0.0007	0.0000	0.0001	0.0001	0.1	0.00001



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	A08	Surfacing Equipment	16 < hp <= 25	0.59	20.0	0.0005	0.0001	0.0012	0.0000	0.0001	0.0001	0.2	0.00001
2027	A08	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	35.8	0.0067	0.0020	0.0117	0.0000	0.0014	0.0013	2.3	0.00011
2027	A08	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	1,152.0	0.0802	0.0141	0.0872	0.0000	0.0105	0.0102	12.6	0.00069
2027	A08	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	15.4	0.0014	0.0002	0.0013	0.0000	0.0002	0.0002	0.2	0.00001
2027	A10	Air Compressors	75 < hp <= 100	0.43	2.5	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.1	0.00000
2027	A10	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	3.6	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.1	0.00000
2027	A10	Concrete/Industrial Saws	25 < hp <= 40	0.59	2.5	0.0000	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	A10	Concrete/Industrial Saws	6 < hp <= 11	0.7	3.6	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2027	A10	Crawler Tractor/Dozers	100 < hp <= 175	0.59	28.9	0.0003	0.0000	0.0009	0.0000	0.0001	0.0001	1.6	0.00000
2027	A10	Excavators	100 < hp <= 175	0.59	17.2	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	1.0	0.00000
2027	A10	Graders	175 < hp <= 300	0.59	1.3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.00000
2027	A10	Irrigation Sets	300 < hp <= 600	0.59	1.2	0.0003	0.0001	0.0012	0.0000	0.0001	0.0001	0.2	0.00000
2027	A10	Off-highway Trucks	300 < hp <= 600	0.59	3,032.8	0.0494	0.0143	0.1890	0.0017	0.0120	0.0116	576.3	0.00072
2027	A10	Other Construction Equipment	100 < hp <= 175	0.43	50.7	0.0010	0.0002	0.0028	0.0000	0.0002	0.0002	2.0	0.00002
2027	A10	Pavers	100 < hp <= 175	0.59	2.5	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.1	0.00000
2027	A10	Pumps	6 < hp <= 11	0.43	1.2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.00000
2027	A10	Rollers	75 < hp <= 100	0.59	22.0	0.0004	0.0000	0.0015	0.0000	0.0001	0.0001	0.8	0.00000
2027	A10	Scrapers	300 < hp <= 600	0.59	3.1	0.0003	0.0000	0.0007	0.0000	0.0000	0.0000	0.6	0.00000
2027	A10	Skid Steer Loaders	50 < hp <= 75	0.21	6.2	0.0008	0.0001	0.0006	0.0000	0.0001	0.0001	0.1	0.00001

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	A10	Surfacing Equipment	16 < hp <= 25	0.59	2.5	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	A10	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	31.6	0.0059	0.0018	0.0104	0.0000	0.0012	0.0012	2.0	0.00010
2027	A10	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	15.6	0.0014	0.0002	0.0013	0.0000	0.0002	0.0002	0.2	0.00001
2027	C02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	C02	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2027	C02	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2027	C02	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2027	C02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	64.0	0.0037	0.0007	0.0083	0.0000	0.0007	0.0006	1.6	0.00003
2027	C02	Concrete/Industrial Saws	6 < hp <= 11	0.7	64.0	0.0013	0.0005	0.0023	0.0000	0.0001	0.0001	0.3	0.00004
2027	C02	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2027	C02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	40.0	0.0004	0.0001	0.0013	0.0000	0.0001	0.0001	2.2	0.00000
2027	C02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2027	C02	Forklifts	75 < hp <= 100	0.59	3,724.0	0.0125	0.0018	0.2076	0.0004	0.0029	0.0029	131.0	0.00012
2027	C02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2027	C02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2027	C02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2027	C02	Off-highway Trucks	300 < hp <= 600	0.59	6,864.0	0.1118	0.0325	0.4277	0.0038	0.0271	0.0263	1,304.3	0.00162
2027	C02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	C02	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2027	C02	Plate Compactors	3 < hp <= 6	0.43	40.0	0.0003	0.0001	0.0005	0.0000	0.0000	0.0000	0.1	0.00001
2027	C02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2027	C02	Rollers	75 < hp <= 100	0.59	56.0	0.0010	0.0001	0.0038	0.0000	0.0001	0.0001	2.0	0.00001
2027	C02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2027	C02	Surfacing Equipment	75 < hp <= 100	0.43	64.0	0.0022	0.0003	0.0047	0.0000	0.0003	0.0003	1.6	0.00001
2027	C02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2027	C02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2027	C02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	840.0	0.0769	0.0133	0.0703	0.0000	0.0102	0.0099	12.2	0.00061
2027	L01	Air Compressors	75 < hp <= 100	0.43	22.8	0.0005	0.0001	0.0015	0.0000	0.0001	0.0001	0.6	0.00000
2027	L01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	19.2	0.0011	0.0002	0.0025	0.0000	0.0002	0.0002	0.5	0.00001
2027	L01	Concrete/Industrial Saws	25 < hp <= 40	0.59	22.8	0.0002	0.0001	0.0015	0.0000	0.0000	0.0000	0.3	0.00001
2027	L01	Concrete/Industrial Saws	6 < hp <= 11	0.7	19.2	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2027	L01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	206.5	0.0023	0.0004	0.0065	0.0000	0.0006	0.0005	11.4	0.00003
2027	L01	Excavators	100 < hp <= 175	0.59	113.3	0.0010	0.0002	0.0033	0.0000	0.0002	0.0002	6.3	0.00001
2027	L01	Graders	175 < hp <= 300	0.59	7.6	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.7	0.00000
2027	L01	Irrigation Sets	300 < hp <= 600	0.59	6.9	0.0020	0.0004	0.0071	0.0000	0.0003	0.0003	1.3	0.00003
2027	L01	Off-highway Trucks	300 < hp <= 600	0.59	4,227.2	0.0688	0.0200	0.2634	0.0023	0.0167	0.0162	803.3	0.00100
2027	L01	Other Construction Equipment	100 < hp <= 175	0.43	309.1	0.0059	0.0014	0.0168	0.0000	0.0013	0.0013	12.5	0.00009

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	L01	Pavers	100 < hp <= 175	0.59	55.9	0.0008	0.0001	0.0019	0.0000	0.0002	0.0002	3.1	0.00001
2027	L01	Plate Compactors	3 < hp <= 6	0.43	49.2	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2027	L01	Pumps	6 < hp <= 11	0.43	6.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2027	L01	Rollers	75 < hp <= 100	0.59	90.4	0.0016	0.0001	0.0062	0.0000	0.0002	0.0002	3.2	0.00001
2027	L01	Scrapers	300 < hp <= 600	0.59	28.4	0.0023	0.0004	0.0063	0.0000	0.0004	0.0004	5.4	0.00002
2027	L01	Skid Steer Loaders	50 < hp <= 75	0.21	52.4	0.0065	0.0012	0.0055	0.0000	0.0009	0.0009	0.6	0.00004
2027	L01	Surfacing Equipment	16 < hp <= 25	0.59	33.7	0.0008	0.0002	0.0021	0.0000	0.0001	0.0001	0.3	0.00002
2027	L01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	70.4	0.0132	0.0040	0.0231	0.0000	0.0027	0.0027	4.5	0.00022
2027	L01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	110.6	0.0101	0.0018	0.0093	0.0000	0.0013	0.0013	1.6	0.00008
2027	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2027	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2027	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2027	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2027	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2027	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2027	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2027	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2027	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2027	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2027	L04	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	L04	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2027	L04	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2027	L04	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2027	L04	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2027	L04	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2027	L04	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2027	L04	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2027	L04	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2027	L04	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2027	L04	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2027	L04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2027	L05	Aerial Lifts	75 < hp <= 100	0.59	16.0	0.0026	0.0004	0.0028	0.0000	0.0003	0.0003	0.7	0.00002
2027	L05	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2027	L05	Cement & Mortar Mixers	300 < hp <= 600	0.59	24.0	0.0115	0.0024	0.0432	0.0000	0.0016	0.0015	4.5	0.00012
2027	L05	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2027	L05	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2027	L05	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	L05	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000
2027	L05	Forklifts	75 < hp <= 100	0.59	24.0	0.0001	0.0000	0.0013	0.0000	0.0000	0.0000	0.8	0.00000
2027	L05	Off-highway Trucks	300 < hp <= 600	0.59	164.0	0.0027	0.0008	0.0102	0.0001	0.0006	0.0006	31.2	0.00004
2027	L05	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2027	L05	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	L05	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2027	L05	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2027	L05	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2027	L05	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2027	L05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	120.0	0.0110	0.0019	0.0100	0.0000	0.0015	0.0014	1.7	0.00009
2027	S02	Aerial Lifts	50 < hp <= 75	0.21	1,320.0	0.0503	0.0096	0.0837	0.0000	0.0060	0.0058	14.4	0.00052
2027	S02	Aerial Lifts	75 < hp <= 100	0.59	456.0	0.0742	0.0117	0.0805	0.0001	0.0094	0.0091	18.7	0.00055
2027	S02	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2027	S02	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2027	S02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2027	S02	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2027	S02	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2027	S02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	98.5	0.0011	0.0002	0.0031	0.0000	0.0003	0.0003	5.5	0.00001
2027	S02	Excavators	100 < hp <= 175	0.59	310.5	0.0027	0.0004	0.0092	0.0001	0.0007	0.0006	17.2	0.00003



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	S02	Forklifts	75 < hp <= 100	0.59	1,664.0	0.0056	0.0008	0.0928	0.0002	0.0013	0.0013	58.5	0.00005
2027	S02	Generator Sets	25 < hp <= 40	0.43	228.0	0.0030	0.0008	0.0133	0.0000	0.0005	0.0005	2.3	0.00007
2027	S02	Off-highway Trucks	175 < hp <= 300	0.43	240.0	0.0007	0.0003	0.0039	0.0000	0.0002	0.0002	16.6	0.00001
2027	S02	Off-highway Trucks	300 < hp <= 600	0.59	1,489.0	0.0242	0.0070	0.0928	0.0008	0.0059	0.0057	282.9	0.00035
2027	S02	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2027	S02	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	S02	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2027	S02	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2027	S02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2027	S02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	480.0	0.0334	0.0059	0.0363	0.0000	0.0044	0.0043	5.2	0.00029
2027	S02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.0	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2027	S03	Aerial Lifts	50 < hp <= 75	0.21	1,320.0	0.0503	0.0096	0.0837	0.0000	0.0060	0.0058	14.4	0.00052
2027	S03	Aerial Lifts	75 < hp <= 100	0.59	456.0	0.0742	0.0117	0.0805	0.0001	0.0094	0.0091	18.7	0.00055
2027	S03	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2027	S03	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2027	S03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2027	S03	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2027	S03	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2027	S03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	S03	Forklifts	75 < hp <= 100	0.59	1,664.0	0.0056	0.0008	0.0928	0.0002	0.0013	0.0013	58.5	0.00005
2027	S03	Off-highway Trucks	175 < hp <= 300	0.43	240.0	0.0007	0.0003	0.0039	0.0000	0.0002	0.0002	16.6	0.00001
2027	S03	Off-highway Trucks	300 < hp <= 600	0.59	602.0	0.0098	0.0028	0.0375	0.0003	0.0024	0.0023	114.4	0.00014
2027	S03	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2027	S03	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	S03	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2027	S03	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2027	S03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2027	S03	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2027	S03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.0	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2027	S04	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001
2027	S04	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010
2027	S04	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077
2027	S04	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2027	S04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	13.6	0.0002	0.0000	0.0004	0.0000	0.0000	0.0000	0.8	0.00000
2027	S04	Excavators	100 < hp <= 175	0.59	13.6	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.8	0.00000
2027	S04	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2027	S04	Off-highway Trucks	300 < hp <= 600	0.59	323.2	0.0053	0.0015	0.0201	0.0002	0.0013	0.0012	61.4	0.00008
2027	S04	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	S04	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2027	S04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2027	S05	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001
2027	S05	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010
2027	S05	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077
2027	S05	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2027	S05	Crawler Tractor/Dozers	100 < hp <= 175	0.59	7.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.4	0.00000
2027	S05	Excavators	100 < hp <= 175	0.59	7.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.4	0.00000
2027	S05	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2027	S05	Off-highway Trucks	300 < hp <= 600	0.59	310.0	0.0050	0.0015	0.0193	0.0002	0.0012	0.0012	58.9	0.00007
2027	S05	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000
2027	S05	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2027	S05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2027	S06	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001
2027	S06	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010
2027	S06	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077
2027	S06	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2027	S06	Crawler Tractor/Dozers	100 < hp <= 175	0.59	11.5	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.6	0.00000

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	S06	Excavators	100 < hp <= 175	0.59	11.5	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.6	0.00000
2027	S06	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2027	S06	Off-highway Trucks	300 < hp <= 600	0.59	319.0	0.0052	0.0015	0.0199	0.0002	0.0013	0.0012	60.6	0.00008
2027	S06	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000
2027	S06	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2027	S06	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2027	S07	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	S07	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2027	S07	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2027	S07	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2027	S07	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2027	S07	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2027	S07	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2027	S07	Crawler Tractor/Dozers	100 < hp <= 175	0.59	61.5	0.0007	0.0001	0.0019	0.0000	0.0002	0.0002	3.4	0.00001
2027	S07	Excavators	100 < hp <= 175	0.59	270.3	0.0024	0.0004	0.0080	0.0000	0.0006	0.0006	15.0	0.00003
2027	S07	Forklifts	75 < hp <= 100	0.59	3,584.0	0.0121	0.0018	0.1998	0.0004	0.0028	0.0027	126.1	0.00012
2027	S07	Generator Sets	25 < hp <= 40	0.43	144.8	0.0019	0.0005	0.0084	0.0000	0.0003	0.0003	1.5	0.00004
2027	S07	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	S07	Off-highway Trucks	300 < hp <= 600	0.59	6,930.2	0.1129	0.0328	0.4318	0.0038	0.0273	0.0265	1,316.9	0.00164
2027	S07	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2027	S07	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2027	S07	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2027	S07	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2027	S07	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2027	S07	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2027	S07	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2027	S07	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	153.6	0.0107	0.0019	0.0116	0.0000	0.0014	0.0014	1.7	0.00009
2027	S07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	600.0	0.0549	0.0095	0.0502	0.0000	0.0073	0.0071	8.7	0.00043
2027	S08	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	S08	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2027	S08	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2027	S08	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2027	S08	Crawler Tractor/Dozers	100 < hp <= 175	0.59	9.9	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2027	S08	Excavators	100 < hp <= 175	0.59	169.9	0.0015	0.0002	0.0050	0.0000	0.0004	0.0003	9.4	0.00002
2027	S08	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2027	S08	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2027	S08	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	S08	Off-highway Trucks	300 < hp <= 600	0.59	6,493.8	0.1057	0.0307	0.4046	0.0036	0.0256	0.0248	1,234.0	0.00154
2027	S08	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2027	S08	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2027	S08	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2027	S09	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	S09	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2027	S09	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2027	S09	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2027	S09	Crawler Tractor/Dozers	100 < hp <= 175	0.59	9.9	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2027	S09	Excavators	100 < hp <= 175	0.59	169.9	0.0015	0.0002	0.0050	0.0000	0.0004	0.0003	9.4	0.00002
2027	S09	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2027	S09	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2027	S09	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2027	S09	Off-highway Trucks	300 < hp <= 600	0.59	6,493.8	0.1057	0.0307	0.4046	0.0036	0.0256	0.0248	1,234.0	0.00154
2027	S09	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2027	S09	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2027	S09	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2027	T01	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2027	T01	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	T01	Air Compressors	75 < hp <= 100	0.43	51.8	0.0011	0.0001	0.0034	0.0000	0.0002	0.0002	1.3	0.00001
2027	T01	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2027	T01	Chain Saws > 6 HP	6 < hp <= 11	0.7	82.0	0.0926	0.0214	0.0005	0.0000	0.0034	0.0031	0.2	0.00000
2027	T01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	82.0	0.0048	0.0009	0.0106	0.0000	0.0008	0.0008	2.1	0.00004
2027	T01	Concrete/Industrial Saws	25 < hp <= 40	0.59	51.8	0.0004	0.0001	0.0034	0.0000	0.0000	0.0000	0.7	0.00002
2027	T01	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2027	T01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	412.7	0.0046	0.0007	0.0130	0.0001	0.0011	0.0011	22.9	0.00005
2027	T01	Excavators	100 < hp <= 175	0.59	558.8	0.0049	0.0008	0.0165	0.0001	0.0012	0.0011	31.0	0.00006
2027	T01	Forklifts	75 < hp <= 100	0.59	3,700.0	0.0125	0.0018	0.2062	0.0004	0.0029	0.0028	130.1	0.00012
2027	T01	Generator Sets	25 < hp <= 40	0.43	301.0	0.0039	0.0011	0.0175	0.0000	0.0006	0.0006	3.1	0.00009
2027	T01	Graders	175 < hp <= 300	0.59	16.9	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000
2027	T01	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2027	T01	Irrigation Sets	300 < hp <= 600	0.59	15.2	0.0044	0.0009	0.0158	0.0000	0.0007	0.0007	2.9	0.00006
2027	T01	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2027	T01	Off-highway Trucks	300 < hp <= 600	0.59	12,536.6	0.2042	0.0593	0.7811	0.0070	0.0494	0.0480	2,382.3	0.00297
2027	T01	Other Construction Equipment	100 < hp <= 175	0.43	516.6	0.0099	0.0023	0.0281	0.0001	0.0022	0.0021	20.9	0.00015
2027	T01	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2027	T01	Pavers	100 < hp <= 175	0.59	51.8	0.0008	0.0001	0.0018	0.0000	0.0002	0.0002	2.9	0.00001
2027	T01	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2027	T01	Pumps	6 < hp <= 11	0.43	254.0	0.0034	0.0011	0.0056	0.0000	0.0004	0.0003	0.7	0.00008

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2027	T01	Rollers	75 < hp <= 100	0.59	194.3	0.0033	0.0003	0.0133	0.0000	0.0005	0.0005	6.8	0.00002
2027	T01	Scrapers	300 < hp <= 600	0.59	64.8	0.0053	0.0008	0.0143	0.0000	0.0009	0.0008	12.3	0.00005
2027	T01	Skid Steer Loaders	50 < hp <= 75	0.21	15.9	0.0020	0.0004	0.0017	0.0000	0.0003	0.0003	0.2	0.00001
2027	T01	Surfacing Equipment	16 < hp <= 25	0.59	51.8	0.0013	0.0003	0.0032	0.0000	0.0001	0.0001	0.5	0.00002
2027	T01	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2027	T01	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2027	T01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	129.1	0.0241	0.0073	0.0423	0.0000	0.0050	0.0049	8.3	0.00041
2027	T01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	466.1	0.0324	0.0057	0.0353	0.0000	0.0043	0.0041	5.1	0.00028
2027	T01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	757.5	0.0693	0.0120	0.0634	0.0000	0.0092	0.0089	11.0	0.00055
2028	A01	Air Compressors	75 < hp <= 100	0.43	120.4	0.0025	0.0003	0.0080	0.0000	0.0004	0.0004	3.1	0.00002
2028	A01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	90.0	0.0053	0.0010	0.0117	0.0000	0.0009	0.0009	2.3	0.00004
2028	A01	Concrete/Industrial Saws	25 < hp <= 40	0.59	112.4	0.0009	0.0003	0.0075	0.0000	0.0001	0.0001	1.6	0.00003
2028	A01	Concrete/Industrial Saws	6 < hp <= 11	0.7	90.0	0.0019	0.0006	0.0032	0.0000	0.0002	0.0002	0.4	0.00005
2028	A01	Cranes	175 < hp <= 300	0.43	8.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.5	0.00000
2028	A01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	687.3	0.0076	0.0012	0.0216	0.0001	0.0019	0.0018	38.1	0.00009
2028	A01	Excavators	100 < hp <= 175	0.59	882.8	0.0078	0.0012	0.0260	0.0001	0.0019	0.0018	48.9	0.00009
2028	A01	Graders	175 < hp <= 300	0.59	36.4	0.0003	0.0001	0.0012	0.0000	0.0001	0.0001	3.5	0.00001
2028	A01	Irrigation Sets	300 < hp <= 600	0.59	32.8	0.0095	0.0020	0.0341	0.0000	0.0016	0.0016	6.2	0.00013



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	A01	Off-highway Trucks	300 < hp <= 600	0.59	7,913.4	0.1289	0.0374	0.4930	0.0044	0.0312	0.0303	1,503.7	0.00187
2028	A01	Other Construction Equipment	100 < hp <= 175	0.43	1,117.4	0.0214	0.0050	0.0608	0.0001	0.0047	0.0046	45.1	0.00033
2028	A01	Pavers	100 < hp <= 175	0.59	112.4	0.0016	0.0003	0.0038	0.0000	0.0004	0.0004	6.2	0.00002
2028	A01	Pumps	6 < hp <= 11	0.43	30.0	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2028	A01	Rollers	75 < hp <= 100	0.59	376.7	0.0065	0.0006	0.0258	0.0000	0.0010	0.0009	13.2	0.00004
2028	A01	Scrapers	300 < hp <= 600	0.59	140.5	0.0114	0.0018	0.0310	0.0001	0.0019	0.0018	26.7	0.00012
2028	A01	Skid Steer Loaders	50 < hp <= 75	0.21	55.8	0.0069	0.0013	0.0058	0.0000	0.0010	0.0009	0.6	0.00005
2028	A01	Surfacing Equipment	16 < hp <= 25	0.59	112.4	0.0027	0.0006	0.0069	0.0000	0.0003	0.0003	1.0	0.00005
2028	A01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	256.7	0.0480	0.0145	0.0841	0.0001	0.0100	0.0097	16.6	0.00082
2028	A01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	126.0	0.0115	0.0020	0.0105	0.0000	0.0015	0.0015	1.8	0.00009
2028	A04	Air Compressors	75 < hp <= 100	0.43	22.8	0.0005	0.0001	0.0015	0.0000	0.0001	0.0001	0.6	0.00000
2028	A04	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	20.4	0.0012	0.0002	0.0026	0.0000	0.0002	0.0002	0.5	0.00001
2028	A04	Concrete/Industrial Saws	25 < hp <= 40	0.59	22.8	0.0002	0.0001	0.0015	0.0000	0.0000	0.0000	0.3	0.00001
2028	A04	Concrete/Industrial Saws	6 < hp <= 11	0.7	20.4	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2028	A04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	147.7	0.0016	0.0003	0.0046	0.0000	0.0004	0.0004	8.2	0.00002
2028	A04	Excavators	100 < hp <= 175	0.59	375.7	0.0033	0.0005	0.0111	0.0001	0.0008	0.0008	20.8	0.00004
2028	A04	Graders	175 < hp <= 300	0.59	8.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.8	0.00000
2028	A04	Irrigation Sets	300 < hp <= 600	0.59	7.2	0.0021	0.0004	0.0075	0.0000	0.0004	0.0003	1.3	0.00003
2028	A04	Off-highway Trucks	300 < hp <= 600	0.59	5,798.9	0.0944	0.0274	0.3613	0.0032	0.0229	0.0222	1,101.9	0.00137

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	A04	Other Construction Equipment	100 < hp <= 175	0.43	1,441.6	0.0276	0.0065	0.0784	0.0002	0.0061	0.0059	58.2	0.00043
2028	A04	Pavers	100 < hp <= 175	0.59	22.8	0.0003	0.0001	0.0008	0.0000	0.0001	0.0001	1.3	0.00000
2028	A04	Pumps	6 < hp <= 11	0.43	6.8	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2028	A04	Rollers	75 < hp <= 100	0.59	92.7	0.0016	0.0001	0.0063	0.0000	0.0002	0.0002	3.3	0.00001
2028	A04	Scrapers	300 < hp <= 600	0.59	28.5	0.0023	0.0004	0.0063	0.0000	0.0004	0.0004	5.4	0.00002
2028	A04	Skid Steer Loaders	50 < hp <= 75	0.21	22.1	0.0027	0.0005	0.0023	0.0000	0.0004	0.0004	0.2	0.00002
2028	A04	Surfacing Equipment	16 < hp <= 25	0.59	22.8	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.2	0.00001
2028	A04	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	91.9	0.0172	0.0052	0.0301	0.0000	0.0036	0.0035	5.9	0.00029
2028	A04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	45.7	0.0042	0.0007	0.0038	0.0000	0.0006	0.0005	0.7	0.00003
2028	A08	Air Compressors	75 < hp <= 100	0.43	53.3	0.0011	0.0001	0.0035	0.0000	0.0002	0.0002	1.4	0.00001
2028	A08	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	42.0	0.0025	0.0005	0.0055	0.0000	0.0004	0.0004	1.1	0.00002
2028	A08	Concrete/Industrial Saws	25 < hp <= 40	0.59	53.3	0.0004	0.0001	0.0035	0.0000	0.0000	0.0000	0.7	0.00002
2028	A08	Concrete/Industrial Saws	6 < hp <= 11	0.7	42.0	0.0009	0.0003	0.0015	0.0000	0.0001	0.0001	0.2	0.00002
2028	A08	Crawler Tractor/Dozers	100 < hp <= 175	0.59	428.1	0.0048	0.0007	0.0134	0.0001	0.0012	0.0011	23.7	0.00005
2028	A08	Excavators	100 < hp <= 175	0.59	789.0	0.0070	0.0011	0.0233	0.0001	0.0017	0.0016	43.7	0.00008
2028	A08	Generator Sets	25 < hp <= 40	0.43	576.0	0.0075	0.0021	0.0335	0.0000	0.0012	0.0012	5.8	0.00018
2028	A08	Graders	175 < hp <= 300	0.59	16.9	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000
2028	A08	Irrigation Sets	300 < hp <= 600	0.59	15.2	0.0044	0.0009	0.0158	0.0000	0.0007	0.0007	2.9	0.00006
2028	A08	Off-highway Trucks	300 < hp <= 600	0.59	7,040.0	0.1146	0.0333	0.4386	0.0039	0.0278	0.0269	1,337.8	0.00167



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	A08	Other Construction Equipment	100 < hp <= 175	0.43	527.1	0.0101	0.0024	0.0287	0.0001	0.0022	0.0021	21.3	0.00016
2028	A08	Pavers	100 < hp <= 175	0.59	53.3	0.0008	0.0001	0.0018	0.0000	0.0002	0.0002	3.0	0.00001
2028	A08	Pumps	6 < hp <= 11	0.43	14.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2028	A08	Rollers	75 < hp <= 100	0.59	159.6	0.0028	0.0003	0.0109	0.0000	0.0004	0.0004	5.6	0.00002
2028	A08	Scrapers	300 < hp <= 600	0.59	66.6	0.0054	0.0009	0.0147	0.0000	0.0009	0.0009	12.7	0.00006
2028	A08	Skid Steer Loaders	50 < hp <= 75	0.21	10.4	0.0013	0.0002	0.0011	0.0000	0.0002	0.0002	0.1	0.00001
2028	A08	Surfacing Equipment	16 < hp <= 25	0.59	53.3	0.0013	0.0003	0.0033	0.0000	0.0001	0.0001	0.5	0.00002
2028	A08	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	88.1	0.0165	0.0050	0.0289	0.0000	0.0034	0.0033	5.7	0.00028
2028	A08	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	1,152.0	0.0802	0.0141	0.0872	0.0000	0.0105	0.0102	12.6	0.00069
2028	A08	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	33.1	0.0030	0.0005	0.0028	0.0000	0.0004	0.0004	0.5	0.00002
2028	A10	Air Compressors	75 < hp <= 100	0.43	1.9	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	A10	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	2.4	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2028	A10	Concrete/Industrial Saws	25 < hp <= 40	0.59	1.9	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	A10	Concrete/Industrial Saws	6 < hp <= 11	0.7	2.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	A10	Crawler Tractor/Dozers	100 < hp <= 175	0.59	22.5	0.0003	0.0000	0.0007	0.0000	0.0001	0.0001	1.2	0.00000
2028	A10	Excavators	100 < hp <= 175	0.59	13.5	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.7	0.00000
2028	A10	Graders	175 < hp <= 300	0.59	1.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1	0.00000
2028	A10	Irrigation Sets	300 < hp <= 600	0.59	0.9	0.0003	0.0001	0.0009	0.0000	0.0000	0.0000	0.2	0.00000
2028	A10	Off-highway Trucks	300 < hp <= 600	0.59	2,278.4	0.0371	0.0108	0.1420	0.0013	0.0090	0.0087	433.0	0.00054

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	A10	Other Construction Equipment	100 < hp <= 175	0.43	39.5	0.0008	0.0002	0.0021	0.0000	0.0002	0.0002	1.6	0.00001
2028	A10	Pavers	100 < hp <= 175	0.59	1.9	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.1	0.00000
2028	A10	Pumps	6 < hp <= 11	0.43	0.8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.00000
2028	A10	Rollers	75 < hp <= 100	0.59	17.2	0.0003	0.0000	0.0012	0.0000	0.0000	0.0000	0.6	0.00000
2028	A10	Scrapers	300 < hp <= 600	0.59	2.4	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.5	0.00000
2028	A10	Skid Steer Loaders	50 < hp <= 75	0.21	4.9	0.0006	0.0001	0.0005	0.0000	0.0001	0.0001	0.1	0.00000
2028	A10	Surfacing Equipment	16 < hp <= 25	0.59	1.9	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	A10	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	24.7	0.0046	0.0014	0.0081	0.0000	0.0010	0.0009	1.6	0.00008
2028	A10	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	12.1	0.0011	0.0002	0.0010	0.0000	0.0001	0.0001	0.2	0.00001
2028	C02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2028	C02	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2028	C02	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2028	C02	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2028	C02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	64.0	0.0037	0.0007	0.0083	0.0000	0.0007	0.0006	1.6	0.00003
2028	C02	Concrete/Industrial Saws	6 < hp <= 11	0.7	64.0	0.0013	0.0005	0.0023	0.0000	0.0001	0.0001	0.3	0.00004
2028	C02	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2028	C02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	40.0	0.0004	0.0001	0.0013	0.0000	0.0001	0.0001	2.2	0.00000
2028	C02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2028	C02	Forklifts	75 < hp <= 100	0.59	3,724.0	0.0125	0.0018	0.2076	0.0004	0.0029	0.0029	131.0	0.00012



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	C02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2028	C02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2028	C02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	C02	Off-highway Trucks	300 < hp <= 600	0.59	6,864.0	0.1118	0.0325	0.4277	0.0038	0.0271	0.0263	1,304.3	0.00162
2028	C02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	C02	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2028	C02	Plate Compactors	3 < hp <= 6	0.43	40.0	0.0003	0.0001	0.0005	0.0000	0.0000	0.0000	0.1	0.00001
2028	C02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2028	C02	Rollers	75 < hp <= 100	0.59	56.0	0.0010	0.0001	0.0038	0.0000	0.0001	0.0001	2.0	0.00001
2028	C02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2028	C02	Surfacing Equipment	75 < hp <= 100	0.43	64.0	0.0022	0.0003	0.0047	0.0000	0.0003	0.0003	1.6	0.00001
2028	C02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2028	C02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2028	C02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	840.0	0.0769	0.0133	0.0703	0.0000	0.0102	0.0099	12.2	0.00061
2028	C03	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2028	C03	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2028	C03	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2028	C03	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2028	C03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	64.0	0.0037	0.0007	0.0083	0.0000	0.0007	0.0006	1.6	0.00003

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	C03	Concrete/Industrial Saws	6 < hp <= 11	0.7	64.0	0.0013	0.0005	0.0023	0.0000	0.0001	0.0001	0.3	0.00004
2028	C03	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2028	C03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	40.0	0.0004	0.0001	0.0013	0.0000	0.0001	0.0001	2.2	0.00000
2028	C03	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2028	C03	Forklifts	75 < hp <= 100	0.59	3,724.0	0.0125	0.0018	0.2076	0.0004	0.0029	0.0029	131.0	0.00012
2028	C03	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2028	C03	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2028	C03	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	C03	Off-highway Trucks	300 < hp <= 600	0.59	6,864.0	0.1118	0.0325	0.4277	0.0038	0.0271	0.0263	1,304.3	0.00162
2028	C03	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	C03	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2028	C03	Plate Compactors	3 < hp <= 6	0.43	40.0	0.0003	0.0001	0.0005	0.0000	0.0000	0.0000	0.1	0.00001
2028	C03	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2028	C03	Rollers	75 < hp <= 100	0.59	56.0	0.0010	0.0001	0.0038	0.0000	0.0001	0.0001	2.0	0.00001
2028	C03	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2028	C03	Surfacing Equipment	75 < hp <= 100	0.43	64.0	0.0022	0.0003	0.0047	0.0000	0.0003	0.0003	1.6	0.00001
2028	C03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2028	C03	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2028	C03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	840.0	0.0769	0.0133	0.0703	0.0000	0.0102	0.0099	12.2	0.00061



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	H01	Air Compressors	75 < hp <= 100	0.43	27.1	0.0006	0.0001	0.0018	0.0000	0.0001	0.0001	0.7	0.00000
2028	H01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	21.6	0.0013	0.0002	0.0028	0.0000	0.0002	0.0002	0.5	0.00001
2028	H01	Concrete/Industrial Saws	25 < hp <= 40	0.59	27.1	0.0002	0.0001	0.0018	0.0000	0.0000	0.0000	0.4	0.00001
2028	H01	Concrete/Industrial Saws	6 < hp <= 11	0.7	21.6	0.0005	0.0002	0.0008	0.0000	0.0000	0.0000	0.1	0.00001
2028	H01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	151.8	0.0017	0.0003	0.0048	0.0000	0.0004	0.0004	8.4	0.00002
2028	H01	Excavators	100 < hp <= 175	0.59	41.8	0.0004	0.0001	0.0012	0.0000	0.0001	0.0001	2.3	0.00000
2028	H01	Graders	175 < hp <= 300	0.59	8.8	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.8	0.00000
2028	H01	Irrigation Sets	300 < hp <= 600	0.59	7.9	0.0023	0.0005	0.0082	0.0000	0.0004	0.0004	1.5	0.00003
2028	H01	Off-highway Trucks	300 < hp <= 600	0.59	1,833.7	0.0299	0.0087	0.1142	0.0010	0.0072	0.0070	348.4	0.00043
2028	H01	Other Construction Equipment	100 < hp <= 175	0.43	301.2	0.0058	0.0013	0.0164	0.0000	0.0013	0.0012	12.2	0.00009
2028	H01	Pavers	100 < hp <= 175	0.59	27.1	0.0004	0.0001	0.0009	0.0000	0.0001	0.0001	1.5	0.00000
2028	H01	Pumps	6 < hp <= 11	0.43	7.2	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2028	H01	Rollers	75 < hp <= 100	0.59	88.0	0.0015	0.0001	0.0060	0.0000	0.0002	0.0002	3.1	0.00001
2028	H01	Scrapers	300 < hp <= 600	0.59	33.8	0.0028	0.0004	0.0075	0.0000	0.0004	0.0004	6.4	0.00003
2028	H01	Skid Steer Loaders	50 < hp <= 75	0.21	28.2	0.0035	0.0007	0.0029	0.0000	0.0005	0.0005	0.3	0.00002
2028	H01	Surfacing Equipment	16 < hp <= 25	0.59	27.1	0.0007	0.0002	0.0017	0.0000	0.0001	0.0001	0.2	0.00001
2028	H01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	58.1	0.0109	0.0033	0.0190	0.0000	0.0023	0.0022	3.8	0.00018
2028	H01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	43.5	0.0040	0.0007	0.0036	0.0000	0.0005	0.0005	0.6	0.00003
2028	L01	Air Compressors	75 < hp <= 100	0.43	22.8	0.0005	0.0001	0.0015	0.0000	0.0001	0.0001	0.6	0.00000

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	L01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	19.2	0.0011	0.0002	0.0025	0.0000	0.0002	0.0002	0.5	0.00001
2028	L01	Concrete/Industrial Saws	25 < hp <= 40	0.59	22.8	0.0002	0.0001	0.0015	0.0000	0.0000	0.0000	0.3	0.00001
2028	L01	Concrete/Industrial Saws	6 < hp <= 11	0.7	19.2	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2028	L01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	206.5	0.0023	0.0004	0.0065	0.0000	0.0006	0.0005	11.4	0.00003
2028	L01	Excavators	100 < hp <= 175	0.59	113.3	0.0010	0.0002	0.0033	0.0000	0.0002	0.0002	6.3	0.00001
2028	L01	Graders	175 < hp <= 300	0.59	7.6	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.7	0.00000
2028	L01	Irrigation Sets	300 < hp <= 600	0.59	6.9	0.0020	0.0004	0.0071	0.0000	0.0003	0.0003	1.3	0.00003
2028	L01	Off-highway Trucks	300 < hp <= 600	0.59	4,227.2	0.0688	0.0200	0.2634	0.0023	0.0167	0.0162	803.3	0.00100
2028	L01	Other Construction Equipment	100 < hp <= 175	0.43	309.1	0.0059	0.0014	0.0168	0.0000	0.0013	0.0013	12.5	0.00009
2028	L01	Pavers	100 < hp <= 175	0.59	55.9	0.0008	0.0001	0.0019	0.0000	0.0002	0.0002	3.1	0.00001
2028	L01	Plate Compactors	3 < hp <= 6	0.43	49.2	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2028	L01	Pumps	6 < hp <= 11	0.43	6.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	L01	Rollers	75 < hp <= 100	0.59	90.4	0.0016	0.0001	0.0062	0.0000	0.0002	0.0002	3.2	0.00001
2028	L01	Scrapers	300 < hp <= 600	0.59	28.4	0.0023	0.0004	0.0063	0.0000	0.0004	0.0004	5.4	0.00002
2028	L01	Skid Steer Loaders	50 < hp <= 75	0.21	52.4	0.0065	0.0012	0.0055	0.0000	0.0009	0.0009	0.6	0.00004
2028	L01	Surfacing Equipment	16 < hp <= 25	0.59	33.7	0.0008	0.0002	0.0021	0.0000	0.0001	0.0001	0.3	0.00002
2028	L01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	70.4	0.0132	0.0040	0.0231	0.0000	0.0027	0.0027	4.5	0.00022
2028	L01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	110.6	0.0101	0.0018	0.0093	0.0000	0.0013	0.0013	1.6	0.00008
2028	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2028	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2028	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2028	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2028	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2028	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2028	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2028	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2028	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2028	L03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	10.8	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.3	0.00000
2028	L03	Concrete/Industrial Saws	6 < hp <= 11	0.7	10.8	0.0002	0.0001	0.0004	0.0000	0.0000	0.0000	0.0	0.00001
2028	L03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	80.4	0.0009	0.0001	0.0025	0.0000	0.0002	0.0002	4.5	0.00001
2028	L03	Excavators	100 < hp <= 175	0.59	31.9	0.0003	0.0000	0.0009	0.0000	0.0001	0.0001	1.8	0.00000
2028	L03	Graders	175 < hp <= 300	0.59	4.2	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.4	0.00000
2028	L03	Irrigation Sets	300 < hp <= 600	0.59	3.8	0.0011	0.0002	0.0040	0.0000	0.0002	0.0002	0.7	0.00002
2028	L03	Off-highway Trucks	300 < hp <= 600	0.59	1,433.7	0.0233	0.0068	0.0893	0.0008	0.0057	0.0055	272.4	0.00034
2028	L03	Other Construction Equipment	100 < hp <= 175	0.43	184.9	0.0035	0.0008	0.0101	0.0000	0.0008	0.0008	7.5	0.00006

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	L03	Pavers	100 < hp <= 175	0.59	29.3	0.0004	0.0001	0.0010	0.0000	0.0001	0.0001	1.6	0.00000
2028	L03	Plate Compactors	3 < hp <= 6	0.43	50.0	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2028	L03	Pumps	6 < hp <= 11	0.43	3.6	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	L03	Rollers	75 < hp <= 100	0.59	56.5	0.0010	0.0001	0.0039	0.0000	0.0001	0.0001	2.0	0.00001
2028	L03	Scrapers	300 < hp <= 600	0.59	14.5	0.0012	0.0002	0.0032	0.0000	0.0002	0.0002	2.7	0.00001
2028	L03	Skid Steer Loaders	50 < hp <= 75	0.21	48.9	0.0061	0.0011	0.0051	0.0000	0.0008	0.0008	0.5	0.00004
2028	L03	Surfacing Equipment	16 < hp <= 25	0.59	5.6	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2028	L03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	48.4	0.0090	0.0027	0.0159	0.0000	0.0019	0.0018	3.1	0.00015
2028	L03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	109.5	0.0100	0.0017	0.0092	0.0000	0.0013	0.0013	1.6	0.00008
2028	L04	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2028	L04	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2028	L04	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2028	L04	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2028	L04	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2028	L04	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2028	L04	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2028	L04	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	L04	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2028	L04	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	L04	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	L04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2028	L05	Aerial Lifts	75 < hp <= 100	0.59	16.0	0.0026	0.0004	0.0028	0.0000	0.0003	0.0003	0.7	0.00002
2028	L05	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2028	L05	Cement & Mortar Mixers	300 < hp <= 600	0.59	24.0	0.0115	0.0024	0.0432	0.0000	0.0016	0.0015	4.5	0.00012
2028	L05	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2028	L05	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2028	L05	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2028	L05	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000
2028	L05	Forklifts	75 < hp <= 100	0.59	24.0	0.0001	0.0000	0.0013	0.0000	0.0000	0.0000	0.8	0.00000
2028	L05	Off-highway Trucks	300 < hp <= 600	0.59	164.0	0.0027	0.0008	0.0102	0.0001	0.0006	0.0006	31.2	0.00004
2028	L05	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2028	L05	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2028	L05	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2028	L05	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2028	L05	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2028	L05	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2028	L05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	120.0	0.0110	0.0019	0.0100	0.0000	0.0015	0.0014	1.7	0.00009
2028	S01	Aerial Lifts	75 < hp <= 100	0.59	16.0	0.0026	0.0004	0.0028	0.0000	0.0003	0.0003	0.7	0.00002
2028	S01	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	S01	Cement & Mortar Mixers	300 < hp <= 600	0.59	24.0	0.0115	0.0024	0.0432	0.0000	0.0016	0.0015	4.5	0.00012
2028	S01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	28.8	0.0017	0.0003	0.0037	0.0000	0.0003	0.0003	0.7	0.00001
2028	S01	Concrete/Industrial Saws	6 < hp <= 11	0.7	28.8	0.0006	0.0002	0.0010	0.0000	0.0001	0.0001	0.1	0.00002
2028	S01	Cranes	175 < hp <= 300	0.43	19.0	0.0002	0.0001	0.0008	0.0000	0.0000	0.0000	1.3	0.00000
2028	S01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	158.8	0.0018	0.0003	0.0050	0.0000	0.0004	0.0004	8.8	0.00002
2028	S01	Excavators	100 < hp <= 175	0.59	72.1	0.0006	0.0001	0.0021	0.0000	0.0002	0.0001	4.0	0.00001
2028	S01	Forklifts	75 < hp <= 100	0.59	24.0	0.0001	0.0000	0.0013	0.0000	0.0000	0.0000	0.8	0.00000
2028	S01	Generator Sets	25 < hp <= 40	0.43	7.4	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	0.1	0.00000
2028	S01	Graders	175 < hp <= 300	0.59	1.8	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.2	0.00000
2028	S01	Irrigation Sets	300 < hp <= 600	0.59	1.6	0.0005	0.0001	0.0017	0.0000	0.0001	0.0001	0.3	0.00001
2028	S01	Off-highway Trucks	300 < hp <= 600	0.59	1,353.5	0.0220	0.0064	0.0843	0.0008	0.0053	0.0052	257.2	0.00032
2028	S01	Other Construction Equipment	100 < hp <= 175	0.43	74.0	0.0014	0.0003	0.0040	0.0000	0.0003	0.0003	3.0	0.00002
2028	S01	Pavers	100 < hp <= 175	0.59	1.6	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.1	0.00000
2028	S01	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2028	S01	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2028	S01	Pumps	6 < hp <= 11	0.43	1.6	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.00000
2028	S01	Rollers	75 < hp <= 100	0.59	95.5	0.0016	0.0002	0.0065	0.0000	0.0002	0.0002	3.4	0.00001
2028	S01	Scrapers	300 < hp <= 600	0.59	41.6	0.0034	0.0005	0.0092	0.0000	0.0006	0.0005	7.9	0.00003
2028	S01	Skid Steer Loaders	50 < hp <= 75	0.21	22.4	0.0028	0.0005	0.0023	0.0000	0.0004	0.0004	0.2	0.00002



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	S01	Surfacing Equipment	16 < hp <= 25	0.59	2.0	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2028	S01	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2028	S01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	71.5	0.0134	0.0040	0.0234	0.0000	0.0028	0.0027	4.6	0.00023
2028	S01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	38.8	0.0027	0.0005	0.0029	0.0000	0.0004	0.0003	0.4	0.00002
2028	S01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	142.4	0.0130	0.0023	0.0119	0.0000	0.0017	0.0017	2.1	0.00010
2028	S02	Aerial Lifts	50 < hp <= 75	0.21	1,320.0	0.0503	0.0096	0.0837	0.0000	0.0060	0.0058	14.4	0.00052
2028	S02	Aerial Lifts	75 < hp <= 100	0.59	456.0	0.0742	0.0117	0.0805	0.0001	0.0094	0.0091	18.7	0.00055
2028	S02	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2028	S02	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2028	S02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2028	S02	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2028	S02	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2028	S02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	36.6	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	2.0	0.00000
2028	S02	Excavators	100 < hp <= 175	0.59	77.6	0.0007	0.0001	0.0023	0.0000	0.0002	0.0002	4.3	0.00001
2028	S02	Forklifts	75 < hp <= 100	0.59	1,664.0	0.0056	0.0008	0.0928	0.0002	0.0013	0.0013	58.5	0.00005
2028	S02	Generator Sets	25 < hp <= 40	0.43	57.0	0.0007	0.0002	0.0033	0.0000	0.0001	0.0001	0.6	0.00002
2028	S02	Off-highway Trucks	175 < hp <= 300	0.43	240.0	0.0007	0.0003	0.0039	0.0000	0.0002	0.0002	16.6	0.00001
2028	S02	Off-highway Trucks	300 < hp <= 600	0.59	823.8	0.0134	0.0039	0.0513	0.0005	0.0032	0.0032	156.5	0.00019

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	S02	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2028	S02	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2028	S02	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2028	S02	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2028	S02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2028	S02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	138.0	0.0096	0.0017	0.0104	0.0000	0.0013	0.0012	1.5	0.00008
2028	S02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.0	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2028	S03	Aerial Lifts	50 < hp <= 75	0.21	1,320.0	0.0503	0.0096	0.0837	0.0000	0.0060	0.0058	14.4	0.00052
2028	S03	Aerial Lifts	75 < hp <= 100	0.59	456.0	0.0742	0.0117	0.0805	0.0001	0.0094	0.0091	18.7	0.00055
2028	S03	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2028	S03	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2028	S03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2028	S03	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2028	S03	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2028	S03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000
2028	S03	Forklifts	75 < hp <= 100	0.59	1,664.0	0.0056	0.0008	0.0928	0.0002	0.0013	0.0013	58.5	0.00005
2028	S03	Off-highway Trucks	175 < hp <= 300	0.43	240.0	0.0007	0.0003	0.0039	0.0000	0.0002	0.0002	16.6	0.00001
2028	S03	Off-highway Trucks	300 < hp <= 600	0.59	602.0	0.0098	0.0028	0.0375	0.0003	0.0024	0.0023	114.4	0.00014
2028	S03	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	S03	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2028	S03	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2028	S03	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2028	S03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2028	S03	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2028	S03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.0	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2028	S04	Aerial Lifts	50 < hp <= 75	0.21	20.0	0.0008	0.0001	0.0013	0.0000	0.0001	0.0001	0.2	0.00001
2028	S04	Aerial Lifts	75 < hp <= 100	0.59	80.0	0.0130	0.0021	0.0141	0.0000	0.0016	0.0016	3.3	0.00010
2028	S04	Cement & Mortar Mixers	300 < hp <= 600	0.59	160.0	0.0765	0.0163	0.2883	0.0001	0.0105	0.0102	30.0	0.00077
2028	S04	Cranes	175 < hp <= 300	0.43	6.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.4	0.00000
2028	S04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	10.4	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.6	0.00000
2028	S04	Excavators	100 < hp <= 175	0.59	10.4	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.6	0.00000
2028	S04	Forklifts	75 < hp <= 100	0.59	250.0	0.0008	0.0001	0.0139	0.0000	0.0002	0.0002	8.8	0.00001
2028	S04	Off-highway Trucks	300 < hp <= 600	0.59	316.8	0.0052	0.0015	0.0197	0.0002	0.0012	0.0012	60.2	0.00007
2028	S04	Paving Equipment	100 < hp <= 175	0.59	8.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.4	0.00000
2028	S04	Rollers	75 < hp <= 100	0.59	4.0	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.1	0.00000
2028	S04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	176.0	0.0161	0.0028	0.0147	0.0000	0.0021	0.0021	2.6	0.00013
2028	S08	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2028	S08	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	S08	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2028	S08	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2028	S08	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.5	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000
2028	S08	Excavators	100 < hp <= 175	0.59	176.5	0.0016	0.0002	0.0052	0.0000	0.0004	0.0004	9.8	0.00002
2028	S08	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2028	S08	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2028	S08	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	S08	Off-highway Trucks	300 < hp <= 600	0.59	6,507.0	0.1060	0.0308	0.4054	0.0036	0.0257	0.0249	1,236.5	0.00154
2028	S08	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	S08	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2028	S08	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2028	S09	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2028	S09	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2028	S09	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2028	S09	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2028	S09	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.5	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000
2028	S09	Excavators	100 < hp <= 175	0.59	176.5	0.0016	0.0002	0.0052	0.0000	0.0004	0.0004	9.8	0.00002
2028	S09	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2028	S09	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	S09	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	S09	Off-highway Trucks	300 < hp <= 600	0.59	6,507.0	0.1060	0.0308	0.4054	0.0036	0.0257	0.0249	1,236.5	0.00154
2028	S09	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	S09	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2028	S09	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2028	T01	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2028	T01	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2028	T01	Air Compressors	75 < hp <= 100	0.43	51.8	0.0011	0.0001	0.0034	0.0000	0.0002	0.0002	1.3	0.00001
2028	T01	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2028	T01	Chain Saws > 6 HP	6 < hp <= 11	0.7	82.0	0.0926	0.0214	0.0005	0.0000	0.0034	0.0031	0.2	0.00000
2028	T01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	82.0	0.0048	0.0009	0.0106	0.0000	0.0008	0.0008	2.1	0.00004
2028	T01	Concrete/Industrial Saws	25 < hp <= 40	0.59	51.8	0.0004	0.0001	0.0034	0.0000	0.0000	0.0000	0.7	0.00002
2028	T01	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2028	T01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	412.7	0.0046	0.0007	0.0130	0.0001	0.0011	0.0011	22.9	0.00005
2028	T01	Excavators	100 < hp <= 175	0.59	558.8	0.0049	0.0008	0.0165	0.0001	0.0012	0.0011	31.0	0.00006
2028	T01	Forklifts	75 < hp <= 100	0.59	3,700.0	0.0125	0.0018	0.2062	0.0004	0.0029	0.0028	130.1	0.00012
2028	T01	Generator Sets	25 < hp <= 40	0.43	301.0	0.0039	0.0011	0.0175	0.0000	0.0006	0.0006	3.1	0.00009
2028	T01	Graders	175 < hp <= 300	0.59	16.9	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000
2028	T01	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	T01	Irrigation Sets	300 < hp <= 600	0.59	15.2	0.0044	0.0009	0.0158	0.0000	0.0007	0.0007	2.9	0.00006
2028	T01	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	T01	Off-highway Trucks	300 < hp <= 600	0.59	12,536.6	0.2042	0.0593	0.7811	0.0070	0.0494	0.0480	2,382.3	0.00297
2028	T01	Other Construction Equipment	100 < hp <= 175	0.43	516.6	0.0099	0.0023	0.0281	0.0001	0.0022	0.0021	20.9	0.00015
2028	T01	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2028	T01	Pavers	100 < hp <= 175	0.59	51.8	0.0008	0.0001	0.0018	0.0000	0.0002	0.0002	2.9	0.00001
2028	T01	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2028	T01	Pumps	6 < hp <= 11	0.43	254.0	0.0034	0.0011	0.0056	0.0000	0.0004	0.0003	0.7	0.00008
2028	T01	Rollers	75 < hp <= 100	0.59	194.3	0.0033	0.0003	0.0133	0.0000	0.0005	0.0005	6.8	0.00002
2028	T01	Scrapers	300 < hp <= 600	0.59	64.8	0.0053	0.0008	0.0143	0.0000	0.0009	0.0008	12.3	0.00005
2028	T01	Skid Steer Loaders	50 < hp <= 75	0.21	15.9	0.0020	0.0004	0.0017	0.0000	0.0003	0.0003	0.2	0.00001
2028	T01	Surfacing Equipment	16 < hp <= 25	0.59	51.8	0.0013	0.0003	0.0032	0.0000	0.0001	0.0001	0.5	0.00002
2028	T01	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2028	T01	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2028	T01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	129.1	0.0241	0.0073	0.0423	0.0000	0.0050	0.0049	8.3	0.00041
2028	T01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	466.1	0.0324	0.0057	0.0353	0.0000	0.0043	0.0041	5.1	0.00028
2028	T01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	757.5	0.0693	0.0120	0.0634	0.0000	0.0092	0.0089	11.0	0.00055
2028	T02	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198
2028	T02	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	T02	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2028	T02	Chain Saws > 6 HP	6 < hp <= 11	0.7	40.0	0.0452	0.0104	0.0003	0.0000	0.0017	0.0015	0.1	0.00000
2028	T02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2028	T02	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2028	T02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	110.6	0.0012	0.0002	0.0035	0.0000	0.0003	0.0003	6.1	0.00001
2028	T02	Excavators	100 < hp <= 175	0.59	246.6	0.0022	0.0003	0.0073	0.0000	0.0005	0.0005	13.7	0.00002
2028	T02	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014
2028	T02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2028	T02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2028	T02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2028	T02	Off-highway Trucks	300 < hp <= 600	0.59	8,061.3	0.1313	0.0381	0.5023	0.0045	0.0318	0.0308	1,531.8	0.00191
2028	T02	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021
2028	T02	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2028	T02	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2028	T02	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2028	T02	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2028	T02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2028	T02	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2028	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.21	80.0	0.0030	0.0009	0.0053	0.0000	0.0006	0.0006	1.1	0.00005
2028	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2028	T02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2028	T02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2028	T02	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021
2029	A01	Air Compressors	75 < hp <= 100	0.43	29.1	0.0006	0.0001	0.0019	0.0000	0.0001	0.0001	0.7	0.00001
2029	A01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	27.6	0.0016	0.0003	0.0036	0.0000	0.0003	0.0003	0.7	0.00001
2029	A01	Concrete/Industrial Saws	25 < hp <= 40	0.59	29.1	0.0002	0.0001	0.0019	0.0000	0.0000	0.0000	0.4	0.00001
2029	A01	Concrete/Industrial Saws	6 < hp <= 11	0.7	27.6	0.0006	0.0002	0.0010	0.0000	0.0001	0.0001	0.1	0.00002
2029	A01	Cranes	175 < hp <= 300	0.43	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-	0.00000
2029	A01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	233.4	0.0026	0.0004	0.0073	0.0000	0.0006	0.0006	12.9	0.00003
2029	A01	Excavators	100 < hp <= 175	0.59	277.0	0.0025	0.0004	0.0082	0.0000	0.0006	0.0006	15.4	0.00003
2029	A01	Graders	175 < hp <= 300	0.59	11.3	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	1.1	0.00000
2029	A01	Irrigation Sets	300 < hp <= 600	0.59	10.2	0.0030	0.0006	0.0106	0.0000	0.0005	0.0005	1.9	0.00004
2029	A01	Off-highway Trucks	300 < hp <= 600	0.59	2,244.7	0.0366	0.0106	0.1399	0.0012	0.0089	0.0086	426.6	0.00053
2029	A01	Other Construction Equipment	100 < hp <= 175	0.43	390.4	0.0075	0.0017	0.0212	0.0000	0.0016	0.0016	15.8	0.00012
2029	A01	Pavers	100 < hp <= 175	0.59	29.1	0.0004	0.0001	0.0010	0.0000	0.0001	0.0001	1.6	0.00000
2029	A01	Pumps	6 < hp <= 11	0.43	9.2	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2029	A01	Rollers	75 < hp <= 100	0.59	153.1	0.0026	0.0002	0.0105	0.0000	0.0004	0.0004	5.4	0.00002
2029	A01	Scrapers	300 < hp <= 600	0.59	36.4	0.0030	0.0005	0.0080	0.0000	0.0005	0.0005	6.9	0.00003
2029	A01	Skid Steer Loaders	50 < hp <= 75	0.21	30.5	0.0038	0.0007	0.0032	0.0000	0.0005	0.0005	0.3	0.00003



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (*CONTINUED*)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	A01	Surfacing Equipment	16 < hp <= 25	0.59	29.1	0.0007	0.0002	0.0018	0.0000	0.0001	0.0001	0.3	0.00001
2029	A01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	172.1	0.0322	0.0097	0.0564	0.0000	0.0067	0.0065	11.1	0.00055
2029	A01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	79.8	0.0073	0.0013	0.0067	0.0000	0.0010	0.0009	1.2	0.00006
2029	A04	Air Compressors	75 < hp <= 100	0.43	30.5	0.0006	0.0001	0.0020	0.0000	0.0001	0.0001	0.8	0.00001
2029	A04	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	26.4	0.0015	0.0003	0.0034	0.0000	0.0003	0.0003	0.7	0.00001
2029	A04	Concrete/Industrial Saws	25 < hp <= 40	0.59	30.5	0.0002	0.0001	0.0020	0.0000	0.0000	0.0000	0.4	0.00001
2029	A04	Concrete/Industrial Saws	6 < hp <= 11	0.7	26.4	0.0006	0.0002	0.0009	0.0000	0.0001	0.0001	0.1	0.00001
2029	A04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	196.8	0.0022	0.0003	0.0062	0.0000	0.0005	0.0005	10.9	0.00002
2029	A04	Excavators	100 < hp <= 175	0.59	493.1	0.0044	0.0007	0.0145	0.0001	0.0010	0.0010	27.3	0.00005
2029	A04	Graders	175 < hp <= 300	0.59	10.6	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	1.0	0.00000
2029	A04	Irrigation Sets	300 < hp <= 600	0.59	9.6	0.0028	0.0006	0.0099	0.0000	0.0005	0.0005	1.8	0.00004
2029	A04	Off-highway Trucks	300 < hp <= 600	0.59	7,740.8	0.1261	0.0366	0.4823	0.0043	0.0305	0.0296	1,471.0	0.00183
2029	A04	Other Construction Equipment	100 < hp <= 175	0.43	1,931.0	0.0370	0.0086	0.1050	0.0002	0.0081	0.0079	78.0	0.00058
2029	A04	Pavers	100 < hp <= 175	0.59	30.5	0.0004	0.0001	0.0010	0.0000	0.0001	0.0001	1.7	0.00000
2029	A04	Pumps	6 < hp <= 11	0.43	8.8	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2029	A04	Rollers	75 < hp <= 100	0.59	123.4	0.0021	0.0002	0.0084	0.0000	0.0003	0.0003	4.3	0.00001
2029	A04	Scrapers	300 < hp <= 600	0.59	38.1	0.0031	0.0005	0.0084	0.0000	0.0005	0.0005	7.2	0.00003
2029	A04	Skid Steer Loaders	50 < hp <= 75	0.21	27.3	0.0034	0.0006	0.0029	0.0000	0.0005	0.0005	0.3	0.00002
2029	A04	Surfacing Equipment	16 < hp <= 25	0.59	30.5	0.0007	0.0002	0.0019	0.0000	0.0001	0.0001	0.3	0.00001

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	A04	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	120.4	0.0225	0.0068	0.0394	0.0000	0.0047	0.0045	7.8	0.00038
2029	A04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	58.5	0.0054	0.0009	0.0049	0.0000	0.0007	0.0007	0.9	0.00004
2029	A05	Off-highway Trucks	300 < hp <= 600	0.59	95.4	0.0016	0.0005	0.0059	0.0001	0.0004	0.0004	18.1	0.00002
2029	A05	Other Construction Equipment	100 < hp <= 175	0.43	47.7	0.0009	0.0002	0.0026	0.0000	0.0002	0.0002	1.9	0.00001
2029	A05	Skid Steer Loaders	50 < hp <= 75	0.21	6.5	0.0008	0.0002	0.0007	0.0000	0.0001	0.0001	0.1	0.00001
2029	A05	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	6.5	0.0012	0.0004	0.0021	0.0000	0.0003	0.0002	0.4	0.00002
2029	A05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	6.5	0.0006	0.0001	0.0005	0.0000	0.0001	0.0001	0.1	0.00000
2029	A08	Air Compressors	75 < hp <= 100	0.43	13.3	0.0003	0.0000	0.0009	0.0000	0.0000	0.0000	0.3	0.00000
2029	A08	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	10.8	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.3	0.00000
2029	A08	Concrete/Industrial Saws	25 < hp <= 40	0.59	13.3	0.0001	0.0000	0.0009	0.0000	0.0000	0.0000	0.2	0.00000
2029	A08	Concrete/Industrial Saws	6 < hp <= 11	0.7	10.8	0.0002	0.0001	0.0004	0.0000	0.0000	0.0000	0.0	0.00001
2029	A08	Crawler Tractor/Dozers	100 < hp <= 175	0.59	108.1	0.0012	0.0002	0.0034	0.0000	0.0003	0.0003	6.0	0.00001
2029	A08	Excavators	100 < hp <= 175	0.59	197.5	0.0017	0.0003	0.0058	0.0000	0.0004	0.0004	10.9	0.00002
2029	A08	Generator Sets	25 < hp <= 40	0.43	144.0	0.0019	0.0005	0.0084	0.0000	0.0003	0.0003	1.5	0.00004
2029	A08	Graders	175 < hp <= 300	0.59	4.5	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.4	0.00000
2029	A08	Irrigation Sets	300 < hp <= 600	0.59	4.0	0.0012	0.0003	0.0042	0.0000	0.0002	0.0002	0.8	0.00002
2029	A08	Off-highway Trucks	300 < hp <= 600	0.59	1,768.7	0.0288	0.0084	0.1102	0.0010	0.0070	0.0068	336.1	0.00042
2029	A08	Other Construction Equipment	100 < hp <= 175	0.43	135.3	0.0026	0.0006	0.0074	0.0000	0.0006	0.0006	5.5	0.00004



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	A08	Pavers	100 < hp <= 175	0.59	13.3	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.7	0.00000
2029	A08	Pumps	6 < hp <= 11	0.43	3.6	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2029	A08	Rollers	75 < hp <= 100	0.59	40.4	0.0007	0.0001	0.0028	0.0000	0.0001	0.0001	1.4	0.00000
2029	A08	Scrapers	300 < hp <= 600	0.59	16.7	0.0014	0.0002	0.0037	0.0000	0.0002	0.0002	3.2	0.00001
2029	A08	Skid Steer Loaders	50 < hp <= 75	0.21	5.6	0.0007	0.0001	0.0006	0.0000	0.0001	0.0001	0.1	0.00000
2029	A08	Surfacing Equipment	16 < hp <= 25	0.59	13.3	0.0003	0.0001	0.0008	0.0000	0.0000	0.0000	0.1	0.00001
2029	A08	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	25.4	0.0047	0.0014	0.0083	0.0000	0.0010	0.0010	1.6	0.00008
2029	A08	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	288.0	0.0200	0.0035	0.0218	0.0000	0.0026	0.0026	3.1	0.00017
2029	A08	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	11.5	0.0011	0.0002	0.0010	0.0000	0.0001	0.0001	0.2	0.00001
2029	C03	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2029	C03	Aerial Lifts	75 < hp <= 100	0.59	976.0	0.1587	0.0251	0.1723	0.0001	0.0201	0.0195	40.0	0.00117
2029	C03	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2029	C03	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2029	C03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	64.0	0.0037	0.0007	0.0083	0.0000	0.0007	0.0006	1.6	0.00003
2029	C03	Concrete/Industrial Saws	6 < hp <= 11	0.7	64.0	0.0013	0.0005	0.0023	0.0000	0.0001	0.0001	0.3	0.00004
2029	C03	Cranes	175 < hp <= 300	0.43	256.0	0.0025	0.0009	0.0108	0.0001	0.0006	0.0006	17.5	0.00005
2029	C03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	40.0	0.0004	0.0001	0.0013	0.0000	0.0001	0.0001	2.2	0.00000
2029	C03	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2029	C03	Forklifts	75 < hp <= 100	0.59	3,724.0	0.0125	0.0018	0.2076	0.0004	0.0029	0.0029	131.0	0.00012

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	C03	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2029	C03	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2029	C03	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2029	C03	Off-highway Trucks	300 < hp <= 600	0.59	6,864.0	0.1118	0.0325	0.4277	0.0038	0.0271	0.0263	1,304.3	0.00162
2029	C03	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2029	C03	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2029	C03	Plate Compactors	3 < hp <= 6	0.43	40.0	0.0003	0.0001	0.0005	0.0000	0.0000	0.0000	0.1	0.00001
2029	C03	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2029	C03	Rollers	75 < hp <= 100	0.59	56.0	0.0010	0.0001	0.0038	0.0000	0.0001	0.0001	2.0	0.00001
2029	C03	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2029	C03	Surfacing Equipment	75 < hp <= 100	0.43	64.0	0.0022	0.0003	0.0047	0.0000	0.0003	0.0003	1.6	0.00001
2029	C03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2029	C03	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2029	C03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	840.0	0.0769	0.0133	0.0703	0.0000	0.0102	0.0099	12.2	0.00061
2029	H01	Air Compressors	75 < hp <= 100	0.43	27.1	0.0006	0.0001	0.0018	0.0000	0.0001	0.0001	0.7	0.00000
2029	H01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	21.6	0.0013	0.0002	0.0028	0.0000	0.0002	0.0002	0.5	0.00001
2029	H01	Concrete/Industrial Saws	25 < hp <= 40	0.59	27.1	0.0002	0.0001	0.0018	0.0000	0.0000	0.0000	0.4	0.00001
2029	H01	Concrete/Industrial Saws	6 < hp <= 11	0.7	21.6	0.0005	0.0002	0.0008	0.0000	0.0000	0.0000	0.1	0.00001
2029	H01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	151.8	0.0017	0.0003	0.0048	0.0000	0.0004	0.0004	8.4	0.00002



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	H01	Excavators	100 < hp <= 175	0.59	41.8	0.0004	0.0001	0.0012	0.0000	0.0001	0.0001	2.3	0.00000
2029	H01	Graders	175 < hp <= 300	0.59	8.8	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.8	0.00000
2029	H01	Irrigation Sets	300 < hp <= 600	0.59	7.9	0.0023	0.0005	0.0082	0.0000	0.0004	0.0004	1.5	0.00003
2029	H01	Off-highway Trucks	300 < hp <= 600	0.59	2,553.7	0.0416	0.0121	0.1591	0.0014	0.0101	0.0098	485.3	0.00060
2029	H01	Other Construction Equipment	100 < hp <= 175	0.43	301.2	0.0058	0.0013	0.0164	0.0000	0.0013	0.0012	12.2	0.00009
2029	H01	Pavers	100 < hp <= 175	0.59	27.1	0.0004	0.0001	0.0009	0.0000	0.0001	0.0001	1.5	0.00000
2029	H01	Pumps	6 < hp <= 11	0.43	7.2	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2029	H01	Rollers	75 < hp <= 100	0.59	88.0	0.0015	0.0001	0.0060	0.0000	0.0002	0.0002	3.1	0.00001
2029	H01	Scrapers	300 < hp <= 600	0.59	33.8	0.0028	0.0004	0.0075	0.0000	0.0004	0.0004	6.4	0.00003
2029	H01	Skid Steer Loaders	50 < hp <= 75	0.21	28.2	0.0035	0.0007	0.0029	0.0000	0.0005	0.0005	0.3	0.00002
2029	H01	Surfacing Equipment	16 < hp <= 25	0.59	27.1	0.0007	0.0002	0.0017	0.0000	0.0001	0.0001	0.2	0.00001
2029	H01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	58.1	0.0109	0.0033	0.0190	0.0000	0.0023	0.0022	3.8	0.00018
2029	H01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	43.5	0.0040	0.0007	0.0036	0.0000	0.0005	0.0005	0.6	0.00003
2029	H02	Air Compressors	75 < hp <= 100	0.43	50.0	0.0010	0.0001	0.0033	0.0000	0.0002	0.0002	1.3	0.00001
2029	H02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	39.6	0.0023	0.0004	0.0051	0.0000	0.0004	0.0004	1.0	0.00002
2029	H02	Concrete/Industrial Saws	25 < hp <= 40	0.59	50.0	0.0004	0.0001	0.0033	0.0000	0.0000	0.0000	0.7	0.00001
2029	H02	Concrete/Industrial Saws	6 < hp <= 11	0.7	39.6	0.0008	0.0003	0.0014	0.0000	0.0001	0.0001	0.2	0.00002
2029	H02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	268.2	0.0030	0.0005	0.0084	0.0000	0.0007	0.0007	14.9	0.00003
2029	H02	Excavators	100 < hp <= 175	0.59	426.5	0.0038	0.0006	0.0126	0.0001	0.0009	0.0009	23.6	0.00004

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	H02	Graders	175 < hp <= 300	0.59	15.9	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	1.5	0.00000
2029	H02	Irrigation Sets	300 < hp <= 600	0.59	14.3	0.0042	0.0009	0.0149	0.0000	0.0007	0.0007	2.7	0.00006
2029	H02	Off-highway Trucks	300 < hp <= 600	0.59	4,497.8	0.0732	0.0213	0.2802	0.0025	0.0177	0.0172	854.7	0.00106
2029	H02	Other Construction Equipment	100 < hp <= 175	0.43	519.5	0.0099	0.0023	0.0282	0.0001	0.0022	0.0021	21.0	0.00016
2029	H02	Pavers	100 < hp <= 175	0.59	50.0	0.0007	0.0001	0.0017	0.0000	0.0002	0.0002	2.8	0.00001
2029	H02	Pumps	6 < hp <= 11	0.43	13.2	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2029	H02	Rollers	75 < hp <= 100	0.59	151.3	0.0026	0.0002	0.0103	0.0000	0.0004	0.0004	5.3	0.00002
2029	H02	Scrapers	300 < hp <= 600	0.59	62.5	0.0051	0.0008	0.0138	0.0000	0.0008	0.0008	11.9	0.00005
2029	H02	Skid Steer Loaders	50 < hp <= 75	0.21	32.2	0.0040	0.0007	0.0034	0.0000	0.0006	0.0005	0.4	0.00003
2029	H02	Surfacing Equipment	16 < hp <= 25	0.59	50.0	0.0012	0.0003	0.0031	0.0000	0.0001	0.0001	0.4	0.00002
2029	H02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	85.4	0.0160	0.0048	0.0280	0.0000	0.0033	0.0032	5.5	0.00027
2029	H02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	54.4	0.0050	0.0009	0.0046	0.0000	0.0007	0.0006	0.8	0.00004
2029	L01	Air Compressors	75 < hp <= 100	0.43	22.8	0.0005	0.0001	0.0015	0.0000	0.0001	0.0001	0.6	0.00000
2029	L01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	19.2	0.0011	0.0002	0.0025	0.0000	0.0002	0.0002	0.5	0.00001
2029	L01	Concrete/Industrial Saws	25 < hp <= 40	0.59	22.8	0.0002	0.0001	0.0015	0.0000	0.0000	0.0000	0.3	0.00001
2029	L01	Concrete/Industrial Saws	6 < hp <= 11	0.7	19.2	0.0004	0.0001	0.0007	0.0000	0.0000	0.0000	0.1	0.00001
2029	L01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	206.5	0.0023	0.0004	0.0065	0.0000	0.0006	0.0005	11.4	0.00003
2029	L01	Excavators	100 < hp <= 175	0.59	113.3	0.0010	0.0002	0.0033	0.0000	0.0002	0.0002	6.3	0.00001
2029	L01	Graders	175 < hp <= 300	0.59	7.6	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.7	0.00000



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	L01	Irrigation Sets	300 < hp <= 600	0.59	6.9	0.0020	0.0004	0.0071	0.0000	0.0003	0.0003	1.3	0.00003
2029	L01	Off-highway Trucks	300 < hp <= 600	0.59	4,227.2	0.0688	0.0200	0.2634	0.0023	0.0167	0.0162	803.3	0.00100
2029	L01	Other Construction Equipment	100 < hp <= 175	0.43	309.1	0.0059	0.0014	0.0168	0.0000	0.0013	0.0013	12.5	0.00009
2029	L01	Pavers	100 < hp <= 175	0.59	55.9	0.0008	0.0001	0.0019	0.0000	0.0002	0.0002	3.1	0.00001
2029	L01	Plate Compactors	3 < hp <= 6	0.43	49.2	0.0004	0.0001	0.0006	0.0000	0.0000	0.0000	0.1	0.00001
2029	L01	Pumps	6 < hp <= 11	0.43	6.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2029	L01	Rollers	75 < hp <= 100	0.59	90.4	0.0016	0.0001	0.0062	0.0000	0.0002	0.0002	3.2	0.00001
2029	L01	Scrapers	300 < hp <= 600	0.59	28.4	0.0023	0.0004	0.0063	0.0000	0.0004	0.0004	5.4	0.00002
2029	L01	Skid Steer Loaders	50 < hp <= 75	0.21	52.4	0.0065	0.0012	0.0055	0.0000	0.0009	0.0009	0.6	0.00004
2029	L01	Surfacing Equipment	16 < hp <= 25	0.59	33.7	0.0008	0.0002	0.0021	0.0000	0.0001	0.0001	0.3	0.00002
2029	L01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	70.4	0.0132	0.0040	0.0231	0.0000	0.0027	0.0027	4.5	0.00022
2029	L01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	110.6	0.0101	0.0018	0.0093	0.0000	0.0013	0.0013	1.6	0.00008
2029	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2029	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2029	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2029	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2029	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2029	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2029	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2029	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2029	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2029	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2029	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2029	L03	Air Compressors	75 < hp <= 100	0.43	46.3	0.0009	0.0001	0.0031	0.0000	0.0002	0.0002	1.2	0.00001
2029	L03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	42.0	0.0025	0.0005	0.0055	0.0000	0.0004	0.0004	1.1	0.00002
2029	L03	Concrete/Industrial Saws	25 < hp <= 40	0.59	46.3	0.0004	0.0001	0.0031	0.0000	0.0000	0.0000	0.7	0.00001
2029	L03	Concrete/Industrial Saws	6 < hp <= 11	0.7	42.0	0.0009	0.0003	0.0015	0.0000	0.0001	0.0001	0.2	0.00002
2029	L03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	320.1	0.0036	0.0005	0.0100	0.0001	0.0009	0.0009	17.7	0.00004
2029	L03	Excavators	100 < hp <= 175	0.59	126.6	0.0011	0.0002	0.0037	0.0000	0.0003	0.0003	7.0	0.00001
2029	L03	Graders	175 < hp <= 300	0.59	16.7	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000
2029	L03	Irrigation Sets	300 < hp <= 600	0.59	15.1	0.0044	0.0009	0.0157	0.0000	0.0007	0.0007	2.8	0.00006
2029	L03	Off-highway Trucks	300 < hp <= 600	0.59	6,058.6	0.0987	0.0287	0.3775	0.0034	0.0239	0.0232	1,151.3	0.00143
2029	L03	Other Construction Equipment	100 < hp <= 175	0.43	829.6	0.0159	0.0037	0.0451	0.0001	0.0035	0.0034	33.5	0.00025
2029	L03	Pavers	100 < hp <= 175	0.59	163.6	0.0024	0.0004	0.0056	0.0000	0.0006	0.0006	9.1	0.00003
2029	L03	Plate Compactors	3 < hp <= 6	0.43	200.0	0.0015	0.0005	0.0024	0.0000	0.0002	0.0001	0.3	0.00004
2029	L03	Pumps	6 < hp <= 11	0.43	14.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2029	L03	Rollers	75 < hp <= 100	0.59	224.7	0.0039	0.0004	0.0154	0.0000	0.0006	0.0006	7.9	0.00003
2029	L03	Scrapers	300 < hp <= 600	0.59	57.8	0.0047	0.0008	0.0127	0.0000	0.0008	0.0007	11.0	0.00005



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	L03	Skid Steer Loaders	50 < hp <= 75	0.21	195.1	0.0242	0.0045	0.0204	0.0000	0.0033	0.0032	2.1	0.00017
2029	L03	Surfacing Equipment	16 < hp <= 25	0.59	68.5	0.0017	0.0004	0.0042	0.0000	0.0002	0.0002	0.6	0.00003
2029	L03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	237.9	0.0445	0.0134	0.0779	0.0001	0.0092	0.0090	15.4	0.00076
2029	L03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	436.4	0.0399	0.0069	0.0365	0.0000	0.0053	0.0051	6.4	0.00032
2029	L04	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2029	L04	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2029	L04	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2029	L04	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2029	L04	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2029	L04	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2029	L04	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2029	L04	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2029	L04	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2029	L04	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2029	L04	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2029	L04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2029	L07	Aerial Lifts	75 < hp <= 100	0.59	400.8	0.0652	0.0103	0.0707	0.0001	0.0083	0.0080	16.4	0.00048
2029	L07	Bore/Drill Rigs	100 < hp <= 175	0.43	120.0	0.0114	0.0038	0.0447	0.0000	0.0026	0.0025	4.8	0.00020
2029	L07	Cement & Mortar Mixers	300 < hp <= 600	0.59	660.0	0.3154	0.0674	1.1890	0.0005	0.0432	0.0419	123.9	0.00317

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	L07	Cranes	175 < hp <= 300	0.43	600.0	0.0060	0.0021	0.0253	0.0001	0.0014	0.0013	41.1	0.00012
2029	L07	Excavators	100 < hp <= 175	0.59	160.8	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2029	L07	Forklifts	75 < hp <= 100	0.59	801.6	0.0027	0.0004	0.0447	0.0001	0.0006	0.0006	28.2	0.00003
2029	L07	Off-highway Trucks	175 < hp <= 300	0.43	160.8	0.0005	0.0002	0.0026	0.0000	0.0002	0.0001	11.1	0.00001
2029	L07	Off-highway Trucks	300 < hp <= 600	0.59	1,536.0	0.0250	0.0073	0.0957	0.0009	0.0061	0.0059	291.9	0.00036
2029	L07	Pavers	100 < hp <= 175	0.59	79.2	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2029	L07	Pumps	6 < hp <= 11	0.43	450.0	0.0061	0.0019	0.0099	0.0000	0.0006	0.0006	1.3	0.00015
2029	L07	Rubber Tire Loaders	75 < hp <= 100	0.21	79.2	0.0005	0.0000	0.0019	0.0000	0.0001	0.0001	1.0	0.00000
2029	L07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	679.2	0.0621	0.0108	0.0568	0.0000	0.0083	0.0080	9.9	0.00049
2029	L07	Trenchers	50 < hp <= 75	0.59	319.2	0.0111	0.0017	0.0445	0.0000	0.0013	0.0013	8.4	0.00017
2029	S01	Aerial Lifts	75 < hp <= 100	0.59	16.0	0.0026	0.0004	0.0028	0.0000	0.0003	0.0003	0.7	0.00002
2029	S01	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2029	S01	Air Compressors	75 < hp <= 100	0.43	15.8	0.0003	0.0000	0.0010	0.0000	0.0001	0.0001	0.4	0.00000
2029	S01	Cement & Mortar Mixers	300 < hp <= 600	0.59	24.0	0.0115	0.0024	0.0432	0.0000	0.0016	0.0015	4.5	0.00012
2029	S01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	37.2	0.0022	0.0004	0.0048	0.0000	0.0004	0.0004	0.9	0.00002
2029	S01	Concrete/Industrial Saws	25 < hp <= 40	0.59	15.8	0.0001	0.0000	0.0011	0.0000	0.0000	0.0000	0.2	0.00000
2029	S01	Concrete/Industrial Saws	6 < hp <= 11	0.7	37.2	0.0008	0.0003	0.0013	0.0000	0.0001	0.0001	0.2	0.00002
2029	S01	Cranes	175 < hp <= 300	0.43	19.0	0.0002	0.0001	0.0008	0.0000	0.0000	0.0000	1.3	0.00000
2029	S01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	508.0	0.0056	0.0009	0.0159	0.0001	0.0014	0.0014	28.2	0.00006



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	S01	Excavators	100 < hp <= 175	0.59	232.9	0.0021	0.0003	0.0069	0.0000	0.0005	0.0005	12.9	0.00002
2029	S01	Forklifts	75 < hp <= 100	0.59	24.0	0.0001	0.0000	0.0013	0.0000	0.0000	0.0000	0.8	0.00000
2029	S01	Generator Sets	25 < hp <= 40	0.43	30.0	0.0004	0.0001	0.0017	0.0000	0.0001	0.0001	0.3	0.00001
2029	S01	Graders	175 < hp <= 300	0.59	5.4	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.5	0.00000
2029	S01	Irrigation Sets	300 < hp <= 600	0.59	4.8	0.0014	0.0003	0.0050	0.0000	0.0002	0.0002	0.9	0.00002
2029	S01	Off-highway Trucks	300 < hp <= 600	0.59	4,815.9	0.0784	0.0228	0.3001	0.0027	0.0190	0.0184	915.1	0.00114
2029	S01	Other Construction Equipment	100 < hp <= 175	0.43	191.3	0.0037	0.0009	0.0104	0.0000	0.0008	0.0008	7.7	0.00006
2029	S01	Pavers	100 < hp <= 175	0.59	21.7	0.0003	0.0000	0.0007	0.0000	0.0001	0.0001	1.2	0.00000
2029	S01	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2029	S01	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2029	S01	Pumps	6 < hp <= 11	0.43	4.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2029	S01	Rollers	75 < hp <= 100	0.59	275.6	0.0048	0.0004	0.0189	0.0000	0.0007	0.0007	9.7	0.00003
2029	S01	Scrapers	300 < hp <= 600	0.59	158.2	0.0129	0.0021	0.0348	0.0001	0.0021	0.0020	30.1	0.00013
2029	S01	Skid Steer Loaders	50 < hp <= 75	0.21	28.9	0.0036	0.0007	0.0030	0.0000	0.0005	0.0005	0.3	0.00002
2029	S01	Surfacing Equipment	16 < hp <= 25	0.59	23.4	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.2	0.00001
2029	S01	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2029	S01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	89.5	0.0167	0.0050	0.0293	0.0000	0.0035	0.0034	5.8	0.00028
2029	S01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	84.0	0.0058	0.0010	0.0064	0.0000	0.0008	0.0007	0.9	0.00005
2029	S01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	147.3	0.0135	0.0023	0.0123	0.0000	0.0018	0.0017	2.1	0.00011

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	S03	Aerial Lifts	50 < hp <= 75	0.21	1,320.0	0.0503	0.0096	0.0837	0.0000	0.0060	0.0058	14.4	0.00052
2029	S03	Aerial Lifts	75 < hp <= 100	0.59	456.0	0.0742	0.0117	0.0805	0.0001	0.0094	0.0091	18.7	0.00055
2029	S03	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2029	S03	Cement & Mortar Mixers	300 < hp <= 600	0.59	84.0	0.0401	0.0086	0.1513	0.0001	0.0055	0.0053	15.8	0.00040
2029	S03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	24.0	0.0014	0.0003	0.0031	0.0000	0.0002	0.0002	0.6	0.00001
2029	S03	Concrete/Industrial Saws	6 < hp <= 11	0.7	24.0	0.0005	0.0002	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2029	S03	Cranes	175 < hp <= 300	0.43	16.0	0.0002	0.0001	0.0007	0.0000	0.0000	0.0000	1.1	0.00000
2029	S03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	16.0	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.9	0.00000
2029	S03	Forklifts	75 < hp <= 100	0.59	1,664.0	0.0056	0.0008	0.0928	0.0002	0.0013	0.0013	58.5	0.00005
2029	S03	Off-highway Trucks	175 < hp <= 300	0.43	240.0	0.0007	0.0003	0.0039	0.0000	0.0002	0.0002	16.6	0.00001
2029	S03	Off-highway Trucks	300 < hp <= 600	0.59	602.0	0.0098	0.0028	0.0375	0.0003	0.0024	0.0023	114.4	0.00014
2029	S03	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2029	S03	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2029	S03	Rollers	75 < hp <= 100	0.59	16.0	0.0003	0.0000	0.0011	0.0000	0.0000	0.0000	0.6	0.00000
2029	S03	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2029	S03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	56.0	0.0105	0.0032	0.0183	0.0000	0.0022	0.0021	3.6	0.00018
2029	S03	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2029	S03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	440.0	0.0403	0.0070	0.0368	0.0000	0.0054	0.0052	6.4	0.00032
2029	S10	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	S10	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144
2029	S10	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2029	S10	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2029	S10	Concrete/Industrial Saws	6 < hp <= 11	0.7	40.0	0.0008	0.0003	0.0014	0.0000	0.0001	0.0001	0.2	0.00002
2029	S10	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2029	S10	Crawler Tractor/Dozers	100 < hp <= 175	0.59	24.0	0.0003	0.0000	0.0008	0.0000	0.0001	0.0001	1.3	0.00000
2029	S10	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2029	S10	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014
2029	S10	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2029	S10	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2029	S10	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2029	S10	Off-highway Trucks	300 < hp <= 600	0.59	7,888.0	0.1285	0.0373	0.4915	0.0044	0.0311	0.0302	1,498.9	0.00187
2029	S10	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021
2029	S10	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2029	S10	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2029	S10	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2029	S10	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2029	S10	Rubber Tire Loaders	75 < hp <= 100	0.21	80.0	0.0005	0.0000	0.0019	0.0000	0.0001	0.0001	1.0	0.00000
2029	S10	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	S10	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2029	S10	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013
2029	S10	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2029	S10	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2029	S10	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021
2029	T01	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2029	T01	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2029	T01	Air Compressors	75 < hp <= 100	0.43	51.8	0.0011	0.0001	0.0034	0.0000	0.0002	0.0002	1.3	0.00001
2029	T01	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2029	T01	Chain Saws > 6 HP	6 < hp <= 11	0.7	82.0	0.0926	0.0214	0.0005	0.0000	0.0034	0.0031	0.2	0.00000
2029	T01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	82.0	0.0048	0.0009	0.0106	0.0000	0.0008	0.0008	2.1	0.00004
2029	T01	Concrete/Industrial Saws	25 < hp <= 40	0.59	51.8	0.0004	0.0001	0.0034	0.0000	0.0000	0.0000	0.7	0.00002
2029	T01	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2029	T01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	412.7	0.0046	0.0007	0.0130	0.0001	0.0011	0.0011	22.9	0.00005
2029	T01	Excavators	100 < hp <= 175	0.59	558.8	0.0049	0.0008	0.0165	0.0001	0.0012	0.0011	31.0	0.00006
2029	T01	Forklifts	75 < hp <= 100	0.59	3,700.0	0.0125	0.0018	0.2062	0.0004	0.0029	0.0028	130.1	0.00012
2029	T01	Generator Sets	25 < hp <= 40	0.43	301.0	0.0039	0.0011	0.0175	0.0000	0.0006	0.0006	3.1	0.00009
2029	T01	Graders	175 < hp <= 300	0.59	16.9	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000
2029	T01	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	T01	Irrigation Sets	300 < hp <= 600	0.59	15.2	0.0044	0.0009	0.0158	0.0000	0.0007	0.0007	2.9	0.00006
2029	T01	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2029	T01	Off-highway Trucks	300 < hp <= 600	0.59	12,536.6	0.2042	0.0593	0.7811	0.0070	0.0494	0.0480	2,382.3	0.00297
2029	T01	Other Construction Equipment	100 < hp <= 175	0.43	516.6	0.0099	0.0023	0.0281	0.0001	0.0022	0.0021	20.9	0.00015
2029	T01	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2029	T01	Pavers	100 < hp <= 175	0.59	51.8	0.0008	0.0001	0.0018	0.0000	0.0002	0.0002	2.9	0.00001
2029	T01	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2029	T01	Pumps	6 < hp <= 11	0.43	254.0	0.0034	0.0011	0.0056	0.0000	0.0004	0.0003	0.7	0.00008
2029	T01	Rollers	75 < hp <= 100	0.59	194.3	0.0033	0.0003	0.0133	0.0000	0.0005	0.0005	6.8	0.00002
2029	T01	Scrapers	300 < hp <= 600	0.59	64.8	0.0053	0.0008	0.0143	0.0000	0.0009	0.0008	12.3	0.00005
2029	T01	Skid Steer Loaders	50 < hp <= 75	0.21	15.9	0.0020	0.0004	0.0017	0.0000	0.0003	0.0003	0.2	0.00001
2029	T01	Surfacing Equipment	16 < hp <= 25	0.59	51.8	0.0013	0.0003	0.0032	0.0000	0.0001	0.0001	0.5	0.00002
2029	T01	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2029	T01	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2029	T01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	129.1	0.0241	0.0073	0.0423	0.0000	0.0050	0.0049	8.3	0.00041
2029	T01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	466.1	0.0324	0.0057	0.0353	0.0000	0.0043	0.0041	5.1	0.00028
2029	T01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	757.5	0.0693	0.0120	0.0634	0.0000	0.0092	0.0089	11.0	0.00055
2029	T02	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198
2029	T02	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	T02	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2029	T02	Chain Saws > 6 HP	6 < hp <= 11	0.7	40.0	0.0452	0.0104	0.0003	0.0000	0.0017	0.0015	0.1	0.00000
2029	T02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2029	T02	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2029	T02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	140.6	0.0016	0.0002	0.0044	0.0000	0.0004	0.0004	7.8	0.00002
2029	T02	Excavators	100 < hp <= 175	0.59	276.6	0.0024	0.0004	0.0082	0.0000	0.0006	0.0006	15.3	0.00003
2029	T02	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014
2029	T02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2029	T02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2029	T02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2029	T02	Off-highway Trucks	300 < hp <= 600	0.59	8,121.1	0.1322	0.0384	0.5060	0.0045	0.0320	0.0311	1,543.2	0.00192
2029	T02	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021
2029	T02	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2029	T02	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2029	T02	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2029	T02	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2029	T02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2029	T02	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2029	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.21	80.0	0.0030	0.0009	0.0053	0.0000	0.0006	0.0006	1.1	0.00005
2029	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2029	T02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2029	T02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2029	T02	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021
2030	A04	Air Compressors	75 < hp <= 100	0.43	30.5	0.0006	0.0001	0.0020	0.0000	0.0001	0.0001	0.8	0.00001
2030	A04	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	26.4	0.0015	0.0003	0.0034	0.0000	0.0003	0.0003	0.7	0.00001
2030	A04	Concrete/Industrial Saws	25 < hp <= 40	0.59	30.5	0.0002	0.0001	0.0020	0.0000	0.0000	0.0000	0.4	0.00001
2030	A04	Concrete/Industrial Saws	6 < hp <= 11	0.7	26.4	0.0006	0.0002	0.0009	0.0000	0.0001	0.0001	0.1	0.00001
2030	A04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	196.8	0.0022	0.0003	0.0062	0.0000	0.0005	0.0005	10.9	0.00002
2030	A04	Excavators	100 < hp <= 175	0.59	493.1	0.0044	0.0007	0.0145	0.0001	0.0010	0.0010	27.3	0.00005
2030	A04	Graders	175 < hp <= 300	0.59	10.6	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	1.0	0.00000
2030	A04	Irrigation Sets	300 < hp <= 600	0.59	9.6	0.0028	0.0006	0.0099	0.0000	0.0005	0.0005	1.8	0.00004
2030	A04	Off-highway Trucks	300 < hp <= 600	0.59	7,740.8	0.1261	0.0366	0.4823	0.0043	0.0305	0.0296	1,471.0	0.00183
2030	A04	Other Construction Equipment	100 < hp <= 175	0.43	1,931.0	0.0370	0.0086	0.1050	0.0002	0.0081	0.0079	78.0	0.00058
2030	A04	Pavers	100 < hp <= 175	0.59	30.5	0.0004	0.0001	0.0010	0.0000	0.0001	0.0001	1.7	0.00000
2030	A04	Pumps	6 < hp <= 11	0.43	8.8	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2030	A04	Rollers	75 < hp <= 100	0.59	123.4	0.0021	0.0002	0.0084	0.0000	0.0003	0.0003	4.3	0.00001
2030	A04	Scrapers	300 < hp <= 600	0.59	38.1	0.0031	0.0005	0.0084	0.0000	0.0005	0.0005	7.2	0.00003
2030	A04	Skid Steer Loaders	50 < hp <= 75	0.21	27.3	0.0034	0.0006	0.0029	0.0000	0.0005	0.0005	0.3	0.00002
2030	A04	Surfacing Equipment	16 < hp <= 25	0.59	30.5	0.0007	0.0002	0.0019	0.0000	0.0001	0.0001	0.3	0.00001

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	A04	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	120.4	0.0225	0.0068	0.0394	0.0000	0.0047	0.0045	7.8	0.00038
2030	A04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	58.5	0.0054	0.0009	0.0049	0.0000	0.0007	0.0007	0.9	0.00004
2030	A05	Off-highway Trucks	300 < hp <= 600	0.59	345.4	0.0056	0.0016	0.0215	0.0002	0.0014	0.0013	65.6	0.00008
2030	A05	Other Construction Equipment	100 < hp <= 175	0.43	172.7	0.0033	0.0008	0.0094	0.0000	0.0007	0.0007	7.0	0.00005
2030	A05	Skid Steer Loaders	50 < hp <= 75	0.21	8.1	0.0010	0.0002	0.0008	0.0000	0.0001	0.0001	0.1	0.00001
2030	A05	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	8.1	0.0015	0.0005	0.0027	0.0000	0.0003	0.0003	0.5	0.00003
2030	A05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	8.1	0.0007	0.0001	0.0007	0.0000	0.0001	0.0001	0.1	0.00001
2030	H03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	50.0	0.0006	0.0001	0.0016	0.0000	0.0001	0.0001	2.8	0.00001
2030	H03	Excavators	100 < hp <= 175	0.59	50.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	2.8	0.00000
2030	H03	Off-highway Trucks	300 < hp <= 600	0.59	100.0	0.0016	0.0005	0.0062	0.0001	0.0004	0.0004	19.0	0.00002
2030	H04	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2030	H04	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2030	H04	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2030	H04	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2030	H04	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2030	H04	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2030	H04	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2030	H04	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	H04	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2030	H04	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2030	H04	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2030	H04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2030	H05	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2030	H05	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2030	H05	Air Compressors	75 < hp <= 100	0.43	27.1	0.0006	0.0001	0.0018	0.0000	0.0001	0.0001	0.7	0.00000
2030	H05	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2030	H05	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	21.6	0.0013	0.0002	0.0028	0.0000	0.0002	0.0002	0.5	0.00001
2030	H05	Concrete/Industrial Saws	25 < hp <= 40	0.59	27.1	0.0002	0.0001	0.0018	0.0000	0.0000	0.0000	0.4	0.00001
2030	H05	Concrete/Industrial Saws	6 < hp <= 11	0.7	21.6	0.0005	0.0002	0.0008	0.0000	0.0000	0.0000	0.1	0.00001
2030	H05	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2030	H05	Crawler Tractor/Dozers	100 < hp <= 175	0.59	151.8	0.0017	0.0003	0.0048	0.0000	0.0004	0.0004	8.4	0.00002
2030	H05	Excavators	100 < hp <= 175	0.59	201.8	0.0018	0.0003	0.0059	0.0000	0.0004	0.0004	11.2	0.00002
2030	H05	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2030	H05	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2030	H05	Graders	175 < hp <= 300	0.59	8.8	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.8	0.00000
2030	H05	Irrigation Sets	300 < hp <= 600	0.59	7.9	0.0023	0.0005	0.0082	0.0000	0.0004	0.0004	1.5	0.00003
2030	H05	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	H05	Off-highway Trucks	300 < hp <= 600	0.59	9,747.7	0.1587	0.0461	0.6073	0.0054	0.0384	0.0373	1,852.3	0.00231
2030	H05	Other Construction Equipment	100 < hp <= 175	0.43	301.2	0.0058	0.0013	0.0164	0.0000	0.0013	0.0012	12.2	0.00009
2030	H05	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2030	H05	Pavers	100 < hp <= 175	0.59	27.1	0.0004	0.0001	0.0009	0.0000	0.0001	0.0001	1.5	0.00000
2030	H05	Pumps	6 < hp <= 11	0.43	247.2	0.0033	0.0011	0.0055	0.0000	0.0003	0.0003	0.7	0.00008
2030	H05	Rollers	75 < hp <= 100	0.59	88.0	0.0015	0.0001	0.0060	0.0000	0.0002	0.0002	3.1	0.00001
2030	H05	Scrapers	300 < hp <= 600	0.59	33.8	0.0028	0.0004	0.0075	0.0000	0.0004	0.0004	6.4	0.00003
2030	H05	Skid Steer Loaders	50 < hp <= 75	0.21	28.2	0.0035	0.0007	0.0029	0.0000	0.0005	0.0005	0.3	0.00002
2030	H05	Surfacing Equipment	16 < hp <= 25	0.59	27.1	0.0007	0.0002	0.0017	0.0000	0.0001	0.0001	0.2	0.00001
2030	H05	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	58.1	0.0109	0.0033	0.0190	0.0000	0.0023	0.0022	3.8	0.00018
2030	H05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	523.5	0.0479	0.0083	0.0438	0.0000	0.0064	0.0062	7.6	0.00038
2030	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2030	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2030	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2030	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2030	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2030	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2030	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2030	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2030	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2030	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2030	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2030	L03	Air Compressors	75 < hp <= 100	0.43	34.7	0.0007	0.0001	0.0023	0.0000	0.0001	0.0001	0.9	0.00001
2030	L03	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	31.2	0.0018	0.0003	0.0041	0.0000	0.0003	0.0003	0.8	0.00001
2030	L03	Concrete/Industrial Saws	25 < hp <= 40	0.59	34.7	0.0003	0.0001	0.0023	0.0000	0.0000	0.0000	0.5	0.00001
2030	L03	Concrete/Industrial Saws	6 < hp <= 11	0.7	31.2	0.0007	0.0002	0.0011	0.0000	0.0001	0.0001	0.1	0.00002
2030	L03	Crawler Tractor/Dozers	100 < hp <= 175	0.59	240.2	0.0027	0.0004	0.0075	0.0000	0.0007	0.0006	13.3	0.00003
2030	L03	Excavators	100 < hp <= 175	0.59	95.0	0.0008	0.0001	0.0028	0.0000	0.0002	0.0002	5.3	0.00001
2030	L03	Graders	175 < hp <= 300	0.59	12.6	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	1.2	0.00000
2030	L03	Irrigation Sets	300 < hp <= 600	0.59	11.3	0.0033	0.0007	0.0118	0.0000	0.0006	0.0005	2.1	0.00005
2030	L03	Off-highway Trucks	300 < hp <= 600	0.59	4,544.0	0.0740	0.0215	0.2831	0.0025	0.0179	0.0174	863.5	0.00107
2030	L03	Other Construction Equipment	100 < hp <= 175	0.43	622.4	0.0119	0.0028	0.0338	0.0001	0.0026	0.0025	25.1	0.00019
2030	L03	Pavers	100 < hp <= 175	0.59	122.7	0.0018	0.0003	0.0042	0.0000	0.0005	0.0004	6.8	0.00002
2030	L03	Plate Compactors	3 < hp <= 6	0.43	150.0	0.0011	0.0004	0.0018	0.0000	0.0001	0.0001	0.2	0.00003
2030	L03	Pumps	6 < hp <= 11	0.43	10.4	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2030	L03	Rollers	75 < hp <= 100	0.59	168.6	0.0029	0.0003	0.0115	0.0000	0.0004	0.0004	5.9	0.00002
2030	L03	Scrapers	300 < hp <= 600	0.59	43.4	0.0035	0.0006	0.0096	0.0000	0.0006	0.0006	8.2	0.00004
2030	L03	Skid Steer Loaders	50 < hp <= 75	0.21	146.5	0.0181	0.0034	0.0153	0.0000	0.0025	0.0024	1.6	0.00012

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	L03	Surfacing Equipment	16 < hp <= 25	0.59	51.3	0.0012	0.0003	0.0031	0.0000	0.0001	0.0001	0.5	0.00002
2030	L03	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	178.7	0.0334	0.0101	0.0585	0.0000	0.0069	0.0067	11.5	0.00057
2030	L03	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	327.4	0.0300	0.0052	0.0274	0.0000	0.0040	0.0039	4.8	0.00024
2030	L07	Aerial Lifts	75 < hp <= 100	0.59	400.8	0.0652	0.0103	0.0707	0.0001	0.0083	0.0080	16.4	0.00048
2030	L07	Bore/Drill Rigs	100 < hp <= 175	0.43	120.0	0.0114	0.0038	0.0447	0.0000	0.0026	0.0025	4.8	0.00020
2030	L07	Cement & Mortar Mixers	300 < hp <= 600	0.59	660.0	0.3154	0.0674	1.1890	0.0005	0.0432	0.0419	123.9	0.00317
2030	L07	Cranes	175 < hp <= 300	0.43	600.0	0.0060	0.0021	0.0253	0.0001	0.0014	0.0013	41.1	0.00012
2030	L07	Excavators	100 < hp <= 175	0.59	160.8	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2030	L07	Forklifts	75 < hp <= 100	0.59	801.6	0.0027	0.0004	0.0447	0.0001	0.0006	0.0006	28.2	0.00003
2030	L07	Off-highway Trucks	175 < hp <= 300	0.43	160.8	0.0005	0.0002	0.0026	0.0000	0.0002	0.0001	11.1	0.00001
2030	L07	Off-highway Trucks	300 < hp <= 600	0.59	1,536.0	0.0250	0.0073	0.0957	0.0009	0.0061	0.0059	291.9	0.00036
2030	L07	Pavers	100 < hp <= 175	0.59	79.2	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2030	L07	Pumps	6 < hp <= 11	0.43	450.0	0.0061	0.0019	0.0099	0.0000	0.0006	0.0006	1.3	0.00015
2030	L07	Rubber Tire Loaders	75 < hp <= 100	0.21	79.2	0.0005	0.0000	0.0019	0.0000	0.0001	0.0001	1.0	0.00000
2030	L07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	679.2	0.0621	0.0108	0.0568	0.0000	0.0083	0.0080	9.9	0.00049
2030	L07	Trenchers	50 < hp <= 75	0.59	319.2	0.0111	0.0017	0.0445	0.0000	0.0013	0.0013	8.4	0.00017
2030	S01	Aerial Lifts	75 < hp <= 100	0.59	16.0	0.0026	0.0004	0.0028	0.0000	0.0003	0.0003	0.7	0.00002
2030	S01	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2030	S01	Air Compressors	75 < hp <= 100	0.43	15.8	0.0003	0.0000	0.0010	0.0000	0.0001	0.0001	0.4	0.00000



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	S01	Cement & Mortar Mixers	300 < hp <= 600	0.59	24.0	0.0115	0.0024	0.0432	0.0000	0.0016	0.0015	4.5	0.00012
2030	S01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	37.2	0.0022	0.0004	0.0048	0.0000	0.0004	0.0004	0.9	0.00002
2030	S01	Concrete/Industrial Saws	25 < hp <= 40	0.59	15.8	0.0001	0.0000	0.0011	0.0000	0.0000	0.0000	0.2	0.00000
2030	S01	Concrete/Industrial Saws	6 < hp <= 11	0.7	37.2	0.0008	0.0003	0.0013	0.0000	0.0001	0.0001	0.2	0.00002
2030	S01	Cranes	175 < hp <= 300	0.43	19.0	0.0002	0.0001	0.0008	0.0000	0.0000	0.0000	1.3	0.00000
2030	S01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	508.0	0.0056	0.0009	0.0159	0.0001	0.0014	0.0014	28.2	0.00006
2030	S01	Excavators	100 < hp <= 175	0.59	232.9	0.0021	0.0003	0.0069	0.0000	0.0005	0.0005	12.9	0.00002
2030	S01	Forklifts	75 < hp <= 100	0.59	24.0	0.0001	0.0000	0.0013	0.0000	0.0000	0.0000	0.8	0.00000
2030	S01	Generator Sets	25 < hp <= 40	0.43	30.0	0.0004	0.0001	0.0017	0.0000	0.0001	0.0001	0.3	0.00001
2030	S01	Graders	175 < hp <= 300	0.59	5.4	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.5	0.00000
2030	S01	Irrigation Sets	300 < hp <= 600	0.59	4.8	0.0014	0.0003	0.0050	0.0000	0.0002	0.0002	0.9	0.00002
2030	S01	Off-highway Trucks	300 < hp <= 600	0.59	4,815.9	0.0784	0.0228	0.3001	0.0027	0.0190	0.0184	915.1	0.00114
2030	S01	Other Construction Equipment	100 < hp <= 175	0.43	191.3	0.0037	0.0009	0.0104	0.0000	0.0008	0.0008	7.7	0.00006
2030	S01	Pavers	100 < hp <= 175	0.59	21.7	0.0003	0.0000	0.0007	0.0000	0.0001	0.0001	1.2	0.00000
2030	S01	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2030	S01	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2030	S01	Pumps	6 < hp <= 11	0.43	4.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2030	S01	Rollers	75 < hp <= 100	0.59	275.6	0.0048	0.0004	0.0189	0.0000	0.0007	0.0007	9.7	0.00003
2030	S01	Scrapers	300 < hp <= 600	0.59	158.2	0.0129	0.0021	0.0348	0.0001	0.0021	0.0020	30.1	0.00013

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	S01	Skid Steer Loaders	50 < hp <= 75	0.21	28.9	0.0036	0.0007	0.0030	0.0000	0.0005	0.0005	0.3	0.00002
2030	S01	Surfacing Equipment	16 < hp <= 25	0.59	23.4	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.2	0.00001
2030	S01	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2030	S01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	89.5	0.0167	0.0050	0.0293	0.0000	0.0035	0.0034	5.8	0.00028
2030	S01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	84.0	0.0058	0.0010	0.0064	0.0000	0.0008	0.0007	0.9	0.00005
2030	S01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	147.3	0.0135	0.0023	0.0123	0.0000	0.0018	0.0017	2.1	0.00011
2030	S10	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198
2030	S10	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144
2030	S10	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2030	S10	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2030	S10	Concrete/Industrial Saws	6 < hp <= 11	0.7	40.0	0.0008	0.0003	0.0014	0.0000	0.0001	0.0001	0.2	0.00002
2030	S10	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2030	S10	Crawler Tractor/Dozers	100 < hp <= 175	0.59	24.0	0.0003	0.0000	0.0008	0.0000	0.0001	0.0001	1.3	0.00000
2030	S10	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2030	S10	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014
2030	S10	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2030	S10	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2030	S10	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	S10	Off-highway Trucks	300 < hp <= 600	0.59	7,888.0	0.1285	0.0373	0.4915	0.0044	0.0311	0.0302	1,498.9	0.00187
2030	S10	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021
2030	S10	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2030	S10	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2030	S10	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2030	S10	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2030	S10	Rubber Tire Loaders	75 < hp <= 100	0.21	80.0	0.0005	0.0000	0.0019	0.0000	0.0001	0.0001	1.0	0.00000
2030	S10	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2030	S10	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2030	S10	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013
2030	S10	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2030	S10	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2030	S10	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021
2030	T01	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2030	T01	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2030	T01	Air Compressors	75 < hp <= 100	0.43	51.8	0.0011	0.0001	0.0034	0.0000	0.0002	0.0002	1.3	0.00001
2030	T01	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2030	T01	Chain Saws > 6 HP	6 < hp <= 11	0.7	82.0	0.0926	0.0214	0.0005	0.0000	0.0034	0.0031	0.2	0.00000
2030	T01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	82.0	0.0048	0.0009	0.0106	0.0000	0.0008	0.0008	2.1	0.00004
2030	T01	Concrete/Industrial Saws	25 < hp <= 40	0.59	51.8	0.0004	0.0001	0.0034	0.0000	0.0000	0.0000	0.7	0.00002

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	T01	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2030	T01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	412.7	0.0046	0.0007	0.0130	0.0001	0.0011	0.0011	22.9	0.00005
2030	T01	Excavators	100 < hp <= 175	0.59	558.8	0.0049	0.0008	0.0165	0.0001	0.0012	0.0011	31.0	0.00006
2030	T01	Forklifts	75 < hp <= 100	0.59	3,700.0	0.0125	0.0018	0.2062	0.0004	0.0029	0.0028	130.1	0.00012
2030	T01	Generator Sets	25 < hp <= 40	0.43	301.0	0.0039	0.0011	0.0175	0.0000	0.0006	0.0006	3.1	0.00009
2030	T01	Graders	175 < hp <= 300	0.59	16.9	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000
2030	T01	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2030	T01	Irrigation Sets	300 < hp <= 600	0.59	15.2	0.0044	0.0009	0.0158	0.0000	0.0007	0.0007	2.9	0.00006
2030	T01	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2030	T01	Off-highway Trucks	300 < hp <= 600	0.59	12,536.6	0.2042	0.0593	0.7811	0.0070	0.0494	0.0480	2,382.3	0.00297
2030	T01	Other Construction Equipment	100 < hp <= 175	0.43	516.6	0.0099	0.0023	0.0281	0.0001	0.0022	0.0021	20.9	0.00015
2030	T01	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2030	T01	Pavers	100 < hp <= 175	0.59	51.8	0.0008	0.0001	0.0018	0.0000	0.0002	0.0002	2.9	0.00001
2030	T01	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2030	T01	Pumps	6 < hp <= 11	0.43	254.0	0.0034	0.0011	0.0056	0.0000	0.0004	0.0003	0.7	0.00008
2030	T01	Rollers	75 < hp <= 100	0.59	194.3	0.0033	0.0003	0.0133	0.0000	0.0005	0.0005	6.8	0.00002
2030	T01	Scrapers	300 < hp <= 600	0.59	64.8	0.0053	0.0008	0.0143	0.0000	0.0009	0.0008	12.3	0.00005
2030	T01	Skid Steer Loaders	50 < hp <= 75	0.21	15.9	0.0020	0.0004	0.0017	0.0000	0.0003	0.0003	0.2	0.00001
2030	T01	Surfacing Equipment	16 < hp <= 25	0.59	51.8	0.0013	0.0003	0.0032	0.0000	0.0001	0.0001	0.5	0.00002



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	T01	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2030	T01	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2030	T01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	129.1	0.0241	0.0073	0.0423	0.0000	0.0050	0.0049	8.3	0.00041
2030	T01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	466.1	0.0324	0.0057	0.0353	0.0000	0.0043	0.0041	5.1	0.00028
2030	T01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	757.5	0.0693	0.0120	0.0634	0.0000	0.0092	0.0089	11.0	0.00055
2030	T02	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198
2030	T02	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144
2030	T02	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2030	T02	Chain Saws > 6 HP	6 < hp <= 11	0.7	40.0	0.0452	0.0104	0.0003	0.0000	0.0017	0.0015	0.1	0.00000
2030	T02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2030	T02	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2030	T02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	140.6	0.0016	0.0002	0.0044	0.0000	0.0004	0.0004	7.8	0.00002
2030	T02	Excavators	100 < hp <= 175	0.59	276.6	0.0024	0.0004	0.0082	0.0000	0.0006	0.0006	15.3	0.00003
2030	T02	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014
2030	T02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2030	T02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2030	T02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2030	T02	Off-highway Trucks	300 < hp <= 600	0.59	8,121.1	0.1322	0.0384	0.5060	0.0045	0.0320	0.0311	1,543.2	0.00192
2030	T02	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2030	T02	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2030	T02	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2030	T02	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2030	T02	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2030	T02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2030	T02	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2030	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.21	80.0	0.0030	0.0009	0.0053	0.0000	0.0006	0.0006	1.1	0.00005
2030	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013
2030	T02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2030	T02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2030	T02	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021
2031	A04	Air Compressors	75 < hp <= 100	0.43	30.5	0.0006	0.0001	0.0020	0.0000	0.0001	0.0001	0.8	0.00001
2031	A04	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	26.4	0.0015	0.0003	0.0034	0.0000	0.0003	0.0003	0.7	0.00001
2031	A04	Concrete/Industrial Saws	25 < hp <= 40	0.59	30.5	0.0002	0.0001	0.0020	0.0000	0.0000	0.0000	0.4	0.00001
2031	A04	Concrete/Industrial Saws	6 < hp <= 11	0.7	26.4	0.0006	0.0002	0.0009	0.0000	0.0001	0.0001	0.1	0.00001
2031	A04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	196.8	0.0022	0.0003	0.0062	0.0000	0.0005	0.0005	10.9	0.00002
2031	A04	Excavators	100 < hp <= 175	0.59	493.1	0.0044	0.0007	0.0145	0.0001	0.0010	0.0010	27.3	0.00005
2031	A04	Graders	175 < hp <= 300	0.59	10.6	0.0001	0.0000	0.0004	0.0000	0.0000	0.0000	1.0	0.00000
2031	A04	Irrigation Sets	300 < hp <= 600	0.59	9.6	0.0028	0.0006	0.0099	0.0000	0.0005	0.0005	1.8	0.00004



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	A04	Off-highway Trucks	300 < hp <= 600	0.59	7,740.8	0.1261	0.0366	0.4823	0.0043	0.0305	0.0296	1,471.0	0.00183
2031	A04	Other Construction Equipment	100 < hp <= 175	0.43	1,931.0	0.0370	0.0086	0.1050	0.0002	0.0081	0.0079	78.0	0.00058
2031	A04	Pavers	100 < hp <= 175	0.59	30.5	0.0004	0.0001	0.0010	0.0000	0.0001	0.0001	1.7	0.00000
2031	A04	Pumps	6 < hp <= 11	0.43	8.8	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2031	A04	Rollers	75 < hp <= 100	0.59	123.4	0.0021	0.0002	0.0084	0.0000	0.0003	0.0003	4.3	0.00001
2031	A04	Scrapers	300 < hp <= 600	0.59	38.1	0.0031	0.0005	0.0084	0.0000	0.0005	0.0005	7.2	0.00003
2031	A04	Skid Steer Loaders	50 < hp <= 75	0.21	27.3	0.0034	0.0006	0.0029	0.0000	0.0005	0.0005	0.3	0.00002
2031	A04	Surfacing Equipment	16 < hp <= 25	0.59	30.5	0.0007	0.0002	0.0019	0.0000	0.0001	0.0001	0.3	0.00001
2031	A04	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	120.4	0.0225	0.0068	0.0394	0.0000	0.0047	0.0045	7.8	0.00038
2031	A04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	58.5	0.0054	0.0009	0.0049	0.0000	0.0007	0.0007	0.9	0.00004
2031	H04	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2031	H04	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2031	H04	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2031	H04	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2031	H04	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2031	H04	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2031	H04	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2031	H04	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2031	H04	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	H04	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2031	H04	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2031	H04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2031	H05	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2031	H05	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2031	H05	Air Compressors	75 < hp <= 100	0.43	27.1	0.0006	0.0001	0.0018	0.0000	0.0001	0.0001	0.7	0.00000
2031	H05	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2031	H05	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	21.6	0.0013	0.0002	0.0028	0.0000	0.0002	0.0002	0.5	0.00001
2031	H05	Concrete/Industrial Saws	25 < hp <= 40	0.59	27.1	0.0002	0.0001	0.0018	0.0000	0.0000	0.0000	0.4	0.00001
2031	H05	Concrete/Industrial Saws	6 < hp <= 11	0.7	21.6	0.0005	0.0002	0.0008	0.0000	0.0000	0.0000	0.1	0.00001
2031	H05	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2031	H05	Crawler Tractor/Dozers	100 < hp <= 175	0.59	151.8	0.0017	0.0003	0.0048	0.0000	0.0004	0.0004	8.4	0.00002
2031	H05	Excavators	100 < hp <= 175	0.59	201.8	0.0018	0.0003	0.0059	0.0000	0.0004	0.0004	11.2	0.00002
2031	H05	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2031	H05	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2031	H05	Graders	175 < hp <= 300	0.59	8.8	0.0001	0.0000	0.0003	0.0000	0.0000	0.0000	0.8	0.00000
2031	H05	Irrigation Sets	300 < hp <= 600	0.59	7.9	0.0023	0.0005	0.0082	0.0000	0.0004	0.0004	1.5	0.00003
2031	H05	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2031	H05	Off-highway Trucks	300 < hp <= 600	0.59	10,467.7	0.1705	0.0495	0.6522	0.0058	0.0413	0.0400	1,989.1	0.00248



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	H05	Other Construction Equipment	100 < hp <= 175	0.43	301.2	0.0058	0.0013	0.0164	0.0000	0.0013	0.0012	12.2	0.00009
2031	H05	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2031	H05	Pavers	100 < hp <= 175	0.59	27.1	0.0004	0.0001	0.0009	0.0000	0.0001	0.0001	1.5	0.00000
2031	H05	Pumps	6 < hp <= 11	0.43	247.2	0.0033	0.0011	0.0055	0.0000	0.0003	0.0003	0.7	0.00008
2031	H05	Rollers	75 < hp <= 100	0.59	88.0	0.0015	0.0001	0.0060	0.0000	0.0002	0.0002	3.1	0.00001
2031	H05	Scrapers	300 < hp <= 600	0.59	33.8	0.0028	0.0004	0.0075	0.0000	0.0004	0.0004	6.4	0.00003
2031	H05	Skid Steer Loaders	50 < hp <= 75	0.21	28.2	0.0035	0.0007	0.0029	0.0000	0.0005	0.0005	0.3	0.00002
2031	H05	Surfacing Equipment	16 < hp <= 25	0.59	27.1	0.0007	0.0002	0.0017	0.0000	0.0001	0.0001	0.2	0.00001
2031	H05	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	58.1	0.0109	0.0033	0.0190	0.0000	0.0023	0.0022	3.8	0.00018
2031	H05	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	523.5	0.0479	0.0083	0.0438	0.0000	0.0064	0.0062	7.6	0.00038
2031	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2031	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2031	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2031	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2031	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2031	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2031	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2031	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2031	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2031	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2031	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2031	L07	Aerial Lifts	75 < hp <= 100	0.59	400.8	0.0652	0.0103	0.0707	0.0001	0.0083	0.0080	16.4	0.00048
2031	L07	Bore/Drill Rigs	100 < hp <= 175	0.43	120.0	0.0114	0.0038	0.0447	0.0000	0.0026	0.0025	4.8	0.00020
2031	L07	Cement & Mortar Mixers	300 < hp <= 600	0.59	660.0	0.3154	0.0674	1.1890	0.0005	0.0432	0.0419	123.9	0.00317
2031	L07	Cranes	175 < hp <= 300	0.43	600.0	0.0060	0.0021	0.0253	0.0001	0.0014	0.0013	41.1	0.00012
2031	L07	Excavators	100 < hp <= 175	0.59	160.8	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2031	L07	Forklifts	75 < hp <= 100	0.59	801.6	0.0027	0.0004	0.0447	0.0001	0.0006	0.0006	28.2	0.00003
2031	L07	Off-highway Trucks	175 < hp <= 300	0.43	160.8	0.0005	0.0002	0.0026	0.0000	0.0002	0.0001	11.1	0.00001
2031	L07	Off-highway Trucks	300 < hp <= 600	0.59	1,536.0	0.0250	0.0073	0.0957	0.0009	0.0061	0.0059	291.9	0.00036
2031	L07	Pavers	100 < hp <= 175	0.59	79.2	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2031	L07	Pumps	6 < hp <= 11	0.43	450.0	0.0061	0.0019	0.0099	0.0000	0.0006	0.0006	1.3	0.00015
2031	L07	Rubber Tire Loaders	75 < hp <= 100	0.21	79.2	0.0005	0.0000	0.0019	0.0000	0.0001	0.0001	1.0	0.00000
2031	L07	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	679.2	0.0621	0.0108	0.0568	0.0000	0.0083	0.0080	9.9	0.00049
2031	L07	Trenchers	50 < hp <= 75	0.59	319.2	0.0111	0.0017	0.0445	0.0000	0.0013	0.0013	8.4	0.00017
2031	S01	Aerial Lifts	75 < hp <= 100	0.59	16.0	0.0026	0.0004	0.0028	0.0000	0.0003	0.0003	0.7	0.00002
2031	S01	Air Compressors	100 < hp <= 175	0.43	24.0	0.0004	0.0001	0.0015	0.0000	0.0001	0.0001	1.0	0.00001
2031	S01	Air Compressors	75 < hp <= 100	0.43	15.8	0.0003	0.0000	0.0010	0.0000	0.0001	0.0001	0.4	0.00000



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	S01	Cement & Mortar Mixers	300 < hp <= 600	0.59	24.0	0.0115	0.0024	0.0432	0.0000	0.0016	0.0015	4.5	0.00012
2031	S01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	37.2	0.0022	0.0004	0.0048	0.0000	0.0004	0.0004	0.9	0.00002
2031	S01	Concrete/Industrial Saws	25 < hp <= 40	0.59	15.8	0.0001	0.0000	0.0011	0.0000	0.0000	0.0000	0.2	0.00000
2031	S01	Concrete/Industrial Saws	6 < hp <= 11	0.7	37.2	0.0008	0.0003	0.0013	0.0000	0.0001	0.0001	0.2	0.00002
2031	S01	Cranes	175 < hp <= 300	0.43	19.0	0.0002	0.0001	0.0008	0.0000	0.0000	0.0000	1.3	0.00000
2031	S01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	508.0	0.0056	0.0009	0.0159	0.0001	0.0014	0.0014	28.2	0.00006
2031	S01	Excavators	100 < hp <= 175	0.59	232.9	0.0021	0.0003	0.0069	0.0000	0.0005	0.0005	12.9	0.00002
2031	S01	Forklifts	75 < hp <= 100	0.59	24.0	0.0001	0.0000	0.0013	0.0000	0.0000	0.0000	0.8	0.00000
2031	S01	Generator Sets	25 < hp <= 40	0.43	30.0	0.0004	0.0001	0.0017	0.0000	0.0001	0.0001	0.3	0.00001
2031	S01	Graders	175 < hp <= 300	0.59	5.4	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.5	0.00000
2031	S01	Irrigation Sets	300 < hp <= 600	0.59	4.8	0.0014	0.0003	0.0050	0.0000	0.0002	0.0002	0.9	0.00002
2031	S01	Off-highway Trucks	300 < hp <= 600	0.59	4,815.9	0.0784	0.0228	0.3001	0.0027	0.0190	0.0184	915.1	0.00114
2031	S01	Other Construction Equipment	100 < hp <= 175	0.43	191.3	0.0037	0.0009	0.0104	0.0000	0.0008	0.0008	7.7	0.00006
2031	S01	Pavers	100 < hp <= 175	0.59	21.7	0.0003	0.0000	0.0007	0.0000	0.0001	0.0001	1.2	0.00000
2031	S01	Paving Equipment	100 < hp <= 175	0.59	16.0	0.0004	0.0001	0.0011	0.0000	0.0001	0.0001	0.9	0.00001
2031	S01	Plate Compactors	3 < hp <= 6	0.43	16.0	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0	0.00000
2031	S01	Pumps	6 < hp <= 11	0.43	4.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2031	S01	Rollers	75 < hp <= 100	0.59	275.6	0.0048	0.0004	0.0189	0.0000	0.0007	0.0007	9.7	0.00003
2031	S01	Scrapers	300 < hp <= 600	0.59	158.2	0.0129	0.0021	0.0348	0.0001	0.0021	0.0020	30.1	0.00013

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	S01	Skid Steer Loaders	50 < hp <= 75	0.21	28.9	0.0036	0.0007	0.0030	0.0000	0.0005	0.0005	0.3	0.00002
2031	S01	Surfacing Equipment	16 < hp <= 25	0.59	23.4	0.0006	0.0001	0.0014	0.0000	0.0001	0.0001	0.2	0.00001
2031	S01	Surfacing Equipment	75 < hp <= 100	0.43	24.0	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.6	0.00001
2031	S01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	89.5	0.0167	0.0050	0.0293	0.0000	0.0035	0.0034	5.8	0.00028
2031	S01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	84.0	0.0058	0.0010	0.0064	0.0000	0.0008	0.0007	0.9	0.00005
2031	S01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	147.3	0.0135	0.0023	0.0123	0.0000	0.0018	0.0017	2.1	0.00011
2031	T01	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2031	T01	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2031	T01	Air Compressors	75 < hp <= 100	0.43	51.8	0.0011	0.0001	0.0034	0.0000	0.0002	0.0002	1.3	0.00001
2031	T01	Cement & Mortar Mixers	300 < hp <= 600	0.59	804.0	0.3843	0.0821	1.4484	0.0006	0.0526	0.0510	150.9	0.00387
2031	T01	Chain Saws > 6 HP	6 < hp <= 11	0.7	82.0	0.0926	0.0214	0.0005	0.0000	0.0034	0.0031	0.2	0.00000
2031	T01	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	82.0	0.0048	0.0009	0.0106	0.0000	0.0008	0.0008	2.1	0.00004
2031	T01	Concrete/Industrial Saws	25 < hp <= 40	0.59	51.8	0.0004	0.0001	0.0034	0.0000	0.0000	0.0000	0.7	0.00002
2031	T01	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2031	T01	Crawler Tractor/Dozers	100 < hp <= 175	0.59	412.7	0.0046	0.0007	0.0130	0.0001	0.0011	0.0011	22.9	0.00005
2031	T01	Excavators	100 < hp <= 175	0.59	558.8	0.0049	0.0008	0.0165	0.0001	0.0012	0.0011	31.0	0.00006
2031	T01	Forklifts	75 < hp <= 100	0.59	3,700.0	0.0125	0.0018	0.2062	0.0004	0.0029	0.0028	130.1	0.00012
2031	T01	Generator Sets	25 < hp <= 40	0.43	301.0	0.0039	0.0011	0.0175	0.0000	0.0006	0.0006	3.1	0.00009
2031	T01	Graders	175 < hp <= 300	0.59	16.9	0.0002	0.0000	0.0006	0.0000	0.0000	0.0000	1.6	0.00000



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	T01	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2031	T01	Irrigation Sets	300 < hp <= 600	0.59	15.2	0.0044	0.0009	0.0158	0.0000	0.0007	0.0007	2.9	0.00006
2031	T01	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2031	T01	Off-highway Trucks	300 < hp <= 600	0.59	12,536.6	0.2042	0.0593	0.7811	0.0070	0.0494	0.0480	2,382.3	0.00297
2031	T01	Other Construction Equipment	100 < hp <= 175	0.43	516.6	0.0099	0.0023	0.0281	0.0001	0.0022	0.0021	20.9	0.00015
2031	T01	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2031	T01	Pavers	100 < hp <= 175	0.59	51.8	0.0008	0.0001	0.0018	0.0000	0.0002	0.0002	2.9	0.00001
2031	T01	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2031	T01	Pumps	6 < hp <= 11	0.43	254.0	0.0034	0.0011	0.0056	0.0000	0.0004	0.0003	0.7	0.00008
2031	T01	Rollers	75 < hp <= 100	0.59	194.3	0.0033	0.0003	0.0133	0.0000	0.0005	0.0005	6.8	0.00002
2031	T01	Scrapers	300 < hp <= 600	0.59	64.8	0.0053	0.0008	0.0143	0.0000	0.0009	0.0008	12.3	0.00005
2031	T01	Skid Steer Loaders	50 < hp <= 75	0.21	15.9	0.0020	0.0004	0.0017	0.0000	0.0003	0.0003	0.2	0.00001
2031	T01	Surfacing Equipment	16 < hp <= 25	0.59	51.8	0.0013	0.0003	0.0032	0.0000	0.0001	0.0001	0.5	0.00002
2031	T01	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2031	T01	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2031	T01	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	129.1	0.0241	0.0073	0.0423	0.0000	0.0050	0.0049	8.3	0.00041
2031	T01	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	466.1	0.0324	0.0057	0.0353	0.0000	0.0043	0.0041	5.1	0.00028
2031	T01	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	757.5	0.0693	0.0120	0.0634	0.0000	0.0092	0.0089	11.0	0.00055
2031	T02	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	T02	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144
2031	T02	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2031	T02	Chain Saws > 6 HP	6 < hp <= 11	0.7	40.0	0.0452	0.0104	0.0003	0.0000	0.0017	0.0015	0.1	0.00000
2031	T02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2031	T02	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2031	T02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	140.6	0.0016	0.0002	0.0044	0.0000	0.0004	0.0004	7.8	0.00002
2031	T02	Excavators	100 < hp <= 175	0.59	276.6	0.0024	0.0004	0.0082	0.0000	0.0006	0.0006	15.3	0.00003
2031	T02	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014
2031	T02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2031	T02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001
2031	T02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2031	T02	Off-highway Trucks	300 < hp <= 600	0.59	8,121.1	0.1322	0.0384	0.5060	0.0045	0.0320	0.0311	1,543.2	0.00192
2031	T02	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021
2031	T02	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2031	T02	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2031	T02	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2031	T02	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2031	T02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2031	T02	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2031	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.21	80.0	0.0030	0.0009	0.0053	0.0000	0.0006	0.0006	1.1	0.00005



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2031	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013
2031	T02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2031	T02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2031	T02	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021
2032	A04	Air Compressors	75 < hp <= 100	0.43	15.4	0.0003	0.0000	0.0010	0.0000	0.0001	0.0001	0.4	0.00000
2032	A04	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	13.2	0.0008	0.0001	0.0017	0.0000	0.0001	0.0001	0.3	0.00001
2032	A04	Concrete/Industrial Saws	25 < hp <= 40	0.59	15.4	0.0001	0.0000	0.0010	0.0000	0.0000	0.0000	0.2	0.00000
2032	A04	Concrete/Industrial Saws	6 < hp <= 11	0.7	13.2	0.0003	0.0001	0.0005	0.0000	0.0000	0.0000	0.1	0.00001
2032	A04	Crawler Tractor/Dozers	100 < hp <= 175	0.59	99.7	0.0011	0.0002	0.0031	0.0000	0.0003	0.0003	5.5	0.00001
2032	A04	Excavators	100 < hp <= 175	0.59	247.1	0.0022	0.0003	0.0073	0.0000	0.0005	0.0005	13.7	0.00002
2032	A04	Graders	175 < hp <= 300	0.59	5.4	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.5	0.00000
2032	A04	Irrigation Sets	300 < hp <= 600	0.59	4.9	0.0014	0.0003	0.0051	0.0000	0.0002	0.0002	0.9	0.00002
2032	A04	Off-highway Trucks	300 < hp <= 600	0.59	3,870.3	0.0630	0.0183	0.2411	0.0021	0.0153	0.0148	735.5	0.00092
2032	A04	Other Construction Equipment	100 < hp <= 175	0.43	964.0	0.0185	0.0043	0.0524	0.0001	0.0040	0.0039	38.9	0.00029
2032	A04	Pavers	100 < hp <= 175	0.59	15.4	0.0002	0.0000	0.0005	0.0000	0.0001	0.0001	0.9	0.00000
2032	A04	Pumps	6 < hp <= 11	0.43	4.4	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0	0.00000
2032	A04	Rollers	75 < hp <= 100	0.59	62.6	0.0011	0.0001	0.0043	0.0000	0.0002	0.0002	2.2	0.00001
2032	A04	Scrapers	300 < hp <= 600	0.59	19.2	0.0016	0.0003	0.0042	0.0000	0.0003	0.0002	3.7	0.00002
2032	A04	Skid Steer Loaders	50 < hp <= 75	0.21	16.9	0.0021	0.0004	0.0018	0.0000	0.0003	0.0003	0.2	0.00001

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2032	A04	Surfacing Equipment	16 < hp <= 25	0.59	15.4	0.0004	0.0001	0.0009	0.0000	0.0000	0.0000	0.1	0.00001
2032	A04	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	64.2	0.0120	0.0036	0.0210	0.0000	0.0025	0.0024	4.1	0.00020
2032	A04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	32.7	0.0030	0.0005	0.0027	0.0000	0.0004	0.0004	0.5	0.00002
2032	H04	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2032	H04	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2032	H04	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2032	H04	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005
2032	H04	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2032	H04	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2032	H04	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2032	H04	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2032	H04	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2032	H04	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2032	H04	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2032	H04	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2032	L02	Aerial Lifts	50 < hp <= 75	0.21	4,920.0	0.1875	0.0357	0.3120	0.0002	0.0222	0.0216	53.8	0.00194
2032	L02	Aerial Lifts	75 < hp <= 100	0.59	960.0	0.1561	0.0247	0.1694	0.0001	0.0198	0.0192	39.4	0.00115
2032	L02	Cement & Mortar Mixers	300 < hp <= 600	0.59	780.0	0.3728	0.0796	1.4052	0.0006	0.0510	0.0495	146.4	0.00375
2032	L02	Cranes	175 < hp <= 300	0.43	240.0	0.0024	0.0008	0.0101	0.0000	0.0006	0.0005	16.4	0.00005



TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2032	L02	Excavators	100 < hp <= 175	0.59	160.0	0.0014	0.0002	0.0047	0.0000	0.0003	0.0003	8.9	0.00002
2032	L02	Forklifts	75 < hp <= 100	0.59	3,560.0	0.0120	0.0018	0.1984	0.0004	0.0028	0.0027	125.2	0.00012
2032	L02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2032	L02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2032	L02	Off-highway Trucks	300 < hp <= 600	0.59	6,474.0	0.1054	0.0306	0.4034	0.0036	0.0255	0.0248	1,230.2	0.00153
2032	L02	Other Construction Equipment	300 < hp <= 600	0.59	40.0	0.0156	0.0021	0.0358	0.0000	0.0023	0.0022	7.6	0.00012
2032	L02	Pumps	6 < hp <= 11	0.43	240.0	0.0032	0.0010	0.0053	0.0000	0.0003	0.0003	0.7	0.00008
2032	L02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	480.0	0.0439	0.0076	0.0402	0.0000	0.0058	0.0057	7.0	0.00035
2032	T02	Aerial Lifts	50 < hp <= 75	0.21	5,040.0	0.1920	0.0366	0.3196	0.0002	0.0228	0.0221	55.2	0.00198
2032	T02	Aerial Lifts	75 < hp <= 100	0.59	1,200.0	0.1951	0.0308	0.2118	0.0002	0.0247	0.0240	49.2	0.00144
2032	T02	Cement & Mortar Mixers	300 < hp <= 600	0.59	1,164.0	0.5563	0.1188	2.0970	0.0009	0.0762	0.0739	218.5	0.00560
2032	T02	Chain Saws > 6 HP	6 < hp <= 11	0.7	40.0	0.0452	0.0104	0.0003	0.0000	0.0017	0.0015	0.1	0.00000
2032	T02	Chippers/Stump Grinders (com)	75 < hp <= 100	0.43	40.0	0.0023	0.0004	0.0052	0.0000	0.0004	0.0004	1.0	0.00002
2032	T02	Cranes	175 < hp <= 300	0.43	524.0	0.0052	0.0018	0.0221	0.0001	0.0012	0.0012	35.9	0.00011
2032	T02	Crawler Tractor/Dozers	100 < hp <= 175	0.59	110.6	0.0012	0.0002	0.0035	0.0000	0.0003	0.0003	6.1	0.00001
2032	T02	Excavators	100 < hp <= 175	0.59	246.6	0.0022	0.0003	0.0073	0.0000	0.0005	0.0005	13.7	0.00002
2032	T02	Forklifts	75 < hp <= 100	0.59	4,444.0	0.0150	0.0022	0.2477	0.0005	0.0035	0.0034	156.3	0.00014
2032	T02	Generator Sets	25 < hp <= 40	0.43	80.0	0.0010	0.0003	0.0047	0.0000	0.0002	0.0002	0.8	0.00002
2032	T02	Graders	40 < hp <= 50	0.59	40.0	0.0003	0.0001	0.0026	0.0000	0.0000	0.0000	0.6	0.00001

TABLE 6-6: NON-ROAD CONSTRUCTION EMISSIONS INVENTORY – HYBRID TERMINAL OPTION (CONTINUED)

Year	Task ID	Equipment Type	HP	LF	Usage (hrs)	CO (ST)	VOC (ST)	NO _x (ST)	SO _x (ST)	PM ₁₀ (ST)	PM _{2.5} (ST)	CO ₂ (MT)	CH ₄ (MT)
2032	T02	Off-highway Trucks	175 < hp <= 300	0.43	920.0	0.0027	0.0013	0.0150	0.0002	0.0009	0.0009	63.7	0.00005
2032	T02	Off-highway Trucks	300 < hp <= 600	0.59	8,061.3	0.1313	0.0381	0.5023	0.0045	0.0318	0.0308	1,531.8	0.00191
2032	T02	Other Construction Equipment	300 < hp <= 600	0.59	72.0	0.0280	0.0038	0.0644	0.0000	0.0042	0.0040	13.7	0.00021
2032	T02	Pavers	100 < hp <= 175	0.59	80.0	0.0012	0.0002	0.0027	0.0000	0.0003	0.0003	4.4	0.00001
2032	T02	Plate Compactors	3 < hp <= 6	0.43	24.0	0.0002	0.0001	0.0003	0.0000	0.0000	0.0000	0.0	0.00000
2032	T02	Pumps	6 < hp <= 11	0.43	610.0	0.0082	0.0026	0.0135	0.0000	0.0008	0.0008	1.7	0.00020
2032	T02	Rollers	75 < hp <= 100	0.59	40.0	0.0007	0.0001	0.0027	0.0000	0.0001	0.0001	1.4	0.00000
2032	T02	Surfacing Equipment	300 < hp <= 600	0.59	16.0	0.0086	0.0012	0.0200	0.0000	0.0012	0.0012	3.0	0.00006
2032	T02	Surfacing Equipment	75 < hp <= 100	0.43	40.0	0.0014	0.0002	0.0029	0.0000	0.0002	0.0002	1.0	0.00001
2032	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.21	80.0	0.0030	0.0009	0.0053	0.0000	0.0006	0.0006	1.1	0.00005
2032	T02	Tractors/Loaders/Backhoes	100 < hp <= 175	0.59	40.0	0.0075	0.0023	0.0131	0.0000	0.0016	0.0015	2.6	0.00013
2032	T02	Tractors/Loaders/Backhoes	50 < hp <= 75	0.21	24.0	0.0017	0.0003	0.0018	0.0000	0.0002	0.0002	0.3	0.00001
2032	T02	Tractors/Loaders/Backhoes	75 < hp <= 100	0.21	1,280.0	0.1171	0.0203	0.1071	0.0001	0.0156	0.0151	18.7	0.00092
2032	T02	Trenchers	50 < hp <= 75	0.59	400.0	0.0139	0.0022	0.0558	0.0000	0.0016	0.0016	10.5	0.00021

Note: HP denotes horsepower; LF denotes load factor; hrs denotes hours; ST denotes short tons; MT denotes metric tons; CO denotes carbon monoxide, NO_x denotes nitrogen oxides, SO_x denotes sulfur oxides, VOC denotes volatile organic compounds, PM_{2.5} denotes fine particulate matter, PM₁₀ denotes coarse particulate matter, CO₂ denotes carbon dioxide, CH₄ denotes methane, N₂O denotes nitrous oxide.

Source: MOVES 4, Landrum & Brown 2024



Attachment 7 NEPA Air Quality Protocol and NEPA Greenhouse Gas Protocol

This attachment contains the NEPA Air Quality Protocol and NEPA Greenhouse Gas Protocol.

After the publication of the Draft EA, Executive Order 13990, which was relied upon for the January 2023 CEQ draft GHG guidance, was revoked and CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA, 42 U.S.C. 4321 et seq., as amended, in response to Executive Order 14154. In addition, the Supreme Court issued the *Seven County Infrastructure Coalition v. Eagle County*, 605 U. S. 975 (2025) ruling on May 29, 2025. As a result of these changes, the references to climate, qualitative climate evaluation that discussed the level of preparedness with respect to the impacts of climate change, the extent to which the alternatives could be affected by future climate conditions, and if the alternatives are consistent with national, state, and local climate goals, and the cumulative impact analysis were removed from the Final EA. Though the NEPA Climate Protocol included methodology for both a climate change and cumulative impact analysis, FAA's final decision will only rely upon the GHG emissions disclosed in the Final EA.



National Environmental Policy Act
Environmental Assessment
Air Quality Assessment Protocol
Seattle-Tacoma International Airport
August 2023

PREPARED FOR
Port of Seattle

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1 Protocol for Air Quality Assessment (NEPA)

The National Environmental Policy Act (NEPA) provides for an environmental review process to disclose the potential impacts, including air quality, from a proposed federal action on the human environment.

1.1 Purpose of this Document

This document describes the overall approach and methods to conduct an air quality assessment to demonstrate compliance to the NEPA.

The Port of Seattle, as the owner and operator of the Seattle-Tacoma International Airport (SEA or Airport), evaluated airport operations and facilities during the Sustainable Airport Master Plan (SAMP) planning process and identified a set of Near-Term Projects (NTPs) designed to help the Airport maintain its essential airport function in the future. The NTPs (as a whole) are referred to as the Proposed Action in this document.

The NEPA documentation will be prepared to investigate, analyze, and disclose the potential environmental impacts of the Proposed Action and the reasonable alternatives in compliance with the NEPA.

1.2 Agency Coordination

The Port of Seattle and the FAA have coordinated with PSCAA in the past on an earlier version of this protocol document, which received concurrence from PSCAA in June 2020. In coordination with the FAA, this air quality protocol document has been updated to reflect updated analysis years, an updated methodology for air quality, and the use of newer software. The climate discussion will be included in a separate protocol document with respect to updated guidance from the Council on Environmental Quality. It is intended that this air quality protocol document be coordinated with Puget Sound Clean Air Agency in an effort to:

- Familiarize the agency with the scope of the Proposed Action and identify any issues of concern early in the process;
- Engage in data exchange of information necessary to complete the air quality assessment; and,
- Obtain concurrence on procedure and methodology prior to the publication of the anticipated NEPA Environmental Assessment (EA).

1.3 Description of the Proposed Action

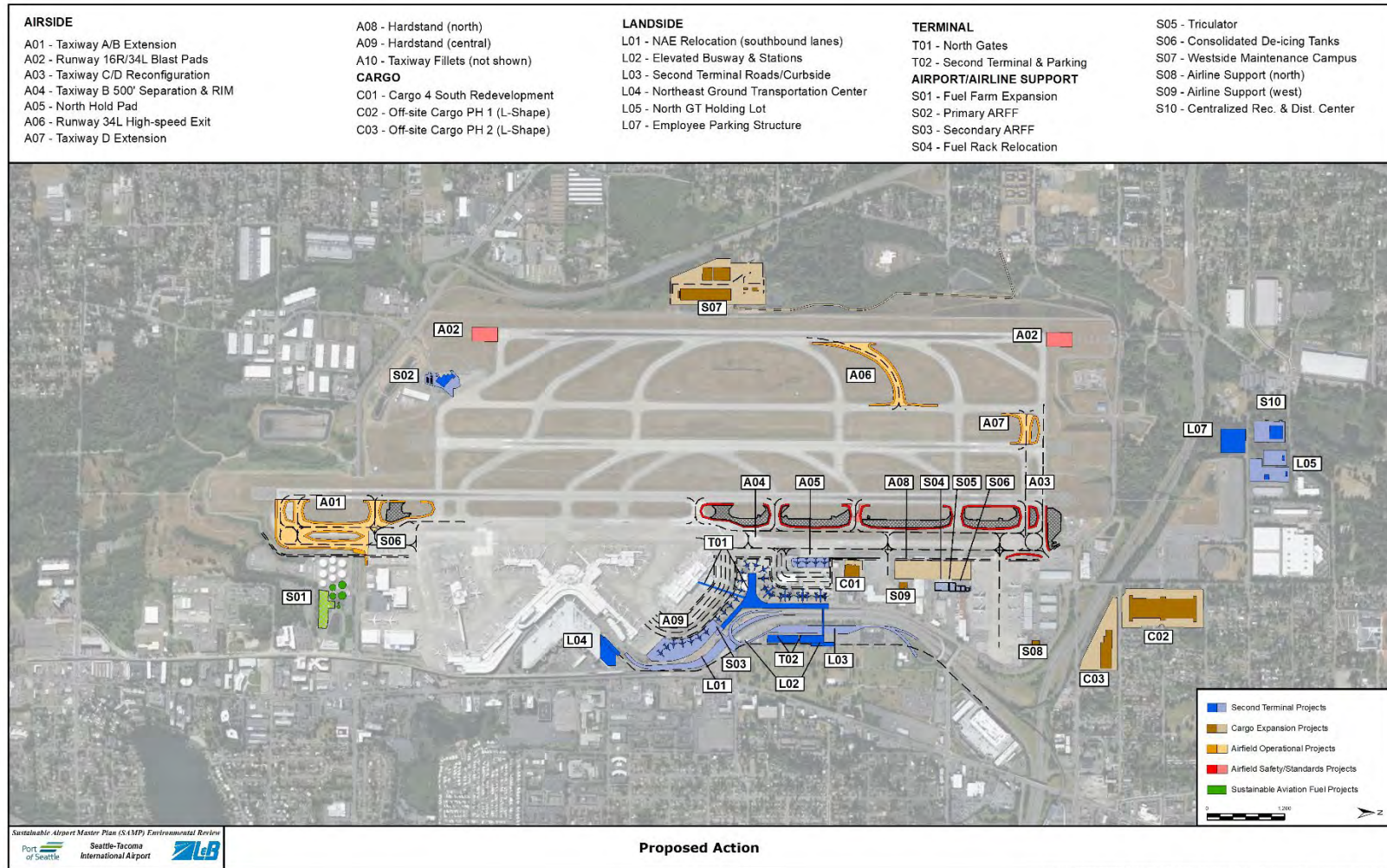
The Port identified a set of NTPs to address the near-term activity levels projected to occur at the Airport. The NTPs include more than 30 projects that would improve efficiency, safety, access to the Airport, and support facilities for airlines and the Airport.

The NTPs include the following primary elements:

- Second terminal concourse
- New passenger terminal and parking
- North Airport Expressway relocation
- North hold pad
- Central hardstand
- Elevated busway and stations
- Second terminal roads and curbside
- Main Terminal north ground transportation lot
- North cargo hardstand
- Cargo 4 south redevelopment
- Cargo warehousing
- Runway 16R/34L blast pads
- Relocated Taxiways A and B
- Extension of Taxiways C and D
- Taxiway infrastructure reconfiguration (south of Taxiway O)
- Runway 34L highspeed exit
- Taxiway D extension
- Fuel farm expansion

The elements of the Proposed Action are shown on **Exhibit 1**.

Exhibit 1 Proposed Action



1.4 Overall Approach (NEPA)

The impacts to air quality due to the Proposed Action for NEPA will be determined in accordance with the guidelines provided in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*; FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*; and FAA's Aviation Emissions and Air Quality Handbook Version 3 Update 1. Potential air quality impacts are categories that are required to be analyzed per these orders and guidance.

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 United States Environmental Protection Agency (USEPA) under the Clean Air Act, 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 focus on the NAAQS criteria pollutants.

1.4.1 Clean Air Act

The Clean Air Act (CAA), including the 1990 Amendments, provides the establishment of standards and programs to evaluate, achieve, and maintain acceptable air quality in the United States. Under the CAA, the USEPA established a set of standards, or criteria, for six pollutants determined to be potentially harmful to human health and welfare.¹

The USEPA considers the presence of the following six criteria pollutants to be indicators of air quality:

- Carbon monoxide (CO);
- Ozone (O₃);
- Nitrogen dioxide (NO₂);
- Sulfur dioxide (SO₂).
- Particulate matter (PM₁₀ and PM_{2.5}); and,
- Lead (Pb).

For each of the criteria pollutants, the USEPA established primary standards intended to protect public health, and secondary standards for the protection of public welfare, which captures factors such as preventing materials damage, preventing crop and vegetation damage, and assuring good visibility. The NAAQS are summarized in **Table 1**. Areas of the country where air pollution levels consistently exceed these standards may be designated nonattainment by the USEPA.

¹ USEPA, Code of Federal Regulations, Title 40, Part 50 (40 CFR Part 50) National Primary and Secondary Ambient Air Quality Standards (NAAQS), July 2011.

Table 1 National Ambient Air Quality Standards

POLLUTANT	PRIMARY/ SECONDARY	AVERAGING TIME	LEVEL	FORM OF MEASUREMENT
Carbon Monoxide	Primary	8 hour	9 ppm	Not to be exceeded more than once per year
Carbon Monoxide	Primary	1 hour	35 ppm	Not to be exceeded more than once per year
Lead	primary and secondary	Rolling 3-month average	0.15 µg/m ³ (1)	Not to be exceeded
Nitrogen Dioxide	Primary	1 hour	100 ppb	98 th percentile of 1-hour daily maximum concentrations, averaged over 3 years
Nitrogen Dioxide	primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone	primary and secondary	8 hour	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Fine Particulate Matter (PM _{2.5})	Primary	1 year	12.0 µg/m ³	Annual mean, averaged over 3 years
Fine Particulate Matter (PM _{2.5})	Secondary	1 year	15.0 µg/m ³	Annual mean, averaged over 3 years
Fine Particulate Matter (PM _{2.5})	primary and secondary	24 hour	35 µg/m ³	98 th percentile, averaged over 3 years
Coarse Particulate Matter (PM ₁₀)	primary and secondary	24 hour	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide	Primary	1 hour	75 ppb (4)	99 th percentile of 1-hour daily maximum concentrations, averaged over 3 years
Sulfur Dioxide	Secondary	3 hour	0.5 ppm	Not to be exceeded more than once per year

- (1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m³ as a calendar quarter average) also remain in effect.
- (2) The level of the annual NO₂ standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
- (3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O₃ standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O₃ standards.
- (4) The previous SO₂ standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO₂ standards or is not meeting the requirements of a SIP call under the previous SO₂ standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Notes: ppm is parts per million; ppb is parts per billion, and µg/m³ is micrograms per cubic meter.

Source: EPA, <https://www.epa.gov/criteria-air-pollutants/naaqs-table>, Accessed December 2022.

A nonattainment area is a homogeneous geographical area (usually referred to as an air quality control region or airshed) that is in violation of one or more NAAQS and has been designated as nonattainment by the USEPA as provided for under the CAA. Each nonattainment area is required to have a State Implementation Plan (SIP), developed by the state that quantifies current conditions, projects future conditions through the date of prescribed attainment, and then identifies mitigation measures that are to be used to bring the area back into attainment.

A maintenance area describes the air quality designation of an area previously designated nonattainment by the USEPA and subsequently redesignated attainment after emissions are reduced. Such an area remains designated as maintenance for a period up to 20 years at which time the state can apply for redesignation to attainment, provided that the NAAQS were sufficiently maintained throughout the maintenance period.

1.4.2 King County Air Quality Status

SEA is located within King County, Washington, which is included in the Puget Sound Intrastate Air Quality Control Region. The area was previously designated maintenance for ozone under the 1-hour 1979 ozone standard; however, the 1-hour standard was revoked by USEPA effective June 15, 2005. The maintenance period for ozone ended on November 25, 2016.² The region is currently designated as in attainment for both the 2015 and 2008 8-hour ozone standard. The region is not subject to a maintenance plan for ozone, although ozone has been considered an important pollutant tracked by the state and local agencies.

In the past, King County was also designated as nonattainment for carbon monoxide (CO); however, on October 11, 1996, the USEPA determined the area had attained the standard and the region was redesignated to attainment of the 1971 standard. The maintenance period for CO ended on October 11, 2016.³ Several areas within King County are classified as maintenance for the PM₁₀ (coarse particles) standard, including Kent, Duwamish and Tacoma. Neither the Proposed Action nor any part of the Airport is within any of these areas. Therefore, the Proposed Action will occur in an area considered in attainment for all criteria pollutants.

1.4.2.1 Conformity

General Conformity

The General Conformity Rule under the CAA is conducted in three phases, depending on the extent of the proposed Federal action: (1) applicability, (2) evaluation, and (3) determination. The applicability phase has two parts. The first part is to determine if the Proposed Action is located in a USEPA-designated nonattainment or maintenance area for one or more of the regulated criteria pollutants. If it is not, then the general conformity rule does not apply. Since the Proposed Action is not located in a USEPA-designated nonattainment or maintenance area for one or more of the regulated criteria pollutants, the general conformity rule does not apply.

Transportation Conformity

Transportation conformity does not apply to the Proposed Action because it does not include actions funded through U.S.C. Title 23 or the Federal Transit Act.

² State of Washington's Department of Ecology. Plans for Maintaining Air Quality. Website accessed December 2022 at <https://ecology.wa.gov/Regulations-Permits/Plans-policies/State-implementation-plans/Maintenance-SIPs>

³ State of Washington's Department of Ecology. Plans for Maintaining Air Quality. Website accessed December 2022 at <https://ecology.wa.gov/Regulations-Permits/Plans-policies/State-implementation-plans/Maintenance-SIPs>

1.4.3 Lead

In general, an analysis of lead is limited to projects that emit significant quantities of the pollutant (i.e. lead smelters). While some active general aviation airports prepare lead emissions inventories due to the large quantity of leaded Avgas used, this is not warranted for SEA because the area is attainment for lead, Avgas fueling at SEA ceased in 2018, and because there are no development project elements in the Proposed Action that would affect or change Avgas-based aircraft.

1.4.4 Hazardous Air Pollutants (NEPA)

Per FAA guidance provided in the Aviation Emissions and Air Quality Handbook, a Hazardous Air Pollutants (HAPs) emissions inventory should be considered if the Proposed Action is considered “major” (e.g., new airport, new runway, major runway extension, new terminal or major terminal expansion or major construction activity); if the Proposed Action is located in a nonattainment or maintenance area; and/or if a criteria air pollutant emissions inventory is also prepared. A HAPs inventory analysis will not be conducted as part of the NEPA assessment because the Proposed Action is not located in a nonattainment or maintenance area.

1.4.5 Ultrafine Particles (NEPA)

UFPs are defined as particles with a diameter less than 0.1 micrometers ($PM_{0.1}$). The existing science is not fully mature, and the measurement and understanding of UFPs and their related health risks has not been clearly defined. Currently UFPs are not regulated by the USEPA or the state either through rate of emissions or concentrations (other than being a subset component of $PM_{2.5}$) and are therefore not typically considered in formal environmental assessments or reviews.

Furthermore, since UFPs are not specifically listed as a criteria pollutant, air toxic, or HAP, an analysis of UFPs will not be considered a requirement of NEPA or the CAA. Therefore, no analysis or discussion of UFPs will be included in the NEPA evaluation.

1.5 Prepare Emissions Inventories for Criteria Pollutants (NEPA)

An emissions inventory is a summary of the total pollutants generated by all active emissions sources that may be affected by the Proposed Action. The emissions inventory provides the total annual pollutant emissions as tons per year.

The elements of the Proposed Action would be anticipated to cause direct and indirect emissions from construction and operational activities. For NEPA purposes, construction refers to the process of building or putting in place the proposed airport improvements. Operational emissions refer to the emissions that are emitted once the proposed improvements are put in place and are operating.

Therefore, an air quality analysis incorporating separate evaluations will be conducted including:

- Preparation of an Aircraft Emissions Inventory including Auxiliary Power Unit (APU) emissions;
- Preparation of a Motor Vehicle and Ground Support Equipment Emissions Inventory;
- Preparation of a Stationary Source Emissions Inventory; and,
- Preparation of a Construction Emissions Inventory.

The emissions results for all inventories will be summed and will be provided in tabular form for each analysis year.

As previously stated, a separate climate protocol document will be developed. The methodology to evaluate impacts to climate due to the Proposed Action for NEPA will be developed in accordance with the guidelines provided in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*; FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*; FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*; and the CEQ's *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change*.

1.5.1 Analysis Years

The air quality analysis will disclose emissions for existing conditions, which will represent calendar year 2022. The analysis will also disclose the emissions and potential air quality impacts due to operation of the Proposed Action, No Action, and any identified alternatives for the projected future conditions in 2032 and 2037. The year 2032 will be used as a basis for analysis because 2032 is the projected opening year of the Proposed Action. In addition, 2037 will be used as a basis for analysis, because it represents a condition five years beyond the opening year.⁴ The air quality analysis will also disclose the potential air quality impacts due to construction activities during the years 2025 to 2032. Because the area of the Proposed Action is in attainment and conformity does not apply, no potential SIP milestone years will be analyzed.

The overall criteria pollutant assessment approach to prepare the emissions inventories is summarized in **Table 2**.

4 The FAA's Desk Reference Section 11.3 states "The environmental consequences section of the NEPA document will include the analysis of the potential noise impacts of the proposed action and alternative(s) for each timeframe evaluated... Timeframes usually selected are the year of anticipated project implementation and 5 to 10 years after implementation." The FAA's Desk Reference Section 1.3.2 for air quality states, "the emissions inventory usually is calculated for the year(s) of project implementation, the planning horizon year(s) in the EA or EIS, and sometimes for intermediate years, if appropriate due to project phasing or if requested by a reviewing agency." The air quality analysis would be conducted consistent with the noise analysis and therefore include an assessment of the implementation year and of the project five years after implementation.

Table 2 NEPA Approach for Emissions Inventories

Emissions Source	Data / Conditions	Data Source	Models to be Used
Aircraft	Number of operations, Fleet Mix, and Engine Types	For existing conditions, FAA's Air Traffic Activity Data System and the Port's EnvironmentalVue Flight Track Monitoring System. For future conditions, Port aircraft statistics and forecast of operations.	FAA AEDT
Aircraft	Taxi Time and other Aircraft Times in Modes	For existing conditions, the Port of Seattle will use FAA's Aviation System Performance Metrics (ASPM). For future conditions, the Port of Seattle will use the delay analysis developed with the Total Airspace and Airport Modeler (TAAM) tool normalized to the ASPM data. ⁵	FAA AEDT
Aircraft	Auxiliary Power Unit (APU) Operating Times	For existing and future conditions, the AEDT database will be used to assign the APU type and the Port of Seattle's Rules and Regulations will be used to assign APU usage.	FAA AEDT
Aircraft	Aircraft Run-Ups	For existing conditions, Port of Seattle records will be used. For the future conditions, usage would be based on the increases in aircraft levels.	FAA AEDT

⁵ Leigh Fisher. Environmental Review Airside Modeling, June 2020.

Emissions Source	Data / Conditions	Data Source	Models to be Used
Ground Support Equipment (GSE)	GSE equipment types, Fuel types, and Operating Times	<i>Tenant-Owned</i> For existing conditions, a GSE survey (i.e., field verification and Port of Seattle data) will be used to identify equipment types and usage. Usage for future conditions would be increased based on the increases in aircraft levels. <i>Port-Owned</i> Additionally, for existing conditions, Port-owned airfield vehicles and equipment usage would be obtained from the Port. Usage for future conditions would be adjusted based on the increases in aircraft levels.	FAA AEDT
Motor Vehicles	Number of vehicles by roadway segment, Vehicle Miles Travelled (VMTs) by vehicle type and average speed	<i>Off-Airport Roadways</i> For existing and future conditions, information from the surface transportation study developed for the NEPA EA will be used. Where data is not being collected for roadway segments within the study area, WSDOT data will be utilized. <i>On-Airport Roadways</i> For existing conditions, Port of Seattle information on the number and types of airside delivery vehicles accessing the airfield through security gates. For future conditions, the increase would be based on the increase in passenger levels. <i>Parking Facilities</i> For existing conditions, information from the Port of Seattle would be used. For future conditions, the increase would be based on the increase in passenger levels and aircraft operations.	USEPA's MOVES3

Emissions Source	Data / Conditions	Data Source	Models to be Used
Stationary Sources	Number, type, and usage for emergency generators, boilers, and fuel tanks, the usage of which may be affected by the Proposed Action	For existing conditions, Port of Seattle records will be used. For future conditions, estimates will be based on increases in aircraft and passenger levels and anticipated new facilities.	FAA AEDT and USEPA AP-42 and other regional Puget Sound Clean Air Agency guidance documents, spreadsheet calculations.
Construction Equipment	Number and type of vehicles, duration of use	Port of Seattle construction phasing schedule, ACEIT database for types and usage of construction equipment, MOVES3 emission factors for King County, WA.	ACEIT and USEPA's MOVES3

Source: Port of Seattle and L&B, 2022.

1.5.2 Aircraft Operational Emissions Inventory

The number and type of aircraft operations directly affect emissions. The emission inventory for aircraft operations will be developed using the AEDT model Version 3e. AEDT models aircraft performance in space and time to estimate fuel consumption, air quality emissions, and noise consequences at airports. Aircraft emissions depend partly on the physical characteristics and performance parameters of each unique aircraft type. These include the airframe type, the type and number of engines, takeoff weight, and approach angle.

In addition to the physical characteristics of the aircraft operating at the Airport, emissions further depend on the number of times that each aircraft type operates in the various modes that define a landing and takeoff cycle (LTO). An LTO consists of the approach, taxi in, startup, taxi out, takeoff, and climb out. In AEDT, these modes are reported as time below mixing height and climb below mixing height.

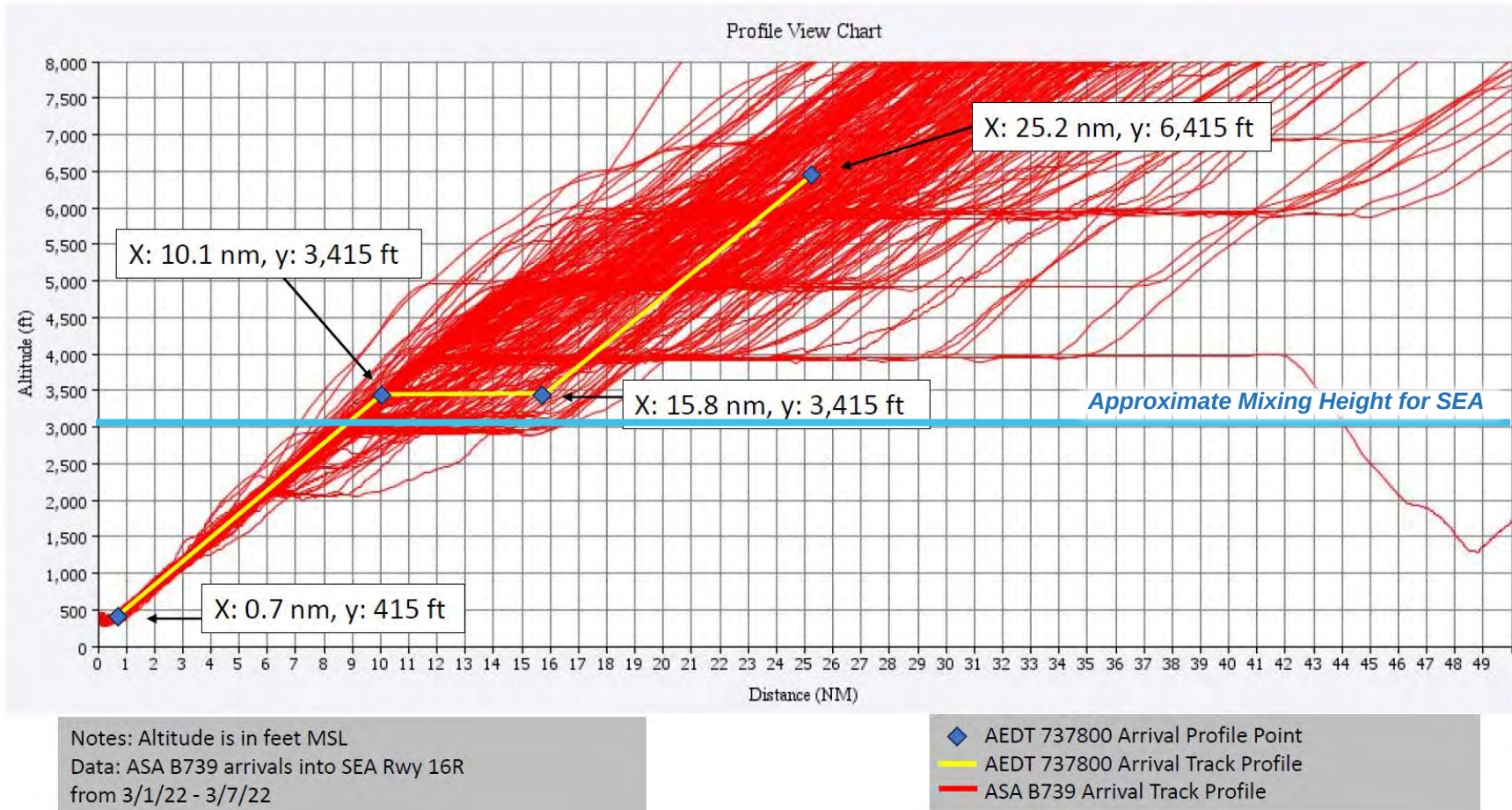
For the NEPA EA, emissions from aircraft will only be calculated when aircraft are operating in these modes within the atmospheric mixing layer, below the mixing height, where the emissions may influence ground-based pollutant concentrations. The mixing height, by definition, is the height below which emissions will be readily mixed to the surface in a time frame of a few minutes to an hour. Thus, the pollutants emitted within this mixing layer are the most important. The mixing height, combined with the angle of approach and the departure angle, determines the total time an aircraft operates in the mixing layer during approach and climb out, and thus potentially impacts human health. The mixing height used in this assessment will be defined as 3,084 feet in altitude above field elevation, which is the recommendation by the FAA based on the USEPA's *Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States*.⁶

Information on the number and type of aircraft operations for the existing conditions will be obtained from the Port of Seattle and by FAA's Air Traffic Activity Data System (ATADS) radar data. The radar data will be used to develop flight tracks in the AEDT. Additional data including aircraft types and engine combinations will then be researched and downloaded from the Port's EnvironmentalVue Flight Track Monitoring System. The assigning of aircraft engines will be based on the specific airframe and the operator. This information will be used to develop a representative aircraft fleet for input into the AEDT model. A review of radar data and the AEDT database confirmed the standard profiles included in AEDT are representative of actual aircraft performance (altitude, speed, thrust) at SEA. See **Exhibit 2** for an example of the comparison of an arrival aircraft altitude with the AEDT arrival standard profile conducted for the purpose of the NEPA EA.

With or without the Proposed Action, aircraft operations are expected to increase each year and by 2037, the number of annual aircraft operations will be higher as compared to the existing condition. Information on the number and type of aircraft operations for the future Proposed Action, No Action, and any identified alternatives will be based on the Port of Seattle's future aircraft activity forecasts and operational analysis. It is anticipated that the Proposed Action alternative will include a higher number of aircraft operations than the No Action alternative in both the 2032 and 2037 timeframes. The resulting emissions from these conditions will be disclosed as part of the analysis. Aircraft operational emissions inventories will be prepared for the existing condition, Proposed Action (2032 and 2037), No Action (2032 and 2037), and any identified alternatives. A qualitative discussion on the FAA's Continuous Lower Energy, Emissions, and Noise (CLEEN) Program and the Port of Seattle's sustainable fuel goals and how they could reduce future emissions will also be included.

⁶ USEPA. *Mixing Heights, Wind Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States*, January 1972. Page 110. Seattle, Washington has a reported diurnal variation of mixing heights between 705 meters (2,313 feet) and 1,175 meters (3,855 feet), with the daily average being 940 meters (3,084 feet).

Exhibit 2 Radar Data and AEDT Arrival Profile Comparison



1.5.2.1 Taxi Time and other Aircraft Times in Mode

The Proposed Action includes various elements that would have the potential to change average aircraft taxi time (delay time) at the Airport. The average taxi in and taxi out time is dependent on the airfield configuration, annual operating levels, and available facilities. The average taxi in and taxi out time for the existing conditions will be based on the FAA's operations and performance data for SEA including Aviation System Performance Metrics (ASPM).

The average taxi in and taxi out time for the future conditions will be determined by delay modeling developed with the Total Airspace and Airport Modeler (TAAM) tool normalized to ASPM. This information will be provided by the Port of Seattle.⁷

1.5.2.2 Aircraft Run-Ups

Aircraft engine ground run-ups are routine aircraft engine maintenance tests performed to test engines and diagnose engine issues. Aircraft run-up activity logs will be provided by the Port of Seattle to determine the amount of run-up operations, the location of the run-up, average duration, and the associated airframe and engine in the existing conditions. Run-up activity in the future conditions will be based on the Port of Seattle's future aircraft activity forecasts and operational analysis.

1.5.3 Auxiliary Power Units Emissions Inventory

Most of the larger jet aircraft use auxiliary power units (APUs) while at the gate to operate the heating, air conditioning, and electric systems. The APU is also used to 'start up' or restart the aircraft engines before departing from the gate or cargo area. APU usage is within the control of the pilot; therefore, APU use and emissions can vary greatly from one airline/operator to another and even one aircraft to another. Most of the smaller general aviation aircraft in the SEA aircraft fleet do not have APUs. Additionally, the use of hardstand and cargo operations (when aircraft are not using gates and jet bridges) impacts the amount of APU emissions. For the existing and future conditions analysis, the AEDT database will be used to assign the specific types of APU used for each aircraft type and the Port of Seattle's Rules and Regulations will be used to determine APU usage.

1.5.4 Ground Support Equipment Emissions Inventory.

Typical ground support equipment (GSE) includes baggage tractors, belt loaders, and catering vehicles that support airport operations.

1.5.4.1 Tenant-Owned

A GSE survey (i.e., field verification and Port of Seattle data) will be used in AEDT modeling of tenant-owned GSE. The survey will be used to identify the most commonly used GSE types and duration of usage for a select group of representative aircraft by airline operating at the Airport. The results of the survey will be used to develop the AEDT inputs for GSE by aircraft operation. Usage for future conditions would be increased based on the increases in aircraft levels. Operational emissions from vehicles such as catering trucks that operate on airport roadways beyond the immediate vicinity of the aircraft will be quantified in the motor vehicle emissions inventory (see Section 1.5.5).

1.5.4.2 Port-Owned GSE

The airport maintains a fleet of GSE vehicles such as sweepers, and other portable equipment such as pressure washers and lighting trailers. GSE owned by the Port of Seattle that are determined not to be included in the GSE for each aircraft operation, will be modeled in AEDT as a separate population.

⁷ Leigh Fisher. Environmental Review Airside Modeling, June 2020.

1.5.5 Motor Vehicle Emissions Inventory

1.5.5.1 Off-Airport Roadways

Motor vehicles operating on off-airport roadways include passenger cars, light duty and heavy-duty trucks, and buses. These vehicles are also referred to as Ground Access Vehicles (GAVs). The study area to be used for this air quality analysis will be the same as that used for the surface transportation study developed for the NEPA EA. The surface transportation study intersections are shown in **Exhibit 3** and the resulting air quality study area is shown in **Exhibit 4**. The USEPA's Motor Vehicle Emissions Simulator version 3 (MOVES3) will be used to develop the emissions inventory for GAVs on roadways that may be directly affected by the Proposed Action.

The Proposed Action includes roadway changes that will offer a greater level of efficiency for GAVs than the No Action, resulting in less idling of engines:

- Construct approximately 7,300 linear feet of new Airport roadways to access the new Second Terminal.
- New Vehicle Service Road bridge over S 188 Street.
- Elevated Busway: Construct a 6,000 linear foot elevated busway to provide a landside connection for non-secure passengers to transfer among the Main Terminal, New Second Terminal, and Rental Car Facility.
- Charter/Cruise Ground Transportation Lot: Expand the existing ground transportation lot on the north side of the existing parking garage.

The Proposed Action also includes relocation of facilities including employee parking lots and cargo facilities that may cause GAVs to travel a further distance.

Each roadway segment to be analyzed for the No Action and Proposed Action scenarios will be measured to define the distance. Data pertaining to the existing number of vehicles traveling on each roadway will be obtained from the surface transportation study being conducted for this project. Where data is not being collected for roadway segments within the study area, WSDOT data will be utilized. MOVES3 will be used to assign the type of vehicles distribution, fuel efficiency, etc. applicable to King County. The Port of Seattle is preparing a surface transportation study to forecast the potential number of vehicles on future roadways included in the Proposed Action. The results of the surface transportation study will be used to determine the motor vehicle emissions for the existing, Proposed Action (2032 and 2037), and No Action (2032 and 2037) conditions.

1.5.5.2 On-Airport Roadways

Additionally, motor vehicles operate on airport roadways related to airside deliveries, which include light duty and heavy-duty trucks, and buses. Information on the number and types of airside delivery vehicles accessing the airfield through security gates will be obtained from the Port. The NEPA emissions inventory for mobile sources will include vehicle activity related to airside deliveries.

1.5.5.3 Parking Facilities

Additionally, motor vehicles operate on airport parking facilities, which include passenger cars, light duty and heavy-duty trucks, and buses. Only emissions for vehicles in parking facilities where it is reasonable to anticipate changes in vehicle traffic due to the Proposed Action would be estimated. The NEPA emissions inventory for mobile sources will include vehicle activity related to parking facilities.

Exhibit 3 Surface Transportation Study Intersections

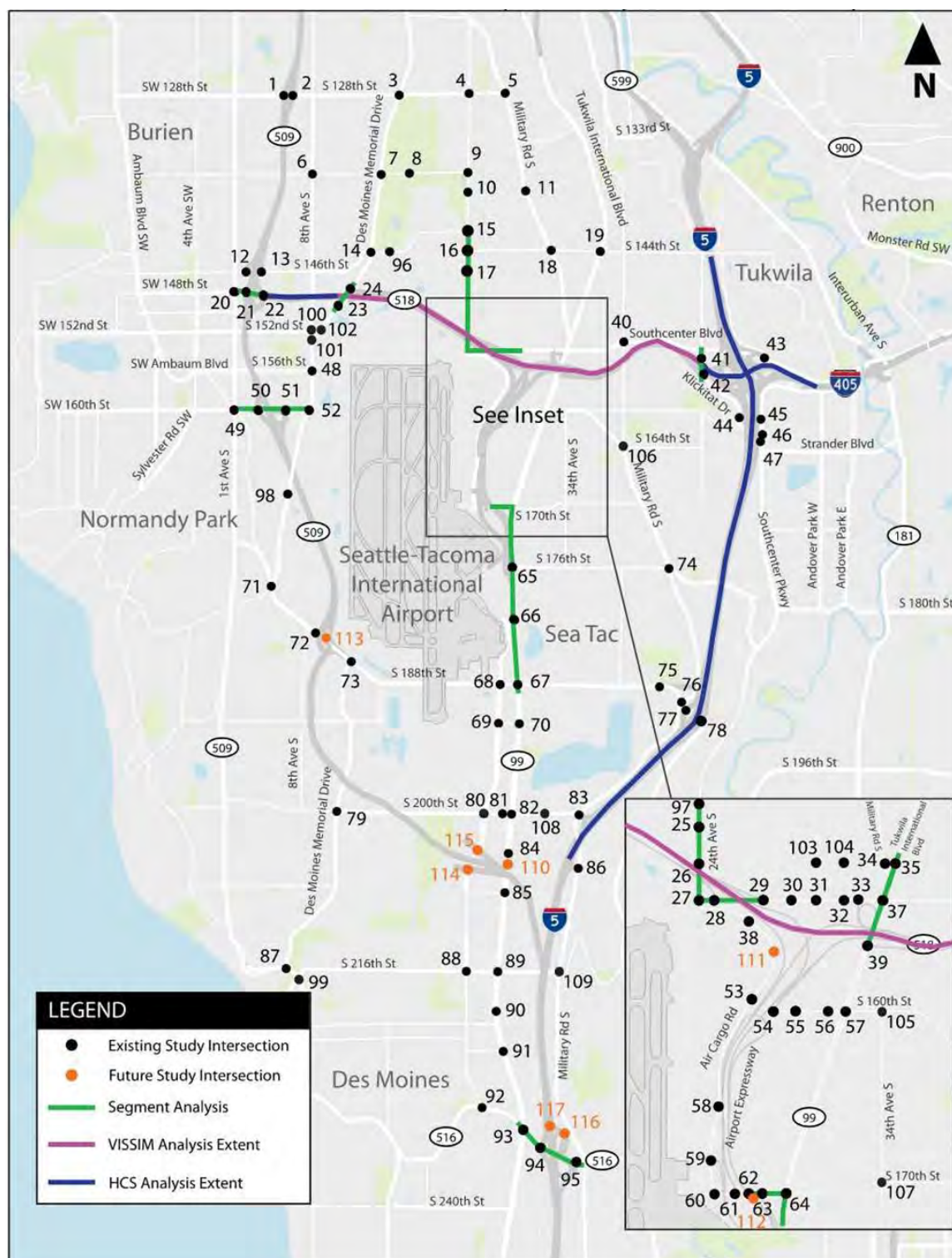


Exhibit 4 Air Quality Study Area



1.5.6 Stationary Source Emissions Inventory

Stationary sources of air pollution include generators, boilers, and fuel tanks located on airport property which may be directly affected by the Proposed Action. The emission inventory for stationary sources will be developed using FAA's AEDT based on the type of stationary source equipment and the duration of its usage. The Proposed Action includes construction and use of additional fuel tanks. Inputs to estimate fuel tank emissions include the size of the tank, type of fuel, and the fuel throughput. Assumptions and emission factors will be based on USEPA AP-42 and other regional Air Quality Management District guidance documents, should a particular equipment type not exist within the AEDT model.

Data will be obtained from the Port of Seattle on the existing use of stationary sources, on an annual basis, which will be projected for 2032 and 2037 for the No Action scenario based on increases of aircraft and passenger levels where applicable. Data will also be obtained from the Port of Seattle for the estimated number and type of stationary sources including anticipated heating and cooling systems and backup generators associated with the proposed new facilities that would be used for the Proposed Action scenario in 2032 and 2037.

1.5.7 Construction Emissions Inventory

Temporary air quality impacts would result from construction activities associated with the Proposed Action. Air pollutants would be emitted by construction equipment and fugitive dust generated during demolition and construction of the proposed development. Construction activities associated with the Proposed Action are set to begin in 2025 and all projects being in construction by 2032. A detailed construction phasing schedule will be used to identify which projects will occur between 2025 and 2032. Potential sources of construction emissions include construction vehicles and equipment. Emissions for on-road and non-road construction equipment will be estimated separately following standard industry practices.

Non-Road Construction Equipment

Potential non-road construction emissions will be estimated using the following formula as provided in the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*.

$$\text{Equipment Emission Rate (tons/year)} = \text{Full Throttle Emission Factor (grams/hp-hour)} \times \text{size (hp)} \\ \times \text{hours per year} \times \text{Load Factor} \times \text{usage Factor} \times (1 \text{ pound}/453.59 \text{ grams}) \times (1 \text{ ton}/2,000 \text{ pounds})$$

Data will be obtained from the Port of Seattle concerning each phase of construction, the duration of the phase, the tasks to be completed, and other additional information for input into the Airport Construction Emissions Inventory Tool (ACEIT) to estimate the type of construction equipment, horsepower, load factor, and operating hours for each project element and phase. The ACEIT was developed by the Airport Cooperative Research Program (ACRP) and the equipment and assumptions used in the program are drawn from ACRP Report 102, *Guidance for Estimating Airport Construction Emissions*. The USEPA's MOVES3 model will be used to identify the emission factor of each criteria air pollutant for each equipment type. Non-road construction equipment emissions will be calculated based on the number of operating hours of equipment use and the emission factors.

Evaporative VOC emissions associated with the application of hot mix asphalt will be estimated using the formula provided in the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*.

$$\text{Asphalt VOCs Emissions Rate (tons/year)} = 0.053 \text{ tons/acre of asphalt placed} \times \text{acres of asphalt} \\ \text{placed per year}$$

The emissions results for all equipment will be summed and will be provided in tabular form for each year of construction.

On-Road Construction Vehicles

Potential on-road construction emissions will be estimated using the following formula as provided in the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*.

$$\text{Emission Rate (tons/year) for on-road vehicles} = \text{Emission Factor (grams/mile)} \times \text{miles per day} \times \text{\# of days/year} \times (1 \text{ pound}/453.59 \text{ grams}) \times (1 \text{ ton}/2,000 \text{ pounds})$$

Emission factors for on-road construction vehicles will be developed using the MOVES3 model. For employee vehicle trips related to construction activities, the model will be run using gasoline passenger vehicles including cars and light duty pickup trucks. For material delivery and off-site haul vehicle trips, diesel combination long-haul trucks will be assumed in order to estimate maximum potential emissions.

Total vehicle miles traveled (VMT) for vehicles operating during each Proposed Action element and for each type of on-road construction activity during each construction year will be estimated. This includes construction employee vehicle trips to and from the job site using model default distances. The analysis will also include material delivery trips and off-site hauling trips using heavy duty trucks using model default distances. Potential on-road construction emissions will be estimated by multiplying the VMT data by the appropriate emission factors and the necessary conversion factors to present the criteria air pollutant emissions in tons. The results will be provided in tabular form for each year of construction.

2 Protocol for Cumulative Impact Analysis for Air Quality (NEPA)

The Council on Environmental Quality (CEQ) Regulations define a cumulative impact as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (see 40 CFR § 1508.7). The analysis of cumulative impacts recognizes that while the impacts of individual actions may be small, when combined with the impacts of past, present, and reasonably foreseeable future actions on populations or resources in and around SEA, the impacts could be potentially significant.

Pursuant to FAA guidance, past, present, and reasonably foreseeable future actions must be considered in determining whether there are potential cumulative impacts. Based on the guidance from 1050.1F Desk Reference, “[t]he significance of cumulative impacts should be determined in the same manner as the significance of direct and indirect impacts.” FAA Order 1050.1F uses the same threshold of significance for project significant impacts as it does for cumulative impacts.

2.1 Review the List of Past, Present, and Reasonably Foreseeable Future Projects

Past Projects

CEQ NEPA regulations require analysis of past actions to the extent they are relevant and useful in analyzing whether the reasonably foreseeable effects of the current action combined with the past action would create cumulative effects. It is important to note that according to the CEQ's memorandum, *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis*, focus should be on whether the information from past projects is “relevant to reasonably foreseeable significant adverse impacts,” is “essential to a reasoned choice among alternatives,” and can be obtained without exorbitant cost. Furthermore, present impacts of past actions that are relevant and useful are those that may have a significant cause-and-effect relationship with the

direct and indirect impacts of the proposed action and alternative(s). Only information that is useful to decision-makers and the public should be included, and the CEQ warns against including extraneous background data.

For this analysis, past projects are defined as those which occurred within the past seven years (between 2015 and 2022). This timeframe goes back far enough to provide a reasonable historical context about the current state of the resource.⁸

Present Projects

Present projects are any actions occurring within the same study area as the existing conditions for the Proposed Action.

Reasonably Foreseeable Future Projects

Reasonably foreseeable future projects are defined as actions that are likely to be completed within the time period from 2022 through 2032 and that have been developed with enough specificity to provide meaningful data for analysis. No projects past 2032 are included because there is a lack of adequate detail about those later projects to enable meaningful review; any analysis of those projects or their impacts would be speculative.

2.2 Identify Air Quality Impacts of the Proposed Action

A review will be conducted of the air quality analyses that have been undertaken for the cumulative projects identified (past, present, and reasonably foreseeable future projects). A qualitative evaluation of the air quality cumulative impacts with consideration of the cumulative projects' will be developed.

Note, the NEPA EA will evaluate the potential air quality impacts on environmental justice communities (areas where minority and low-income populations represent a higher fraction of the population compared with the general population) independent of the air quality analysis. As such, an environmental justice impact analysis will not be included in the air quality analysis.

⁸ The FAA has discretion to determine whether, and to what extent, information about the specific nature, design, or present impacts of a past action are useful for the analysis of the impacts of the proposed action and alternative(s).



National Environmental Policy Act Environmental Assessment

Climate Assessment Protocol

Seattle-Tacoma International Airport

August 2023

Revised August 17, 2023

PREPARED FOR

Port of Seattle

After the publication of the Draft EA, Executive Order 13990, which was relied upon for the January 2023 CEQ draft GHG guidance, was revoked and CEQ revoked its regulations (40 CFR parts 1500-1508) implementing NEPA, 42 U.S.C. 4321 et seq., as amended, in response to Executive Order 14154. In addition, the Supreme Court issued the *Seven County Infrastructure Coalition v. Eagle County*, 605 U. S. 975 (2025) ruling on May 29, 2025. As a result of these changes, the references to climate, qualitative climate evaluation that discussed the level of preparedness with respect to the impacts of climate change, the extent to which the alternatives could be affected by future climate conditions, and if the alternatives are consistent with national, state, and local climate goals, and the cumulative impact analysis were removed from the Final EA. Though this protocol included methodology for both a climate change and cumulative impact analysis, FAA's final decision will only rely upon the GHG emissions disclosed in the Final EA.

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1 Protocol for Climate Assessment (NEPA)

The National Environmental Policy Act (NEPA) provides for an environmental review process to disclose the potential impacts, including climate, from a proposed federal action on the human environment. Additionally, the Council on Environmental Quality (CEQ) issued guidance for agencies in January 2023 to guide the quantification of reasonably foreseeable GHG emission for the proposed action, no action alternative, and any reasonable alternatives, using available information and data.

1.1 Purpose of this Document

This document describes the overall approach and methods to conduct a climate assessment to demonstrate compliance to the NEPA, including the January 2023 CEQ guidance.

The Port of Seattle, as the owner and operator of the Seattle-Tacoma International Airport (SEA or Airport), evaluated airport operations and facilities during the Sustainable Airport Master Plan (SAMP) planning process and identified a set of Near-Term Projects (NTPs) designed to help the Airport maintain its essential airport function in the future. The NTPs (as a whole) are referred to as the Proposed Action in this document.

The NEPA documentation will be prepared to investigate, analyze, and disclose the potential environmental impacts of the Proposed Action and any identified alternatives in compliance with the NEPA.

1.2 Agency Coordination

The Port of Seattle and the FAA coordinated an air quality protocol with the Puget Sound Clean Air Agency (PSCAA) in 2020 that included the proposed climate assessment methodology. The air quality protocol was updated in 2023 to reflect changes in the analysis years and the use of newer software. During this update, the Port of Seattle and the FAA decided to create a separate climate assessment protocol. It is intended that this climate assessment protocol document be coordinated with the PSCAA in an effort to:

- Familiarize the agency with the scope of the Proposed Action and identify any issues of concern early in the process;
- Engage in data exchange of information necessary to complete the climate assessment; and,
- Obtain concurrence on procedure and methodology prior to the publication of the anticipated NEPA Environmental Assessment (EA).

1.3 Description of the Proposed Action

The Port identified a set of NTPs to address the near-term activity levels projected to occur at the Airport. The NTPs include more than 30 projects that would improve efficiency, safety, access to the Airport, and support facilities for airlines and the Airport.

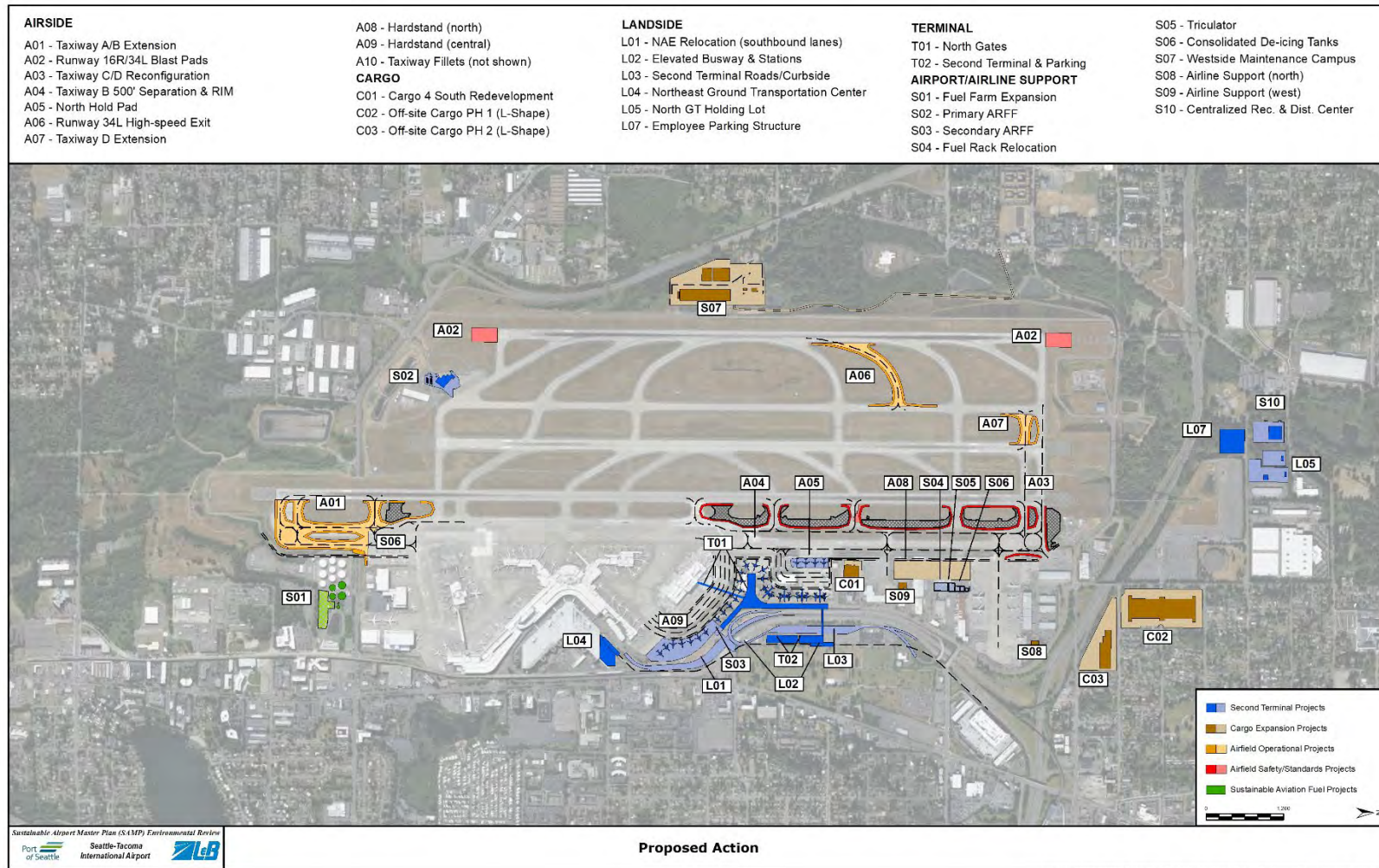
The NTPs include the following primary elements:

- Second terminal concourse
- New passenger terminal and parking
- North Airport Expressway relocation
- North hold pad
- Central hardstand

- Elevated busway and stations
- Second terminal roads and curbside
- Main Terminal north ground transportation lot
- North ground transportation holding lot
- North cargo hardstand
- Cargo 4 south redevelopment
- Cargo warehousing
- Runway 16R/34L blast pads
- Relocated Taxiways A and B
- Extension of Taxiways C and D
- Taxiway infrastructure reconfiguration (south of Taxiway O)
- Runway 34L highspeed exit
- Taxiway D extension
- Fuel farm expansion
- Employee parking structure

The elements of the Proposed Action are shown on **Exhibit 1**.

Exhibit 1 Proposed Action



2 Prepare Climate Assessment (NEPA)

The impacts to climate due to the Proposed Action for NEPA will be determined in accordance with the guidelines provided in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*; FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*; FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*; and the CEQ's *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change*. Per these guidelines, the climate assessment will include the development of a NEPA greenhouse gas (GHG) emissions inventory, disclosure of estimated GHG emissions, and a qualitative climate evaluation for the proposed action, no action alternative, and any reasonable alternatives as detailed below.

2.1 Develop Greenhouse Gas (GHG) Emissions Inventory (NEPA)

A GHG emissions inventory is a summary of the GHG pollutants generated by all active emissions sources that may be affected by the Proposed Action. The GHG emissions inventories are prepared based on actual and/or estimated energy or fuel consumption or vehicle miles travelled (VMTs) and an appropriate emission factor.

The elements of the Proposed Action would be anticipated to cause direct and indirect GHG emissions from construction and operational activities. For NEPA purposes, construction refers to the process of building or putting in place the proposed airport improvements. Operational emissions refer to the emissions that are emitted once the proposed improvements are put in place and are operating.

Therefore, a climate analysis incorporating separate evaluations will be conducted including the preparation of:

- Aircraft GHG Emissions Inventory including Auxiliary Power Unit (APU) GHG emissions;
- Motor Vehicle and Ground Support Equipment (GSE) GHG Emissions Inventory;
- Stationary Source GHG Emissions Inventory;
- Electricity Consumption GHG Emissions Inventory; and,
- Construction GHG Emissions Inventory.

2.1.1 Short Term and Long-Term Effects

According to CEQ's *National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change*, "[w]hen considering effects, agencies should take into account both the short and long-term adverse and beneficial effects using a temporal scope that is grounded in the concept of reasonable foreseeability. Agencies should identify an appropriate lifetime for the proposed action using available indicators and guided by the concept of reasonable foreseeability."

The GHG emissions will be disclosed for existing conditions, which will represent calendar year 2022. The GHG emissions and potential climate impacts due to the operation of the Proposed Action, No Action, and any identified alternatives for the projected future conditions in 2032 and 2037 will be estimated and disclosed. The year 2032 will be used as a basis for analysis because 2032 is the projected opening year of the Proposed Action. In addition, 2037 will be used as a basis for analysis, because it represents a condition five years beyond the opening year, and is consistent with the analysis years used for noise and air quality (criteria pollutant) analysis.¹ The climate assessment will also disclose the potential climate impacts due to construction activities during the years 2025 to 2032.

¹ The FAA's Desk Reference Section 11.3 states "The environmental consequences section of the NEPA document will include the analysis of the potential noise impacts of the proposed action and alternative(s) for each timeframe

A qualitative discussion will be included in the NEPA EA regarding the potential emissions over the projected lifetime of the Proposed Action and any identified alternatives past 2037.²

2.1.2 Greenhouse Gases and Global Warming Potential

GHGs are gases that trap heat in the earth's atmosphere. The primary GHGs which will be the focus of this assessment include the following:

- **Carbon dioxide (CO₂)**, which enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), agriculture, irrigation, and deforestation, as well as the manufacturing of cement.
- **Methane (CH₄)**, which is emitted through the production and transportation of coal, natural gas, and oil, as well as from livestock. Other major human-caused sources of methane emissions include agricultural activities, and the decay of waste in landfills and wastewater treatment plants.
- **Nitrous oxide (N₂O)**, which at airports is released most often during the burning of fuel at high temperatures. This greenhouse gas is caused mostly by agricultural soil management, but also by motor vehicles, which also include non-road vehicles, such as those used for agriculture.

Two key ways in which these GHGs differ from each other are their ability to absorb energy and how long they stay in the atmosphere. The Global Warming Potential (GWP) was developed to allow comparisons of the global warming impacts of different gases by converting each gas amount to a carbon dioxide equivalent (CO₂E).³ GWPs provide a common unit of measure, which allows for one emission estimate of the different GHGs. CO₂ has a GWP of one because it is the gas used as the reference point. For this analysis, GWPs would be based on a 100-year period provided in the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1* and based on the Intergovernmental Panel on Climate Change (IPCC), Fifth Assessment Report (AR5).⁴ Methane does not last as long in the atmosphere as CO₂, however, it absorbs much more energy. Therefore, one ton of methane has 34 times more heat capturing potential than one ton of carbon dioxide. The amount of methane emissions will be multiplied by 34 to determine its CO₂E value. Nitrous oxide lasts in the atmosphere far longer than CO₂. The amount of nitrous oxide emissions will be multiplied by 298 to determine its CO₂E value.

The NEPA GHG emissions inventory will be conducted to provide the estimate of the annual rate (metric tons per year) of GHG emissions attributable to airport sources for each analysis year.

evaluated... Timeframes usually selected are the year of anticipated project implementation and 5 to 10 years after implementation." The FAA's Desk Reference Section 1.3.2 for air quality states, "the emissions inventory usually is calculated for the year(s) of project implementation, the planning horizon year(s) in the EA or EIS, and sometimes for intermediate years, if appropriate due to project phasing or if requested by a reviewing agency." The air quality analysis would be conducted consistent with the noise analysis and therefore include an assessment of the implementation year and of the project five years after implementation.

² Because the lifetime of airport projects are virtually unlimited if well maintained, decommissioning of the airport is not included as part of this analysis.

³ EPA, 2017, Understanding Global Warming Potentials. <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>, Accessed August 2017.

⁴ There are also 20-year GWP values which prioritizes gases with shorter lifetimes. For example, the GWP 20 value for methane is 86, according to IPCC AR5, as compared to the GWP 100 value of 34. There is no difference between GWP 100 and GWP 20 for CO₂ and only a minor difference for nitrous oxide (GWP 100 is 298 and GWP 20 is 268). It is acknowledged that GHG emissions, especially for methane, would be higher using the GWP 20 instead of the GWP 100. This analysis used FAA guidance specifically provided in the FAA's *Aviation Emissions and Air Quality Handbook* to determine potential GHG emissions.

2.1.3 Scope/Categories of Emissions

GHG emissions inventories are presented in a different manner than air quality criteria pollutant emissions inventories. GHG emissions inventories are categorized into three groups, Scope 1, 2, and 3 emissions, as described below.

- Scope 1 – GHG emissions from sources owned or controlled by the Port at the Airport, including Port-owned vehicles, equipment, and stationary sources such as natural gas boilers and diesel generators. These GHGs are primarily limited to the project site.
- Scope 2 – GHG emissions from off-Airport generation of electricity purchased by the Port and consumed at the Airport. It is recognized that the estimation of GHG emissions from electricity generation is a widely accepted methodology according to international and FAA guidelines on preparing GHG emissions inventories.
- Scope 3 –GHG emissions caused by airport operations that are not under the direct control of the Port, including sources like aircraft and passenger-related motor vehicle emissions.

Furthermore, GHG emissions are categorized by the degrees of control that an airport operator may have over them. These categories are defined as follows:

- Category 1 – GHG emissions from sources that are controlled by the reporting entity, such as Port-owned ground support equipment (GSE) or vehicles and electrical consumption by the Port. In the case of an airport operator these include Scope 1 emissions but can also include some Scope 2 and Scope 3 sources over which the entity can exert some control. Examples of the latter can include personal vehicle use for business purposes that is reimbursed by the airport operator.
- Category 2 – This category comprises Scope 3 emissions associated with sources owned and controlled by airlines and airport tenants. Examples include aircraft, APUs, tenant-owned GSE, electrical consumption, and other stationary sources controlled by tenants.
- Category 3 – This category generally comprises Scope 3 emissions associated with public sources associated with the airport. Examples include private automobiles, taxis used for drop-off, limousines, buses, and shuttle vans traveling to and from the airport.

2.1.4 Operational Emissions Sources

The overall GHG assessment approach to develop the operational emissions inventories for NEPA is summarized in **Table 1**, with further details following.

Table 1 NEPA Approach for GHG Emissions Inventories

Emissions Source	Data / Conditions	Data Source	Models to be Used	Scope and Category
Aircraft	Fuel Dispensed	For existing conditions, fuel dispensed will be used to estimate emissions from aircraft fuel consumption. For future conditions, the fuel consumption would be based on the increases in aircraft levels.	Fuel Emission Factors from FAA <i>Aviation Emissions and Air Quality Handbook Version 3 Update 1</i>	Scope 3, Category 2
Aircraft	Auxiliary Power Unit (APU) Operating Times	For existing and future conditions, the AEDT database will be used to assign the APU type and the Port of Seattle's Rules and Regulations will be used to assign APU usage. The AEDT output will be used to determine hours of APU run time per type/model.	Fuel flow rates and Emission Factors from FAA <i>Aviation Emissions and Air Quality Handbook Version 3 Update 1</i> . Number of APU, fuel type, operating time from AEDT.	Scope 3, Category 2
Ground Support Equipment (GSE)	GSE equipment types, Fuel types, and Operating Times	<i>Tenant-Owned</i> For existing conditions, a GSE survey (i.e., field verification and Port of Seattle data) will be used to identify equipment types and usage. Usage for future conditions would be increased based on the increases in aircraft levels.	Emission factors from USEPA's MOVES3 and FAA <i>Aviation Emissions and Air Quality Handbook Version 3 Update 1</i> . Number of GSE, fuel type, operating time from AEDT.	Scope 3, Category 2

Emissions Source	Data / Conditions	Data Source	Models to be Used	Scope and Category
Ground Support Equipment (GSE)	GSE equipment types, Fuel types, and Operating Times	<i>Port-Owned</i> For existing conditions, Port-owned airfield vehicles and equipment usage would be obtained from the Port. Usage for future conditions would be based on the increases in aircraft levels. The AEDT output will be used to determine hours of GSE run time per type/model.	Emission factors from USEPA's MOVES3 and FAA <i>Aviation Emissions and Air Quality Handbook Version 3 Update 1</i>. Number of GSE, fuel type, operating time from AEDT.	Scope 1, Category 1
Motor Vehicles	Number of vehicles by roadway segment, Vehicle Miles Travelled (VMTs) by vehicle type and average speed	<i>Off-Airport Roadways</i> For existing and future conditions, information from the surface transportation study developed for the NEPA EA will be used. Where data is not being collected for roadway segments within the study area, WSDOT data will be utilized. <i>On-Airport Roadways</i> For existing conditions, Port of Seattle information on the number and types of airside delivery vehicles accessing the airfield through security gates. For future conditions, the increase would be based on the increase in passenger levels. <i>Parking Facilities</i> For existing conditions, information from the Port of Seattle would be used. For future conditions, the increase would be based on the increase in passenger levels and aircraft operations.	USEPA's MOVES3	Scope 3, Category 3

Emissions Source	Data / Conditions	Data Source	Models to be Used	Scope and Category
Stationary Sources	Number, type, and usage for emergency generators, boilers, and fuel tanks, the usage of which may be affected by the Proposed Action	For existing conditions, Port of Seattle records will be used. For future conditions, estimates will be based on increases in aircraft and passenger levels and anticipated new facilities.	Fuel consumption from Port records and Emission Factors from USEPA.	Scope 1, Category 1
Electricity Consumption	<i>Port of Seattle Electricity Consumption</i> Electricity use in Airport buildings, airfield lighting	For existing conditions, Port of Seattle records will be used. For the future conditions, electricity consumption would be based on the change in new facility square footage for each scenario.	Port to provide emission factors	Scope 2, Category 1
Electricity Consumption	<i>Tenant Electricity Consumption</i> Electricity provided by the Port directly to tenants	For existing conditions, Port of Seattle records will be used. For the future conditions, electricity consumption would be based on the change in square footage for each scenario.	Port to provide emission factors	Scope 3, Category 2

Port of Seattle and L&B, 2023.

2.1.5 Aircraft

Aircraft activity at the Airport are considered Scope 3, Category 2. The existing GHG emission inventory for aircraft operations, APU use, and aircraft engine ground run-ups will be developed using the fuel dispensed at the Airport to estimate emissions from aircraft activity. With or without the Proposed Action, aircraft operations and aircraft engine ground run-ups are expected to increase each year and by 2037, the number of annual aircraft operations will be higher as compared to the existing condition. For future conditions, the fuel consumption would be based on the increases in aircraft levels. The resulting operational emissions from these conditions will be disclosed as part of the analysis for the existing condition, Proposed Action (2032 and 2037), No Action (2032 and 2037), and any identified alternatives.

The emission factors for Jet A LTO shown in **Table 2** will be used to determine GHG emissions from the fuel dispensed at the Airport.

Table 2 GHG Emission Factors for Aircraft Fuel

Fuel	CO ₂	N ₂ O	CH ₄
Jet A- LTO	9.75 kg/gallon	0.30 g/gallon	0.0 g/gallon
Jet A- Startup mode	9.75 kg/gallon	0.30 g/gallon	0.0 g/gallon
Avgas LTO/Startup	8.31 kg/gallon	0.11 g/gallon	7.06 g/gallon

Source: US EPA, Emission Factors for Greenhouse Gas Inventories, Center for Corporate Climate Leadership, April 2022, https://www.epa.gov/system/files/documents/2022-04/ghg_emission_factors_hub.pdf

2.1.6 Auxiliary Power Units

Most of the larger jet aircraft use auxiliary power units (APUs) while at the gate to operate the heating, air conditioning, and electric systems. The APU is also used to ‘start up’ or restart the aircraft engines before departing from the gate or cargo area. APU usage is within the control of the pilot; therefore, APU use and emissions can vary greatly from one airline/operator to another and even one aircraft to another.

APUs are considered Scope 3, Category 2. Most of the smaller general aviation aircraft in the SEA aircraft fleet do not have APUs. Additionally, the use of hardstand and cargo operations (when aircraft are not using gates and jet bridges) impacts the amount of APU emissions. For the existing and future conditions analysis, the AEDT database will be used to assign the specific types of APU used for each aircraft type. The Port of Seattle’s Rules and Regulations will be used to determine existing and future APU usage.

The AEDT will be used to estimate the hours of usage and type of APU equipment. Fuel usage will be determined using the following formula from the FAA’s *Aviation Emissions and Air Quality Handbook Version 3 Update 1*.

Fuel Usage (gallons) = Fuel Flow Rate (pounds per hour) x Operating Time (minutes) x number of operations x 1 hour per 60 minutes / 6.84 pounds per gallon

Fuel flow rates (pounds per hour) will be taken from the FAA’s *Aviation Emissions and Air Quality Handbook Version 3 Update 1 Table C-2*. Operating time will come from the Port of Seattle’s Rules and Regulations and number of operations will be based on aircraft operations as developed through AEDT modeling. Once the number of gallons is determined, the emission factors for Jet A Startup mode shown in **Table 2** will be used to determine GHG emissions.

2.1.7 Ground Support Equipment

Typical ground support equipment (GSE) includes baggage tractors, belt loaders, and catering vehicles that support airport operations. Annual GHG emissions will be determined using the following formula from the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*.

$$\text{Equipment Emission Rate (tons/year)} = \text{Full Throttle Emission Factor (grams/hp-hour)} \times \text{size (hp)} \times \text{hours per year} \times \text{Load Factor} \times \text{Usage Factor} \times (1 \text{ pound}/453.59 \text{ grams}) \times (1 \text{ ton}/2,000 \text{ pounds})$$

The full throttle emission factor will be developed from MOVES3.⁵ Horsepower, operating time per unit and number of operations, and load factor will be obtained from the AEDT outputs as detailed below.

2.1.7.1 Tenant-Owned

Tenant-owned GSE are considered Scope 3, Category 2. A GSE survey (i.e., field verification and Port of Seattle data) will be used in AEDT modeling of tenant-owned GSE. The survey will be used to identify the most commonly used GSE types and duration of usage for a select group of representative aircraft by airline operating at the Airport. The results of the survey will be used to develop the AEDT inputs for GSE by aircraft operation. The AEDT will provide the estimated annual usage for each GSE type and the FAA's equipment emission rate equation identified in Section 2.1.7 will be used to estimate the annual tenant-owned GSE emissions. Usage for future conditions would be increased based on the increases in aircraft levels. Operational emissions from vehicles such as catering trucks that operate on airport roadways beyond the immediate vicinity of the aircraft will be quantified in the motor vehicles NEPA GHG emissions inventory.

2.1.7.2 Port-Owned GSE

The airport maintains a fleet of GSE vehicles such as sweepers, and other portable equipment such as pressure washers and lighting trailers used on the airfield. Port-owned GSE vehicles are considered Scope 1, Category 1. GSE owned by the Port of Seattle that are determined not to be included in the GSE for each aircraft operation, will be modeled in AEDT as a separate population.

2.1.8 Stationary Source

Stationary sources of air pollution include generators, boilers, and fuel tanks located on airport property which may be directly affected by the Proposed Action. Stationary sources used by the Port are also included in Scope 1, Category 1. The emission inventory for stationary sources will be developed using FAA's AEDT based on the type of stationary source equipment and the duration of its usage. The Proposed Action includes construction and use of additional fuel tanks. Inputs to estimate fuel tank emissions include the size of the tank, type of fuel, and the fuel throughput. Assumptions and emission factors will be based on USEPA AP-42 and other regional air quality regulatory agency guidance documents, should a particular equipment type not exist within the AEDT model.

Data will be obtained from the Port of Seattle on the existing fuel or run-time use of stationary sources, on an annual basis, which will be projected for 2032 and 2037 for the No Action scenario based on projected increases of aircraft and passenger levels where applicable. Data will also be obtained from the Port of Seattle for the estimated number and type of stationary sources including anticipated heating and cooling systems and backup generators associated with the proposed new facilities that would be used for the Proposed Action scenario in 2032 and 2037.

In order to determine GHG emissions, the emission factors shown in **Table 3** will be used.

⁵ The Airport Support Equipment available in MOVES3 will be used for Ground Support Equipment

Table 3 GHG Emission Factors for Stationary Sources

Fuel	CO ₂	N ₂ O	CH ₄
Natural Gas	0.05444 kg/ standard cubic foot (scf)	0.00010 g/scf	0.00103 g/scf
No. 2 Oil (Diesel)	10.21 kg/gallon	0.08 g/gallon	0.41 g/gallon

Source: US EPA, Emission Factors for Greenhouse Gas Inventories, Center for Corporate Climate Leadership, April 2022, https://www.epa.gov/system/files/documents/2022-04/ghg_emission_factors_hub.pdf

2.1.9 Motor Vehicles

GHG emissions from motor vehicles operating on on- and off-airport roadways and within select parking lots are considered Scope 3, Category 3.

2.1.9.1 Off-Airport Roadways

Motor vehicles operating on off-airport roadways include passenger cars, light duty and heavy-duty trucks, and buses. These vehicles are also referred to as Ground Access Vehicles (GAVs). The study area to be used for this analysis will be the same as that used for the surface transportation study developed for the NEPA EA. The USEPA's Motor Vehicle Emissions Simulator version 3 (MOVES3) will be used to develop the NEPA GHG emissions inventory for GAVs on roadways that may be directly affected by the Proposed Action.

The Proposed Action includes roadway changes that will offer a greater level of efficiency for GAVs than the No Action:

- Construct approximately 7,300 linear feet of new Airport roadways to access the new Second Terminal.
- New Vehicle Service Road bridge over S 188 Street.
- Elevated Busway: Construct a 6,000 linear foot elevated busway to provide a landside connection for non-secure passengers to transfer among the Main Terminal, New Second Terminal, and Rental Car Facility.
- Charter/Cruise Ground Transportation Lot: Expand the existing ground transportation lot on the north side of the existing parking garage.

The Proposed Action also includes relocation of facilities including employee parking lots and cargo facilities that may cause GAVs to travel a further distance.

Each roadway segment to be analyzed for the No Action and Proposed Action scenarios will be measured to define the distance. Data will be obtained from the Port of Seattle and WSDOT pertaining to the existing number of vehicles traveling on each roadway. Within King County, MOVES3 will be used to assign the distribution of vehicle types, fuel efficiency, etc. to the respective roadways. The Port of Seattle is preparing a surface transportation study to forecast the potential number of vehicles on future roadways included in the Proposed Action. The results of the surface transportation study will be used to determine the motor vehicle emissions for the existing, Proposed Action (2032 and 2037), and No Action (2032 and 2037) conditions.

2.1.9.2 On-Airport Roadways

Additionally, motor vehicles operate on airport roadways related to airside deliveries, which include light duty and heavy-duty trucks, and buses. Information on the number and types of airside delivery vehicles accessing the airfield through security gates will be obtained from the Port, and average trip distances on the airfield calculated. The NEPA GHG emissions inventory for mobile sources will include vehicle activity related to airside deliveries.

2.1.9.3 Parking Facilities

Additionally, motor vehicles operate on airport parking facilities, which include passenger cars, light duty and heavy-duty trucks, and buses. Only emissions for vehicles in parking facilities where it is reasonable to anticipate changes in vehicle traffic due to the Proposed Action would be estimated. The NEPA GHG emissions inventory for mobile sources will include vehicle activity related to parking facilities.

2.1.10 Electricity Consumption

GHG emissions are created as a result of the generation of electricity used in Airport buildings (e.g., Airport terminals, distribution center, bus maintenance facility, and other miscellaneous sources), airfield lighting, and provided from the Port directly to tenants.

2.1.10.1 Port of Seattle Electricity Consumption

Port of Seattle electricity consumption is a result of electricity use in Airport buildings (e.g., Airport terminals, distribution center, bus maintenance facility, and other miscellaneous sources) and the airfield lighting which are generated from offsite power plant locations. This is considered Scope 2, Category 1.

GHG emissions from the consumption of electricity are calculated by multiplying the total annual electrical consumption by the emission factor of the electricity provider. The total annual electrical consumption and the appropriate emission factors will be provided by the Port.

2.1.10.2 Tenant Electricity Consumption

Tenant electricity consumption includes electricity used by tenant facilities including electricity for charging electrified GSE. This is considered Scope 3, Category 2.

GHG emissions from the consumption of electricity are calculated by multiplying the total annual electrical consumption by the emission factor of the electricity provider. The total annual electrical consumption and the appropriate emission factors will be provided by the Port.

2.1.11 Construction

Temporary increase in GHG emissions would result from construction activities associated with the Proposed Action. GHG pollutants would be emitted by construction equipment during demolition and construction of the proposed development.⁶ Construction activities associated with the Proposed Action are set to begin in 2025 and all projects being in construction by 2032. A detailed construction phasing schedule will be used to identify which projects will occur between 2025 and 2032. Potential sources of construction emissions include construction vehicles and equipment. Emissions for on-road and non-road construction equipment will be estimated separately following standard industry practices.

The USEPA's MOVES3 model will be used to identify the emission factor for each equipment type. Non-road construction equipment GHG emissions will be calculated based on the number of operating hours and the emission factors. The GHG emissions results for all equipment will be summed and provided in tabular form for each year of construction.

Emission factors for on-road construction vehicles will also be developed using MOVES3. Potential on-road construction GHG emissions will be estimated by multiplying the VMT data by the appropriate emission factors and the necessary conversion factors to present the GHG emissions in metric tons. The results will be provided in tabular form for each year of construction.

⁶ Embodied carbon associated with building materials used in the construction of the Proposed Action will not be included in this analysis.

Non-Road Construction Equipment

Potential non-road construction emissions will be estimated using the following formula as provided in the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*.

$$\text{Equipment Emission Rate (tons/year)} = \text{Full Throttle Emission Factor (grams/hp-hour)} \times \text{size (hp)} \times \text{hours per year} \times \text{Load Factor} \times \text{usage Factor} \times (1 \text{ pound}/453.59 \text{ grams}) \times (1 \text{ ton}/2,000 \text{ pounds})$$

Data will be obtained from the Port of Seattle concerning each phase of construction, the duration of the phase, the tasks to be completed, and other additional information for input into the Airport Construction Emissions Inventory Tool (ACEIT) to estimate the type of construction equipment, horsepower, load factor, and operating hours for each project element and phase. The ACEIT was developed by the Airport Cooperative Research Program (ACRP) and the equipment and assumptions used in the program are drawn from ACRP Report 102, *Guidance for Estimating Airport Construction Emissions*. The USEPA's MOVES3 model will be used to identify the emission factor of each GHG pollutant for each equipment type. Non-road construction equipment emissions will be calculated based on the number of operating hours of equipment use and the emission factors.

The GHG emissions results for all equipment will be summed and will be provided in tabular form for each year of construction.

On-Road Construction Vehicles

Potential on-road construction emissions will be estimated using the following formula as provided in the FAA's *Aviation Emissions and Air Quality Handbook Version 3 Update 1*.

$$\text{Emission Rate (tons/year) for on-road vehicles} = \text{Emission Factor (grams/mile)} \times \text{miles per day} \times \# \text{ of days/year} \times (1 \text{ pound}/453.59 \text{ grams}) \times (1 \text{ ton}/2,000 \text{ pounds})$$

Emission factors for on-road construction vehicles will be developed using the MOVES3 model. For employee vehicle trips related to construction activities, the model will be run using gasoline passenger vehicles including cars and light duty pickup trucks. For material delivery and off-site haul vehicle trips, diesel combination long-haul trucks will be assumed in order to estimate maximum potential emissions.

Total vehicle miles traveled (VMT) for vehicles operating during each Proposed Action element and for each type of on-road construction activity during each construction year will be estimated. This includes construction employee vehicle trips to and from the job site using model default distances. The analysis will also include material delivery trips and off-site hauling trips using heavy duty trucks using model default distances. Potential on-road construction emissions will be estimated by multiplying the VMT data by the appropriate emission factors and the necessary conversion factors to present the GHG emissions in tons. The results will be provided in tabular form for each year of construction.

2.2 Conduct Qualitative Climate Evaluation (NEPA)

Per CEQ and FAA guidance, the NEPA EA will include a discussion on the level of preparedness with respect to the impacts of climate change and a discussion of the extent to which the Proposed Action and any identified alternatives could be affected by future climate conditions.

2.2.1 Level of Preparedness

FAA 1050.1F Desk Reference states that the affected environment should discuss the current level of preparedness in the study area with respect to the impacts of climate change. This involves describing current

measures in place within the study area to adapt to the impacts of climate change.⁷ As such, the following items will be qualitatively discussed in the NEPA EA.

1. Review the Port sustainability initiatives, opportunities, and actions to aid with achieving climate adaptation in its SAMP Planning Technical Memorandum.⁸
2. Identify additional GHG reduction programs which the Port may implement independent of the Proposed Action. This would include, for example, a qualitative discussion of the implementation of SAF consumption at the Airport, further electrification of GSE, and the usage of renewable natural gas for future boilers.
3. Discussion of the Port's vulnerability assessment that identifies the existing and future vulnerabilities of the Airport related to climate change.

2.2.2 Climate Adaptation

The NEPA EA will include a discussion of the extent to which the Proposed Action and any identified alternatives could be affected by future climate conditions. This discussion will include the following items:

1. Identify potential long-term effects of climate on the Airport's infrastructure, based on the Port's vulnerability assessment.
2. Search for other climate change assessments in the local area to discuss potential climate change impacts that may occur in the short term (through 2037) and beyond. This includes outreach to state agencies, city government and local universities for existing studies. One piece will include a review of the most recent State of Knowledge reports from the University of Washington's Climate Impacts Research Group.
3. Review National Climate Assessment (NCA)⁹ section for the region for a high-level overview of key messages related to expected climate changes and their impacts in the region that may occur in the short term (through 2037) and beyond. For example, the Northwest may be susceptible to changes in relative amounts and timing of snow and rainfall which can pose threats to reliable hydropower production.
4. Review existing climate action plans and goals, as available, for the county and state, and how the Proposed Action and any identified alternatives will meet or detract from achieving these goals.
5. Conduct a desktop review to identify and discuss additional climate action plans and goals of stakeholders at SEA, including but not limited to, the FAA's Aviation Climate Action Plan, and that of the airlines operating at SEA, where available.
6. Use the ACRP Airport Climate Risk Operational Screening Tool to conduct a screening level assessment that identifies potential long-term climate risks, including:
 - Potential changes in climate in various periods based on specific climate vectors (e.g. higher temperatures, increased storm frequency, etc.) in years 2040 and 2070.
 - Impacts to airport infrastructure and operations.

In addition, this discussion will also include any considerations for the Proposed Action to adapt to forecasted climate change conditions.

Note, the NEPA EA will evaluate the potential climate impacts on the local environmental justice communities (areas where minority and low-income populations represent a higher fraction of the population compared with the general population) independent of the climate assessment. As such, an environmental justice impact analysis will not be included in the climate assessment.

⁷ FAA, 1050.1F Desk Reference, Section 3.2, July 2015.

⁸ Port of Seattle, Sustainability Planning and Management Strategy, Technical Memorandum No. 9 Final, May 2018.

⁹ U.S. Global Change Research Program. Fourth National Climate Assessment. Volume II: Impacts, Risks, and Adaptation in the United States. Available online: <https://nca2018.globalchange.gov/>

3 Protocol for Cumulative GHG Impact Analysis (NEPA)

The Council on Environmental Quality (CEQ) Regulations define a cumulative impact as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (see 40 CFR § 1508.7).

The analysis of cumulative impacts recognizes that while the impacts of individual actions may be small, when combined with the impacts of past, present, and reasonably foreseeable future actions on populations or resources in and around SEA, the impacts could be potentially significant.

Pursuant to FAA guidance, past, present, and reasonably foreseeable future actions must be considered in determining whether there are potential cumulative impacts. Based on the guidance from 1050.1F Desk Reference, “[t]he significance of cumulative impacts should be determined in the same manner as the significance of direct and indirect impacts.” FAA Order 1050.1F uses the same threshold of significance for project significant impacts as it does for cumulative impacts.

3.1 Review the List of Past, Present, and Reasonably Foreseeable Future Projects

Past Projects

CEQ NEPA regulations require analysis of past actions to the extent they are relevant and useful in analyzing whether the reasonably foreseeable effects of the current action combined with the past action would create cumulative effects. It is important to note that according to the CEQ's memorandum, *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis*, focus should be on whether the information from past projects is “relevant to reasonably foreseeable significant adverse impacts,” is “essential to a reasoned choice among alternatives,” and can be obtained without exorbitant cost. Furthermore, present impacts of past actions that are relevant and useful are those that may have a significant cause-and-effect relationship with the direct and indirect impacts of the proposed action and alternative(s). Only information that is useful to decision-makers and the public should be included, and the CEQ warns against including extraneous background data.

For this analysis, past projects are defined as those which occurred within the past seven years (between 2015 and 2022). This timeframe goes back far enough to provide a reasonable historical context about the current state of the resource.¹⁰

Present Projects

Present projects are any actions occurring within the same study area as the existing conditions for the Proposed Action.

Reasonably Foreseeable Future Projects

Reasonably foreseeable future projects are defined as actions that are likely to be completed within the time period from 2022 through 2032 and that have been developed with enough specificity to provide meaningful data

¹⁰ The FAA has discretion to determine whether, and to what extent, information about the specific nature, design, or present impacts of a past action are useful for the analysis of the impacts of the proposed action and alternative(s).

for analysis. No projects past 2032 are included because there is a lack of adequate detail about those later projects to enable meaningful review; any analysis of those projects or their impacts would be speculative.

3.2 Identify Climate Impacts of the Proposed Action

A review will be conducted of the climate analyses that have been undertaken for the cumulative projects identified (past, present, and reasonably foreseeable future projects). A qualitative evaluation of the climate cumulative impacts with consideration of the cumulative projects' will be developed.

Note, the NEPA EA will evaluate the potential climate impacts on environmental justice communities (areas where minority and low-income populations represent a higher fraction of the population compared with the general population) independent of the climate assessment. As such, an environmental justice impact analysis will not be included in the climate assessment.

APPENDIX C

Air Quality & Greenhouse Gas Emissions

References

Erik Saganić, PSCAA, Email to Kandice Krull, FAA, RE: SEA SAMP NTP EA NEPA AQ Protocol, July 26, 2023

Erik Saganić, PSCAA, Email to Kandice Krull, FAA, RE: Sea-Tac Int'l Airport: Sustainable Airport Master Plan Near-Term Projects Environmental Review - Climate Assessment Protocol - November 21, 2023

USEPA NAAQA Table

Erik Saganić, PSCAA, Email to Kandice Krull, FAA, RE: Sea-Tac International Airport Preliminary Air Results, December 14, 2023
Emission Factors for Greenhouse Gas Inventories

From: [Sarah Potter](#)
To: [Gaby Elizondo](#)
Subject: FW: SEA SAMP NTP EA NEPA AQ Protocol
Date: Saturday, July 29, 2023 6:06:44 AM

FYI

Sarah Potter
Executive Vice President

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From: Erik Saganić <ErikS@pscleanair.gov>
Sent: Wednesday, July 26, 2023 4:43 PM
To: Krull, Kandice (FAA) <Kandice.Krull@faa.gov>; Phil Swartzendruber <PhilS@pscleanair.gov>; Kathy Strange <KathyS@pscleanair.gov>
Cc: Rybolt, Steve (Rybolt.S@portseattle.org) <Rybolt.S@portseattle.org>; Sarah Potter <Sarah.Potter@landrumbrown.com>
Subject: RE: SEA SAMP NTP EA NEPA AQ Protocol

Hi Kandice and all,

Thanks so much for taking the time to meet and after review, we have no further comments, thanks again, Erik

From: Krull, Kandice (FAA) <Kandice.Krull@faa.gov>
Sent: Thursday, July 13, 2023 9:27 AM
To: Phil Swartzendruber <PhilS@pscleanair.gov>; Erik Saganić <ErikS@pscleanair.gov>; Kathy Strange <KathyS@pscleanair.gov>
Cc: Rybolt, Steve (Rybolt.S@portseattle.org) <Rybolt.S@portseattle.org>; Sarah Potter <Sarah.Potter@landrumbrown.com>
Subject: SEA SAMP NTP EA NEPA AQ Protocol

Good morning everyone,

Thank you again for taking the time yesterday to discuss the AQ Protocol. Attached is the updated AQ Protocol for the NTP NEPA EA. Changes were made utilizing track changes to make it easier for you to track. Included below are the links to the resource materials the FAA agreed to provide. Please let me know if you would prefer attachments instead of links.

We would greatly appreciate any comments or concurrence with the Air Quality Protocol by Friday July 28.

Thanks so much
Kandice

Kandice Krull
Environmental Protection Specialist
FAA - Denver Airports District Office
303-342-1261

From: Majeed, Mohammed (FAA) <Mohammed.Majeed@faa.gov>
Sent: Wednesday, July 12, 2023 4:12 PM
To: Krull, Kandice (FAA) <Kandice.Krull@faa.gov>
Cc: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Strasser, Alan (FAA) <Alan.Strasser@faa.gov>
Subject: RE: AEDT Tech and User Manual documents

Kandice,

PS: You may want to share the URL links to these documents rather than the documents as attachments; see URL links below.

[AEDT: Product Information \(faa.gov\)](#). You can find all AEDT 3e documentation including the User and Tech Manuals.

[Aviation Emissions and Air Quality Handbook | Federal Aviation Administration \(faa.gov\)](#)

Let me know if you have any questions.

Thanks,

Mohammed

From: Majeed, Mohammed (FAA)
Sent: Wednesday, July 12, 2023 5:59 PM
To: Krull, Kandice (FAA) <Kandice.Krull@faa.gov>
Cc: Iovinelli, Ralph (FAA) <Ralph.Iovinelli@faa.gov>; Strasser, Alan (FAA) <Alan.Strasser@faa.gov>
Subject: AEDT Tech and User Manual documents

Kandice,

Per our discussion, see attached two AEDT documents – the Tech and User Manuals. See below the relevant sections in these documents for discussion on the mixing height and how to modify it in the

tool. The Air Quality Handbook cannot be attached because of its size. I will send it in a separate message.

AEDT Tech Manual: Section 5.1.1 Airborne Emissions
AEDT User Manual: Appendix B.1.16 Preferences – Study

Regards,

Mohammed

Mohammed A Majeed, Ph.D., P.E.
General Engineer, Federal Aviation Administration
Office of Environment and Energy
Emissions Division (AEE-300)
800 Independence Ave SW
Building 10A Room 902
Washington, DC 20591
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Mobile: (302) 766-3239

From: [Sarah Potter](#)
To: [Gaby Elizondo](#)
Subject: FW: [EXTERNAL] RE: Sea-Tac Int'l Airport: Sustainable Airport Master Plan Near-Term Projects Environmental Review - Climate Assessment Protocol - PLEASE REVIEW
Date: Monday, November 27, 2023 8:30:20 AM

Sarah Potter

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From: Erik Saganić <ErikS@pscleanair.gov>
Sent: Tuesday, November 21, 2023 5:07 PM
To: Krull, Kandice (FAA) <Kandice.Krull@faa.gov>; 'Rybolt, Steve' <Rybolt.S@portseattle.org>
Cc: Phil Swartzendruber <PhilS@pscleanair.gov>; Kathy Strange <KathyS@pscleanair.gov>; Sarah Potter <sarah.potter@landrumbrown.com>
Subject: RE: [EXTERNAL] RE: Sea-Tac Int'l Airport: Sustainable Airport Master Plan Near-Term Projects Environmental Review - Climate Assessment Protocol - PLEASE REVIEW

You don't often get email from eriks@pscleanair.gov. [Learn why this is important](#)

No further comment at this time, thanks for checking in, Erik

From: Krull, Kandice (FAA) <Kandice.Krull@faa.gov>
Sent: Tuesday, November 21, 2023 12:23 PM
To: Erik Saganić <ErikS@pscleanair.gov>; 'Rybolt, Steve' <Rybolt.S@portseattle.org>
Cc: Phil Swartzendruber <PhilS@pscleanair.gov>; Kathy Strange <KathyS@pscleanair.gov>; 'Sarah Potter' <sarah.potter@landrumbrown.com>
Subject: RE: [EXTERNAL] RE: Sea-Tac Int'l Airport: Sustainable Airport Master Plan Near-Term Projects Environmental Review - Climate Assessment Protocol - PLEASE REVIEW

Good afternoon Eric,

I was following up to see if you had any additional comments or concerns given the additional information I provided. We are ready to start on the analysis but wanted to confirm that there were no outstanding issues before we got too far.

Please let me know by the end of the month if there are any additional comments or questions.

Thanks so much,
Kandice

Kandice Krull
Environmental Protection Specialist
FAA - Denver Airports District Office
303-342-1261

From: Krull, Kandice (FAA)
Sent: Thursday, November 2, 2023 8:52 AM
To: Erik Saganic <ErikS@pscleanair.gov>; Rybolt, Steve <Rybolt.S@portseattle.org>
Cc: Phil Swartzendruber <PhilS@pscleanair.gov>; Kathy Strange <KathyS@pscleanair.gov>; Sarah Potter <sarah.potter@landrumbrown.com>
Subject: RE: [EXTERNAL] RE: Sea-Tac Int'l Airport: Sustainable Airport Master Plan Near-Term Projects Environmental Review - Climate Assessment Protocol - PLEASE REVIEW

Good morning Eric,

I realized after I received your email that some of our responses were not included with the submittal of the revised Climate Assessment Protocol. The following were the responses for the comments that did not result in changes to the Protocol:

- **PSCAA Comment:** Black carbon, as a pollutant category, also has a significant CO₂e for many sources. This discussion suggests that it's not included, is that correct, if so, why?
 - **FAA Response:** While black carbon aerosols play a role in climate impacts, the contribution of black carbon to current climate change remains highly uncertain. The FAA is currently studying how to measure and predict non-volatile particulate matter emissions (a.k.a. soot or black carbon) from sustainable and conventional aviation fuels. The EA will likely include a qualitative discussion on how advances in engine combustion designs are yielding reductions in emissions of non-volatile particulate matter.
- **PSCAA Comment:** So, this implies that APUs use Jet-A? Is this correct? Naively, I find this surprising as most other types of generators don't use Jet-A, and I'd think other fuels would be cheaper.
 - **FAA Response:** APUs are engine-driven generators contained in the aircraft (usually in the tail) that provide the aircraft with necessary energy during the time the aircraft is at the gate. Part of the generated energy is used for air conditioning. As an alternative, the required energy can be supplied by ground-based equipment that delivers electrical power at 400 Hz and preconditioned air to the aircraft. The use of fuel dispensed metric will capture APU usage and therefore APUs will be removed as a separate source. Port owned ground power units (GPUs) and preconditioned air units (PCAs) will be captured under Ground Support Equipment.
- **PSCAA Comment:** GSE electrification is a known GHG reduction pathway, and so the (lack of) infrastructure could be a key limiting (non)Action. Not clear this is in the proposed Action or Alternative, but it could be. It's quantifiable and should be discussed. Directly its Scope 3, but it actually seems like a Scope1-Scope 3 split incentive/responsibility problem. A plausible

alternative could include full electrification of GSE. So this section would need mention of a model or calculation method for electric GSE.

- **FAA Response:** The Port has installed over 400 charging points/stations for electric ground support equipment (eGSE) throughout the Airport across all terminals. While there is no requirement by the Port for airlines to utilize eGSE, several airlines have opted to utilize eGSE. The eGSE will be captured in the GSE survey and accounted for in the AEDT modeling for the existing conditions. Since there are no requirements for the implementation of additional electric GSE in the future by the Port or by the Proposed Action, any additional use of eGSE in the future than what is accounted for in the existing conditions would be speculative for both the No Action and Proposed Action. As such, no further alternatives, such as those including full electrification of GSE, as recommended for the purpose of this analysis.
- **PSCAA Comment:** The proposed Action includes SAF tanks and infrastructure, correct? So, there should be some semi-quantitative discussion (relative emission factor * fuel volume) of the potential GHG reduction that would be enabled. And, that the enabled (potential) SAF fuel volume is in excess (it is?) of the projected demand/use, such that the proposed tanks aren't the limiting factor (and thus GHG emission causing).
 - **FAA Response:** While SAF tanks and infrastructure are included in the Proposed Action, there is no requirement for the Port or tenants to utilize SAF. In addition, there are supply chain issues with obtaining SAF and isn't clear when these issues will be resolved. As such, any use of SAF in the future would be speculative for both the No Action and Proposed Action. As such, no quantitative discussion is recommended for the purpose of this analysis. Qualitative discussions on the FAA's CLEEN program and the Port's sustainable fuel goals and how they could reduce future emissions will be included--see Section 2.2.
- **PSCAA Comment:** Are these then all "Full Throttle" emission factors, when most of the use isn't at "full throttle"? The issue being that the fuel-use/hp-hour (fuel efficiency) is probably fairly different across the range of "throttle settings". Same note applies to all the full throttle references above
 - **FAA Response:** Yes--the use of the "full throttle emission factor" is based on FAA guidance.

I hope these responses help explain why changes were or were not made in the Protocol. Please let me know if you have any questions or comments.

Kandice

Kandice Krull
Environmental Protection Specialist
FAA - Denver Airports District Office
303-342-1261

From: Erik Saganić <ErikS@pscleanair.gov>
Sent: Monday, October 16, 2023 2:14 PM

To: Rybolt, Steve <Rybolt.S@portseattle.org>

Cc: Phil Swartzendruber <PhilS@psccleanair.gov>; Kathy Strange <KathyS@psccleanair.gov>; Sarah Potter <sarah.potter@landrumbrown.com>; Krull, Kandice (FAA) <Kandice.Krull@faa.gov>

Subject: RE: [EXTERNAL] RE: Sea-Tac Int'l Airport: Sustainable Airport Master Plan Near-Term Projects Environmental Review - Climate Assessment Protocol - PLEASE REVIEW

Thanks so much for the follow up and edits.

I do have one more comment regarding the black carbon estimates that we provided earlier that do not seem included in the revisions.

As black carbon is one of the largest positive contributors to radiative forcing to the atmosphere (https://www.ipcc.ch/apps/nj-lite/ar5wg2/nj-lite_download2.php?id=9465#page=72), we request that you revisit including estimated black carbon emissions through available data from model outputs. Although you likely won't be able to put emissions in equivalent CO₂ units, cataloguing the emissions would help track the potential impact in different modeled scenarios. From the MOVES model output, we would request including elemental carbon be reported. And from the AEDT model, we request the non-volatile particulate matter be reported.

We appreciate you again for all of your time and energy in this process, Erik Saganić

From: Rybolt, Steve <Rybolt.S@portseattle.org>

Sent: Monday, October 9, 2023 4:19 PM

To: Erik Saganić <ErikS@psccleanair.gov>

Cc: Phil Swartzendruber <PhilS@psccleanair.gov>; Kathy Strange <KathyS@psccleanair.gov>; Sarah Potter <sarah.potter@landrumbrown.com>; Krull, Kandice (FAA) <Kandice.Krull@faa.gov>

Subject: RE: [EXTERNAL] RE: Sea-Tac Int'l Airport: Sustainable Airport Master Plan Near-Term Projects Environmental Review - Climate Assessment Protocol - PLEASE REVIEW

Hi Erik,

Attached is an updated Climate Assessment Protocol that we've updated with the Federal Aviation Administration (I have also included your original comments). We believe it addresses all of the Puget Sound Clear Air Agency's (PSCAA) comments.

I am looking for the PSCAA's concurrence on this protocol by Friday, October 20, 2023.

Please let Kandice or I know if you have any questions.

We have also just started the modeling of the Proposed Action (i.e. future conditions with projects) and will reach out when we have initial results later this Fall.

Thank you,

Steve Rybolt

Senior Environmental Program Manager
Port of Seattle | Sea-Tac International Airport
C: 206.554.1235
F: 206.787.6617

From: Erik Saganić <ErikS@pscleanair.gov>
Sent: Thursday, August 10, 2023 4:49 PM
To: Rybolt, Steve <Rybolt.S@portseattle.org>
Cc: Phil Swartzendruber <PhilS@pscleanair.gov>; Kathy Strange <KathyS@pscleanair.gov>; Sarah Potter <sarah.potter@landrumbrown.com>; Krull, Kandice (FAA) <Kandice.Krull@faa.gov>
Subject: [EXTERNAL] RE: Sea-Tac Int'l Airport: Sustainable Airport Master Plan Near-Term Projects Environmental Review - Climate Assessment Protocol - PLEASE REVIEW

WARNING: External email. Links or attachments may be unsafe.

Hi Steve,

Please see the attached notes and some minor edits to the NEPA Climate Assessment Protocol, thanks for the chance to review, Erik

From: Rybolt, Steve <Rybolt.S@portseattle.org>
Sent: Monday, July 31, 2023 1:28 PM
To: Erik Saganić <ErikS@pscleanair.gov>
Cc: Phil Swartzendruber <PhilS@pscleanair.gov>; Kathy Strange <KathyS@pscleanair.gov>; Sarah Potter <sarah.potter@landrumbrown.com>; Krull, Kandice (FAA) <Kandice.Krull@faa.gov>
Subject: Sea-Tac Int'l Airport: Sustainable Airport Master Plan Near-Term Projects Environmental Review - Climate Assessment Protocol - PLEASE REVIEW

Hi Erik,

Thanks to you and the PSCAA Team for reviewing our NEPA Air Quality Protocol. We have begun our analyses and once we have initial data, we will be sharing that with you to determine if dispersion modeling may be warranted to support the analysis.

As we identified in the NEPA Air Quality Protocol, we have drafted a separate Climate Assessment Protocol.

Attached you will find the NEPA Climate Assessment Protocol. We are seeking any comments to the document no later than August 11, 2023.

I'm happy to set up a time to discuss and if you need more time, please let us know.

Please let Kandice or I know if you have any questions.

Thank you,

Steve Rybolt

Senior Environmental Program Manager

Port of Seattle | Sea-Tac International Airport

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Criteria
Air
Pollutants

CONTACT US <<https://epa.gov/criteria-air-pollutants/forms/contact-us-about-criteria-air-pollutants>>

NAAQS Table

The Clean Air Act <<https://epa.gov/clean-air-act-overview>>, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for six principal pollutants ("criteria" air pollutants <<https://epa.gov/criteria-air-pollutants>>) which can be harmful to public health and the environment. The Clean Air Act identifies two types of national ambient air quality standards. **Primary standards** provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. **Secondary standards** provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Periodically, the standards are reviewed and sometimes may be revised, establishing new standards. The most recently established standards are listed below. In some areas of the U.S., certain regulatory requirements may also remain for implementation of previously established standards <<https://epa.gov/ground-level-ozone-pollution/ozone-implementation-regulatory-actions>>.

Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air (µg/m³).

Pollutant [links to historical tables of NAAQS reviews]	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO) < https://epa.gov/co-pollution/timeline-carbon-monoxide-co-national-ambient-air-quality-standards-naaqs >	primary	8 hours	9 ppm	Not to be exceeded more than once per year
		1 hour	35 ppm	

Pollutant [links to historical tables of NAAQS reviews]	Primary/ Secondary	Averaging Time	Level	Form
Lead (Pb) < https://epa.gov/lead-air-pollution/timeline-lead-pb-national-ambient-air-quality-standards-naaqs >	primary and secondary	Rolling 3 month average	0.15 µg/m ³ ⁽¹⁾	Not to be exceeded
Nitrogen Dioxide (NO ₂) < https://epa.gov/no2-pollution/timeline-nitrogen-dioxide-no2-national-ambient-air-quality-standards-naaqs >	primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	primary and secondary	1 year	53 ppb ⁽²⁾	Annual Mean
Ozone (O ₃) < https://epa.gov/ground-level-ozone-pollution/timeline-ozone-national-ambient-air-quality-standards-naaqs >	primary and secondary	8 hours	0.070 ppm ⁽³⁾	Annual fourth- highest daily maximum 8- hour concentration, averaged over 3 years

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form
Particle Pollution (PM) < https://epa.gov/pm-pollution/timeline-particulate-matter-pm-national-ambient-air-quality-standards-naaqs >	PM _{2.5}	primary	1 year	9.0 µg/m ³	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m ³	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m ³	98th percentile, averaged over 3 years
	PM ₁₀	primary and secondary	24 hours	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO ₂) < https://epa.gov/so2-pollution/timeline-sulfur-dioxide-national-ambient-air-quality-standards-naaqs >		primary	1 hour	75 ppb ⁽⁴⁾	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m³ as a calendar quarter average) also remain in effect.

(2) The level of the annual NO₂ standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O₃ standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O₃ standards.

(4) The previous SO₂ standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO₂ standards or is not meeting the requirements of a SIP call under the previous SO₂ standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Menu of Control Measures for NAAQS Implementation

The Menu of Control Measures (MCM) provides state, local and tribal air agencies with the existing emission reduction measures as well as relevant information concerning the efficiency and cost effectiveness of the measures. State, local and tribal agencies will be able to use this information in developing emission reduction strategies, plans and programs to assure they attain and maintain the National Ambient Air Quality Standards (NAAQS). The MCM is a living document that can be updated with newly available or more current data as it becomes available.

- Menu of Control Measures <<https://epa.gov/criteria-air-pollutants/menu-control-measures-naaqs-implementation>>

[Criteria Air Pollutants Home <https://epa.gov/criteria-air-pollutants>](https://epa.gov/criteria-air-pollutants)

[Information by Pollutant <https://epa.gov/criteria-air-pollutants/information-pollutant>](https://epa.gov/criteria-air-pollutants/information-pollutant)

[NAAQS Review Process <https://epa.gov/criteria-air-pollutants/process-reviewing-national-ambient-air-quality-standards>](https://epa.gov/criteria-air-pollutants/process-reviewing-national-ambient-air-quality-standards)

[NAAQS Designations Process <https://epa.gov/criteria-air-pollutants/process-determine-whether-areas-meet-naaqs-designations-process>](https://epa.gov/criteria-air-pollutants/process-determine-whether-areas-meet-naaqs-designations-process)

[NAAQS Implementation Process <https://epa.gov/criteria-air-pollutants/process-working-areas-attain-and-maintain-naaqs-implementation-process>](https://epa.gov/criteria-air-pollutants/process-working-areas-attain-and-maintain-naaqs-implementation-process)

Current NAAQS Table

Contact Us <<https://epa.gov/criteria-air-pollutants/forms/contact-us-about-criteria-air-pollutants>> to ask a question, provide feedback, or report a problem.

LAST UPDATED ON FEBRUARY 7, 2024



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FW: Sea-Tac International Airport Preliminary Air Results

Sarah Potter <sarah.potter@landrumbrown.com>

Fri 12/15/2023 8:11 AM

To: Gaby Elizondo <Gaby.Elizondo@landrumbrown.com>

See below.

Sarah Potter

Executive Vice President

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From: Krull, Kandice (FAA) <Kandice.Krull@faa.gov>

Sent: Thursday, December 14, 2023 1:10 PM

To: Erik Saganić <ErikS@psccleanair.gov>

Cc: Rybolt, Steve (Rybolt.S@portseattle.org) <Rybolt.S@portseattle.org>; Sarah Potter <sarah.potter@landrumbrown.com>; Kathy Strange <KathyS@psccleanair.gov>; Phil Swartzendruber <PhilS@psccleanair.gov>

Subject: RE: Sea-Tac International Airport Preliminary Air Results

You don't often get email from kandice.krull@faa.gov. [Learn why this is important](#)

Thanks for the quick response Erik. We really appreciate all of your help with this project.

We will share the entire air quality analysis, including the climate analysis, once it is completed.

Happy holidays

Kandice

Kandice Krull

Environmental Protection Specialist

FAA - Denver Airports District Office

303-342-1261

From: Erik Saganić <ErikS@pscleanair.gov>

Sent: Thursday, December 14, 2023 10:19 AM

To: Krull, Kandice (FAA) <Kandice.Krull@faa.gov>

Cc: Rybolt, Steve (Rybolt.S@portseattle.org) <Rybolt.S@portseattle.org>; Sarah Potter <sarah.potter@landrumbrown.com>; Kathy Strange <KathyS@pscleanair.gov>; Phil Swartzendruber <PhilS@pscleanair.gov>

Subject: RE: Sea-Tac International Airport Preliminary Air Results

Thanks Kandice,

I have no further comments on the table below. I would not expect these numbers to result in an exceedance of the NAAQS.

Erik

From: Krull, Kandice (FAA)

Sent: Thursday, December 7, 2023 2:55 PM

To: erics@psccleanair.gov

Cc: Rybolt, Steve (Rybolt.S@portseattle.org) <Rybolt.S@portseattle.org>; Phil Swartzendruber <PhilS@psccleanair.gov>; Kathy Strange <KathyS@psccleanair.gov>; Sarah Potter <sarah.potter@landrumbrown.com>

Subject: Sea-Tac International Airport Preliminary Air Results

Hi Eric,

We have preliminary results from the air quality analysis for the SEA SAMP NTP EA ready for PSCAA review. We are hoping to get input from the PSCAA on the potential for the project to cause an exceedance of the NAAQS within the region. We are more than willing to have a call to discuss the results and get feedback if that would be easier.

We are requesting a response by Friday January 12, 2024.

Thanks so much,

Kandice

Kandice Krull

Environmental Protection Specialist

FAA - Denver Airports District Office

303-342-1261

From: Sarah Potter <Sarah.Potter@landrumbrown.com>

Sent: Wednesday, December 6, 2023 4:13 PM

To: Krull, Kandice (FAA) <Kandice.Krull@faa.gov>

Cc: Rybolt, Steve <Rybolt.S@portseattle.org>

Subject: FW: SEA SAMP - Preliminary AQ Operational Emissions Inventories

HI Kandice – The following are the results that were prepared using AEDT version 3e.

Sarah Potter

Executive Vice President

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From: Gaby Elizondo <Gaby.Elizondo@landrumbrown.com>
Sent: Wednesday, December 6, 2023 6:07 PM
To: Sarah Potter <Sarah.Potter@landrumbrown.com>
Subject: SEA SAMP - Preliminary AQ Operational Emissions Inventories

Hey Sarah,

See below for the SEA SAMP preliminary air quality operational emissions inventories for 2032 and 2037. Let me know if you need anything else.

Table 1: 2032 No Action and 2032 Proposed Action Operational Emissions Inventory

Annual Emissions (tons per year)						
	CO	VOC	NOx	SOx	PM 10	PM 2.5

2032 No Action

Aircraft	2,587	282	2,857	259	28	28
GSE	314	11	22	0	2	2
Stationary Sources	19	12	34	1	1	1
Motor Vehicles	1,916	15	176	2	3	3
<i>2032 No Action Subtotal</i>	<i>4,837</i>	<i>320</i>	<i>3,089</i>	<i>263</i>	<i>35</i>	<i>35</i>

2032 Proposed Action

Aircraft	2,603	284	2,904	262	29	29
GSE	320	12	23	0	3	2
Stationary Sources	26	16	47	2	2	2
Motor Vehicles	1,961	15	179	3	3	3
<i>2032 Proposed Action Subtotal</i>	<i>4,910</i>	<i>327</i>	<i>3,153</i>	<i>267</i>	<i>37</i>	<i>36</i>
<i>2032 Net Emissions</i>	<i>73</i>	<i>7</i>	<i>64</i>	<i>4</i>	<i>1</i>	<i>1</i>

Table 2: 2037 No Action and 2037 Proposed Action Operational Emissions Inventory**Annual Emissions (tons per year)**

	CO	VOC	NOx	SOx	PM 10	PM 2.5

2037 No Action

Aircraft	2,511	267	3,076	266	30	30
GSE	320	12	22	0	3	2
Stationary Sources	19	12	34	1	1	1
Motor Vehicles	1,620	12	160	3	2	2
<i>2037 No Action Subtotal</i>	<i>4,470</i>	<i>302</i>	<i>3,292</i>	<i>270</i>	<i>36</i>	<i>36</i>

2037 Proposed Action

Aircraft	2,819	292	3,324	293	32	32
GSE	343	12	24	0	3	2
Stationary Sources	26	16	47	2	2	2
Motor Vehicles	1,720	12	168	3	2	2
<i>2037 Proposed Action Subtotal</i>	<i>4,908</i>	<i>333</i>	<i>3,564</i>	<i>298</i>	<i>39</i>	<i>39</i>
<i>2037 Net Emissions</i>	<i>438</i>	<i>31</i>	<i>272</i>	<i>27</i>	<i>3</i>	<i>3</i>

Thanks,

Gaby Elizondo, AICP

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Last Modified: 1 April 2022

Gas	100-Year GWP
CH ₄	25

Source: Intergovernmental Panel on Climate Change (IPCC), Fourth Assessment Report (AR4), 2007. See the source note to Table 11 for further explanation.

Table 1

Fuel Type	Heat Content (HHV)	CO ₂ Factor	CH ₄ Factor	N ₂ O Factor	CO ₂ Factor	CH ₄ Factor	N ₂ O Factor
	mmBtu per short ton	kg CO ₂ per mmBtu	g CH ₄ per mmBtu	g N ₂ O per mmBtu	kg CO ₂ per short ton	g CH ₄ per short ton	g N ₂ O per short ton
Coal and Coke							
Anthracite Coal	25.09	103.69	11	1.6	2,602	276	40
Bituminous Coal	24.93	93.28	11	1.6	2,325	274	40
Sub-bituminous Coal	17.25	97.17	11	1.6	1,676	190	28
Lignite Coal	14.21	97.72	11	1.6	1,389	156	23
Mixed (Commercial Sector)	21.39	94.27	11	1.6	2,016	235	34
Mixed (Electric Power Sector)	19.73	95.52	11	1.6	1,885	217	32
Mixed (Industrial Coking)	26.28	93.90	11	1.6	2,468	289	42
Mixed (Industrial Sector)	22.35	94.67	11	1.6	2,116	246	36
Coal Coke	24.80	113.67	11	1.6	2,819	273	40
Other Fuels - Solid							
Municipal Solid Waste	9.95	90.70	32	4.2	902	318	42
Petroleum Coke (Solid)	30.00	102.41	32	4.2	3,072	960	126
Plastics	38.00	75.00	32	4.2	2,850	1,216	160
Tires	28.00	85.97	32	4.2	2,407	896	118
Biomass Fuels - Solid							
Agricultural Byproducts	8.25	118.17	32	4.2	975	264	35
Peat	8.00	111.84	32	4.2	895	256	34
Solid Byproducts	10.39	105.51	32	4.2	1,096	332	44
Wood and Wood Residuals	17.48	93.90	7.2	3.6	1,640	126	63
	mmBtu per scf	kg CO ₂ per mmBtu	g CH ₄ per mmBtu	g N ₂ O per mmBtu	kg CO ₂ per scf	g CH ₄ per scf	g N ₂ O per scf
Natural Gas							
Natural Gas	0.001026	53.06	1.0	0.10	0.05444	0.00103	0.00010
Other Fuels - Gaseous							
Blast Furnace Gas	0.000092	274.32	0.022	0.10	0.02524	0.000002	0.000009
Coke Oven Gas	0.000599	46.85	0.48	0.10	0.02806	0.000288	0.000060
Fuel Gas	0.001388	59.00	3.0	0.60	0.08189	0.004164	0.000833
Propane Gas	0.002516	61.46	3.0	0.60	0.15463	0.007548	0.001510
Biomass Fuels - Gaseous							
Landfill Gas	0.000485	52.07	3.2	0.63	0.025254	0.001552	0.000306
Other Biomass Gases	0.000655	52.07	3.2	0.63	0.034106	0.002096	0.000413
	mmBtu per gallon	kg CO ₂ per mmBtu	g CH ₄ per mmBtu	g N ₂ O per mmBtu	kg CO ₂ per gallon	g CH ₄ per gallon	g N ₂ O per gallon
Petroleum Products							
Asphalt and Road Oil	0.158	75.36	3.0	0.60	11.91	0.47	0.09
Aviation Gasoline	0.120	69.25	3.0	0.60	8.31	0.36	0.07
Butane	0.103	64.77	3.0	0.60	6.67	0.31	0.06
Butylene	0.105	68.72	3.0	0.60	7.22	0.32	0.06
Crude Oil	0.138	74.54	3.0	0.60	10.29	0.41	0.08
Distillate Fuel Oil No. 1	0.139	73.25	3.0	0.60	10.18	0.42	0.08
Distillate Fuel Oil No. 2	0.138	73.96	3.0	0.60	10.21	0.41	0.08
Distillate Fuel Oil No. 4	0.146	75.04	3.0	0.60	10.96	0.44	0.09
Ethane	0.068	59.60	3.0	0.60	4.05	0.20	0.04
Ethylene	0.058	65.96	3.0	0.60	3.83	0.17	0.03
Heavy Gas Oils	0.148	74.92	3.0	0.60	11.09	0.44	0.09
Isobutane	0.099	64.94	3.0	0.60	6.43	0.30	0.06
Isobutylene	0.103	68.86	3.0	0.60	7.09	0.31	0.06
Kerosene	0.135	75.20	3.0	0.60	10.15	0.41	0.08
Kerosene-Type Jet Fuel	0.135	72.22	3.0	0.60	9.75	0.41	0.08
Liquefied Petroleum Gases (LPG)	0.092	61.71	3.0	0.60	5.68	0.28	0.06
Lubricants	0.144	74.27	3.0	0.60	10.69	0.43	0.09
Motor Gasoline	0.125	70.22	3.0	0.60	8.78	0.38	0.08
Naphtha (<401 deg F)	0.125	68.02	3.0	0.60	8.50	0.38	0.08
Natural Gasoline	0.110	66.88	3.0	0.60	7.36	0.33	0.07
Other Oil (>401 deg F)	0.139	76.22	3.0	0.60	10.59	0.42	0.08
Pentanes Plus	0.110	70.02	3.0	0.60	7.70	0.33	0.07
Petrochemical Feedstocks	0.125	71.02	3.0	0.60	8.88	0.38	0.08
Propane	0.091	62.87	3.0	0.60	5.72	0.27	0.05
Propylene	0.091	67.77	3.0	0.60	6.17	0.27	0.05
Residual Fuel Oil No. 5	0.140	72.93	3.0	0.60	10.21	0.42	0.08
Residual Fuel Oil No. 6	0.150	75.10	3.0	0.60	11.27	0.45	0.09
Special Naphtha	0.125	72.34	3.0	0.60	9.04	0.38	0.08
Unfinished Oils	0.139	74.54	3.0	0.60	10.36	0.42	0.08
Used Oil	0.138	74.00	3.0	0.60	10.21	0.41	0.08
Biomass Fuels - Liquid							
Biodiesel (100%)	0.128	73.84	1.1	0.11	9.45	0.14	0.01
Ethanol (100%)	0.084	68.44	1.1	0.11	5.75	0.09	0.01
Rendered Animal Fat	0.125	71.06	1.1	0.11	8.88	0.14	0.01
Vegetable Oil	0.120	81.55	1.1	0.11	9.79	0.13	0.01
Biomass Fuels - Kraft Pulp Liquor, by Wood Furnish							
North American Softwood		94.4	1.9	0.42			
North American Hardwood		93.7	1.9	0.42			
Bagasse		95.5	1.9	0.42			
Bamboo		93.7	1.9	0.42			
Straw		95.1	1.9	0.42			

Table 2 Mobile Combustion CO₂

Fuel Type	kg CO ₂ per unit	Unit
Aviation Gasoline	8.31	gallon
Biodiesel (100%)	9.45	gallon
Compressed Natural Gas (CNG)	0.05444	scf
Diesel Fuel	10.21	gallon
Ethanol (100%)	5.75	gallon
Kerosene-Type Jet Fuel	9.75	gallon
Liquefied Natural Gas (LNG)	4.50	gallon
Liquefied Petroleum Gases (LPG)	5.68	gallon
Motor Gasoline	8.78	gallon
Residual Fuel Oil	11.27	gallon

Source:

Federal Register EPA; 40 CFR Part 98; e-CFR, (see link below), Table C-1 (as amended at 81 FR 89252, Dec. 9, 2016).

https://www.ecfr.gov/cgi-bin/text-id?SID=a265d7d6f98ec86fcd8640b9793a3f6&mc=true&node=pt40.23.98&rgn=div5#ap40.23.98_19.1

LNG: The factor was developed based on the CO₂ factor for Natural Gas factor and LNG fuel density from GREET1_2021.xlsx Model, Argonne National Laboratory (Fuel_Specs worksheet).

Table 3 Mobile Combustion CH₄ and N₂O for On-Road Gasoline Vehicles

Vehicle Type	Year	CH ₄ Factor (g / mile)	N ₂ O Factor (g / mile)
Gasoline Passenger Cars	1973-1974	0.1696	0.0197
	1975	0.1423	0.0443
	1976-1977	0.1406	0.0458
	1978-1979	0.1389	0.0473
	1980	0.1326	0.0499
	1981	0.0802	0.0626
	1982	0.0795	0.0627
	1983	0.0782	0.0630
	1984-1993	0.0704	0.0647
	1994	0.0617	0.0603
	1995	0.0531	0.0560
	1996	0.0434	0.0503
	1997	0.0337	0.0446
	1998	0.0240	0.0389
	1999	0.0215	0.0355
	2000	0.0175	0.0304
	2001	0.0105	0.0212
	2002	0.0102	0.0207
	2003	0.0095	0.0181
	2004	0.0078	0.0085
	2005	0.0075	0.0067
	2006	0.0076	0.0075
	2007	0.0072	0.0052
	2008	0.0072	0.0049
	2009	0.0071	0.0046
	2010	0.0071	0.0046
	2011	0.0071	0.0046
	2012	0.0071	0.0046
	2013	0.0071	0.0046
	2014	0.0071	0.0046
	2015	0.0068	0.0042
	2016	0.0065	0.0038
	2017	0.0054	0.0018
	2018	0.0052	0.0016
	2019	0.0051	0.0015
Gasoline Light-Duty Trucks (Vans, Pickup Trucks, SUVs)	1973-1974	0.1908	0.0218
	1975	0.1634	0.0513
	1976	0.1594	0.0555
	1977-1978	0.1614	0.0534
	1979-1980	0.1594	0.0555
	1981	0.1479	0.0660
	1982	0.1442	0.0681
	1983	0.1368	0.0722
	1984	0.1284	0.0764
	1985	0.1220	0.0806
	1986	0.1146	0.0848
	1987-1993	0.0813	0.1035
	1994	0.0646	0.0982
	1995	0.0517	0.0908
	1996	0.0452	0.0871
	1997	0.0452	0.0871
	1998	0.0412	0.0787
	1999	0.0333	0.0618
	2000	0.0340	0.0631
	2001	0.0221	0.0379
	2002	0.0242	0.0424
	2003	0.0221	0.0373
	2004	0.0115	0.0088
	2005	0.0105	0.0064
	2006	0.0108	0.0080
	2007	0.0103	0.0061
	2008	0.0095	0.0036
	2009	0.0095	0.0036
	2010	0.0095	0.0035
	2011	0.0096	0.0034
	2012	0.0096	0.0033
	2013	0.0095	0.0035
	2014	0.0095	0.0033
	2015	0.0094	0.0031
	2016	0.0091	0.0029
	2017	0.0084	0.0018
	2018	0.0081	0.0015
	2019	0.0080	0.0013
Gasoline Heavy-Duty Vehicles	≤1980	0.4604	0.0497
	1981-1984	0.4482	0.0538
	1985-1986	0.4090	0.0515
	1987	0.3675	0.0849
	1988-1989	0.3492	0.0933
	1990-1995	0.3246	0.1142
	1996	0.1278	0.1680
	1997	0.0924	0.1726
	1998	0.0655	0.1750
	1999	0.0648	0.1724
	2000	0.0630	0.1660
	2001	0.0577	0.1468
	2002	0.0634	0.1673
	2003	0.0602	0.1553
	2004	0.0298	0.0164
	2005	0.0297	0.0083
	2006	0.0299	0.0241
	2007	0.0322	0.0015
	2008	0.0340	0.0015
	2009	0.0339	0.0015
	2010	0.0320	0.0015
	2011	0.0304	0.0015
	2012	0.0313	0.0015
	2013	0.0313	0.0015
	2014	0.0315	0.0015
	2015	0.0332	0.0021
	2016	0.0321	0.0061
	2017	0.0329	0.0084
	2018	0.0326	0.0082
	2019	0.0330	0.0091
Gasoline Motorcycles	1960-1995	0.0899	0.0087
	1996-2019	0.0672	0.0069

Source: EPA (2021) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019 (Annexes). All values are calculated from Tables A-90 through A-94.

Table 4 Mobile Combustion CH₄ and N₂O for On-Road Diesel and Alternative Fuel Vehicles

Vehicle Type	Fuel Type	Vehicle Year	CH ₄ Factor (g / mile)	N ₂ O Factor (g / mile)
Passenger Cars	Diesel	1960-1982	0.0006	0.0012
		1983-2006	0.0005	0.0010
		2007-2019	0.0302	0.0192
Light-Duty Trucks	Diesel	1960-1982	0.0011	0.0017
		1983-2006	0.0009	0.0014
		2007-2019	0.0290	0.0214
Medium- and Heavy-Duty Vehicles	Diesel	1960-2006	0.0051	0.0048
		2007-2019	0.0095	0.0431
Light-Duty Cars	Methanol		0.0080	0.0050
	Ethanol		0.0080	0.0050
	CNG		0.0810	0.0050
	LPG		0.0080	0.0050
	Biodiesel		0.0300	0.0190
Light-Duty Trucks	Ethanol		0.0120	0.0090
	CNG		0.1210	0.0090
	LPG		0.0120	0.0120
	LNG		0.1210	0.0090
	Biodiesel		0.0290	0.0210
Medium-Duty Trucks	CNG		4.200	0.0010
	LPG		0.0140	0.0340
	LNG		4.200	0.0010
	Biodiesel		0.0090	0.0430
Heavy-Duty Trucks	Methanol		0.0750	0.0280
	Ethanol		0.0750	0.0280
	CNG		3.70	0.0010
	LPG		0.0130	0.0260
	LNG		3.70	0.0010
	Biodiesel		0.0090	0.0430
Buses	Methanol		0.0160	0.0320
	Ethanol		0.0160	0.0320
	CNG		10.00	0.0010
	LPG		0.0340	0.0170
	LNG		10.00	0.0010
	Biodiesel		0.0090	0.0430

Source: EPA (2021) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019 (Annexes). All values are calculated from Tables A-93 through A-96.

Table 5 Mobile Combustion CH₄ and N₂O for Non-Road Vehicles

Vehicle Type	Fuel Type	CH ₄ Factor (g / gallon)	N ₂ O Factor (g / gallon)
Ships and Boats	Residual Fuel Oil	1.11	0.32
	Gasoline (2 stroke)	4.58	0.08
	Gasoline (4 stroke)	2.24	0.01
	Diesel	6.41	0.17
Locomotives	Diesel	0.80	0.26
Aircraft	Jet Fuel	-	0.30
	Aviation Gasoline	7.06	0.11
Agricultural Equipment ^a	Gasoline (2 stroke)	9.19	0.26
	Gasoline (4 stroke)	3.33	1.83
	Diesel	0.97	0.90
	LPG	0.42	0.60
Agricultural Offroad Trucks	Gasoline	3.33	1.84
	Diesel	0.99	0.92
Construction/Mining Equipment ^b	Gasoline (2 stroke)	12.11	0.34
	Gasoline (4 stroke)	3.03	1.67
	Diesel	0.94	0.87
	LPG	0.44	0.63
Construction/Mining Offroad Trucks	Gasoline	3.03	1.67
	Diesel	0.99	0.92
Lawn and Garden Equipment	Gasoline (2 stroke)	10.21	0.28
	Gasoline (4 stroke)	2.85	1.56
	Diesel	0.93	0.86
	LPG	0.45	0.64
Airport Equipment	Gasoline	3.88	2.13
	Diesel	0.99	0.91
Industrial/Commercial Equipment	LPG	0.45	0.64
	Gasoline (2 stroke)	9.21	0.26
	Gasoline (4 stroke)	3.04	1.67
	Diesel	0.93	0.87
Logging Equipment	LPG	0.45	0.64
	Gasoline (2 stroke)	12.48	0.35
	Gasoline (4 stroke)	2.85	1.57
	Diesel	0.99	0.92
Railroad Equipment	Gasoline	2.87	1.59
	Diesel	0.83	0.78
Recreational Equipment	LPG	0.43	0.63
	Gasoline (2 stroke)	4.27	0.20
	Gasoline (4 stroke)	4.30	2.22
	Diesel	0.80	0.75
	LPG	0.41	0.58

Source: EPA (2021) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019 (Annexes). All values are calculated from Tables A-97 through A-98.

Notes:

CH₄ and N₂O Emission Factors: Updates due to a methodology change.

^a Includes equipment, such as tractors and combines, as well as fuel consumption from trucks that are used off-road in agriculture.

^b Includes equipment, such as cranes, dumpers, and excavators, as well as fuel consumption from trucks that are used off-road in construction.

Table 6 Electricity

eGRID Subregion	Total Output Emission Factors			Non-Baseload Emission Factors		
	CO ₂ Factor (lb / MWh)	CH ₄ Factor (lb / MWh)	N ₂ O Factor (lb / MWh)	CO ₂ Factor (lb / MWh)	CH ₄ Factor (lb / MWh)	N ₂ O Factor (lb / MWh)
AKGD (ASCC Alaska Grid)	1,097.6	0.100	0.014	1,315.1	0.126	0.017
AKMS (ASCC Miscellaneous)	534.1	0.027	0.005	1,517.7	0.086	0.012
AZNM (WECC Southwest)	846.6	0.054	0.007	1,368.6	0.090	0.013
CAMX (WECC California)	513.5	0.032	0.004	1,006.5	0.053	0.007
ERCT (ERCOT All)	818.6	0.052	0.007	1,296.6	0.086	0.012
FRCC (FRCC All)	835.1	0.049	0.006	1,011.0	0.052	0.007
HIMS (HICC Miscellaneous)	1,143.2	0.110	0.017	1,542.1	0.134	0.022
HIOA (HICC Oahu)	1,653.0	0.178	0.027	1,753.5	0.175	0.027
MROE (MRO East)	1,526.4	0.139	0.020	1,628.9	0.143	0.021
MROW (MRO West)	979.5	0.104	0.015	1,810.0	0.185	0.027
NEWE (NPCC New England)	528.2	0.074	0.010	862.5	0.070	0.009
NWPP (WECC Northwest)	600.0	0.056	0.008	1,653.0	0.159	0.023
NYCW (NPCC NYC/Westchester)	634.6	0.022	0.003	970.2	0.021	0.002
NYLI (NPCC Long Island)	1,203.9	0.138	0.018	1,280.6	0.034	0.004
NYUP (NPCC Upstate NY)	233.5	0.016	0.002	877.9	0.042	0.005
PRMS (Puerto Rico Miscellaneous)	1,602.2	0.085	0.014	1,673.3	0.070	0.013
RFCE (RFC East)	652.5	0.045	0.006	1,233.4	0.085	0.012
RFCM (RFC Michigan)	1,153.1	0.101	0.014	1,725.7	0.163	0.023
RFCW (RFC West)	965.0	0.086	0.012	1,810.4	0.173	0.025
RMPA (WECC Rockies)	1,144.8	0.101	0.014	1,651.9	0.131	0.019
SPNO (SPP North)	954.0	0.100	0.014	1,969.9	0.205	0.030
SPSO (SPP South)	931.8	0.060	0.009	1,514.1	0.100	0.014
SRMV (SERC Mississippi Valley)	740.4	0.032	0.004	1,137.4	0.055	0.008
SRMW (SERC Midwest)	1,480.7	0.156	0.023	1,866.5	0.194	0.028
SRSO (SERC South)	860.2	0.060	0.009	1,336.9	0.094	0.013
SRTV (SERC Tennessee Valley)	834.2	0.075	0.011	1,511.8	0.135	0.019
SRVC (SERC Virginia/Carolina)	623.1	0.050	0.007	1,323.9	0.114	0.016
US Average	818.3	0.065	0.009	1,399.6	0.109	0.015

Source: EPA eGRID2020, February 2022

Note: Total output emission factors can be used as default factors for estimating GHG emissions from electricity use when developing a carbon footprint or emissions inventory. Annual non-baseload output emission factors should not be used for those purposes, but can be used to estimate GHG emissions reductions from reductions in electricity use.



Table 7 Steam and Heat

	CO ₂ Factor (kg / mmBtu)	CH ₄ Factor (g / mmBtu)	N ₂ O Factor (g / mmBtu)
Steam and Heat	66.33	1.250	0.125

Note: Emission factors are per mmBtu of steam or heat purchased. These factors assume natural gas fuel is used to generate steam or heat at 80 percent thermal efficiency.

Scope 3 Emission Factors

Scope 3 emission factors provided below are aligned with the Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions, version 1.0 (Scope 3 Calculation Guidance). Where applicable, the specific calculation method is referenced. Refer to the Scope 3 Calculation Guidance for more information (<http://www.ghgprotocol.org/scope-3-technical-calculation-guidance>).

Table 8 Scope 3 Category 4: Upstream Transportation and Distribution and Category 9: Downstream Transportation and Distribution

These factors are intended for use in the distance-based method defined in the Scope 3 Calculation Guidance. If fuel data are available, then the fuel-based method should be used, with factors from Tables 2 through 5.

Vehicle Type	CO ₂ Factor (kg / unit)	CH ₄ Factor (g / unit)	N ₂ O Factor (g / unit)	Units
Medium- and Heavy-Duty Truck	1.450	0.013	0.034	vehicle-mile
Passenger Car ^A	0.332	0.007	0.007	vehicle-mile
Light-Duty Truck ^B	0.454	0.012	0.009	vehicle-mile
Medium- and Heavy-Duty Truck	0.211	0.0020	0.0049	ton-mile
Rail	0.022	0.0017	0.0006	ton-mile
Waterborne Craft	0.041	0.0183	0.0008	ton-mile
Aircraft ^C	1.165	-	0.0359	ton-mile

Source:

CO₂, CH₄, and N₂O emissions data for road vehicles are from Table 2-13 of the EPA (2021) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019.

Vehicle-miles and passenger-miles data for road vehicles are from Table VM-1 of the Federal Highway Administration Highway Statistics 2019.

CO₂e emissions data for non-road vehicles are based on Table A-107 of the EPA (2021) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019, which are distributed into CO₂, CH₄, and N₂O emissions based on fuel/vehicle emission factors.

Freight ton-mile data are from Table 1-50 of the Bureau of Transportation Statistics, National Transportation Statistics for 2021 (Data based on 2019 for rail, waterborne craft and aircraft; medium- and heavy-duty truck based on 2018, due to data availability).

Notes:

Vehicle-mile factors are appropriate to use when the entire vehicle is dedicated to transporting the reporting company's product. Ton-mile factors are appropriate when the vehicle is shared with products from other companies.

^A Passenger car: includes passenger cars, minivans, SUVs, and small pickup trucks (vehicles with wheelbase less than 121 inches).

^B Light-duty truck: includes full-size pickup trucks, full-size vans, and extended-length SUVs (vehicles with wheelbase greater than 121 inches).

^C Medium- and Heavy-Duty Truck: includes Combination Trucks and single frame trucks that have 2-Axes and at least 6 tires or a gross vehicle weight rating exceeding 10,000 lbs.

Table 9 Scope 3 Category 5: Waste Generated in Operations and Category 12: End-of-Life Treatment of Sold Products

These factors are intended for use in the waste-type-specific method or the average-data method defined in the Scope 3 Calculation Guidance for category 5 and category 12. Choose the appropriate material and disposal method from the table below. For the average-data method, use one of the mixed material types, such as mixed MSW.

Material	Metric Tons CO ₂ e / Short Ton Material					
	Recycled ^a	Landfilled ^b	Combusted ^c	Composted ^d	Anaerobically Digested (Dry Digestate with Curing)	Anaerobically Digested (Wet Digestate with Curing)
Aluminum Cans	0.06	0.02	0.01	NA	NA	NA
Aluminum Ingot	0.04	0.02	0.01	NA	NA	NA
Steel Cans	0.32	0.02	0.01	NA	NA	NA
Copper Wire	0.18	0.02	0.01	NA	NA	NA
Glass	0.05	0.02	0.01	NA	NA	NA
HDPE	0.21	0.02	2.80	NA	NA	NA
LDPE	NA	0.02	2.80	NA	NA	NA
PET	0.23	0.02	2.05	NA	NA	NA
LLDPE	NA	0.02	2.80	NA	NA	NA
PS	NA	0.02	2.80	NA	NA	NA
PVC	NA	0.02	3.02	NA	NA	NA
PLA	NA	0.02	1.26	NA	NA	NA
Corrugated Containers	0.11	0.90	0.05	NA	NA	NA
Magazines/Third-class mail	0.02	0.42	0.05	NA	NA	NA
Newspaper	0.02	0.35	0.05	NA	NA	NA
Office Paper	0.02	1.25	0.05	NA	NA	NA
Phonebooks	0.04	0.35	0.05	NA	NA	NA
Textbooks	0.04	1.25	0.05	NA	NA	NA
Dimensional Lumber	0.09	0.17	0.05	NA	NA	NA
Medium-density Fiberboard	0.15	0.07	0.05	NA	NA	NA
Food Waste (non-meat)	NA	0.58	0.05	0.15	0.14	0.11
Food Waste (meat only)	NA	0.58	0.05	NA	0.14	0.11
Beef	NA	0.58	0.05	0.15	0.14	0.11
Poultry	NA	0.58	0.05	0.15	0.14	0.11
Grains	NA	0.58	0.05	0.15	0.14	0.11
Bread	NA	0.58	0.05	0.15	0.14	0.11
Fruits and Vegetables	NA	0.58	0.05	0.15	0.14	0.11
Dairy Products	NA	0.58	0.05	0.15	0.14	0.11
Yard Trimmings	NA	0.33	0.05	0.19	0.11	NA
Grass	NA	0.26	0.05	0.19	0.09	NA
Leaves	NA	0.26	0.05	0.19	0.13	NA
Branches	NA	0.53	0.05	0.19	0.16	NA
Mixed Paper (general)	0.07	0.80	0.05	NA	NA	NA
Mixed Paper (primarily residential)	0.07	0.77	0.05	NA	NA	NA
Mixed Paper (primarily from offices)	0.03	0.75	0.05	NA	NA	NA
Mixed Metals	0.23	0.02	0.01	NA	NA	NA
Mixed Plastics	0.22	0.02	2.34	NA	NA	NA
Mixed Recyclables	0.09	0.68	0.11	NA	NA	NA
Food Waste	NA	0.58	0.05	0.15	NA	NA
Mixed Organics	NA	0.48	0.05	0.17	NA	NA
Mixed MSW	NA	0.52	0.43	NA	NA	NA
Carpet	NA	0.02	1.68	NA	NA	NA
Desktop CPUs	NA	0.02	0.40	NA	NA	NA
Portable Electronic Devices	NA	0.02	0.89	NA	NA	NA
Flat-panel Displays	NA	0.02	0.74	NA	NA	NA
CRT Displays	NA	0.02	0.64	NA	NA	NA
Electronic Peripherals	NA	0.02	2.23	NA	NA	NA
Hard-copy Devices	NA	0.02	1.92	NA	NA	NA
Mixed Electronics	NA	0.02	0.87	NA	NA	NA
Clay Bricks	NA	0.02	NA	NA	NA	NA
Concrete	0.01	0.02	NA	NA	NA	NA
Fly Ash	0.01	0.02	NA	NA	NA	NA
Tires	0.10	0.02	2.21	NA	NA	NA
Asphalt Concrete	-	0.02	NA	NA	NA	NA
Asphalt Shingles	0.03	0.02	0.70	NA	NA	NA
Drywall	NA	0.02	NA	NA	NA	NA
Fiberglass Insulation	0.05	0.02	NA	NA	NA	NA
Vinyl Flooring	NA	0.02	0.29	NA	NA	NA
Wood Flooring	NA	0.18	0.08	NA	NA	NA

Source: EPA, Office of Resource Conservation and Recovery (February 2016) Documentation for Greenhouse Gas Emission and Energy Factors used in the Waste Reduction Model (WARM). Factors from tables provided in the Management Practices Chapters and Background Chapters. WARM Version 15, November 2020 Update. Additional data provided by EPA, WARM-15 Background Data.

Notes: These factors do not include any avoided emissions impact from any of the disposal methods. All the factors presented here include transportation emissions, which are optional in the Scope 3 Calculation Guidance, with an assumed average distance traveled to the processing facility. AR4 GWPs are used to convert all waste emission factors into CO₂e.

^a Recycling emissions include transport to recycling facility and sorting of recycled materials at material recovery facility.

^b Landfilling emissions include transport to landfill, equipment use at landfill and fugitive landfill CH₄ emissions. Landfill CH₄ is based on typical landfill gas collection practices and average landfill moisture conditions.

^c Combustion emissions include transport to combustion facility and combustion-related non-biogenic CO₂ and N₂O

^d Composting emissions include transport to composting facility, equipment use at composting facility and CH₄ and N₂O emissions during composting.

Table 10 Scope 3 Category 6: Business Travel and Category 7: Employee Commuting

These factors are intended for use in the distance-based method defined in the Scope 3 Calculation Guidance. If fuel data are available, then the fuel-based method should be used, with factors from Tables 2 through 5.

Vehicle Type	CO ₂ Factor (kg / unit)	CH ₄ Factor (g / unit)	N ₂ O Factor (g / unit)	Units
Passenger Car ^A	0.332	0.007	0.007	vehicle-mile
Light-Duty Truck ^B	0.454	0.012	0.009	vehicle-mile
Motorcycle	0.183	0.070	0.007	vehicle-mile
Intercity Rail - Northeast Corridor ^C	0.058	0.0055	0.0007	passenger-mile
Intercity Rail - Other Routes ^C	0.150	0.0117	0.0038	passenger-mile
Intercity Rail - National Average ^C	0.113	0.0092	0.0026	passenger-mile
Commuter Rail ^D	0.139	0.0112	0.0028	passenger-mile
Transit Rail (i.e. Subway, Tram) ^E	0.099	0.0084	0.0012	passenger-mile
Bus	0.056	0.0210	0.0009	passenger-mile
Air Travel - Short Haul (< 300 miles)	0.207	0.0064	0.0066	passenger-mile
Air Travel - Medium Haul (>= 300 miles, < 2300 miles)	0.129	0.0006	0.0041	passenger-mile
Air Travel - Long Haul (>= 2300 miles)	0.163	0.0006	0.0052	passenger-mile

Source:

CO₂, CH₄, and N₂O emissions data for highway vehicles are from Table 2-13 of the EPA (2021) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2019.

Vehicle-miles and passenger-miles data for highway vehicles are from Table VM-1 of the Federal Highway Administration Highway Statistics 2019.

Fuel consumption data and passenger-miles data for rail are from Tables A.14 to A.16 and C.9 to C.11 of the Transportation Energy Data Book: Edition 39. Fuel consumption was converted to emissions by using fuel and electricity emission factors presented in the tables above.

Intercity Rail factors from communication with Amtrak (Laura Fotiou), March 2020. These are based on 2019 values.

Air Travel factors from 2021 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting. Version 1.0 June 2021.

Notes:

^A Passenger car: includes passenger cars, minivans, SUVs, and small pickup trucks (vehicles with wheelbase less than 121 inches).

^B Light-duty truck: includes full-size pickup trucks, full-size vans, and extended-length SUVs (vehicles with wheelbase greater than 121 inches).

^C Intercity rail: Amtrak long-distance rail between major cities. Northeast Corridor extends from Boston to Washington D.C. Other Routes are all routes outside the Northeast Corridor.

^D Commuter rail: rail service between a central city and adjacent suburbs (also called regional rail or suburban rail).

^E Transit rail: rail typically within an urban center, such as subways, elevated railways, metropolitan railways (metro), streetcars, trolley cars, and tramways.

Global Warming Potentials

Table 11 Global Warming Potentials (GWPs)

Gas	100-Year GWP
CO ₂	1
CH ₄	25
N ₂ O	298
HFC-23	14,800
HFC-32	675
HFC-41	92
HFC-125	3,500
HFC-134	1,100
HFC-134a	1,430
HFC-143	353
HFC-143a	4,470
HFC-152	53
HFC-152a	124
HFC-161	12
HFC-227ea	3,220
HFC-236cb	1,340
HFC-236ea	1,370
HFC-236fa	9,810
HFC-245ca	693
HFC-245fa	1,030
HFC-365mfc	794
HFC-43-10mee	1,640
SF ₆	22,800
NF ₃	17,200
CF ₄	7,390
C ₂ F ₆	12,200
C ₃ F ₈	8,830
C-C ₂ F ₆	10,300
C ₂ F ₁₀	8,860
C ₂ F ₁₂	9,160
C ₂ F ₁₄	9,300
C ₁₀ F ₁₈	>7,500

Source:

100-year GWPs from IPCC Fourth Assessment Report (AR4), 2007. IPCC AR4 was published in 2007 and is among the most current and comprehensive peer-reviewed assessments of climate change. AR4 provides revised GWPs of several GHGs relative to the values provided in previous assessment reports, following advances in scientific knowledge on the radiative efficiencies and atmospheric lifetimes of these GHGs and of CO₂. Because the GWPs provided in AR4 reflect an improved scientific understanding of the radiative effects of these gases in the atmosphere, the values provided are more appropriate for supporting the overall goal of organizational GHG reporting than the Second Assessment Report (SAR) GWP values previously used in the Emission Factors Hub. While EPA recognizes that Fifth Assessment Report (AR5) GWPs have been published, in an effort to ensure consistency and comparability of GHG data between EPA's voluntary and non-voluntary GHG reporting programs (e.g. GHG Reporting Program and National Inventory), EPA recommends the use of AR4 GWPs. The United States and other developed countries to the UNFCCC have agreed to submit annual inventories in 2015 and future years to the UNFCCC using GWP values from AR4, which will replace the current use of SAR GWP values. Utilizing AR4 GWPs improves EPA's ability to analyze corporate, national, and sub-national GHG data consistently, enhances communication of GHG information between programs, and gives outside stakeholders a consistent, predictable set of GWPs to avoid confusion and additional burden.

Table 12 Global Warming Potentials (GWPs) for Blended Refrigerants

ASHRAE #	100-year GWP	Blend Composition
R-401A	16	53% HCFC-22, 34% HCFC-124, 13% HFC-152a
R-401B	14	61% HCFC-22, 28% HCFC-124, 11% HFC-152a
R-401C	19	33% HCFC-22, 52% HCFC-124, 15% HFC-152a
R-402A	2,100	38% HCFC-22, 6% HFC-125, 2% propane
R-402B	1,330	6% HCFC-22, 38% HFC-125, 2% propane
R-403B	3,444	56% HCFC-22, 39% PFC-218, 5% propane
R-404A	3,922	44% HFC-125, 4% HFC-134a, 52% HFC-143a
R-406A	0	55% HCFC-22, 41% HCFC-142b, 4% isobutane
R-407A	2,107	20% HFC-32, 40% HFC-125, 40% HFC-134a
R-407B	2,804	10% HFC-32, 70% HFC-125, 20% HFC-134a
R-407C	1,774	23% HFC-32, 25% HFC-125, 52% HFC-134a
R-407D	1,627	15% HFC-32, 15% HFC-125, 70% HFC-134a
R-407E	1,552	25% HFC-32, 15% HFC-125, 60% HFC-134a
R-408A	2,301	47% HCFC-22, 7% HFC-125, 46% HFC-143a
R-409A	0	60% HCFC-22, 25% HCFC-124, 15% HCFC-142b
R-410A	2,088	50% HFC-32, 50% HFC-125
R-410B	2,229	45% HFC-32, 55% HFC-125
R-411A	14	87.5% HCFC-22, 11 HFC-152a, 1.5% propylene
R-411B	4	94% HCFC-22, 3% HFC-152a, 3% propylene
R-413A	2,053	88% HFC-134a, 9% PFC-218, 3% isobutane
R-414A	0	51% HCFC-22, 28.5% HCFC-124, 16.5% HCFC-142b
R-414B	0	5% HCFC-22, 39% HCFC-124, 9.5% HCFC-142b
R-417A	2,346	46.6% HFC-125, 5% HFC-134a, 3.4% butane
R-422A	3,143	85.1% HFC-125, 11.5% HFC-134a, 3.4% isobutane
R-422D	2,729	65.1% HFC-125, 31.5% HFC-134a, 3.4% isobutane
R-423A	2,280	47.5% HFC-227ea, 52.5% HFC-134a
R-424A	2,440	50.5% HFC-125, 47% HFC-134a, 2.5% butane/pentane
R-426A	1,508	5.1% HFC-125, 93% HFC-134a, 1.9% butane/pentane
R-428A	3,607	77.5% HFC-125, 2% HFC-143a, 1.9% isobutane
R-434A	3,245	63.2% HFC-125, 16% HFC-134a, 18% HFC-143a, 2.8% isobutane
R-500	32	73.8% CFC-12, 26.2% HFC-152a, 48.8% HCFC-22
R-502	0	48.8% HCFC-22, 51.2% CFC-115
R-504	325	48.2% HFC-32, 51.8% CFC-115
R-507	3,985	5% HFC-125, 5% HFC-143a
R-508A	13,214	39% HFC-23, 61% PFC-116
R-508B	13,396	46% HFC-23, 54% PFC-116

Source:

100-year GWPs from IPCC Fourth Assessment Report (AR4), 2007. See the source note to Table 11 for further explanation. GWPs of blended refrigerants are based on their HFC and PFC constituents, which are based on data from <http://www.epa.gov/ozone/snap/refrigerants/refblend.html>.