Appendix B

# AIR QUALITY AND GREENHOUSE GAS EMISSIONS IMPACT ASSESSMENT

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July 7, 2015 NAS-02

Chris Carterette, Project Manager
San Diego Association of Governments
401 B Street, Suite 800
San Diego, CA 92101

**Subject: Air Quality and Greenhouse Gas Emissions Impact Assessment for the Rose Creek Bikeway Project**

Dear Mr. Carterette:

This letter summarizes the air quality and greenhouse gas (GHG) emissions analysis for the Rose Creek Bikeway Project (project). The project proposes to construct a bicycle facility which would extend for a distance of approximately two miles beginning at the northern terminus of Santa Fe Street (just south of State Route 52 and east of Interstate [I-] 5) and terminating on the west side of Mission Bay Drive, north of Garnett Avenue. The proposed project includes a combination on- and off-street bicycle facility configuration. The on-street configuration would extend approximately 7,200 linear feet (LF) from the northern terminus of Santa Fe Street southward along the existing paved area of Santa Fe Street to an existing bridge over Rose Creek. The on-street portion would consist of a 10-foot-wide cycle-track on the west side of the road and possibly a new sidewalk (3,600 feet long and 5 feet wide) on the east side of the roadway. The decision to construct this sidewalk will be made during final design of the project. The off-street portion of the bikeway would begin at a new bridge constructed near the existing Santa Fe Street bridge and extend approximately 4,000 LF along the east side of Rose Creek to the west side of Mission Bay Drive. The off-street portion would consist of a concrete 10-foot-wide path with 2-foot shoulders. In addition to the new bridge over Rose Creek, the off-street portion would include new structures beneath the existing I-5 and Mission Bay Drive bridges to accommodate the facility. Project grading would require 7,000 cubic yards (cy) of material considered unsuitable for use as structural fill to be exported, and 10,000 cy of structural fill to be imported.

Emissions were quantified using the Road Construction Emissions Model (Roadway Model) Version, 7.1.2, developed by Sacramento Metropolitan Air Quality Management District (SMAQMD). The Roadway Model contains OFFROAD2011 emission factors and

EMFAC2011 emission factors from the California Air Resources Board's (CARB's) models for off-road equipment and on-road vehicles. Construction of the on- and off-street portions of the project would occur sequentially, and total construction is estimated to occur over the course of one year, starting in 2016. A complete listing of the assumptions used in the analysis and model output is provided as Attachment A of this letter.

## Air Quality

### Consistency with Air Quality Plans

The project site is located within the San Diego Air Basin (SDAB). The San Diego Air Pollution Control District (SDAPCD) manages air quality in the SDAB. Air quality plans applicable to the SDAB include the San Diego Regional Air Quality Strategy (RAQS) and applicable portions of the State Implementation Plan (SIP). The RAQS and SIP outline the SDAPCD's plans and control measures designed to attain state and federal air quality standards. Projects that propose development consistent with the growth anticipated by the applicable general plan(s) are consistent with the RAQS and applicable portions of the SIP. The proposed project is included in Riding to 2050, the San Diego Regional Bicycle Plan (SANDAG 2010), which supports implementation of both the Regional Comprehensive Plan (RCP) and Regional Transportation Plan (RTP; 2030 and 2050), and is, therefore, accounted for in the RAQS and SIP. Operation of the project would not generate substantial air quality emissions since the facility would be used for biking and walking. As a result, it would not conflict with or obstruct implementation of applicable air quality plans; furthermore, the project would help reduce emissions and promote air quality policies by reducing the reliance on the automobile and encouraging alternative modes of transportation. Therefore, no associated air quality impacts would occur.

### Conformance to Federal and State Air Quality Standards

Construction activities associated with the project would generate short-term emissions of Reactive Organic Gas (ROG), Oxides of Nitrogen (NOx), carbon monoxide (CO), $PM_{10}$, and $PM_{2.5}$. Emissions would originate from off-road diesel equipment exhaust, employee and material delivery vehicle exhaust, re-entrained paved road dust, fugitive dust from land clearing, and off-gassing from architectural coating and paving. Construction was assumed to occur during the calendar year 2016. Table 1 includes the assumed amount of equipment to be used during each construction activity for both the on- and off-street portions of the project. See Attachment A for additional model assumptions.

**Table 1**
**CONSTRUCTION EQUIPMENT ASSUMPTIONS**

| Equipment Per Phase | On-Street Portion[1] | Off-Street Portion[1] | Horsepower[2] |
|---|---|---|---|
| Grubbing/Land Clearing | | | |
| Crawler Tractors | 0 | 1 | 208 |
| Excavators | 0 | 1 | 163 |
| Signal Boards | 2 | 0 | 20 |
| Grading/Excavation | | | |
| Cranes | 0 | 1 | 226 |
| Crawler Tractors | 0 | 1 | 208 |
| Excavators | 1 | 1 | 163 |
| Rollers | 1 | 1 | 81 |
| Rubber Tired Loaders | 1 | 1 | 200 |
| Signal Boards | 2 | 0 | 20 |
| Tractors/Loaders/Backhoes | 2 | 1 | 98 |
| Drainage/Utilities/Subgrade | | | |
| Air Compressors | 1 | 1 | 106 |
| Generator Sets | 1 | 1 | 66 |
| Plate Compactors | 1 | 3 | 8 |
| Pumps | 0 | 1 | 53 |
| Signal Boards | 2 | 0 | 20 |
| Tractors/Loaders/Backhoes | 2 | 2 | 98 |
| Paving | | | |
| Pavers | 1 | 1 | 126 |
| Paving Equipment | 2 | 1 | 131 |
| Rollers | 1 | 1 | 81 |
| Signal Boards | 2 | 0 | 20 |
| Tractors/Loaders/Backhoes | 0 | 1 | 98 |

Notes:
[1] Amount of equipment was received from Nasland (pers. comm. 2014).
[2] Equipment horsepower contained in Roadway Model.

The proposed project would be required to comply with applicable SDAPCD emissions and fugitive dust measures. An estimate of the worst daily emissions associated with construction of the proposed project is presented in Table 2. Emissions associated with the project were compared to SDAPCD's "Air Quality Impact Analysis (AQIA) Trigger Levels" as contained within SDAPCD Regulation II, Rule 20.2. As shown in Table 2, criteria pollutant emissions associated with project construction would be below the applicable threshold levels.

**Table 2**
**MAXIMUM DAILY CONSTRUCTION EMISSIONS**

| Construction Activity | Pollutant Emissions (pounds per day) | | | | |
|---|---|---|---|---|---|
| | ROG | NOx | CO | $PM_{10}$ | $PM_{2.5}$ |
| Grubbing/Land Clearing | 2.5 | 29.6 | 16.4 | 6.0 | 1.8 |
| Grading/Excavation | 6.4 | 74.1 | 38.6 | 7.3 | 3.6 |
| Drainage/Utilities/Sub-Grade | 5.5 | 39.5 | 31.0 | 7.3 | 3.3 |
| Paving | 3.2 | 29.1 | 20.5 | 1.8 | 1.6 |
| **Worst-Case Daily Emissions** | **6.4** | **74.1** | **38.6** | **7.3** | **3.6** |
| SDAPCD Thresholds | 137 | 250 | 550 | 100 | 55 |

Source: Roadway Model emissions modeling by HELIX 2014 (output data is provided in Attachment A).
Note: Emissions were calculated for both on- and off-street portions of the project with the highest daily emissions shown here.

It should be noted that approximately 1,250 of the 7,000 cubic yards of soil planned for export is contaminated with lead levels greater than the California Soluble Threshold Limit Concentration (Kleinfelder 2015). As detailed in the *Aerial Deposited Lead Survey Report* (Kleinfelder 2015) completed for the Project, once excavated, this soil is considered California hazardous waste and should be disposed of at a Class I or II facility.

With the exception of the infrequent operation of maintenance vehicles along the bikeway, the proposed bicycle facility would not be used by motorized vehicles and no other operational emissions would be expected. Thus, operation of the proposed facility would not violate applicable air quality standards or substantially contribute to an existing or projected air quality violation.

**Cumulatively Considerable Net Increase**

The SDAB is currently classified as nonattainment for certain Federal- and State-designated criteria pollutants including ozone, $PM_{10}$, and $PM_{2.5}$ (CARB 2014). As discussed above, emissions from project-related construction activities would be minimal, short-term, and localized. Project operation is anticipated to lower cumulative emissions by encouraging alternative modes of transportation such as walking and biking. The project would, therefore, not result in a cumulatively considerable net increase in criteria pollutants.

**Sensitive Receptors**

Sensitive receptors are facilities and structures where people live or spend considerable amounts of time, including hospitals, retirement homes, residences, schools, and childcare centers. Project construction would be located near some residences and schools. The nearest school (Alcott Elementary School) is located more than 0.5 mile away from the nearest proposed construction area, and the nearest residence is located approximately 190 feet from the nearest construction area. However, as discussed above, project construction activities would be

minimal, and the project would comply with all SDAPCD emissions and fugitive dust standards. Additionally, as previously discussed, with the exception of the infrequent operation of maintenance vehicles along the bikeway, operation of the project would not generate direct air quality emissions and would therefore not impact sensitive receptors.

**Odors**

Project construction (specifically, the use of diesel construction equipment and vehicles) could generate odors associated with fuel combustion. However, these odors would dissipate into the atmosphere upon release, and would only temporarily remain in proximity to the construction equipment and vehicles. Potential odors would be temporary and localized within the immediate project vicinity, and would not affect a substantial number of people.

**Greenhouse Gas Emissions**

Global climate change refers to changes in average climatic conditions on Earth, as a whole, including temperature, wind patterns, precipitation, and storms. Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$), as well as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride ($SF_6$). These greenhouse gases (GHGs) allow solar radiation (sunlight) into the Earth's atmosphere, but prevent radiative heat from escaping, thus warming the Earth's atmosphere. GHGs are emitted by both natural processes and human activities. Concentrations of GHGs have increased in the atmosphere since the industrial revolution. Human activities that generate GHG emissions include combustion of fossil fuels ($CO_2$ and $N_2O$); natural gas generated from landfills, fermentation of manure and cattle farming ($CH_4$); and industrial processes such as nylon and nitric acid production ($N_2O$).

**Methodology**

Assembly Bill (AB) 32, the California Global Warming Solutions Act, established a stated goal of reducing GHG emissions to 1990 levels by the year 2020, which would require a reduction of approximately 30 percent from "business as usual" or forecasted emission levels. Senate Bill (SB) 97, a companion bill, directed the California Natural Resources Agency (Resources Agency) to certify and adopt guidelines for the mitigation of GHG or the effects of GHG emissions. SB 97 was the State Legislature's directive to the Resources Agency to specifically establish that GHG emissions and their impacts are appropriate subjects for CEQA analysis.

SANDAG has adopted the following planning documents to address regional energy savings and climate change:

- The Climate Action Strategy is a guide on climate change policy and identifies a range of potential policy measures for consideration as SANDAG updates long-term planning documents like the RTP and RCP.

- The Regional Energy Strategy serves as the energy policy blueprint through 2030 to support decision-making as the region strives to meet the energy needs of a growing population and economy while enhancing our quality of life.

- The Sustainable Region Program Action Plan is designed to assist local governments in developing energy management plans and implementing cost-saving energy measures.

SANDAG also works with federal and state energy planning/regulating agencies to help the region attain its energy goals.

The County of San Diego uses 900 MT $CO_2e$ as its interim threshold. If a project would exceed the annual 900 MT screening threshold, then a potentially significant GHG emissions impact would occur and preparation of a detailed quantitative GHG analysis would be required (County 2015). Thus, 900 MT is used in this analysis to determine the potential for significant GHG impacts to occur from the project.

GHG emissions associated with the project include those from construction and operations, as discussed below.

**Emissions**

Construction emissions would be associated with off-road diesel equipment exhaust, and from worker and truck trips to and from the project site. The primary emissions occur as $CO_2$ from gasoline and diesel combustion, with more limited vehicle tailpipe emissions of nitrous oxide ($N_2O$) and methane ($CH_4$). Table 1, presented earlier, provides a detailed list of off-road construction equipment assumed to be working on-site for each phase. The model default on-road haul truck trip distance of 30 miles per round trip was used because the source of the soil to be imported and destination of the soil to be exported was not known at the time of this analysis. As discussed previously, approximately 1,250 CY of contaminated soil will need to be transported to a Class I or II facility for proper disposal. One Class I facility currently being considered for receipt of the contaminated soil is the Copper Mountain Landfill located approximately 200 miles east in Wellton, Arizona. Though the distance to this disposal site is greater than the model defaults assumed, the emissions generated by the additional haul truck miles traveled would be negligible because contaminated soils represent only seven percent of the total material to be hauled and the remaining material would likely be hauled to the Miramar Landfill located only nine miles to the east; a shorter distance than the assumed default, thereby offsetting the difference.

It was assumed that construction would occur during the year 2016. Guidance from the County of San Diego recommends amortizing construction emissions to account for the annual contribution of GHG emissions over a project's lifetime. SANDAG has projected this project's lifetime to be 50 years. As shown in Table 3, amortized construction emissions would be substantially below the 900 MT of $CO_2$ equivalents ($CO_2e$) screening threshold.

**Table 3**
**CONSTRUCTION GHG EMISSIONS (MT/yr)**

| Construction Activity | $CO_2e$ |
|---|---|
| Grubbing/Land Clearing | 18.68 |
| Grading/Excavation | 272.35 |
| Drainage/Utilities/Sub-Grade | 120.63 |
| Paving | 41.23 |
| **TOTAL** | **452.89** |
| Amortized Construction Emissions[1] | 9.06 |
| **County of San Diego Threshold[2]** | **900** |

Source: Roadway Model emissions modeling by HELIX 2014 (output data is provided in Attachment A).
[1] Construction emissions are amortized over the 50 year project lifetime

The project could result in operational emissions associated with production of energy consumed by the proposed lighting along the bikeway and the operation of maintenance vehicles along the bikeway; these emissions, however, would be very minor, as the lighting proposed for this project would be minimal and maintenance activities would be infrequent. Additionally, the project would encourage the use of bicycles and walking as alternatives to driving, and, thus, is anticipated to result in a net decrease in GHG emissions over the project's lifetime.

**Consistency with Applicable Plans**

The proposed project would not constitute a significant source of GHG emissions, and would aid in the reduction of regional GHG emissions through encouraging alternative transportation. As such, the project would be consistent with SANDAG's *Climate Action Strategy*, *Regional Energy Strategy,* and *Sustainable Region Program Action Plan*; all of which obtain goals associated with the reduction of transportation-related GHG emissions through reducing regional vehicle miles traveled and automobile reliance, as well as promoting walking and bicycling as viable transportation alternatives. Implementation of the project would therefore not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

**Summary**

The project would result in construction emissions of criteria pollutants and GHGs. Operational GHG emissions could result from the proposed lighting and maintenance of the facility; however these emissions would be negligible, and would be offset by the project's anticipated net decrease in emissions through encouraging alternative modes of transportation. As such, the project would support regional goals to improve air quality and reduce GHG emissions by reducing the reliance on the automobile.

Sincerely,

Joanne M. Dramko, AICP, GISP
Senior Air Quality Scientist

**Attachment**

Attachment A: Roadway Model Emissions

**References**

California Air Resources Board (CARB). 2014. *Area Designations: Activities and Maps*. Available: http://www.arb.ca.gov/desig/adm/adm.htm. Accessed September 2014.

California Air Pollution Control Officers Association (CAPCOA). 2008. *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*. January. Available at: http://www.capcoa.org/wp-content/uploads/2012/03/CAPCOA-White-Paper.pdf.

County of San Diego. 2015. *2015 GHG Guidance – Recommended Approach to Addressing Climate Change in CEQA Documents*. January 21.

Kleinfelder. 2015. *Aerially Deposited Lead Survey Report – Rose Creek Bikeway Project San Diego, California. May 22.*

Nasland Engineering. 2014. Email communication between Thornburgh, L. and McIntyre, B. of HELIX Environmental Planning, Inc. September 17.

San Diego Association of Governments (SANDAG). 2010. *Riding to 2050, the San Diego Regional Bicycle Plan.*

# Attachment A

# ROADWAY MODEL EMISSIONS

# Road Construction Emissions Model, Version 7.1.5.1

| Emission Estimates for -> Rose Creek Bicycle Facility Project - Paved Portion<br>Project Phases (English Units) | ROG (lbs/day) | CO (lbs/day) | NOx (lbs/day) | Total PM10 (lbs/day) | Exhaust PM10 (lbs/day) | Fugitive Dust PM10 (lbs/day) | Total PM2.5 (lbs/day) | Exhaust PM2.5 (lbs/day) | Fugitive Dust PM2.5 (lbs/day) | CO2 (lbs/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Grubbing/Land Clearing** | 0.9 | 4.1 | 3.5 | 6.0 | 0.2 | 5.8 | 1.4 | 0.2 | 1.2 | 759.2 |
| **Grading/Excavation** | 3.1 | 17.2 | 24.4 | 7.3 | 1.5 | 5.8 | 2.5 | 1.3 | 1.2 | 3,538.7 |
| **Drainage/Utilities/Sub-Grade** | 3.0 | 15.5 | 20.9 | 7.3 | 1.5 | 5.8 | 2.5 | 1.3 | 1.2 | 3,250.2 |
| **Paving** | 2.3 | 14.6 | 17.5 | 1.0 | 1.0 | - | 0.9 | 0.9 | - | 2,422.5 |
| **Maximum (pounds/day)** | 3.1 | 17.2 | 24.4 | 7.3 | 1.5 | 5.8 | 2.5 | 1.3 | 1.2 | 3,538.7 |
| **Total (tons/construction project)** | 0.1 | 0.7 | 0.9 | 0.3 | 0.1 | 0.2 | 0.1 | 0.1 | 0.0 | 132.3 |

Notes:

| | |
|---|---|
| Project Start Year -> | 2016 |
| Project Length (months) -> | 4 |
| Total Project Area (acres) -> | 2 |
| Maximum Area Disturbed/Day (acres) -> | 1 |
| Total Soil Imported/Exported ($yd^3$/day)-> | 0 |

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

| Emission Estimates for -> Rose Creek Bicycle Facility Project - Paved Portion<br>Project Phases (Metric Units) | ROG (kgs/day) | CO (kgs/day) | NOx (kgs/day) | Total PM10 (kgs/day) | Exhaust PM10 (kgs/day) | Fugitive Dust PM10 (kgs/day) | Total PM2.5 (kgs/day) | Exhaust PM2.5 (kgs/day) | Fugitive Dust PM2.5 (kgs/day) | CO2 (kgs/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Grubbing/Land Clearing** | 0.4 | 1.9 | 1.6 | 2.7 | 0.1 | 2.6 | 0.6 | 0.1 | 0.5 | 345.1 |
| **Grading/Excavation** | 1.4 | 7.8 | 11.1 | 3.3 | 0.7 | 2.6 | 1.1 | 0.6 | 0.5 | 1,608.5 |
| **Drainage/Utilities/Sub-Grade** | 1.4 | 7.1 | 9.5 | 3.3 | 0.7 | 2.6 | 1.1 | 0.6 | 0.5 | 1,477.4 |
| **Paving** | 1.1 | 6.6 | 8.0 | 0.5 | 0.5 | - | 0.4 | 0.4 | - | 1,101.2 |
| **Maximum (kilograms/day)** | 1.4 | 7.8 | 11.1 | 3.3 | 0.7 | 2.6 | 1.1 | 0.6 | 0.5 | 1,608.5 |
| **Total (megagrams/construction project)** | 0.1 | 0.6 | 0.8 | 0.2 | 0.1 | 0.2 | 0.1 | 0.0 | 0.0 | 120.0 |

Notes:

| | |
|---|---|
| Project Start Year -> | 2016 |
| Project Length (months) -> | 4 |
| Total Project Area (hectares) -> | 1 |
| Maximum Area Disturbed/Day (hectares) -> | 0 |
| Total Soil Imported/Exported ($meters^3$/day)-> | 0 |

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

# Road Construction Emissions Model

Version 7.1.5.1

## Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

**Input Type**

| | | |
|---|---|---|
| Project Name | Rose Creek Bicycle Facility Project - Paved Portion | |
| Construction Start Year | 2016 | Enter a Year between 2009 and 2025 (inclusive) |
| Project Type | 2 | 1 New Road Construction<br>2 Road Widening<br>3 Bridge/Overpass Construction |
| Project Construction Time | 4.00 | months |
| Predominant Soil/Site Type: Enter 1, 2, or 3 | 2 | 1. Sand Gravel<br>2. Weathered Rock-Earth<br>3. Blasted Rock |
| Project Length | 1.36 | miles |
| Total Project Area | 2.31 | acres |
| Maximum Area Disturbed/Day | 0.58 | acres |
| Water Trucks Used? | 1 | 1. Yes<br>2. No |
| Soil Imported | | $yd^3$/day |
| Soil Exported | | $yd^3$/day |
| Average Truck Capacity | 20 | $yd^3$ (assume 20 if unknown) |

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

**The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.**

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

| Construction Periods | User Override of Construction Months | Program Calculated Months |
|---|---|---|
| Grubbing/Land Clearing | | 0.40 |
| Grading/Excavation | | 1.80 |
| Drainage/Utilities/Sub-Grade | | 1.20 |
| Paving | | 0.60 |
| **Totals** | 0.00 | 4.00 |

| 2005 | % | 2006 | % | 2007 | % |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

**NOTE: soil hauling emissions are included in the Grading/Excavation Construction Period Phase, therefore the Construction Period for Grading/Excavation cannot be zero if hauling is part of the project.**

Hauling emission default values can be overridden in cells C45 through C46.

## Soil Hauling Emissions

| User Input | User Override of Soil Hauling Defaults | Default Values |
|---|---|---|
| Miles/round trip | | 30 |
| Round trips/day | | 0 |
| Vehicle miles traveled/day (calculated) | | 0 |

| Hauling Emissions | ROG | NOx | CO | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|
| Emission rate (grams/mile) | 0.16 | 8.25 | 0.70 | 0.17 | 0.10 | 1679.86 |
| Emission rate (grams/trip) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pounds per day | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tons per contruction period | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Worker commute default values can be overridden in cells C60 through C65.

## Worker Commute Emissions

| | User Override of Worker Commute Default Values | Default Values |
|---|---|---|
| Miles/ one-way trip | | 20 |
| One-way trips/day | | 2 |
| No. of employees: Grubbing/Land Clearing | | 8 |
| No. of employees: Grading/Excavation | | 23 |
| No. of employees: Drainage/Utilities/Sub-Grade | | 16 |
| No. of employees: Paving | | 13 |

| | ROG | NOx | CO | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|
| Emission rate - Grubbing/Land Clearing (grams/mile) | 0.147 | 0.194 | 1.744 | 0.047 | 0.020 | 443.650 |
| Emission rate - Grading/Excavation (grams/mile) | 0.147 | 0.194 | 1.744 | 0.047 | 0.020 | 443.650 |
| Emission rate - Draining/Utilities/Sub-Grade (gr/mile) | 0.147 | 0.194 | 1.744 | 0.047 | 0.020 | 443.650 |
| Emission rate - Paving (grams/mile) | 0.147 | 0.194 | 1.744 | 0.047 | 0.020 | 443.650 |
| Emission rate - Grubbing/Land Clearing (grams/trip) | 0.505 | 0.323 | 4.200 | 0.004 | 0.003 | 95.592 |
| Emission rate - Grading/Excavation (grams/trip) | 0.505 | 0.323 | 4.200 | 0.004 | 0.003 | 95.592 |
| Emission rate - Draining/Utilities/Sub-Grade (gr/trip) | 0.505 | 0.323 | 4.200 | 0.004 | 0.003 | 95.592 |
| Emission rate - Paving (grams/trip) | 0.505 | 0.323 | 4.200 | 0.004 | 0.003 | 95.592 |
| Pounds per day - Grubbing/Land Clearing | 0.114 | 0.139 | 1.291 | 0.031 | 0.013 | 296.319 |
| Tons per const. Period - Grub/Land Clear | 0.001 | 0.001 | 0.006 | 0.000 | 0.000 | 1.304 |
| Pounds per day - Grading/Excavation | 0.342 | 0.417 | 3.873 | 0.093 | 0.040 | 888.958 |
| Tons per const. Period - Grading/Excavation | 0.007 | 0.008 | 0.077 | 0.002 | 0.001 | 17.601 |
| Pounds per day - Drainage/Utilities/Sub-Grade | 0.247 | 0.301 | 2.797 | 0.067 | 0.029 | 642.025 |
| Tons per const. Period - Drain/Util/Sub-Grade | 0.003 | 0.004 | 0.037 | 0.001 | 0.000 | 8.475 |
| Pounds per day - Paving | 0.190 | 0.232 | 2.152 | 0.052 | 0.022 | 493.865 |
| Tons per const. Period - Paving | 0.001 | 0.002 | 0.014 | 0.000 | 0.000 | 3.260 |
| tons per construction period | 0.012 | 0.014 | 0.134 | 0.003 | 0.001 | 30.639 |

Water truck default values can be overriden in cells C91 through C93 and E91 through E93.

| Water Truck Emissions | User Override of Default # Water Trucks | Program Estimate of Number of Water Trucks | User Override of Truck Miles Traveled/Day | Default Values Miles Traveled/Day |
|---|---|---|---|---|
| Grubbing/Land Clearing - Exhaust | | 1 | | 40 |
| Grading/Excavation - Exhaust | | 1 | | 40 |
| Drainage/Utilities/Subgrade | 4.00 | 1 | | 40 |

| | ROG | NOx | CO | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|
| Emission rate - Grubbing/Land Clearing (grams/mile) | 0.16 | 8.25 | 0.70 | 0.17 | 0.10 | 1679.86 |
| Emission rate - Grading/Excavation (grams/mile) | 0.16 | 8.25 | 0.70 | 0.17 | 0.10 | 1679.86 |
| Emission rate - Draining/Utilities/Sub-Grade (gr/mile) | 0.16 | 8.25 | 0.70 | 0.17 | 0.10 | 1679.86 |
| Pounds per day - Grubbing/Land Clearing | 0.01 | 0.73 | 0.06 | 0.01 | 0.01 | 148.00 |
| Tons per const. Period - Grub/Land Clear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.65 |
| Pound per day - Grading/Excavation | 0.01 | 0.73 | 0.06 | 0.01 | 0.01 | 148.00 |
| Tons per const. Period - Grading/Excavation | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 2.93 |
| Pound per day - Drainage/Utilities/Subgrade | 0.06 | 2.91 | 0.25 | 0.06 | 0.03 | 592.02 |
| Tons per const. Period - Drainage/Utilities/Subgrade | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 7.81 |

Fugitive dust default values can be overridden in cells C110 through C112.

| Fugitive Dust | User Override of Max Acreage Disturbed/Day | Default Maximum Acreage/Day | PM10 pounds/day | PM10 tons/per period | PM2.5 pounds/day | PM2.5 tons/per period |
|---|---|---|---|---|---|---|
| Fugitive Dust - Grubbing/Land Clearing | | 0.5785 | 5.8 | 0.0 | 1.2 | 0.0 |
| Fugitive Dust - Grading/Excavation | | 0.5785 | 5.8 | 0.1 | 1.2 | 0.0 |
| Fugitive Dust - Drainage/Utilities/Subgrade | | 0.5785 | 5.8 | 0.1 | 1.2 | 0.0 |

## Off-Road Equipment Emissions

| **Grubbing/Land Clearing** | Default Number of Vehicles | | ROG | CO | NOx | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|
| Override of Default Number of Vehicles | *Program-estimate* | Type | pounds/day | pounds/day | pounds/day | pounds/day | pounds/day | pounds/day |
| | | Aerial Lifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Air Compressors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Bore/Drill Rigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cement and Mortar Mixers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Concrete/Industrial Saws | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cranes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 1 | Crawler Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crushing/Proc. Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 2 | Excavators | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Generator Sets | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Graders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Trucks | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Construction Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other General Industrial Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Material Handling Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pavers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Paving Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Plate Compactors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pressure Washers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pumps | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rollers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rough Terrain Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Dozers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Scrapers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.00 | 3 | Signal Boards | 0.73 | 2.73 | 2.64 | 0.19 | 0.18 | 314.87 |
| | | Skid Steer Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Surfacing Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Sweepers/Scrubbers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Tractors/Loaders/Backhoes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Trenchers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Welders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Grubbing/Land Clearing | pounds per day | 0.7 | 2.7 | 2.6 | 0.2 | 0.2 | 314.9 |
| | Grubbing/Land Clearing | tons per phase | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.4 |

| **Grading/Excavation** | Default Number of Vehicles | | ROG | CO | NOx | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|
| Override of Default Number of Vehicles | *Program-estimate* | Type | pounds/day | pounds/day | pounds/day | pounds/day | pounds/day | pounds/day |
| | | Aerial Lifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Air Compressors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Bore/Drill Rigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cement and Mortar Mixers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Concrete/Industrial Saws | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0 | Cranes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 1 | Crawler Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crushing/Proc. Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 3 | Excavators | 0.41 | 2.79 | 4.47 | 0.22 | 0.20 | 572.86 |
| | | Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Generator Sets | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 2 | Graders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Trucks | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Construction Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other General Industrial Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Material Handling Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pavers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Paving Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Plate Compactors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pressure Washers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pumps | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 2 | Rollers | 0.35 | 1.51 | 3.09 | 0.23 | 0.21 | 279.53 |
| | | Rough Terrain Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Dozers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Rubber Tired Loaders | 0.52 | 3.12 | 6.51 | 0.22 | 0.20 | 662.62 |
| 0.00 | 2 | Scrapers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.00 | 3 | Signal Boards | 0.73 | 2.73 | 2.64 | 0.19 | 0.18 | 314.87 |
| | | Skid Steer Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Surfacing Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Sweepers/Scrubbers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.00 | 4 | Tractors/Loaders/Backhoes | 0.72 | 3.15 | 6.54 | 0.50 | 0.46 | 671.85 |
| | | Trenchers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Welders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Grading/Excavation | pounds per day | 2.7 | 13.3 | 23.2 | 1.4 | 1.3 | 2501.7 |
| | Grading | tons per phase | 0.1 | 0.3 | 0.5 | 0.0 | 0.0 | 49.5 |

| **Drainage/Utilities/Subgrade**<br>Override of Default Number of Vehicles | Default Number of Vehicles<br>*Program-estimate* | | ROG<br>pounds/day | CO<br>pounds/day | NOx<br>pounds/day | PM10<br>pounds/day | PM2.5<br>pounds/day | CO2<br>pounds/day |
|---|---|---|---|---|---|---|---|---|
| | | Aerial Lifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Air Compressors | 0.68 | 3.42 | 4.38 | 0.37 | 0.34 | 507.95 |
| | | Bore/Drill Rigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cement and Mortar Mixers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Concrete/Industrial Saws | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cranes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crawler Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crushing/Proc. Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Excavators | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Generator Sets | 0.51 | 2.98 | 3.86 | 0.27 | 0.25 | 487.07 |
| 0.00 | 1 | Graders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Trucks | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Construction Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other General Industrial Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Material Handling Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pavers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Paving Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Plate Compactors | 0.04 | 0.21 | 0.25 | 0.01 | 0.01 | 34.45 |
| | | Pressure Washers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 1 | Pumps | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rollers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 1 | Rough Terrain Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Dozers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 1 | Scrapers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.00 | 3 | Signal Boards | 0.73 | 2.73 | 2.64 | 0.19 | 0.18 | 314.87 |
| | | Skid Steer Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Surfacing Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Sweepers/Scrubbers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.00 | 3 | Tractors/Loaders/Backhoes | 0.72 | 3.15 | 6.54 | 0.50 | 0.46 | 671.85 |
| | | Trenchers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Welders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Drainage | pounds per day | 2.7 | 12.5 | 17.7 | 1.3 | 1.2 | 2016.2 |
| | Drainage | tons per phase | 0.0 | 0.2 | 0.2 | 0.0 | 0.0 | 26.6 |

| **Paving** Override of Default Number of Vehicles | Default Number of Vehicles *Program-estimate* | Type | ROG pounds/day | CO pounds/day | NOx pounds/day | PM10 pounds/day | PM2.5 pounds/day | CO2 pounds/day |
|---|---|---|---|---|---|---|---|---|
| | | Aerial Lifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Air Compressors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Bore/Drill Rigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cement and Mortar Mixers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Concrete/Industrial Saws | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cranes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crawler Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crushing/Proc. Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Excavators | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Generator Sets | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Graders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Trucks | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Construction Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other General Industrial Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Material Handling Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Pavers | 0.42 | 2.84 | 4.49 | 0.22 | 0.21 | 481.68 |
| 2.00 | 1 | Paving Equipment | 0.64 | 5.39 | 7.06 | 0.35 | 0.32 | 852.61 |
| | | Plate Compactors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pressure Washers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pumps | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 2 | Rollers | 0.35 | 1.51 | 3.09 | 0.23 | 0.21 | 279.53 |
| | | Rough Terrain Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Dozers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Scrapers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2.00 | 3 | Signal Boards | 0.73 | 2.73 | 2.64 | 0.19 | 0.18 | 314.87 |
| | | Skid Steer Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Surfacing Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Sweepers/Scrubbers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 3 | Tractors/Loaders/Backhoes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Trenchers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Welders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Paving | pounds per day | 2.1 | 12.5 | 17.3 | 1.0 | 0.9 | 1928.7 |
| | Paving | tons per phase | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 12.7 |
| **Total Emissions all Phases (tons per construction period) =>** | | | 0.1 | 0.5 | 0.8 | 0.1 | 0.0 | 90.3 |

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

| **Equipment** | | Default Values Horsepower | | Default Values Hours/day |
|---|---|---|---|---|
| Aerial Lifts | | 63 | | 8 |
| Air Compressors | | 106 | | 8 |
| Bore/Drill Rigs | | 206 | | 8 |
| Cement and Mortar Mixers | | 10 | | 8 |
| Concrete/Industrial Saws | | 64 | | 8 |
| Cranes | | 226 | | 8 |
| Crawler Tractors | | 208 | | 8 |
| Crushing/Proc. Equipment | | 142 | | 8 |
| Excavators | | 163 | | 8 |
| Forklifts | | 89 | | 8 |
| Generator Sets | | 66 | | 8 |
| Graders | | 175 | | 8 |
| Off-Highway Tractors | | 123 | | 8 |
| Off-Highway Trucks | | 400 | | 8 |
| Other Construction Equipment | | 172 | | 8 |
| Other General Industrial Equipment | | 88 | | 8 |
| Other Material Handling Equipment | | 167 | | 8 |
| Pavers | | 126 | | 8 |
| Paving Equipment | | 131 | | 8 |
| Plate Compactors | | 8 | | 8 |
| Pressure Washers | | 26 | | 8 |
| Pumps | | 53 | | 8 |
| Rollers | | 81 | | 8 |
| Rough Terrain Forklifts | | 100 | | 8 |
| Rubber Tired Dozers | | 255 | | 8 |
| Rubber Tired Loaders | | 200 | | 8 |
| Scrapers | | 362 | | 8 |
| Signal Boards | | 20 | | 8 |
| Skid Steer Loaders | | 65 | | 8 |
| Surfacing Equipment | | 254 | | 8 |
| Sweepers/Scrubbers | | 64 | | 8 |
| Tractors/Loaders/Backhoes | | 98 | | 8 |
| Trenchers | | 81 | | 8 |
| Welders | | 45 | | 8 |

0

**END OF DATA ENTRY SHEET**

# Road Construction Emissions Model, Version 7.1.5.1

| Emission Estimates for -> Rose Creek Bicycle Facility Project - Unpaved Portion<br>Project Phases (English Units) | ROG (lbs/day) | CO (lbs/day) | NOx (lbs/day) | Total PM10 (lbs/day) | Exhaust PM10 (lbs/day) | Fugitive Dust PM10 (lbs/day) | Total PM2.5 (lbs/day) | Exhaust PM2.5 (lbs/day) | Fugitive Dust PM2.5 (lbs/day) | CO2 (lbs/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Grubbing/Land Clearing** | 1.2 | 8.2 | 14.8 | 3.4 | 0.6 | 2.7 | 1.1 | 0.6 | 0.6 | 1,743.3 |
| **Grading/Excavation** | 2.8 | 17.3 | 37.5 | 4.3 | 1.6 | 2.7 | 1.9 | 1.3 | 0.6 | 5,465.7 |
| **Drainage/Utilities/Sub-Grade** | 2.7 | 15.3 | 19.7 | 4.2 | 1.5 | 2.7 | 1.9 | 1.3 | 0.6 | 2,907.0 |
| **Paving** | 1.6 | 10.6 | 14.6 | 0.9 | 0.9 | - | 0.8 | 0.8 | - | 1,967.9 |
| **Maximum (pounds/day)** | 2.8 | 17.3 | 37.5 | 4.3 | 1.6 | 2.7 | 1.9 | 1.3 | 0.6 | 5,465.7 |
| **Total (tons/construction project)** | 0.1 | 0.8 | 1.5 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 209.1 |

Notes:

| | |
|---|---|
| Project Start Year -> | 2016 |
| Project Length (months) -> | 5 |
| Total Project Area (acres) -> | 1 |
| Maximum Area Disturbed/Day (acres) -> | 0 |
| Total Soil Imported/Exported ($yd^3$/day)-> | 351 |

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

| Emission Estimates for -> Rose Creek Bicycle Facility Project - Unpaved Portion<br>Project Phases (Metric Units) | ROG (kgs/day) | CO (kgs/day) | NOx (kgs/day) | Total PM10 (kgs/day) | Exhaust PM10 (kgs/day) | Fugitive Dust PM10 (kgs/day) | Total PM2.5 (kgs/day) | Exhaust PM2.5 (kgs/day) | Fugitive Dust PM2.5 (kgs/day) | CO2 (kgs/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Grubbing/Land Clearing** | 0.6 | 3.7 | 6.7 | 1.5 | 0.3 | 1.2 | 0.5 | 0.3 | 0.3 | 792.4 |
| **Grading/Excavation** | 1.3 | 7.9 | 17.0 | 2.0 | 0.7 | 1.2 | 0.9 | 0.6 | 0.3 | 2,484.4 |
| **Drainage/Utilities/Sub-Grade** | 1.2 | 7.0 | 9.0 | 1.9 | 0.7 | 1.2 | 0.9 | 0.6 | 0.3 | 1,321.4 |
| **Paving** | 0.7 | 4.8 | 6.6 | 0.4 | 0.4 | - | 0.4 | 0.4 | - | 894.5 |
| **Maximum (kilograms/day)** | 1.3 | 7.9 | 17.0 | 2.0 | 0.7 | 1.2 | 0.9 | 0.6 | 0.3 | 2,484.4 |
| **Total (megagrams/construction project)** | 0.1 | 0.7 | 1.3 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 189.6 |

Notes:

| | |
|---|---|
| Project Start Year -> | 2016 |
| Project Length (months) -> | 5 |
| Total Project Area (hectares) -> | 0 |
| Maximum Area Disturbed/Day (hectares) -> | 0 |
| Total Soil Imported/Exported ($meters^3$/day)-> | 269 |

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

# Road Construction Emissions Model

Version 7.1.5.1

## Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

**Input Type**

| | | |
|---|---|---|
| Project Name | Rose Creek Bicycle Facility Project - Unpaved Portion | |
| Construction Start Year | 2016 | Enter a Year between 2009 and 2025 (inclusive) |
| Project Type | 1 | 1 New Road Construction<br>2 Road Widening<br>3 Bridge/Overpass Construction |
| Project Construction Time | 5.00 | months |
| Predominant Soil/Site Type: Enter 1, 2, or 3 | 2 | 1. Sand Gravel<br>2. Weathered Rock-Earth<br>3. Blasted Rock |
| Project Length | 0.65 | miles |
| Total Project Area | 1.10 | acres |
| Maximum Area Disturbed/Day | 0.27 | acres |
| Water Trucks Used? | 1 | 1. Yes<br>2. No |
| Soil Imported | 206.72 | $yd^3$/day |
| Soil Exported | 144.70 | $yd^3$/day |
| Average Truck Capacity | 20 | $yd^3$ (assume 20 if unknown) |

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

**The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.**

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

| Construction Periods | User Override of Construction Months | Program Calculated Months |
|---|---|---|
| Grubbing/Land Clearing | | 0.50 |
| Grading/Excavation | | 2.25 |
| Drainage/Utilities/Sub-Grade | | 1.50 |
| Paving | | 0.75 |
| **Totals** | 0.00 | 5.00 |

| 2005 | % | 2006 | % | 2007 | % |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

**NOTE: soil hauling emissions are included in the Grading/Excavation Construction Period Phase, therefore the Construction Period for Grading/Excavation cannot be zero if hauling is part of the project.**

Hauling emission default values can be overridden in cells C45 through C46.

## Soil Hauling Emissions

| User Input | User Override of Soil Hauling Defaults | Default Values |
|---|---|---|
| Miles/round trip | | 30 |
| Round trips/day | | 18 |
| Vehicle miles traveled/day (calculated) | | 527.13 |

| Hauling Emissions | ROG | NOx | CO | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|
| Emission rate (grams/mile) | 0.16 | 8.25 | 0.70 | 0.17 | 0.10 | 1679.86 |
| Emission rate (grams/trip) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pounds per day | 0.18 | 9.58 | 0.81 | 0.19 | 0.12 | 1950.45 |
| Tons per contruction period | 0.00 | 0.24 | 0.02 | 0.00 | 0.00 | 48.27 |

Worker commute default values can be overridden in cells C60 through C65.

## Worker Commute Emissions

| | User Override of Worker Commute Default Values | Default Values |
|---|---|---|
| Miles/ one-way trip | | 20 |
| One-way trips/day | | 2 |
| No. of employees: Grubbing/Land Clearing | | 5 |
| No. of employees: Grading/Excavation | | 18 |
| No. of employees: Drainage/Utilities/Sub-Grade | | 15 |
| No. of employees: Paving | | 11 |

| | ROG | NOx | CO | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|
| Emission rate - Grubbing/Land Clearing (grams/mile) | 0.147 | 0.194 | 1.744 | 0.047 | 0.020 | 443.650 |
| Emission rate - Grading/Excavation (grams/mile) | 0.147 | 0.194 | 1.744 | 0.047 | 0.020 | 443.650 |
| Emission rate - Draining/Utilities/Sub-Grade (gr/mile) | 0.147 | 0.194 | 1.744 | 0.047 | 0.020 | 443.650 |
| Emission rate - Paving (grams/mile) | 0.147 | 0.194 | 1.744 | 0.047 | 0.020 | 443.650 |
| Emission rate - Grubbing/Land Clearing (grams/trip) | 0.505 | 0.323 | 4.200 | 0.004 | 0.003 | 95.592 |
| Emission rate - Grading/Excavation (grams/trip) | 0.505 | 0.323 | 4.200 | 0.004 | 0.003 | 95.592 |
| Emission rate - Draining/Utilities/Sub-Grade (gr/trip) | 0.505 | 0.323 | 4.200 | 0.004 | 0.003 | 95.592 |
| Emission rate - Paving (grams/trip) | 0.505 | 0.323 | 4.200 | 0.004 | 0.003 | 95.592 |
| Pounds per day - Grubbing/Land Clearing | 0.076 | 0.093 | 0.861 | 0.021 | 0.009 | 197.546 |
| Tons per const. Period - Grub/Land Clear | 0.000 | 0.001 | 0.005 | 0.000 | 0.000 | 1.087 |
| Pounds per day - Grading/Excavation | 0.266 | 0.324 | 3.013 | 0.073 | 0.031 | 691.411 |
| Tons per const. Period - Grading/Excavation | 0.007 | 0.008 | 0.075 | 0.002 | 0.001 | 17.112 |
| Pounds per day - Drainage/Utilities/Sub-Grade | 0.228 | 0.278 | 2.582 | 0.062 | 0.026 | 592.638 |
| Tons per const. Period - Drain/Util/Sub-Grade | 0.004 | 0.005 | 0.043 | 0.001 | 0.000 | 9.779 |
| Pounds per day - Paving | 0.171 | 0.208 | 1.937 | 0.047 | 0.020 | 444.479 |
| Tons per const. Period - Paving | 0.001 | 0.002 | 0.016 | 0.000 | 0.000 | 3.667 |
| tons per construction period | 0.012 | 0.015 | 0.138 | 0.003 | 0.001 | 31.644 |

Water truck default values can be overriden in cells C91 through C93 and E91 through E93.

| Water Truck Emissions | User Override of Default # Water Trucks | Program Estimate of Number of Water Trucks | User Override of Truck Miles Traveled/Day | Default Values Miles Traveled/Day |
|---|---|---|---|---|
| Grubbing/Land Clearing - Exhaust | | 1 | | 40 |
| Grading/Excavation - Exhaust | | 1 | | 40 |
| Drainage/Utilities/Subgrade | | 1 | | 40 |

| | ROG | NOx | CO | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|
| Emission rate - Grubbing/Land Clearing (grams/mile) | 0.16 | 8.25 | 0.70 | 0.17 | 0.10 | 1679.86 |
| Emission rate - Grading/Excavation (grams/mile) | 0.16 | 8.25 | 0.70 | 0.17 | 0.10 | 1679.86 |
| Emission rate - Draining/Utilities/Sub-Grade (gr/mile) | 0.16 | 8.25 | 0.70 | 0.17 | 0.10 | 1679.86 |
| Pounds per day - Grubbing/Land Clearing | 0.01 | 0.73 | 0.06 | 0.01 | 0.01 | 148.00 |
| Tons per const. Period - Grub/Land Clear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.81 |
| Pound per day - Grading/Excavation | 0.01 | 0.73 | 0.06 | 0.01 | 0.01 | 148.00 |
| Tons per const. Period - Grading/Excavation | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 3.66 |
| Pound per day - Drainage/Utilities/Subgrade | 0.01 | 0.73 | 0.06 | 0.01 | 0.01 | 148.00 |
| Tons per const. Period - Drainage/Utilities/Subgrade | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 2.44 |

Fugitive dust default values can be overridden in cells C110 through C112.

| Fugitive Dust | User Override of Max Acreage Disturbed/Day | Default Maximum Acreage/Day | PM10 pounds/day | PM10 tons/per period | PM2.5 pounds/day | PM2.5 tons/per period |
|---|---|---|---|---|---|---|
| Fugitive Dust - Grubbing/Land Clearing | | 0.274 | 2.7 | 0.0 | 0.6 | 0.0 |
| Fugitive Dust - Grading/Excavation | | 0.274 | 2.7 | 0.1 | 0.6 | 0.0 |
| Fugitive Dust - Drainage/Utilities/Subgrade | | 0.274 | 2.7 | 0.0 | 0.6 | 0.0 |

## Off-Road Equipment Emissions

| Grubbing/Land Clearing<br>Override of Default Number of Vehicles | Default Number of Vehicles<br>*Program-estimate* | Type | ROG<br>pounds/day | CO<br>pounds/day | NOx<br>pounds/day | PM10<br>pounds/day | PM2.5<br>pounds/day | CO2<br>pounds/day |
|---|---|---|---|---|---|---|---|---|
| | | Aerial Lifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Air Compressors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Bore/Drill Rigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cement and Mortar Mixers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Concrete/Industrial Saws | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cranes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Crawler Tractors | 0.74 | 4.47 | 9.52 | 0.37 | 0.34 | 824.89 |
| | | Crushing/Proc. Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Excavators | 0.41 | 2.79 | 4.47 | 0.22 | 0.20 | 572.86 |
| | | Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Generator Sets | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Graders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Trucks | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Construction Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other General Industrial Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Material Handling Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pavers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Paving Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Plate Compactors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pressure Washers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pumps | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rollers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rough Terrain Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Dozers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Scrapers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 2 | Signal Boards | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Skid Steer Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Surfacing Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Sweepers/Scrubbers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Tractors/Loaders/Backhoes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Trenchers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Welders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Grubbing/Land Clearing | pounds per day | 1.1 | 7.3 | 14.0 | 0.6 | 0.5 | 1397.8 |
| | Grubbing/Land Clearing | tons per phase | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 7.7 |

| **Grading/Excavation** | Default Number of Vehicles | | ROG | CO | NOx | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|
| Override of Default Number of Vehicles | *Program-estimate* | Type | pounds/day | pounds/day | pounds/day | pounds/day | pounds/day | pounds/day |
| | | Aerial Lifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Air Compressors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Bore/Drill Rigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cement and Mortar Mixers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Concrete/Industrial Saws | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 0 | Cranes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Crawler Tractors | 0.74 | 4.47 | 9.52 | 0.37 | 0.34 | 824.89 |
| | | Crushing/Proc. Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 3 | Excavators | 0.41 | 2.79 | 4.47 | 0.22 | 0.20 | 572.86 |
| | | Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Generator Sets | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 1 | Graders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Trucks | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Construction Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other General Industrial Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Material Handling Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pavers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Paving Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Plate Compactors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pressure Washers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pumps | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 2 | Rollers | 0.35 | 1.51 | 3.09 | 0.23 | 0.21 | 279.53 |
| | | Rough Terrain Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Dozers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Rubber Tired Loaders | 0.52 | 3.12 | 6.51 | 0.22 | 0.20 | 662.62 |
| 0.00 | 2 | Scrapers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 2 | Signal Boards | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Skid Steer Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Surfacing Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Sweepers/Scrubbers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 2 | Tractors/Loaders/Backhoes | 0.36 | 1.57 | 3.27 | 0.25 | 0.23 | 335.92 |
| | | Trenchers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Welders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Grading/Excavation | pounds per day | 2.4 | 13.5 | 26.9 | 1.3 | 1.2 | 2675.8 |
| | Grading | tons per phase | 0.1 | 0.3 | 0.7 | 0.0 | 0.0 | 66.2 |

| **Drainage/Utilities/Subgrade**<br>Override of Default Number of Vehicles | Default Number of Vehicles<br>*Program-estimate* | | ROG<br>pounds/day | CO<br>pounds/day | NOx<br>pounds/day | PM10<br>pounds/day | PM2.5<br>pounds/day | CO2<br>pounds/day |
|---|---|---|---|---|---|---|---|---|
| | | Aerial Lifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Air Compressors | 0.68 | 3.42 | 4.38 | 0.37 | 0.34 | 507.95 |
| | | Bore/Drill Rigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cement and Mortar Mixers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Concrete/Industrial Saws | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cranes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crawler Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crushing/Proc. Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Excavators | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Generator Sets | 0.51 | 2.98 | 3.86 | 0.27 | 0.25 | 487.07 |
| 0.00 | 1 | Graders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Trucks | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Construction Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other General Industrial Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Material Handling Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pavers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Paving Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.00 | 1 | Plate Compactors | 0.12 | 0.63 | 0.75 | 0.03 | 0.03 | 103.35 |
| | | Pressure Washers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Pumps | 0.44 | 2.47 | 3.19 | 0.23 | 0.22 | 396.14 |
| | | Rollers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 1 | Rough Terrain Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Dozers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 2 | Scrapers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 2 | Signal Boards | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Skid Steer Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Surfacing Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Sweepers/Scrubbers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 2 | Tractors/Loaders/Backhoes | 0.72 | 3.15 | 6.54 | 0.50 | 0.46 | 671.85 |
| | | Trenchers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Welders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Drainage | pounds per day | 2.5 | 12.6 | 18.7 | 1.4 | 1.3 | 2166.3 |
| | Drainage | tons per phase | 0.0 | 0.2 | 0.3 | 0.0 | 0.0 | 35.7 |

| **Paving** | Default Number of Vehicles | | ROG | CO | NOx | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|
| Override of Default Number of Vehicles | *Program-estimate* | Type | pounds/day | pounds/day | pounds/day | pounds/day | pounds/day | pounds/day |
| | | Aerial Lifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Air Compressors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Bore/Drill Rigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cement and Mortar Mixers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Concrete/Industrial Saws | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cranes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crawler Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crushing/Proc. Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Excavators | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Generator Sets | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Graders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Trucks | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Construction Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other General Industrial Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Material Handling Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Pavers | 0.42 | 2.84 | 4.49 | 0.22 | 0.21 | 481.68 |
| | 1 | Paving Equipment | 0.32 | 2.69 | 3.53 | 0.18 | 0.16 | 426.30 |
| | | Plate Compactors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pressure Washers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pumps | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 3 | Rollers | 0.35 | 1.51 | 3.09 | 0.23 | 0.21 | 279.53 |
| | | Rough Terrain Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Dozers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Scrapers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 2 | Signal Boards | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Skid Steer Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Surfacing Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Sweepers/Scrubbers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 2 | Tractors/Loaders/Backhoes | 0.36 | 1.57 | 3.27 | 0.25 | 0.23 | 335.92 |
| | | Trenchers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Welders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Paving | pounds per day | 1.4 | 8.6 | 14.4 | 0.9 | 0.8 | 1523.4 |
| | Paving | tons per phase | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 12.6 |
| **Total Emissions all Phases (tons per construction period) =>** | | | 0.1 | 0.7 | 1.2 | 0.1 | 0.1 | 122.2 |

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

| **Equipment** | | Default Values Horsepower | | Default Values Hours/day |
|---|---|---|---|---|
| Aerial Lifts | | 63 | | 8 |
| Air Compressors | | 106 | | 8 |
| Bore/Drill Rigs | | 206 | | 8 |
| Cement and Mortar Mixers | | 10 | | 8 |
| Concrete/Industrial Saws | | 64 | | 8 |
| Cranes | | 226 | | 8 |
| Crawler Tractors | | 208 | | 8 |
| Crushing/Proc. Equipment | | 142 | | 8 |
| Excavators | | 163 | | 8 |
| Forklifts | | 89 | | 8 |
| Generator Sets | | 66 | | 8 |
| Graders | | 175 | | 8 |
| Off-Highway Tractors | | 123 | | 8 |
| Off-Highway Trucks | | 400 | | 8 |
| Other Construction Equipment | | 172 | | 8 |
| Other General Industrial Equipment | | 88 | | 8 |
| Other Material Handling Equipment | | 167 | | 8 |
| Pavers | | 126 | | 8 |
| Paving Equipment | | 131 | | 8 |
| Plate Compactors | | 8 | | 8 |
| Pressure Washers | | 26 | | 8 |
| Pumps | | 53 | | 8 |
| Rollers | | 81 | | 8 |
| Rough Terrain Forklifts | | 100 | | 8 |
| Rubber Tired Dozers | | 255 | | 8 |
| Rubber Tired Loaders | | 200 | | 8 |
| Scrapers | | 362 | | 8 |
| Signal Boards | | 20 | | 8 |
| Skid Steer Loaders | | 65 | | 8 |
| Surfacing Equipment | | 254 | | 8 |
| Sweepers/Scrubbers | | 64 | | 8 |
| Tractors/Loaders/Backhoes | | 98 | | 8 |
| Trenchers | | 81 | | 8 |
| Welders | | 45 | | 8 |

0

**END OF DATA ENTRY SHEET**

# Road Construction Emissions Model, Version 7.1.5.1

| Emission Estimates for -> Rose Creek Bicycle Facility Project - Unpaved Portion - Bridg<br>Project Phases (English Units) | ROG (lbs/day) | CO (lbs/day) | NOx (lbs/day) | Total PM10 (lbs/day) | Exhaust PM10 (lbs/day) | Fugitive Dust PM10 (lbs/day) | Total PM2.5 (lbs/day) | Exhaust PM2.5 (lbs/day) | Fugitive Dust PM2.5 (lbs/day) | CO2 (lbs/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Grubbing/Land Clearing** | 1.2 | 8.2 | 14.8 | 1.1 | 0.6 | 0.5 | 0.7 | 0.6 | 0.1 | 1,743.3 |
| **Grading/Excavation** | 3.6 | 21.3 | 36.6 | 2.3 | 1.8 | 0.5 | 1.7 | 1.6 | 0.1 | 4,512.1 |
| **Drainage/Utilities/Sub-Grade** | 2.8 | 15.7 | 19.8 | 2.0 | 1.5 | 0.5 | 1.4 | 1.3 | 0.1 | 3,005.8 |
| **Paving** | 1.6 | 9.9 | 14.5 | 0.9 | 0.9 | - | 0.8 | 0.8 | - | 1,819.8 |
| **Maximum (pounds/day)** | 3.6 | 21.3 | 36.6 | 2.3 | 1.8 | 0.5 | 1.7 | 1.6 | 0.1 | 4,512.1 |
| **Total (tons/construction project)** | 0.1 | 0.5 | 0.9 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 111.5 |

Notes:

| | |
|---|---|
| Project Start Year -> | 2016 |
| Project Length (months) -> | 3 |
| Total Project Area (acres) -> | 0 |
| Maximum Area Disturbed/Day (acres) -> | 0 |
| Total Soil Imported/Exported ($yd^3$/day)-> | 0 |

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

| Emission Estimates for -> Rose Creek Bicycle Facility Project - Unpaved Portion - Bridg<br>Project Phases (Metric Units) | ROG (kgs/day) | CO (kgs/day) | NOx (kgs/day) | Total PM10 (kgs/day) | Exhaust PM10 (kgs/day) | Fugitive Dust PM10 (kgs/day) | Total PM2.5 (kgs/day) | Exhaust PM2.5 (kgs/day) | Fugitive Dust PM2.5 (kgs/day) | CO2 (kgs/day) |
|---|---|---|---|---|---|---|---|---|---|---|
| **Grubbing/Land Clearing** | 0.6 | 3.7 | 6.7 | 0.5 | 0.3 | 0.2 | 0.3 | 0.3 | 0.0 | 792.4 |
| **Grading/Excavation** | 1.6 | 9.7 | 16.6 | 1.0 | 0.8 | 0.2 | 0.8 | 0.7 | 0.0 | 2,050.9 |
| **Drainage/Utilities/Sub-Grade** | 1.3 | 7.1 | 9.0 | 0.9 | 0.7 | 0.2 | 0.7 | 0.6 | 0.0 | 1,366.3 |
| **Paving** | 0.7 | 4.5 | 6.6 | 0.4 | 0.4 | - | 0.4 | 0.4 | - | 827.2 |
| **Maximum (kilograms/day)** | 1.6 | 9.7 | 16.6 | 1.0 | 0.8 | 0.2 | 0.8 | 0.7 | 0.0 | 2,050.9 |
| **Total (megagrams/construction project)** | 0.1 | 0.5 | 0.8 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 101.2 |

Notes:

| | |
|---|---|
| Project Start Year -> | 2016 |
| Project Length (months) -> | 3 |
| Total Project Area (hectares) -> | 0 |
| Maximum Area Disturbed/Day (hectares) -> | 0 |
| Total Soil Imported/Exported ($meters^3$/day)-> | 0 |

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I. Total PM2.5 emissions shown in Column J are the sume of exhaust and fugitive dust emissions shown in columns K and L.

# Road Construction Emissions Model

Version 7.1.5.1

## Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C25.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

**Input Type**

| | | |
|---|---|---|
| Project Name | Rose Creek Bicycle Facility Project - Unpaved Portion - Bridge | |
| Construction Start Year | 2016 | Enter a Year between 2009 and 2025 (inclusive) |
| Project Type | 3 | 1 New Road Construction<br>2 Road Widening<br>3 Bridge/Overpass Construction |
| Project Construction Time | 3.00 | months |
| Predominant Soil/Site Type: Enter 1, 2, or 3 | 2 | 1. Sand Gravel<br>2. Weathered Rock-Earth<br>3. Blasted Rock |
| Project Length | 0.11 | miles |
| Total Project Area | 0.19 | acres |
| Maximum Area Disturbed/Day | 0.05 | acres |
| Water Trucks Used? | 1 | 1. Yes<br>2. No |
| Soil Imported | | $yd^3$/day |
| Soil Exported | | $yd^3$/day |
| Average Truck Capacity | 20 | $yd^3$ (assume 20 if unknown) |

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

**The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.**

Note: The program's estimates of construction period phase length can be overridden in cells C34 through C37.

| Construction Periods | User Override of Construction Months | Program Calculated Months |
|---|---|---|
| Grubbing/Land Clearing | | 0.30 |
| Grading/Excavation | | 1.35 |
| Drainage/Utilities/Sub-Grade | | 0.90 |
| Paving | | 0.45 |
| **Totals** | 0.00 | 3.00 |

| 2005 | % | 2006 | % | 2007 | % |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

**NOTE: soil hauling emissions are included in the Grading/Excavation Construction Period Phase, therefore the Construction Period for Grading/Excavation cannot be zero if hauling is part of the project.**

Hauling emission default values can be overridden in cells C45 through C46.

## Soil Hauling Emissions

| User Input | User Override of Soil Hauling Defaults | Default Values |
|---|---|---|
| Miles/round trip | | 30 |
| Round trips/day | | 0 |
| Vehicle miles traveled/day (calculated) | | 0 |

| Hauling Emissions | ROG | NOx | CO | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|
| Emission rate (grams/mile) | 0.16 | 8.25 | 0.70 | 0.17 | 0.10 | 1679.86 |
| Emission rate (grams/trip) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pounds per day | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tons per contruction period | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Worker commute default values can be overridden in cells C60 through C65.

## Worker Commute Emissions

| | User Override of Worker Commute Default Values | Default Values |
|---|---|---|
| Miles/ one-way trip | | 20 |
| One-way trips/day | | 2 |
| No. of employees: Grubbing/Land Clearing | | 5 |
| No. of employees: Grading/Excavation | | 28 |
| No. of employees: Drainage/Utilities/Sub-Grade | | 18 |
| No. of employees: Paving | | 8 |

| | ROG | NOx | CO | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|
| Emission rate - Grubbing/Land Clearing (grams/mile) | 0.147 | 0.194 | 1.744 | 0.047 | 0.020 | 443.650 |
| Emission rate - Grading/Excavation (grams/mile) | 0.147 | 0.194 | 1.744 | 0.047 | 0.020 | 443.650 |
| Emission rate - Draining/Utilities/Sub-Grade (gr/mile) | 0.147 | 0.194 | 1.744 | 0.047 | 0.020 | 443.650 |
| Emission rate - Paving (grams/mile) | 0.147 | 0.194 | 1.744 | 0.047 | 0.020 | 443.650 |
| Emission rate - Grubbing/Land Clearing (grams/trip) | 0.505 | 0.323 | 4.200 | 0.004 | 0.003 | 95.592 |
| Emission rate - Grading/Excavation (grams/trip) | 0.505 | 0.323 | 4.200 | 0.004 | 0.003 | 95.592 |
| Emission rate - Draining/Utilities/Sub-Grade (gr/trip) | 0.505 | 0.323 | 4.200 | 0.004 | 0.003 | 95.592 |
| Emission rate - Paving (grams/trip) | 0.505 | 0.323 | 4.200 | 0.004 | 0.003 | 95.592 |
| Pounds per day - Grubbing/Land Clearing | 0.076 | 0.093 | 0.861 | 0.021 | 0.009 | 197.546 |
| Tons per const. Period - Grub/Land Clear | 0.000 | 0.000 | 0.003 | 0.000 | 0.000 | 0.652 |
| Pounds per day - Grading/Excavation | 0.419 | 0.510 | 4.734 | 0.114 | 0.048 | 1086.504 |
| Tons per const. Period - Grading/Excavation | 0.006 | 0.008 | 0.070 | 0.002 | 0.001 | 16.135 |
| Pounds per day - Drainage/Utilities/Sub-Grade | 0.266 | 0.324 | 3.013 | 0.073 | 0.031 | 691.411 |
| Tons per const. Period - Drain/Util/Sub-Grade | 0.003 | 0.003 | 0.030 | 0.001 | 0.000 | 6.845 |
| Pounds per day - Paving | 0.114 | 0.139 | 1.291 | 0.031 | 0.013 | 296.319 |
| Tons per const. Period - Paving | 0.001 | 0.001 | 0.006 | 0.000 | 0.000 | 1.467 |
| tons per construction period | 0.010 | 0.012 | 0.109 | 0.003 | 0.001 | 25.098 |

Water truck default values can be overriden in cells C91 through C93 and E91 through E93.

| Water Truck Emissions | User Override of Default # Water Trucks | Program Estimate of Number of Water Trucks | User Override of Truck Miles Traveled/Day | Default Values Miles Traveled/Day |
|---|---|---|---|---|
| Grubbing/Land Clearing - Exhaust | | 1 | | 40 |
| Grading/Excavation - Exhaust | | 1 | | 40 |
| Drainage/Utilities/Subgrade | | 1 | | 40 |

| | ROG | NOx | CO | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|
| Emission rate - Grubbing/Land Clearing (grams/mile) | 0.16 | 8.25 | 0.70 | 0.17 | 0.10 | 1679.86 |
| Emission rate - Grading/Excavation (grams/mile) | 0.16 | 8.25 | 0.70 | 0.17 | 0.10 | 1679.86 |
| Emission rate - Draining/Utilities/Sub-Grade (gr/mile) | 0.16 | 8.25 | 0.70 | 0.17 | 0.10 | 1679.86 |
| Pounds per day - Grubbing/Land Clearing | 0.01 | 0.73 | 0.06 | 0.01 | 0.01 | 148.00 |
| Tons per const. Period - Grub/Land Clear | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.49 |
| Pound per day - Grading/Excavation | 0.01 | 0.73 | 0.06 | 0.01 | 0.01 | 148.00 |
| Tons per const. Period - Grading/Excavation | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 2.20 |
| Pound per day - Drainage/Utilities/Subgrade | 0.01 | 0.73 | 0.06 | 0.01 | 0.01 | 148.00 |
| Tons per const. Period - Drainage/Utilities/Subgrade | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 1.47 |

Fugitive dust default values can be overridden in cells C110 through C112.

| Fugitive Dust | User Override of Max Acreage Disturbed/Day | Default Maximum Acreage/Day | PM10 pounds/day | PM10 tons/per period | PM2.5 pounds/day | PM2.5 tons/per period |
|---|---|---|---|---|---|---|
| Fugitive Dust - Grubbing/Land Clearing | | 0.0475 | 0.5 | 0.0 | 0.1 | 0.0 |
| Fugitive Dust - Grading/Excavation | | 0.0475 | 0.5 | 0.0 | 0.1 | 0.0 |
| Fugitive Dust - Drainage/Utilities/Subgrade | | 0.0475 | 0.5 | 0.0 | 0.1 | 0.0 |

## Off-Road Equipment Emissions

| Grubbing/Land Clearing<br>Override of Default Number of Vehicles | Default Number of Vehicles<br>*Program-estimate* | Type | ROG<br>pounds/day | CO<br>pounds/day | NOx<br>pounds/day | PM10<br>pounds/day | PM2.5<br>pounds/day | CO2<br>pounds/day |
|---|---|---|---|---|---|---|---|---|
| | | Aerial Lifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Air Compressors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Bore/Drill Rigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cement and Mortar Mixers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Concrete/Industrial Saws | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cranes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Crawler Tractors | 0.74 | 4.47 | 9.52 | 0.37 | 0.34 | 824.89 |
| | | Crushing/Proc. Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 2 | Excavators | 0.41 | 2.79 | 4.47 | 0.22 | 0.20 | 572.86 |
| | | Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Generator Sets | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Graders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Trucks | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Construction Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other General Industrial Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Material Handling Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pavers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Paving Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Plate Compactors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pressure Washers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pumps | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rollers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rough Terrain Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Dozers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Scrapers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 1 | Signal Boards | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Skid Steer Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Surfacing Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Sweepers/Scrubbers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Tractors/Loaders/Backhoes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Trenchers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Welders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Grubbing/Land Clearing | pounds per day | 1.1 | 7.3 | 14.0 | 0.6 | 0.5 | 1397.8 |
| | Grubbing/Land Clearing | tons per phase | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.6 |

| **Grading/Excavation** | Default Number of Vehicles | | ROG | CO | NOx | PM10 | PM2.5 | CO2 |
|---|---|---|---|---|---|---|---|---|
| Override of Default Number of Vehicles | *Program-estimate* | Type | pounds/day | pounds/day | pounds/day | pounds/day | pounds/day | pounds/day |
| | | Aerial Lifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Air Compressors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Bore/Drill Rigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cement and Mortar Mixers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Concrete/Industrial Saws | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Cranes | 0.75 | 3.00 | 8.48 | 0.38 | 0.35 | 601.74 |
| 1.00 | 2 | Crawler Tractors | 0.74 | 4.47 | 9.52 | 0.37 | 0.34 | 824.89 |
| | | Crushing/Proc. Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 4 | Excavators | 0.41 | 2.79 | 4.47 | 0.22 | 0.20 | 572.86 |
| | | Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Generator Sets | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 2 | Graders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Trucks | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Construction Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other General Industrial Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Material Handling Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pavers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Paving Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Plate Compactors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pressure Washers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pumps | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 3 | Rollers | 0.35 | 1.51 | 3.09 | 0.23 | 0.21 | 279.53 |
| | | Rough Terrain Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Dozers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 3 | Rubber Tired Loaders | 0.52 | 3.12 | 6.51 | 0.22 | 0.20 | 662.62 |
| 0.00 | 4 | Scrapers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 1 | Signal Boards | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Skid Steer Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Surfacing Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Sweepers/Scrubbers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 2 | Tractors/Loaders/Backhoes | 0.36 | 1.57 | 3.27 | 0.25 | 0.23 | 335.92 |
| | | Trenchers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Welders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Grading/Excavation | pounds per day | 3.1 | 16.5 | 35.3 | 1.7 | 1.5 | 3277.6 |
| | Grading | tons per phase | 0.0 | 0.2 | 0.5 | 0.0 | 0.0 | 48.7 |

| **Drainage/Utilities/Subgrade**<br>Override of Default Number of Vehicles | Default Number of Vehicles<br>*Program-estimate* | | ROG<br>pounds/day | CO<br>pounds/day | NOx<br>pounds/day | PM10<br>pounds/day | PM2.5<br>pounds/day | CO2<br>pounds/day |
|---|---|---|---|---|---|---|---|---|
| | | Aerial Lifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Air Compressors | 0.68 | 3.42 | 4.38 | 0.37 | 0.34 | 507.95 |
| | | Bore/Drill Rigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cement and Mortar Mixers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Concrete/Industrial Saws | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cranes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crawler Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crushing/Proc. Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Excavators | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Generator Sets | 0.51 | 2.98 | 3.86 | 0.27 | 0.25 | 487.07 |
| 0.00 | 2 | Graders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Trucks | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Construction Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other General Industrial Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Material Handling Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pavers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Paving Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3.00 | 1 | Plate Compactors | 0.12 | 0.63 | 0.75 | 0.03 | 0.03 | 103.35 |
| | | Pressure Washers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Pumps | 0.44 | 2.47 | 3.19 | 0.23 | 0.22 | 396.14 |
| | | Rollers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 1 | Rough Terrain Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Dozers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 4 | Scrapers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 1 | Signal Boards | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Skid Steer Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Surfacing Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Sweepers/Scrubbers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 2 | Tractors/Loaders/Backhoes | 0.72 | 3.15 | 6.54 | 0.50 | 0.46 | 671.85 |
| | | Trenchers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Welders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Drainage | pounds per day | 2.5 | 12.6 | 18.7 | 1.4 | 1.3 | 2166.3 |
| | Drainage | tons per phase | 0.0 | 0.1 | 0.2 | 0.0 | 0.0 | 21.4 |

| **Paving** Override of Default Number of Vehicles | Default Number of Vehicles *Program-estimate* | Type | ROG pounds/day | CO pounds/day | NOx pounds/day | PM10 pounds/day | PM2.5 pounds/day | CO2 pounds/day |
|---|---|---|---|---|---|---|---|---|
| | | Aerial Lifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Air Compressors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Bore/Drill Rigs | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cement and Mortar Mixers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Concrete/Industrial Saws | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Cranes | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crawler Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Crushing/Proc. Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Excavators | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Generator Sets | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Graders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Tractors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Off-Highway Trucks | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Construction Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other General Industrial Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Other Material Handling Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Pavers | 0.42 | 2.84 | 4.49 | 0.22 | 0.21 | 481.68 |
| | 1 | Paving Equipment | 0.32 | 2.69 | 3.53 | 0.18 | 0.16 | 426.30 |
| | | Plate Compactors | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pressure Washers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Pumps | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | 1 | Rollers | 0.35 | 1.51 | 3.09 | 0.23 | 0.21 | 279.53 |
| | | Rough Terrain Forklifts | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Dozers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Rubber Tired Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Scrapers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 1 | Signal Boards | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Skid Steer Loaders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Surfacing Equipment | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Sweepers/Scrubbers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1.00 | 2 | Tractors/Loaders/Backhoes | 0.36 | 1.57 | 3.27 | 0.25 | 0.23 | 335.92 |
| | | Trenchers | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | | Welders | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Paving | pounds per day | 1.4 | 8.6 | 14.4 | 0.9 | 0.8 | 1523.4 |
| | Paving | tons per phase | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 7.5 |
| **Total Emissions all Phases (tons per construction period) =>** | | | 0.1 | 0.4 | 0.8 | 0.0 | 0.0 | 82.3 |

Equipment default values for horsepower and hours/day can be overridden in cells C289 through C322 and E289 through E322.

| **Equipment** | | Default Values Horsepower | | Default Values Hours/day |
|---|---|---|---|---|
| Aerial Lifts | | 63 | | 8 |
| Air Compressors | | 106 | | 8 |
| Bore/Drill Rigs | | 206 | | 8 |
| Cement and Mortar Mixers | | 10 | | 8 |
| Concrete/Industrial Saws | | 64 | | 8 |
| Cranes | | 226 | | 8 |
| Crawler Tractors | | 208 | | 8 |
| Crushing/Proc. Equipment | | 142 | | 8 |
| Excavators | | 163 | | 8 |
| Forklifts | | 89 | | 8 |
| Generator Sets | | 66 | | 8 |
| Graders | | 175 | | 8 |
| Off-Highway Tractors | | 123 | | 8 |
| Off-Highway Trucks | | 400 | | 8 |
| Other Construction Equipment | | 172 | | 8 |
| Other General Industrial Equipment | | 88 | | 8 |
| Other Material Handling Equipment | | 167 | | 8 |
| Pavers | | 126 | | 8 |
| Paving Equipment | | 131 | | 8 |
| Plate Compactors | | 8 | | 8 |
| Pressure Washers | | 26 | | 8 |
| Pumps | | 53 | | 8 |
| Rollers | | 81 | | 8 |
| Rough Terrain Forklifts | | 100 | | 8 |
| Rubber Tired Dozers | | 255 | | 8 |
| Rubber Tired Loaders | | 200 | | 8 |
| Scrapers | | 362 | | 8 |
| Signal Boards | | 20 | | 8 |
| Skid Steer Loaders | | 65 | | 8 |
| Surfacing Equipment | | 254 | | 8 |
| Sweepers/Scrubbers | | 64 | | 8 |
| Tractors/Loaders/Backhoes | | 98 | | 8 |
| Trenchers | | 81 | | 8 |
| Welders | | 45 | | 8 |

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**END OF DATA ENTRY SHEET**