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Greenhouse Gas Analysis for the Riverford Road Roundabouts Project San Diego County, California 11-SD-67-R3.7/R4.2

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TABLE OF CONTENTS

FIGURES

TABLES

TABLE OF CONTENTS (cont.)

ATTACHMENTS

Acronyms and Abbreviations

2017 Scoping Plan	*2017 Climate Change Scoping Plan Update, the Strategy for Achieving California's 2030 Greenhouse Gas Target*
2022 Scoping Plan	*2022 Scoping Plan Update for Achieving Carbon Neutrality*
AB	Assembly Bill
BAU	business as usual
Board	County Board of Supervisors
CalEEMod	California Emissions Estimator Model
CalSTA	California State Transportation Agency
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CAPTI	Climate Action Plan for Transportation Infrastructure
CARB	California Air Resources Board
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CH_4	methane
CO_2	carbon dioxide
CTP	California Transportation Plan
EO	Executive Order
FHWA	Federal Highway Administration
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbons
IPCC	Intergovernmental Panel on Climate Change
MMT CO_2E	million metric tons carbon dioxide equivalent
MPO	Metropolitan Planning Organizations
MT CO_2E	metric tons of carbon dioxide equivalent
N_2O	nitrous oxide
NEPA	National Environmental Policy Act
NHTSA	National Highway Traffic Safety Administration
OS	Operating System
project	Riverford Road Roundabouts Project
RCEM	Roadway Construction Emissions Model
RPS	Renewables Portfolio Standard
RTP	Regional Transportation Plan
SANDAG	San Diego Association of Governments
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
Scoping Plan	*Climate Change Scoping Plan: A Framework for Change*
SCS	Sustainable Communities Strategy
SMAQMD	Sacramento Metropolitan Air Quality Management District
U.S. EPA	U.S. Environmental Protection Agency
VMT	vehicle miles traveled

1.0 Introduction

The County of San Diego (County) Department of Public Works (DPW) is proposing the Riverford Road Roundabouts Project, which would construct roundabouts at two intersections near the existing State Route 67 (SR-67)/Riverford Road interchange, to relieve local traffic congestion. The purpose of this study is to address potential greenhouse gas impacts associated with the project, consistent with the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) review. The detailed County of San Diego CEQA review is included as Attachment 1 to this technical study.

1.1 Understanding Global Climate Change

To evaluate the incremental effect of the project on statewide greenhouse gas (GHG) emissions and global climate change, it is important to have a basic understanding of the nature of the global climate change problem. Global climate change is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. The earth's climate is in a state of constant flux with periodic warming and cooling cycles. Extreme periods of cooling are termed "ice ages," which may then be followed by extended periods of warmth. For most of the earth's geologic history, these periods of warming and cooling have been the result of many complicated interacting natural factors that include volcanic eruptions that spew gases and particles (dust) into the atmosphere; the amount of water, vegetation, and ice covering the earth's surface; subtle changes in the earth's orbit; and the amount of energy released by the sun (sun cycles). However, since the beginning of the Industrial Revolution around 1750, the average temperature of the earth has been increasing at a rate that is faster than can be explained by natural climate cycles alone.

With the Industrial Revolution came an increase in the combustion of carbon-based fuels such as wood, coal, oil, natural gas, and biomass. Industrial processes have also created emissions of substances not found in nature. This in turn has led to a marked increase in the emissions of gases shown to influence the world's climate. These gases, termed "greenhouse" gases, influence the amount of heat trapped in the earth's atmosphere. Recently observed increased concentrations of GHGs in the atmosphere appear to be related to increases in human activity. Therefore, the current cycle of "global warming" is believed to be largely due to human activity. Of late, the issue of global warming, or global climate change, has arguably become the most important and widely debated environmental issue in the United States and the world. Because it is believed that the increased GHG concentrations around the world are related to human activity and the collective of human actions taking place throughout the world, it is quintessentially a global or cumulative issue.

1.2 Greenhouse Gases of Primary Concern

There are numerous GHGs, both naturally occurring and man made. Each GHG has variable atmospheric lifetime and global warming potential (GWP). The atmospheric lifetime of the gas is the average time a molecule stays stable in the atmosphere. Most GHGs have long atmospheric lifetimes, staying in the atmosphere hundreds or thousands of years. GWP is a measure of the potential for a

gas to trap heat and warm the atmosphere. Although GWP is related to its atmospheric lifetime, many other factors including chemical reactivity of the gas also influence GWP. GWP is reported as a unitless factor representing the potential for the gas to affect global climate relative to the potential of carbon dioxide (CO_2). Because CO_2 is the reference gas for establishing GWP, by definition its GWP is 1. Although methane (CH_4) has a shorter atmospheric lifetime than CO_2, it has a 100-year GWP of 28; this means that CH_4 has 28 times more effect on global warming than CO_2.

The GWP is officially defined as (U.S. Environmental Protection Agency [U.S. EPA] 2010):

> The cumulative radiative forcing—both direct and indirect effects—integrated over a period of time from the emission of a unit mass of gas relative to some reference gas.

GHG emissions estimates are typically represented in terms of equivalent metric tons of CO_2 (MT CO_2E). CO_2E emissions are the product of the amount of each gas by its GWP. The effects of several GHGs may be discussed in terms of MT CO_2E and can be summed to represent the total potential of these gases to warm the global climate. Table 1 summarizes some of the most common GHGs.

It should be noted that the U.S. EPA and other organizations update the GWP values they use occasionally. This change can be due to updated scientific estimates of the energy absorption or lifetime of the gases or to changing atmospheric concentrations of GHGs that result in a change in the energy absorption of one additional ton of a gas relative to another. The GWPs shown in Table 1 are the most current. However, it should be noted that in the California Emissions Estimator Model (CalEEMod), which is the model used in this analysis to calculate emissions, CH_4 has a GWP of 25 and nitrous oxide (N_2O) has a GWP of 298, consistent with the *2017 Climate Change Scoping Plan Update, the Strategy for Achieving California's 2030 Greenhouse Gas Target* (2017 Scoping Plan).

All of the gases in Table 1 are produced by either biogenic (natural) sources, anthropogenic (human) sources, or both. CO_2, CH_4, and N_2O are the GHGs of primary concern in this analysis. CO_2 would be emitted by the project due to the combustion of fossil fuels in vehicles (including construction), from electricity generation and natural gas consumption, from water use, and from solid waste disposal. Smaller amounts of CH_4 and N_2O would be emitted from the same project operations.

Table 1
Global Warming Potentials and Atmospheric Lifetimes
(years)

Gas	Atmospheric Lifetime (years)	100-year GWP	20-year GWP
Carbon dioxide (CO_2)	50–200	1	1
Methane (CH_4)	12.4	25/28*	84
Nitrous oxide (N_2O)	121	298/265*	264
HFC-23	222	12,400	10,800
HFC-32	5.2	677	2,430
HFC-125	28.2	3,170	6,090
HFC-134a	13.4	1,300	3,710
HFC-143a	47.1	4,800	6,940
HFC-152a	1.5	138	506
HFC-227ea	38.9	3,350	5,360

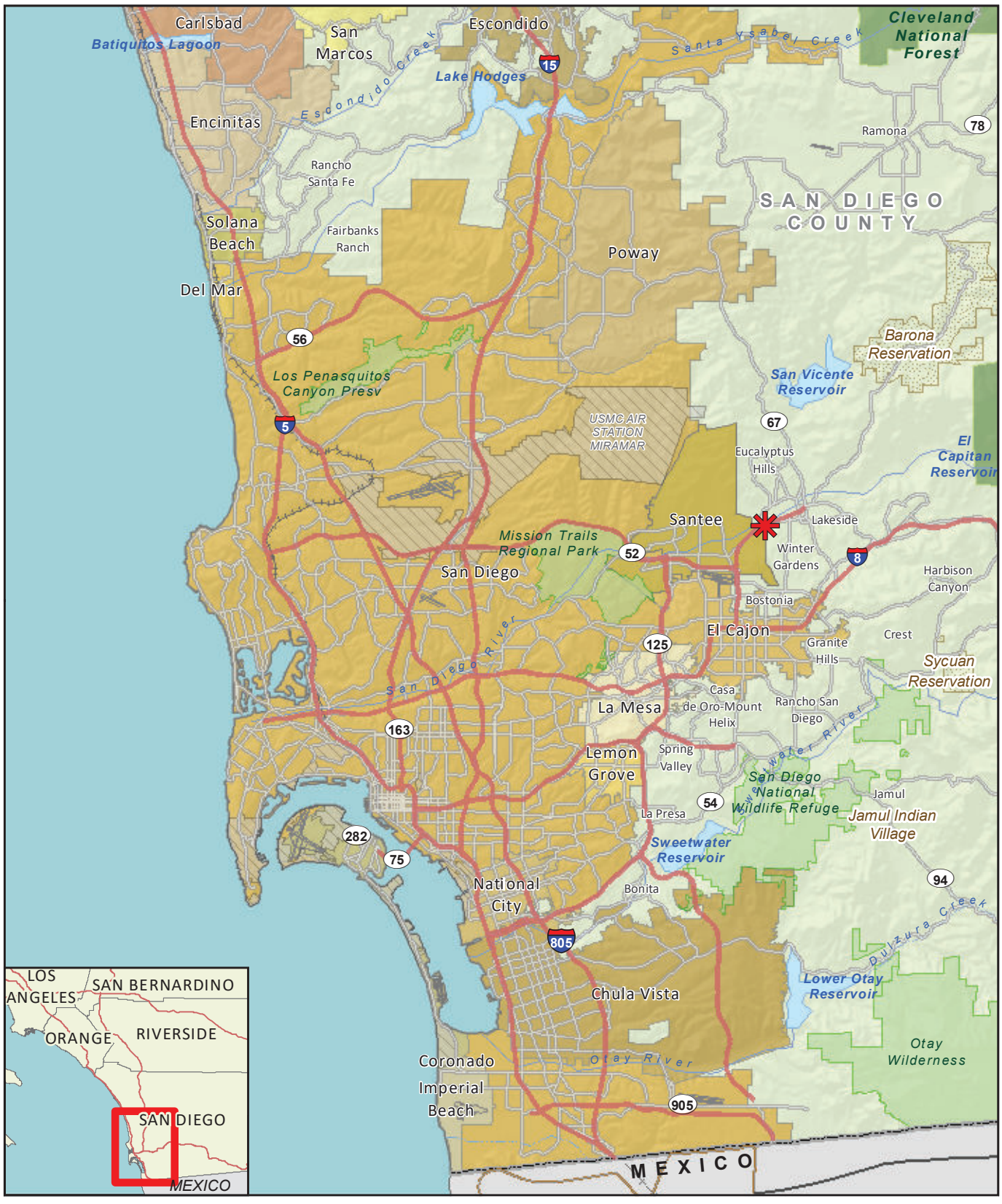
Table 1 Global Warming Potentials and Atmospheric Lifetimes (years)			
Gas	Atmospheric Lifetime (years)	100-year GWP	20-year GWP
HFC-236fa	242	8,060	6,940
HFC-43-10mee	16.1	1,650	4,310
CF_4	50,000	6,630	4,880
C_2F_6	10,000	11,100	8,210
C_3F_8	2,600	8,900	6,640
C_4F_{10}	2,600	9,200	6,870
c-C_4F_8	3,200	9,540	7,110
C_5F_{12}	4,100	8,550	6,350
C_6F_{14}	3,100	7,910	5,890
SF_6	3,200	23,500	17,500
SOURCE: Intergovernmental Panel on Climate Change (IPCC) 2007, 2014. *The CH_4 and N_2O 100-year GWPs included in CalEEMod are 25 and 298, respectively, from the IPCC Fourth Assessment Report. All other values are from the current Fifth Assessment Report.			

2.0 Project Purpose and Need

The County DPW proposes the Riverford Road Roundabouts Project (proposed project), to construct roundabouts at two intersections ("two intersections"), in Lakeside, San Diego County (Figures 1 and 2). The northern intersection is located at the on- and off-ramps of State Route 67 (SR-67) and Riverford Road and the southern is at the Riverford Road and Woodside Avenue intersection. Both intersections currently experience traffic congestion with vehicle queues at the SR-67 ramps. The roundabouts would improve the overall traffic efficiency, circulation, and ease congestion. Caltrans is considered a CEQA Responsible Agency because they are a public agency who also has responsibility for carrying out or approving the project (i.e., the project located within the Caltrans' right-of-way of this SR-67 interchange).

The northern roundabout would replace a two-way stop-controlled intersection at the on-/off-ramps of SR-67 southbound and Riverford Road (northern roundabout). To accommodate the roundabout, the intersection would be widened. The on-/off-ramps to/from SR-67 southbound would be realigned and widened. The existing North Woodside Avenue connection to Riverford Road would be relocated via construction of a new leg that will connect and convey existing traffic flow in and out of the northern roundabout.

The southern roundabout would replace the existing three-way signal-controlled intersection at Woodside Avenue and Riverford Road. To accommodate the roundabout, the intersection would be widened, and its elevation lowered to meet the existing elevation of Riverford Road. Existing northbound SR-67 off-ramp connection to Woodside Avenue would be relocated via construction of a new leg, conveying exiting traffic flow into the southern roundabout.



Project Location

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FIGURE 1
Regional Location

Image Source: NearMap (flown June 2023)

Project Boundary

FIGURE 2
Project Location on Aerial Photograph

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The proposed project would also construct Class II bicycle lanes, sidewalks, crosswalks, and shared-use pathways (for pedestrians and bicyclists) to create a "complete street." Rapid flashing beacons would be installed at multiple crosswalks (southbound SR-67 off-ramp at northern roundabout and northbound SR-67 off-ramp at southern roundabout). The proposed improvements are shown on Figure 3.

Stormwater drainage facilities (e.g., vegetated and/or concrete swales) and water quality treatment features (e.g., biofiltration basins) would be constructed to capture and treat roadway stormwater. Drainage facilities and water quality improvement features would vary in size and may include vegetation/plantings and permeable landscape. New curb cuts, gutters, storm drain inlets, headwalls, channels, and sidewalk underdrains would be added and convey stormwater to the proposed water quality treatment features. Additionally, dirt slopes underneath bridge overpasses would be stabilized, and the project would add multiple streetlights to help illuminate both roundabouts for drivers' safety. Riverford Road between both intersections would be widened to accommodate the shared-use pathways and stormwater drainage facilities. Retaining walls would be constructed where grading cannot be achieved and range in height from 3.5 feet to 25 feet, depending on location.

Construction of the proposed improvements would be phased over approximately one to two years, with the potential for temporary full closure of both project intersections. Traffic detours would be in place as-needed and would utilize the adjacent Winter Gardens SR-67 Interchange, Channel Road, and Riverside Drive.

Rock removal via blasting and/or other rock fracturing methods are likely; however, access to adjacent residences and businesses in the vicinity of the project, as well as for emergency vehicles, would be maintained at all times.

The proposed project would be constructed largely within the existing County's and Caltrans' right-of-way, with slight encroachment onto the City of Santee's right-of-way. In addition, temporary and permanent property acquisitions are proposed to facilitate project design and construction needs.

3.0 Regulatory Setting

In response to rising concern associated with increasing GHG emissions and global climate change impacts, several plans and regulations have been adopted at the international, national, and state levels with the aim of reducing GHG emissions. The following is a discussion of the federal, state, and local plans and regulations most applicable to the project.

3.1 Federal

3.1.1 U.S. Environmental Protection Agency

In 2009, the U.S. Environmental Protection Agency (U.S. EPA) issued its science-based finding that the buildup of heat-trapping GHGs in the atmosphere endangers public health and welfare. The "Endangerment Finding" reflects the overwhelming scientific evidence on the causes and impacts of climate change. It was made after a thorough rulemaking process considering thousands of public

Map Source: Parsons

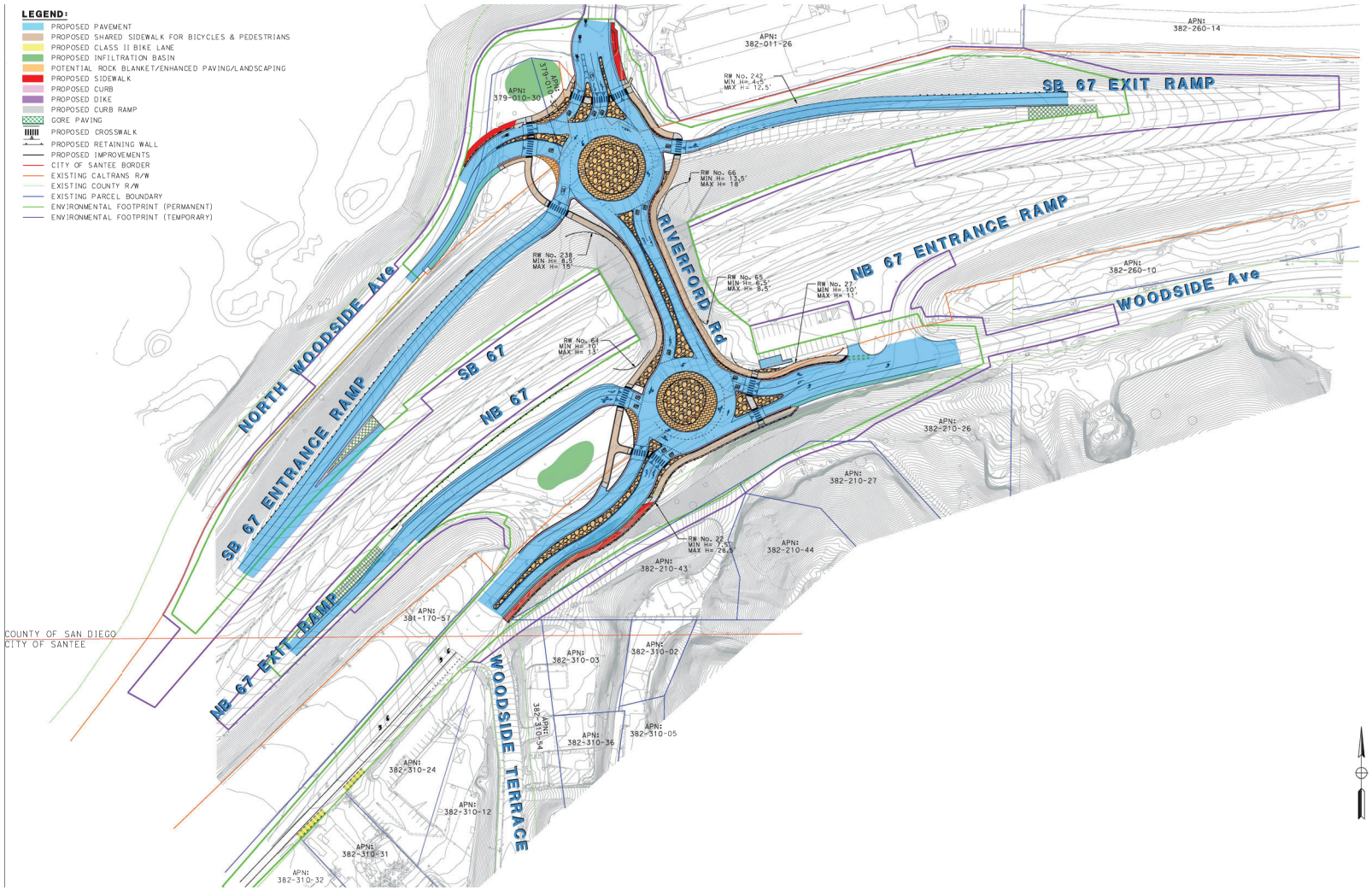

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FIGURE 3
Proposed Improvements

comments and was upheld by the federal courts. The U.S. EPA has many federal level programs and projects to reduce GHG emissions. The U.S. EPA provides technical expertise and encourages voluntary reductions from the private sector. The U.S. EPA also collaborates with the public sector, including states, tribes, localities, and resource managers, to encourage smart growth, sustainability preparation, and renewable energy and climate change preparation. These initiatives include the Clean Energy – Environment State Partnership Program, the Climate Ready Water Utilities Initiative, the Climate Ready Estuaries Program, and the Sustainable Communities Partnership.

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level.

3.1.2 Federal Highway Administration

The Federal Highway Administration (FHWA) recognizes the threats that extreme weather, sea level change, and other changes in environmental conditions pose to valuable transportation infrastructure and those who depend on it. FHWA therefore supports a sustainability approach that assesses vulnerability to climate risks and incorporates resilience into planning, asset management, project development and design, and operations and maintenance practices. This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values. Program and project elements that foster sustainability and resilience also support economic vitality and global efficiency, increase safety and mobility, enhance the environment, promote energy conservation, and improve the quality of life.

3.1.3 Corporate Average Fuel Economy Standards

The federal Corporate Average Fuel Economy standards determine the fuel efficiency of certain vehicle classes in the U.S. The National Highway Traffic Safety Administration (NHTSA) sets Corporate Average Fuel Economy standards for passenger cars and for light trucks (collectively, light-duty vehicles) and separately sets fuel consumption standards for medium- and heavy-duty trucks and engines. With improved gas mileage, fewer gallons of transportation fuel would be combusted to travel the same distance, thereby reducing nationwide GHG emissions associated with vehicle travel. The most recent standards require an industry-wide fleet average of approximately 49 miles per gallon for passenger cars and light trucks in model year 2026, by increasing fuel efficiency by 8 percent annually for model years 2024 and 2025 and 10 percent annually for model year 2026.

3.2 State

The State of California has adopted a number of plans and regulations aimed at identifying statewide and regional GHG emissions caps, GHG emissions reduction targets, and actions and timelines to achieve the target GHG reductions.

3.2.1 Executive Orders and Statewide GHG Emission Targets

3.2.1.1 Executive Order S-3-05

Executive Order (EO) S-3-05 established the following GHG emission reduction targets for the state of California:

- by 2010, reduce GHG emissions to 2000 levels;
- by 2020, reduce GHG emissions to 1990 levels;
- by 2050, reduce GHG emissions to 80 percent below 1990 levels.

This EO also directs the secretary of the California Environmental Protection Agency to oversee the efforts made to reach these targets, and to prepare biannual reports on the progress made toward meeting the targets and on the impacts to California related to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. With regard to impacts, the report shall also prepare and document mitigation and adaptation plans to combat the impacts. The first Climate Action Team Assessment Report was produced in March 2006, and has since been updated every two years.

3.2.1.2 Executive Order B-30-15

EO B-30-15, issued on April 29, 2015, establishes an interim GHG emission reduction goal for the state of California by 2030 of 40 percent below 1990 levels. This EO also directed all state agencies with jurisdiction over GHG emitting sources to implement measures designed to achieve the new interim 2030 goal, as well as the pre-existing, long-term 2050 goal identified in EO S-3-05. Additionally, this EO directed the California Air Resources Board (CARB) to update its Climate Change Scoping Plan to address the 2030 goal.

3.2.1.3 Assembly Bill 1279

Assembly Bill (AB) 1279, approved in September 2022, requires the state to achieve net zero GHG emissions as soon as possible, but no later than 2045, and achieve and maintain net negative GHG emissions thereafter, and to ensure that by 2045, statewide anthropogenic GHG emissions are reduced to at least 85 percent below 1990 levels. The bill would require the state board to work with relevant state agencies to ensure that updates to the scoping plan identify and recommend measures to achieve these policy goals and to identify and implement a variety of policies and strategies that enable carbon dioxide removal solutions and carbon capture, utilization, and storage technologies.

3.2.2 California Global Warming Solutions Act

In response to EO S-3-05, the California Legislature passed AB 32, the California Global Warming Solutions Act of 2006, and thereby enacted Sections 38500–38599 of the California Health and Safety Code. The heart of AB 32 is its requirement that CARB establish an emissions cap and adopt rules and regulations that would reduce GHG emissions to 1990 levels by 2020. AB 32 also required CARB to adopt a plan by January 1, 2009, indicating how emission reductions would be achieved from significant GHG sources via regulations, market mechanisms, and other actions.

In 2008, CARB estimated that annual statewide GHG emissions were 427 million metric tons carbon dioxide equivalent (MMT CO_2E) in 1990 and would reach 596 MMT CO_2E by 2020 under a business as usual (BAU) condition (CARB 2008). To achieve the mandate of AB 32, CARB determined that a 169 MMT CO_2E (or approximate 28.5 percent) reduction in BAU emissions was needed by 2020. In 2010, CARB prepared an updated 2020 forecast to account for the recession and slower forecasted growth. CARB determined that the economic downturn reduced the 2020 BAU by 55 MMT CO_2E; as a result, achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of 21.7 (not 28.5) percent from the 2020 BAU. California has achieved its 2020 goal.

Approved in September 2016, Senate Bill (SB) 32 updates the California Global Warming Solutions Act of 2006 and enacts EO B-30-15. Under SB 32, the state would reduce its GHG emissions to 40 percent below 1990 levels by 2030. This is equivalent to an emissions level of approximately 260 MMT CO_2E for 2030. In implementing the 40 percent reduction goal, CARB is required to prioritize emissions reductions to consider the social costs of the emissions of GHGs; where "social costs" is defined as "an estimate of the economic damages, including, but not limited to, changes in net agricultural productivity; impacts to public health; climate adaptation impacts, such as property damages from increased flood risk; and changes in energy system costs, per metric ton of greenhouse gas emission per year."

3.2.3 Climate Change Scoping Plan

As directed by the California Global Warming Solutions Act of 2006, in 2008, CARB adopted the *Climate Change Scoping Plan: A Framework for Change* (Scoping Plan), which identifies the main strategies California will implement to achieve the GHG reductions necessary to reduce forecasted BAU emissions in 2020 to the state's historic 1990 emissions level (CARB 2008). In November 2017, CARB released the *2017 Climate Change Scoping Plan Update, the Strategy for Achieving California's 2030 Greenhouse Gas Target* (2017 Scoping Plan; CARB 2017). The 2017 Scoping Plan identifies state strategies for achieving the state's 2030 GHG emissions reduction target codified by SB 32. Measures under the 2017 Scoping Plan Scenario build on existing programs such as the Low Carbon Fuel Standard, Advanced Clean Cars Program, Renewables Portfolio Standard (RPS), Sustainable Communities Strategy (SCS), Short-Lived Climate Pollutant Reduction Strategy, and the Cap-and-Trade Program. Additionally, the 2017 Scoping Plan proposes new policies to address GHG emissions from natural and working lands. The *2022 Scoping Plan Update for Achieving Carbon Neutrality* (2022 Scoping Plan; CARB 2022a) was adopted in December 2022. The 2022 Scoping Plan assesses the progress towards the 2030 GHG emissions reduction target identified in the 2017 Scoping Plan and lays out a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045, as directed by AB 1279. The 2022 Scoping Plan identifies strategies related to clean technology, energy development, natural and working lands, and others, and is designed to meet the state's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

3.2.4 Regional Emissions Targets – Senate Bill 375

SB 375, the 2008 Sustainable Communities and Climate Protection Act, was signed into law in September 2008 and requires CARB to set regional targets for reducing passenger vehicle GHG

emissions in accordance with the Scoping Plan. The purpose of SB 375 is to align regional transportation planning efforts, regional GHG reduction targets, and fair-share housing allocations under state housing law. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a SCS or Alternative Planning Strategy to address GHG reduction targets from cars and light-duty trucks in the context of that MPO's Regional Transportation Plan. The County's MPO is the San Diego Association of Governments (SANDAG), and the region's Sustainable Communities Strategy/Regional Transportation Plan (SCS/RTP) is San Diego Forward: The 2021 Regional Plan (see Section 3.3.2). The current targets for the region are a 15 percent reduction in GHG emissions per capita from automobiles and light-duty trucks compared to 2005 levels by 2020 and a 19 percent reduction by 2035. These targets are periodically reviewed and updated.

3.2.5 California Department of Transportation

3.2.5.1 Climate Action Plan for Transportation Infrastructure

The California State Transportation Agency (CalSTA) released the Climate Action Plan for Transportation Infrastructure (CAPTI) in 2021 (CalSTA 2021). The CAPTI details how the state will invest in transportation to combat and adapt to climate change while supporting public health, safety, and equity. EO N-19-19 calls for actions from multiple state agencies to reduce GHG emissions, and allowed transportation funding for CalSTA to work to align transportation spending with the state's Scoping Plan where feasible; direct investments to strategically support smart growth to increase infill housing production; reduce congestion through strategies that encourage a reduction in driving and invest further in walking, biking, and transit; and ensure that overall transportation costs for low-income Californians do not increase as a result of these policies. EO N-79-20 accelerates the transition away from fossil fuels by requiring all new cars sold in California to be zero-emission by 2035, all new commercial trucks sold in the state to be zero-emission by 2045 for all operations where feasible, and all new off-road vehicles and equipment sold to be zero-emission by 2035 where feasible. The CAPTI builds on these two executive orders and provides a framework, strategies, and actions to align with statewide GHG reduction goals.

3.2.5.2 California Transportation Plan

The California Transportation Plan (CTP) provides a common framework for guiding transportation decisions and investments by all levels of government and the private sector (California Department of Transportation [Caltrans] 2021a). Caltrans is required to facilitate, develop, and prepare the CTP and to update it every five years. The CTP 2050 provides a policy framework for making effective, transparent, and transformational transportation decisions in California. It addresses the varied transportation needs of urban, suburban, rural, and Tribal communities; and emphasizes implementation and identifies a timeline, roles, and responsibilities for each plan recommendation. The CTP contains policies and strategies required to close the gap between what the RTPs aim to achieve and how much more is required to meet 2050 GHG reduction goals.

3.2.5.3 Caltrans Strategic Plan

The Caltrans 2020–2024 Strategic Plan includes goals of stewardship, climate action, and equity. Climate action strategies include developing and implementing a Caltrans Climate Action Plan; a

robust program of climate action education, training, and outreach; partnership and collaboration; a vehicle miles traveled (VMT) monitoring and reduction program; and engaging with the most vulnerable communities in developing and implementing Caltrans climate action activities (Caltrans 2021b).

3.2.5.4 Caltrans Policy Directives and Other Initiatives

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012) established a policy to ensure coordinated efforts to incorporate climate change into departmental decisions and activities. Caltrans Greenhouse Gas Emissions and Mitigation Report (Caltrans 2020) provides a comprehensive overview of Caltrans' emissions. The report documents and evaluates current Caltrans procedures and activities that track and reduce GHG emissions, and identifies additional opportunities for further reducing GHG emissions from Caltrans-controlled emission sources, in support of Caltrans and State goals.

3.3 Local

3.3.1 County of San Diego

The County General Plan applies to the unincorporated area of the county and is the County's long-term blueprint for the vision of the future. It reflects an environmentally sustainable approach to planning that balances the need for adequate infrastructure, housing, and economic vitality while maintaining and preserving existing communities, agricultural areas, and open spaces. The General Plan contains goals and policies specific to reducing GHG emissions, including efficient and compact growth and development; increasing energy efficiency and use of renewable energy sources; increasing recycling; and improving access to sustainable transportation. The County General Plan incorporates smart growth and land planning principles intended to reduce vehicle miles traveled, and thereby reduce GHG emissions. Specifically, the General Plan directed preparation of a County Climate Action Plan (CAP) with reduction targets; development of regulations to encourage energy-efficient building design and construction; and development of regulations that encourage energy recovery and renewable energy facilities, among other actions. These planning and regulatory efforts are intended to ensure that actions of the County do not impede AB 32 and SB 375 mandates.

As such, on February 14, 2018, the County Board of Supervisors (Board) adopted a CAP, which identifies specific strategies and measures to reduce GHG emissions in the largely rural, unincorporated areas of San Diego County as well as County government operations (County of San Diego 2018). The CAP aims to meet the state's 2020 and 2030 GHG reduction targets (AB 32 and SB 32, respectively), and demonstrate progress towards the 2050 GHG reduction goal.

On September 30, 2020, the Board voted to set aside its approval of the County's 2018 CAP and related actions because the Final Supplemental Environmental Impact Report (2018 CAP SEIR) was found to be out of compliance with the CEQA. In response to this Board action, the County is preparing a CAP Update to revise the 2018 CAP and correct the items identified by the 4th District Court of Appeal in San Diego within the Final 2018 CAP SEIR that were not compliant.

Pending adoption of a new CAP, the County would continue to implement the 26 GHG reduction measures and sustainability initiatives and programs identified in the 2018 CAP to reduce GHG emissions to meet the State's 2030 reduction target.

3.3.2 Regional Transportation Plan/Sustainable Communities Strategy

San Diego Forward: The 2021 Regional Plan is the 2050 RTP prepared by SANDAG and adopted in December 2021. The RTP establishes an implementation plan for how the region will grow over the next 30 years. Developed in accordance with California Senate Bill 375, the RTP includes an SCS. An SCS demonstrates how the region will meet its GHG reduction targets through integrated land use, housing, and transportation planning. While the purpose of an SCS is to reduce GHG emissions due to mobile sources, it also results in a decrease in mobile sources of criteria pollutants. Enhanced public transit service combined with incentives for land use development that provides a better market for public transit will play an important role in the SCS.

The SCS focuses on the following five main strategies, referred to as the 5 Big Moves, that will result in a more efficient transportation system:

1. Complete Corridors – Complete corridors act as the backbone of the entire regional transportation system, using technology, infrastructure improvements, pricing, and connectivity to support all forms of movement.

2. Transit Leap – Transit leap offers people a network of high-capacity, high-speed, and high-frequency transit services that will incorporate new modes of transit while also providing improved existing services.

3. Mobility Hubs – Mobility hubs are the centers of activity where a high concentration of people, destinations, and travel choices converge. They offer on-demand travel options and safe streets to enhance connections to high-quality transit while also making it easier for people to take short trips without needing a car.

4. Flexible Fleets – Flexible fleets offer people a variety of on-demand, shared vehicles, including microtransit, bikeshare, scooters, and other modes of transportation, to connect them to transit and make travel easy within Mobility Hubs.

5. Next Operating System (OS) – Next OS refers to an integrated digital platform that ties the transportation system together. Next OS enables the transportation system to be managed in real time so that people can be connected immediately to the modes of transportation that work best for them for any given situation and at any time.

4.0 GHG Inventories

4.1 National GHG Inventory

The U.S. EPA develops an annual report, called the Inventory of U.S. Greenhouse Gas Emissions and Sinks, that tracks U.S. GHG emissions and sinks by source, economic sector, and GHG going back to 1990. A summary of the 1990 and 2021 (most current) national GHG emissions by economic sector is provided in Table 2.

Table 2
National GHG Emissions by Sector

Sector	1990 Emissions in MMT CO_2E	2021 Emissions in MMT CO_2E
Transportation	1,521.4	1,804.3
Electric Power Industry	1,879.7	1,584.1
Industrial	1,677.3	1,487.3
Agriculture	592.9	635.8
Commercial	447.0	439.2
Residential	345.6	365.6
U.S. Territories	23.4	24.1
Total Gross Emissions (Sources)	**6,487.3**	**6,340.2**
Land Use, Land Use Change, and Forestry (LULUCF) Sector Net Total[a]	*(881.0)*	*(754.2)*
Net Emissions (Sources and Sinks)	**5,606.4**	**5,586.0**

SOURCE: U.S. EPA. 2023
[a]The LULUCF Sector Net Total is the net sum of all LULUCH CH_4 and N_2O emissions to the atmosphere plus LULUCF net carbon stock changes.
Notes: Total (gross) emissions are presented without LULUCF. Total net emissions are presented with LULUCF. Totals may not sum due to independent rounding. Parentheses indicate negative values or sequestration.

4.2 State GHG Inventory

CARB performs statewide GHG inventories. The inventory is divided into broad sectors of economic activity. Emissions are quantified in million metric tons of CO_2 equivalent (MMT CO_2E). Table 3 shows the estimated statewide GHG emissions for the years 1990, 2014, and 2018. Although annual GHG inventory data is available for years 2000 through 2018, the years 1990, 2014, and 2020 are highlighted in Table 3 because 1990 is the baseline year for established reduction targets, 2014 corresponds to the same years for which inventory data for the County is available, and 2020 is the most recent data available.

Table 3 California GHG Emissions by Sector			
Sector	1990[1] Emissions in MMT CO_2E (% total)[2]	2014[3] Emissions in MMT CO_2E (% total)[2]	2020[3] Emissions in MMT CO_2E (% total)[2]
Electricity Generation	110.5 (25.7%)	89.0 (20.1%)	59.8 (16.2%)
Transportation	150.6 (35.0%)	167.4 (37.8%)	139.9 (37.9%)
Industrial	105.3 (24.4%)	103.7 (23.4%)	85.3 (23.1%)
Commercial	14.4 (3.4%)	21.3 (4.8%)	22.0 (6.0%)
Residential	29.7 (6.9%)	27.2 (6.1%)	31.6 (8.6%)
Agriculture & Forestry	18.9 (4.4%)	34.8 (7.8%)	31.6 (8.6%)
Not Specified	1.3 (0.3%)	--	--
Total[4]	**430.7**	**443.4**	**369.3**

SOURCE: CARB 2007 and 2022b.
[1]1990 data was obtained from the CARB 2007 source and based on the Intergovernmental Panel on Climate Change fourth assessment report Global Warming Potentials.
[2]Percentages may not total 100 due to rounding.
[3]2014 and 2018 data was retrieved from the CARB 2020a source and are based on the Intergovernmental Panel on Climate Change fourth assessment report Global Warming Potentials.
[4]Totals may vary due to independent rounding.

4.3 Local GHG Inventory

A County emissions inventory was prepared for year 2014, which was the baseline year for the County's CAP. Table 4 summarizes the sources and quantities of community emissions. The largest source of emissions is transportation.

Table 4 County of San Diego GHG Emissions in 2014	
Sector	2014 GHG Emissions (MT CO_2E)
On-Road Transportation	1,456,060 (45%)
Electricity	760,638 (24%)
Solid Waste	338,107 (11%)
Natural Gas	290,712 (9%)
Agriculture	163,696 (5%)
Water	134,269 (4%)
Off-Road Transportation	36,927 (1%)
Wastewater	21,183 (1%)
Propane	9,914 (<1%)
Total	**3,211,505**
SOURCE: County of San Diego 2018.	

5.0 Project Analysis

GHG emissions from transportation projects can be divided into those produced during operation of the State Highway System (operational emissions) and those produced during construction. The

primary GHGs produced by the transportation sector are CO_2, CH_4, N_2O, and hydrofluorocarbons (HFCs). CO_2 emissions are a product of burning gasoline or diesel fuel in internal combustion engines, along with relatively small amounts of CH_4 and N_2O. A small amount of HFC emissions related to refrigeration is also included in the transportation sector, but would not be generated during construction or operation of this project.

The CEQA Guidelines generally address GHG emissions as a cumulative impact due to the global nature of climate change (Pub. Resources Code, Section 21083(b)(2)). As the California Supreme Court explained, "because of the global scale of climate change, any one project's contribution is unlikely to be significant by itself." (Cleveland National Forest Foundation *v.* San Diego Assn. of Governments (2017) 3 Cal.5th 497, 512). In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (CEQA Guidelines Sections 15064(h)(1) and 15130). Attachment 1 of this technical study includes the proposed project's detailed CEQA Analysis.

To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. Although climate change is ultimately a cumulative impact, not every individual project that emits greenhouse gases must necessarily be found to contribute to a significant cumulative impact on the environment. There are currently no federal quantitative significance thresholds. However, emissions associated with the project were calculated for informational purposes.

5.1 Operational Emissions

The purpose of this project is to relieve congestion and improve traffic flow by constructing roundabouts and reconfiguring intersections on Riverford Road adjacent to SR-67. The project would not increase capacity or traffic volumes. It would improve traffic flow which would reduce stop-and-go movements, which in turn would result in a reduction in operational emissions. The project would also construct concrete sidewalks, pedestrian crosswalks, shared-use paths, and/or Class II bicycle paths. Because the project would not increase the number of travel lanes or capacity on affected roads, no increase in VMT would occur. While some GHG emissions during the construction period would be unavoidable, no increase in operational GHG emissions is expected.

5.2 Construction Emissions

The project would result in short-term emissions associated with construction. Construction emissions associated with the project were modeled using the Sacramento Metropolitan Air Quality Management District's (SMAQMD) Roadway Construction Emissions Model (RCEM) Version 9.0.1 (SMAQMD 2022). The RCEM is a spreadsheet-based model that is able to use basic project information (e.g., total construction months, project type, total project area) to estimate a construction schedule and quantify exhaust emissions from heavy-duty construction equipment, haul trucks, and worker commute trips associated with linear construction projects. Version 9.0.1 of the model incorporates the most currently approved 2017 Emission Factor (EMFAC2017) model and Off-Road emissions factors model. The 2021 Emission Factor (EMFAC2021) model was released in January 2021; however, EMFAC2021 has not yet been approved for use by the U.S. EPA. EMFAC2017 is the most recent version of the model approved by the U.S. EPA, and therefore was used in this

analysis. Use of EMFAC2021 would not result in emissions that are substantially different than those calculated in this analysis, particularly since the main source of emissions would be construction equipment which are calculated using the Off-Road emissions factor model methodologies incorporated into RCEM. Although RCEM was developed by SMAQMD, it is appropriate for use in San Diego because it is applicable for all statewide construction projects that involve construction equipment that is subject to CARB construction equipment emissions standards, and incorporates statewide emission factor models (EMFAC2017 and Off-Road). RCEM calculates emissions from grubbing/land clearing, grading/excavation, drainage/utilities/sub-grade, and paving activities associated with construction projects that are linear in nature (e.g., road or levee construction, pipeline installation, transmission lines). Construction is expected to begin in 2027 and last approximately one to two years. The total project area is approximately 17.60 acres. Road construction phases include grubbing/land clearing, grading/excavation, drainage/utilities/subgrade, and paving. Project construction would include the export of 11,340 cubic yards of concrete and 6,190 cubic yards of asphalt.

5.2.1 Construction Equipment

The default RCEM construction equipment list was reviewed by the County's Department of Public Works, and additional construction equipment including cranes, drill rigs, dump trucks, and woodchippers were added; to the modeling inputs. Additionally, a hydraulic splitter and excavator with pneumatic hammer attachment were added to the modeling inputs to account for equipment that may be required to remove rock south of Woodside Avenue (the two rock removal scenarios would be either rock drilling or blasting, and are discussed in Section 5.2.2). The default number of workers per phase were modeled. Table 5 summarizes the modeled construction equipment for each phase. It should be noted that this equipment list is preliminary since the project is in the early stages of design; however, it is representative of what would be required.

Table 5
Construction Parameters

Construction Phase	Phase Duration (Months)	Equipment
Grubbing/Land Clearing	2	1 Crawler Tractor
		2 Excavators
		1 Dump Truck with Tow-Behind Woodchipper (modeled as Off-Highway Truck and Other General Industrial Equipment)
		1 Hydraulic Splitter (modeled as Bore/Drill Rig)
		1 Pneumatic Hammer (modeled as Excavator)
		2 Signal Boards
		7 Workers
Grading/Excavation	11	1 Bore/Drill Rig
		1 Crane
		1 Crawler Tractor
		3 Excavators
		2 Graders

Table 5 Construction Parameters		
Construction Phase	Phase Duration (Months)	Equipment
		3 Dump Trucks (modeled as Off-Highway Trucks)
		2 Rollers
		1 Rubber Tired Loader
		2 Scrapers
		4 Tractors/Loaders/Backhoes
		1 Hydraulic Splitter (modeled as Bore/Drill Rig)
		1 Pneumatic Hammer (modeled as Excavator)
		2 Signal Boards
		22 Workers
Drainage/Utilities/ Subgrade	7	1 Air Compressor
		2 Cement and Mortar Mixers
		1 Crane
		1 Generator Set
		1 Grader
		1 Plate Compactor
		1 Pump
		1 Rough Terrain Forklift
		1 Scraper
		3 Tractors/Loaders/Backhoes
		1 Hydraulic Splitter (modeled as Bore/Drill Rig)
		1 Pneumatic Hammer (modeled as Excavator)
		2 Signal Boards
		15 Workers
Paving	4	3 Asphalt Dump Trucks (modeled as Off-Highway Trucks)
		1 Paver
		1 Paving Equipment
		3 Rollers
		3 Tractors/Loaders/Backhoes
		2 Signal Boards
		12 Workers
SOURCE: RCEM Input/Output, Attachment 2.		

5.2.2 Rock Removal

As discussed, either rock drilling or blasting would be required to remove rock south of Woodside Avenue. The following two scenarios were considered in this analysis:

Scenario 1: Non-Blasting

- Hydraulic splitter – The hydraulic splitter would be inserted into drilled holes in the rock and split the rock from inside the hole.
- Pneumatic hammer – A pneumatic hammer attached to an excavator would break rock.
- Chemical expanders – Chemicals would be poured into the drilled holes. The chemicals would expand and break the rock.

Caltrans Specifications would be followed for any of the rock breaking options.

Scenario 2: Blasting and Controlled Blasting

There are two types of blasting: Blasting and Controlled Blasting. Either method would also likely be used in conjunction with the non-blasting equipment/methods listed above. Caltrans Specifications would be followed for any of the blasting options. The contractor would implement the following methods:

Blasting

- Blasting within 30 feet of a building, highway facility or utilities is considered near-field blasting which requires an additional blasting consultant to monitor the operation with 10 years or experience in blasting monitoring.
- Presplitting can be used with blasting or controlled blasting by drilling 3-inch diameter holes aligned and spaced 3 feet apart to control the limits of the blasting slope.
- Blasting activities must comply with federal, State, and local blasting regulations, including Title 8 of the California Code of Regulations Chapter 4, Subchapter 7, Group 18, "Explosive Materials."
- Contractor is required to provide a blasting safety plan.

Controlled Blasting

- Controlled blasting is using a predetermined spacing and alignment with small drilled holes to control where the rock will break.
- Blasting activities must comply with federal, State, and local blasting regulations, including Title 8 of the California Code of Regulations Chapter 4, Subchapter 7, Group 18, "Explosives and Pyrotechnics," Regulations, Division 4.5, Chapter 33, "Best Management Practices for Perchlorate Materials."
- Requires a blasting safety plan and a controlled blasting plan.
- Requires a pre-blasting survey of all structures including buildings within 330 feet of controlled blasting zone.
- Requires a post-blasting survey as well to determine that no damage was done to any items documented in the pre-blasting survey.

- Requires a Vibration and Noise Monitoring Report
    - Vibration levels will need to be below 2 inch per second at the nearest building highway facility or utility.
    - Noise must be below 128 decibels at the nearest building.
    - These are controlled by varying sequencing and/or blasting strength.
- Includes using a seismograph and decibel noise recorded.
- Requires a blast monitoring consultant with 5 years of experience.

In order to account for heavy equipment required for either rock removal method, a hydraulic splitter and excavator with pneumatic hammer equipment were added to the grubbing/land clearing, grading/excavation, and drainage/utilities/subgrade phases of construction.

Criteria pollutant emissions would also result from rock drilling, explosive detonation, and ejected material, and these emissions are addressed in the Air Quality Analysis. No additional GHG emissions would result from these processes.

5.2.3 Calculation Results

Using the methodology discussed in Sections 5.1 through 5.2.2, total construction emissions were calculated using RCEM modeling and are summarized in Table 6. Based on guidance from the South Coast Air Quality Management District (SCAQMD), total construction GHG emissions resulting from a project should be amortized over 30 years to account for their contribution to GHG emissions over the lifetime of a project (SCAQMD 2009). Amortized emissions are also shown in Table 6.

Table 6
Project Construction-Related GHG Emissions
(MT CO_2E per Year)

Phase	GHG Emissions
Grubbing/Land Clearing	168
Grading/Excavation	1,918
Drainage/Utilities/Subgrade	609
Paving	316
Total	**3,011**
Amortized over 30 years	100

As further detailed in Attachment 1, while the project would result in GHG emissions during construction, it is anticipated that the project would not result in any increase in operational GHG emissions. The project would provide transportation infrastructure improvements without changing the traffic carrying capacity of the area. The project would improve traffic flow in the vicinity. Thus, the project is not anticipated to generate new vehicle trips and would not substantially increase operational emissions relative to existing conditions. Additionally, the project does not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Overall, the project is not anticipated to result in an operational GHG impact.

5.3 Project-Level GHG Reduction Strategies

The following measures would also be implemented as project design features to reduce GHG emissions and potential climate change impacts from the project.

- Minimize tree and vegetation removals.
- Revegetation.
- Implement construction dust-control measures/best management practices.
- The construction contractor shall utilize alternative fuels such as renewable diesel for construction equipment when feasible.
- Idling shall be limited to 5 minutes for delivery and dump trucks and other diesel-powered equipment (with some exceptions).
- The construction contractor shall schedule truck trips outside of peak morning and evening commute hours and implement a Traffic Management Plan to minimize effects to traffic.
- The construction contractor shall reduce construction waste.
- The construction contractor shall maximize improved fuel efficiency of construction equipment through ensuring that construction equipment is maintained and properly tuned and equipment has been right-sized for the job.
- The construction contractor shall provide construction personnel with the knowledge to identify environmental issues and best practice methods to minimize impacts to the human and natural environment. Supplement existing training with information regarding methods to reduce GHG emissions related to construction.
- Earthwork Balance: Reduce the need for transport of earthen materials by balancing cut and fill quantities.
- Long-Life Pavement Minimize life-cycle costs by designing long-lasting pavement structures. Consider future climate conditions in decisions.
- All removed asphalt would be reused as grindings elsewhere.

The project would also follow Caltrans' Standard Specification Section 14-9.02, "Air Pollution Control" (Caltrans 2023), which includes the following:

- 14-9.02 Air Pollution Control:
  - Comply with air pollution control rules, regulations, ordinances, and statutes that apply to work performed under the Contract[1], including air pollution control rules, regulations, ordinances, and statutes provided in Government Code § 11017 (Pub Cont Code 10231).
  - Do not dispose of material by burning.

5.4 Adaptation

Caltrans District 11 conducted a Climate Change Vulnerability Assessment to identify segments of the State Highway System vulnerable to climate change effects of precipitation, temperature, wildfire,

[1]As defined by the 2023 Caltrans Standard Specifications: "Contract" refers to "Written and executed contract between the Department and the Contractor."

storm surge, and sea level rise (Caltrans 2019). The objectives of the assessment are to understand the types of weather-related and longer-term climate change events that would likely occur with greater frequency and intensity in future years, identify Caltrans assets vulnerable to various climate-influenced natural hazards, and develop a method for prioritizing candidate projects, taking financial constraints (among other things) into consideration. The following climate stressors have been identified in District 11: temperature, precipitation, wildfire, sea level rise, storm surge, and cliff retreat.

5.4.1 Temperature

Temperature affects the binder used by Caltrans. Binder is essentially the "glue" that ties together the aggregate materials in asphalt. Selecting the appropriate and recommended pavement binder relies, in part, on temperature metrics relating to high and low temperatures. The District 11 vulnerability assessment assessed the expected low and high temperatures for pavement binder specification in three future 30-year periods centered on the years 2025, 2055 and 2085. This data is used by Caltrans to identify how pavement design practices might need to shift over time given the expected changes in temperature in the future, and to help inform decisions on how to provide the best pavement quality for California highway users.

Two future climate projections using medium and high greenhouse gas and aerosol emissions scenarios have been analyzed in the vulnerability assessment. These scenarios are known as Representative Concentration Pathways (RCP). Each RCP represents a standardized set of assumptions of humanity's trajectory in the coming years. The Medium Emissions Scenario (RCP 4.5) represents a mitigation scenario where global CO2 emissions peak by 2040 and then decline. The High Emissions Scenario (RCP 8.5) represents a scenario where CO2 emissions continue to rise throughout the 21st century. Table 7 summarizes the annual average minimum and annual average maximum temperatures for the project area under each RCP.

Table 7
Average Minimum and Maximum Temperatures in the Project Area

Year	Average Annual Minimum Temperature (°F)	Average Annual Maximum Temperature (°F)
RCP 4.5		
2025	75.5	82.2
2055	78.3	84.8
2085	78.8	86.0
RCP 8.5		
2025	77.2	81.2
2055	78.4	83.9
2085	81.2	88.3

SOURCE: Cal-Adapt 2023.

To ensure long-term pavement quality on Caltrans roadways, Caltrans has created a recommendation for areas in California based on the climate regions to help determine the types of pavement mixes recommended for each area. Additionally, high temperatures are considered in the design of pavements in particular to mitigate future deterioration. The project would be adapted

and resilient to climate change effects and would adhere to Caltrans standards. Thus, the project would not exacerbate existing risks related to temperature or contribute to new risks that could occur under climate change.

5.4.2 Precipitation

Heavy precipitation events may change and become more frequent with longer periods of drought. A 100-year design standard is often in the design of transportation facilities. Transportation assets in California are impacted by precipitation in a variety of ways—from inundation/flooding, landslides, washouts or structural damage. Based on Cal-Adapt data, maximum one day precipitation is anticipated to increase by +0.066 inches by the mid-century and +0.110 inches by end-century under the RCP 8.5 scenario.

The San Diego River is located north of the project area, approximately 0.10 mile north of SR-67 southbound. The San Diego River flows east-to-west and runs underneath the Riverford Road bridge outside of the project footprint. Due to topography, the project area is located outside the 100-year Federal Emergency Management Agency floodway.

5.4.3 Wildfire

Increasing temperatures, changing precipitation patterns, and resulting changes to land cover are expected to impact wildfire frequency and intensity in future years. Wildfire is a direct concern for driver safety, system operations, and Caltrans infrastructure. Wildfires can indirectly lead to landslide and flooding exposure by burning off soil-stabilizing land cover, and wildfire smoke that impacts visibility. The vulnerability assessment analyzed the level of wildfire concerns under three future 30-year time periods (with midpoints at 2025, 2055, and 2085) based on the RCP 8.5 emissions scenario. The western portion of Woodside Avenue within the project area is identified as an exposed roadway in a moderate concern area in the 2025, 2055, and 2085 RCP 8.5 scenarios. However, no aspects of the project would result in a greater risk of exposure to wildfire. In addition, Caltrans 2023 revised Standard Specification 7-1.02M(2) mandates fire prevention procedures during construction, including a fire prevention plan. Thus, the project would not exacerbate existing wildlife risks or contribute to new risks that could occur under climate change.

5.4.4 Sea Level Rise/Storm Surge/Cliff Retreat

The project is outside the coastal zone and not in an area subject to sea level rise. Accordingly, direct impacts to transportation facilities due to projected sea level rise, storm surge, and coastal cliff retreat are not expected.

5.5 Council on Environmental GHG Guidance

The Council on Environmental Quality (CEQ) has issued interim guidance to assist agencies in analyzing GHGs and climate change effects of their proposed actions under NEPA (CEQ 2023). The guidance states “NEPA reviews should quantify proposed actions' GHG emissions, place GHG emissions in appropriate context and disclose relevant GHG emissions and relevant climate impacts,

and identify alternatives and mitigation measures to avoid or reduce GHG emissions. CEQ encourages agencies to mitigate GHG emissions associated with their proposed actions to the greatest extent possible, consistent with national, science-based GHG reduction policies established to avoid the worst impacts of climate change." The guidance goes on to say that "when conducting climate change analyses in NEPA reviews, agencies should consider: (1) the potential effects of a proposed action on climate change, including by assessing both GHG emissions and reductions from the proposed action; and (2) the effects of climate change on a proposed action and its environmental impacts."

GHG emissions associated with temporary construction activities have been calculated and are summarized in Table 6. Additionally, the project would implement GHG reduction strategies outlined in Section 5.3. These strategies were not factored into the GHG emission calculations. Therefore, implementation of these measures would reduce GHG emissions beyond those summarized in Table 6. Furthermore, project GHG emissions would be temporary and would cease after construction activities are complete. The project would not result in an increase in long-term operational emissions because no increase in VMT would occur. Rather, the project would improve traffic flow, thereby resulting in a decrease in mobile-source GHG emissions when compared to the existing condition. Therefore, the project would not have a significant effect on climate change. Furthermore, as analyzed under Section 5.4, Adaptation, the effects of climate change on the project are not expected.

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ATTACHMENTS

ATTACHMENT 1

County of San Diego CEQA Analysis

County of San Diego CEQA Analysis

1.0 Thresholds of Significance

Based on the CEQA Guidelines Appendix G, impacts related to greenhouse gas (GHG) emissions would be significant if the project would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of GHGs.

State CEQA Guidelines Section 15064.4 states that "the determination of the significance of greenhouse gas emissions (GHG) calls for careful judgment by the lead agency, consistent with the provisions in Section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of greenhouse gas emissions resulting from a project." Section 15064.4(b) further states that a lead agency should consider the following non-exclusive factors when assessing the significance of GHG emissions:

1. The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;

2. Whether the project emissions exceed a threshold of significance that the lead agency applies to the project; and

3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

The State CEQA Guidelines Section 15064(h)(1) states that "the lead agency shall consider whether the cumulative impact is significant and whether the effects of the project are cumulatively considerable." A cumulative impact may be significant when the project's incremental effect, though individually limited, is cumulatively considerable.

The County does not currently have locally-adopted screening criteria for GHG thresholds. Pending adoption of a new CAP, appropriate GHG emissions thresholds were considered for the purposes of this analysis. The CEQA Guidelines do not provide numeric or quantitative thresholds of significance for evaluating GHG emissions. Instead, they leave the determination of threshold significance up to the lead agency and provide it the discretion to consider thresholds of significance previously adopted or recommended by other public agencies or experts, provided that the lead agency's decision is supported by substantial evidence (CEQA Guidelines Sections 15064.7[b] and 15064.7[c]). Additionally, any public agency may also use an environmental standard as a threshold of significance, as it would promote consistency in significance determination and integrate

environmental review with other environmental program planning and regulations (CEQA Guidelines Section 15064.7[d]).

Based on the specific characteristics of this project, including its temporary construction-related GHG emissions, and the fact that the project would not result in an increase in operational emissions, this impact analysis follows guidance consistent with California Air Pollution Control Officers Association's (CAPCOA) report *CEQA & Climate Change* (CAPCOA 2008). CAPCOA developed a screening threshold of 900 metric tons of carbon dioxide equivalent (MT CO_2E) for determining whether further analysis of a project's GHG impacts would be needed. Direct and cumulative impacts would be potentially significant and require further analysis if the project results in emissions that exceed this threshold beyond current baseline emissions. This threshold was developed to demonstrate compliance with the statewide reduction targets in 2020. Because the project would be completed after 2020, the 900 MT CO_2E screening threshold would no longer be applicable. SB 32 sets a GHG emission reduction target of 40 percent below 1990 levels by 2030, which would equate to a screening threshold of 540 MT CO_2E. The screening level does not indicate impact significance; rather, it is intended to be used to screen out smaller projects that do not generate substantial amounts of GHG emissions and allows regulatory and discretionary actions to focus on the more significant sources of GHG emissions.

2.0 CEQA Impact Analysis

1. *Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?*

The purpose of this project is to relieve congestion and improve traffic flow by constructing roundabouts and reconfiguring intersections on Riverford Road adjacent to SR-67. The project would not increase capacity or traffic volumes. The project would improve traffic flow, thereby reducing stop-and-go movements, which in turn would reduce operational emissions. The project would also construct concrete sidewalks, pedestrian crosswalks, shared-use paths, and/or Class II bicycle paths. Because the project would not increase the number of travel lanes or capacity on affected roads, no increase in vehicle miles traveled (VMT) would occur. While some GHG emissions during the construction period would be unavoidable, no increase in operational GHG emissions is expected.

Construction emissions were calculated using the methodology discussed in Section 5.2 of the GHG Analysis prepared for the report. Total construction emissions are summarized in Table 1.

Table 1
Project Construction-Related GHG Emissions
(MT CO_2e per Year)

Phase	GHG Emissions
Grubbing/Land Clearing	168
Grading/Excavation	1,918
Drainage/Utilities/Subgrade	609
Paving	316
Total	**3,011**
Amortized over 30 years	100

As shown, construction of the project would result in a total of 3,011 MT CO_2E over the two-year construction period. Based on guidance from the South Coast Air Quality Management District (SCAQMD), total construction GHG emissions resulting from a project should be amortized over 30 years and added to its operational emissions to account for their contribution to GHG emissions over the lifetime of a project (SCAQMD 2009). Construction emissions would equate to approximately 100 MT CO_2E when amortized over 30 years. As discussed above, the project would not result in any increase in operational emissions. Therefore, total project GHG emissions would be less than the 540 MT CO_2E annual screening level threshold. By emitting less than 540 MT CO_2E, the project's contribution of GHGs to cumulative statewide emissions would be less than cumulatively considerable. Therefore, the project would not generate GHG emissions, either directly or indirectly, that would have a significant impact on the environment, and impacts would be less than significant.

2. *Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of GHGs?*

EO S-3-05 and EO B-30-15 established GHG emission reduction targets for the state, and AB 32 launched the CARB Climate Change Scoping Plan that outlined the reduction measures needed to reach the 2020 target, which the state has achieved. As required by SB 32, CARB's 2017 Climate Change Scoping Plan outlines reduction measures needed to achieve the interim 2030 target. AB 1279, the California Climate Crisis Act, codified the carbon neutrality target as 85 percent below 1990 levels by 2045. The 2022 Scoping Plan was adopted in December 2022. The 2022 Scoping Plan lays out a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045, as directed by AB 1279. As discussed under Issue 1, the project would result in temporary construction emissions that would equate to approximately 91 MT CO_2E when amortized over 30 years. This would be less than the screening level threshold of 540 MT CO_2E which was developed to be consistent with the state's 2030 reduction goals. Further, project GHG emissions would be temporary and would cease after construction activities are complete. The project would not result in an increase in long-term operational emissions because no increase in VMT would occur. Rather, the project would improve traffic flow, thereby resulting in a decrease in mobile-source GHG emissions when compared to the existing condition. Therefore, the project would not conflict with the state's long-term GHG reduction goals established by SB 32 or the carbon neutrality goal established by AB 1279.

<u>San Diego Forward</u>

The project was also evaluated for consistency with the San Diego Forward, which is the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) that demonstrates how the region would meet its transportation related GHG reduction goals. The RTP/SCS focuses on the following five main strategies, referred to as the 5 Big Moves, that will result in a more efficient transportation system:

1. Complete Corridors – Complete corridors act as the backbone of the entire regional transportation system, using technology, infrastructure improvements, pricing, and connectivity to support all forms of movement.

   The project would support this strategy by providing much-needed transportation infrastructure improvements along Riverford Road. The project would also support

"complete street" strategies by constructing concrete sidewalks, pedestrian crosswalks, shared-use paths, and/or Class II bicycle paths.

2. Transit Leap – Transit leap offers people a network of high-capacity, high-speed, and high-frequency transit services that will incorporate new modes of transit while also providing improved existing services.

   There are no regular bus routes along the affected roadways in the vicinity of the project site, therefore, it would not affect existing bus services. There is a Caltrans Park and Ride lot located northeast of the intersection of Riverford Road and Woodside Avenue. Park and Ride lots are free parking lots for the ride share commuter (vanpool/carpool). By improving congestion in the vicinity of this parking lot, commuters may be more inclined to use the Park and Ride lot because of improved access.

3. Mobility Hubs – Mobility hubs are the centers of activity where a high concentration of people, destinations, and travel choices converge. They offer on-demand travel options and safe streets to enhance connections to high-quality transit while also making it easier for people to take short trips without needing a car.

   Mobility Hubs are places where transit and other shared mobility services, amenities, and supporting technology converge to offer a seamless travel experience. The network identified in San Diego Forward includes the region's urban hub and 30 Mobility Hubs that were identified based on land use and employment characteristics. The project is not located within a Mobility Hub, and therefore would not conflict with strategies related to Mobility Hubs.

4. Flexible Fleets – Flexible fleets offer people a variety of on-demand, shared vehicles, including microtransit, bikeshare, scooters, and other modes of transportation, to connect them to transit and make travel easy within Mobility Hubs.

   As discussed above, the project is not located within a Mobility Hub, and therefore would not conflict with strategies related to Mobility Hubs, including the provision of flexible fleets.

5. Next Operating System (OS) – Next OS refers to an integrated digital platform that ties the transportation system together. Next OS enables the transportation system to be managed in real time so that people can be connected immediately to the modes of transportation that work best for them for any given situation and at any time.

   The project would have no impact on the Next OS digital platform.

<u>County of San Diego General Plan</u>

The project would be consistent with the County's General Plan goals and policies related to transportation and conservation. Specifically, the project would implement the following Mobility Element and Conservation and Open Space Element goals and policies (County of San Diego 2011):

Goal M-3 Transportation Facility Development. New or expanded transportation facilities that are phased with and equitably funded by the development that necessitates their construction.

Policy M-3.1 Public Road Rights-of-Way. Require development to dedicate right-of-way for public roads and other transportation routes identified in the Mobility Element roadway network, Community Plans, or Road Master Plans. Require the provision of sufficient right-of-way width, as specified in the County Public Road Standards and Community Trails Master Plan, to adequately accommodate all users, including transit riders, pedestrians, bicyclists, and equestrians.

Goal M-4 Safe and Compatible Roads. Roads designed to be safe for all users and compatible with their context.

Policy M-4.1 Walkable Village Roads. Encourage multi-modal roads in Villages and compact residential areas with pedestrian-oriented development patterns that enhance pedestrian safety and walkability, along with other non-motorized modes of travel, such as designing narrower but slower speed roads that increase pedestrian safety.

Goal M-5 Safe and Efficient Multi-Modal Transportation System. A multi-modal transportation system that provides for the safe, accessible, convenient, and efficient movement of people and goods within the unincorporated County.

Policy M-5.1 Regional Coordination. Coordinate with regional planning agencies, transit agencies, and adjacent jurisdictions to provide a transportation system with the following:

- Sufficient capacity consistent with the County General Plan Land Use Map.
- Travel choices, including multiple routes and modes of travel to provide the opportunity for reducing vehicle miles traveled.
- Facilities sited and designed to be compatible with the differing scales, intensities, and characteristics of the unincorporated communities while still accommodating regional, community, and neighborhood travel demands.
- Maximized efficiency to enhance connectivity between different modes of travel.

Policy M-5.2 Impact Mitigation for New Roadways and Improvements. Coordinate with Caltrans to mitigate negative impacts from existing, expanded, or new State freeways or highways and to reduce impacts of road improvements and/or design modifications to State facilities on adjacent communities.

Goal M-9 Effective Use of Existing Transportation Network. Reduce the need to widen or build roads through effective use of the existing transportation network and maximizing the use of alternative modes of travel throughout the County.

Policy M-9.1 Transportation Systems Management. Explore the provision of operational improvements (i.e., adding turn lanes, acceleration lanes, intersection improvements, etc.) that increase the effective vehicular capacity of the public road network prior to increasing the number of road lanes. Ensure operational improvements do not adversely impact the transit, bicycle, and pedestrian networks.

Goal M-11 Bicycle and Pedestrian Facilities. Bicycle and pedestrian networks and facilities that provide safe, efficient, and attractive mobility options as well as recreational opportunities for County residents.

Policy M-11.1 Bicycle Facility Design. Support regional and community-scaled planning of pedestrian and bicycle networks.

Policy M-11.2 Bicycle and Pedestrian Facilities in Development. Require development and Town Center plans in Villages and Rural Villages to incorporate site design and on-site amenities for alternate modes of transportation, such as comprehensive bicycle and pedestrian networks and facilities, including both on-street facilities as well as off-street bikeways, to safely serve the full range of intended users, along with areas for transit facilities, where appropriate and coordinated with the transit service provider.

Policy COS-14.10 Low-Emission Construction Vehicles and Equipment. Require County contractors and encourage other developers to use low-emission construction vehicles and equipment to improve air quality and reduce GHG emissions.

Goal COS-16 Sustainable Mobility. Transportation and mobility systems that contribute to environmental and human sustainability and minimize GHG and other air pollutant emissions.

Policy COS-16.1 Alternative Transportation Modes. Work with SANDAG and local transportation agencies to expand opportunities for transit use. Support the development of alternative transportation modes, as provided by Mobility Element policies.

Climate Action Plan (CAP)

The County has set aside approval of its 2018 CAP; however, pending adoption of a new CAP, continues to implement the 26 GHG reduction measures and sustainability initiatives and programs. The project would be consistent with the following two applicable 2018 CAP measures:

- T-2.1 Improve Roadway Segments as Multi-Modal. Improve roadway segments, intersections, and bikeways to implement multi-modal enhancements for pedestrian and cyclist comfort and safety along County-maintained public roads by improving 700 centerline miles of roadway segments, including 250 intersections and 210 lane miles of bikeway improvements by 2030 and an additional 500 centerline miles of roadway segments, including 250 intersections and 210 lane miles of bikeway improvements by 2050.
- T-3.2 Use Alternative Fuels in County Projects. Require County projects to use alternative fuels in 100% of construction equipment during construction by 2030.

The County has released its Draft 2024 CAP for public review. The Draft 2024 CAP contains the following similar GHG reduction measures:

- T-1.1a Use alternative fuel and/or zero-emission construction equipment in County projects to reduce emissions from medium- and heavy-duty vehicles and equipment.

- T-5.1 Implement the County's Active Transportation Plan to install 345 miles of sidewalk and 315 miles of bikeways by 2030 to encourage alternative modes of transportation in the unincorporated area.

In order to demonstrate consistency with the 2024 CAP, the County has developed a CAP Consistency Checklist. If adopted, the County would be required to implement the following CAP consistency requirement for County-initiated projects: "The project must use electric-powered or other zero emissions vehicles and equipment during construction activities. This requirement applies to medium- and heavy-duty vehicles and equipment (defined as equal to or greater than 50 horsepower)." It goes on to state that this measure is not applicable if "electric-powered or zero emission vehicles and equipment are not commercially available for the project's medium- and heavy-duty vehicle and equipment needs during construction. To support this, demonstrate that a minimum of three fleet owners/operators/fuel providers in San Diego County or adjacent counties were contacted and responded that electric-powered or other zero emission equipment and/or fuel options are not commercially available for the project's vehicle and equipment needs during construction." Therefore, if the CAP is adopted prior to project approval and if technology is available, the project would be required to be consistent with this measure.

In summary, the project would be consistent with San Diego Forward and the County's General Plan and CAP because the project would improve traffic flow, thereby resulting in a decrease in mobile-source GHG emissions when compared to the existing condition. Therefore, the project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of GHGs, and impacts would be less than significant.

3.0 References Cited

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.

San Diego, County of

2011 San Diego County General Plan. Adopted August 3, 2011.

South Coast Air Quality Management District (SCAQMD)

2009 Greenhouse Gas CEQA Significance Threshold Stakeholder Working Group 14. November 19.

ATTACHMENT 2

Road Construction Emissions Model

		ROG	Nox	CO	Sox	PM10	PM2.5
Grubbing/Land Clearing	RCEM	1.88	18.72	20.66	0.07	20.77	4.78
	Blasting	0	1.7	6.70	0.2	7.4	1.6
	Total	1.88	20.42	27.36	0.27	28.17	6.38
Grading/Excavation	RCEM	6.42	54.90	60.68	0.17	22.22	6.16
	Blasting	0	1.7	6.70	0.2	7.4	1.6
	Total	6.42	56.60	67.38	0.37	29.62	7.76
Drainage/Utilities/Subgrade	RCEM	3.16	28.76	34.58	0.08	21.18	5.24
	Blasting	0	1.7	6.70	0.2	7.4	1.6
	Total	3.16	30.46	41.28	0.28	28.58	6.84
Paving	RCEM	2.73	20.55	28.63	0.07	0.90	0.81
	Blasting	0	0	0	0	0	0
	Total	2.73	20.55	28.63	0.07	0.90	0.81

Road Construction Emissions Model, Version 9.0.1

Daily Emission Estimates for -> Riverford Road Roundabouts				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust					
Project Phases (Pounds)	**ROG (lbs/day)**	**CO (lbs/day)**	**NOx (lbs/day)**	**PM10 (lbs/day)**	**PM10 (lbs/day)**	**PM10 (lbs/day)**	**PM2.5 (lbs/day)**	**PM2.5 (lbs/day)**	**PM2.5 (lbs/day)**	**SOx (lbs/day)**	**CO2 (lbs/day)**	**CH4 (lbs/day)**	**N2O (lbs/day)**	**CO2e (lbs/day)**
Grubbing/Land Clearing	1.88	20.66	18.72	20.77	0.77	20.00	4.78	0.62	4.16	0.07	7,130.42	1.54	0.39	7,283.80
Grading/Excavation	6.42	60.68	54.90	22.22	2.22	20.00	6.16	2.00	4.16	0.17	16,170.32	5.04	0.15	16,341.85
Drainage/Utilities/Sub-Grade	3.16	34.58	28.76	21.18	1.18	20.00	5.24	1.08	4.16	0.08	7,437.88	1.81	0.07	7,503.65
Paving	2.73	28.63	20.55	0.90	0.90	0.00	0.81	0.81	0.00	0.07	6,742.32	2.07	0.06	6,813.17
Maximum (pounds/day)	6.42	60.68	54.90	22.22	2.22	20.00	6.16	2.00	4.16	0.17	16,170.32	5.04	0.39	16,341.85
Total (tons/construction project)	1.18	11.72	10.17	4.82	0.42	4.40	1.29	0.37	0.92	0.03	2,982.86	0.87	0.04	3,015.17

Notes:

Project Start Year ->	2027
Project Length (months) ->	24
Total Project Area (acres) ->	18
Maximum Area Disturbed/Day (acres) ->	1
Water Truck Used? ->	No

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	398	0	600	280	0
Grading/Excavation	0	0	0	0	880	0
Drainage/Utilities/Sub-Grade	0	0	0	0	600	0
Paving	0	0	0	0	480	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 G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Riverford Road Roundabouts				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust					
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	**ROG (tons/phase)**	**CO (tons/phase)**	**NOx (tons/phase)**	**PM10 (tons/phase)**	**PM10 (tons/phase)**	**PM10 (tons/phase)**	**PM2.5 (tons/phase)**	**PM2.5 (tons/phase)**	**PM2.5 (tons/phase)**	**SOx (tons/phase)**	**CO2 (tons/phase)**	**CH4 (tons/phase)**	**N2O (tons/phase)**	**CO2e (MT/phase)**
Grubbing/Land Clearing	0.04	0.45	0.41	0.46	0.02	0.44	0.11	0.01	0.09	0.00	156.87	0.03	0.01	145.37
Grading/Excavation	0.78	7.34	6.64	2.69	0.27	2.42	0.75	0.24	0.50	0.02	1,956.61	0.61	0.02	1,793.85
Drainage/Utilities/Sub-Grade	0.24	2.66	2.21	1.63	0.09	1.54	0.40	0.08	0.32	0.01	572.72	0.14	0.01	524.16
Paving	0.12	1.26	0.90	0.04	0.04	0.00	0.04	0.04	0.00	0.00	296.66	0.09	0.00	271.96
Maximum (tons/phase)	0.78	7.34	6.64	2.69	0.27	2.42	0.75	0.24	0.50	0.02	1956.61	0.61	0.02	1,793.85
Total (tons/construction project)	1.18	11.72	10.17	4.82	0.42	4.40	1.29	0.37	0.92	0.03	2982.86	0.87	0.04	2,735.34

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

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model **Version 9.0.1**
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 D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

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.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	Riverford Road Roundabouts	
Construction Start Year	2027	Enter a Year between 2014 and 2040 (inclusive)
Project Type	2	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	24.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	2	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	0.80	miles
Total Project Area	17.60	acres
Maximum Area Disturbed/Day	1.00	acre
Water Trucks Used?	2	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County. NEW LINK 8-2-2022.

https://maps.conservation.ca.gov/cgs/gmc/

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			
Asphalt	Grubbing/Land Clearing	20.00		398.41
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving			

Mitigation Options

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer
Off-road Equipment Emissions Mitigation		Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard

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 D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing	2.00	2.40		1/1/2027
Grading/Excavation	11.00	10.80		3/3/2027
Drainage/Utilities/Sub-Grade	7.00	7.20		2/1/2028
Paving	4.00	3.60		9/1/2028
Totals (Months)		24		

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing		30.00		0	0.00
Miles/round trip: Grading/Excavation		30.00		0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade		30.00		0	0.00
Miles/round trip: Paving		30.00		0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.03	0.42	3.12	0.11	0.05	0.02	1,629.11	0.00	0.26	1,705.46
Grading/Excavation (grams/mile)	0.03	0.42	3.13	0.11	0.05	0.02	1,627.13	0.00	0.26	1,703.39
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.42	3.15	0.11	0.05	0.02	1,608.15	0.00	0.25	1,683.52
Paving (grams/mile)	0.03	0.42	3.15	0.11	0.05	0.02	1,608.15	0.00	0.25	1,683.52
Grubbing/Land Clearing (grams/trip)	0.00	0.00	4.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	4.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing		30.00		20	600.00
Miles/round trip: Grading/Excavation		30.00		0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade		30.00		0	0.00
Miles/round trip: Paving		30.00		0	0.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.03	0.42	3.12	0.11	0.05	0.02	1,629.11	0.00	0.26	1,705.46
Grading/Excavation (grams/mile)	0.03	0.42	3.13	0.11	0.05	0.02	1,627.13	0.00	0.26	1,703.39
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.42	3.15	0.11	0.05	0.02	1,608.15	0.00	0.25	1,683.52
Paving (grams/mile)	0.03	0.42	3.15	0.11	0.05	0.02	1,608.15	0.00	0.25	1,683.52
Grubbing/Land Clearing (grams/trip)	0.00	0.00	4.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	4.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.04	0.55	4.33	0.15	0.07	0.02	2,154.95	0.00	0.34	2,255.94
Tons per const. Period - Grubbing/Land Clearing	0.00	0.01	0.10	0.00	0.00	0.00	47.41	0.00	0.01	49.63
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.01	0.10	0.00	0.00	0.00	47.41	0.00	0.01	49.63

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions	User Override of Worker Commute Default Values	Default Values		
User Input				
Miles/ one-way trip		20	Calculated Daily Trips	Calculated Daily VMT
One-way trips/day		2		
No. of employees: Grubbing/Land Clearing		7	14	280.00
No. of employees: Grading/Excavation		22	44	880.00
No. of employees: Drainage/Utilities/Sub-Grade		15	30	600.00
No. of employees: Paving		12	24	480.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.01	0.68	0.04	0.05	0.02	0.00	276.66	0.00	0.00	278.11
Grading/Excavation (grams/mile)	0.01	0.67	0.04	0.05	0.02	0.00	275.87	0.00	0.00	277.31
Draining/Utilities/Sub-Grade (grams/mile)	0.01	0.64	0.04	0.05	0.02	0.00	268.32	0.00	0.00	269.68
Paving (grams/mile)	0.01	0.64	0.04	0.05	0.02	0.00	268.32	0.00	0.00	269.68
Grubbing/Land Clearing (grams/trip)	0.83	2.39	0.21	0.00	0.00	0.00	59.60	0.05	0.03	68.64
Grading/Excavation (grams/trip)	0.82	2.38	0.21	0.00	0.00	0.00	59.43	0.05	0.03	68.43
Draining/Utilities/Sub-Grade (grams/trip)	0.78	2.31	0.20	0.00	0.00	0.00	57.77	0.05	0.02	66.38
Paving (grams/trip)	0.78	2.31	0.20	0.00	0.00	0.00	57.77	0.05	0.02	66.38
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.03	0.49	0.03	0.03	0.01	0.00	172.62	0.00	0.00	173.79
Tons per const. Period - Grubbing/Land Clearing	0.00	0.01	0.00	0.00	0.00	0.00	3.80	0.00	0.00	3.82
Pounds per day - Grading/Excavation	0.10	1.54	0.10	0.09	0.04	0.01	540.97	0.01	0.01	544.64
Tons per const. Period - Grading/Excavation	0.01	0.19	0.01	0.01	0.00	0.00	65.46	0.00	0.00	65.90
Pounds per day - Drainage/Utilities/Sub-Grade	0.06	1.00	0.07	0.06	0.03	0.00	358.74	0.01	0.01	361.11
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.08	0.01	0.00	0.00	0.00	27.62	0.00	0.00	27.81
Pounds per day - Paving	0.05	0.80	0.05	0.05	0.02	0.00	287.00	0.00	0.01	288.89
Tons per const. Period - Paving	0.00	0.04	0.00	0.00	0.00	0.00	12.63	0.00	0.00	12.71
Total tons per construction project	0.02	0.31	0.02	0.02	0.01	0.00	109.51	0.00	0.00	110.24

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Round Trips/Vehicle/Day	Default Values Round Trips/Vehicle/Day	Calculated Trips/day	User Override of Miles/Round Trip	Default Values Miles/Round Trip	Calculated Daily VMT
User Input								
Grubbing/Land Clearing - Exhaust		0		5	0		8.00	0.00
Grading/Excavation - Exhaust		0		5	0		8.00	0.00
Drainage/Utilities/Subgrade		0		5	0		8.00	0.00
Paving		0		5	0		8.00	0.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.03	0.42	3.12	0.11	0.05	0.02	1,629.11	0.00	0.26	1,705.46
Grading/Excavation (grams/mile)	0.03	0.42	3.13	0.11	0.05	0.02	1,627.13	0.00	0.26	1,703.39
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.42	3.15	0.11	0.05	0.02	1,608.15	0.00	0.25	1,683.52
Paving (grams/mile)	0.03	0.42	3.15	0.11	0.05	0.02	1,608.15	0.00	0.25	1,683.52
Grubbing/Land Clearing (grams/trip)	0.00	0.00	4.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	4.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	4.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total tons per construction project	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: Fugitive dust default values can be overridden in cells D183 through D185.

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		1.00	20.00	0.44	4.16	0.09
Fugitive Dust - Grading/Excavation		1.00	20.00	2.42	4.16	0.50
Fugitive Dust - Drainage/Utilities/Subgrade		1.00	20.00	1.54	4.16	0.32

Off-Road Equipment Emissions

Grubbing/Land Clearing	Default Number of Vehicles	Mitigation Option Override of	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Bore/Drill Rigs	0.21	2.04	1.87	0.06	0.06	0.01	917.25	0.30	0.01	927.15
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1		Model Default Tier	Crawler Tractors	0.37	2.10	3.96	0.15	0.14	0.01	758.27	0.25	0.01	766.45
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00	2		Model Default Tier	Excavators	0.50	9.78	3.66	0.18	0.17	0.02	1,501.02	0.49	0.01	1,517.20
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Off-Highway Trucks	0.48	3.19	2.87	0.10	0.09	0.01	1,279.68	0.41	0.01	1,293.45
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Other General Industrial Equipn	0.14	1.91	1.29	0.06	0.06	0.00	248.02	0.08	0.00	250.70
			Model Default Tier	Other Material Handling Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	2		Model Default Tier	Signal Boards	0.11	0.60	0.72	0.03	0.03	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	1.81	19.61	14.36	0.59	0.54	0.05	4,802.86	1.53	0.04	4,854.07
Grubbing/Land Clearing	tons per phase	0.04	0.43	0.32	0.01	0.01	0.00	105.66	0.03	0.00	106.79

Grading/Excavation	Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*		Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00			Model Default Tier	Bore/Drill Rigs	0.42	4.07	3.73	0.12	0.11	0.02	1,834.50	0.59	0.02	1,854.30
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	0		Model Default Tier	Cranes	0.31	1.74	3.17	0.13	0.12	0.01	558.83	0.18	0.01	564.85
1.00	1		Model Default Tier	Crawler Tractors	0.37	2.10	3.96	0.15	0.14	0.01	758.27	0.25	0.01	766.45
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00	3		Model Default Tier	Excavators	0.67	13.04	4.89	0.24	0.22	0.02	2,001.35	0.65	0.02	2,022.93
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	2		Model Default Tier	Graders	0.62	3.19	6.91	0.22	0.20	0.01	1,280.48	0.41	0.01	1,294.28
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Model Default Tier	Off-Highway Trucks	1.43	9.56	8.60	0.31	0.28	0.04	3,839.03	1.24	0.03	3,880.36
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	2		Model Default Tier	Rollers	0.27	3.69	2.89	0.15	0.13	0.01	508.12	0.16	0.00	513.60
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1		Model Default Tier	Rubber Tired Loaders	0.23	1.47	1.86	0.06	0.06	0.01	605.62	0.20	0.01	612.16
2.00	2		Model Default Tier	Scrapers	1.34	10.76	12.74	0.50	0.46	0.03	2,936.30	0.95	0.03	2,967.95
2.00	2		Model Default Tier	Signal Boards	0.11	0.60	0.72	0.03	0.03	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.00	4		Model Default Tier	Tractors/Loaders/Backhoes	0.53	8.92	5.34	0.22	0.20	0.01	1,208.22	0.39	0.01	1,221.22
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment — If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grading/Excavation	pounds per day	6.32	59.14	54.80	2.13	1.97	0.16	15,629.36	5.03	0.14	15,797.21
Grading/Excavation	tons per phase	0.76	7.16	6.63	0.26	0.24	0.02	1,891.15	0.61	0.02	1,911.46

Drainage/Utilities/Subgrade	Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1		Model Default Tier	Air Compressors	0.23	2.41	1.53	0.07	0.07	0.00	375.26	0.02	0.00	376.62
1.00			Model Default Tier	Bore/Drill Rigs	0.21	2.04	1.87	0.06	0.06	0.01	917.25	0.30	0.01	927.15
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Cranes	0.31	1.74	3.17	0.13	0.12	0.01	558.83	0.18	0.01	564.85
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00			Model Default Tier	Excavators	0.17	3.26	1.22	0.06	0.06	0.01	500.34	0.16	0.00	505.73
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1		Model Default Tier	Generator Sets	0.27	3.66	2.40	0.10	0.10	0.01	623.04	0.02	0.00	625.01
1.00	1		Model Default Tier	Graders	0.31	1.59	3.46	0.11	0.10	0.01	640.24	0.21	0.01	647.14
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1		Model Default Tier	Plate Compactors	0.04	0.21	0.25	0.01	0.01	0.00	34.48	0.00	0.00	34.65
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1		Model Default Tier	Pumps	0.29	3.72	2.43	0.10	0.10	0.01	623.04	0.03	0.00	625.06
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1		Model Default Tier	Rough Terrain Forklifts	0.10	2.29	1.28	0.04	0.03	0.00	333.72	0.11	0.00	337.31
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1		Model Default Tier	Scrapers	0.67	5.38	6.37	0.25	0.23	0.02	1,468.15	0.47	0.01	1,483.97
2.00	2		Model Default Tier	Signal Boards	0.11	0.60	0.72	0.03	0.03	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00	3		Model Default Tier	Tractors/Loaders/Backhoes	0.40	6.69	4.01	0.16	0.15	0.01	906.17	0.29	0.01	915.91
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day	3.10	33.58	28.69	1.12	1.05	0.07	7,079.13	1.80	0.06	7,142.54
Drainage/Utilities/Sub-Grade	tons per phase	0.24	2.59	2.21	0.09	0.08	0.01	545.09	0.14	0.00	549.98

Paving	Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00			Model Default Tier	Off-Highway Trucks	1.43	9.56	8.60	0.31	0.28	0.04	3,839.03	1.24	0.03	3,880.36
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.00	1		Model Default Tier	Pavers	0.17	2.90	1.58	0.07	0.07	0.00	454.99	0.15	0.00	459.90
1.00	1		Model Default Tier	Paving Equipment	0.15	2.55	1.26	0.06	0.06	0.00	394.32	0.13	0.00	398.57
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00	2		Model Default Tier	Rollers	0.41	5.54	4.33	0.22	0.20	0.01	762.19	0.25	0.01	770.40
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.00	2		Model Default Tier	Signal Boards	0.11	0.60	0.72	0.03	0.03	0.00	98.63	0.01	0.00	99.13
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.00	3		Model Default Tier	Tractors/Loaders/Backhoes	0.40	6.69	4.01	0.16	0.15	0.01	906.17	0.29	0.01	915.91
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

			ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
	Paving	pounds per day	2.68	27.83	20.50	0.85	0.79	0.07	6,455.32	2.07	0.06	6,524.27
	Paving	tons per phase	0.12	1.22	0.90	0.04	0.03	0.00	284.03	0.09	0.00	287.07
Total Emissions all Phases (tons per construction period) =>			1.16	11.40	10.06	0.39	0.37	0.03	2,825.94	0.87	0.03	2,855.30

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET