Appendix A

NERTS Air Quality and Greenhouse Gas Assessment (revised)

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Northeast Recycling and Transfer Station Project

Air Quality and Greenhouse Gas Assessment

Revised Final

February 2025

King County Department of Natural Resources and Parks,
Solid Waste Division

Northeast Recycling and Transfer Station Project E00633E19

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Project Manager:	Melissa Wu/Jacobs Engineering Group Inc.
Author:	Stacia Dugan/Jacobs Engineering Group Inc.

Jacobs Engineering Group Inc.

1100 112th Avenue Northeast, Suite 500
Bellevue, Washington 98004
United States
T +1.425.453.5000
www.jacobs.com

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03	2/27/25	Final Air Quality and Greenhouse Gas Assessment	SD	EG	MW

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Acronyms and Abbreviations

°F	degree(s) Fahrenheit
µg/m^3	microgram(s) per cubic meter
BMP	best management practice
CFR	*Code of Federal Regulations*
CH_4	methane
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
County	King County, Washington
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gas
GWP	global warming potential
HAP	hazardous air pollutant
HHW	household hazardous waste
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NERTS	Northeast Recycling and Transfer Station
NO_x	nitrogen oxides
PM_{10}	particulate matter with particles equal to or smaller than 10 micrometers in aerodynamic diameter
$PM_{2.5}$	particulate matter with particles equal to or smaller than 2.5 micrometers in aerodynamic diameter
ppb	part(s) per billion
ppm	part(s) per million
ppmw	part(s) per million by weight
PSCAA	Puget Sound Clean Air Agency
RICE	reciprocating internal combustion engine
SEPA	Washington State Environmental Policy Act
SF_6	sulfur hexafluoride
SWD	Solid Waste Division
TBD	to be determined
VOC	volatile organic compound
WAC	Washington Administrative Code

EXECUTIVE SUMMARY

Purpose and Need

The King County Department of Natural Resources and Parks, Solid Waste Division (SWD), operates a system of eight transfer stations, two drop box facilities, one facility and one Wastemobile that accept moderate risk waste (MRW) from residents and small businesses, and one regional landfill in King County, Washington. The County 2019 Comprehensive Solid Waste Management Plan (2019 Solid Waste Comp Plan) (King County 2019), which was adopted by cities per the adoption process described in the interlocal agreements between King County and incorporated cities in King County (see Section 1.2.1 in the FEIS) and approved by Ecology, identified the need for a new transfer station to replace the aging Houghton Recycling and Transfer Station in the northeast Lake Washington area of King County. The nearly 60-year-old Houghton Recycling and Transfer Station is one of the busiest in terms of tonnage and transactions, yet it has outlived its useful life and lacks capacity for the type of recycling and collection services that are increasingly in demand. The new recycling and transfer station (RTS), which will be called the Northeast Recycling and Transfer Station (NERTS), is proposed to be located in the northeastern part of King County, an area illustrated in Figure 5-4 of the 2019 Solid Waste Comp Plan. This document analyzes the impacts of a new NERTS for the alternatives under consideration.

Alternatives

The County is considering two action alternatives (Alternatives 1 and 2) in addition to the No Action Alternative for the NERTS, as follows:

- No Action Alternative – A new recycling and transfer station would not be sited in northeastern King County. The existing Houghton Transfer Station at 11724 NE 60th Street in Kirkland would continue to be operated.
- Alternative 1: The existing Houghton RTS and adjacent area at 11724 NE 60th Street in Kirkland. Two options:
  - 1A – A facility constructed after the existing transfer station building is closed and deconstructed or demolished
  - 1B – A facility constructed while the existing transfer station building is open and operating, and then the existing transfer station building would be closed and repurposed, or deconstructed or demolished and replaced after the new station is open

Alternative 2: A site comprised of six tax parcels in the 15000 block of Woodinville-Redmond Road NE in Woodinville

Summary of Findings

The No Action Alternative would not affect the current or future emissions from the facility but would result in higher operational impacts than the proposed Alternatives 1 and 2. The air quality impacts from the construction and operation of the proposed actions would not have significant cumulative impacts on air quality. Potential air quality impacts would further be limited because the facility would employ best management practices to control air emissions.

Alternatives 1A, 1B, and 2 include the use of a compactor, whereas the No Action Alternative does not. The addition of a compactor has the potential to reduce the total number of transfer hauling trips and vehicle miles traveled by nearly one third (King County 2019a). The emission calculations assumed a 25 percent reduction in transfer hauling trips. The reduction in hauling trips would result in lower impacts on air quality over the long term than the No Action Alternative. In addition, improvements in site access associated with Alternatives 1A, 1B, and 2 would reduce queuing and vehicle idling time. Reductions in trip mileage and vehicle idling times results in less combustion of fossil fuels and lower emissions of

criteria pollutants, air toxics, and greenhouse gases. The action alternatives include enclosing the transfer building, which would reduce emissions of fugitive dust and odors.

Emissions from off-road construction equipment and on-road vehicles during construction and operation were estimated using emission factors from the U.S. Environmental Protection Agency's Motor Vehicle Emission Simulator Version 4 (MOVES4) program and are included in Appendix A.

The MOVES4 program indicates that construction emissions for all the Alternatives are within the same order of magnitude with each other. The GHG emissions range from 10,950 metric tons CO_2e for Alternative 1a to 13,093 tons CO_2e for Alternative 1b. The construction activities, equipment use, and vehicle trips used in the construction emission calculations are based on conservative assumptions and would be almost the same for the alternatives. The main differences between Alternatives 1A, 1B and 2 are the export and import amounts of soil and refuse. The estimated operating emissions from Alternatives 1 and 2 would be less than the No Action Alternative.

1. Introduction and Project Description

King County Department of Natural Resources and Parks, Solid Waste Division (SWD), is proposing to site, design, and build a modern transfer station in northeast King County (the County) to meet the region's growing demand for environmentally responsible waste management services. The new station would replace the existing aging Houghton RTS in Kirkland, which has been in service since the mid--1960s and does not have the capacity to offer the recycling and collection services customers increasingly need and want. This Air Quality and Greenhouse Gas Assessment, prepared in support of an environmental impact statement (EIS) prepared by the County as required by the Washington State Environmental Policy Act (SEPA), addresses criteria air pollutants, hazardous and toxic air pollutants, greenhouse gases (GHGs), and odor emission impacts associated with the No Action Alternative and the proposed action alternatives.

Air quality resources are affected by both natural conditions and human activities that may alter the levels of atmospheric emissions in an airshed. This assessment describes the existing air quality in the area of the proposed alternatives for the new Northeast Recycling and Transfer Station (NERTS) and evaluates potential impacts on air quality that may result from the No Action Alternative and from the construction and operation of two potential action alternatives for a new transfer station (Alternative 1 in Kirkland and Alternative 2 in Woodinville, Washington) (see Figure 1-1). This assessment has been assembled to aid in EIS decision-making, with detailed information regarding impacts of criteria pollutants, air toxics from mobile sources, odors, and GHG during project construction and operation. It also will aid the design and construction teams by identifying potential air quality and GHG impacts at the project sites and on adjacent properties.

The Puget Sound Clean Air Agency (PSCAA), Washington State Department of Ecology (Ecology), and U.S. Environmental Protection Agency (EPA) work together in regulating air quality in the Puget Sound lowlands airshed. Frequently, transfer stations are not required to get an Air Quality Permit to operate; however, they are required to follow regulations designed to protect air quality and prevent nuisance odors and dust.

1.1. Project Description

The new NERTS facility will include an enclosed solid waste transfer and processing area, enclosed solid waste compactor units, a recycling collection and sorting area, employee facility, scale house and weigh station, space for on-site customer queuing, a possible fueling station, and possible moderate risk waste disposal for products from homes and small qualifying businesses (Alternative 2 only).

The new facility would be designed and constructed to meet today's building and environmental standards and standards for service, operational efficiency, and customer and employee safety. The facility would provide improved recycling services to meet the County's environmental goals, and waste would be cost-effectively compacted for efficient transport. The facility would also have space for waste storage in the event of a major regional disaster and sufficient off- street queuing space for private and commercial vehicles.

1.2. Project Alternatives

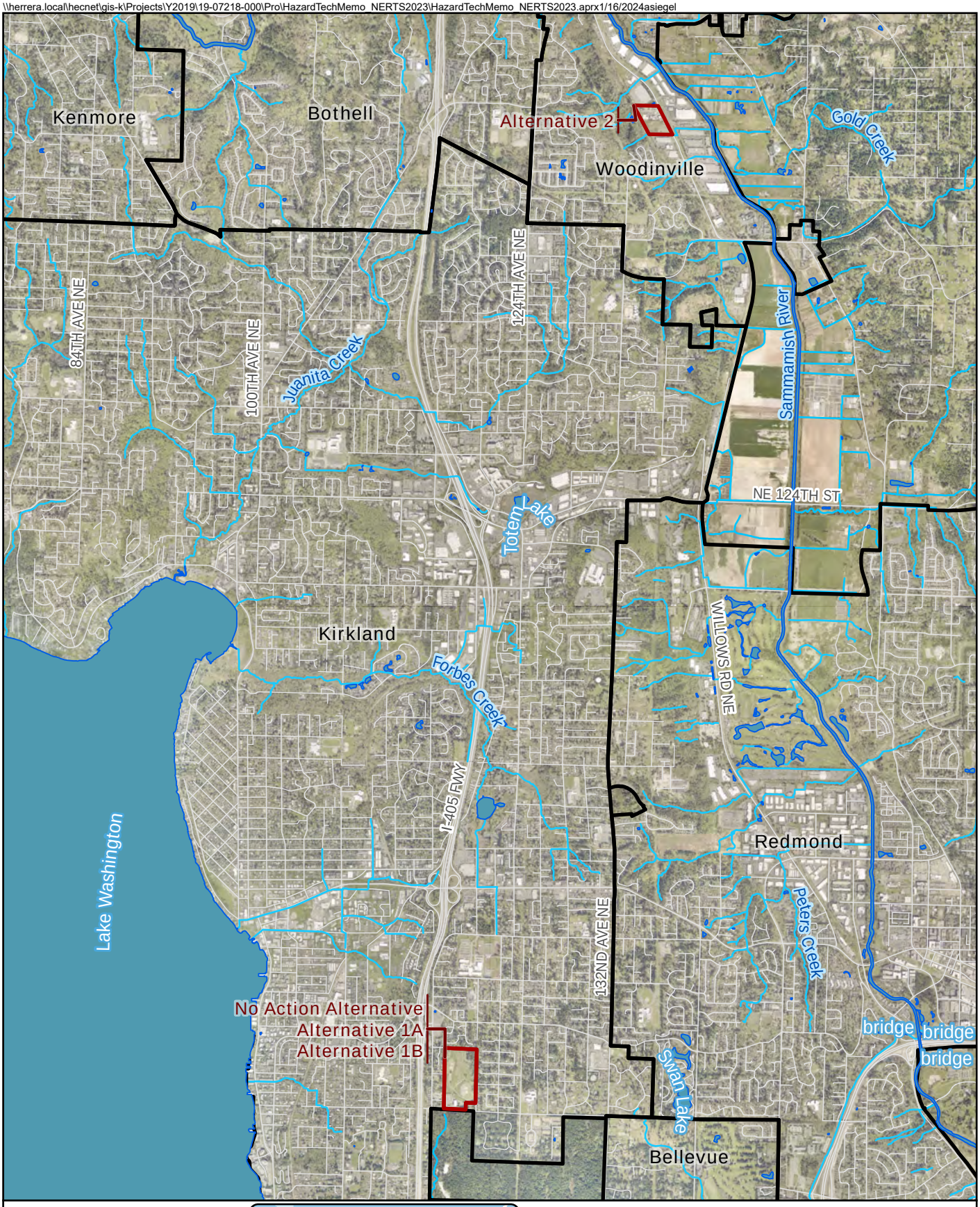
1.2.1. No Action Alternative

The existing Houghton Transfer Station is located at 11724 NE 60th Street in Kirkland on parcel 1759701890. The site is bordered to the east and west by single-family homes. Directly south of the site is NE 60th Street and directly south of NE 60th Street is Bridle Trails State Park. Under the No Action Alternative, no new NERTS facility would be developed at any location, and the existing Houghton RTS would continue to operate at its current location. If a new transfer station were not built, the existing transfer station would continue to offer limited recycling services for as long as it operates, and services would not be modernized or expanded to accommodate a growing population and solid waste industry changes. The facility would not be enclosed to control noise and odors. Waste would continue to not be

compacted, which affects the number of transfer trucks and trailers that use the Houghton RTS, and there would not be space for waste storage in the event of a major regional disaster. The existing site is 8.4 acres. Access to the site is from NE 60th Street.

The existing facility is not enclosed, so it does not control noise nor odors. In 2022, the Houghton Transfer Station received two odor complaints on SWD's customer service line.

The Houghton RTS was built to codes before King County established sustainability goals for building development. The existing station does not include green building and sustainable design features that are part of the two action alternatives.



Legend
- Road
- Streams
- Alternative Locations
- Waterbody
- City Limit

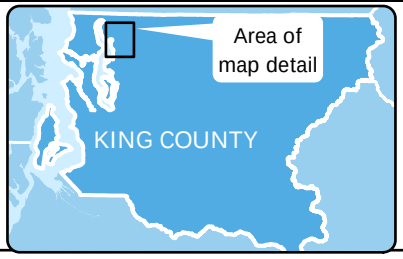


Figure 1-1. Vicinity Map of King County Solid Waste Division Northeast Recycling and Transfer Station Alternatives.

N
PLAN

SCALE: 1" = 4,000'-0"
0 2,000 4,000
Feet

King County

SCALE: 1"=120'-0"

0' 60' 120' 240' 480'

N
PLAN

LEGEND

SITE BOUNDARY

AREA BOUNDARY

Figure 1-2
No Action Alternative

King County Solid Waste Division
Northeast Recycling and Transfer Station

King County

1.2.1. Elements Common to the Action Alternatives

The new facility would be built to modern transfer station and green building standards. The addition of compactors to reduce the volume of garbage before it is hauled to the landfill or other disposal facility could reduce the total number of transfer hauling trips to and from the new station by nearly a third, reducing the cost of operations and traffic impacts (King County 2019). In addition, modern transfer stations are built as fully enclosed buildings, resulting in reduced external dust, noise, odor, and litter. New transfer stations offer sufficient queuing space for customers and storage space for waste, including expanded dedicated areas for recycling services. All action alternatives would include the following physical elements (except where noted):

- Scale house and scales
- Enclosed transfer building for waste handling, sorting, and processing, with separate areas for commercial and self-haul drop-off
- Waste compactors
- Recycling and material staging areas
- Administration and staff area, and possible public education/meeting area
- Station perimeter fence
- MRW collection building (Alternative 2 only)
- A fueling station (to be determined)
- A “To Be Determined” building to house additional private recycling or reuse operators or other service providers
- Roadways for customers and SWD vehicles
- Covered and uncovered parking for waste transfer trailers
- Staff and visitor parking
- Stormwater management
- Wastewater management
- Landscaping.

1.2.1.1. Building Features

The approximate footprint of the building area would be between 80,000 square feet and 125,000 square feet. This would provide space for solid waste, recycling, administration, MRW collection (Alternative 2 only), and disaster event waste storage. Buffers between the active area of the station and neighboring uses would be appropriately sized and designed to reduce or eliminate impacts.

The height of the new station would depend on site conditions, city zoning codes, and the duly adopted building code. The distance from the main tipping floor – where refuse is dumped by customers – down to the compactor(s) would be approximately 20 feet and may be partially below grade. The height from the main tipping floor to the highest point of the roof would be approximately 50 feet – which is the distance required for commercial garbage trucks to tip without hitting the overhead misting (or equivalent technology), fire sprinkler, ventilation, and other systems. The overall height of the new station would be approximately 70 feet above the lowest level (50 to 70 feet above ground level). Development of buildings, parking areas, and roadways at the new transfer station would result in up to seven to nine acres of impervious surfaces.

The new transfer station will target the highest green building standards possible at each site, under King County’s Green Building and Sustainable Development ordinance and King County Code Title 18 Environmental Sustainability Programs.

1.2.1.2. Elements of Operation

The following activities and services would be provided at the new station:

- Disposal and transfer of garbage from self-haul and commercial customers
- Acceptance of source-separated waste from self-haul customers
  - Co-mingled recyclables (curbside mix of paper, cardboard, tin, aluminum, plastic containers, glass bottles and jars)
  - Cardboard
  - Mixed yard and food waste
  - Clean wood
  - Plastic film
  - Expanded polystyrene (Styrofoam)
  - Scrap metal
  - Mercury lighting (fluorescent tubes and compact fluorescent bulbs)
  - Large appliances (refrigerant and non-refrigerant)
  - Small appliances (anything with a cord)
  - Additional recyclables, which may include bicycles and bicycle parts, CD/DVD/VCR players, rigid plastics, textiles, mattresses, carpet, gypsum wallboard, aggregates (bricks, pavers, porcelain sinks and toilets), asphalt shingles and other construction and demolition waste; and other materials targeted for diversion from disposal
- Potential removal of recyclables from mixed loads and/or construction and demolition waste loads
- Potential mixed waste sorting and processing
- Potential transfer of commercial yard waste and curbside recyclables
- Potential on-site organics sorting and processing
- Potential MRW service.

While providing recycling services remains an important element of the 2019 Solid Waste Comp Plan, specific policies and goals change over time. To this end, transfer stations, which are meant to last for approximately 50 years, must be designed to be flexible, with sufficient space to reconfigure operations as program requirements change over time.

The following measures are anticipated during operations for the health and safety of customers, employees, and neighbors:

- The transfer building will be fully enclosed except for the entry/exit points, reducing off-site dust, noise, odor, and litter.
- A mechanical exhaust ventilation system with filtration media will be incorporated into the transfer station building for odor and dust control within the building.
- A misting system or equivalent technology will be installed in the transfer building for odor and dust control within the building.
- The tipping floor will be cleared at the end of each day, with waste stored in the sealed compactor, if necessary.
- Fully loaded transfer trailers will be removed from the station in the order they are filled.
- Transfer trailers will be fully enclosed, and doors and door-seals will be maintained to reduce the potential for odor, spills and litter leaving the building.
- Efficient on-site traffic flows will minimize vehicle queuing, reducing emissions.
- The station will be cleaned weekly at a minimum.

1.2.1.3. Alternative 1

The site for Alternative 1 is located at 11724 NE 60th Street in Kirkland. Alternative 1 has two options:

- 1A – a facility constructed after the existing transfer station building is closed and deconstructed or demolished (Figure 1-3)
- 1B – a facility constructed while the existing transfer station building is open and operating, and then the existing transfer station building would be closed and repurposed, or deconstructed or demolished and replaced after the new station is open (Figure 1-4).

Alternative 1A includes removal of the existing transfer station building prior to construction of the new station and inclusion of a "TBD" (to-be-determined) facility to house future private recycling or reuse operations or service providers; Alternative 1A does not provide for a MRW collection facility. The proposed potential site development area for Alternative 1A is about 10 acres. Full recycling services would be provided with Alternative 1A. Taylor Fields (the closed Houghton landfill property) is currently used as baseball fields and for active and passive recreation, with a network of trails traversing the property. The entire parcel is owned by King County SWD. Improvements to Taylor Fields are also planned.

Alternative 1B retains the existing transfer station building during construction of the new station, and then closes and repurposes it, or deconstructs or demolishes and replaces it after the new station is open. While a future use has not been determined, the repurposed or replaced facility could house future private recycling or reuse operations or service providers. Alternative 1B does not provide for a MRW collection facility. The proposed potential site development area for Alternative 1B is about 12.75 acres. Full recycling services would be provided with Alternative 1B. Improvements to Taylor Fields are also planned.

The site is bordered to the east and west by single-family homes. Directly south of the site is NE 60th Street and directly south of NE 60th Street is Bridle Trails State Park. The area immediately north of the existing transfer station, where much of the development would take place, is also zoned P – Park/Open Space. Both Alternative 1A and Alternative 1B may include removal of some existing waste in the development footprint to accommodate construction of new facilities.

1.2.1.4. Alternative 2

The site for Alternative 2 is located on six tax parcels in the 15000 block of Woodinville-Redmond Road NE in Woodinville on parcels 1526059086, 5711600010, 5711600020, 5711600030, 1526059094, and 1526059095. The proposed site is 12.9 acres, with an area available for development of at least seven acres with additional area potentially available dependent on compliance with federal, state, and local environmental regulations. (Figure 1-5). The site is bordered to the north and south by commercial and light industrial uses. To the east is Woodinville-Redmond Road NE and further east are commercial and light industrial uses. To the west is a sloped greenspace, an abandoned Burlington Northern-Santa Fe Railroad (BNSF) rail line, and residential properties. Access to the Woodinville site is from Woodinville-Redmond Road Northeast. The site is currently used for commercial uses including construction, portable toilet rental, manufacturing, and automotive businesses, which would be relocated. A portion of the site is vacant and undeveloped and contains a wetland. Full recycling services would be provided with Alternative 2.

Alternative 2 offers service for collection of MRW, which would be stored in specialized containers on site. MRW includes hazardous waste generated by households and small businesses. Where the SWD currently provides MRW service, the following materials are accepted: pesticides, glues and adhesives, antifreeze, aerosols, automotive products, fuels, rechargeable batteries, button batteries, pool and spa chemicals, oil-based paints, hobby chemicals, mercury devices, thinners and solvents, fluorescent bulbs, toxic cleaning products, fuel cylinders (under five gallons), lithium batteries, and alkaline batteries. Individual loads are limited to 50 gallons and containers greater than five gallons are generally not accepted.

SCALE: 1"=120'-0"

0' 60' 120' 240' 480'

N PLAN

LEGEND

- ALTERNATIVE LOCATION
- POTENTIAL SITE DEVELOPMENT AREA
- FUTURE DEVELOPMENT AREAS
- EXAMPLE ENTRANCE / EXIT

Figure 1-3
Action Alternative 1A

King County Solid Waste Division
Northeast Recycling and Transfer Station

King County

SCALE: 1"=120'-0"

0' 60' 120' 240' 480'

N
PLAN

LEGEND

- ALTERNATIVE LOCATION
- POTENTIAL SITE DEVELOPMENT AREA
- FUTURE DEVELOPMENT AREAS
- EXISTING BUILDINGS TO REMAIN DURING CONSTRUCTION
- EXAMPLE ENTRANCE / EXIT

Figure 1-4
Action Alternative 1B

King County Solid Waste Division
Northeast Recycling and Transfer Station

King County

SCALE: 1"=120'-0"

0' 60' 120' 240' 480'

N

LEGEND

- ALTERNATIVE BOUNDARY
- POTENTIAL SITE DEVELOPMENT AREA
- FUTURE DEVELOPMENT AREAS
- 79.8' WETLAND BUFFER
- 10'-0" BUILDING SETBACK
- EXISTING WETLAND AREA
- EXAMPLE ENTRANCE / EXIT

Figure 1-5
Alternative 2

King County Solid Waste Division
Northeast Recycling and Transfer Station

King County

1.3. Construction Methods for the Action Alternatives

Design of the new NERTS facility has not been initiated at this time. However, it is anticipated that the action alternatives would require general earthwork and other activities to prepare the site for construction of facility buildings and associated functions. These activities may include, but not be limited to, soil excavation, soil filling, site grading, pile driving, utility trenching, waste excavation, modification or installation of environmental controls, installation of underground utilities, installation of drainage systems, material deliveries, building construction, and installation of equipment. Each of these activities would utilize appropriate construction equipment for the desired function. King County will require the design to minimize soil disturbance to the extent feasible.

2. Regulatory Context

2.1. Federal and State Laws, Plans, and Policies

2.1.1. Ambient Air Quality Standards

Under the Clean Air Act, EPA established National Ambient Air Quality Standards (NAAQS) to protect the public from air pollutants that have been proven harmful to public health and the environment. There are two types of NAAQS. Primary standards protect public health, including sensitive categories such as elderly, children, and asthmatics. Secondary standards protect animals, crops, vegetation, and buildings and are effective against degradation of visibility. Air pollutants regulated by the NAAQS are called "criteria" pollutants. Criteria air pollutants include nitrogen dioxide; carbon monoxide; sulfur dioxide; particulate matter with aerodynamic diameter equal to or smaller than 10 micrometers (PM_{10}) and particulate matter with aerodynamic diameter equal to or smaller than 2.5 micrometers ($PM_{2.5}$); lead; ozone and its precursors, including nitrogen oxides (NO_x); and volatile organic compounds (VOCs). The Clean Air Act also gives the authority to states to establish air quality rules and regulations aimed at meeting air quality standards. Table 2-1 summarizes the current NAAQS.

Table 2-1. National and Washington State Standards Ambient Air Quality Standards

Criteria Pollutant	Averaging Time	Primary Standard	Secondary Standard	Details
Ozone	8 hours	0.070 ppm	0.070 ppm	Annual fourth highest 8-hour concentration, averaged over 3 years
Carbon Monoxide	1 hour	35 ppm		Not to be exceeded more than once per year
	8 hours	9 ppm		Not to be exceeded more than once per year
Nitrogen Dioxide	1 hour	100 ppb		98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Annual arithmetic mean	0.053 ppm	0.053 ppm	Not to exceed this level in a calendar year
Sulfur Dioxide[a]	1 hour	0.75 ppm		99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	3 hours		0.5 ppm	Not to be exceeded more than once per year
PM_{10}	24 hours	150 µg/m^3	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
$PM_{2.5}$[b]	24 hours	35 µg/m^3	35 µg/m^3	98th percentile, averaged over 3 years
	Annual arithmetic mean	12 µg/m^3	15 µg/m^3	Annual mean, averaged over 3 years
Lead	Rolling 3-month average	0.15 µg/m^3	0.15 µg/m^3	Not to be exceeded

Source: EPA 40 CFR Part 50 (https://www.epa.gov/criteria-air-pollutants/naaqs-table) and WAC Chapter 173-476

[a] "Sunset" provisions apply to the annual and 24-hour sulfur dioxide standards under WAC 173-476-130(1)(a) and (b). The Proposed Action area has been in attainment for more than one year and therefore it is not subject to these standards.

[b] PSCAA has also established a health goal for $PM_{2.5}$ of 25 µg/m^3 on a daily average; this is the level PSCAA hopes eventually to achieve; however, it is not a standard as are the NAAQS.

µg/m^3 = microgram(s) per cubic meter

CFR = *Code of Federal Regulations*

ppb = part(s) per billion

ppm = part(s) per million

Current Washington State Ambient Air Quality Standards are established in the Washington Administrative Code (WAC) Title 173. Ecology adopted the NAAQS in accordance with WAC 173-476. PSCAA enforces these standards and has also established a more stringent daily average goal for particulate matter less than or equal to 2.5 micrometers in diameter ($PM_{2.5}$).

2.1.2. Greenhouse Gases

Gases that trap heat in the atmosphere are referred to as GHGs because, like a greenhouse, they capture heat radiated from the earth. The accumulation of GHGs is a driving force in global climate change. Definitions of climate change vary among regulatory authorities and the scientific community. In general, climate change can be described as significant changes in global temperature, precipitation, wind patterns, and other measures of climate that occur over several decades or longer that can be caused by natural fluctuations and human activities that alter the composition of the global atmosphere. The average annual air temperature in the Puget Sound Region has increased 1.3 degrees Fahrenheit (°F) from 1895 to 2014 and is projected to be 5.5°F warmer by the 2050s (King County 2023).

On December 7, 2009, EPA determined that the presence of GHGs in the atmosphere endangers public health and public welfare and included them as contributors to air pollution. There are seven GHGs:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons
- Perfluorocarbons
- Sulfur hexafluoride (SF_6)
- Nitrogen trifluoride

The primary human activities that release GHGs include combustion of fossil fuels for transportation, heating, and electricity; agricultural practices that release CH_4, such as livestock production and decomposition of crop residue; and industrial processes that release smaller amounts of gases with high global warming potential (GWP) such as SF_6. Deforestation and land cover conversion also contribute to global warming by reducing the earth's capacity to remove CO_2 from the air and altering the earth's albedo (surface reflectance), thus allowing more solar radiation to be absorbed.

The principal GHGs of concern considered in this analysis are generated by the combustion of fuel in mobile sources and include CO_2, CH_4 and N_2O. Each of the principal GHGs has a long atmospheric lifetime, existing in the atmosphere for one year to several thousand years. In addition, the potential heat-trapping capacity of each of these gases varies significantly, and therefore GHGs are ranked by their GWP. The GWP is based on the capacity of a GHG to absorb solar radiation, as well as its residence time in the atmosphere, compared with CO_2. EPA's Mandatory GHG Reporting Rule, 40 CFR 98 Subpart A, Table A-1 provides the 100-year GWPs for selected compounds. Based on the table, CO_2 has a GWP of 1, CH_4 has a GWP of 25, and N_2O has a GWP of 298. Emissions of GHGs are typically estimated as carbon dioxide equivalents (CO_2e). Estimates of individual GHGs are converted to CO_2e by multiplying each pollutant by its GWP relative to CO_2. While CH_4, N_2O, and SF_6 have much higher GWPs than CO_2, CO_2 is emitted in such vastly higher quantities that it accounts for the majority of GHG emissions in CO_2e, both from residential developments and general human activity.

In March 2008, the Washington legislature enacted House Bill 2815, which directed Ecology to develop rules for the mandatory reporting of GHG emissions by sources that emit more than certain specified threshold amounts. These rules are codified in WAC Chapter 173-441, which requires that any source that emits 10,000 metric tons of CO_2e per calendar year report its GHG emissions to Ecology. The document titled *Guidance for Ecology Including Greenhouse Gas Emissions in SEPA Reviews* indicates that for projects emitting at least 10,000 metric tons of CO_2e per year, but less than 25,000 metric tons per year, a qualitative disclosure of GHG emissions is required under SEPA (Ecology 2011). For projects emitting more than 25,000 metric tons per year, a quantitative disclosure of GHGs is required.

While GHG concentrations are global and not localized, all of the project alternatives would directly result in GHG emissions due to emissions from mobile sources.

2.1.2.1. King County Programs

King County implemented a Strategic Climate Action Plan (SCAP) in 2015. The SCAP is a five-year blueprint for the County's climate action, integrating climate change into all areas of County operations and work with King County cities, partners, communities, and residents. The SCAP is updated every five years to reflect the County's continuous learning approach to climate action and was most recently updated in 2020. The County's goal is to reduce countywide sources of GHG emissions, compared with a 2007 baseline by 25 percent by 2020, 50 percent by 2030, and 80 percent by 2050. King County's goal for government operations is to reduce emissions associated with its facilities by at least 25 percent by 2020, 50 percent by 2025, and 80 percent by 2030 compared with 2007 levels. The Implementation Plan for a Carbon Neutral King County Government included parts of the 2016 Comprehensive Plan, which states that King County's Wastewater Treatment Division and SWD shall each independently achieve carbon-neutral operations by 2025 (King County 2019b).

In addition, the SCAP includes goals to build, maintain, and operate County facilities consistent with the highest green building and sustainable development practices; minimize operational resource use; maximize reuse and recycling; and choose products and services with low environmental and carbon impacts.

2.1.3. Emergency Generators

It has not been determined whether the facility will be equipped with an emergency engine for backup power. If an emergency generator is selected in the future, PSCAA Regulation 1, Section 6.03 (c)(3)(C) states that notifications and permits are not required for standby internal combustion engines operating fewer than 500 hours per year provided that they are not operated at a facility with a power supply contract that offers a lower rate in exchange for the power supplier's ability to curtail energy consumption with prior notice.

The facility is expected to abide by all applicable federal regulations. Owners of reciprocating internal combustion engines that commenced construction after July 11, 2005 must comply with the New Source Performance Standards under 40 CFR Part 60, Subpart IIII. New and existing stationary internal combustion engines are also subject to the National Emission Standard for Hazardous Air Pollutants under 40 Code of Federal Regulations Part 63, Subpart ZZZZ; however, new stationary engines that comply with 40 CFR 60 Subpart IIII already meet Subpart ZZZZ, therefore only Subpart IIII will be discussed below.

Subpart IIII requires that reciprocating internal combustion engines (RICE) be certified to comply with a certain emission standard: Tier 1, Tier 2, Tier 3, or Tier 4. Higher tiers correspond to stricter standards, and the required standard depends on model year, engine size/rating, and application. Engines classified as emergency engines must also comply with the following operational and record-keeping requirements:

- There is no limit on use in emergency situations. Engines may only operate up to 100 hours per year for non-emergency use. Fifty of these 100 hours must be used for testing and maintenance, emergency demand response, or in situations where voltage or frequency deviates by more than five percent. The remaining 50 hours may be used for these or other non-emergency purposes, with some restrictions. (40 CFR § 60.4211(f)).
- The operator must keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter (40 CFR § 60.4209(a)).
- If the engine does not meet the emission standard for non-emergency engines for the same model year, the owner must record the time of operation of the engine and the reason the engine was in operation during that time (40 CFR § 60.4214(b)).
- The engines must be maintained in accordance with manufacturer's instructions (40 CFR §60.4211(a)(1)).

- The operator must use diesel fuel that meets the requirements of 40 CFR 80.510(b). This means low-sulfur diesel fuel (500 parts per million by weight [ppmw] sulfur or less) or ultra-low sulfur diesel (ULSD) fuel (15 ppmw sulfur or less), where available. ULSD is generally available in Washington State.
- New emergency engines must be fitted with a permanent label stating that they are for emergency use only, meeting the requirements in 40 CFR § 1039.135 (40 CFR § 60.4210(f)).

2.1.4. Mobile Source Air Toxics

The Clean Air Act identifies 188 air toxics, also known as hazardous air pollutants (HAPs). EPA assessed and identified a subset of 21 HAPs emitted by mobile sources, which are set forth in an EPA final rule, *Control of Emissions of Hazardous Air Pollutants from Mobile Sources* (40 Federal Register 59, 80, 85, and 86). Washington State regulates more than 430 toxic air pollutants from commercial and industrial sources, including the 21 HAPs emitted by mobile sources.

On-road mobile sources include automobiles and light-duty and heavy-duty trucks used for employee commutes and material transport. Non-road sources include various types of construction equipment. On-road and non-road mobile sources emit air toxics that are included in EPA's list of HAPs and Washington State toxic air pollutants that can cause cancer and other health risks. Vehicle emissions from construction activities may affect local air toxic concentrations but should not be large enough to affect regional air quality. These local impacts should be of short-term duration. Nationwide mobile source air toxics emissions are expected to be lower than present levels in future years as a result of EPA's national emissions control programs and fuel economy standards. Long-term operation of the action alternatives should result in a reduction of air toxic emissions.

2.2. PSCAA Requirements

The following regulations are general emission standards that apply to all facilities in PSCAA jurisdiction and will be applicable to the transfer station. PSCAA Regulation I, Sections 9.03, 9.07, 9.09, 9.11, 9.13, 9.15, and 9.20 address fugitive dust, visible emissions, odor, and concealment, as follows:

- PSCAA Regulation I, Section 9.03 Emission of Air Contaminant: Visual Standard and WAC 173-400-040(1) – It shall be unlawful for any person to cause or allow the emission of any air contaminant for a period or periods aggregating more than 3 minutes in any 1 hour, which is greater than 20 percent opacity.
- PSCAA Regulation I, Section 9.07 Sulfur Dioxide Emission Standard and WAC 173-400-040 (6) – It shall be unlawful for any person to cause or allow the emission of sulfur dioxide from any source in excess of 1,000 ppm by volume on a dry basis, 1- hour average (corrected to 7 percent oxygen for fuel-burning equipment and refuse-burning equipment).
- PSCAA Regulation I, Section 9.09 Particulate Matter Emission Standards – It shall be unlawful for any person to cause or allow the emission of particulate matter in excess of 0.05 grain per dry standard cubic foot corrected to 7 percent oxygen from fuel-burning equipment using a fuel other than wood.
- PSCAA Regulation I, Sections 9.11 Emission of Air Contaminant: Detriment to Person or Property and WAC 173-400-040 (5) and (6) – It shall be unlawful for any person to cause or allow the emission of any air contaminant in sufficient quantities and of such characteristics and duration as is, or is likely to be, injurious to human health, plant or animal life, or property, or which unreasonably interferes with enjoyment of life and property. Air contaminants include odor emissions.
- PSCAA Regulation I, Sections 9.13 Emission of Air Contaminant: Concealment and Masking Restricted –

  (a) It shall be unlawful for any person to cause or allow the installation or use of any device or use of any means which, without resulting in a reduction in the total amount of air contaminant emitted, conceals an emission of air contaminant which would otherwise violate this article.

(b) It shall be unlawful for any person to cause or allow the installation or use of any device or use of any means designed to mask the emission of an air contaminant which causes detriment to health, safety or welfare of any person.

- PSCAA Regulation I, Sections 9.15 Fugitive Dust Control Measures (a) It shall be unlawful for any person to cause or allow visible emissions of fugitive dust unless reasonable precautions are employed to minimize the emissions. Reasonable precautions include, but are not limited to, the following:
    1. The use of control equipment, enclosures, and wet (or chemical) suppression techniques, as practical, and curtailment during high winds;
    2. Surfacing roadways and parking areas with asphalt, concrete, or gravel;
    3. Treating temporary, low-traffic areas (e.g., construction sites) with water or chemical stabilizers, reducing vehicle speeds, constructing pavement or rip rap exit aprons, and cleaning vehicle undercarriages before they exit to prevent the track-out of mud or dirt onto paved public roadways; or
    4. Covering or wetting truck loads or allowing adequate freeboard to prevent the escape of dust-bearing materials.
- PSCAA Regulation I, Section 9.20 Maintenance of Equipment – Requires a facility to maintain equipment in good working order.

3. Methodology

In accordance with federal Clean Air Act requirements, the air quality in a given region or area is measured by the concentrations of criteria pollutants in ambient air, defined as that portion of the atmosphere to which the public has access. The air quality in a region is a result not only of the types and quantities of atmospheric pollutants in an area, but also surface topography, the size of the topological "air basin," and the prevailing meteorological conditions.

Air quality is affected by pollutants that are generated by both natural and human-made sources. In general, the largest human-made contributors to air emissions are fossil fuel combustion sources such as transportation and industrial operations. The largest contributors of pollution related to transportation are motor vehicles. Pollutants of concern for transportation typically include the criteria pollutants, air toxics, and GHGs.

The study area for impacts on air quality is the area immediately surrounding the existing Houghton Transfer Station in Kirkland, Washington, and a site composed of six properties in the 15000 block of Woodinville-Redmond Road NE in Woodinville, Washington.

4. Affected Environment

4.1. Regional Topography and Climate

The proposed alternatives are all located in King County within the Puget Sound Lowlands region. The region has a mild oceanic climate that is the product of the interaction between the distance from Puget Sound, the complex terrain, and airflow patterns. Airflow in the region comes from over the ocean from the northwest through the Strait of Juan de Fuca or the southwest through the Chehalis River valley. Occasionally, cold air moves into the area from the interior of Canada's Fraser River canyon.

The prevailing wind direction is south or southwest during the wet season and northwest in summer. The average wind velocity is less than 10 miles per hour. There is sufficient wind most of the year to disperse air pollutants released into the atmosphere. Air pollution is usually most noticeable in the late fall and winter season, under conditions of clear skies, light winds, and a sharp temperature inversion. These conditions generally only prevail a few days before a weather system moves through, removing the pollution by wind and rain (WRCC 2023).

With an increase in distance from the Sound, winter temperatures decrease, and summer temperatures increase. The No Action Alternative and Alternative 1 are located in Kirkland, Washington. Alternative 2 is located in Woodinville, Washington, which is on the north border of Kirkland. Average temperatures and rainfall are based on data collected from the Seattle-Tacoma International Airport. Based on data from 1945 to 2022, the average temperatures generally range from 37°F to 79°F, with a record minimum temperature of 0°F recorded on January 31, 1950 and a maximum temperature of 108°F on June 28, 2021 (NOAA 2023). Based on data from 1991 to 2020, total precipitation varies from 0.6 inch in July to 6.31 inches in November. The average annual precipitation is 39.34 inches (NOAA 2023.).

4.2. Attainment, Nonattainment, and Maintenance Areas

EPA designates areas for regulated air pollutants discussed in Section 2.1.1, as follows:

- Attainment status indicates that air quality in an area meets the federal, health-based ambient air quality standards.
- Nonattainment status indicates that air quality in an area has violated those standards. When nonattainment areas come back into compliance with federal standards, they are classified as maintenance areas.
- Areas in which EPA is not able to determine an attainment status are designated unclassifiable.

EPA, Ecology, and PSCAA maintain a network of air quality monitoring stations throughout Washington, to measure existing air quality and determine whether areas are designated as "attainment" or "nonattainment" for each NAAQS. The nearest monitoring station to the project area is a monitoring station for $PM_{2.5}$ located on the northern boundary of Bridle Trails State Park.

All areas of Washington, except a small area in Whatcom County, currently meet air quality standards and are considered to be in attainment. However, in the summers of 2017, 2018, and 2020, wildfire smoke caused unprecedented levels of fine particle pollution, and it is anticipated that the area will continue to see air quality impacts from wildfire smoke in the future (PSCAA 2021).

4.3. Sensitive Receptors

The Houghton Transfer Station property is surrounded to the north and northeast by athletic fields and to the south by Bridle Trails State Park. Single family homes are to the west and the east. The Alternative 2 site in Woodinville is bordered to the north, south, and east by commercial and light industrial uses. To the west is a sloped greenspace, a rail line, and residential properties.

Air quality does not affect each person in the same way, and some groups are more sensitive to adverse health effects than others. Sensitive receptors are people who may have a significantly increased sensitivity or exposure to contaminants by virtue of their age and health. People using parks and

playgrounds can be more exposed to air pollutants when there is poor air quality because people engaged in strenuous work or exercise have increased breathing rates. However, exposure times are generally far shorter for parks and playground users than for people in residential locations. People tend to be more exposed to air quality in residential locations than in commercial and industrial areas because people generally spend longer periods of time at their residences.

An individual's response to odors is subjective, with some people being more sensitive to certain odors than others. The body's response to odors takes a direct route to the limbic system, which is the region of the brain related to emotion and memory, so a person's response can be based on past experiences.

5. Impacts and Potential Mitigation Measures

5.1. Overview

The impacts on air quality from the No Action Alternative and Alternatives 1 and 2 are presented in this section. Impacts were categorized into impacts during construction and operation. Air emissions include emissions of criteria pollutants and air toxics from the combustion of fuels, fugitive dust, GHGs, and odors.

5.2. No Action Alternative

The purpose of transfer stations is to make solid waste collection more efficient and reduce overall transportation costs, air emissions, energy use, truck traffic, and road wear and tear. Under the No Action Alternative, the County would continue to operate the existing Houghton Transfer Station as is. A shutdown of the existing transfer station would result in an increase in travel distances for both customers and commercial haulers, and an increase in transportation costs, air emissions, energy use, truck traffic, and road wear and tear.

Access to the site is from NE 60th Street. The site is bordered to the north, east, and west by single family homes and to the south by Bridle Trails State Park. The area to the north of the existing transfer station is zoned P, Park/Open Space. The *King County Solid Waste Comprehensive Plan* anticipates that the total solid waste tonnage disposed of and recycled will increase by more than one million between 2025 and 2040; at the same time, the Houghton/Northeast service area population is expected to grow during the same period by almost 35,000 (King County 2019a).

There would be no construction impacts associated with the No Action Alternative. Therefore, no change in current or future impacts on air quality would occur. Operation of the facility would continue as is and would not be modernized or expanded to accommodate a growing population and industry changes. Therefore, the No Action Alternative would not affect the current or future emissions from the facility but would result in higher operational impacts than the action alternatives.

The current facility is not enclosed. Enclosing a transfer station reduces fugitive dust emissions and odors, so the emissions from the No Action Alternative would be higher than emissions under the action alternatives.

Waste would not be compacted; lack of compaction increases the number of transit trucks and trailers needed to transfer the waste compared with the action alternatives. Current estimates are that the average daily hauling volumes needed to serve the existing Houghton RTS without the use of a compactor would increase from 25 transfer trailers on weekdays and up to seven transfer trailers on weekends (50 weekday trips and 13 weekend trips) under existing conditions to 33 transfer trailers on weekdays and up to 9 transfer trailers on weekends (66 weekday trips and 18 weekend trips) under the No Action Alternative in 2040 (KCSWD 2023). The higher number of trips results in higher emissions of criteria pollutants and GHGs from mobile sources.

Access to the site is from NE 60th Street. Under the No Action Alternative, there is insufficient queuing space that would continue to affect the flow of traffic and endanger drivers and road users. The queuing would also result in an increase in emissions of criteria pollutants and GHGs as compared with the action alternatives because of cars and trucks idling while waiting to enter the facility. These impacts are discussed further in Sections 5.3, 5.4, and 5.5.

5.3. Impacts Common to All Action Alternatives

The air quality impacts from construction and operation under the proposed actions would not have significant cumulative impacts on air quality. Potential air quality impacts would further be limited because the facility would employ best management practices (BMPs) to control air emissions. Construction activities are expected to result in short-term impacts on air quality; however, the impacts are expected to be minimal compared with the reductions in air quality impacts expected from the long-term operation of

the new transfer station. Potential impacts on air quality during construction and operation are discussed in the remainder of this section.

5.3.1. Impacts from Construction

Construction would generate air emissions of criteria pollutants, air toxics, GHGs, odors and fugitive dust, temporarily resulting in air quality degradation on a short-term basis in and around the project construction area. For all action alternatives, the construction period is expected to last approximately 30 months, with the new facility anticipated to open for business in 2029 during the last phases of construction. The new transfer facility would be designed for an approximate 50-year lifespan. The approximate footprint of the building area would be between 80,000 and 125,000 square feet. Buildings, parking areas, and roadways at the new transfer station would result in up to 4 to 8.5 acres (370,260 square feet) of impervious surfaces. This would provide space for solid waste, recycling administration, and disaster event refuse storage. Buffers between the active area of the station and neighboring uses would be appropriately sized and designed to reduce or eliminate impacts. All sites would be built to a selected level of Living Building Challenge (LBC) green building standards. The number of employees based at the station on any given day would range from six to 15, with transfer truck drivers, maintenance, and other staff on site as needed.

Construction and demolition activities of the proposed project would have the potential to result in short-term construction equipment-related exhaust emissions and fugitive dust in the project vicinity. Emissions during construction of the project would include engine exhaust from construction workers' vehicles, haul trucks, and off-road construction equipment; fugitive dust from earth-moving activities; re-entrained dust from vehicle travel on paved and unpaved roads; and off-gas emissions from paving of the roadways.

Construction is anticipated to last approximately 2.5 years, from 2027 to 2029. Emissions from off-road construction equipment and on-road vehicles during construction were estimated using emission factors from the EPA MOVES4 program. The analysis estimated GHG emissions and criteria air pollutant emissions, including carbon monoxide, NO_x, PM_{10}, $PM_{2.5}$, sulfur dioxide, and VOC emissions associated with construction. Summaries of the emission estimates are included in Sections 5.3.1.1 and 5.3.1.2. Details regarding the calculation methodology are discussed in *Northeast Recycling and Transfer Station Project Air Quality and Greenhouse Gas Emission Calculations*, which is included in Appendix A.

The County would implement BMPs and emission-control measures specified by Ecology and PSCAA guidelines and regulations to ensure that concentrations of air pollutants are minimized during the construction phase. Implementation of BMPs, such as using energy-efficient construction equipment and limiting the equipment and vehicle idling time during construction, would reduce criteria pollutants, air toxics, and GHG emissions from construction activities. Fugitive dust would be reduced by spraying exposed soil with water or other dust suppressant and covering dirt, gravel, and debris piles as needed. Additional information on the mitigation measures that will be used to reduce construction impacts are provided in Section 5.3.4 of this document.

5.3.1.1. Direct Impacts

Criteria and Toxic Air Pollutants

Exhaust emissions during construction would be generated by the combustion of fuel used in construction equipment and from motor vehicles used to transport people and goods to and from the project site during construction. Construction vehicle activity and disruption of normal traffic flow may also result in increased motor vehicle emissions within certain areas around the site. Potential air quality impacts would be of short-term duration (less than 30 months), occurring only while construction work is in progress. With the BMPs in place and compliance with the PSCAA requirements listed in Section 2.2, the NAAQS would not be violated.

Estimated construction emissions using the MOVES4 program for each action alternative are shown in Tables 5-1 through 5-3. Under the No Action Alternative, no new facility would be constructed; therefore, there would be no emissions resulting from construction, and no air quality impacts would occur.

Table 5-1. Construction Emissions from Alternative 1A

	VOC ton/year	NO_x ton/year	CO ton/year	SO_x ton/year	PM_{10} ton/year	$PM_{2.5}$ ton/year
Construction Emissions 2027	**0.40**	**16.24**	**3.34**	**0.02**	**22.04**	**3.34**
Non-road Construction Equipment	0.28	13.76	0.78	0.02	0.20	0.20
On-road Vehicles	0.11	2.48	2.57	0.00	0.17	0.09
Fugitive Dust	N/A	N/A	N/A	N/A	21.67	3.04
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A
Construction Emissions 2028	**0.27**	**8.00**	**3.93**	**0.01**	**30.90**	**3.70**
Non-road Construction Equipment	0.10	4.28	0.31	0.01	0.07	0.07
On-road Vehicles	0.17	3.72	3.62	0.00	0.24	0.13
Fugitive Dust	N/A	N/A	N/A	N/A	30.59	3.50
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A
Construction Emissions 2029	**0.11**	**3.93**	**1.30**	**0.005**	**6.56**	**0.84**
Non-road Construction Equipment	0.06	2.81	0.15	0.00	0.04	0.04
On-road Vehicles	0.05	1.13	1.16	0.00	0.08	0.04
Fugitive Dust	N/A	N/A	N/A	N/A	6.43	0.76
Asphalt Offgas	0.01	N/A	N/A	N/A	N/A	N/A
Total for Alternative	0.78	28.17	8.58	0.03	59.50	7.88

Table 5-2. Construction Emissions from Alternative 1B

	VOC ton/year	NO_x ton/year	CO ton/year	SO_x ton/year	PM_{10} ton/year	$PM_{2.5}$ ton/year
Construction Emissions 2027	**0.45**	**17.38**	**3.77**	**0.02**	**26.08**	**3.79**
Non-road Construction Equipment	0.28	13.76	0.78	0.02	0.20	0.20
On-road Vehicles	0.16	3.62	3.00	0.004	0.24	0.14
Fugitive Dust	N/A	N/A	N/A	N/A	25.64	3.46
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A
Construction Emissions 2028	**0.38**	**12.90**	**4.35**	**0.02**	**32.95**	**3.98**
Non-road Construction Equipment	0.19	8.68	0.53	0.01	0.14	0.13
On-road Vehicles	0.19	4.22	3.82	0.005	0.27	0.14
Fugitive Dust	N/A	N/A	N/A	N/A	32.55	3.70
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A
Construction Emissions 2029	**0.12**	**3.93**	**1.30**	**0.005**	**6.56**	**0.84**
Non-road Construction Equipment	0.06	2.81	0.15	0.003	0.04	0.04
On-road Vehicles	0.05	1.13	1.16	0.002	0.08	0.04
Fugitive Dust	N/A	N/A	N/A	N/A	6.43	0.76
Asphalt Offgas	0.01	N/A	N/A	N/A	N/A	N/A
Total for Alternative	**0.94**	**34.21**	**9.43**	**0.04**	**65.58**	**8.61**

Table 5-3. Construction Emissions from Alternative 2

	VOC ton/year	NO_x ton/year	CO ton/year	SO_x ton/year	PM_{10} ton/year	$PM_{2.5}$ ton/year
Construction Emissions 2027	**0.35**	**15.01**	**2.88**	**0.02**	**17.80**	**2.86**
Non-road Construction Equipment	0.28	13.76	0.78	0.02	0.20	0.20
On-road Vehicles	0.06	1.26	2.11	0.002	0.09	0.05
Fugitive Dust	N/A	N/A	N/A	N/A	17.50	2.62
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A
Construction Emissions 2028	**0.34**	**11.86**	**3.93**	**0.02**	**28.83**	**3.52**
Non-road Construction Equipment	0.19	8.68	0.53	0.01	0.14	0.13
On-road Vehicles	0.15	3.18	3.40	0.004	0.21	0.11
Fugitive Dust	N/A	N/A	N/A	N/A	28.49	3.28
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A
Construction Emissions 2029	**0.12**	**3.93**	**1.30**	**0.005**	**6.56**	**0.84**
Non-road Construction Equipment	0.06	2.81	0.15	0.003	0.04	0.04
On-road Vehicles	0.05	1.13	1.16	0.002	0.08	0.04
Fugitive Dust	N/A	N/A	N/A	N/A	6.43	0.76
Asphalt Offgas	0.01	N/A	N/A	N/A	N/A	N/A
Total for Alternative	**0.80**	**30.81**	**8.12**	**0.04**	**53.19**	**7.23**

GHGs

Project construction would have the potential to emit GHGs from the combustion of fossil fuels in construction equipment and vehicles. The disruption and removal of trees, vegetation, and soil during construction would generate emissions through the loss of carbon storage. Vegetation can act as a carbon sink by absorbing CO_2 from the atmosphere, releasing oxygen through photosynthesis, and retaining the carbon within the vegetation. Indirect emissions would result from the embodied emissions generated from the extraction, manufacture, and transportation of the building materials used in construction.

GHG emissions from construction activities were estimated for Alternative 1 and Alternative 2 using the MOVES4 program. These estimates are shown in Table 5-4.

Table 5-4. GHG Emissions from Construction

	Alternative 1A CO_2e metric ton/year	Alternative 1B CO_2e metric ton/year	Alternative CO_2e metric ton/year
Construction Emissions 2027	**6199**	**6453**	**5925**
Non-road Construction Equipment	5510	5510	5510
On-road Vehicles	689	942	415
Fugitive Dust	N/A	N/A	N/A
Asphalt Offgas	N/A	N/A	N/A
Construction Emissions 2028	**3203**	**5092**	**4836**
Non-road Construction Equipment	2100	3866	3866
On-road Vehicles	1103	1227	970
Fugitive Dust	N/A	N/A	N/A
Asphalt Offgas	N/A	N/A	N/A
Construction Emissions 2029	**1548**	**1548**	**1548**
Non-road Construction Equipment	1161	1161	1161

	Alternative 1A CO_2e metric ton/year	Alternative 1B CO_2e metric ton/year	Alternative CO_2e metric ton/year
On-road Vehicles	386	386	386
Fugitive Dust	N/A	N/A	N/A
Asphalt Offgas	N/A	N/A	N/A
Total for Alternative	**10950**	**13093**	**12308**

As discussed in Section 2.1.2, Ecology has developed rules for the mandatory reporting of GHG emissions by sources that emit more than 10,000 metric tons of CO2e per calendar year. Guidance for Ecology Including Greenhouse Gas Emissions in SEPA Reviews indicates that for projects emitting at least 10,000 metric tons of CO2e per year, but less than 25,000 metric tons per year, a qualitative disclosure of GHG emissions is required under SEPA (Ecology 2011). For projects emitting more than 25,000 metric tons per year, a quantitative disclosure of GHGs is required. Construction emissions are the highest in 2027 and the lowest in 2029. All emissions are less than 10,000 metric tons of CO2e per calendar year.

The GHG emissions from the construction phase of the project and during the operation of the facility over the subsequent 50 years will be offset by the emission reduction created during operation by the use of compactors, which have the potential to reduce the total number of transfer hauling trips and vehicle miles traveled to and from the new station by nearly a third (King County 2019).

Fugitive Dust

Construction would result in fugitive emissions of particulates from soil disturbances caused by the operation of motor vehicles and construction equipment on unpaved areas of the site. Operations include excavation and grading of the site and the movement of haul vehicles and container-handling equipment and other vehicles. The emissions that these activities would generate would be minimized using BMPs and would be in compliance with PSCAA's nuisance regulations discussed in Section 2.2. These emissions have been quantified using MOVES4 and are shown in Tables 5-1 through 5-3.

5.3.1.2. Indirect Impacts

GHG emissions from the use of electricity and from embodied emissions associated with the materials used to construct the new transfer station are considered to be indirect GHG emissions.

The County has developed a GHG Emissions Worksheet that can assist applicants in answering the SEPA Checklist question relating to GHG emissions: *SEPA Greenhouse Gas (GHG) Emissions Worksheet* (King County 2019). The SEPA GHG Emissions worksheet estimate GHG emissions that will be created over the lifespan of a project. This includes emissions associated with extraction of raw materials, manufacturing of construction materials, transportation of construction materials, energy consumed during a building's operation, and transportation of building occupants. Because the emission factors include transportation of construction materials and preparation of the building site (but not the entire site), those emissions are double counted, since they are also included in the direct emissions calculated by the MOVES4 model.

The County's GHG Emission Worksheet estimates GHG emissions from construction and operation at 89,981 metric tons of CO_2e over a 62.5 year lifespan, which results in GHG emissions of 1,440 metric tons per year. The summary of the emission is presented in Table 5-5. This estimate is well below the 10,000 metric ton GHG mandatory reporting limit.

Table 5-5. GHG Emissions Based on King County SEPA GHG Emission Worksheet

Type (Residential) or Principal Activity (Commercial)	Lifespan	Square Feet (in thousands of square feet)	Emissions Per Thousand Square Feet (MTCO2e)			Lifespan Emissions (MTCO2e)
			Embodied	Energy	Transportation	
Warehouse or Storage	62.5	125	39	352	181	71,468
Pavement		370.26				18,513
Total						**89,981**

MTCO2e = metric tons of carbon dioxide equivalent

A transfer station was not one of the building options in the worksheet, so a warehouse was selected for the calculations. The worksheet also uses a default project lifespan of 62.5 years, while the lifespan for the transfer station was assumed to be 50 years. The worksheet is protected and cannot be modified, but the emission factors in the worksheet can be used to estimate the emissions for this project. The calculation was rerun using the emission factors, the project lifespan of 50 years, and the average number of 11 employees onsite. The results are presented in Table 5-6.

Table 5-6. GHG Emissions Based on King County SEPA GHG Emission Worksheet Adjusted for Proposed Action

Type (Residential) or Principal Activity (Commercial)	Lifespan (years)	Square Feet (in thousands of square feet)	Emissions Per Thousand Square Feet (MTCO2e)		Emissions Per Person Per Year	Lifespan Emissions (MTCO2e)
			Embodied	Energy	Transportation	
Warehouse or Storage	50	125	39	280	4.9	39,929
Pavement		370.26				17,428
Total						**57,357**

The embodied emissions are unaffected by shortening the lifespan, but the energy usage and transportation emissions are reduced, so the total estimated lifespan emissions are 57,357 MTCO2e which equals 1,147 MTCO2e per year. This is less than Ecology's threshold of 10,000 MTCO2e per calendar year, so mandatory reporting of GHG emissions is not required.

5.3.2. Impacts from Operation

The transfer building would be fully enclosed except for the entry/exit points, thus reducing offsite noise, odor, and dust. A misting system and mechanical exhaust ventilation system would be incorporated into the transfer station building for odor and dust control. The station would offer sufficient queuing space for customers and storage space for waste, including dedicated areas for recycling services. All action alternatives would include the addition of compactors to reduce the volume of garbage before it is hauled to the landfill or other disposal facility. Compactors have the potential to reduce the total number of transfer hauling trips to and from the new station by nearly one third, thus reducing the cost of operations and traffic impacts (King County 2019a).

The proposed facilities would offer expanded recycling services compared with the existing facility and thus would support King County's Re+ program. The program reinvents the region's waste system to cut carbon emission by recycling and reusing materials that are currently being sent to the landfill. Re+ contributes to the County's Strategic Climate Action Plan goal of cutting countywide greenhouse gas emissions in half by the end of the decade while transitioning the region to a sustainable circular economy. In addition to supporting innovative projects, Re+ will include actions aimed at reimagining the way waste is managed at the city, county, and state level.

In Alternative 2, a MRW facility would accept, store, and handle HHW according to HHW storage, handling, and transportation regulations, so VOC emissions from this activity should be insignificant.

5.3.2.1. Direct Impacts

Criteria and Toxic Air Pollutants

Emissions would be generated by the combustion of fuel used in vehicles to transport the waste to and from the site. Emissions would also be generated by personal vehicles used to transport employees to and from the site. However, emissions would be less than emissions under the No Action Alternative because of the effect of compactors on reducing hauling trips and improvements to the onsite traffic flows that would minimize vehicle queuing. Operation emissions are shown for all alternatives in Table 5-7/

Table 5-7. Criteria and Air Toxic Pollutant Operation Emissions for All Scenarios

Scenario		VOC ton/year	NOx ton/year	CO ton/year	Sox ton/year	PM10 ton/year	PM2.5 ton/year	Air Toxics ton/year
2023	Existing Condition	0.82	9.71	8.97	0.01	0.74	0.44	5.26E-01
2029	No Action	0.81	8.51	10.66	0.01	0.78	0.35	3.99E-01
2029	Alternatives 1A, 1B	0.77	7.65	10.26	0.01	0.72	0.31	3.63E-01
2029	Alternative 2	0.73	7.96	9.81	0.01	0.70	0.32	3.85E-01
2040	No Action	0.20	3.18	4.90	0.01	0.42	0.07	3.13E-02
2040	Alternatives 1A, 1B	0.19	2.82	4.62	0.01	0.39	0.06	2.80E- 02
2040	Alternative 2	0.18	2.92	4.43	0.01	0.36	0.06	2.93E-02

Net operation emission changes for Alternatives 1 and 2 compared with the No Action Alternative are provided in Table 5-8.

Table 5-8. Difference in Operation Emissions as Compared with No Action Alternative

Scenario		VOC ton/year	NO_x ton/year	CO ton/year	SO_x ton/year	PM_{10} ton/year	$PM_{2.5}$ ton/year	Air Toxics ton/year
2029	Alternative 1	-0.04	-0.86	-0.40	-0.001	-0.06	-0.03	-0.04
2029	Alternative 2	-0.08	-0.55	-0.85	-0.001	-0.08	-0.02	-1.44E-02-
2040	Alternative 1	-0.01	-0.37	-0.28	-0.001	-0.03	-0.01	-0.003
2040	Alternative 2	-0.02	-0.26	-0.47	0.000	-0.06	-0.01	-2.06E-03

Compared with the No Action Alternative, both Alternatives 1 and 2 would result in emission reductions for criteria pollutants and air toxics in 2029 and 2040.

GHG Emissions

Emissions would be generated by the combustion of fuel in vehicles used to transport people and goods to and from the site after the project is completed. The estimated GHG emissions for the years 2029 and 2040 are presented in Table 5-9 as well as a comparison with the No Action Alternative.

Table 5-9. GHG Emissions from Operation for All Scenarios

Scenario		GHG MTCO2e /year	Compared to No Action MTCO2e /year
2023	Existing Condition	1,921	Not Applicable
2029	No Action	2,706	Not Applicable
2029	Alternatives 1A, 1B	2,467	-239
2029	Alternative 2	2,586	-120
2040	No Action	2,123	Not Applicable
2040	Alternatives 1A, 1B	1,910	-213
2040	Alternative 2	2,033	-90

Fugitive Dust Emissions

Fugitive emissions should be minor during operation and significantly less than emissions under the No Action Alternative. Enclosing the transfer station will reduce the amount of wind-blown garbage and dust from the facility.

Odors

Odors from storage and transportation of waste can vary depending on the type of waste and the method of transport. Typical odor-causing compounds from waste transportation include volatile organic acids and methyl mercaptan. These are often associated with decomposing putrescible wastes. Although odors have not typically been an issue at the existing transfer station, odors would be reduced under the action alternatives compared with the No Action Alternative because the transfer station and transfer trailers will be enclosed, and a misting system and mechanical exhaust ventilation system would be incorporated into the transfer station building design.

BMPs that are currently being used at the existing transfer station would continue to be followed. The BMPs include limiting the time the waste sits onsite by following the rule of "first in, first out," so that fully loaded transfer trailers are removed from the station in the order that they are filled. Cleaning the station on a regular basis is another BMP that would continue to be implemented.

5.3.2.2. Indirect Impacts

The largest potential indirect emissions source related to facility construction would be traffic-related emissions associated with disrupted or rerouted traffic in the site vicinity.

GHG emissions would be indirectly generated from the use of electricity, gas, or other power source during the operation of the project after it is constructed.

The County's *SEPA Greenhouse Gas (GHG) Emissions Worksheet* (King County 2019) was used to estimate indirect emissions associated with the operation of the facility for the years 2029 and 2040, and are presented in Table 5-10.

Table 5-10. 2029 and 2040 Indirect Operating Emissions of GHGs for All Alternatives

Source	2029 GHG, MTCO2e /year			2040 GHG, MTCO2e /year		
	No Action	Alternatives 1A, 1B	Alternative 2	No Action	Alternatives 1A, 1B	Alternative 2
Facility Energy Use	22	700	700	22	700	700

The emissions from energy use may be overestimated for 2040. The project would use electricity supplied by Puget Sound Energy, which is committed to working toward the following goals:

- Reducing emissions from PSE electric and gas operations and electric supply to net zero by 2030. By 2045, PSE will have a 100 percent carbon-free electric supply.
- To reach net zero carbon emissions for natural gas used in customer homes and businesses by 2045, with an interim target of a 30 percent emissions reduction by 2030. (PSE 2023)

Energy use by the new facility results in higher operational GHG emissions for the action alternatives than the No Action Alternative. The new facilities would have the addition of a compactor powered by electricity; however, the new facilities would also be designed to be more energy efficient. Because the project would be completed in 2030, operations would use 100 percent carbon-neutral energy. Therefore, there would be no indirect GHG emissions associated with the electricity use.

5.3.3. Mitigation Measures

Operation and construction of the project would comply with federal, state, and regional regulations related to air quality. Potential impacts on air quality would be minimized or avoided through project planning, design, and the application of required BMPs.

5.3.3.1. Construction

Although significant adverse air quality impacts are not anticipated from construction of Alternatives 1A, 1B, or 2, the construction contractors would be required to use BMPs to reduce impacts on air quality. BMPs for reducing the potential for air quality impacts during construction include measures for reducing emissions from the combustion of fossil fuels and fugitive dust. The largest potential indirect emissions source related to facility construction would be traffic-related emissions from disrupted or rerouted traffic in the site vicinity.

Criteria and Toxic Air Pollutants

Emissions from vehicles and construction equipment can be reduced with the following BMPs:

- Use only equipment and trucks that are maintained in optimal operational condition.
- Use ultra-low sulfur fuel in equipment fueled by diesel.
- Require all off-road equipment to have emission reduction equipment (e.g., require project sponsors and contractors to participate in Puget Sound Region Diesel Solutions, a program designed to reduce air pollution from diesel).
- Use car-pooling or other trip-reduction strategies for construction workers.
- Implement time limit restrictions on idling of construction trucks and other vehicles.
- Stage construction to minimize overall transportation system congestion and delays to reduce regional emissions of pollutants during construction.

GHGs

GHG emissions can be reduced through habitat restoration and by using procedures that increase energy efficiency, use renewable energy, reduce carbon emissions, divert materials from landfills, and use reduced embodied carbon in construction materials. Many of the methods used to meet these goals are the same methods used to reduce emissions of criteria pollutants and air toxics, including the following:

- Adhering to the County's 2022 update to the Green Building ordinance ensuring that the design, construction, and operation of any King County capital project is consistent with the latest green building and sustainable development practices.
- Landscaping and planting trees and bushes.
- Using energy-efficient construction equipment and limiting the equipment and vehicle idling time during construction.

Fugitive Dust

Fugitive dust emissions can be reduced using the following BMPs:

- Spray exposed soil with water or other suppressant to reduce emissions and deposition of particulate matter.
- Pave or use gravel on staging areas and roads that would be exposed for long periods.
- Cover all trucks transporting materials; wet down materials in trucks or provide adequate freeboard (space from the top of the material to the top of the truck bed) to reduce emissions and deposition of particulate matter during transport.
- Provide wheel washers to remove particulate matter that would otherwise be carried off site by vehicles in order to decrease deposition of particulate matter on area roadways.
- Cover dirt, gravel, and debris piles as needed to reduce dust and wind-blown debris.

5.3.3.2. Operation

The following measures are anticipated during operations to protect the health and safety of customers, employees, and neighbors:

- **Criteria and Toxic Air Pollutants**. Establishing efficient onsite traffic flows to minimize vehicle queuing, thus reducing emissions.
- **GHG Emissions**. Using procedures that increase energy efficiency, using renewable energy when available, and diverting recyclable materials away from landfills. Many of the methods used to reduce GHG emissions are the same methods discussed above to reduce emissions of criteria pollutants and air toxics.
- **Fugitive Dust and Odor**. Some of the operating procedures that will be used to reduce odors and fugitive dust include the following:
  - The transfer building will be fully enclosed, except for the entry/exit points, thus reducing offsite noise, odor, and dust.
  - A mechanical exhaust ventilation system will be incorporated into the transfer station building for odor and dust control.
  - A misting system will be installed in the transfer building for odor and dust control.
  - Fully loaded transfer trailers will be removed from the station in the order that they are filled.
  - Transfer trailers will be fully enclosed, and doors and door-seals will be maintained to reduce the potential for odor, spills, and litter.
  - Surfaces where trucks operate will be paved.
  - The station will be cleaned on a regular basis.

5.3.4. Significant Unavoidable Adverse Impacts

There are no significant unavoidable adverse impacts associated with the action alternatives.

5.4. Alternative 1

Impacts to air quality specific to Alternatives 1A and 1B are described below.

5.4.1. Impacts from Construction

With regard to construction, the main difference between Alternatives 1A and 1B is that Alternative 1B has a larger footprint. Alternative 1B also provides a larger potential buffer between the operations and the neighbors to the west.

The impacts from construction of Alternative 1A and 1B would be as described in Section 5.3. In addition, since the site is located on an old landfill, activities that break the existing surface have the potential to release odors from the buried material.

Actual emissions for Alternative 1A and 1B are anticipated to be below the conservatively estimated emissions presented in Section 5.3. With the BMPs in place, neither alternative would violate the PSCAA requirements listed in Section 2.2 or effectively alter the GHG impact assessment.

5.4.2. Impacts from Operation

With regard to operation, the main difference between Alternatives 1A and 1B is that the layout for Alternative 1B provides a larger buffer between the operations and the neighbors to the west. This buffer allows for additional dilution of any odors or dust emissions before they reach the neighbors' homes.

5.4.3. Mitigation Measures

Mitigation measures for Alternatives 1A and 1B would be the same as those discussed in Section 5.3.3 for both construction and operation.

5.4.4. Cumulative Impacts

Both Alternatives 1A and 1B would result in short-term impacts on air quality during the construction phase. However, long-term impacts should be significantly lower than those under the No Action Alternative; therefore, cumulative impacts should be fewer.

5.4.5. Significant Unavoidable Adverse Impacts

There are no significant unavoidable adverse impacts associated with Action Alternatives 1A and 1B.

5.5. Alternative 2

Impacts to air quality specific to Alternative 2 are described in the following section.

5.5.1. Impacts from Construction

The site is currently used for commercial uses, including construction, portable toilet rental, manufacturing, and automotive businesses, which would be relocated. The impacts from construction of Alternative 2 would be as described in Section 5.3. Emissions from the construction of Alternative 2 should be higher than the emissions from Alternatives 1A and slightly lower than Alternative 1B. With the BMPs in place, the alternative would not violate the PSCAA requirements listed in Section 2.2.

5.5.2. Impacts from Operation

The Alternative 1 site in Kirkland is located 22 miles from the Cedar Hills Landfill. The Alternative 2 site in Woodinville is located 29 miles from Cedar Hills Landfill. Therefore, the trip distance for the Woodinville site is approximately a third more than for the Kirkland site. However, the average trip distance for self-haul customers to the Alternative 2 site is less than the distance to the Alternative 1 site. The MOVES4 emissions estimates indicate that the operating emissions from Alternative 2 would be less than emissions from Alternative 1. The station will offer sufficient queuing space for customers, which will reduce idling time and motor vehicle emissions compared with the No Action Alternative.

With regard to operation, Alternative 2 would have the narrowest buffer between the operation and existing neighbors and would have the least opportunity for dilution of any odor or dust emissions before they reach the property line. The facility would also be a new odor source in the area. Odor impacts are subject to an individual’s response, which is subjective, with some people being more sensitive to certain odors than others.

Changes in land use also might affect the travel patterns in the area, potentially resulting in vehicles idling for longer periods of time, resulting in an increase in vehicle emissions over current conditions in the area. However, the area is currently primarily industrial, and BMP measures will be in place to limit odors and impacts on traffic. These BMPs have been demonstrated to be effective at other facilities near residences.

5.5.3. Mitigation Measures

Mitigation measures for Alternative 2 would be the same as those discussed in Section 5.3.3 for both construction and operation.

5.5.4. Cumulative Impacts

Alternative 2 would result in short-term impacts on air quality during the construction phase. However, long-term impacts should be lower than those under the No Action Alternative; therefore, cumulative impacts should be fewer.

5.5.5. Significant Unavoidable Adverse Impacts

There are no significant unavoidable adverse impacts associated with Action Alternative 2.

5.6. Comparison of Alternatives

Alternatives 1A, 1B, and 2 all result in lower impacts on air quality on a long-term basis than the No Action Alternative. The No Action Alternative has higher operational impacts for CAPs, MSATs, odors, and fugitive dust.

The potential for the action alternatives to reduce the total number of transfer hauling trips and vehicle miles traveled by nearly one third (King County 2019a) would reduce future impacts on air quality. In addition, improvements in access to the site should reduce queuing and vehicle idling time. The action alternatives include enclosing the transfer building, which should also result in a reduction in emissions of fugitive dust and odors. All of the alternatives would reduce transportation GHG emissions compared to the No Action Alternative. However these are offset by energy use by the new facility and result in total operational GHG emissions that are higher for the action alternatives than the No Action Alternative.

The construction impact for Alternatives 1A, 1B, and 2 would be similar. However, excavation activities during construction at the Alternative 1 site have a greater potential to generate odors than excavation activities at the Alternative 2 site because the Alternative 1 site is located on a closed landfill, and activities that break the existing surface have the potential to release odors from the buried material. Alternative 1B has slightly higher construction emissions than Alternatives 1A and 2, but provides the largest buffer between the operations and the neighbors. This buffer allows for additional dilution of any odors or dust emissions before they reach adjacent properties. With BMPs in place, the impacts from either alternative would not violate the PSCAA requirements listed in Section 2.2 or significantly affect ambient air quality.

6. References

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Appendix A
Northeast Recycling and Transfer Station Project Air Quality and Greenhouse Gas Emission Calculations Technical Memorandum

Subject	**Northeast Recycling and Transfer Station Project Air Quality and Greenhouse Gas Emission Calculations**
Project Name	Northeast Recycling and Transfer Station Project (E00633E19)
To	Mary O'Hara, Project Manager/King County
From	Melissa Wu, Project Manager/Jacobs
Prepared by	Hong Zhuang/Jacobs; Grace Lee/Jacobs
Reviewed by	Evan Griffiths, Assistant Project Manager/Jacobs
Date	February 27, 2025

This report summarizes the methodology and results of the emission estimates for construction and operation of the project alternatives under consideration for the proposed Northeast Recycling and Transfer Station (NERTS). The memorandum supports the air quality and greenhouse gas (GHG) assessment prepared for the project's Environmental Impact Statement.

Construction Emission Modeling Methodology

Construction activities of the proposed project would have the potential to result in short-term, construction equipment-related exhaust emissions and fugitive dust in the project vicinity. Emissions during construction of the project would include engine exhaust from vehicle trips traveled by construction workers and haul trucks; off-road construction equipment; fugitive dust from earth-moving activities; re-entrained dust from vehicle travel on paved and unpaved roads; and offgas emissions from paving of the roadways.

Construction is anticipated to last approximately 2.5 years, from 2027 to 2029. Emissions from off-road construction equipment and on-road vehicles during construction were estimated using emission factors from the U.S. Environmental Protection Agency (EPA) Motor Vehicle Emission Simulator Version 4 (MOVES4) program. MOVES4 is a state-of-the-science emission modeling system that estimates emissions for mobile sources at the national, county, and project level for criteria air pollutants (CAPs), GHGs, and air toxics. MOVES4 is the current version of MOVES, and it accounts for the latest regulations and emission standards for vehicles, such as the heavy-duty low nitrogen oxides (NO_x) rule for model years 2027 and later and the light-duty GHG rule for model years 2023 and later. MOVES4 also improved the modeling ability of alternative fuel vehicles. The analysis estimated the GHG emissions and CAP emissions, including carbon monoxide (CO), NO_x, particles with a diameter of 10 micrometers or less (PM_{10}), particles with a diameter of 2.5 micrometers or less ($PM_{2.5}$), sulfur dioxide (SO_2), and volatile organic compound (VOC) emissions associated with construction. Calculations were carried out as follows:

- For off-road equipment, emissions were calculated based on projected construction durations, hours of equipment operation, and estimated numbers and types of equipment for each year. Project-specific equipment information has been used where available, supplemented with default settings and parameters from MOVES4, such as horsepower ratings and load factors.
- For on-road vehicles, including haul trucks, onsite trucks, and worker commute vehicles, emissions were calculated based on the anticipated number of trips and trip distances to the construction sites. All haul trucks were assumed to be heavy-duty diesel vehicles (combination unit short-haul vehicles), onsite pickups were assumed to be gasoline light commercial trucks, and worker commute vehicles were assumed to be gasoline-powered passenger cars and trucks. In reality, there would be more electric vehicles and vehicles powered by cleaner fuels in future years. These vehicles would have zero or lower emissions compared to the gasoline- or diesel-powered vehicles used in the analysis. Therefore, the emissions estimated for this analysis are conservative; actual project emissions would be lower.

- Construction of the project would result in fugitive dust emissions from earthmoving activities, demolition, material handling, and re-entrained road dust from vehicle travel on paved and unpaved roads. Fugitive dust emission factors were calculated using EPA AP-42 (EPA 1995).

Construction Emissions Summary

Estimated construction emissions for Alternative 1A, Alternative 1B, and Alternative 2 are shown in Tables 1 through 3. Detailed construction information and emission calculations are provided in Attachment 1, Construction Emission Calculations. Under the No Action Alternative, no new facility would be constructed and there would be no new emissions or associated air quality impacts.

Table 1. Construction Emissions from Alternative 1A

	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e
	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year
Construction Emissions 2027	**0.40**	**16.24**	**3.34**	**0.02**	**22.04**	**3.34**	***6199***
Non-road Construction Equipment	0.28	13.76	0.78	0.02	0.20	0.20	5510
On-road Vehicles	0.11	2.48	2.57	0.00	0.17	0.09	689
Fugitive Dust	N/A	N/A	N/A	N/A	21.67	3.04	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A
Construction Emissions 2028	**0.27**	**8.00**	**3.93**	**0.01**	**30.90**	**3.70**	**3203**
Non-road Construction Equipment	0.10	4.28	0.31	0.01	0.07	0.07	2100
On-road Vehicles	0.17	3.72	3.62	0.00	0.24	0.13	1103
Fugitive Dust	N/A	N/A	N/A	N/A	30.59	3.50	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A
Construction Emissions 2029	**0.11**	**3.93**	**1.30**	**0.005**	**6.56**	**0.84**	**1548**
Non-road Construction Equipment	0.06	2.81	0.15	0.00	0.04	0.04	1161
On-road Vehicles	0.05	1.13	1.16	0.00	0.08	0.04	386
Fugitive Dust	N/A	N/A	N/A	N/A	6.43	0.76	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A

CO_2e = carbon dioxide equivalent
N/A = not applicable

Table 2. Construction Emissions from Alternative 1B

	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e
	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year
Construction Emissions 2027	**0.45**	**17.38**	**3.77**	**0.02**	**26.08**	**3.79**	**6453**
Non-road Construction Equipment	0.28	13.76	0.78	0.02	0.20	0.20	5510
On-road Vehicles	0.16	3.62	3.00	0.004	0.24	0.14	942
Fugitive Dust	N/A	N/A	N/A	N/A	25.64	3.46	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A
Construction Emissions 2028	**0.38**	**12.90**	**4.35**	**0.02**	**32.95**	**3.98**	**5092**
Non-road Construction Equipment	0.19	8.68	0.53	0.01	0.14	0.13	3866
On-road Vehicles	0.19	4.22	3.82	0.005	0.27	0.14	1227
Fugitive Dust	N/A	N/A	N/A	N/A	32.55	3.70	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A
Construction Emissions 2029	**0.12**	**3.93**	**1.30**	**0.005**	**6.56**	**0.84**	**1548**
Non-road Construction Equipment	0.06	2.81	0.15	0.003	0.04	0.04	1161

	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e
	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year
On-road Vehicles	0.05	1.13	1.16	0.002	0.08	0.04	386
Fugitive Dust	N/A	N/A	N/A	N/A	6.43	0.76	N/A
Asphalt Offgas	0.01	N/A	N/A	N/A	N/A	N/A	N/A

CO_2e = carbon dioxide equivalent
N/A = not applicable

Table 3. Construction Emissions from Alternative 2

	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e
	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year
Construction Emissions 2027	**0.35**	**15.01**	**2.88**	**0.02**	**17.80**	**2.86**	**5925**
Non-road Construction Equipment	0.28	13.76	0.78	0.02	0.20	0.20	5510
On-road Vehicles	0.06	1.26	2.11	0.002	0.09	0.05	415
Fugitive Dust	N/A	N/A	N/A	N/A	17.50	2.62	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A
Construction Emissions 2028	**0.34**	**11.86**	**3.93**	**0.02**	**28.83**	**3.52**	**4836**
Non-road Construction Equipment	0.19	8.68	0.53	0.01	0.14	0.13	3866
On-road Vehicles	0.15	3.18	3.40	0.004	0.21	0.11	970
Fugitive Dust	N/A	N/A	N/A	N/A	28.49	3.28	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A
Construction Emissions 2029	**0.12**	**3.93**	**1.30**	**0.005**	**6.56**	**0.84**	**1548**
Non-road Construction Equipment	0.06	2.81	0.15	0.003	0.04	0.04	1161
On-road Vehicles	0.05	1.13	1.16	0.002	0.08	0.04	386
Fugitive Dust	N/A	N/A	N/A	N/A	6.43	0.76	N/A
Asphalt Offgas	0.01	N/A	N/A	N/A	N/A	N/A	N/A

Construction emission totals are similar for Alternatives 1A, 1B, and 2 for 2027, 2028, and 2029. Construction emissions are the highest in 2027 and the lowest in 2029.

Construction emissions would occur in the short term, only while construction work is in progress. Construction equipment and vehicles used for the project would comply with EPA's emissions standards for on-road vehicles and off-road construction equipment. In addition, the project would comply with applicable dust-control requirements in Puget Sound Clean Air Agency regulations and would implement best management practices to minimize emissions from construction.

Operation Emissions Methodology

Operation emissions would be generated by the vehicles transporting the waste and worker commute trips to and from the site. Vehicle trips and vehicle miles traveled (VMT) associated with the project were estimated based on potential routes the vehicles would take between each centroid location of relevant zip codes using actual King County transaction data.

Emissions from vehicles during operations were estimated using emission factors from EPA's MOVES4 program. The analysis estimated the GHG and CAP emissions (including CO, NO_x, PM_{10}, $PM_{2.5}$, SO_2, and VOCs) associated with operations. Mobile source air toxics (MSAT) emissions of 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter from vehicle trips were also included in this analysis.

Vehicle operation emissions were estimated using MOVES4 based on data for daily VMT and average vehicle speeds in the project area for seven scenarios:

- 2023 Existing Condition
- 2029 No Action Alternative
- 2029 Alternatives 1A and B
- 2029 Alternative 2
- 2040 No Action Alternative
- 2040 Alternatives 1A and 1B
- 2040 Alternative 2

Alterative 1A and Alternative 1B would have similar operation VMT and emissions, therefore, they were represented with the same emission scenario. Operation emissions were calculated for the vehicle types and assigned corresponding MOVES4 source type categories shown in Table 4.

Table 4. Vehicle Categories for Operation

Operation Vehicle Types	MOVES4 Source Category
King County transfer trailers	Combination short-haul truck
Commercial hauling trucks	Refuse truck
Self-haul vehicles (cars)	Passenger car
Self-haul vehicles (trucks)	Single-unit short-haul truck
Employees	Passenger car and passenger truck
Moderate Risk Waste self-haul	Single-unit short-haul truck
Moderate Risk Waste transfer trucks	Single-unit short-haul truck

Fuel types for each type of vehicle included in the analysis were determined based on MOVES4 defaults for King County, which accounts for an increased number of electric or alternative fuel vehicles in future years. Employee vehicles included passenger cars and passenger trucks. The higher emission rates of these two types of vehicles were used in the analysis. Visitor trips to the site were assumed to be negligible and were not calculated. MOVES4 defaults were used to run MOVES4 where project-specific or agency-provided data were not available. Vehicle fuel types of each source category in Table 3 were based on MOVES4 default fuel distribution in the county for each analysis year.

Operation Emissions Summary

A summary of the operation emissions for CAPs and GHGs, and for MSATs from the project is shown in Tables 5 and 7. Detailed operation emission calculations are provided in Attachment 2, Operation Emission Calculations. To determine the net emissions from the proposed action alternatives during operation, the No Action Alternative scenario was used as a baseline. Net operation emission changes for action alternatives compared with the No Action Alternative for CAPs and GHs, and for MSATs are provided in Tables 6 and 8, respectively. Compared with the No Action Alternative, all action alternatives would result in emission reductions for CAPs, GHGs, and MSATs in 2029 and 2040.

Table 5. Operation Emissions for All Scenarios – CAPs and GHGs

Scenario		VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e
		ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year
2023	Existing Condition	0.82	9.71	8.97	0.01	0.74	0.44	1,921
2029	No Action	0.81	8.51	10.66	0.01	0.78	0.35	2,706
2029	Alternative 1A, 1B	0.77	7.65	10.26	0.01	0.72	0.31	2,467
2029	Alternative 2	0.73	7.96	9.81	0.01	0.70	0.32	2,586

Scenario		VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e
		ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year
2040	No Action	0.20	3.18	4.90	0.01	0.42	0.07	2,123
2040	Alternative 1A, 1B	0.19	2.82	4.62	0.01	0.39	0.06	1,910
2040	Alternative 2	0.18	2.92	4.43	0.01	0.36	0.06	2,033

Table 6. Difference in Operation Emissions Compared with No Action Alternative – CAPs and GHGs

Scenario		VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e
		ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year
2029	Alternative 1A, 1B	-0.04	-0.86	-0.40	-0.001	-0.06	-0.03	-239
2029	Alternative 2	-0.08	-0.55	-0.85	-0.001	-0.08	-0.02	-120
2040	Alternative 1A, 1B	-0.01	-0.37	-0.28	-0.001	-0.03	-0.01	-213
2040	Alternative 2	-0.02	-0.26	-0.47	0.000	-0.06	-0.01	-90

Table 7. Operation Emissions for All Scenarios – MSATs

Scenario		Naphthalene ton/year	1,3-Butadiene ton/year	Acetaldehyde ton/year	Acrolein ton/year	Benzene ton/year	Ethylbenzene ton/year	Formaldehyde ton/year	Diesel PM ton/year	PAHs ton/year	Total ton/year
2023	Existing Condition	5.21E-03	1.96E-03	2.26E-02	3.82E-03	9.24E-03	5.52E-03	4.71E-02	4.28E-01	2.62E-03	5.26E-01
2029	No Action	4.70E-03	1.57E-03	2.15E-02	3.53E-03	8.09E-03	6.18E-03	4.37E-02	3.08E-01	2.17E-03	3.99E-01
2029	Alternative 1A, 1B	4.41E-03	1.48E-03	2.01E-02	3.29E-03	7.84E-03	6.01E-03	4.10E-02	2.77E-01	2.01E-03	3.63E-01
2029	Alternative 2	4.18E-03	1.40E-03	1.93E-02	3.15E-03	7.35E-03	5.60E-03	3.90E-02	3.03E-01	1.97E-03	3.85E-01
2040	No Action	8.14E-05	0.00E+00	3.75E-03	2.57E-04	1.60E-03	2.82E-03	3.08E-03	1.97E-02	3.21E-05	3.13E-02
2040	Alternative 1A, 1B	7.67E-05	0.00E+00	3.42E-03	2.28E-04	1.60E-03	2.73E-03	2.87E-03	1.71E-02	3.07E-05	2.80E-02
2040	Alternative 2	7.52E-05	0.00E+00	3.44E-03	2.38E-04	1.46E-03	2.56E-03	2.81E-03	1.87E-02	2.94E-05	2.93E-02

Table 8. Difference in Operation Emissions Compared with No Action Alternative – MSATs

Scenario		Naphthalene ton/year	1,3-Butadiene ton/year	Acetaldehyde ton/year	Acrolein ton/year	Benzene ton/year	Ethylbenzene ton/year	Formaldehyde ton/year	Diesel PM ton/year	PAHs ton/year	Total ton/year
2029	Alternative 1A, 1B	-2.92E-04	-8.74E-05	-1.44E-03	-2.34E-04	-2.48E-04	-1.67E-04	-2.77E-03	-3.02E-02	-1.52E-04	-3.56E-02
2029	Alternative 2	-5.13E-04	-1.65E-04	-2.27E-03	-3.82E-04	-7.40E-04	-5.78E-04	-4.75E-03	-4.77E-03	-2.00E-04	-1.44E-02
2040	Alternative 1A, 1B	-4.66E-06	0.00E+00	-3.32E-04	-2.87E-05	-3.27E-09	-8.92E-05	-2.12E-04	-2.67E-03	-1.45E-06	-3.34E-03
2040	Alternative 2	-6.25E-06	0.00E+00	-3.14E-04	-1.94E-05	-1.36E-04	-2.55E-04	-2.69E-04	-1.06E-03	-2.74E-06	-2.06E-03

PAH = polycyclic aromatic hydrocarbon

Reference

U.S. Environmental Protection Agency (EPA). 1995. *Compilation of Air Pollutant Emissions Factors, Volume 1: Stationary Point and Area Sources*. AP-42. Fifth Edition.

Attachment 1
Construction Emission Calculations

NERTS Project Construction Emissions Summary

Construction Emissions Summary - Alternative 1a

	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e
	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year
Total Project Construction Emissions 2027	**0.40**	**16.24**	**3.34**	**0.02**	**22.04**	**3.34**	**6198.95**
Nonroad Construction Equipment	0.28	13.76	0.78	0.02	0.20	0.20	5510.19
Onroad Vehicles	0.11	2.48	2.57	0.00	0.17	0.09	688.76
Fugitive Dust	N/A	N/A	N/A	N/A	21.67	3.04	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A
Total Project Construction Emissions 2028	**0.27**	**8.00**	**3.93**	**0.01**	**30.90**	**3.70**	**3203.17**
Nonroad Construction Equipment	0.10	4.28	0.31	0.01	0.07	0.07	2100.05
Onroad Vehicles	0.17	3.72	3.62	0.00	0.24	0.13	1103.12
Fugitive Dust	N/A	N/A	N/A	N/A	30.59	3.50	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A
Total Project Construction Emissions 2029	**0.11**	**3.93**	**1.30**	**0.005**	**6.56**	**0.84**	**1547.59**
Nonroad Construction Equipment	0.06	2.81	0.15	0.00	0.04	0.04	1161.15
Onroad Vehicles	0.05	1.13	1.16	0.00	0.08	0.04	386.44
Fugitive Dust	N/A	N/A	N/A	N/A	6.43	0.76	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
N/A = not applicable

Construction Emissions Summary - Alternative 1b

	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e
	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year
Total Project Construction Emissions 2027	**0.45**	**17.38**	**3.77**	**0.02**	**26.08**	**3.79**	**6452.51**
Nonroad Construction Equipment	0.28	13.76	0.78	0.02	0.20	0.20	5510.19
Onroad Vehicles	0.16	3.62	3.00	0.004	0.24	0.14	942.32
Fugitive Dust	N/A	N/A	N/A	N/A	25.64	3.46	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A
Total Project Construction Emissions 2028	**0.38**	**12.90**	**4.35**	**0.02**	**32.95**	**3.98**	**5092.42**
Nonroad Construction Equipment	0.19	8.68	0.53	0.01	0.14	0.13	3865.80
Onroad Vehicles	0.19	4.22	3.82	0.005	0.27	0.14	1226.62
Fugitive Dust	N/A	N/A	N/A	N/A	32.55	3.70	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A
Total Project Construction Emissions 2029	**0.12**	**3.93**	**1.30**	**0.005**	**6.56**	**0.84**	**1547.59**
Nonroad Construction Equipment	0.06	2.81	0.15	0.003	0.04	0.04	1161.15
Onroad Vehicles	0.05	1.13	1.16	0.002	0.08	0.04	386.44
Fugitive Dust	N/A	N/A	N/A	N/A	6.43	0.76	N/A
Asphalt Offgas	0.01	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
N/A = not applicable

Construction Emissions Summary - Alternative 2

	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e
	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year
Total Project Construction Emissions 2027	**0.35**	**15.01**	**2.88**	**0.02**	**17.80**	**2.86**	**5925.10**
Nonroad Construction Equipment	0.28	13.76	0.78	0.02	0.20	0.20	5510.19
Onroad Vehicles	0.06	1.26	2.11	0.002	0.09	0.05	414.91
Fugitive Dust	N/A	N/A	N/A	N/A	17.50	2.62	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A
Total Project Construction Emissions 2028	**0.34**	**11.86**	**3.93**	**0.02**	**28.83**	**3.52**	**4835.54**
Nonroad Construction Equipment	0.19	8.68	0.53	0.01	0.14	0.13	3865.80
Onroad Vehicles	0.15	3.18	3.40	0.004	0.21	0.11	969.74
Fugitive Dust	N/A	N/A	N/A	N/A	28.49	3.28	N/A
Asphalt Offgas	0.00	N/A	N/A	N/A	N/A	N/A	N/A
Total Project Construction Emissions 2029	**0.12**	**3.93**	**1.30**	**0.005**	**6.56**	**0.84**	**1547.59**
Nonroad Construction Equipment	0.06	2.81	0.15	0.003	0.04	0.04	1161.15
Onroad Vehicles	0.05	1.13	1.16	0.002	0.08	0.04	386.44
Fugitive Dust	N/A	N/A	N/A	N/A	6.43	0.76	N/A
Asphalt Offgas	0.01	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
N/A = not applicable

Phasing Information (start and end month for each) - Alternative 1a

Phase Description	Start	End	Number of Working Days
Activity/Phase #1 -NTP	1/1/2027	1/31/2027	26
Activity/Phase #2 - Mob	2/1/2027	2/28/2027	23
Activity/Phase #3 - Clearing	3/1/2027	4/30/2027	51
Activity/Phase #4 - Excavation (2027)	5/1/2027	12/31/2027	209
Activity/Phase #4 - Excavation (2028)	1/1/2028	4/30/2028	103
Activity/Phase #5 - Foundations/Walls/Roof (2028)	2/1/2028	12/31/2028	286
Activity/Phase #5 - Foundations/Walls/Roof (2029)	1/1/2029	1/31/2029	26
Activity/Phase #6 - Equipment	2/1/2029	4/30/2029	75
Activity/Phase #7 - Landscaping	5/1/2029	5/31/2029	26
Activity/Phase #8 - Commissioning	6/1/2029	6/30/2029	25

Phasing Information (start and end month for each) - Alternative 1b

Phase Description	Start	End	Number of Working Days
Activity/Phase #1 -NTP	1/1/2027	1/31/2027	26
Activity/Phase #2 - Mob	2/1/2027	2/28/2027	23
Activity/Phase #3 - Clearing	3/1/2027	4/30/2027	51
Activity/Phase #4 - Excavation (2027)	5/1/2027	12/31/2027	209
Activity/Phase #4 - Excavation (2028)	1/1/2028	4/30/2028	103
Activity/Phase #5 - Foundations/Walls/Roof (2028)	2/1/2028	12/31/2028	286
Activity/Phase #5 - Foundations/Walls/Roof (2029)	1/1/2029	1/31/2029	26
Activity/Phase #6 - Equipment	2/1/2029	4/30/2029	75
Activity/Phase #7 - Landscaping	5/1/2029	5/31/2029	26
Activity/Phase #8 - Commissioning	6/1/2029	6/30/2029	25

Phasing Information (start and end month for each) - Alternative 2

Phase Description	Start	End	Number of Working Days
Activity/Phase #1 -NTP	1/1/2027	1/31/2027	26
Activity/Phase #2 - Mob	2/1/2027	2/28/2027	23
Activity/Phase #3 - Clearing	3/1/2027	4/30/2027	51
Activity/Phase #4 - Excavation (2027)	5/1/2027	12/31/2027	209
Activity/Phase #4 - Excavation (2028)	1/1/2028	4/30/2028	103
Activity/Phase #5 - Foundations/Walls/Roof (2028)	2/1/2028	12/31/2028	286
Activity/Phase #5 - Foundations/Walls/Roof (2029)	1/1/2029	1/31/2029	26
Activity/Phase #6 - Equipment	2/1/2029	4/30/2029	75
Activity/Phase #7 - Landscaping	5/1/2029	5/31/2029	26
Activity/Phase #8 - Commissioning	6/1/2029	6/30/2029	25

Alternative 1a: Construction Emissions Calculations - Offroad Construction Equipment

Offroad Construction Equipment Emissions - Roadway Construction

						Emission Factors							Emissions							
						VOC	NOx	CO	SOx	PM10	PM2.5	CO2e	VOC	NOx	CO	SOx	PM10	PM2.5	CO2e	
Construction Equipment Name	Number of Equipment	Hours per Day	Number of Days	Total Hours	Year	lb/hour	lb/hour	lb/hour	lb/hour	lb/hour	lb/hour	lb/hour	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year	MOVES Equipment Types
Phase 1																				
Water truck	1	10	26	260	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.004	0.184	0.009	0.000	0.002	0.002	64.479	Off-highway Trucks
Phase 2																				
Low boys	2	4	8	61	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.001	0.043	0.002	0.000	0.001	0.001	15.210	Off-highway Trucks
Excavators	4	4	8	123	2027	0.003	0.076	0.014	0.000	0.003	0.003	120.681	0.000	0.005	0.001	0.000	0.000	0.000	6.715	Excavators
Graders	1	10	23	230	2027	0.003	0.051	0.014	0.000	0.003	0.003	142.936	0.000	0.006	0.002	0.000	0.000	0.000	14.912	graders
Dozers	2	4	8	61	2027	0.007	0.190	0.035	0.000	0.007	0.007	182.442	0.000	0.006	0.001	0.000	0.000	0.000	5.076	Crawler Tractor/Dozers
Off Road Dump Truck	4	4	8	123	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.002	0.087	0.004	0.000	0.001	0.001	30.421	Off-highway Trucks
10 wheeler dump truck and trailer	4	4	8	123	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.002	0.087	0.004	0.000	0.001	0.001	30.421	Off-highway Trucks
fork lifts	2	1	4	8	2027	0.004	0.112	0.024	0.000	0.004	0.003	71.733	0.000	0.000	0.000	0.000	0.000	0.000	0.249	Rough Terrain Forklifts
Cranes	2	1	4	8	2027	0.006	0.119	0.028	0.000	0.005	0.005	116.765	0.000	0.000	0.000	0.000	0.000	0.000	0.406	cranes
Water truck	1	10	23	230	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.003	0.163	0.008	0.000	0.002	0.002	57.039	Off-highway Trucks
Phase 3																				
Excavators	4	10	51	2040	2027	0.003	0.076	0.014	0.000	0.003	0.003	120.681	0.003	0.077	0.014	0.000	0.003	0.003	111.671	Excavators
Dozers	2	5	51	510	2027	0.007	0.190	0.035	0.000	0.007	0.007	182.442	0.002	0.048	0.009	0.000	0.002	0.002	42.205	Crawler Tractor/Dozers
Off Road Dump Truck	2	10	51	1020	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.014	0.721	0.035	0.001	0.010	0.009	252.954	Off-highway Trucks
Water truck	1	8	51	408	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.006	0.288	0.014	0.000	0.004	0.004	101.182	Off-highway Trucks
Phase 4 (2027)																				
Excavators	4	10	209	8360	2027	0.003	0.076	0.014	0.000	0.003	0.003	120.681	0.014	0.317	0.058	0.001	0.012	0.012	457.633	Excavators
Dozers	2	10	209	4180	2027	0.007	0.190	0.035	0.000	0.007	0.007	182.442	0.015	0.396	0.073	0.001	0.014	0.014	345.918	Crawler Tractor/Dozers
Off Road Dump Truck	4	10	209	8360	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.114	5.911	0.283	0.006	0.079	0.077	2073.234	Off-highway Trucks
10 wheeler dump truck and trailer	4	10	139	5573	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.076	3.940	0.189	0.004	0.053	0.051	1382.156	Off-highway Trucks
Water truck	1	10	209	2090	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.029	1.478	0.071	0.002	0.020	0.019	518.309	Off-highway Trucks
Phase 4 (2028)																				
Excavators	4	2.5	103	1030	2028	0.003	0.072	0.012	0.000	0.003	0.002	120.681	0.002	0.037	0.006	0.000	0.001	0.001	56.383	Excavators
Dozers	2	2.5	103	515	2028	0.006	0.175	0.028	0.000	0.006	0.006	182.442	0.002	0.045	0.007	0.000	0.001	0.001	42.619	Crawler Tractor/Dozers
Off Road Dump Truck	4	2.5	103	1030	2028	0.026	1.404	0.061	0.001	0.018	0.018	546.725	0.014	0.723	0.031	0.001	0.009	0.009	255.434	Off-highway Trucks
10 wheeler dump truck and trailer	4	2.5	69	687	2028	0.026	1.404	0.061	0.001	0.018	0.018	546.725	0.009	0.482	0.021	0.000	0.006	0.006	170.290	Off-highway Trucks
Water truck	1	2.5	103	258	2028	0.026	1.404	0.061	0.001	0.018	0.018	546.725	0.003	0.181	0.008	0.000	0.002	0.002	63.859	Off-highway Trucks

Phase 5 (2028)																				
Excavators	2	10	286	5720	2028	0.003	0.072	0.012	0.000	0.003	0.002	120.681	0.009	0.205	0.034	0.001	0.007	0.007	313.117	Excavators
Construction Cranes	2	10	286	5720	2028	0.005	0.103	0.023	0.000	0.004	0.004	116.766	0.016	0.296	0.066	0.001	0.012	0.012	302.961	Cranes
Fork Lifts	2	10	286	5720	2028	0.003	0.105	0.018	0.000	0.003	0.003	71.733	0.009	0.299	0.052	0.001	0.008	0.008	186.119	Rough Terrain Forklifts
Water truck	1	10	286	2860	2028	0.026	1.404	0.061	0.001	0.018	0.018	546.725	0.038	2.008	0.087	0.002	0.026	0.025	709.265	Off-highway Trucks
Phase 5 (2029)																				
Excavators	2	10	26	520	2029	0.003	0.070	0.011	0.000	0.002	0.002	120.681	0.001	0.018	0.003	0.000	0.001	0.001	28.465	Excavators
Construction Cranes	2	10	26	520	2029	0.005	0.092	0.020	0.000	0.004	0.004	116.767	0.001	0.024	0.005	0.000	0.001	0.001	27.542	Cranes
Fork Lifts	2	10	26	520	2029	0.002	0.098	0.014	0.000	0.002	0.002	71.734	0.001	0.026	0.004	0.000	0.001	0.001	16.920	Rough Terrain Forklifts
Water truck	1	10	26	260	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.003	0.182	0.007	0.000	0.002	0.002	64.479	Off-highway Trucks
Phase 6																				
Low Boys	4	8	50	1600	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.021	1.118	0.045	0.001	0.014	0.014	396.792	Off-highway Trucks
Construction Cranes	2	10	75	1500	2029	0.005	0.092	0.020	0.000	0.004	0.004	116.767	0.004	0.069	0.015	0.000	0.003	0.003	79.448	Cranes
Fork Lifts	2	10	75	1500	2029	0.002	0.098	0.014	0.000	0.002	0.002	71.734	0.002	0.074	0.010	0.000	0.002	0.002	48.808	Rough Terrain Forklifts
Water truck	1	10	75	750	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.010	0.524	0.021	0.001	0.007	0.006	185.996	Off-highway Trucks
Phase 7																				
Dozers	2	10	26	520	2029	0.006	0.163	0.022	0.000	0.005	0.005	182.443	0.001	0.042	0.006	0.000	0.001	0.001	43.033	Crawler Tractor/Dozers
10 wheeler dump truck and trailer	2	10	26	520	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.007	0.363	0.015	0.000	0.005	0.004	128.957	Off-highway Trucks
Excavators	2	5	26	260	2029	0.003	0.070	0.011	0.000	0.002	0.002	120.681	0.000	0.009	0.001	0.000	0.000	0.000	14.233	Excavators
Water truck	1	10	26	260	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.003	0.182	0.007	0.000	0.002	0.002	64.479	Off-highway Trucks
Phase 8																				
Water truck	1	10	25	250	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.003	0.175	0.007	0.000	0.002	0.002	61.999	Off-highway Trucks
Total 2027													**0.285**	**13.758**	**0.776**	**0.016**	**0.205**	**0.199**	**5510.190**	
Total 2028													**0.101**	**4.276**	**0.313**	**0.006**	**0.074**	**0.072**	**2100.046**	
Total 2029													**0.057**	**2.806**	**0.147**	**0.003**	**0.040**	**0.039**	**1161.150**	

Note:

1. Emission factors were obtained from a MOVES4 Nonroad Module run for King County, weekdays, 12-month average, based on MOVES4 defaults.
2. All equipment assumed to be diesel-fueled.

Alternative 1a: Construction Emissions Calculations - Onroad Vehicles

Onroad Vehicles Emissions - Roadway Construction

Vehicles	Type	Number of Vehicles	Number of RTs/day per Vehicle	Miles/RT	Number of Days	Total Vehicle Miles	Year	Emission Factors							Emissions						
								VOC	NOx	CO	SOx	PM10	PM2.5	CO2e	VOC	NOx	CO	SOx	PM10	PM2.5	CO2e
								g/mile	g/mile	g/mile	g/mile	g/mile	g/mile	g/mile	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year
Phase 1																					
Worker commute	Passenger	4	1	30	26	3120	2027	0.028	0.164	3.460	0.002	0.034	0.007	333.608	0.000	0.001	0.012	0.000	0.000	0.000	1.041
Haul trucks	Haul	0	0	0	26	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	0	0	0	26	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	26	10400	2027	0.041	0.170	3.023	0.002	0.035	0.007	355.134	0.000	0.002	0.035	0.000	0.000	0.000	3.693
Phase 2																					
Worker commute	Passenger	20	1	30	23	13800	2027	0.028	0.164	3.460	0.002	0.034	0.007	333.608	0.000	0.002	0.053	0.000	0.001	0.000	4.604
Haul trucks	Haul	0	0	0	23	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	0	0	0	23	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	23	9200	2027	0.041	0.170	3.023	0.002	0.035	0.007	355.134	0.000	0.002	0.031	0.000	0.000	0.000	3.267
Phase 3																					
Worker commute	Passenger	40	1	30	51	61200	2027	0.028	0.164	3.460	0.002	0.034	0.007	333.608	0.002	0.011	0.233	0.000	0.002	0.000	20.417
Haul trucks	Haul	1	40	30	51	61200	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.018	0.444	0.167	0.000	0.028	0.017	99.000
Concrete trucks	Haul	0	0	0	51	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	51	20400	2027	0.041	0.170	3.023	0.002	0.035	0.007	355.134	0.001	0.004	0.068	0.000	0.001	0.000	7.245
Phase 4 (2027)																					
Worker commute	Passenger	40	1	30	209	250800	2027	0.028	0.164	3.460	0.002	0.034	0.007	333.608	0.008	0.045	0.956	0.000	0.009	0.002	83.669
Haul trucks	Haul	1	43	30	209	269610	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.080	1.957	0.735	0.002	0.122	0.074	436.132
Concrete trucks	Haul	0	0	0	209	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	209	83600	2027	0.041	0.170	3.023	0.002	0.035	0.007	355.134	0.004	0.016	0.279	0.000	0.003	0.001	29.689
Phase 4 (2028)																					
Worker commute	Passenger	40	1	30	103	123600	2028	0.023	0.140	3.273	0.002	0.034	0.006	323.510	0.003	0.019	0.446	0.000	0.005	0.001	39.986
Haul trucks	Haul	1	43	30	103	132870	2028	0.246	5.850	2.367	0.005	0.349	0.196	1598.680	0.036	0.857	0.347	0.001	0.051	0.029	212.417
Concrete trucks	Haul	0	0	0	103	0	2028	0.246	5.850	2.367	0.005	0.349	0.196	1598.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	103	41200	2028	0.033	0.154	2.724	0.002	0.035	0.007	346.110	0.001	0.007	0.124	0.000	0.002	0.000	14.260
Phase 5 (2028)																					
Worker commute	Passenger	40	1	30	286	343200	2028	0.023	0.140	3.273	0.002	0.034	0.006	323.510	0.009	0.053	1.238	0.001	0.013	0.002	111.029
Haul trucks	Haul	0	0	0	286	0	2028	0.246	5.850	2.367	0.005	0.349	0.196	1598.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	1	50	30	286	429000	2028	0.246	5.850	2.367	0.005	0.349	0.196	1598.680	0.117	2.766	1.119	0.002	0.165	0.093	685.834
Onsite pickups	Pickup	4	1	100	286	114400	2028	0.033	0.154	2.724	0.002	0.035	0.007	346.110	0.004	0.019	0.343	0.000	0.004	0.001	39.595
Phase 5 (2029)																					
Worker commute	Passenger	40	1	30	26	31200	2029	0.019	0.100	3.019	0.002	0.033	0.006	313.072	0.001	0.003	0.104	0.000	0.001	0.000	9.768
Haul trucks	Haul	0	0	0	26	0	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	1	50	30	26	39000	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.010	0.212	0.097	0.000	0.014	0.008	61.636
Onsite pickups	Pickup	4	1	100	26	10400	2029	0.029	0.121	2.518	0.002	0.034	0.007	335.542	0.000	0.001	0.029	0.000	0.000	0.000	3.490
Phase 6																					
Worker commute	Passenger	40	1	30	75	90000	2029	0.019	0.100	3.019	0.002	0.033	0.006	313.072	0.002	0.010	0.300	0.000	0.003	0.001	28.176
Haul trucks	Haul	1	25	30	62.5	46875	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.011	0.255	0.117	0.000	0.017	0.009	74.081
Concrete trucks	Haul	1	50	30	62.5	93750	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.023	0.510	0.234	0.001	0.034	0.018	148.163
Onsite pickups	Pickup	4	1	100	75	30000	2029	0.029	0.121	2.518	0.002	0.034	0.007	335.542	0.001	0.004	0.083	0.000	0.001	0.000	10.066
Phase 7																					
Worker commute	Passenger	20	1	30	26	15600	2029	0.019	0.100	3.019	0.002	0.033	0.006	313.072	0.000	0.002	0.052	0.000	0.001	0.000	4.884
Haul trucks	Haul	1	30	30	26	23400	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.006	0.127	0.058	0.000	0.008	0.005	36.981
Concrete trucks	Haul	0	0	0	26	0	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	26	10400	2029	0.029	0.121	2.518	0.002	0.034	0.007	335.542	0.000	0.001	0.029	0.000	0.000	0.000	3.490
Phase 8																					
Worker commute	Passenger	10	1	30	25	7500	2029	0.019	0.100	3.019	0.002	0.033	0.006	313.072	0.000	0.001	0.025	0.000	0.000	0.000	2.348
Haul trucks	Haul	0	0	0	25	0	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	0	0	0	25	0	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	25	10000	2029	0.029	0.121	2.518	0.002	0.034	0.007	335.542	0.000	0.001	0.028	0.000	0.000	0.000	3.355
Total 2027															**0.114**	**2.484**	**2.568**	**0.003**	**0.166**	**0.095**	**688.756**
Total 2028															**0.170**	**3.722**	**3.618**	**0.004**	**0.239**	**0.126**	**1103.120**
Total 2029															**0.055**	**1.129**	**1.156**	**0.002**	**0.081**	**0.041**	**386.438**

Notes:

1. Emission factors were obtained from MOVES4 Onroad Module runs at the Project Scale for King County at the annual level for weekdays. Emission factors represent the maximum emission rate between winter and summer afternoons.
2. Passenger vehicles included gasoline cars and gasoline trucks. Emission factors represent the higher emission rate of the two types of vehicles.
3. PM emission factors includes tire wear and brake wear.
4. Emission factors are at an average vehicle speed of 40 mph.

Alternative 1b: Fugitive Dust Emissions - Roadway Construction

A) Bulldozing - Demolition

Fugitive dust emissions from bulldozing

Activity	Year	Equipment Type	Number of Equipment	Daily Hours	Days	Emission Factor PM_{10} lb/hr	Emission Factor $PM_{2.5}$ lb/hr	Daily Emissions PM_{10} lb/day	Daily Emissions $PM_{2.5}$ lb/day	Annual Emissions PM_{10} ton/year	Annual Emissions $PM_{2.5}$ ton/year
Phase 1	2027	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
Phase 2	2027	Dozer or Similar	2	4	8	0.753	0.414	6.02	3.31	0.02	0.01
Phase 3	2027	Dozer or Similar	2	5	51	0.753	0.414	7.53	4.14	0.19	0.11
Phase 4 (2027)	2027	Dozer or Similar	2	10	209	0.753	0.414	15.06	8.28	1.57	0.86
Phase 4 (2028)	2028	Dozer or Similar	2	10	103	0.753	0.414	15.06	8.28	0.78	0.43
Phase 5 (2028)	2028	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
Phase 5 (2029)	2029	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
Phase 6	2029	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
Phase 7	2029	Dozer or Similar	2	10	26	0.753	0.414	15.06	8.28	0.20	0.11
Phase 8	2029	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
									Total 2027	**1.79**	**0.98**
									Total 2028	**0.78**	**0.43**
									Total 2029	**0.20**	**0.11**

Notes:

PM emissions were calculated using the following equation and parameters (AP-42 Table 11.9-1 for Bulldozing, Overburden):

Emission Factor (lb/hr)= k x $(s)^{1.5}$ / $(M)^{1.4}$ For PM10 and k x 5.7 x $(s)^{1.2}$ / $(M)^{1.3}$ for PM2.5

k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)

s = Silt Content (6.9% per AP-42 Table 11.9-3 default for overburden)

M = Moisture Content (7.9% per AP-42 Table 11.9-3 default for overburden)

B) Grading

Fugitive dust emissions from grading

Activity	Year	Equipment Type	Number of Grading Equipment	# Acres/Equipment	Acreage Graded/Day	Number of Days	Grader/Scraper VMT miles/day	Grader/Scraper VMT miles/year	Emission Factors PM10 lb/VMT	Emission Factors PM2.5 lb/VMT	Daily Emissions PM10 lb/day	Daily Emissions PM2.5 lb/day	Annual Emissions PM10 ton/year	Annual Emissions PM2.5 ton/year
Phase 1	2027	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 2	2027	Grader	1	0.5	0.5	23	0.34	7.91	1.54	0.167	0.53	0.06	0.01	0.00
Phase 3	2027	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 4 (2027)	2027	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 4 (2028)	2028	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 5 (2028)	2028	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 5 (2029)	2029	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 6	2029	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 7	2029	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 8	2029	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
												Total 2027	**0.01**	**0.00**
												Total 2028	**0.00**	**0.00**
												Total 2029	**0.00**	**0.00**

Notes:

PM emissions were calculated using the following equation and parameters:

Emission factor (lb/VMT) = k x 0.051 x $(S)^{2.0}$ for PM10 and k x 0.040 x $(S)^{2.5}$ for PM2.5 (AP-42 Table 11.9-1)

k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)

S = Mean Vehicle Speed, default = 7.1 miles/hour per AP-42 Table 11.9-3

VMT = As / Wb X 43,560 (sqft/acre) /5280 (ft/mile)

VMT: vehicle miles traveled

As: the acreage of the grading site (Assumes 0.5 acres per grader per day, 0.5 acres per scraper per day)

Wb: blade width of the grader; assumed Wb = 12 ft

C) Earth Material Loading/Handling
Dust from Material Loading

Activity	Year	Number of Days	Total Amount Handled	Material Amount		Material Amount		Emission Factors		Daily Emissions		Annual Emissions	
								PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
			cy	cy/day	cy/year	ton/day	ton/year	lb/ton	lb/ton	lb/day	lb/day	ton/year	ton/year
Phase 1	2027	26	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 2	2027	23	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 3	2027	51	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 4 (2027)	2027	209	141,086	675.1	141,086	1012.6	211629.6	0.00013	0.000051	0.27	0.10	0.028	0.011
Phase 4 (2028)	2028	103	69,531	675.1	69,531	1012.6	104295.9	0.00013	0.000051	0.27	0.10	0.014	0.005
Phase 5 (2028)	2028	286	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 5 (2029)	2029	26	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 6	2029	75	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 7	2029	26	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 8	2029	25	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
											Total 2027	**0.028**	**0.011**
											Total 2028	**0.014**	**0.005**
											Total 2029	**0.000**	**0.000**

Notes:
Fugitive dust from materials unloading from trains and/or trucks are calculated using the following equations and parameters:
Emission factor (lb/ton) = (k)(0.0032)[(U/5)$^{1.3}$]/[(M/2)$^{1.4}$] (AP-42 13.2.4)
k = particle size constant (0.35 for PM10 and 0.053 for PM2.5)
U = average wind speed = 1.71 m/s (3.83 mph) for Woodinville, Washington (https://weatherspark.com/y/938/Average-Weather-in-Woodinville-Washington-United-States-Year-Round)
M = moisture content = 3.4% (AP-42 Table 13.2.4-1 for Exposed Ground)
Material density 1.5 ton/CY (typical soil density)
Emissions include those from loading and unloading (handling of the material twice).

D) Re-entrained Fugitive Dust Emissions from Vehicle Travel on Paved Roads
Paved Road Fugitive Dust Emissions

Activity	Year	Total VMT	Percent Miles on Paved Road	Miles on Paved Road	PM10	PM2.5
		VMT/year	%	VMT/year	ton/year	ton/year
Phase 1	2027	13,520	90%	12,168	0.01	0.00
Phase 2	2027	23,000	90%	20,700	0.01	0.00
Phase 3	2027	142,800	90%	128,520	0.07	0.02
Phase 4 (2027)	2027	604,010	90%	543,609	0.30	0.07
Phase 4 (2028)	2028	297,670	90%	267,903	0.15	0.04
Phase 5 (2028)	2028	886,600	90%	797,940	0.44	0.11
Phase 5 (2029)	2029	80,600	90%	72,540	0.04	0.01
Phase 6	2029	260,625	95%	247,594	0.14	0.03
Phase 7	2029	49,400	95%	46,930	0.03	0.01
Phase 8	2029	17,500	95%	16,625	0.01	0.00
				Total 2027	**0.38**	**0.10**
				Total 2028	**0.58**	**0.15**
				Total 2029	**0.21**	**0.05**

Notes:
Emission factor (g/VMT) = k X (sL)^0.91 X W^1.02 X (1-P/4N)

		PM10	**PM2.5**
k		1.0	0.25
sL	g/m2	0.20	0.20
W	tons	2.4	2.4
P	days	180	180
N	days	365	365
EF	(g/VMT)	0.495	0.124

Equation from: AP-42 13.2.1
k (particle size multiplier) is from EPA AP-42 Table 13.2.1-1
sL (silt loading) of 0.2 is from EPA AP-42 Table 13.2.1-2 for ADT category 500 - 5000; this is a conservative assumption since the roadways would have higher ADT and lower sL value
W (mean vehicle weight) of 2.4 tons per California Air Resources Board's data at https://ww3.arb.ca.gov/ei/areasrc/fullpdf/2021_paved_roads_7_9.pdf
P = number of days in a year with at least 0.01 inch of precipitation; 180 days used for the calculation per EPA AP-42 Figure 13.2.1-2
N = number of days in the annual average period (default 365)

E) Re-entrained Fugitive Dust Emissions from Vehicle Travel on Unpaved Roads

Activity	Year	Total VMT	Percent Miles on Unpaved Road	Miles on Paved Road	PM_{10}	$PM_{2.5}$
		VMT/year	%	VMT/year	ton/year	ton/year
Phase 1	2027	13,520	10%	1352	0.33	0.03
Phase 2	2027	23,000	10%	2300	0.57	0.06
Phase 3	2027	142,800	10%	14280	3.52	0.35
Phase 4 (2027)	2027	604,010	10%	60401	14.90	1.49
Phase 4 (2028)	2028	297,670	10%	29767	7.34	0.73
Phase 5 (2028)	2028	886,600	10%	88660	21.88	2.19
Phase 5 (2029)	2029	80,600	10%	8060	1.99	0.20
Phase 6	2029	260,625	5%	13031	3.22	0.32
Phase 7	2029	49,400	5%	2470	0.61	0.06
Phase 8	2029	17,500	5%	875	0.22	0.02
				Total 2027	**19.33**	**1.93**
				Total 2028	**29.22**	**2.92**
				Total 2029	**6.03**	**0.60**

Notes:
Emission factor without accounting for precipitation (g/VMT) = k X (s/12)^a X (W/3)^b * 453.6
Emission factor accounting for precipitation (g/VMT) = k X (s/12)^a X (W/3)^b X 453.6 X (365-P)/365

		PM_{10}	**$PM_{2.5}$**
k	lb/VMT	1.5	0.15
a		0.90	0.90
b		0.45	0.45
s	%	8.3	8.3
W	tons	2.4	2.4
P	days	180	180
EF	g/VMT	441.633	44.163
EF with precipitation	g/VMT	223.842	22.384

Equation from: AP-42 13.2.2
k (particle size multiplier) is from EPA AP-42 Table 13.2.2-2
a (constant) is from EPA AP-42 Table 13.2.2-2
b (constant) is from EPA AP-42 Table 13.2.2-2

s (surface material silt content) is the default from California Emission Estimator Model (CalEEMod) tool
W (mean vehicle weight) is the default from California Emission Estimator Model (CalEEMod) tool

P (average number of days with precipitation over 0.01 inch) is 180 days per EPA AP-42 Figure 13.2.2-1

F) Demolition and Debris Loading

				Demolition		Debris Loading		Total	
Activity	Year	Demolished	Debris Weight	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
		ft2	tons/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
Phase 1	2027	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2	2027	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3	2027	57168	2630	0.11	0.02	0.03	0.00	0.14	0.02
Phase 4 (2027)	2027	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 4 (2028)	2028	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 5 (2028)	2028	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 5 (2029)	2029	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 6	2029	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 7	2029	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 8	2029	0	0	0.00	0.00	0.00	0.00	0.00	0.00
		Total 2027		**0.11**	**0.02**	**0.03**	**0.00**	**0.14**	**0.02**
		Total 2028		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
		Total 2029		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Notes:
Emission factor (lb/short ton of debris) = k * (0.0032) * (U/5)^1.3 / (M/2)^1.4

		PM_{10}	$PM_{2.5}$
k		0.35	0.053
U	m/s	1.71	1.71
M	%	3.4%	3.4%
EF	lb/short ton of debris	0.083	0.013

Equation from: AP-42 13.2.4.3

k (particle size multiplier) is from EPA AP-42 Section 13.2.4.3 (0.35 for PM10 and 0.053 for PM2.5)

U (average wind speed) = 1.71 m/s (3.83 mph) for Woodinville, Washington (https://weatherspark.com/y/938/Average-Weather-in-Woodinville-Washington-United-States-Year-Round)

M (moisture content) = 3.4% (AP-42 Table 13.2.4-1 for Exposed Ground)

1 square foot of structure demolition represents 0.046 short ton of waste material per CalEEMod Appendix C Section 4.5.1.

Debris Loading Emission Factor:

$EF_{L\text{-}p} = k \times EF_{L\text{-}TSP}$

Debris Loading Emission factor (lb/short ton of debris) = k * 0.058

		PM_{10}	$PM_{2.5}$
k		0.35	0.053
EF	lb/short ton of debris	0.020	0.003

Debris loading emissions Equation from CalEEMod Appendix Section 4.5.2

k = particle size multiplier.

EF_L = loading dust emission factor (lb/short ton).

$EF_{L\text{-}TSP}$: Used 0.058 lb/short ton, the average of TSP factors (i.e., 0.053 and 0.063 lb/short ton) measured from two tests of the filling of trucks with crushed limestone using a front-end loader (Midwest Research Institute 1988:28)

Summary of Fugitive Dust Emissions

	Annual Emissions	
	PM10	PM2.5
	ton/year	ton/year
Total 2027	**21.67**	**3.04**
Total 2028	**30.59**	**3.50**
Total 2029	**6.43**	**0.76**

Alternative 1b: Asphalt Offgas from Paving - Roadway Construction

Offgas Emissions

Activity	Year	Acres Paved	Emission Factor lb/acre	Annual Emissions VOC ton/year
Phase 1	2027	0	2.62	0.00
Phase 2	2027	0	2.62	0.00
Phase 3	2027	0	2.62	0.00
Phase 4 (2027)	2027	0	2.62	0.00
Phase 4 (2028)	2028	0	2.62	0.00
Phase 5 (2028)	2028	0	2.62	0.00
Phase 5 (2029)	2029	0	2.62	0.00
Phase 6	2029	0	2.62	0.00
Phase 7	2029	4	2.62	0.01
Phase 8	2029	0	2.62	0.00
Total 2027				**0.00**
Total 2028				**0.00**
Total 2029				**0.01**

Note:

1. Offgas emission factor from asphalt paving is from CalEEMod Version 2022.1, Appendix C.

Alternative 1b: Construction Emissions Calculations - Offroad Construction Equipment

Offroad Construction Equipment Emissions - Roadway Construction

						Emission Factors							Emissions							
						VOC	NOx	CO	SOx	PM10	PM2.5	CO2e	VOC	NOx	CO	SOx	PM10	PM2.5	CO2e	
Construction Equipment Name	Number of Equipment	Hours per Day	Number of Days	Total Hours	Year	lb/hour	lb/hour	lb/hour	lb/hour	lb/hour	lb/hour	lb/hour	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year	MOVES Equipment Types
Phase 1																				
Water truck	1	10	26	260	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.004	0.184	0.009	0.000	0.002	0.002	64.479	Off-highway Trucks
Phase 2																				
Low boys	2	4	8	61	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.001	0.043	0.002	0.000	0.001	0.001	15.210	Off-highway Trucks
Excavators	4	4	8	123	2027	0.003	0.076	0.014	0.000	0.003	0.003	120.681	0.000	0.005	0.001	0.000	0.000	0.000	6.715	Excavators
Graders	1	10	23	230	2027	0.003	0.051	0.014	0.000	0.003	0.003	142.936	0.000	0.006	0.002	0.000	0.000	0.000	14.912	graders
Dozers	2	4	8	61	2027	0.007	0.190	0.035	0.000	0.007	0.007	182.442	0.000	0.006	0.001	0.000	0.000	0.000	5.076	Crawler Tractor/Dozers
Off Road Dump Truck	4	4	8	123	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.002	0.087	0.004	0.000	0.001	0.001	30.421	Off-highway Trucks
10 wheeler dump truck and trailer	4	4	8	123	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.002	0.087	0.004	0.000	0.001	0.001	30.421	Off-highway Trucks
fork lifts	2	1	4	8	2027	0.004	0.112	0.024	0.000	0.004	0.003	71.733	0.000	0.000	0.000	0.000	0.000	0.000	0.249	Rough Terrain Forklifts
Cranes	2	1	4	8	2027	0.006	0.119	0.028	0.000	0.005	0.005	116.765	0.000	0.000	0.000	0.000	0.000	0.000	0.406	cranes
Water truck	1	10	23	230	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.003	0.163	0.008	0.000	0.002	0.002	57.039	Off-highway Trucks
Phase 3																				
Excavators	4	10	51	2040	2027	0.003	0.076	0.014	0.000	0.003	0.003	120.681	0.003	0.077	0.014	0.000	0.003	0.003	111.671	Excavators
Dozers	2	5	51	510	2027	0.007	0.190	0.035	0.000	0.007	0.007	182.442	0.002	0.048	0.009	0.000	0.002	0.002	42.205	Crawler Tractor/Dozers
Off Road Dump Truck	2	10	51	1020	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.014	0.721	0.035	0.001	0.010	0.009	252.954	Off-highway Trucks
Water truck	1	8	51	408	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.006	0.288	0.014	0.000	0.004	0.004	101.182	Off-highway Trucks
Phase 4 (2027)																				
Excavators	4	10	209	8360	2027	0.003	0.076	0.014	0.000	0.003	0.003	120.681	0.014	0.317	0.058	0.001	0.012	0.012	457.633	Excavators
Dozers	2	10	209	4180	2027	0.007	0.190	0.035	0.000	0.007	0.007	182.442	0.015	0.396	0.073	0.001	0.014	0.014	345.918	Crawler Tractor/Dozers
Off Road Dump Truck	4	10	209	8360	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.114	5.911	0.283	0.006	0.079	0.077	2073.234	Off-highway Trucks
10 wheeler dump truck and trailer	4	10	139	5573	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.076	3.940	0.189	0.004	0.053	0.051	1382.156	Off-highway Trucks
Water truck	1	10	209	2090	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.029	1.478	0.071	0.002	0.020	0.019	518.309	Off-highway Trucks
Phase 4 (2028)																				
Excavators	4	10	103	4120	2028	0.003	0.072	0.012	0.000	0.003	0.002	120.681	0.007	0.148	0.025	0.001	0.005	0.005	225.532	Excavators
Dozers	2	10	103	2060	2028	0.006	0.175	0.028	0.000	0.006	0.006	182.442	0.006	0.180	0.029	0.001	0.006	0.006	170.477	Crawler Tractor/Dozers
Off Road Dump Truck	4	10	103	4120	2028	0.026	1.404	0.061	0.001	0.018	0.018	546.725	0.054	2.892	0.125	0.003	0.037	0.036	1021.738	Off-highway Trucks
10 wheeler dump truck and trailer	4	10	69	2747	2028	0.026	1.404	0.061	0.001	0.018	0.018	546.725	0.036	1.928	0.084	0.002	0.025	0.024	681.158	Off-highway Trucks
Water truck	1	10	103	1030	2028	0.026	1.404	0.061	0.001	0.018	0.018	546.725	0.014	0.723	0.031	0.001	0.009	0.009	255.434	Off-highway Trucks

Phase 5 (2028)																				
Excavators	2	10	286	5720	2028	0.003	0.072	0.012	0.000	0.003	0.002	120.681	0.009	0.205	0.034	0.001	0.007	0.007	313.117	Excavators
Construction Cranes	2	10	286	5720	2028	0.005	0.103	0.023	0.000	0.004	0.004	116.766	0.016	0.296	0.066	0.001	0.012	0.012	302.961	Cranes
Fork Lifts	2	10	286	5720	2028	0.003	0.105	0.018	0.000	0.003	0.003	71.733	0.009	0.299	0.052	0.001	0.008	0.008	186.119	Rough Terrain Forklifts
Water truck	1	10	286	2860	2028	0.026	1.404	0.061	0.001	0.018	0.018	546.725	0.038	2.008	0.087	0.002	0.026	0.025	709.265	Off-highway Trucks
Phase 5 (2029)																				
Excavators	2	10	26	520	2029	0.003	0.070	0.011	0.000	0.002	0.002	120.681	0.001	0.018	0.003	0.000	0.001	0.001	28.465	Excavators
Construction Cranes	2	10	26	520	2029	0.005	0.092	0.020	0.000	0.004	0.004	116.767	0.001	0.024	0.005	0.000	0.001	0.001	27.542	Cranes
Fork Lifts	2	10	26	520	2029	0.002	0.098	0.014	0.000	0.002	0.002	71.734	0.001	0.026	0.004	0.000	0.001	0.001	16.920	Rough Terrain Forklifts
Water truck	1	10	26	260	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.003	0.182	0.007	0.000	0.002	0.002	64.479	Off-highway Trucks
Phase 6																				
Low Boys	4	8	50	1600	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.021	1.118	0.045	0.001	0.014	0.014	396.792	Off-highway Trucks
Construction Cranes	2	10	75	1500	2029	0.005	0.092	0.020	0.000	0.004	0.004	116.767	0.004	0.069	0.015	0.000	0.003	0.003	79.448	Cranes
Fork Lifts	2	10	75	1500	2029	0.002	0.098	0.014	0.000	0.002	0.002	71.734	0.002	0.074	0.010	0.000	0.002	0.002	48.808	Rough Terrain Forklifts
Water truck	1	10	75	750	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.010	0.524	0.021	0.001	0.007	0.006	185.996	Off-highway Trucks
Phase 7																				
Dozers	2	10	26	520	2029	0.006	0.163	0.022	0.000	0.005	0.005	182.443	0.001	0.042	0.006	0.000	0.001	0.001	43.033	Crawler Tractor/Dozers
10 wheeler dump truck and trailer	2	10	26	520	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.007	0.363	0.015	0.000	0.005	0.004	128.957	Off-highway Trucks
Excavators	2	5	26	260	2029	0.003	0.070	0.011	0.000	0.002	0.002	120.681	0.000	0.009	0.001	0.000	0.000	0.000	14.233	Excavators
Water truck	1	10	26	260	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.003	0.182	0.007	0.000	0.002	0.002	64.479	Off-highway Trucks
Phase 8																				
Water truck	1	10	25	250	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.003	0.175	0.007	0.000	0.002	0.002	61.999	Off-highway Trucks
Total 2027													**0.285**	**13.758**	**0.776**	**0.016**	**0.205**	**0.199**	**5510.190**	
Total 2028													**0.188**	**8.679**	**0.533**	**0.011**	**0.136**	**0.132**	**3865.801**	
Total 2029													**0.057**	**2.806**	**0.147**	**0.003**	**0.040**	**0.039**	**1161.150**	

Note:

1. Emission factors were obtained from a MOVES4 Nonroad Module run for King County, weekdays, 12-month average, based on MOVES4 defaults.
2. All equipment assumed to be diesel-fueled.

Alternative 1b: Construction Emissions Calculations - Onroad Vehicles

Onroad Vehicles Emissions - Roadway Construction

								Emission Factors							Emissions						
		Number of	Number of RTs/day per		Number of	Total Vehicle		VOC	NOx	CO	SOx	PM10	PM2.5	CO2e	VOC	NOx	CO	SOx	PM10	PM2.5	CO2e
Vehicles	Type	Vehicles	Vehicle	Miles/RT	Days	Miles	Year	g/mile	g/mile	g/mile	g/mile	g/mile	g/mile	g/mile	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year
Phase 1																					
Worker commute	Passenger	4	1	30	26	3120	2027	0.028	0.164	3.460	0.002	0.034	0.007	333.608	0.000	0.001	0.012	0.000	0.000	0.000	1.041
Haul trucks	Haul	0	0	0	26	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	0	0	0	26	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	26	10400	2027	0.041	0.170	3.023	0.002	0.035	0.007	355.134	0.000	0.002	0.035	0.000	0.000	0.000	3.693
Phase 2																					
Worker commute	Passenger	20	1	30	23	13800	2027	0.028	0.164	3.460	0.002	0.034	0.007	333.608	0.000	0.002	0.053	0.000	0.001	0.000	4.604
Haul trucks	Haul	0	0	0	23	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	0	0	0	23	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	23	9200	2027	0.041	0.170	3.023	0.002	0.035	0.007	355.134	0.000	0.002	0.031	0.000	0.000	0.000	3.267
Phase 3																					
Worker commute	Passenger	40	1	30	51	61200	2027	0.028	0.164	3.460	0.002	0.034	0.007	333.608	0.002	0.011	0.233	0.000	0.002	0.000	20.417
Haul trucks	Haul	1	40	30	51	61200	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.018	0.444	0.167	0.000	0.028	0.017	99.000
Concrete trucks	Haul	0	0	0	51	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	51	20400	2027	0.041	0.170	3.023	0.002	0.035	0.007	355.134	0.001	0.004	0.068	0.000	0.001	0.000	7.245
Phase 4 (2027)																					
Worker commute	Passenger	40	1	30	209	250800	2027	0.028	0.164	3.460	0.002	0.034	0.007	333.608	0.008	0.045	0.956	0.000	0.009	0.002	83.669
Haul trucks	Haul	1	68	30	209	426360	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.127	3.095	1.162	0.003	0.192	0.118	689.697
Concrete trucks	Haul	0	0	0	209	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	209	83600	2027	0.041	0.170	3.023	0.002	0.035	0.007	355.134	0.004	0.016	0.279	0.000	0.003	0.001	29.689
Phase 4 (2028)																					
Worker commute	Passenger	40	1	30	103	123600	2028	0.023	0.140	3.273	0.002	0.034	0.006	323.510	0.003	0.019	0.446	0.000	0.005	0.001	39.986
Haul trucks	Haul	1	68	30	103	210120	2028	0.246	5.850	2.367	0.005	0.349	0.196	1598.680	0.057	1.355	0.548	0.001	0.081	0.045	335.915
Concrete trucks	Haul	0	0	0	103	0	2028	0.246	5.850	2.367	0.005	0.349	0.196	1598.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	103	41200	2028	0.033	0.154	2.724	0.002	0.035	0.007	346.110	0.001	0.007	0.124	0.000	0.002	0.000	14.260
Phase 5 (2028)																					
Worker commute	Passenger	40	1	30	286	343200	2028	0.023	0.140	3.273	0.002	0.034	0.006	323.510	0.009	0.053	1.238	0.001	0.013	0.002	111.029
Haul trucks	Haul	0	0	0	286	0	2028	0.246	5.850	2.367	0.005	0.349	0.196	1598.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	1	50	30	286	429000	2028	0.246	5.850	2.367	0.005	0.349	0.196	1598.680	0.117	2.766	1.119	0.002	0.165	0.093	685.834
Onsite pickups	Pickup	4	1	100	286	114400	2028	0.033	0.154	2.724	0.002	0.035	0.007	346.110	0.004	0.019	0.343	0.000	0.004	0.001	39.595
Phase 5 (2029)																					
Worker commute	Passenger	40	1	30	26	31200	2029	0.019	0.100	3.019	0.002	0.033	0.006	313.072	0.001	0.003	0.104	0.000	0.001	0.000	9.768
Haul trucks	Haul	0	0	0	26	0	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	1	50	30	26	39000	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.010	0.212	0.097	0.000	0.014	0.008	61.636
Onsite pickups	Pickup	4	1	100	26	10400	2029	0.029	0.121	2.518	0.002	0.034	0.007	335.542	0.000	0.001	0.029	0.000	0.000	0.000	3.490
Phase 6																					
Worker commute	Passenger	40	1	30	75	90000	2029	0.019	0.100	3.019	0.002	0.033	0.006	313.072	0.002	0.010	0.300	0.000	0.003	0.001	28.176
Haul trucks	Haul	1	25	30	62.5	46875	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.011	0.255	0.117	0.000	0.017	0.009	74.081
Concrete trucks	Haul	1	50	30	62.5	93750	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.023	0.510	0.234	0.001	0.034	0.018	148.163
Onsite pickups	Pickup	4	1	100	75	30000	2029	0.029	0.121	2.518	0.002	0.034	0.007	335.542	0.001	0.004	0.083	0.000	0.001	0.000	10.066
Phase 7																					
Worker commute	Passenger	20	1	30	26	15600	2029	0.019	0.100	3.019	0.002	0.033	0.006	313.072	0.000	0.002	0.052	0.000	0.001	0.000	4.884
Haul trucks	Haul	1	30	30	26	23400	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.006	0.127	0.058	0.000	0.008	0.005	36.981
Concrete trucks	Haul	0	0	0	26	0	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	26	10400	2029	0.029	0.121	2.518	0.002	0.034	0.007	335.542	0.000	0.001	0.029	0.000	0.000	0.000	3.490
Phase 8																					
Worker commute	Passenger	10	1	30	25	7500	2029	0.019	0.100	3.019	0.002	0.033	0.006	313.072	0.000	0.001	0.025	0.000	0.000	0.000	2.348
Haul trucks	Haul	0	0	0	25	0	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	0	0	0	25	0	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	25	10000	2029	0.029	0.121	2.518	0.002	0.034	0.007	335.542	0.000	0.001	0.028	0.000	0.000	0.000	3.355
Total 2027															**0.161**	**3.622**	**2.995**	**0.004**	**0.237**	**0.138**	**942.321**
Total 2028															**0.191**	**4.220**	**3.819**	**0.005**	**0.269**	**0.143**	**1226.618**
Total 2029															**0.055**	**1.129**	**1.156**	**0.002**	**0.081**	**0.041**	**386.438**

Notes:

1. Emission factors were obtained from MOVES4 Onroad Module runs at the Project Scale for King County at the annual level for weekdays. Emission factors represent the maximum emission rate between winter and summer afternoons.
2. Passenger vehicles included gasoline cars and gasoline trucks. Emission factors represent the higher emission rate of the two types of vehicles.
3. PM emission factors includes tire wear and brake wear.
4. Emission factors are at an average vehicle speed of 40 mph.

Alternative 1b: Fugitive Dust Emissions - Roadway Construction

A) Bulldozing - Demolition

Fugitive dust emissions from bulldozing

Activity	Year	Equipment Type	Number of Equipment	Daily Hours	Days	Emission Factor PM_{10} lb/hr	Emission Factor $PM_{2.5}$ lb/hr	Daily Emissions PM_{10} lb/day	Daily Emissions $PM_{2.5}$ lb/day	Annual Emissions PM_{10} ton/year	Annual Emissions $PM_{2.5}$ ton/year
Phase 1	2027	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
Phase 2	2027	Dozer or Similar	2	4	8	0.753	0.414	6.02	3.31	0.02	0.01
Phase 3	2027	Dozer or Similar	2	5	51	0.753	0.414	7.53	4.14	0.19	0.11
Phase 4 (2027)	2027	Dozer or Similar	2	10	209	0.753	0.414	15.06	8.28	1.57	0.86
Phase 4 (2028)	2028	Dozer or Similar	2	10	103	0.753	0.414	15.06	8.28	0.78	0.43
Phase 5 (2028)	2028	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
Phase 5 (2029)	2029	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
Phase 6	2029	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
Phase 7	2029	Dozer or Similar	2	10	26	0.753	0.414	15.06	8.28	0.20	0.11
Phase 8	2029	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
									Total 2027	**1.79**	**0.98**
									Total 2028	**0.78**	**0.43**
									Total 2029	**0.20**	**0.11**

Notes:

PM emissions were calculated using the following equation and parameters (AP-42 Table 11.9-1 for Bulldozing, Overburden):

Emission Factor (lb/hr)= k x $(s)^{1.5}$ / $(M)^{1.4}$ For PM10 and k x 5.7 x $(s)^{1.2}$ / $(M)^{1.3}$ for PM2.5

k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)

s = Silt Content (6.9% per AP-42 Table 11.9-3 default for overburden)

M = Moisture Content (7.9% per AP-42 Table 11.9-3 default for overburden)

B) Grading

Fugitive dust emissions from grading

Activity	Year	Equipment Type	Number of Grading Equipment	# Acres/Equipment	Acreage Graded/Day	Number of Days	Grader/Scraper VMT miles/day	Grader/Scraper VMT miles/year	Emission Factors PM10 lb/VMT	Emission Factors PM2.5 lb/VMT	Daily Emissions PM10 lb/day	Daily Emissions PM2.5 lb/day	Annual Emissions PM10 ton/year	Annual Emissions PM2.5 ton/year
Phase 1	2027	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 2	2027	Grader	1	0.5	0.5	23	0.34	7.91	1.54	0.167	0.53	0.06	0.01	0.00
Phase 3	2027	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 4 (2027)	2027	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 4 (2028)	2028	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 5 (2028)	2028	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 5 (2029)	2029	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 6	2029	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 7	2029	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 8	2029	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
												Total 2027	**0.01**	**0.00**
												Total 2028	**0.00**	**0.00**
												Total 2029	**0.00**	**0.00**

Notes:

PM emissions were calculated using the following equation and parameters:

Emission factor (lb/VMT) = k x 0.051 x $(S)^{2.0}$ for PM10 and k x 0.040 x $(S)^{2.5}$ for PM2.5 (AP-42 Table 11.9-1)

k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)

S = Mean Vehicle Speed, default = 7.1 miles/hour per AP-42 Table 11.9-3

VMT = As / Wb X 43,560 (sqft/acre) /5280 (ft/mile)

VMT: vehicle miles traveled

As: the acreage of the grading site (Assumes 0.5 acres per grader per day, 0.5 acres per scraper per day)

Wb: blade width of the grader; assumed Wb = 12 ft

C) Earth Material Loading/Handling
Dust from Material Loading

Activity	Year	Number of Days	Total Amount Handled	Material Amount		Material Amount		Emission Factors		Daily Emissions		Annual Emissions	
								PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
			cy	cy/day	cy/year	ton/day	ton/year	lb/ton	lb/ton	lb/day	lb/day	ton/year	ton/year
Phase 1	2027	26	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 2	2027	23	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 3	2027	51	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 4 (2027)	2027	209	245,913	1176.6	245,913	1764.9	368869.9	0.00013	0.000051	0.47	0.18	0.049	0.019
Phase 4 (2028)	2028	103	121,192	1176.6	121,192	1764.9	181787.6	0.00013	0.000051	0.47	0.18	0.024	0.009
Phase 5 (2028)	2028	286	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 5 (2029)	2029	26	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 6	2029	75	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 7	2029	26	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 8	2029	25	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
											Total 2027	**0.049**	**0.019**
											Total 2028	**0.024**	**0.009**
											Total 2029	**0.000**	**0.000**

Notes:
Fugitive dust from materials unloading from trains and/or trucks are calculated using the following equations and parameters:
Emission factor (lb/ton) = (k)(0.0032)[(U/5)$^{1.3}$]/[(M/2)$^{1.4}$] (AP-42 13.2.4)
k = particle size constant (0.35 for PM10 and 0.053 for PM2.5)
U = average wind speed = 1.71 m/s (3.83 mph) for Woodinville, Washington (https://weatherspark.com/y/938/Average-Weather-in-Woodinville-Washington-United-States-Year-Round)
M = moisture content = 3.4% (AP-42 Table 13.2.4-1 for Exposed Ground)
Material density 1.5 ton/CY (typical soil density)
Emissions include those from loading and unloading (handling of the material twice).

D) Re-entrained Fugitive Dust Emissions from Vehicle Travel on Paved Roads
Paved Road Fugitive Dust Emissions

Activity	Year	Total VMT	Percent Miles on Paved Road	Miles on Paved Road	PM10	PM2.5
		VMT/year	%	VMT/year	ton/year	ton/year
Phase 1	2027	13,520	90%	12,168	0.01	0.00
Phase 2	2027	23,000	90%	20,700	0.01	0.00
Phase 3	2027	142,800	90%	128,520	0.07	0.02
Phase 4 (2027)	2027	760,760	90%	684,684	0.37	0.09
Phase 4 (2028)	2028	374,920	90%	337,428	0.18	0.05
Phase 5 (2028)	2028	886,600	90%	797,940	0.44	0.11
Phase 5 (2029)	2029	80,600	90%	72,540	0.04	0.01
Phase 6	2029	260,625	95%	247,594	0.14	0.03
Phase 7	2029	49,400	95%	46,930	0.03	0.01
Phase 8	2029	17,500	95%	16,625	0.01	0.00
				Total 2027	**0.46**	**0.12**
				Total 2028	**0.62**	**0.15**
				Total 2029	**0.21**	**0.05**

Notes:
Emission factor (g/VMT) = k X (sL)^0.91 X W^1.02 X (1-P/4N)

		PM10	**PM2.5**
k		1.0	0.25
sL	g/m2	0.20	0.20
W	tons	2.4	2.4
P	days	180	180
N	days	365	365
EF	(g/VMT)	0.495	0.124

Equation from: AP-42 13.2.1
k (particle size multiplier) is from EPA AP-42 Table 13.2.1-1
sL (silt loading) of 0.2 is from EPA AP-42 Table 13.2.1-2 for ADT category 500 - 5000; this is a conservative assumption since the roadways would have higher ADT and lower sL value
W (mean vehicle weight) of 2.4 tons per California Air Resources Board's data at https://ww3.arb.ca.gov/ei/areasrc/fullpdf/2021_paved_roads_7_9.pdf
P = number of days in a year with at least 0.01 inch of precipitation; 180 days used for the calculation per EPA AP-42 Figure 13.2.1-2
N = number of days in the annual average period (default 365)

E) Re-entrained Fugitive Dust Emissions from Vehicle Travel on Unpaved Roads

Activity	Year	Total VMT	Percent Miles on Unpaved Road	Miles on Paved Road	PM_{10}	$PM_{2.5}$
		VMT/year	%	VMT/year	ton/year	ton/year
Phase 1	2027	13,520	10%	1352	0.33	0.03
Phase 2	2027	23,000	10%	2300	0.57	0.06
Phase 3	2027	142,800	10%	14280	3.52	0.35
Phase 4 (2027)	2027	760,760	10%	76076	18.77	1.88
Phase 4 (2028)	2028	374,920	10%	37492	9.25	0.93
Phase 5 (2028)	2028	886,600	10%	88660	21.88	2.19
Phase 5 (2029)	2029	80,600	10%	8060	1.99	0.20
Phase 6	2029	260,625	5%	13031	3.22	0.32
Phase 7	2029	49,400	5%	2470	0.61	0.06
Phase 8	2029	17,500	5%	875	0.22	0.02
				Total 2027	**23.20**	**2.32**
				Total 2028	**31.13**	**3.11**
				Total 2029	**6.03**	**0.60**

Notes:
Emission factor without accounting for precipitation (g/VMT) = k X (s/12)^a X (W/3)^b * 453.6
Emission factor accounting for precipitation (g/VMT) = k X (s/12)^a X (W/3)^b X 453.6 X (365-P)/365

		PM_{10}	**$PM_{2.5}$**
k	lb/VMT	1.5	0.15
a		0.90	0.90
b		0.45	0.45
s	%	8.3	8.3
W	tons	2.4	2.4
P	days	180	180
EF	g/VMT	441.633	44.163
EF with precipitation	g/VMT	223.842	22.384

Equation from: AP-42 13.2.2
k (particle size multiplier) is from EPA AP-42 Table 13.2.2-2
a (constant) is from EPA AP-42 Table 13.2.2-2
b (constant) is from EPA AP-42 Table 13.2.2-2

s (surface material silt content) is the default from California Emission Estimator Model (CalEEMod) tool
W (mean vehicle weight) is the default from California Emission Estimator Model (CalEEMod) tool

P (average number of days with precipitation over 0.01 inch) is 180 days per EPA AP-42 Figure 13.2.2-1

F) Demolition and Debris Loading

				Demolition		Debris Loading		Total	
Activity	Year	Demolished	Debris Weight	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
		ft2	tons/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
Phase 1	2027	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2	2027	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3	2027	57168	2630	0.11	0.02	0.03	0.00	0.14	0.02
Phase 4 (2027)	2027	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 4 (2028)	2028	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 5 (2028)	2028	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 5 (2029)	2029	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 6	2029	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 7	2029	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 8	2029	0	0	0.00	0.00	0.00	0.00	0.00	0.00
		Total 2027		**0.11**	**0.02**	**0.03**	**0.00**	**0.14**	**0.02**
		Total 2028		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
		Total 2029		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Notes:
Emission factor (lb/short ton of debris) = k * (0.0032) * (U/5)^1.3 / (M/2)^1.4

		PM_{10}	$PM_{2.5}$
k		0.35	0.053
U	m/s	1.71	1.71
M	%	3.4%	3.4%
EF	lb/short ton of debris	0.083	0.013

Equation from: AP-42 13.2.4.3

k (particle size multiplier) is from EPA AP-42 Section 13.2.4.3 (0.35 for PM10 and 0.053 for PM2.5)

U (average wind speed) = 1.71 m/s (3.83 mph) for Woodinville, Washington (https://weatherspark.com/y/938/Average-Weather-in-Woodinville-Washington-United-States-Year-Round)

M (moisture content) = 3.4% (AP-42 Table 13.2.4-1 for Exposed Ground)

1 square foot of structure demolition represents 0.046 short ton of waste material per CalEEMod Appendix C Section 4.5.1.

Debris Loading Emission Factor:

$EF_{L\text{-}p} = k \times EF_{L\text{-}TSP}$

Debris Loading Emission factor (lb/short ton of debris) = k * 0.058

		PM_{10}	$PM_{2.5}$
k		0.35	0.053
EF	lb/short ton of debris	0.020	0.003

Debris loading emissions Equation from CalEEMod Appendix Section 4.5.2

k = particle size multiplier.

EF_L = loading dust emission factor (lb/short ton).

$EF_{L\text{-}TSP}$: Used 0.058 lb/short ton, the average of TSP factors (i.e., 0.053 and 0.063 lb/short ton) measured from two tests of the filling of trucks with crushed limestone using a front-end loader (Midwest Research Institute 1988:28)

Summary of Fugitive Dust Emissions

	Annual Emissions	
	PM10	PM2.5
	ton/year	ton/year
Total 2027	**25.64**	**3.46**
Total 2028	**32.55**	**3.70**
Total 2029	**6.43**	**0.76**

Alternative 1b: Asphalt Offgas from Paving - Roadway Construction

Offgas Emissions

Activity	Year	Acres Paved	Emission Factor lb/acre	Annual Emissions VOC ton/year
Phase 1	2027	0	2.62	0.00
Phase 2	2027	0	2.62	0.00
Phase 3	2027	0	2.62	0.00
Phase 4 (2027)	2027	0	2.62	0.00
Phase 4 (2028)	2028	0	2.62	0.00
Phase 5 (2028)	2028	0	2.62	0.00
Phase 5 (2029)	2029	0	2.62	0.00
Phase 6	2029	0	2.62	0.00
Phase 7	2029	4	2.62	0.01
Phase 8	2029	0	2.62	0.00
Total 2027				**0.00**
Total 2028				**0.00**
Total 2029				**0.01**

Note:

1. Offgas emission factor from asphalt paving is from CalEEMod Version 2022.1, Appendix C.

Alternatiive 2: Construction Emissions Calculations - Offroad Construction Equipment

Offroad Construction Equipment Emissions - Roadway Construction

						Emission Factors							Emissions							
						VOC	NOx	CO	SOx	PM10	PM2.5	CO2e	VOC	NOx	CO	SOx	PM10	PM2.5	CO2e	
Construction Equipment Name	Number of Equipment	Hours per Day	Number of Days	Total Hours	Year	lb/hour	lb/hour	lb/hour	lb/hour	lb/hour	lb/hour	lb/hour	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year	MOVES Equipment Types
Phase 1																				
Water truck	1	10	26	260	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.004	0.184	0.009	0.000	0.002	0.002	64.479	Off-highway Trucks
Phase 2																				
Low boys	2	4	8	61	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.001	0.043	0.002	0.000	0.001	0.001	15.210	Off-highway Trucks
Excavators	4	4	8	123	2027	0.003	0.076	0.014	0.000	0.003	0.003	120.681	0.000	0.005	0.001	0.000	0.000	0.000	6.715	Excavators
Graders	1	10	23	230	2027	0.003	0.051	0.014	0.000	0.003	0.003	142.936	0.000	0.006	0.002	0.000	0.000	0.000	14.912	graders
Dozers	2	4	8	61	2027	0.007	0.190	0.035	0.000	0.007	0.007	182.442	0.000	0.006	0.001	0.000	0.000	0.000	5.076	Crawler Tractor/Dozers
Off Road Dump Truck	4	4	8	123	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.002	0.087	0.004	0.000	0.001	0.001	30.421	Off-highway Trucks
10 wheeler dump truck and trailer	4	4	8	123	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.002	0.087	0.004	0.000	0.001	0.001	30.421	Off-highway Trucks
fork lifts	2	1	4	8	2027	0.004	0.112	0.024	0.000	0.004	0.003	71.733	0.000	0.000	0.000	0.000	0.000	0.000	0.249	Rough Terrain Forklifts
Cranes	2	1	4	8	2027	0.006	0.119	0.028	0.000	0.005	0.005	116.765	0.000	0.000	0.000	0.000	0.000	0.000	0.406	cranes
Water truck	1	10	23	230	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.003	0.163	0.008	0.000	0.002	0.002	57.039	Off-highway Trucks
Phase 3																				
Excavators	4	10	51	2040	2027	0.003	0.076	0.014	0.000	0.003	0.003	120.681	0.003	0.077	0.014	0.000	0.003	0.003	111.671	Excavators
Dozers	2	5	51	510	2027	0.007	0.190	0.035	0.000	0.007	0.007	182.442	0.002	0.048	0.009	0.000	0.002	0.002	42.205	Crawler Tractor/Dozers
Off Road Dump Truck	2	10	51	1020	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.014	0.721	0.035	0.001	0.010	0.009	252.954	Off-highway Trucks
Water truck	1	8	51	408	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.006	0.288	0.014	0.000	0.004	0.004	101.182	Off-highway Trucks
Phase 4 (2027)																				
Excavators	4	10	209	8360	2027	0.003	0.076	0.014	0.000	0.003	0.003	120.681	0.014	0.317	0.058	0.001	0.012	0.012	457.633	Excavators
Dozers	2	10	209	4180	2027	0.007	0.190	0.035	0.000	0.007	0.007	182.442	0.015	0.396	0.073	0.001	0.014	0.014	345.918	Crawler Tractor/Dozers
Off Road Dump Truck	4	10	209	8360	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.114	5.911	0.283	0.006	0.079	0.077	2073.234	Off-highway Trucks
10 wheeler dump truck and trailer	4	10	139	5573	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.076	3.940	0.189	0.004	0.053	0.051	1382.156	Off-highway Trucks
Water truck	1	10	209	2090	2027	0.027	1.414	0.068	0.001	0.019	0.018	546.725	0.029	1.478	0.071	0.002	0.020	0.019	518.309	Off-highway Trucks
Phase 4 (2028)																				
Excavators	4	10	103	4120	2028	0.003	0.072	0.012	0.000	0.003	0.002	120.681	0.007	0.148	0.025	0.001	0.005	0.005	225.532	Excavators
Dozers	2	10	103	2060	2028	0.006	0.175	0.028	0.000	0.006	0.006	182.442	0.006	0.180	0.029	0.001	0.006	0.006	170.477	Crawler Tractor/Dozers
Off Road Dump Truck	4	10	103	4120	2028	0.026	1.404	0.061	0.001	0.018	0.018	546.725	0.054	2.892	0.125	0.003	0.037	0.036	1021.738	Off-highway Trucks
10 wheeler dump truck and trailer	4	10	69	2747	2028	0.026	1.404	0.061	0.001	0.018	0.018	546.725	0.036	1.928	0.084	0.002	0.025	0.024	681.158	Off-highway Trucks
Water truck	1	10	103	1030	2028	0.026	1.404	0.061	0.001	0.018	0.018	546.725	0.014	0.723	0.031	0.001	0.009	0.009	255.434	Off-highway Trucks

Phase 5 (2028)																				
Excavators	2	10	286	5720	2028	0.003	0.072	0.012	0.000	0.003	0.002	120.681	0.009	0.205	0.034	0.001	0.007	0.007	313.117	Excavators
Construction Cranes	2	10	286	5720	2028	0.005	0.103	0.023	0.000	0.004	0.004	116.766	0.016	0.296	0.066	0.001	0.012	0.012	302.961	Cranes
Fork Lifts	2	10	286	5720	2028	0.003	0.105	0.018	0.000	0.003	0.003	71.733	0.009	0.299	0.052	0.001	0.008	0.008	186.119	Rough Terrain Forklifts
Water truck	1	10	286	2860	2028	0.026	1.404	0.061	0.001	0.018	0.018	546.725	0.038	2.008	0.087	0.002	0.026	0.025	709.265	Off-highway Trucks
Phase 5 (2029)																				
Excavators	2	10	26	520	2029	0.003	0.070	0.011	0.000	0.002	0.002	120.681	0.001	0.018	0.003	0.000	0.001	0.001	28.465	Excavators
Construction Cranes	2	10	26	520	2029	0.005	0.092	0.020	0.000	0.004	0.004	116.767	0.001	0.024	0.005	0.000	0.001	0.001	27.542	Cranes
Fork Lifts	2	10	26	520	2029	0.002	0.098	0.014	0.000	0.002	0.002	71.734	0.001	0.026	0.004	0.000	0.001	0.001	16.920	Rough Terrain Forklifts
Water truck	1	10	26	260	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.003	0.182	0.007	0.000	0.002	0.002	64.479	Off-highway Trucks
Phase 6																				
Low Boys	4	8	50	1600	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.021	1.118	0.045	0.001	0.014	0.014	396.792	Off-highway Trucks
Construction Cranes	2	10	75	1500	2029	0.005	0.092	0.020	0.000	0.004	0.004	116.767	0.004	0.069	0.015	0.000	0.003	0.003	79.448	Cranes
Fork Lifts	2	10	75	1500	2029	0.002	0.098	0.014	0.000	0.002	0.002	71.734	0.002	0.074	0.010	0.000	0.002	0.002	48.808	Rough Terrain Forklifts
Water truck	1	10	75	750	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.010	0.524	0.021	0.001	0.007	0.006	185.996	Off-highway Trucks
Phase 7																				
Dozers	2	10	26	520	2029	0.006	0.163	0.022	0.000	0.005	0.005	182.443	0.001	0.042	0.006	0.000	0.001	0.001	43.033	Crawler Tractor/Dozers
10 wheeler dump truck and trailer	2	10	26	520	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.007	0.363	0.015	0.000	0.005	0.004	128.957	Off-highway Trucks
Excavators	2	5	26	260	2029	0.003	0.070	0.011	0.000	0.002	0.002	120.681	0.000	0.009	0.001	0.000	0.000	0.000	14.233	Excavators
Water truck	1	10	26	260	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.003	0.182	0.007	0.000	0.002	0.002	64.479	Off-highway Trucks
Phase 8																				
Water truck	1	10	25	250	2029	0.026	1.398	0.056	0.001	0.017	0.017	546.726	0.003	0.175	0.007	0.000	0.002	0.002	61.999	Off-highway Trucks
Total 2027													**0.285**	**13.758**	**0.776**	**0.016**	**0.205**	**0.199**	**5510.190**	
Total 2028													**0.188**	**8.679**	**0.533**	**0.011**	**0.136**	**0.132**	**3865.801**	
Total 2029													**0.057**	**2.806**	**0.147**	**0.003**	**0.040**	**0.039**	**1161.150**	

Note:

1. Emission factors were obtained from a MOVES4 Nonroad Module run for King County, weekdays, 12-month average, based on MOVES4 defaults.
2. All equipment assumed to be diesel-fueled.

Alternative 2: Construction Emissions Calculations - Onroad Vehicles

Onroad Vehicles Emissions - Roadway Construction

								Emission Factors							Emissions						
		Number of	Number of RTs/day per		Number of	Total Vehicle		VOC	NOx	CO	SOx	PM10	PM2.5	CO2e	VOC	NOx	CO	SOx	PM10	PM2.5	CO2e
Vehicles	Type	Vehicles	Vehicle	Miles/RT	Days	Miles	Year	g/mile	g/mile	g/mile	g/mile	g/mile	g/mile	g/mile	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year
Phase 1																					
Worker commute	Passenger	4	1	30	26	3120	2027	0.028	0.164	3.460	0.002	0.034	0.007	333.608	0.000	0.001	0.012	0.000	0.000	0.000	1.041
Haul trucks	Haul	0	0	0	26	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	0	0	0	26	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	26	10400	2027	0.041	0.170	3.023	0.002	0.035	0.007	355.134	0.000	0.002	0.035	0.000	0.000	0.000	3.693
Phase 2																					
Worker commute	Passenger	20	1	30	23	13800	2027	0.028	0.164	3.460	0.002	0.034	0.007	333.608	0.000	0.002	0.053	0.000	0.001	0.000	4.604
Haul trucks	Haul	0	0	0	23	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	0	0	0	23	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	23	9200	2027	0.041	0.170	3.023	0.002	0.035	0.007	355.134	0.000	0.002	0.031	0.000	0.000	0.000	3.267
Phase 3																					
Worker commute	Passenger	40	1	30	51	61200	2027	0.028	0.164	3.460	0.002	0.034	0.007	333.608	0.002	0.011	0.233	0.000	0.002	0.000	20.417
Haul trucks	Haul	1	40	30	51	61200	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.018	0.444	0.167	0.000	0.028	0.017	99.000
Concrete trucks	Haul	0	0	0	51	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	51	20400	2027	0.041	0.170	3.023	0.002	0.035	0.007	355.134	0.001	0.004	0.068	0.000	0.001	0.000	7.245
Phase 4 (2027)																					
Worker commute	Passenger	40	1	30	209	250800	2027	0.028	0.164	3.460	0.002	0.034	0.007	333.608	0.008	0.045	0.956	0.000	0.009	0.002	83.669
Haul trucks	Haul	1	16	30	209	100320	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.030	0.728	0.273	0.001	0.045	0.028	162.282
Concrete trucks	Haul	0	0	0	209	0	2027	0.270	6.586	2.473	0.005	0.409	0.251	1617.640	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	209	83600	2027	0.041	0.170	3.023	0.002	0.035	0.007	355.134	0.004	0.016	0.279	0.000	0.003	0.001	29.689
Phase 4 (2028)																					
Worker commute	Passenger	40	1	30	103	123600	2028	0.023	0.140	3.273	0.002	0.034	0.006	323.510	0.003	0.019	0.446	0.000	0.005	0.001	39.986
Haul trucks	Haul	1	16	30	103	49440	2028	0.246	5.850	2.367	0.005	0.349	0.196	1598.680	0.013	0.319	0.129	0.000	0.019	0.011	79.039
Concrete trucks	Haul	0	0	0	103	0	2028	0.246	5.850	2.367	0.005	0.349	0.196	1598.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	103	41200	2028	0.033	0.154	2.724	0.002	0.035	0.007	346.110	0.001	0.007	0.124	0.000	0.002	0.000	14.260
Phase 5 (2028)																					
Worker commute	Passenger	40	1	30	286	343200	2028	0.023	0.140	3.273	0.002	0.034	0.006	323.510	0.009	0.053	1.238	0.001	0.013	0.002	111.029
Haul trucks	Haul	0	0	0	286	0	2028	0.246	5.850	2.367	0.005	0.349	0.196	1598.680	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	1	50	30	286	429000	2028	0.246	5.850	2.367	0.005	0.349	0.196	1598.680	0.117	2.766	1.119	0.002	0.165	0.093	685.834
Onsite pickups	Pickup	4	1	100	286	114400	2028	0.033	0.154	2.724	0.002	0.035	0.007	346.110	0.004	0.019	0.343	0.000	0.004	0.001	39.595
Phase 5 (2029)																					
Worker commute	Passenger	40	1	30	26	31200	2029	0.019	0.100	3.019	0.002	0.033	0.006	313.072	0.001	0.003	0.104	0.000	0.001	0.000	9.768
Haul trucks	Haul	0	0	0	26	0	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	1	50	30	26	39000	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.010	0.212	0.097	0.000	0.014	0.008	61.636
Onsite pickups	Pickup	4	1	100	26	10400	2029	0.029	0.121	2.518	0.002	0.034	0.007	335.542	0.000	0.001	0.029	0.000	0.000	0.000	3.490
Phase 6																					
Worker commute	Passenger	40	1	30	75	90000	2029	0.019	0.100	3.019	0.002	0.033	0.006	313.072	0.002	0.010	0.300	0.000	0.003	0.001	28.176
Haul trucks	Haul	1	25	30	62.5	46875	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.011	0.255	0.117	0.000	0.017	0.009	74.081
Concrete trucks	Haul	1	50	30	62.5	93750	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.023	0.510	0.234	0.001	0.034	0.018	148.163
Onsite pickups	Pickup	4	1	100	75	30000	2029	0.029	0.121	2.518	0.002	0.034	0.007	335.542	0.001	0.004	0.083	0.000	0.001	0.000	10.066
Phase 7																					
Worker commute	Passenger	20	1	30	26	15600	2029	0.019	0.100	3.019	0.002	0.033	0.006	313.072	0.000	0.002	0.052	0.000	0.001	0.000	4.884
Haul trucks	Haul	1	30	30	26	23400	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.006	0.127	0.058	0.000	0.008	0.005	36.981
Concrete trucks	Haul	0	0	0	26	0	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	26	10400	2029	0.029	0.121	2.518	0.002	0.034	0.007	335.542	0.000	0.001	0.029	0.000	0.000	0.000	3.490
Phase 8																					
Worker commute	Passenger	10	1	30	25	7500	2029	0.019	0.100	3.019	0.002	0.033	0.006	313.072	0.000	0.001	0.025	0.000	0.000	0.000	2.348
Haul trucks	Haul	0	0	0	25	0	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Concrete trucks	Haul	0	0	0	25	0	2029	0.222	4.938	2.267	0.005	0.327	0.177	1580.400	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Onsite pickups	Pickup	4	1	100	25	10000	2029	0.029	0.121	2.518	0.002	0.034	0.007	335.542	0.000	0.001	0.028	0.000	0.000	0.000	3.355
Total 2027															**0.064**	**1.255**	**2.106**	**0.002**	**0.090**	**0.048**	**414.906**
Total 2028															**0.148**	**3.184**	**3.400**	**0.004**	**0.207**	**0.108**	**969.742**
Total 2029															**0.055**	**1.129**	**1.156**	**0.002**	**0.081**	**0.041**	**386.438**

Notes:

1. Emission factors were obtained from MOVES4 Onroad Module runs at the Project Scale for King County at the annual level for weekdays. Emission factors represent the maximum emission rate between winter and summer afternoons.
2. Passenger vehicles included gasoline cars and gasoline trucks. Emission factors represent the higher emission rate of the two types of vehicles.
3. PM emission factors includes tire wear and brake wear.
4. Emission factors are at an average vehicle speed of 40 mph.

Alternative 2: Fugitive Dust Emissions - Roadway Construction

A) Bulldozing - Demolition

Fugitive dust emissions from bulldozing

Activity	Year	Equipment Type	Number of Equipment	Daily Hours	Days	Emission Factor PM_{10} lb/hr	Emission Factor $PM_{2.5}$ lb/hr	Daily Emissions PM_{10} lb/day	Daily Emissions $PM_{2.5}$ lb/day	Annual Emissions PM_{10} ton/year	Annual Emissions $PM_{2.5}$ ton/year
Phase 1	2027	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
Phase 2	2027	Dozer or Similar	2	4	8	0.753	0.414	6.02	3.31	0.02	0.01
Phase 3	2027	Dozer or Similar	2	5	51	0.753	0.414	7.53	4.14	0.19	0.11
Phase 4 (2027)	2027	Dozer or Similar	2	10	209	0.753	0.414	15.06	8.28	1.57	0.86
Phase 4 (2028)	2028	Dozer or Similar	2	10	103	0.753	0.414	15.06	8.28	0.78	0.43
Phase 5 (2028)	2028	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
Phase 5 (2029)	2029	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
Phase 6	2029	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
Phase 7	2029	Dozer or Similar	2	10	26	0.753	0.414	15.06	8.28	0.20	0.11
Phase 8	2029	Dozer or Similar	0	0	0	0.753	0.414	0.00	0.00	0.00	0.00
									Total 2027	**1.79**	**0.98**
									Total 2028	**0.78**	**0.43**
									Total 2029	**0.20**	**0.11**

Notes:

PM emissions were calculated using the following equation and parameters (AP-42 Table 11.9-1 for Bulldozing, Overburden):

Emission Factor (lb/hr)= k x $(s)^{1.5}$ / $(M)^{1.4}$ For PM10 and k x 5.7 x $(s)^{1.2}$ / $(M)^{1.3}$ for PM2.5

k = Scaling Constant (0.75 for PM10 and 0.105 for PM2.5)

s = Silt Content (6.9% per AP-42 Table 11.9-3 default for overburden)

M = Moisture Content (7.9% per AP-42 Table 11.9-3 default for overburden)

B) Grading

Fugitive dust emissions from grading

Activity	Year	Equipment Type	Number of Grading Equipment	# Acres/Equipment	Acreage Graded/Day	Number of Days	Grader/Scraper VMT miles/day	Grader/Scraper VMT miles/year	Emission Factors PM10 lb/VMT	Emission Factors PM2.5 lb/VMT	Daily Emissions PM10 lb/day	Daily Emissions PM2.5 lb/day	Annual Emissions PM10 ton/year	Annual Emissions PM2.5 ton/year
Phase 1	2027	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 2	2027	Grader	1	0.5	0.5	23	0.34	7.91	1.54	0.167	0.53	0.06	0.01	0.00
Phase 3	2027	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 4 (2027)	2027	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 4 (2028)	2028	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 5 (2028)	2028	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 5 (2029)	2029	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 6	2029	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 7	2029	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
Phase 8	2029	Grader	0	0.5	0	0	0.00	0.00	1.54	0.167	0.00	0.00	0.00	0.00
												Total 2027	**0.01**	**0.00**
												Total 2028	**0.00**	**0.00**
												Total 2029	**0.00**	**0.00**

Notes:

PM emissions were calculated using the following equation and parameters:

Emission factor (lb/VMT) = k x 0.051 x $(S)^{2.0}$ for PM10 and k x 0.040 x $(S)^{2.5}$ for PM2.5 (AP-42 Table 11.9-1)

k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)

S = Mean Vehicle Speed, default = 7.1 miles/hour per AP-42 Table 11.9-3

VMT = As / Wb X 43,560 (sqft/acre) /5280 (ft/mile)

VMT: vehicle miles traveled

As: the acreage of the grading site (Assumes 0.5 acres per grader per day, 0.5 acres per scraper per day)

Wb: blade width of the grader; assumed Wb = 12 ft

C) Earth Material Loading/Handling

Dust from Material Loading

Activity	Year	Number of Days	Total Amount Handled	Material Amount		Material Amount		Emission Factors		Daily Emissions		Annual Emissions	
								PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
			cy	cy/day	cy/year	ton/day	ton/year	lb/ton	lb/ton	lb/day	lb/day	ton/year	ton/year
Phase 1	2027	26	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 2	2027	23	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 3	2027	51	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 4 (2027)	2027	209	126,645	606.0	126,645	908.9	189967.9	0.00013	0.000051	0.24	0.09	0.025	0.010
Phase 4 (2028)	2028	103	62,414	606.0	62,414	908.9	93620.6	0.00013	0.000051	0.24	0.09	0.012	0.005
Phase 5 (2028)	2028	286	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 5 (2029)	2029	26	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 6	2029	75	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 7	2029	26	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
Phase 8	2029	25	0	0.0	0	0.0	0.0	0.00013	0.000051	0.00	0.00	0.000	0.000
											Total 2027	**0.025**	**0.010**
											Total 2028	**0.012**	**0.005**
											Total 2029	**0.000**	**0.000**

Notes:

Fugitive dust from materials unloading from trains and/or trucks are calculated using the following equations and parameters:

Emission factor (lb/ton) = (k)(0.0032)[$(U/5)^{1.3}$]/[$(M/2)^{1.4}$] (AP-42 13.2.4)

k = particle size constant (0.35 for PM10 and 0.053 for PM2.5)

U = average wind speed = 1.71 m/s (3.83 mph) for Woodinville, Washington (https://weatherspark.com/y/938/Average-Weather-in-Woodinville-Washington-United-States-Year-Round)

M = moisture content = 3.4% (AP-42 Table 13.2.4-1 for Exposed Ground)

Material density 1.5 ton/CY (typical soil density)

Emissions include those from loading and unloading (handling of the material twice).

D) Re-entrained Fugitive Dust Emissions from Vehicle Travel on Paved Roads

Paved Road Fugitive Dust Emissions

Activity	Year	Total VMT	Percent Miles on Paved Road	Miles on Paved Road	PM10	PM2.5
		VMT/year	%	VMT/year	ton/year	ton/year
Phase 1	2027	13,520	90%	12,168	0.01	0.00
Phase 2	2027	23,000	90%	20,700	0.01	0.00
Phase 3	2027	142,800	90%	128,520	0.07	0.02
Phase 4 (2027)	2027	434,720	90%	391,248	0.21	0.05
Phase 4 (2028)	2028	214,240	90%	192,816	0.11	0.03
Phase 5 (2028)	2028	886,600	90%	797,940	0.44	0.11
Phase 5 (2029)	2029	80,600	90%	72,540	0.04	0.01
Phase 6	2029	260,625	95%	247,594	0.14	0.03
Phase 7	2029	49,400	95%	46,930	0.03	0.01
Phase 8	2029	17,500	95%	16,625	0.01	0.00
				Total 2027	**0.30**	**0.08**
				Total 2028	**0.54**	**0.14**
				Total 2029	**0.21**	**0.05**

Notes:

Emission factor (g/VMT) = k X (sL)^0.91 X W^1.02 X (1-P/4N)

		PM10	**PM2.5**
k		1.0	0.25
sL	g/m2	0.20	0.20
W	tons	2.4	2.4
P	days	180	180
N	days	365	365
EF	(g/VMT)	0.495	0.124

Equation from: AP-42 13.2.1

k (particle size multiplier) is from EPA AP-42 Table 13.2.1-1

sL (silt loading) of 0.2 is from EPA AP-42 Table 13.2.1-2 for ADT category 500 - 5000; this is a conservative assumption since the roadways would have higher ADT and lower sL value

W (mean vehicle weight) of 2.4 tons per California Air Resources Board's data at https://ww3.arb.ca.gov/ei/areasrc/fullpdf/2021_paved_roads_7_9.pdf

P = number of days in a year with at least 0.01 inch of precipitation; 180 days used for the calculation per EPA AP-42 Figure 13.2.1-2

N = number of days in the annual average period (default 365)

E) Re-entrained Fugitive Dust Emissions from Vehicle Travel on Unpaved Roads

Activity	Year	Total VMT	Percent Miles on Unpaved Road	Miles on Paved Road	PM_{10}	$PM_{2.5}$
		VMT/year	%	VMT/year	ton/year	ton/year
Phase 1	2027	13,520	10%	1352	0.33	0.03
Phase 2	2027	23,000	10%	2300	0.57	0.06
Phase 3	2027	142,800	10%	14280	3.52	0.35
Phase 4 (2027)	2027	434,720	10%	43472	10.73	1.07
Phase 4 (2028)	2028	214,240	10%	21424	5.29	0.53
Phase 5 (2028)	2028	886,600	10%	88660	21.88	2.19
Phase 5 (2029)	2029	80,600	10%	8060	1.99	0.20
Phase 6	2029	260,625	5%	13031.25	3.22	0.32
Phase 7	2029	49,400	5%	2470	0.61	0.06
Phase 8	2029	17,500	5%	875	0.22	0.02
				Total 2027	**15.15**	**1.52**
				Total 2028	**27.16**	**2.72**
				Total 2029	**6.03**	**0.60**

Notes:
Emission factor without accounting for precipitation (g/VMT) = k X (s/12)^a X (W/3)^b * 453.6
Emission factor accounting for precipitation (g/VMT) = k X (s/12)^a X (W/3)^b X 453.6 X (365-P)/365

		PM_{10}	**$PM_{2.5}$**
k	lb/VMT	1.5	0.15
a		0.90	0.90
b		0.45	0.45
s	%	8.3	8.3
W	tons	2.4	2.4
P	days	180	180
EF	g/VMT	441.633	44.163
EF with precipitation	g/VMT	223.842	22.384

Equation from: AP-42 13.2.2
k (particle size multiplier) is from EPA AP-42 Table 13.2.2-2
a (constant) is from EPA AP-42 Table 13.2.2-2
b (constant) is from EPA AP-42 Table 13.2.2-2

s (surface material silt content) is the default from California Emission Estimator Model (CalEEMod) tool
W (mean vehicle weight) is the default from California Emission Estimator Model (CalEEMod) tool

P (average number of days with precipitation over 0.01 inch) is 180 days per EPA AP-42 Figure 13.2.2-1

F) Demolition and Debris Loading

				Demolition		Debris Loading		Total	
Activity	Year	Demolished	Debris Weight	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
		ft2	tons/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
Phase 1	2027	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2	2027	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 3	2027	97340	4477.64	0.19	0.03	0.05	0.01	0.23	0.04
Phase 4 (2027)	2027	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 4 (2028)	2028	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 5 (2028)	2028	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 5 (2029)	2029	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 6	2029	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 7	2029	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Phase 8	2029	0	0	0.00	0.00	0.00	0.00	0.00	0.00
		Total 2027		**0.19**	**0.03**	**0.05**	**0.01**	**0.23**	**0.04**
		Total 2028		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
		Total 2029		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Notes:
Emission factor (lb/short ton of debris) = k * (0.0032) * (U/5)^1.3 / (M/2)^1.4

		PM_{10}	$PM_{2.5}$
k		0.35	0.053
U	m/s	1.71	1.71
M	%	3.4%	3.4%
EF	lb/short ton of debris	0.083	0.013

Equation from: AP-42 13.2.4.3

k (particle size multiplier) is from EPA AP-42 Section 13.2.4.3 (0.35 for PM10 and 0.053 for PM2.5)

U (average wind speed) = 1.71 m/s (3.83 mph) for Woodinville, Washington (https://weatherspark.com/y/938/Average-Weather-in-Woodinville-Washington-United-States-Year-Round)

M (moisture content) = 3.4% (AP-42 Table 13.2.4-1 for Exposed Ground)

1 square foot of structure demolition represents 0.046 short ton of waste material per CalEEMod Appendix C Section 4.5.1.

Debris Loading Emission Factor:

$EF_{L\text{-}p} = k \times EF_{L\text{-}TSP}$

Debris Loading Emission factor (lb/short ton of debris) = k * 0.058

		PM_{10}	$PM_{2.5}$
k		0.35	0.053
EF	lb/short ton of debris	0.020	0.003

Debris loading emissions Equation from CalEEMod Appendix Section 4.5.2

k = particle size multiplier.

EF_L = loading dust emission factor (lb/short ton).

$EF_{L\text{-}TSP}$: Used 0.058 lb/short ton, the average of TSP factors (i.e., 0.053 and 0.063 lb/short ton) measured from two tests of the filling of trucks with crushed limestone using a front-end loader (Midwest Research Institute 1988:28)

Summary of Fugitive Dust Emissions

	Annual Emissions	
	PM10	PM2.5
	ton/year	ton/year
Total 2027	**17.50**	**2.62**
Total 2028	**28.49**	**3.28**
Total 2029	**6.43**	**0.76**

Alternative 2: Asphalt Offgas from Paving - Roadway Construction

Offgas Emissions

Activity	Year	Acres Paved	Emission Factor lb/acre	Annual Emissions VOC ton/year
Phase 1	2027	0	2.62	0.00
Phase 2	2027	0	2.62	0.00
Phase 3	2027	0	2.62	0.00
Phase 4 (2027)	2027	0	2.62	0.00
Phase 4 (2028)	2028	0	2.62	0.00
Phase 5 (2028)	2028	0	2.62	0.00
Phase 5 (2029)	2029	0	2.62	0.00
Phase 6	2029	0	2.62	0.00
Phase 7	2029	4	2.62	0.01
Phase 8	2029	0	2.62	0.00
Total 2027				**0.00**
Total 2028				**0.00**
Total 2029				**0.01**

Note:

1. Offgas emission factor from asphalt paving is from CalEEMod Version 2022.1, Appendix C.

Attachment 2
Operation Emission Calculations

NERTS Project Operation Emissions Summary

Operation Emissions Summary - All Scenarios		CAPs						GHGs	MSATs									
		VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e	Naphthalene	1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	DPM	PAH	Total
Scenario		ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
2023	Existing Condition	0.82	9.71	8.97	0.01	0.74	0.44	1,921	5.21E-03	1.96E-03	2.26E-02	3.82E-03	9.24E-03	5.52E-03	4.71E-02	4.28E-01	2.62E-03	5.26E-01
2029	No Action	0.81	8.51	10.66	0.01	0.78	0.35	2,706	4.70E-03	1.57E-03	2.15E-02	3.53E-03	8.09E-03	6.18E-03	4.37E-02	3.08E-01	2.17E-03	3.99E-01
2029	Alternative 1a, 1b	0.77	7.65	10.26	0.01	0.72	0.31	2,467	4.41E-03	1.48E-03	2.01E-02	3.29E-03	7.84E-03	6.01E-03	4.10E-02	2.77E-01	2.01E-03	3.63E-01
2029	Alternative 2	0.73	7.96	9.81	0.01	0.70	0.32	2,586	4.18E-03	1.40E-03	1.93E-02	3.15E-03	7.35E-03	5.60E-03	3.90E-02	3.03E-01	1.97E-03	3.85E-01
2040	No Action	0.20	3.18	4.90	0.01	0.42	0.07	2,123	8.14E-05	0.00E+00	3.75E-03	2.57E-04	1.60E-03	2.82E-03	3.08E-03	1.97E-02	3.21E-05	3.13E-02
2040	Alternative 1a, 1b	0.19	2.82	4.62	0.01	0.39	0.06	1,910	7.67E-05	0.00E+00	3.42E-03	2.28E-04	1.60E-03	2.73E-03	2.87E-03	1.71E-02	3.07E-05	2.80E-02
2040	Alternative 2	0.18	2.92	4.43	0.01	0.36	0.06	2,033	7.52E-05	0.00E+00	3.44E-03	2.38E-04	1.46E-03	2.56E-03	2.81E-03	1.87E-02	2.94E-05	2.93E-02

Notes:
CAP = criteria air pollutant
GHG = greenhouse gas
MSAT = mobile source air toxic

Difference in Operation Emissions as Compared to No Action		CAPs						GHGs	MSATs									
		VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e	Naphthalene	1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	DPM	PAH	PAH
Scenario		ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
2029	Alternative 1a, 1b	-0.04	-0.86	-0.40	-0.001	-0.06	-0.03	-239	-2.92E-04	-8.74E-05	-1.44E-03	-2.34E-04	-2.48E-04	-1.67E-04	-2.77E-03	-3.02E-02	-1.52E-04	-3.56E-02
2029	Alternative 2	-0.08	-0.55	-0.85	-0.001	-0.08	-0.02	-120	-5.13E-04	-1.65E-04	-2.27E-03	-3.82E-04	-7.40E-04	-5.78E-04	-4.75E-03	-4.77E-03	-2.00E-04	-1.44E-02
2040	Alternative 1a, 1b	-0.01	-0.37	-0.28	-0.001	-0.03	-0.01	-213	-4.66E-06	0.00E+00	-3.32E-04	-2.87E-05	-3.27E-09	-8.92E-05	-2.12E-04	-2.67E-03	-1.45E-06	-3.34E-03
2040	Alternative 2	-0.02	-0.26	-0.47	0.000	-0.06	-0.01	-90	-6.25E-06	0.00E+00	-3.14E-04	-1.94E-05	-1.36E-04	-2.55E-04	-2.69E-04	-1.06E-03	-2.74E-06	-2.06E-03

Notes:
CAP = criteria air pollutant
GHG = greenhouse gas
MSAT = mobile source air toxic

Operation Emissions Summary - Existing Condition 2023		CAPs						GHGs	MSATs									
		VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e	Naphthalene	1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	DPM	PAH	Total
Vehicle Classification [1,4]	VMT Description	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
KC Transfer Trailers	To and From CHRLF and back to parking	0.21	4.85	1.62	0.00	0.31	0.21	800	1.76E-03	5.40E-04	7.88E-03	1.35E-03	1.51E-03	7.82E-04	1.62E-02	2.14E-01	1.02E-03	2.45E-01
Commercial Hauling Trucks	To and From zip code mid-point and back to parking	0.14	2.31	0.95	0.00	0.19	0.10	411	1.23E-03	3.67E-04	5.43E-03	9.18E-04	1.06E-03	4.72E-04	1.16E-02	9.61E-02	6.05E-04	1.18E-01
Self-Haul Vehicles (Cars) [2]	To and From zip code mid-point and back to parking	0.17	0.20	3.99	0.00	0.04	0.01	245	1.19E-04	2.54E-04	6.39E-04	3.77E-05	2.97E-03	2.47E-03	8.07E-04	N/A	4.86E-05	7.35E-03
Self-Haul Vehicles (Trucks) [2]	To and From zip code mid-point	0.28	2.32	2.11	0.00	0.19	0.12	442	2.09E-03	7.77E-04	8.59E-03	1.51E-03	3.44E-03	1.60E-03	1.84E-02	1.18E-01	9.46E-04	1.55E-01
Employees [3]	To and From zip code mid-point	0.01	0.02	0.30	0.00	0.00	0.00	22	1.14E-05	2.40E-05	6.09E-05	3.68E-06	2.60E-04	1.98E-04	7.75E-05	N/A	4.56E-06	6.40E-04
MRW Self-Haul	To and From zip code mid-point	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MRW Transfer Trucks	To and From Vendor facility	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total		0.82	9.71	8.97	0.01	0.74	0.44	1,921	5.21E-03	1.96E-03	2.26E-02	3.82E-03	9.24E-03	5.52E-03	4.71E-02	4.28E-01	2.62E-03	5.26E-01

Notes:
CAP = criteria air pollutant
GHG = greenhouse gas
MSAT = mobile source air toxic
N/A = not applicable
1. Visitor trips to the facility are assumed to be negligible and associated emissions are not calculated.
2. Assumed half of Self-Haul Vehicle volume were cars and the other half were trucks.
3. Employee passenger vehicles included gasoline cars and gasoline trucks. The MOVES4 emission factors used represent the higher emission rates of the two types of vehicles.
4. MOVES4 defaults were used for the fuel type distribution for each vehicle classification for each scenario's year.

NERTS Project Operation Emissions Summary

Operation Emissions Summary - No Action 2029

		CAPs						GHGs	MSATs									
		VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e	Naphthalene	1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	DPM	PAH	Total
Vehicle Classification [1,4]	VMT Description	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
KC Transfer Trailers	To and From CHRLF and back to parking	0.16	3.55	1.65	0.00	0.25	0.13	987	1.20E-03	3.61E-04	5.93E-03	9.66E-04	1.02E-03	6.89E-04	1.14E-02	1.25E-01	6.28E-04	1.47E-01
Commercial Hauling Trucks	To and From zip code mid-point and back to parking	0.13	2.37	1.28	0.00	0.22	0.09	585	1.05E-03	3.05E-04	5.34E-03	8.04E-04	9.06E-04	4.92E-04	1.06E-02	7.45E-02	4.90E-04	9.45E-02
Self-Haul Vehicles (Cars) [2]	To and From zip code mid-point and back to parking	0.19	0.11	5.13	0.00	0.06	0.01	365	6.40E-05	7.36E-05	2.98E-04	2.18E-05	2.23E-03	2.96E-03	4.90E-04	N/A	2.99E-05	6.17E-03
Self-Haul Vehicles (Trucks) [2]	To and From zip code mid-point	0.33	2.48	2.40	0.00	0.24	0.12	752	2.37E-03	8.24E-04	9.97E-03	1.74E-03	3.84E-03	1.93E-03	2.12E-02	1.09E-01	1.02E-03	1.51E-01
Employees [3]	To and From zip code mid-point	0.01	0.01	0.20	0.00	0.00	0.00	17	2.65E-06	2.81E-06	1.19E-05	9.41E-07	8.53E-05	1.11E-04	2.07E-05	N/A	1.28E-06	2.37E-04
MRW Self-Haul	To and From zip code mid-point	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MRW Transfer Trucks	To and From Vendor facility	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total		0.81	8.51	10.66	0.01	0.78	0.35	2,706	4.70E-03	1.57E-03	2.15E-02	3.53E-03	8.09E-03	6.18E-03	4.37E-02	3.08E-01	2.17E-03	3.99E-01

Notes:
CAP = criteria air pollutant
GHG = greenhouse gas
MSAT = mobile source air toxic
N/A = not applicable
1. Visitor trips to the facility are assumed to be negligible and associated emissions are not calculated.
2. Assumed half of Self-Haul Vehicle volume were cars and the other half were trucks.
3. Employee passenger vehicles included gasoline cars and gasoline trucks. The MOVES4 emission factors used represent the higher emission rates of the two types of vehicles.
4. MOVES4 defaults were used for the fuel type distribution for each vehicle classification for each scenario's year.

Operation Emissions Summary - No Action 2040

		CAPs						GHGs	MSATs									
		VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e	Naphthalene	1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	DPM	PAH	Total
Vehicle Classification [1,4]	VMT Description	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
KC Transfer Trailers	To and From CHRLF and back to parking	0.03	1.51	1.17	0.00	0.13	0.03	879	1.92E-05	0.00E+00	1.37E-03	1.18E-04	1.35E-08	3.68E-04	8.75E-04	1.10E-02	5.97E-06	1.38E-02
Commercial Hauling Trucks	To and From zip code mid-point and back to parking	0.02	0.95	1.00	0.00	0.12	0.02	445	9.06E-06	0.00E+00	1.43E-03	5.55E-05	1.44E-05	1.80E-04	1.33E-03	2.97E-03	2.93E-06	5.99E-03
Self-Haul Vehicles (Cars) [2]	To and From zip code mid-point and back to parking	0.09	0.01	1.72	0.00	0.05	0.01	211	1.84E-05	0.00E+00	7.02E-05	6.80E-06	8.80E-04	1.47E-03	1.60E-04	N/A	8.30E-06	2.61E-03
Self-Haul Vehicles (Trucks) [2]	To and From zip code mid-point	0.05	0.71	0.95	0.00	0.12	0.02	576	3.39E-05	0.00E+00	8.76E-04	7.62E-05	6.63E-04	7.35E-04	7.04E-04	5.73E-03	1.45E-05	8.84E-03
Employees [3]	To and From zip code mid-point	0.00	0.00	0.07	0.00	0.00	0.00	11	8.68E-07	0.00E+00	3.32E-06	3.22E-07	4.03E-05	6.62E-05	7.55E-06	N/A	4.03E-07	1.19E-04
MRW Self-Haul	To and From zip code mid-point	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MRW Transfer Trucks	To and From Vendor facility	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total		0.20	3.18	4.90	0.01	0.42	0.07	2,123	8.14E-05	0.00E+00	3.75E-03	2.57E-04	1.60E-03	2.82E-03	3.08E-03	1.97E-02	3.21E-05	3.13E-02

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1. Visitor trips to the facility are assumed to be negligible and associated emissions are not calculated.
2. Assumed half of Self-Haul Vehicle volume were cars and the other half were trucks.
3. Employee passenger vehicles included gasoline cars and gasoline trucks. The MOVES4 emission factors used represent the higher emission rates of the two types of vehicles.
4. MOVES4 defaults were used for the fuel type distribution for each vehicle classification for each scenario's year.

NERTS Project Operation Emissions Summary

Operation Emissions Summary - Alternative 1a and 1b (Kirkland/Houghton) 2029		CAPs						GHGs	MSATs									
		VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e	Naphthalene	1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	DPM	PAH	Total
Vehicle Classification [1,4]	VMT Description	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
KC Transfer Trailers	To and From CHRLF and back to parking	0.12	2.69	1.25	0.00	0.19	0.10	748	9.11E-04	2.73E-04	4.49E-03	7.32E-04	7.73E-04	5.22E-04	8.65E-03	9.44E-02	4.76E-04	1.11E-01
Commercial Hauling Trucks	To and From zip code mid-point and back to parking	0.13	2.37	1.28	0.00	0.22	0.09	585	1.05E-03	3.05E-04	5.34E-03	8.04E-04	9.06E-04	4.92E-04	1.06E-02	7.45E-02	4.90E-04	9.45E-02
Self-Haul Vehicles (Cars) [2]	To and From zip code mid-point and back to parking	0.19	0.11	5.13	0.00	0.06	0.01	365	6.40E-05	7.36E-05	2.98E-04	2.18E-05	2.23E-03	2.96E-03	4.90E-04	N/A	2.99E-05	6.17E-03
Self-Haul Vehicles (Trucks) [2]	To and From zip code mid-point	0.33	2.48	2.40	0.00	0.24	0.12	752	2.37E-03	8.24E-04	9.97E-03	1.74E-03	3.84E-03	1.93E-03	2.12E-02	1.09E-01	1.02E-03	1.51E-01
Employees [3]	To and From zip code mid-point	0.01	0.01	0.20	0.00	0.00	0.00	17	2.65E-06	2.81E-06	1.19E-05	9.41E-07	8.53E-05	1.11E-04	2.07E-05	N/A	1.28E-06	2.37E-04
MRW Self-Haul	To and From zip code mid-point	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MRW Transfer Trucks	To and From Vendor facility	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total		0.77	7.65	10.26	0.01	0.72	0.31	2,467	4.41E-03	1.48E-03	2.01E-02	3.29E-03	7.84E-03	6.01E-03	4.10E-02	2.77E-01	2.01E-03	3.63E-01

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3. Employee passenger vehicles included gasoline cars and gasoline trucks. The MOVES4 emission factors used represent the higher emission rates of the two types of vehicles.
4. MOVES4 defaults were used for the fuel type distribution for each vehicle classification for each scenario's year.

Operation Emissions Summary - Alternative 1a and 1b (Kirkland/Houghton) 2040		CAPs						GHGs	MSATs									
		VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e	Naphthalene	1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	DPM	PAH	Total
Vehicle Classification [1,4]	VMT Description	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
KC Transfer Trailers	To and From CHRLF and back to parking	0.02	1.14	0.89	0.00	0.10	0.02	666	1.46E-05	0.00E+00	1.04E-03	8.96E-05	1.02E-08	2.79E-04	6.63E-04	8.35E-03	4.52E-06	1.04E-02
Commercial Hauling Trucks	To and From zip code mid-point and back to parking	0.02	0.95	1.00	0.00	0.12	0.02	445	9.06E-06	0.00E+00	1.43E-03	5.55E-05	1.44E-05	1.80E-04	1.33E-03	2.97E-03	2.93E-06	5.99E-03
Self-Haul Vehicles (Cars) [2]	To and From zip code mid-point and back to parking	0.09	0.01	1.72	0.00	0.05	0.01	211	1.84E-05	0.00E+00	7.02E-05	6.80E-06	8.80E-04	1.47E-03	1.60E-04	N/A	8.30E-06	2.61E-03
Self-Haul Vehicles (Trucks) [2]	To and From zip code mid-point	0.05	0.71	0.95	0.00	0.12	0.02	576	3.39E-05	0.00E+00	8.76E-04	7.62E-05	6.63E-04	7.35E-04	7.04E-04	5.73E-03	1.45E-05	8.84E-03
Employees [3]	To and From zip code mid-point	0.00	0.00	0.07	0.00	0.00	0.00	11	8.68E-07	0.00E+00	3.32E-06	3.22E-07	4.03E-05	6.62E-05	7.55E-06	N/A	4.03E-07	1.19E-04
MRW Self-Haul	To and From zip code mid-point	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MRW Transfer Trucks	To and From Vendor facility	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total		0.19	2.82	4.62	0.01	0.39	0.06	1,910	7.67E-05	0.00E+00	3.42E-03	2.28E-04	1.60E-03	2.73E-03	2.87E-03	1.71E-02	3.07E-05	2.80E-02

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1. Visitor trips to the facility are assumed to be negligible and associated emissions are not calculated.
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NERTS Project Operation Emissions Summary

Operation Emissions Summary - Alternative 2 (Woodinville) 2029		CAPs						GHGs	MSATs									
		VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e	Naphthalene	1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	DPM	PAH	Total
Vehicle Classification [1,4]	VMT Description	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
KC Transfer Trailers	To and From CHRLF and back to parking	0.15	3.38	1.56	0.00	0.23	0.12	961	1.16E-03	3.47E-04	5.68E-03	9.26E-04	9.81E-04	6.57E-04	1.10E-02	1.18E-01	6.00E-04	1.39E-01
Commercial Hauling Trucks	To and From zip code mid-point and back to parking	0.12	2.28	1.21	0.00	0.18	0.09	622	9.61E-04	2.79E-04	4.85E-03	7.34E-04	8.27E-04	4.48E-04	9.68E-03	7.80E-02	4.68E-04	9.63E-02
Self-Haul Vehicles (Cars) [2]	To and From zip code mid-point and back to parking	0.15	0.09	4.17	0.00	0.06	0.01	283	5.50E-05	6.33E-05	2.56E-04	1.88E-05	1.85E-03	2.35E-03	4.21E-04	N/A	2.50E-05	5.05E-03
Self-Haul Vehicles (Trucks) [2]	To and From zip code mid-point	0.25	1.94	1.85	0.00	0.19	0.09	588	1.79E-03	6.24E-04	7.53E-03	1.31E-03	2.97E-03	1.50E-03	1.59E-02	8.62E-02	7.75E-04	1.19E-01
Employees [3]	To and From zip code mid-point	0.01	0.01	0.30	0.00	0.00	0.00	27	4.26E-06	4.52E-06	1.93E-05	1.51E-06	1.37E-04	1.77E-04	3.33E-05	N/A	2.04E-06	3.80E-04
MRW Self-Haul	To and From zip code mid-point	0.05	0.24	0.71	0.00	0.03	0.01	103	2.16E-04	8.08E-05	9.14E-04	1.56E-04	5.69E-04	4.58E-04	1.92E-03	2.04E-02	9.41E-05	2.48E-02
MRW Transfer Trucks	To and From Vendor facility	0.00	0.01	0.01	0.00	0.00	0.00	2	5.88E-06	1.97E-06	2.43E-05	4.30E-06	8.44E-06	4.58E-06	5.23E-05	2.97E-04	2.55E-06	4.01E-04
Total		0.73	7.96	9.81	0.01	0.70	0.32	2,586	4.18E-03	1.40E-03	1.93E-02	3.15E-03	7.35E-03	5.60E-03	3.90E-02	3.03E-01	1.97E-03	3.85E-01

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4. MOVES4 defaults were used for the fuel type distribution for each vehicle classification for each scenario's year.

Operation Emissions Summary - Alternative 2 (Woodinville) 2040		CAPs						GHGs	MSATs									
		VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$	CO_2e	Naphthalene	1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Ethyl Benzene	Formaldehyde	DPM	PAH	Total
Vehicle Classification [1,4]	VMT Description	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	metric ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year	ton/year
KC Transfer Trailers	To and From CHRLF and back to parking	0.03	1.40	1.09	0.00	0.12	0.02	858	1.80E-05	0.00E+00	1.29E-03	1.11E-04	1.25E-08	3.45E-04	8.20E-04	1.04E-02	5.59E-06	1.30E-02
Commercial Hauling Trucks	To and From zip code mid-point and back to parking	0.02	0.87	0.91	0.00	0.09	0.01	476	8.21E-06	0.00E+00	1.28E-03	5.03E-05	1.28E-05	1.63E-04	1.19E-03	2.80E-03	2.65E-06	5.50E-03
Self-Haul Vehicles (Cars) [2]	To and From zip code mid-point and back to parking	0.07	0.01	1.39	0.00	0.04	0.01	164	1.58E-05	0.00E+00	6.04E-05	5.85E-06	7.23E-04	1.16E-03	1.38E-04	N/A	6.94E-06	2.11E-03
Self-Haul Vehicles (Trucks) [2]	To and From zip code mid-point	0.04	0.57	0.68	0.00	0.09	0.01	444	2.67E-05	0.00E+00	7.14E-04	6.20E-05	5.13E-04	5.81E-04	5.67E-04	4.40E-03	1.14E-05	6.87E-03
Employees [3]	To and From zip code mid-point	0.01	0.00	0.11	0.00	0.00	0.00	17	1.40E-06	0.00E+00	5.35E-06	5.18E-07	6.48E-05	1.05E-04	1.22E-05	N/A	6.45E-07	1.90E-04
MRW Self-Haul	To and From zip code mid-point	0.01	0.07	0.24	0.00	0.02	0.00	72	4.99E-06	0.00E+00	9.09E-05	7.97E-06	1.47E-04	2.08E-04	8.28E-05	1.03E-03	2.15E-06	1.58E-03
MRW Transfer Trucks	To and From Vendor facility	0.00	0.00	0.00	0.00	0.00	0.00	2	6.29E-08	0.00E+00	1.71E-06	1.49E-07	1.43E-06	2.01E-06	1.35E-06	1.54E-05	3.13E-08	2.21E-05
Total		0.18	2.92	4.43	0.01	0.36	0.06	2,033	7.52E-05	0.00E+00	3.44E-03	2.38E-04	1.46E-03	2.56E-03	2.81E-03	1.87E-02	2.94E-05	2.93E-02

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1. Visitor trips to the facility are assumed to be negligible and associated emissions are not calculated.
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Operations Emission Factors Summary

Emission Factors Summary

No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	Source Type	Road Type	VMT per Day	Fuel Type 1	Fuel Type 1 Fraction	Fuel Type 2	Fuel Type 2 Fraction	Fuel Type 3	Fuel Type 3 Fraction	Fuel Type 4	Fuel Type 4 Fraction	Fuel Type 5	Fuel Type 5 Fraction
1	Existing Condition	2023	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	713	Gasoline	0.975	Diesel Fuel	0.005	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.020
2	Existing Condition	2023	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	713	Gasoline	0.288	Diesel Fuel	0.708	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
3	Existing Condition	2023	Weekdays	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	401	Gasoline	0.012	Diesel Fuel	0.920	Compressed Natural Gas (CNG)	0.067	Ethanol (E-85)	0.000	Electricity	0.000
4	Existing Condition	2023	Weekdays	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	60	Gasoline	0.975	Diesel Fuel	0.005	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.020
5	Existing Condition	2023	Weekdays	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	60	Gasoline	0.964	Diesel Fuel	0.028	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.002	Electricity	0.006
6	Existing Condition	2023	Weekdays	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	670	Gasoline	0.000	Diesel Fuel	0.996	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
7	Existing Condition	2023	Weekdays	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	0	Gasoline	0.288	Diesel Fuel	0.708	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
8	Existing Condition	2023	Weekdays	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	0	Gasoline	0.288	Diesel Fuel	0.708	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
9	Existing Condition	2023	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	797	Gasoline	0.975	Diesel Fuel	0.005	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.020
10	Existing Condition	2023	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	797	Gasoline	0.288	Diesel Fuel	0.708	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
11	Existing Condition	2023	Weekdays	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	547	Gasoline	0.012	Diesel Fuel	0.920	Compressed Natural Gas (CNG)	0.067	Ethanol (E-85)	0.000	Electricity	0.000
12	Existing Condition	2023	Weekdays	12	local link 4	Employees (Cars)	Passenger Car	Local	74	Gasoline	0.975	Diesel Fuel	0.005	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.020
13	Existing Condition	2023	Weekdays	13	local link 5	Employees (Trucks)	Passenger Truck	Local	74	Gasoline	0.964	Diesel Fuel	0.028	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.002	Electricity	0.006
14	Existing Condition	2023	Weekdays	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	585	Gasoline	0.000	Diesel Fuel	0.996	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
15	Existing Condition	2023	Weekdays	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	0	Gasoline	0.288	Diesel Fuel	0.708	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
16	Existing Condition	2023	Weekdays	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	0	Gasoline	0.288	Diesel Fuel	0.708	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
17	Existing Condition	2023	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	1241	Gasoline	0.975	Diesel Fuel	0.005	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.020
18	Existing Condition	2023	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	1241	Gasoline	0.288	Diesel Fuel	0.708	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
19	Existing Condition	2023	Weekend	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	0	Gasoline	0.012	Diesel Fuel	0.920	Compressed Natural Gas (CNG)	0.067	Ethanol (E-85)	0.000	Electricity	0.000
20	Existing Condition	2023	Weekend	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	60	Gasoline	0.975	Diesel Fuel	0.005	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.020
21	Existing Condition	2023	Weekend	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	60	Gasoline	0.964	Diesel Fuel	0.028	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.002	Electricity	0.006
22	Existing Condition	2023	Weekend	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	670	Gasoline	0.000	Diesel Fuel	0.996	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
23	Existing Condition	2023	Weekend	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	0	Gasoline	0.288	Diesel Fuel	0.708	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
24	Existing Condition	2023	Weekend	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	0	Gasoline	0.288	Diesel Fuel	0.708	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
25	Existing Condition	2023	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	1389	Gasoline	0.975	Diesel Fuel	0.005	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.020
26	Existing Condition	2023	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	1389	Gasoline	0.288	Diesel Fuel	0.708	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
27	Existing Condition	2023	Weekend	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	0	Gasoline	0.012	Diesel Fuel	0.920	Compressed Natural Gas (CNG)	0.067	Ethanol (E-85)	0.000	Electricity	0.000
28	Existing Condition	2023	Weekend	12	local link 4	Employees (Cars)	Passenger Car	Local	74	Gasoline	0.975	Diesel Fuel	0.005	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.020
29	Existing Condition	2023	Weekend	13	local link 5	Employees (Trucks)	Passenger Truck	Local	74	Gasoline	0.964	Diesel Fuel	0.028	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.002	Electricity	0.006
30	Existing Condition	2023	Weekend	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	585	Gasoline	0.000	Diesel Fuel	0.996	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
31	Existing Condition	2023	Weekend	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	0	Gasoline	0.288	Diesel Fuel	0.708	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
32	Existing Condition	2023	Weekend	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	0	Gasoline	0.288	Diesel Fuel	0.708	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.000
33	No Action	2029	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	1612	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
34	No Action	2029	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	1612	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
35	No Action	2029	Weekdays	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	627	Gasoline	0.006	Diesel Fuel	0.899	Compressed Natural Gas (CNG)	0.082	Ethanol (E-85)	0.000	Electricity	0.014
36	No Action	2029	Weekdays	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	60	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
37	No Action	2029	Weekdays	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	60	Gasoline	0.892	Diesel Fuel	0.024	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.082
38	No Action	2029	Weekdays	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	884	Gasoline	0.000	Diesel Fuel	0.992	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.004
39	No Action	2029	Weekdays	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
40	No Action	2029	Weekdays	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
41	No Action	2029	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	1667	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
42	No Action	2029	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	1667	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
43	No Action	2029	Weekdays	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	855	Gasoline	0.006	Diesel Fuel	0.899	Compressed Natural Gas (CNG)	0.082	Ethanol (E-85)	0.000	Electricity	0.014
44	No Action	2029	Weekdays	12	local link 4	Employees (Cars)	Passenger Car	Local	74	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
45	No Action	2029	Weekdays	13	local link 5	Employees (Trucks)	Passenger Truck	Local	74	Gasoline	0.892	Diesel Fuel	0.024	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.082
46	No Action	2029	Weekdays	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	772	Gasoline	0.000	Diesel Fuel	0.992	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.004
47	No Action	2029	Weekdays	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
48	No Action	2029	Weekdays	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
49	No Action	2029	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	2119	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
50	No Action	2029	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	2119	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
51	No Action	2029	Weekend	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	0	Gasoline	0.006	Diesel Fuel	0.899	Compressed Natural Gas (CNG)	0.082	Ethanol (E-85)	0.000	Electricity	0.014
52	No Action	2029	Weekend	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	60	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
53	No Action	2029	Weekend	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	60	Gasoline	0.892	Diesel Fuel	0.024	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.082
54	No Action	2029	Weekend	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	884	Gasoline	0.000	Diesel Fuel	0.992	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.004
55	No Action	2029	Weekend	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
56	No Action	2029	Weekend	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
57	No Action	2029	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	2191	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
58	No Action	2029	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	2191	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
59	No Action	2029	Weekend	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	0	Gasoline	0.006	Diesel Fuel	0.899	Compressed Natural Gas (CNG)	0.082	Ethanol (E-85)	0.000	Electricity	0.014
60	No Action	2029	Weekend	12	local link 4	Employees (Cars)	Passenger Car	Local	74	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
61	No Action	2029	Weekend	13	local link 5	Employees (Trucks)	Passenger Truck	Local	74	Gasoline	0.892	Diesel Fuel	0.024	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.082
62	No Action	2029	Weekend	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	772	Gasoline	0.000	Diesel Fuel	0.992	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.004
63	No Action	2029	Weekend	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
64	No Action	2029	Weekend	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
65	No Action	2040	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	1612	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
66	No Action	2040	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	1612	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
67	No Action	2040	Weekdays	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	627	Gasoline	0.001	Diesel Fuel	0.818	Compressed Natural Gas (CNG)	0.093	Ethanol (E-85)	0.000	Electricity	0.089
68	No Action	2040	Weekdays	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	60	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287

Operations Emission Factors Summary

Emission Factors Summary

No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	Source Type	Road Type	VMT per Day	Fuel Type 1	Fuel Type 1 Fraction	Fuel Type 2	Fuel Type 2 Fraction	Fuel Type 3	Fuel Type 3 Fraction	Fuel Type 4	Fuel Type 4 Fraction	Fuel Type 5	Fuel Type 5 Fraction
69	No Action	2040	Weekdays	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	60	Gasoline	0.746	Diesel Fuel	0.018	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.235
70	No Action	2040	Weekdays	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	884	Gasoline	0.000	Diesel Fuel	0.974	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.023
71	No Action	2040	Weekdays	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
72	No Action	2040	Weekdays	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
73	No Action	2040	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	1667	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
74	No Action	2040	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	1667	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
75	No Action	2040	Weekdays	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	855	Gasoline	0.001	Diesel Fuel	0.818	Compressed Natural Gas (CNG)	0.093	Ethanol (E-85)	0.000	Electricity	0.089
76	No Action	2040	Weekdays	12	local link 4	Employees (Cars)	Passenger Car	Local	74	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
77	No Action	2040	Weekdays	13	local link 5	Employees (Trucks)	Passenger Truck	Local	74	Gasoline	0.746	Diesel Fuel	0.018	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.235
78	No Action	2040	Weekdays	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	772	Gasoline	0.000	Diesel Fuel	0.974	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.023
79	No Action	2040	Weekdays	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
80	No Action	2040	Weekdays	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
81	No Action	2040	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	2119	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
82	No Action	2040	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	2119	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
83	No Action	2040	Weekend	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	0	Gasoline	0.001	Diesel Fuel	0.818	Compressed Natural Gas (CNG)	0.093	Ethanol (E-85)	0.000	Electricity	0.089
84	No Action	2040	Weekend	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	60	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
85	No Action	2040	Weekend	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	60	Gasoline	0.746	Diesel Fuel	0.018	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.235
86	No Action	2040	Weekend	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	884	Gasoline	0.000	Diesel Fuel	0.974	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.023
87	No Action	2040	Weekend	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
88	No Action	2040	Weekend	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
89	No Action	2040	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	2191	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
90	No Action	2040	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	2191	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
91	No Action	2040	Weekend	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	0	Gasoline	0.001	Diesel Fuel	0.818	Compressed Natural Gas (CNG)	0.093	Ethanol (E-85)	0.000	Electricity	0.089
92	No Action	2040	Weekend	12	local link 4	Employees (Cars)	Passenger Car	Local	74	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
93	No Action	2040	Weekend	13	local link 5	Employees (Trucks)	Passenger Truck	Local	74	Gasoline	0.746	Diesel Fuel	0.018	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.235
94	No Action	2040	Weekend	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	772	Gasoline	0.000	Diesel Fuel	0.974	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.023
95	No Action	2040	Weekend	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
96	No Action	2040	Weekend	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
97	Alternative 1	2029	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	1612	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
98	Alternative 1	2029	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	1612	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
99	Alternative 1	2029	Weekdays	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	627	Gasoline	0.006	Diesel Fuel	0.899	Compressed Natural Gas (CNG)	0.082	Ethanol (E-85)	0.000	Electricity	0.014
100	Alternative 1	2029	Weekdays	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	60	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
101	Alternative 1	2029	Weekdays	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	60	Gasoline	0.892	Diesel Fuel	0.024	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.082
102	Alternative 1	2029	Weekdays	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	670	Gasoline	0.000	Diesel Fuel	0.992	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.004
103	Alternative 1	2029	Weekdays	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
104	Alternative 1	2029	Weekdays	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
105	Alternative 1	2029	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	1667	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
106	Alternative 1	2029	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	1667	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
107	Alternative 1	2029	Weekdays	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	855	Gasoline	0.006	Diesel Fuel	0.899	Compressed Natural Gas (CNG)	0.082	Ethanol (E-85)	0.000	Electricity	0.014
108	Alternative 1	2029	Weekdays	12	local link 4	Employees (Cars)	Passenger Car	Local	74	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
109	Alternative 1	2029	Weekdays	13	local link 5	Employees (Trucks)	Passenger Truck	Local	74	Gasoline	0.892	Diesel Fuel	0.024	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.082
110	Alternative 1	2029	Weekdays	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	585	Gasoline	0.000	Diesel Fuel	0.992	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.004
111	Alternative 1	2029	Weekdays	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
112	Alternative 1	2029	Weekdays	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
113	Alternative 1	2029	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	2119	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
114	Alternative 1	2029	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	2119	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
115	Alternative 1	2029	Weekend	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	0	Gasoline	0.006	Diesel Fuel	0.899	Compressed Natural Gas (CNG)	0.082	Ethanol (E-85)	0.000	Electricity	0.014
116	Alternative 1	2029	Weekend	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	60	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
117	Alternative 1	2029	Weekend	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	60	Gasoline	0.892	Diesel Fuel	0.024	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.082
118	Alternative 1	2029	Weekend	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	670	Gasoline	0.000	Diesel Fuel	0.992	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.004
119	Alternative 1	2029	Weekend	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
120	Alternative 1	2029	Weekend	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
121	Alternative 1	2029	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	2191	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
122	Alternative 1	2029	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	2191	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
123	Alternative 1	2029	Weekend	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	0	Gasoline	0.006	Diesel Fuel	0.899	Compressed Natural Gas (CNG)	0.082	Ethanol (E-85)	0.000	Electricity	0.014
124	Alternative 1	2029	Weekend	12	local link 4	Employees (Cars)	Passenger Car	Local	74	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
125	Alternative 1	2029	Weekend	13	local link 5	Employees (Trucks)	Passenger Truck	Local	74	Gasoline	0.892	Diesel Fuel	0.024	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.082
126	Alternative 1	2029	Weekend	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	585	Gasoline	0.000	Diesel Fuel	0.992	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.004
127	Alternative 1	2029	Weekend	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
128	Alternative 1	2029	Weekend	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
129	Alternative 1	2040	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	1612	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
130	Alternative 1	2040	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	1612	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
131	Alternative 1	2040	Weekdays	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	627	Gasoline	0.001	Diesel Fuel	0.818	Compressed Natural Gas (CNG)	0.093	Ethanol (E-85)	0.000	Electricity	0.089
132	Alternative 1	2040	Weekdays	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	60	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
133	Alternative 1	2040	Weekdays	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	60	Gasoline	0.746	Diesel Fuel	0.018	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.235
134	Alternative 1	2040	Weekdays	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	670	Gasoline	0.000	Diesel Fuel	0.974	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.023
135	Alternative 1	2040	Weekdays	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
136	Alternative 1	2040	Weekdays	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086

Operations Emission Factors Summary

Emission Factors Summary

No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	Source Type	Road Type	VMT per Day	Fuel Type 1	Fuel Type 1 Fraction	Fuel Type 2	Fuel Type 2 Fraction	Fuel Type 3	Fuel Type 3 Fraction	Fuel Type 4	Fuel Type 4 Fraction	Fuel Type 5	Fuel Type 5 Fraction
137	Alternative 1	2040	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	1667	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
138	Alternative 1	2040	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	1667	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
139	Alternative 1	2040	Weekdays	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	855	Gasoline	0.001	Diesel Fuel	0.818	Compressed Natural Gas (CNG)	0.093	Ethanol (E-85)	0.000	Electricity	0.089
140	Alternative 1	2040	Weekdays	12	local link 4	Employees (Cars)	Passenger Car	Local	74	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
141	Alternative 1	2040	Weekdays	13	local link 5	Employees (Trucks)	Passenger Truck	Local	74	Gasoline	0.746	Diesel Fuel	0.018	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.235
142	Alternative 1	2040	Weekdays	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	585	Gasoline	0.000	Diesel Fuel	0.974	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.023
143	Alternative 1	2040	Weekdays	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
144	Alternative 1	2040	Weekdays	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
145	Alternative 1	2040	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	2119	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
146	Alternative 1	2040	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	2119	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
147	Alternative 1	2040	Weekend	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	0	Gasoline	0.001	Diesel Fuel	0.818	Compressed Natural Gas (CNG)	0.093	Ethanol (E-85)	0.000	Electricity	0.089
148	Alternative 1	2040	Weekend	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	60	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
149	Alternative 1	2040	Weekend	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	60	Gasoline	0.746	Diesel Fuel	0.018	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.235
150	Alternative 1	2040	Weekend	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	670	Gasoline	0.000	Diesel Fuel	0.974	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.023
151	Alternative 1	2040	Weekend	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
152	Alternative 1	2040	Weekend	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
153	Alternative 1	2040	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	2191	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
154	Alternative 1	2040	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	2191	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
155	Alternative 1	2040	Weekend	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	0	Gasoline	0.001	Diesel Fuel	0.818	Compressed Natural Gas (CNG)	0.093	Ethanol (E-85)	0.000	Electricity	0.089
156	Alternative 1	2040	Weekend	12	local link 4	Employees (Cars)	Passenger Car	Local	74	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
157	Alternative 1	2040	Weekend	13	local link 5	Employees (Trucks)	Passenger Truck	Local	74	Gasoline	0.746	Diesel Fuel	0.018	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.235
158	Alternative 1	2040	Weekend	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	585	Gasoline	0.000	Diesel Fuel	0.974	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.023
159	Alternative 1	2040	Weekend	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
160	Alternative 1	2040	Weekend	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
161	Alternative 2	2029	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	474	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
162	Alternative 2	2029	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	474	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
163	Alternative 2	2029	Weekdays	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	714	Gasoline	0.006	Diesel Fuel	0.899	Compressed Natural Gas (CNG)	0.082	Ethanol (E-85)	0.000	Electricity	0.014
164	Alternative 2	2029	Weekdays	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	94	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
165	Alternative 2	2029	Weekdays	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	94	Gasoline	0.892	Diesel Fuel	0.024	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.082
166	Alternative 2	2029	Weekdays	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	935	Gasoline	0.000	Diesel Fuel	0.992	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.004
167	Alternative 2	2029	Weekdays	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	172	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
168	Alternative 2	2029	Weekdays	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	18	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
169	Alternative 2	2029	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	2144	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
170	Alternative 2	2029	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	2144	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
171	Alternative 2	2029	Weekdays	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	992	Gasoline	0.006	Diesel Fuel	0.899	Compressed Natural Gas (CNG)	0.082	Ethanol (E-85)	0.000	Electricity	0.014
172	Alternative 2	2029	Weekdays	12	local link 4	Employees (Cars)	Passenger Car	Local	135	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
173	Alternative 2	2029	Weekdays	13	local link 5	Employees (Trucks)	Passenger Truck	Local	135	Gasoline	0.892	Diesel Fuel	0.024	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.082
174	Alternative 2	2029	Weekdays	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	705	Gasoline	0.000	Diesel Fuel	0.992	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.004
175	Alternative 2	2029	Weekdays	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	778	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
176	Alternative 2	2029	Weekdays	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	2	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
177	Alternative 2	2029	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	624	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
178	Alternative 2	2029	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	624	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
179	Alternative 2	2029	Weekend	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	0	Gasoline	0.006	Diesel Fuel	0.899	Compressed Natural Gas (CNG)	0.082	Ethanol (E-85)	0.000	Electricity	0.014
180	Alternative 2	2029	Weekend	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	94	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
181	Alternative 2	2029	Weekend	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	94	Gasoline	0.892	Diesel Fuel	0.024	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.082
182	Alternative 2	2029	Weekend	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	935	Gasoline	0.000	Diesel Fuel	0.992	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.004
183	Alternative 2	2029	Weekend	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
184	Alternative 2	2029	Weekend	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
185	Alternative 2	2029	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	2818	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
186	Alternative 2	2029	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	2818	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
187	Alternative 2	2029	Weekend	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	0	Gasoline	0.006	Diesel Fuel	0.899	Compressed Natural Gas (CNG)	0.082	Ethanol (E-85)	0.000	Electricity	0.014
188	Alternative 2	2029	Weekend	12	local link 4	Employees (Cars)	Passenger Car	Local	135	Gasoline	0.891	Diesel Fuel	0.003	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.106
189	Alternative 2	2029	Weekend	13	local link 5	Employees (Trucks)	Passenger Truck	Local	135	Gasoline	0.892	Diesel Fuel	0.024	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.082
190	Alternative 2	2029	Weekend	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	705	Gasoline	0.000	Diesel Fuel	0.992	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.004
191	Alternative 2	2029	Weekend	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
192	Alternative 2	2029	Weekend	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	0	Gasoline	0.291	Diesel Fuel	0.688	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.018
193	Alternative 2	2040	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	474	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
194	Alternative 2	2040	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	474	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
195	Alternative 2	2040	Weekdays	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	714	Gasoline	0.001	Diesel Fuel	0.818	Compressed Natural Gas (CNG)	0.093	Ethanol (E-85)	0.000	Electricity	0.089
196	Alternative 2	2040	Weekdays	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	94	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
197	Alternative 2	2040	Weekdays	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	94	Gasoline	0.746	Diesel Fuel	0.018	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.235
198	Alternative 2	2040	Weekdays	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	935	Gasoline	0.000	Diesel Fuel	0.974	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.023
199	Alternative 2	2040	Weekdays	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	172	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
200	Alternative 2	2040	Weekdays	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	18	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
201	Alternative 2	2040	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	2144	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
202	Alternative 2	2040	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	2144	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
203	Alternative 2	2040	Weekdays	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	992	Gasoline	0.001	Diesel Fuel	0.818	Compressed Natural Gas (CNG)	0.093	Ethanol (E-85)	0.000	Electricity	0.089
204	Alternative 2	2040	Weekdays	12	local link 4	Employees (Cars)	Passenger Car	Local	135	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287

Operations Emission Factors Summary **Emission Factors Summary**

No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	Source Type	Road Type	VMT per Day	Fuel Type 1	Fuel Type 1 Fraction	Fuel Type 2	Fuel Type 2 Fraction	Fuel Type 3	Fuel Type 3 Fraction	Fuel Type 4	Fuel Type 4 Fraction	Fuel Type 5	Fuel Type 5 Fraction
205	Alternative 2	2040	Weekdays	13	local link 5	Employees (Trucks)	Passenger Truck	Local	135	Gasoline	0.746	Diesel Fuel	0.018	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.235
206	Alternative 2	2040	Weekdays	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	705	Gasoline	0.000	Diesel Fuel	0.974	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.023
207	Alternative 2	2040	Weekdays	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	778	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
208	Alternative 2	2040	Weekdays	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	2	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
209	Alternative 2	2040	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	Passenger Car	Freeway	624	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
210	Alternative 2	2040	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Freeway	624	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
211	Alternative 2	2040	Weekend	3	freeway link 3	Commercial Hauling Trucks	Refuse Truck	Freeway	0	Gasoline	0.001	Diesel Fuel	0.818	Compressed Natural Gas (CNG)	0.093	Ethanol (E-85)	0.000	Electricity	0.089
212	Alternative 2	2040	Weekend	4	freeway link 4	Employees (Cars)	Passenger Car	Freeway	94	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
213	Alternative 2	2040	Weekend	5	freeway link 5	Employees (Trucks)	Passenger Truck	Freeway	94	Gasoline	0.746	Diesel Fuel	0.018	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.235
214	Alternative 2	2040	Weekend	6	freeway link 6	KC Transfer Trailers	Combination Short-haul Truck	Freeway	935	Gasoline	0.000	Diesel Fuel	0.974	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.023
215	Alternative 2	2040	Weekend	7	freeway link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Freeway	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
216	Alternative 2	2040	Weekend	8	freeway link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Freeway	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
217	Alternative 2	2040	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	Passenger Car	Local	2818	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
218	Alternative 2	2040	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	Single Unit Short-haul Truck	Local	2818	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
219	Alternative 2	2040	Weekend	11	local link 3	Commercial Hauling Trucks	Refuse Truck	Local	0	Gasoline	0.001	Diesel Fuel	0.818	Compressed Natural Gas (CNG)	0.093	Ethanol (E-85)	0.000	Electricity	0.089
220	Alternative 2	2040	Weekend	12	local link 4	Employees (Cars)	Passenger Car	Local	135	Gasoline	0.711	Diesel Fuel	0.001	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.000	Electricity	0.287
221	Alternative 2	2040	Weekend	13	local link 5	Employees (Trucks)	Passenger Truck	Local	135	Gasoline	0.746	Diesel Fuel	0.018	Compressed Natural Gas (CNG)	0.000	Ethanol (E-85)	0.001	Electricity	0.235
222	Alternative 2	2040	Weekend	14	local link 6	KC Transfer Trailers	Combination Short-haul Truck	Local	705	Gasoline	0.000	Diesel Fuel	0.974	Compressed Natural Gas (CNG)	0.003	Ethanol (E-85)	0.000	Electricity	0.023
223	Alternative 2	2040	Weekend	15	local link 7	MRW Self-Haul	Car/Single Unit Short-haul Truck	Local	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086
224	Alternative 2	2040	Weekend	16	local link 8	MRW Transfer Trucks	Single Unit Short-haul Truck	Local	0	Gasoline	0.272	Diesel Fuel	0.638	Compressed Natural Gas (CNG)	0.004	Ethanol (E-85)	0.000	Electricity	0.086

Notes:

N/A = not applicable

1. Emission factors were obtained from MOVES4 Onroad module runs at the Project Scale for King County at the annual level for both weekdays and weekends. Emission factors represent the maximum emission rate between winter and summer afternoons.

2. PM emission factors include tire wear and brake wear.

3. Emission factors for MRW Self-haul is the average of cars and single unit shot haul trucks.

Operations Emission Factors Summary

Emission Factors Summary

							Overall Emission Factors (grams/mile) - CAPs [1,2]										Overall Emission Factors (grams/mile) - GHGs [1]			
No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Volatile Organic Compounds (VOC)	Sulfur Dioxide (SO2)	Primary Exhaust PM10 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary Exhaust PM2.5 - Total	Primary PM2.5 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Atmospheric CO2	Methane (CH4)	Nitrous Oxide (N2O)	CO2 Equivalent
1	Existing Condition	2023	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	3.49E+00	2.35E-01	1.87E-01	1.42E-03	2.79E-03	1.46E-02	8.30E-03	2.47E-03	1.24E-03	1.82E-03	2.79E+02	1.19E-02	1.55E-03	2.80E+02
2	Existing Condition	2023	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	2.01E+00	2.16E+00	2.45E-01	1.90E-03	1.04E-01	2.51E-02	9.11E-03	9.60E-02	1.37E-03	3.14E-03	5.14E+02	1.01E-02	3.29E-02	5.24E+02
3	Existing Condition	2023	Weekdays	3	freeway link 3	Commercial Hauling Trucks	2.07E+00	5.50E+00	2.88E-01	4.35E-03	2.26E-01	5.99E-02	2.40E-02	2.08E-01	3.60E-03	7.48E-03	1.27E+03	7.25E-02	1.01E-01	1.30E+03
4	Existing Condition	2023	Weekdays	4	freeway link 4	Employees (Cars)	3.41E+00	2.35E-01	1.84E-01	1.40E-03	2.74E-03	1.22E-02	8.06E-03	2.42E-03	1.21E-03	1.52E-03	2.74E+02	1.15E-02	1.46E-03	2.75E+02
5	Existing Condition	2023	Weekdays	5	freeway link 5	Employees (Trucks)	3.68E+00	3.50E-01	1.86E-01	1.79E-03	3.08E-03	1.31E-02	7.95E-03	2.73E-03	1.19E-03	1.64E-03	3.50E+02	1.40E-02	2.31E-03	3.51E+02
6	Existing Condition	2023	Weekdays	6	freeway link 6	KC Transfer Trailers	2.94E+00	9.00E+00	3.96E-01	5.61E-03	3.82E-01	1.27E-01	3.10E-02	3.52E-01	4.64E-03	1.59E-02	1.63E+03	1.80E-02	1.32E-01	1.67E+03
7	Existing Condition	2023	Weekdays	7	freeway link 7	MRW Self-Haul	2.75E+00	1.20E+00	2.16E-01	1.66E-03	5.36E-02	1.98E-02	8.70E-03	4.92E-02	1.31E-03	2.48E-03	3.97E+02	1.10E-02	1.72E-02	4.02E+02
8	Existing Condition	2023	Weekdays	8	freeway link 8	MRW Transfer Trucks	2.01E+00	2.16E+00	2.45E-01	1.90E-03	1.04E-01	2.51E-02	9.11E-03	9.60E-02	1.37E-03	3.14E-03	5.14E+02	1.01E-02	3.29E-02	5.24E+02
9	Existing Condition	2023	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	7.16E+00	3.05E-01	2.81E-01	2.22E-03	5.12E-03	6.38E-02	1.20E-02	4.53E-03	1.80E-03	7.98E-03	4.42E+02	2.49E-02	4.29E-03	4.44E+02
10	Existing Condition	2023	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	3.62E+00	4.03E+00	5.19E-01	2.85E-03	2.09E-01	1.53E-01	1.31E-02	1.93E-01	1.97E-03	1.91E-02	7.69E+02	2.71E-02	4.78E-02	7.84E+02
11	Existing Condition	2023	Weekdays	11	local link 3	Commercial Hauling Trucks	4.54E+00	1.07E+01	6.88E-01	6.52E-03	4.48E-01	4.98E-01	3.91E-02	4.12E-01	5.86E-03	6.23E-02	1.89E+03	2.34E-01	1.45E-01	1.94E+03
12	Existing Condition	2023	Weekdays	12	local link 4	Employees (Cars)	7.10E+00	3.05E-01	2.78E-01	2.19E-03	5.08E-03	6.25E-02	1.16E-02	4.49E-03	1.74E-03	7.81E-03	4.34E+02	2.46E-02	4.15E-03	4.36E+02
13	Existing Condition	2023	Weekdays	13	local link 5	Employees (Trucks)	6.69E+00	4.17E-01	2.92E-01	2.69E-03	6.03E-03	6.78E-02	1.14E-02	5.34E-03	1.71E-03	8.48E-03	5.33E+02	2.90E-02	6.53E-03	5.36E+02
14	Existing Condition	2023	Weekdays	14	local link 6	KC Transfer Trailers	3.36E+00	9.99E+00	4.35E-01	6.00E-03	4.49E-01	1.89E-01	3.48E-02	4.13E-01	5.22E-03	2.36E-02	1.75E+03	2.18E-02	1.40E-01	1.79E+03
15	Existing Condition	2023	Weekdays	15	local link 7	MRW Self-Haul	5.39E+00	2.17E+00	4.00E-01	2.53E-03	1.07E-01	1.08E-01	1.25E-02	9.86E-02	1.88E-03	1.35E-02	6.06E+02	2.60E-02	2.61E-02	6.14E+02
16	Existing Condition	2023	Weekdays	16	local link 8	MRW Transfer Trucks	3.62E+00	4.03E+00	5.19E-01	2.85E-03	2.09E-01	1.53E-01	1.31E-02	1.93E-01	1.97E-03	1.91E-02	7.69E+02	2.71E-02	4.78E-02	7.84E+02
17	Existing Condition	2023	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	3.49E+00	2.35E-01	1.86E-01	1.42E-03	2.79E-03	1.46E-02	8.30E-03	2.47E-03	1.24E-03	1.82E-03	2.79E+02	1.19E-02	1.55E-03	2.80E+02
18	Existing Condition	2023	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	2.01E+00	2.16E+00	2.34E-01	1.90E-03	1.04E-01	2.51E-02	9.11E-03	9.60E-02	1.37E-03	3.14E-03	5.14E+02	1.01E-02	3.29E-02	5.24E+02
19	Existing Condition	2023	Weekend	3	freeway link 3	Commercial Hauling Trucks	1.90E+01	5.46E+01	5.35E+00	2.27E-02	2.74E+00	0.00E+00	0.00E+00	2.52E+00	0.00E+00	0.00E+00	6.57E+03	1.65E+00	5.33E-01	6.77E+03
20	Existing Condition	2023	Weekend	4	freeway link 4	Employees (Cars)	3.41E+00	2.35E-01	1.83E-01	1.40E-03	2.74E-03	1.22E-02	8.06E-03	2.42E-03	1.21E-03	1.52E-03	2.74E+02	1.15E-02	1.46E-03	2.75E+02
21	Existing Condition	2023	Weekend	5	freeway link 5	Employees (Trucks)	3.68E+00	3.50E-01	1.84E-01	1.79E-03	3.08E-03	1.31E-02	7.95E-03	2.73E-03	1.19E-03	1.64E-03	3.50E+02	1.40E-02	2.31E-03	3.51E+02
22	Existing Condition	2023	Weekend	6	freeway link 6	KC Transfer Trailers	2.94E+00	9.00E+00	3.96E-01	5.61E-03	3.82E-01	1.27E-01	3.10E-02	3.52E-01	4.64E-03	1.59E-02	1.63E+03	1.80E-02	1.32E-01	1.67E+03
23	Existing Condition	2023	Weekend	7	freeway link 7	MRW Self-Haul	2.75E+00	1.20E+00	2.10E-01	1.66E-03	5.36E-02	1.98E-02	8.70E-03	4.92E-02	1.31E-03	2.48E-03	3.97E+02	1.10E-02	1.72E-02	4.02E+02
24	Existing Condition	2023	Weekend	8	freeway link 8	MRW Transfer Trucks	1.71E+01	2.31E+01	4.26E+00	1.26E-02	1.58E+00	0.00E+00	0.00E+00	1.45E+00	0.00E+00	0.00E+00	3.35E+03	1.89E-01	2.50E-01	3.43E+03
25	Existing Condition	2023	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	7.21E+00	3.06E-01	2.84E-01	2.25E-03	5.15E-03	6.48E-02	1.23E-02	4.56E-03	1.84E-03	8.10E-03	4.48E+02	2.51E-02	4.40E-03	4.50E+02
26	Existing Condition	2023	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	3.67E+00	4.09E+00	5.17E-01	2.88E-03	2.13E-01	1.57E-01	1.35E-02	1.96E-01	2.02E-03	1.96E-02	7.78E+02	2.77E-02	4.84E-02	7.93E+02
27	Existing Condition	2023	Weekend	11	local link 3	Commercial Hauling Trucks	1.90E+01	5.46E+01	5.35E+00	2.27E-02	2.74E+00	0.00E+00	0.00E+00	2.52E+00	0.00E+00	0.00E+00	6.57E+03	1.65E+00	5.33E-01	6.77E+03
28	Existing Condition	2023	Weekend	12	local link 4	Employees (Cars)	7.26E+00	3.07E-01	2.87E-01	2.29E-03	5.19E-03	6.60E-02	1.26E-02	4.59E-03	1.89E-03	8.25E-03	4.55E+02	2.53E-02	4.53E-03	4.57E+02
29	Existing Condition	2023	Weekend	13	local link 5	Employees (Trucks)	6.82E+00	4.20E-01	2.99E-01	2.81E-03	6.10E-03	7.17E-02	1.25E-02	5.40E-03	1.87E-03	8.96E-03	5.58E+02	2.97E-02	7.13E-03	5.61E+02
30	Existing Condition	2023	Weekend	14	local link 6	KC Transfer Trailers	3.90E+00	1.12E+01	4.90E-01	6.61E-03	5.38E-01	2.62E-01	3.86E-02	4.95E-01	5.79E-03	3.27E-02	1.92E+03	2.65E-02	1.53E-01	1.97E+03
31	Existing Condition	2023	Weekend	15	local link 7	MRW Self-Haul	5.44E+00	2.20E+00	4.00E-01	2.56E-03	1.09E-01	1.11E-01	1.29E-02	1.00E-01	1.93E-03	1.38E-02	6.13E+02	2.64E-02	2.64E-02	6.21E+02
32	Existing Condition	2023	Weekend	16	local link 8	MRW Transfer Trucks	1.71E+01	2.31E+01	4.26E+00	1.26E-02	1.58E+00	0.00E+00	0.00E+00	1.45E+00	0.00E+00	0.00E+00	3.35E+03	1.89E-01	2.50E-01	3.43E+03
33	No Action	2029	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	2.30E+00	7.10E-02	1.07E-01	1.07E-03	1.49E-03	1.03E-02	6.82E-03	1.32E-03	1.02E-03	1.28E-03	2.09E+02	5.21E-03	7.40E-04	2.10E+02
34	No Action	2029	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.16E+00	1.11E+00	1.33E-01	1.66E-03	4.93E-02	1.78E-02	8.11E-03	4.52E-02	1.22E-03	2.22E-03	4.47E+02	5.98E-03	3.75E-02	4.59E+02
35	No Action	2029	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.68E+00	3.19E+00	1.62E-01	3.94E-03	1.11E-01	5.64E-02	2.30E-02	1.02E-01	3.45E-03	7.05E-03	1.16E+03	1.14E-01	1.24E-01	1.20E+03
36	No Action	2029	Weekdays	4	freeway link 4	Employees (Cars)	2.30E+00	7.10E-02	1.07E-01	1.07E-03	1.49E-03	1.03E-02	6.82E-03	1.32E-03	1.02E-03	1.29E-03	2.09E+02	5.21E-03	7.41E-04	2.10E+02
37	No Action	2029	Weekdays	5	freeway link 5	Employees (Trucks)	2.12E+00	9.42E-02	9.53E-02	1.39E-03	1.75E-03	1.13E-02	6.86E-03	1.55E-03	1.03E-03	1.42E-03	2.72E+02	5.31E-03	1.13E-03	2.72E+02
38	No Action	2029	Weekdays	6	freeway link 6	KC Transfer Trailers	2.24E+00	4.88E+00	2.20E-01	5.14E-03	1.68E-01	1.24E-01	3.01E-02	1.54E-01	4.51E-03	1.56E-02	1.52E+03	1.72E-02	1.67E-01	1.57E+03
39	No Action	2029	Weekdays	7	freeway link 7	MRW Self-Haul	1.73E+00	5.88E-01	1.20E-01	1.36E-03	2.54E-02	1.40E-02	7.46E-03	2.33E-02	1.12E-03	1.75E-03	3.28E+02	5.60E-03	1.91E-02	3.34E+02
40	No Action	2029	Weekdays	8	freeway link 8	MRW Transfer Trucks	1.16E+00	1.11E+00	1.33E-01	1.66E-03	4.93E-02	1.78E-02	8.11E-03	4.52E-02	1.22E-03	2.22E-03	4.47E+02	5.98E-03	3.75E-02	4.59E+02
41	No Action	2029	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	4.81E+00	8.56E-02	1.60E-01	1.75E-03	3.09E-03	5.58E-02	1.07E-02	2.74E-03	1.60E-03	6.98E-03	3.47E+02	1.06E-02	2.30E-03	3.48E+02
42	No Action	2029	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	2.16E+00	2.32E+00	3.21E-01	2.51E-03	1.01E-01	1.45E-01	1.27E-02	9.27E-02	1.91E-03	1.81E-02	6.75E+02	2.10E-02	5.51E-02	6.92E+02
43	No Action	2029	Weekdays	11	local link 3	Commercial Hauling Trucks	4.01E+00	7.32E+00	4.07E-01	5.78E-03	2.23E-01	4.79E-01	3.74E-02	2.05E-01	5.62E-03	5.99E-02	1.69E+03	3.89E-01	1.77E-01	1.76E+03
44	No Action	2029	Weekdays	12	local link 4	Employees (Cars)	4.70E+00	8.53E-02	1.55E-01	1.67E-03	3.00E-03	5.29E-02	9.79E-03	2.65E-03	1.47E-03	6.61E-03	3.31E+02	1.04E-02	2.10E-03	3.32E+02
45	No Action	2029	Weekdays	13	local link 5	Employees (Trucks)	3.81E+00	1.00E-01	1.41E-01	2.08E-03	3.49E-03	5.86E-02	9.84E-03	3.09E-03	1.48E-03	7.32E-03	4.13E+02	1.05E-02	3.18E-03	4.14E+02
46	No Action	2029	Weekdays	14	local link 6	KC Transfer Trailers	2.63E+00	5.62E+00	2.45E-01	5.48E-03	1.99E-01	1.86E-01	3.38E-02	1.83E-01	5.07E-03	2.32E-02	1.62E+03	2.11E-02	1.77E-01	1.67E+03
47	No Action	2029	Weekdays	15	local link 7	MRW Self-Haul	3.48E+00	1.20E+00	2.41E-01	2.13E-03	5.20E-02	1.00E-01	1.17E-02	4.77E-02	1.76E-03	1.25E-02	5.11E+02	1.58E-02	2.87E-02	5.20E+02
48	No Action	2029	Weekdays	16	local link 8	MRW Transfer Trucks	2.16E+00	2.32E+00	3.21E-01	2.51E-03	1.01E-01	1.45E-01	1.27E-02	9.27E-02	1.91E-03	1.81E-02	6.75E+02	2.10E-02	5.51E-02	6.92E+02
49	No Action	2029	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	2.30E+00	7.10E-02	1.07E-01	1.07E-03	1.49E-03	1.03E-02	6.82E-03	1.32E-03	1.02E-03	1.28E-03	2.09E+02	5.21E-03	7.40E-04	2.10E+02
50	No Action	2029	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.16E+00	1.11E+00	1.28E-01	1.66E-03	4.92E-02	1.78E-02	8.11E-03	4.52E-02	1.22E-03	2.22E-03	4.47E+02	5.98E-03	3.75E-02	4.59E+02
51	No Action	2029	Weekend	3	freeway link 3	Commercial Hauling Trucks	1.61E+01	4.19E+01	3.07E+00	2.04E-02	1.50E+00	0.00E+00	0.00E+00	1.38E+00	0.00E+00	0.00E+00	5.96E+03	2.68E+00	6.44E-01	6.21E+03
52	No Action	2029	Weekend	4	freeway link 4	Employees (Cars)	2.30E+00	7.10E-02	1.07E-01	1.07E-03	1.49E-03	1.03E-02	6.82E-03	1.32E-03	1.02E-03	1.29E-03	2.09E+02	5.21E-03	7.41E-04	2.10E+02
53	No Action	2029	Weekend	5	freeway link 5	Employees (Trucks)	2.12E+00	9.42E-02	9.39E-02	1.39E-03	1.75E-03	1.13E-02	6.86E-03	1.55E-03	1.03E-03	1.42E-03	2.72E+02	5.31E-03	1.13E-03	2.72E+02
54	No Action	2029	Weekend	6	freeway link 6	KC Transfer Trailers	2.24E+00	4.88E+00	2.20E-01	5.14E-03	1.68E-01	1.24E-01	3.01E-02	1.54E-01	4.51E-03	1.56E-02	1.52E+03	1.72E-02	1.67E-01	1.57E+03
55	No Action	2029	Weekend	7	freeway link 7	MRW Self-Haul	1.73E+00	5.88E-01	1.17E-01	1.36E-03	2.54E-02	1.40E-02	7.46E-03	2.33E-02	1.12E-03	1.75E-03	3.28E+02	5.60E-03	1.91E-02	3.34E+02
56	No Action	2029	Weekend	8	freeway link 8	MRW Transfer Trucks	1.12E+01	1.48E+01	2.53E+00	1.13E-02	1.04E+00	0.00E+00	0.00E+00	9.61E-01	0.00E+00	0.00E+00	2.98E+03	1.45E-01	2.72E-01	3.06E+03
57	No Action	2029	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	4.83E+00	8.56E-02	1.61E-01	1.76E-03	3.11E-03	5.64E-02	1.09E-02	2.75E-03	1.63E-03	7.05E-03	3.50E+02	1.07E-02	2.33E-03	3.51E+02
58	No Action	2029	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	2.18E+00	2.34E+00	3.20E-01	2.53E-03	1.02E-01	1.47E-01	1.29E-02	9.37E-02	1.94E-03	1.84E-02	6.79E+02	2.12E-02	5.54E-02	6.96E+02
59	No Action	2029	Weekend	11	local link 3	Commercial Hauling Trucks	1.61E+01	4.19E+01	3.07E+00	2.04E-02	1.50E+00	0.00E+00	0.00E+00	1.38E+00	0.00E+00	0.00E+00	5.96E+03	2.68E+00	6.44E-01	6.21E+03
60	No Action	2029	Weekend	12	local link 4	Employees (Cars)	4.81E+00	8.56E-02	1.60E-01	1.74E-03	3.09E-03	5.58E-02	1.07E-02	2.74E-03	1.60E-03	6.98E-03	3.47E+02	1.06E-02	2.30E-03	3.48E+02
61	No Action	2029	Weekend	13	local link 5	Employees (Trucks)	3.89E+00	1.01E-01	1.44E-01	2.18E-03	3.52E-03	6.19E-02	1.07E-02	3.11E-03	1.61E-03	7.74E-03	4.32E+02	1.07E-02	3.47E-03	4.34E+02
62	No Action	2029	Weekend	14	local link 6	KC Transfer Trailers	3.11E+00	6.50E+00	2.79E-01	6.02E-03	2.38E-01	2.58E-01	3.75E-02	2.19E-01	5.62E-03	3.22E-02	1.78E+03	2.62E-02	1.94E-01	1.83E+03
63	No Action	2029	Weekend	15	local link 7	MRW Self-Haul	3.50E+00	1.21E+00	2.40E-01	2.14E-03	5.25E-02	1.02E-01	1.19E-02	4.82E-02	1.78E-03	1.27E-02	5.15E+02	1.60E-02	2.89E-02	5.24E+02
64	No Action	2029	Weekend	16	local link 8	MRW Transfer Trucks	1.12E+01	1.48E+01	2.53E+00	1.13E-02	1.04E+00	0.00E+00	0.00E+00	9.61E-01	0.00E+00	0.00E+00	2.98E+03	1.45E-01	2.72E-01	3.06E+03
65	No Action	2040	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	7.70E-01	5.49E-03	5.20E-02	6.18E-04	6.49E-04	7.51E-03	4.99E-03	5.74E-04	7.48E-04	9.38E-04	1.21E+02	2.12E-03	4.12E-04	1.21E+02
66	No Action	2040	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	4.83E-01	2.32E-01	2.29E-02	1.28E-03	2.55E-03	1.43E-02	6.87E-03	2.33E-03	1.03E-03	1.79E-03	3.46E+02	3.85E-03	4.30E-02	3.59E+02
67	No Action	2040	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.18E+00	9.75E-01	2.13E-02	2.98E-03	3.92E-03	4.65E-02	1.93E-02	3.60E-03	2.89E-03	5.81E-03	8.86E+02	1.47E-01	1.36E-01	9.30E+02
68	No Action	2040	Weekdays	4	freeway link 4	Employees (Cars)	7.70E-01	5.49E-03	5.20E-02	6.18E-04	6.49E-04	7.53E-03	4.99E-03	5.74E-04	7.49E-04	9.41E-04	1.21E+02	2.12E-03	4.12E-04	1.21E+02

Operations Emission Factors Summary

Emission Factors Summary

							Overall Emission Factors (grams/mile) - CAPs [1,2]										Overall Emission Factors (grams/mile) - GHGs [1]			
No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Volatile Organic Compounds (VOC)	Sulfur Dioxide (SO2)	Primary Exhaust PM10 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary Exhaust PM2.5 - Total	Primary PM2.5 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Atmospheric CO2	Methane (CH4)	Nitrous Oxide (N2O)	CO2 Equivalent
69	No Action	2040	Weekdays	5	freeway link 5	Employees (Trucks)	8.92E-01	8.01E-03	6.20E-02	8.79E-04	8.00E-04	8.62E-03	5.21E-03	7.08E-04	7.82E-04	1.08E-03	1.72E+02	2.58E-03	5.43E-04	1.72E+02
70	No Action	2040	Weekdays	6	freeway link 6	KC Transfer Trailers	1.54E+00	1.97E+00	4.34E-02	4.48E-03	1.48E-02	1.17E-01	2.81E-02	1.36E-02	4.22E-03	1.47E-02	1.34E+03	1.81E-02	2.02E-01	1.40E+03
71	No Action	2040	Weekdays	7	freeway link 7	MRW Self-Haul	6.27E-01	1.19E-01	3.74E-02	9.48E-04	1.60E-03	1.09E-02	5.93E-03	1.45E-03	8.90E-04	1.36E-03	2.33E+02	2.99E-03	2.17E-02	2.40E+02
72	No Action	2040	Weekdays	8	freeway link 8	MRW Transfer Trucks	4.83E-01	2.32E-01	2.29E-02	1.28E-03	2.55E-03	1.43E-02	6.87E-03	2.33E-03	1.03E-03	1.79E-03	3.46E+02	3.85E-03	4.30E-02	3.59E+02
73	No Action	2040	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	1.61E+00	6.62E-03	7.73E-02	1.01E-03	1.12E-03	4.09E-02	7.83E-03	9.93E-04	1.17E-03	5.11E-03	2.01E+02	4.33E-03	1.28E-03	2.01E+02
74	No Action	2040	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	8.26E-01	7.53E-01	5.15E-02	1.88E-03	5.38E-03	1.19E-01	1.08E-02	4.91E-03	1.62E-03	1.48E-02	5.05E+02	1.40E-02	6.21E-02	5.24E+02
75	No Action	2040	Weekdays	11	local link 3	Commercial Hauling Trucks	3.22E+00	3.17E+00	7.06E-02	4.21E-03	9.24E-03	4.06E-01	3.14E-02	8.50E-03	4.71E-03	5.07E-02	1.25E+03	5.11E-01	1.92E-01	1.32E+03
76	No Action	2040	Weekdays	12	local link 4	Employees (Cars)	1.57E+00	6.60E-03	7.45E-02	9.63E-04	1.08E-03	3.87E-02	7.16E-03	9.55E-04	1.07E-03	4.84E-03	1.91E+02	4.22E-03	1.17E-03	1.92E+02
77	No Action	2040	Weekdays	13	local link 5	Employees (Trucks)	1.64E+00	9.41E-03	8.94E-02	1.31E-03	1.31E-03	4.46E-02	7.48E-03	1.16E-03	1.12E-03	5.58E-03	2.61E+02	4.94E-03	1.52E-03	2.62E+02
78	No Action	2040	Weekdays	14	local link 6	KC Transfer Trailers	1.89E+00	2.45E+00	5.29E-02	4.74E-03	1.75E-02	1.76E-01	3.16E-02	1.61E-02	4.75E-03	2.20E-02	1.42E+03	2.28E-02	2.14E-01	1.48E+03
79	No Action	2040	Weekdays	15	local link 7	MRW Self-Haul	1.22E+00	3.80E-01	6.44E-02	1.45E-03	3.25E-03	7.98E-02	9.31E-03	2.95E-03	1.40E-03	9.97E-03	3.53E+02	9.19E-03	3.17E-02	3.62E+02
80	No Action	2040	Weekdays	16	local link 8	MRW Transfer Trucks	8.26E-01	7.53E-01	5.15E-02	1.88E-03	5.38E-03	1.19E-01	1.08E-02	4.91E-03	1.62E-03	1.48E-02	5.05E+02	1.40E-02	6.21E-02	5.24E+02
81	No Action	2040	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	7.70E-01	5.49E-03	5.18E-02	6.18E-04	6.49E-04	7.51E-03	4.99E-03	5.74E-04	7.48E-04	9.38E-04	1.21E+02	2.12E-03	4.12E-04	1.21E+02
82	No Action	2040	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	4.83E-01	2.32E-01	1.87E-02	1.28E-03	2.55E-03	1.43E-02	6.87E-03	2.33E-03	1.03E-03	1.79E-03	3.46E+02	3.85E-03	4.30E-02	3.59E+02
83	No Action	2040	Weekend	3	freeway link 3	Commercial Hauling Trucks	1.15E+01	2.83E+01	5.24E-01	1.53E-02	2.45E-02	0.00E+00	0.00E+00	2.25E-02	0.00E+00	0.00E+00	4.52E+03	3.50E+00	6.99E-01	4.81E+03
84	No Action	2040	Weekend	4	freeway link 4	Employees (Cars)	7.70E-01	5.49E-03	5.18E-02	6.18E-04	6.49E-04	7.53E-03	4.99E-03	5.74E-04	7.49E-04	9.41E-04	1.21E+02	2.12E-03	4.12E-04	1.21E+02
85	No Action	2040	Weekend	5	freeway link 5	Employees (Trucks)	8.92E-01	8.01E-03	6.09E-02	8.79E-04	8.00E-04	8.62E-03	5.21E-03	7.08E-04	7.82E-04	1.08E-03	1.72E+02	2.58E-03	5.43E-04	1.72E+02
86	No Action	2040	Weekend	6	freeway link 6	KC Transfer Trailers	1.54E+00	1.97E+00	4.34E-02	4.48E-03	1.48E-02	1.17E-01	2.81E-02	1.36E-02	4.22E-03	1.47E-02	1.34E+03	1.81E-02	2.02E-01	1.40E+03
87	No Action	2040	Weekend	7	freeway link 7	MRW Self-Haul	6.27E-01	1.19E-01	3.52E-02	9.48E-04	1.60E-03	1.09E-02	5.93E-03	1.45E-03	8.90E-04	1.36E-03	2.33E+02	2.99E-03	2.17E-02	2.40E+02
88	No Action	2040	Weekend	8	freeway link 8	MRW Transfer Trucks	5.38E+00	6.06E+00	3.28E-01	8.90E-03	1.88E-02	0.00E+00	0.00E+00	1.72E-02	0.00E+00	0.00E+00	2.34E+03	1.11E-01	2.85E-01	2.43E+03
89	No Action	2040	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	1.61E+00	6.63E-03	7.77E-02	1.02E-03	1.13E-03	4.13E-02	7.95E-03	1.00E-03	1.19E-03	5.16E-03	2.02E+02	4.35E-03	1.30E-03	2.03E+02
90	No Action	2040	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	8.34E-01	7.62E-01	4.78E-02	1.89E-03	5.43E-03	1.21E-01	1.10E-02	4.97E-03	1.64E-03	1.51E-02	5.08E+02	1.42E-02	6.24E-02	5.27E+02
91	No Action	2040	Weekend	11	local link 3	Commercial Hauling Trucks	1.15E+01	2.83E+01	5.24E-01	1.53E-02	2.45E-02	0.00E+00	0.00E+00	2.25E-02	0.00E+00	0.00E+00	4.52E+03	3.50E+00	6.99E-01	4.81E+03
92	No Action	2040	Weekend	12	local link 4	Employees (Cars)	1.61E+00	6.62E-03	7.71E-02	1.01E-03	1.12E-03	4.09E-02	7.82E-03	9.93E-04	1.17E-03	5.11E-03	2.01E+02	4.33E-03	1.28E-03	2.01E+02
93	No Action	2040	Weekend	13	local link 5	Employees (Trucks)	1.67E+00	9.45E-03	9.19E-02	1.37E-03	1.34E-03	4.72E-02	8.17E-03	1.18E-03	1.23E-03	5.89E-03	2.73E+02	5.06E-03	1.66E-03	2.74E+02
94	No Action	2040	Weekend	14	local link 6	KC Transfer Trailers	2.33E+00	3.02E+00	6.50E-02	5.20E-03	2.13E-02	2.45E-01	3.51E-02	1.96E-02	5.26E-03	3.06E-02	1.56E+03	2.87E-02	2.35E-01	1.63E+03
95	No Action	2040	Weekend	15	local link 7	MRW Self-Haul	1.22E+00	3.84E-01	6.28E-02	1.46E-03	3.28E-03	8.11E-02	9.45E-03	2.98E-03	1.42E-03	1.01E-02	3.55E+02	9.28E-03	3.18E-02	3.65E+02
96	No Action	2040	Weekend	16	local link 8	MRW Transfer Trucks	5.38E+00	6.06E+00	3.28E-01	8.90E-03	1.88E-02	0.00E+00	0.00E+00	1.72E-02	0.00E+00	0.00E+00	2.34E+03	1.11E-01	2.85E-01	2.43E+03
97	Alternative 1	2029	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	2.30E+00	7.10E-02	1.07E-01	1.07E-03	1.49E-03	1.03E-02	6.82E-03	1.32E-03	1.02E-03	1.28E-03	2.09E+02	5.21E-03	7.40E-04	2.10E+02
98	Alternative 1	2029	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.16E+00	1.11E+00	1.33E-01	1.66E-03	4.93E-02	1.78E-02	8.11E-03	4.52E-02	1.22E-03	2.22E-03	4.47E+02	5.98E-03	3.75E-02	4.59E+02
99	Alternative 1	2029	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.68E+00	3.19E+00	1.62E-01	3.94E-03	1.11E-01	5.64E-02	2.30E-02	1.02E-01	3.45E-03	7.05E-03	1.16E+03	1.14E-01	1.24E-01	1.20E+03
100	Alternative 1	2029	Weekdays	4	freeway link 4	Employees (Cars)	2.30E+00	7.10E-02	1.07E-01	1.07E-03	1.49E-03	1.03E-02	6.82E-03	1.32E-03	1.02E-03	1.29E-03	2.09E+02	5.21E-03	7.41E-04	2.10E+02
101	Alternative 1	2029	Weekdays	5	freeway link 5	Employees (Trucks)	2.12E+00	9.42E-02	9.53E-02	1.39E-03	1.75E-03	1.13E-02	6.86E-03	1.55E-03	1.03E-03	1.42E-03	2.72E+02	5.31E-03	1.13E-03	2.72E+02
102	Alternative 1	2029	Weekdays	6	freeway link 6	KC Transfer Trailers	2.24E+00	4.88E+00	2.20E-01	5.14E-03	1.68E-01	1.24E-01	3.01E-02	1.54E-01	4.51E-03	1.56E-02	1.52E+03	1.72E-02	1.67E-01	1.57E+03
103	Alternative 1	2029	Weekdays	7	freeway link 7	MRW Self-Haul	1.73E+00	5.88E-01	1.20E-01	1.36E-03	2.54E-02	1.40E-02	7.46E-03	2.33E-02	1.12E-03	1.75E-03	3.28E+02	5.60E-03	1.91E-02	3.34E+02
104	Alternative 1	2029	Weekdays	8	freeway link 8	MRW Transfer Trucks	1.16E+00	1.11E+00	1.33E-01	1.66E-03	4.93E-02	1.78E-02	8.11E-03	4.52E-02	1.22E-03	2.22E-03	4.47E+02	5.98E-03	3.75E-02	4.59E+02
105	Alternative 1	2029	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	4.81E+00	8.56E-02	1.60E-01	1.75E-03	3.09E-03	5.58E-02	1.07E-02	2.74E-03	1.60E-03	6.98E-03	3.47E+02	1.06E-02	2.30E-03	3.48E+02
106	Alternative 1	2029	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	2.16E+00	2.32E+00	3.21E-01	2.51E-03	1.01E-01	1.45E-01	1.27E-02	9.27E-02	1.91E-03	1.81E-02	6.75E+02	2.10E-02	5.51E-02	6.92E+02
107	Alternative 1	2029	Weekdays	11	local link 3	Commercial Hauling Trucks	4.01E+00	7.32E+00	4.07E-01	5.78E-03	2.23E-01	4.79E-01	3.74E-02	2.05E-01	5.62E-03	5.99E-02	1.69E+03	3.89E-01	1.77E-01	1.76E+03
108	Alternative 1	2029	Weekdays	12	local link 4	Employees (Cars)	4.70E+00	8.53E-02	1.55E-01	1.67E-03	3.00E-03	5.29E-02	9.79E-03	2.65E-03	1.47E-03	6.61E-03	3.31E+02	1.04E-02	2.10E-03	3.32E+02
109	Alternative 1	2029	Weekdays	13	local link 5	Employees (Trucks)	3.81E+00	1.00E-01	1.41E-01	2.08E-03	3.49E-03	5.86E-02	9.84E-03	3.09E-03	1.48E-03	7.32E-03	4.13E+02	1.05E-02	3.18E-03	4.14E+02
110	Alternative 1	2029	Weekdays	14	local link 6	KC Transfer Trailers	2.63E+00	5.62E+00	2.45E-01	5.48E-03	1.99E-01	1.86E-01	3.38E-02	1.83E-01	5.07E-03	2.32E-02	1.62E+03	2.11E-02	1.77E-01	1.67E+03
111	Alternative 1	2029	Weekdays	15	local link 7	MRW Self-Haul	3.48E+00	1.20E+00	2.41E-01	2.13E-03	5.20E-02	1.00E-01	1.17E-02	4.77E-02	1.76E-03	1.25E-02	5.11E+02	1.58E-02	2.87E-02	5.20E+02
112	Alternative 1	2029	Weekdays	16	local link 8	MRW Transfer Trucks	2.16E+00	2.32E+00	3.21E-01	2.51E-03	1.01E-01	1.45E-01	1.27E-02	9.27E-02	1.91E-03	1.81E-02	6.75E+02	2.10E-02	5.51E-02	6.92E+02
113	Alternative 1	2029	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	2.30E+00	7.10E-02	1.07E-01	1.07E-03	1.49E-03	1.03E-02	6.82E-03	1.32E-03	1.02E-03	1.28E-03	2.09E+02	5.21E-03	7.40E-04	2.10E+02
114	Alternative 1	2029	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.16E+00	1.11E+00	1.28E-01	1.66E-03	4.92E-02	1.78E-02	8.11E-03	4.52E-02	1.22E-03	2.22E-03	4.47E+02	5.98E-03	3.75E-02	4.59E+02
115	Alternative 1	2029	Weekend	3	freeway link 3	Commercial Hauling Trucks	1.61E+01	4.19E+01	3.07E+00	2.04E-02	1.50E+00	0.00E+00	0.00E+00	1.38E+00	0.00E+00	0.00E+00	5.96E+03	2.68E+00	6.44E-01	6.21E+03
116	Alternative 1	2029	Weekend	4	freeway link 4	Employees (Cars)	2.30E+00	7.10E-02	1.07E-01	1.07E-03	1.49E-03	1.03E-02	6.82E-03	1.32E-03	1.02E-03	1.29E-03	2.09E+02	5.21E-03	7.41E-04	2.10E+02
117	Alternative 1	2029	Weekend	5	freeway link 5	Employees (Trucks)	2.12E+00	9.42E-02	9.39E-02	1.39E-03	1.75E-03	1.13E-02	6.86E-03	1.55E-03	1.03E-03	1.42E-03	2.72E+02	5.31E-03	1.13E-03	2.72E+02
118	Alternative 1	2029	Weekend	6	freeway link 6	KC Transfer Trailers	2.24E+00	4.88E+00	2.20E-01	5.14E-03	1.68E-01	1.24E-01	3.01E-02	1.54E-01	4.51E-03	1.56E-02	1.52E+03	1.72E-02	1.67E-01	1.57E+03
119	Alternative 1	2029	Weekend	7	freeway link 7	MRW Self-Haul	1.73E+00	5.88E-01	1.17E-01	1.36E-03	2.54E-02	1.40E-02	7.46E-03	2.33E-02	1.12E-03	1.75E-03	3.28E+02	5.60E-03	1.91E-02	3.34E+02
120	Alternative 1	2029	Weekend	8	freeway link 8	MRW Transfer Trucks	1.12E+01	1.48E+01	2.53E+00	1.13E-02	1.04E+00	0.00E+00	0.00E+00	9.61E-01	0.00E+00	0.00E+00	2.98E+03	1.45E-01	2.72E-01	3.06E+03
121	Alternative 1	2029	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	4.83E+00	8.56E-02	1.61E-01	1.76E-03	3.11E-03	5.64E-02	1.09E-02	2.75E-03	1.63E-03	7.05E-03	3.50E+02	1.07E-02	2.33E-03	3.51E+02
122	Alternative 1	2029	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	2.18E+00	2.34E+00	3.20E-01	2.53E-03	1.02E-01	1.47E-01	1.29E-02	9.37E-02	1.94E-03	1.84E-02	6.79E+02	2.12E-02	5.54E-02	6.96E+02
123	Alternative 1	2029	Weekend	11	local link 3	Commercial Hauling Trucks	1.61E+01	4.19E+01	3.07E+00	2.04E-02	1.50E+00	0.00E+00	0.00E+00	1.38E+00	0.00E+00	0.00E+00	5.96E+03	2.68E+00	6.44E-01	6.21E+03
124	Alternative 1	2029	Weekend	12	local link 4	Employees (Cars)	4.81E+00	8.56E-02	1.60E-01	1.74E-03	3.09E-03	5.58E-02	1.07E-02	2.74E-03	1.60E-03	6.98E-03	3.47E+02	1.06E-02	2.30E-03	3.48E+02
125	Alternative 1	2029	Weekend	13	local link 5	Employees (Trucks)	3.89E+00	1.01E-01	1.44E-01	2.18E-03	3.52E-03	6.19E-02	1.07E-02	3.11E-03	1.61E-03	7.74E-03	4.32E+02	1.07E-02	3.47E-03	4.34E+02
126	Alternative 1	2029	Weekend	14	local link 6	KC Transfer Trailers	3.11E+00	6.50E+00	2.79E-01	6.02E-03	2.38E-01	2.58E-01	3.75E-02	2.19E-01	5.62E-03	3.22E-02	1.78E+03	2.62E-02	1.94E-01	1.83E+03
127	Alternative 1	2029	Weekend	15	local link 7	MRW Self-Haul	3.50E+00	1.21E+00	2.40E-01	2.14E-03	5.25E-02	1.02E-01	1.19E-02	4.82E-02	1.78E-03	1.27E-02	5.15E+02	1.60E-02	2.89E-02	5.24E+02
128	Alternative 1	2029	Weekend	16	local link 8	MRW Transfer Trucks	1.12E+01	1.48E+01	2.53E+00	1.13E-02	1.04E+00	0.00E+00	0.00E+00	9.61E-01	0.00E+00	0.00E+00	2.98E+03	1.45E-01	2.72E-01	3.06E+03
129	Alternative 1	2040	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	7.70E-01	5.49E-03	5.20E-02	6.18E-04	6.49E-04	7.51E-03	4.99E-03	5.74E-04	7.48E-04	9.38E-04	1.21E+02	2.12E-03	4.12E-04	1.21E+02
130	Alternative 1	2040	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	4.83E-01	2.32E-01	2.29E-02	1.28E-03	2.55E-03	1.43E-02	6.87E-03	2.33E-03	1.03E-03	1.79E-03	3.46E+02	3.85E-03	4.30E-02	3.59E+02
131	Alternative 1	2040	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.18E+00	9.75E-01	2.13E-02	2.98E-03	3.92E-03	4.65E-02	1.93E-02	3.60E-03	2.89E-03	5.81E-03	8.86E+02	1.47E-01	1.36E-01	9.30E+02
132	Alternative 1	2040	Weekdays	4	freeway link 4	Employees (Cars)	7.70E-01	5.49E-03	5.20E-02	6.18E-04	6.49E-04	7.53E-03	4.99E-03	5.74E-04	7.49E-04	9.41E-04	1.21E+02	2.12E-03	4.12E-04	1.21E+02
133	Alternative 1	2040	Weekdays	5	freeway link 5	Employees (Trucks)	8.92E-01	8.01E-03	6.20E-02	8.79E-04	8.00E-04	8.62E-03	5.21E-03	7.08E-04	7.82E-04	1.08E-03	1.72E+02	2.58E-03	5.43E-04	1.72E+02
134	Alternative 1	2040	Weekdays	6	freeway link 6	KC Transfer Trailers	1.54E+00	1.97E+00	4.34E-02	4.48E-03	1.48E-02	1.17E-01	2.81E-02	1.36E-02	4.22E-03	1.47E-02	1.34E+03	1.81E-02	2.02E-01	1.40E+03
135	Alternative 1	2040	Weekdays	7	freeway link 7	MRW Self-Haul	6.27E-01	1.19E-01	3.74E-02	9.48E-04	1.60E-03	1.09E-02	5.93E-03	1.45E-03	8.90E-04	1.36E-03	2.33E+02	2.99E-03	2.17E-02	2.40E+02
136	Alternative 1	2040	Weekdays	8	freeway link 8	MRW Transfer Trucks	4.83E-01	2.32E-01	2.29E-02	1.28E-03	2.55E-03	1.43E-02	6.87E-03	2.33E-03	1.03E-03	1.79E-03	3.46E+02	3.85E-03	4.30E-02	3.59E+02

Operations Emission Factors Summary

Emission Factors Summary

							Overall Emission Factors (grams/mile) - CAPs [1,2]										Overall Emission Factors (grams/mile) - GHGs [1]			
No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Volatile Organic Compounds (VOC)	Sulfur Dioxide (SO2)	Primary Exhaust PM10 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary Exhaust PM2.5 - Total	Primary PM2.5 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Atmospheric CO2	Methane (CH4)	Nitrous Oxide (N2O)	CO2 Equivalent
137	Alternative 1	2040	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	1.61E+00	6.62E-03	7.73E-02	1.01E-03	1.12E-03	4.09E-02	7.83E-03	9.93E-04	1.17E-03	5.11E-03	2.01E+02	4.33E-03	1.28E-03	2.01E+02
138	Alternative 1	2040	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	8.26E-01	7.53E-01	5.15E-02	1.88E-03	5.38E-03	1.19E-01	1.08E-02	4.91E-03	1.62E-03	1.48E-02	5.05E+02	1.40E-02	6.21E-02	5.24E+02
139	Alternative 1	2040	Weekdays	11	local link 3	Commercial Hauling Trucks	3.22E+00	3.17E+00	7.06E-02	4.21E-03	9.24E-03	4.06E-01	3.14E-02	8.50E-03	4.71E-03	5.07E-02	1.25E+03	5.11E-01	1.92E-01	1.32E+03
140	Alternative 1	2040	Weekdays	12	local link 4	Employees (Cars)	1.57E+00	6.60E-03	7.45E-02	9.63E-04	1.08E-03	3.87E-02	7.16E-03	9.55E-04	1.07E-03	4.84E-03	1.91E+02	4.22E-03	1.17E-03	1.92E+02
141	Alternative 1	2040	Weekdays	13	local link 5	Employees (Trucks)	1.64E+00	9.41E-03	8.94E-02	1.31E-03	1.31E-03	4.46E-02	7.48E-03	1.16E-03	1.12E-03	5.58E-03	2.61E+02	4.94E-03	1.52E-03	2.62E+02
142	Alternative 1	2040	Weekdays	14	local link 6	KC Transfer Trailers	1.89E+00	2.45E+00	5.29E-02	4.74E-03	1.75E-02	1.76E-01	3.16E-02	1.61E-02	4.75E-03	2.20E-02	1.42E+03	2.28E-02	2.14E-01	1.48E+03
143	Alternative 1	2040	Weekdays	15	local link 7	MRW Self-Haul	1.22E+00	3.80E-01	6.44E-02	1.45E-03	3.25E-03	7.98E-02	9.31E-03	2.95E-03	1.40E-03	9.97E-03	3.53E+02	9.19E-03	3.17E-02	3.62E+02
144	Alternative 1	2040	Weekdays	16	local link 8	MRW Transfer Trucks	8.26E-01	7.53E-01	5.15E-02	1.88E-03	5.38E-03	1.19E-01	1.08E-02	4.91E-03	1.62E-03	1.48E-02	5.05E+02	1.40E-02	6.21E-02	5.24E+02
145	Alternative 1	2040	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	7.70E-01	5.49E-03	5.18E-02	6.18E-04	6.49E-04	7.51E-03	4.99E-03	5.74E-04	7.48E-04	9.38E-04	1.21E+02	2.12E-03	4.12E-04	1.21E+02
146	Alternative 1	2040	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	4.83E-01	2.32E-01	1.87E-02	1.28E-03	2.55E-03	1.43E-02	6.87E-03	2.33E-03	1.03E-03	1.79E-03	3.46E+02	3.85E-03	4.30E-02	3.59E+02
147	Alternative 1	2040	Weekend	3	freeway link 3	Commercial Hauling Trucks	1.15E+01	2.83E+01	5.24E-01	1.53E-02	2.45E-02	0.00E+00	0.00E+00	2.25E-02	0.00E+00	0.00E+00	4.52E+03	3.50E+00	6.99E-01	4.81E+03
148	Alternative 1	2040	Weekend	4	freeway link 4	Employees (Cars)	7.70E-01	5.49E-03	5.18E-02	6.18E-04	6.49E-04	7.53E-03	4.99E-03	5.74E-04	7.49E-04	9.41E-04	1.21E+02	2.12E-03	4.12E-04	1.21E+02
149	Alternative 1	2040	Weekend	5	freeway link 5	Employees (Trucks)	8.92E-01	8.01E-03	6.09E-02	8.79E-04	8.00E-04	8.62E-03	5.21E-03	7.08E-04	7.82E-04	1.08E-03	1.72E+02	2.58E-03	5.43E-04	1.72E+02
150	Alternative 1	2040	Weekend	6	freeway link 6	KC Transfer Trailers	1.54E+00	1.97E+00	4.34E-02	4.48E-03	1.48E-02	1.17E-01	2.81E-02	1.36E-02	4.22E-03	1.47E-02	1.34E+03	1.81E-02	2.02E-01	1.40E+03
151	Alternative 1	2040	Weekend	7	freeway link 7	MRW Self-Haul	6.27E-01	1.19E-01	3.52E-02	9.48E-04	1.60E-03	1.09E-02	5.93E-03	1.45E-03	8.90E-04	1.36E-03	2.33E+02	2.99E-03	2.17E-02	2.40E+02
152	Alternative 1	2040	Weekend	8	freeway link 8	MRW Transfer Trucks	5.38E+00	6.06E+00	3.28E-01	8.90E-03	1.88E-02	0.00E+00	0.00E+00	1.72E-02	0.00E+00	0.00E+00	2.34E+03	1.11E-01	2.85E-01	2.43E+03
153	Alternative 1	2040	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	1.61E+00	6.63E-03	7.77E-02	1.02E-03	1.13E-03	4.13E-02	7.95E-03	1.00E-03	1.19E-03	5.16E-03	2.02E+02	4.35E-03	1.30E-03	2.03E+02
154	Alternative 1	2040	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	8.34E-01	7.62E-01	4.78E-02	1.89E-03	5.43E-03	1.21E-01	1.10E-02	4.97E-03	1.64E-03	1.51E-02	5.08E+02	1.42E-02	6.24E-02	5.27E+02
155	Alternative 1	2040	Weekend	11	local link 3	Commercial Hauling Trucks	1.15E+01	2.83E+01	5.24E-01	1.53E-02	2.45E-02	0.00E+00	0.00E+00	2.25E-02	0.00E+00	0.00E+00	4.52E+03	3.50E+00	6.99E-01	4.81E+03
156	Alternative 1	2040	Weekend	12	local link 4	Employees (Cars)	1.61E+00	6.62E-03	7.71E-02	1.01E-03	1.12E-03	4.09E-02	7.82E-03	9.93E-04	1.17E-03	5.11E-03	2.01E+02	4.33E-03	1.28E-03	2.01E+02
157	Alternative 1	2040	Weekend	13	local link 5	Employees (Trucks)	1.67E+00	9.45E-03	9.19E-02	1.37E-03	1.34E-03	4.72E-02	8.17E-03	1.18E-03	1.23E-03	5.89E-03	2.73E+02	5.06E-03	1.66E-03	2.74E+02
158	Alternative 1	2040	Weekend	14	local link 6	KC Transfer Trailers	2.33E+00	3.02E+00	6.50E-02	5.20E-03	2.13E-02	2.45E-01	3.51E-02	1.96E-02	5.26E-03	3.06E-02	1.56E+03	2.87E-02	2.35E-01	1.63E+03
159	Alternative 1	2040	Weekend	15	local link 7	MRW Self-Haul	1.22E+00	3.84E-01	6.28E-02	1.46E-03	3.28E-03	8.11E-02	9.45E-03	2.98E-03	1.42E-03	1.01E-02	3.55E+02	9.28E-03	3.18E-02	3.65E+02
160	Alternative 1	2040	Weekend	16	local link 8	MRW Transfer Trucks	5.38E+00	6.06E+00	3.28E-01	8.90E-03	1.88E-02	0.00E+00	0.00E+00	1.72E-02	0.00E+00	0.00E+00	2.34E+03	1.11E-01	2.85E-01	2.43E+03
161	Alternative 2	2029	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	2.31E+00	7.10E-02	1.07E-01	1.07E-03	1.49E-03	1.04E-02	6.85E-03	1.32E-03	1.03E-03	1.30E-03	2.10E+02	5.22E-03	7.44E-04	2.10E+02
162	Alternative 2	2029	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.16E+00	1.11E+00	1.33E-01	1.66E-03	4.94E-02	1.81E-02	8.15E-03	4.53E-02	1.22E-03	2.26E-03	4.48E+02	6.03E-03	3.75E-02	4.59E+02
163	Alternative 2	2029	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.70E+00	3.25E+00	1.64E-01	3.97E-03	1.14E-01	6.05E-02	2.26E-02	1.04E-01	3.40E-03	7.57E-03	1.17E+03	1.17E-01	1.25E-01	1.21E+03
164	Alternative 2	2029	Weekdays	4	freeway link 4	Employees (Cars)	2.25E+00	7.10E-02	1.05E-01	1.05E-03	1.44E-03	7.99E-03	6.36E-03	1.27E-03	9.53E-04	9.99E-04	2.05E+02	5.05E-03	6.90E-04	2.05E+02
165	Alternative 2	2029	Weekdays	5	freeway link 5	Employees (Trucks)	2.11E+00	9.46E-02	9.37E-02	1.37E-03	1.71E-03	8.79E-03	6.39E-03	1.52E-03	9.58E-04	1.10E-03	2.67E+02	5.17E-03	1.06E-03	2.68E+02
166	Alternative 2	2029	Weekdays	6	freeway link 6	KC Transfer Trailers	2.13E+00	4.70E+00	2.12E-01	5.10E-03	1.61E-01	1.02E-01	2.92E-02	1.49E-01	4.39E-03	1.27E-02	1.50E+03	1.62E-02	1.66E-01	1.55E+03
167	Alternative 2	2029	Weekdays	7	freeway link 7	MRW Self-Haul	1.73E+00	5.89E-01	1.20E-01	1.37E-03	2.54E-02	1.43E-02	7.50E-03	2.33E-02	1.13E-03	1.78E-03	3.29E+02	5.63E-03	1.91E-02	3.34E+02
168	Alternative 2	2029	Weekdays	8	freeway link 8	MRW Transfer Trucks	1.16E+00	1.11E+00	1.33E-01	1.66E-03	4.94E-02	1.81E-02	8.15E-03	4.53E-02	1.22E-03	2.26E-03	4.48E+02	6.03E-03	3.75E-02	4.59E+02
169	Alternative 2	2029	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	3.89E+00	8.23E-02	1.39E-01	1.44E-03	2.38E-03	4.46E-02	1.06E-02	2.10E-03	1.59E-03	5.58E-03	2.84E+02	9.29E-03	1.58E-03	2.85E+02
170	Alternative 2	2029	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	1.70E+00	1.81E+00	2.34E-01	2.12E-03	8.04E-02	9.03E-02	1.26E-02	7.38E-02	1.89E-03	1.13E-02	5.71E+02	1.48E-02	4.66E-02	5.85E+02
171	Alternative 2	2029	Weekdays	11	local link 3	Commercial Hauling Trucks	3.03E+00	5.70E+00	2.96E-01	5.08E-03	1.93E-01	2.72E-01	3.22E-02	1.77E-01	4.83E-03	3.40E-02	1.49E+03	2.78E-01	1.57E-01	1.54E+03
172	Alternative 2	2029	Weekdays	12	local link 4	Employees (Cars)	3.98E+00	8.26E-02	1.40E-01	1.46E-03	2.44E-03	4.53E-02	9.37E-03	2.16E-03	1.41E-03	5.67E-03	2.88E+02	9.40E-03	1.63E-03	2.89E+02
173	Alternative 2	2029	Weekdays	13	local link 5	Employees (Trucks)	3.29E+00	9.77E-02	1.28E-01	1.83E-03	3.03E-03	5.05E-02	9.42E-03	2.69E-03	1.41E-03	6.31E-03	3.62E+02	9.56E-03	2.46E-03	3.63E+02
174	Alternative 2	2029	Weekdays	14	local link 6	KC Transfer Trailers	2.56E+00	5.46E+00	2.42E-01	5.34E-03	1.90E-01	1.83E-01	3.34E-02	1.74E-01	5.02E-03	2.29E-02	1.57E+03	2.02E-02	1.73E-01	1.63E+03
175	Alternative 2	2029	Weekdays	15	local link 7	MRW Self-Haul	2.80E+00	9.47E-01	1.86E-01	1.78E-03	4.14E-02	6.75E-02	1.16E-02	3.80E-02	1.74E-03	8.44E-03	4.27E+02	1.21E-02	2.41E-02	4.35E+02
176	Alternative 2	2029	Weekdays	16	local link 8	MRW Transfer Trucks	1.70E+00	1.81E+00	2.34E-01	2.12E-03	8.04E-02	9.03E-02	1.26E-02	7.38E-02	1.89E-03	1.13E-02	5.71E+02	1.48E-02	4.66E-02	5.85E+02
177	Alternative 2	2029	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	2.31E+00	7.10E-02	1.07E-01	1.07E-03	1.49E-03	1.04E-02	6.85E-03	1.32E-03	1.03E-03	1.30E-03	2.10E+02	5.22E-03	7.44E-04	2.10E+02
178	Alternative 2	2029	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.16E+00	1.11E+00	1.28E-01	1.66E-03	4.94E-02	1.81E-02	8.15E-03	4.53E-02	1.22E-03	2.26E-03	4.48E+02	6.03E-03	3.75E-02	4.59E+02
179	Alternative 2	2029	Weekend	3	freeway link 3	Commercial Hauling Trucks	1.61E+01	4.19E+01	3.07E+00	2.04E-02	1.50E+00	0.00E+00	0.00E+00	1.38E+00	0.00E+00	0.00E+00	5.96E+03	2.68E+00	6.44E-01	6.21E+03
180	Alternative 2	2029	Weekend	4	freeway link 4	Employees (Cars)	2.25E+00	7.10E-02	1.05E-01	1.05E-03	1.44E-03	7.99E-03	6.36E-03	1.27E-03	9.53E-04	9.99E-04	2.05E+02	5.05E-03	6.90E-04	2.05E+02
181	Alternative 2	2029	Weekend	5	freeway link 5	Employees (Trucks)	2.11E+00	9.46E-02	9.24E-02	1.37E-03	1.71E-03	8.79E-03	6.39E-03	1.52E-03	9.58E-04	1.10E-03	2.67E+02	5.17E-03	1.06E-03	2.68E+02
182	Alternative 2	2029	Weekend	6	freeway link 6	KC Transfer Trailers	2.13E+00	4.70E+00	2.12E-01	5.10E-03	1.61E-01	1.02E-01	2.92E-02	1.49E-01	4.39E-03	1.27E-02	1.50E+03	1.62E-02	1.66E-01	1.55E+03
183	Alternative 2	2029	Weekend	7	freeway link 7	MRW Self-Haul	1.73E+00	5.89E-01	1.17E-01	1.37E-03	2.54E-02	1.43E-02	7.50E-03	2.33E-02	1.13E-03	1.78E-03	3.29E+02	5.63E-03	1.91E-02	3.34E+02
184	Alternative 2	2029	Weekend	8	freeway link 8	MRW Transfer Trucks	1.12E+01	1.48E+01	2.53E+00	1.13E-02	1.04E+00	0.00E+00	0.00E+00	9.61E-01	0.00E+00	0.00E+00	2.98E+03	1.45E-01	2.72E-01	3.06E+03
185	Alternative 2	2029	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	4.02E+00	8.28E-02	1.41E-01	1.47E-03	2.48E-03	4.57E-02	9.49E-03	2.19E-03	1.42E-03	5.71E-03	2.90E+02	9.45E-03	1.65E-03	2.91E+02
186	Alternative 2	2029	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	1.75E+00	1.86E+00	2.38E-01	2.16E-03	8.22E-02	9.70E-02	1.13E-02	7.55E-02	1.69E-03	1.21E-02	5.83E+02	1.55E-02	4.77E-02	5.97E+02
187	Alternative 2	2029	Weekend	11	local link 3	Commercial Hauling Trucks	1.61E+01	4.19E+01	3.07E+00	2.04E-02	1.50E+00	0.00E+00	0.00E+00	1.38E+00	0.00E+00	0.00E+00	5.96E+03	2.68E+00	6.44E-01	6.21E+03
188	Alternative 2	2029	Weekend	12	local link 4	Employees (Cars)	4.23E+00	8.36E-02	1.44E-01	1.51E-03	2.63E-03	4.73E-02	1.01E-02	2.32E-03	1.51E-03	5.91E-03	2.99E+02	9.70E-03	1.75E-03	3.00E+02
189	Alternative 2	2029	Weekend	13	local link 5	Employees (Trucks)	3.47E+00	9.84E-02	1.30E-01	1.90E-03	3.21E-03	5.25E-02	1.01E-02	2.84E-03	1.52E-03	6.56E-03	3.76E+02	9.85E-03	2.64E-03	3.77E+02
190	Alternative 2	2029	Weekend	14	local link 6	KC Transfer Trailers	3.04E+00	6.41E+00	2.72E-01	6.01E-03	2.35E-01	2.40E-01	3.61E-02	2.16E-01	5.41E-03	3.00E-02	1.77E+03	2.56E-02	1.93E-01	1.83E+03
191	Alternative 2	2029	Weekend	15	local link 7	MRW Self-Haul	2.89E+00	9.72E-01	1.89E-01	1.81E-03	4.24E-02	7.13E-02	1.04E-02	3.89E-02	1.56E-03	8.92E-03	4.37E+02	1.25E-02	2.47E-02	4.44E+02
192	Alternative 2	2029	Weekend	16	local link 8	MRW Transfer Trucks	1.12E+01	1.48E+01	2.53E+00	1.13E-02	1.04E+00	0.00E+00	0.00E+00	9.61E-01	0.00E+00	0.00E+00	2.98E+03	1.45E-01	2.72E-01	3.06E+03
193	Alternative 2	2040	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	7.71E-01	5.49E-03	5.20E-02	6.19E-04	6.50E-04	7.62E-03	5.01E-03	5.75E-04	7.52E-04	9.53E-04	1.21E+02	2.12E-03	4.14E-04	1.21E+02
194	Alternative 2	2040	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	4.84E-01	2.33E-01	2.30E-02	1.28E-03	2.56E-03	1.46E-02	6.91E-03	2.33E-03	1.04E-03	1.82E-03	3.46E+02	3.89E-03	4.30E-02	3.59E+02
195	Alternative 2	2040	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.20E+00	1.01E+00	2.22E-02	3.00E-03	4.00E-03	5.00E-02	1.90E-02	3.68E-03	2.85E-03	6.25E-03	8.93E+02	1.51E-01	1.37E-01	9.38E+02
196	Alternative 2	2040	Weekdays	4	freeway link 4	Employees (Cars)	7.55E-01	5.49E-03	5.12E-02	6.06E-04	6.31E-04	5.85E-03	4.65E-03	5.58E-04	6.98E-04	7.31E-04	1.19E+02	2.05E-03	3.84E-04	1.19E+02
197	Alternative 2	2040	Weekdays	5	freeway link 5	Employees (Trucks)	8.92E-01	8.04E-03	6.10E-02	8.65E-04	7.87E-04	6.69E-03	4.86E-03	6.97E-04	7.29E-04	8.37E-04	1.69E+02	2.52E-03	5.07E-04	1.69E+02
198	Alternative 2	2040	Weekdays	6	freeway link 6	KC Transfer Trailers	1.44E+00	1.83E+00	4.11E-02	4.45E-03	1.43E-02	9.54E-02	2.74E-02	1.31E-02	4.11E-03	1.19E-02	1.33E+03	1.70E-02	2.01E-01	1.39E+03
199	Alternative 2	2040	Weekdays	7	freeway link 7	MRW Self-Haul	6.28E-01	1.19E-01	3.75E-02	9.49E-04	1.60E-03	1.11E-02	5.96E-03	1.45E-03	8.94E-04	1.39E-03	2.34E+02	3.01E-03	2.17E-02	2.40E+02
200	Alternative 2	2040	Weekdays	8	freeway link 8	MRW Transfer Trucks	4.84E-01	2.33E-01	2.30E-02	1.28E-03	2.56E-03	1.46E-02	6.91E-03	2.33E-03	1.04E-03	1.82E-03	3.46E+02	3.89E-03	4.30E-02	3.59E+02
201	Alternative 2	2040	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	1.30E+00	6.37E-03	6.66E-02	8.29E-04	8.95E-04	3.27E-02	7.75E-03	7.92E-04	1.16E-03	4.08E-03	1.64E+02	3.78E-03	8.81E-04	1.64E+02
202	Alternative 2	2040	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	6.08E-01	5.52E-01	4.01E-02	1.57E-03	4.06E-03	7.41E-02	1.07E-02	3.71E-03	1.60E-03	9.26E-03	4.24E+02	1.01E-02	5.28E-02	4.40E+02
203	Alternative 2	2040	Weekdays	11	local link 3	Commercial Hauling Trucks	2.34E+00	2.33E+00	5.09E-02	3.74E-03	6.96E-03	2.31E-01	2.70E-02	6.40E-03	4.05E-03	2.89E-02	1.11E+03	3.65E-01	1.71E-01	1.17E+03
204	Alternative 2	2040	Weekdays	12	local link 4	Employees (Cars)	1.33E+00	6.39E-03	6.73E-02	8.41E-04	9.14E-04	3.32E-02	6.86E-03	8.09E-04	1.03E-03	4.15E-03	1.66E+02	3.82E-03	9.05E-04	1.67E+02

Operations Emission Factors Summary

Emission Factors Summary

							Overall Emission Factors (grams/mile) - CAPs [1,2]										Overall Emission Factors (grams/mile) - GHGs [1]			
No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Volatile Organic Compounds (VOC)	Sulfur Dioxide (SO2)	Primary Exhaust PM10 - Total	Primary PM10 - Brakewear Particulate	Primary PM10 - Tirewear Particulate	Primary Exhaust PM2.5 - Total	Primary PM2.5 - Tirewear Particulate	Primary PM2.5 - Brakewear Particulate	Atmospheric CO2	Methane (CH4)	Nitrous Oxide (N2O)	CO2 Equivalent
205	Alternative 2	2040	Weekdays	13	local link 5	Employees (Trucks)	1.41E+00	9.13E-03	8.06E-02	1.16E-03	1.15E-03	3.84E-02	7.17E-03	1.01E-03	1.07E-03	4.80E-03	2.29E+02	4.50E-03	1.18E-03	2.29E+02
206	Alternative 2	2040	Weekdays	14	local link 6	KC Transfer Trailers	1.84E+00	2.37E+00	5.06E-02	4.62E-03	1.67E-02	1.74E-01	3.13E-02	1.53E-02	4.70E-03	2.17E-02	1.38E+03	2.16E-02	2.09E-01	1.45E+03
207	Alternative 2	2040	Weekdays	15	local link 7	MRW Self-Haul	9.53E-01	2.79E-01	5.33E-02	1.20E-03	2.48E-03	5.34E-02	9.21E-03	2.25E-03	1.38E-03	6.67E-03	2.94E+02	6.96E-03	2.68E-02	3.02E+02
208	Alternative 2	2040	Weekdays	16	local link 8	MRW Transfer Trucks	6.08E-01	5.52E-01	4.01E-02	1.57E-03	4.06E-03	7.41E-02	1.07E-02	3.71E-03	1.60E-03	9.26E-03	4.24E+02	1.01E-02	5.28E-02	4.40E+02
209	Alternative 2	2040	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	7.71E-01	5.49E-03	5.18E-02	6.19E-04	6.50E-04	7.62E-03	5.01E-03	5.75E-04	7.52E-04	9.53E-04	1.21E+02	2.12E-03	4.14E-04	1.21E+02
210	Alternative 2	2040	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	4.84E-01	2.33E-01	1.88E-02	1.28E-03	2.56E-03	1.46E-02	6.91E-03	2.33E-03	1.04E-03	1.82E-03	3.46E+02	3.89E-03	4.30E-02	3.59E+02
211	Alternative 2	2040	Weekend	3	freeway link 3	Commercial Hauling Trucks	1.15E+01	2.83E+01	5.24E-01	1.53E-02	2.45E-02	0.00E+00	0.00E+00	2.25E-02	0.00E+00	0.00E+00	4.52E+03	3.50E+00	6.99E-01	4.81E+03
212	Alternative 2	2040	Weekend	4	freeway link 4	Employees (Cars)	7.55E-01	5.49E-03	5.10E-02	6.06E-04	6.31E-04	5.85E-03	4.65E-03	5.58E-04	6.98E-04	7.31E-04	1.19E+02	2.05E-03	3.84E-04	1.19E+02
213	Alternative 2	2040	Weekend	5	freeway link 5	Employees (Trucks)	8.92E-01	8.04E-03	6.00E-02	8.65E-04	7.87E-04	6.69E-03	4.86E-03	6.97E-04	7.29E-04	8.37E-04	1.69E+02	2.52E-03	5.07E-04	1.69E+02
214	Alternative 2	2040	Weekend	6	freeway link 6	KC Transfer Trailers	1.44E+00	1.83E+00	4.11E-02	4.45E-03	1.43E-02	9.54E-02	2.74E-02	1.31E-02	4.11E-03	1.19E-02	1.33E+03	1.70E-02	2.01E-01	1.39E+03
215	Alternative 2	2040	Weekend	7	freeway link 7	MRW Self-Haul	6.28E-01	1.19E-01	3.53E-02	9.49E-04	1.60E-03	1.11E-02	5.96E-03	1.45E-03	8.94E-04	1.39E-03	2.34E+02	3.01E-03	2.17E-02	2.40E+02
216	Alternative 2	2040	Weekend	8	freeway link 8	MRW Transfer Trucks	5.38E+00	6.06E+00	3.28E-01	8.90E-03	1.88E-02	0.00E+00	0.00E+00	1.72E-02	0.00E+00	0.00E+00	2.34E+03	1.11E-01	2.85E-01	2.43E+03
217	Alternative 2	2040	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	1.34E+00	6.41E-03	6.74E-02	8.46E-04	9.23E-04	3.34E-02	6.95E-03	8.16E-04	1.04E-03	4.18E-03	1.68E+02	3.84E-03	9.17E-04	1.68E+02
218	Alternative 2	2040	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	6.32E-01	5.73E-01	3.71E-02	1.61E-03	4.24E-03	7.95E-02	9.57E-03	3.87E-03	1.44E-03	9.94E-03	4.34E+02	1.06E-02	5.40E-02	4.50E+02
219	Alternative 2	2040	Weekend	11	local link 3	Commercial Hauling Trucks	1.15E+01	2.83E+01	5.24E-01	1.53E-02	2.45E-02	0.00E+00	0.00E+00	2.25E-02	0.00E+00	0.00E+00	4.52E+03	3.50E+00	6.99E-01	4.81E+03
220	Alternative 2	2040	Weekend	12	local link 4	Employees (Cars)	1.41E+00	6.47E-03	6.89E-02	8.72E-04	9.64E-04	3.46E-02	7.36E-03	8.53E-04	1.10E-03	4.32E-03	1.73E+02	3.94E-03	9.71E-04	1.73E+02
221	Alternative 2	2040	Weekend	13	local link 5	Employees (Trucks)	1.48E+00	9.22E-03	8.19E-02	1.20E-03	1.21E-03	4.00E-02	7.68E-03	1.07E-03	1.15E-03	4.99E-03	2.37E+02	4.63E-03	1.26E-03	2.38E+02
222	Alternative 2	2040	Weekend	14	local link 6	KC Transfer Trailers	2.26E+00	2.95E+00	6.38E-02	5.19E-03	2.11E-02	2.28E-01	3.38E-02	1.94E-02	5.06E-03	2.85E-02	1.55E+03	2.82E-02	2.34E-01	1.62E+03
223	Alternative 2	2040	Weekend	15	local link 7	MRW Self-Haul	9.87E-01	2.90E-01	5.23E-02	1.23E-03	2.58E-03	5.65E-02	8.26E-03	2.34E-03	1.24E-03	7.06E-03	3.01E+02	7.20E-03	2.74E-02	3.09E+02
224	Alternative 2	2040	Weekend	16	local link 8	MRW Transfer Trucks	5.38E+00	6.06E+00	3.28E-01	8.90E-03	1.88E-02	0.00E+00	0.00E+00	1.72E-02	0.00E+00	0.00E+00	2.34E+03	1.11E-01	2.85E-01	2.43E+03

Notes:

N/A = not applicable

1. Emission factors were obtained from MOVES4 Onroad module runs at the Project Scale for King County at t
factors represent the maximum emission rate between winter and summer afternoons.

2. PM emission factors include tire wear and brake wear.

3. Emission factors for MRW Self-haul is the average of cars and single unit shot haul trucks.

Operations Emission Factors Summary

Emission Factors Summary

							Overall Emission Factors (grams/mile) - MSATs [1]									Emissions - CAPs (ton/year)					
No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	Naphthalene	1,3-Butadiene	Acetaldehyde	acrolein	benzene	ethyl benzene	formaldehyde	DPM	PAH	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
1	Existing Condition	2023	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	1.00E-04	2.10E-04	5.36E-04	3.19E-05	2.76E-03	2.46E-03	6.84E-04	N/A	4.18E-05	3.81E-02	4.79E-02	7.13E-01	2.90E-04	5.24E-03	1.13E-03
2	Existing Condition	2023	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.74E-03	6.39E-04	7.13E-03	1.26E-03	2.73E-03	1.32E-03	1.54E-02	1.04E-01	7.96E-04	5.01E-02	4.41E-01	4.09E-01	3.88E-04	2.83E-02	2.05E-02
3	Existing Condition	2023	Weekdays	3	freeway link 3	Commercial Hauling Trucks	2.55E-03	7.64E-04	1.10E-02	1.89E-03	2.19E-03	9.35E-04	2.37E-02	2.26E-01	1.30E-03	3.31E-02	6.31E-01	2.38E-01	5.00E-04	3.56E-02	2.52E-02
4	Existing Condition	2023	Weekdays	4	freeway link 4	Employees (Cars)	9.66E-05	2.02E-04	5.15E-04	3.07E-05	2.69E-03	2.40E-03	6.58E-04	N/A	4.04E-05	3.18E-03	4.07E-03	5.90E-02	2.42E-05	3.97E-04	8.91E-05
5	Existing Condition	2023	Weekdays	5	freeway link 5	Employees (Trucks)	1.29E-04	2.75E-04	6.94E-04	4.18E-05	3.17E-03	2.60E-03	8.79E-04	N/A	5.23E-05	3.22E-03	6.05E-03	6.37E-02	3.10E-05	4.18E-04	9.62E-05
6	Existing Condition	2023	Weekdays	6	freeway link 6	KC Transfer Trailers	3.30E-03	1.01E-03	1.47E-02	2.53E-03	2.83E-03	1.44E-03	3.02E-02	3.82E-01	1.87E-03	7.61E-02	1.73E+00	5.65E-01	1.08E-03	1.04E-01	7.15E-02
7	Existing Condition	2023	Weekdays	7	freeway link 7	MRW Self-Haul	9.23E-04	4.24E-04	3.83E-03	6.46E-04	2.75E-03	1.89E-03	8.03E-03	1.04E-01	4.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8	Existing Condition	2023	Weekdays	8	freeway link 8	MRW Transfer Trucks	1.74E-03	6.39E-04	7.13E-03	1.26E-03	2.73E-03	1.32E-03	1.54E-02	1.04E-01	7.96E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9	Existing Condition	2023	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	2.17E-04	4.66E-04	1.17E-03	6.85E-05	5.17E-03	4.17E-03	1.47E-03	N/A	8.76E-05	6.43E-02	6.98E-02	1.64E+00	5.08E-04	1.85E-02	3.27E-03
10	Existing Condition	2023	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	3.79E-03	1.42E-03	1.56E-02	2.73E-03	6.45E-03	2.98E-03	3.34E-02	2.09E-01	1.72E-03	1.19E-01	9.21E-01	8.28E-01	6.50E-04	8.57E-02	4.88E-02
11	Existing Condition	2023	Weekdays	11	local link 3	Commercial Hauling Trucks	6.01E-03	1.78E-03	2.66E-02	4.48E-03	5.18E-03	2.33E-03	5.68E-02	4.48E-01	2.91E-03	1.08E-01	1.68E+00	7.11E-01	1.02E-03	1.54E-01	7.52E-02
12	Existing Condition	2023	Weekdays	12	local link 4	Employees (Cars)	2.14E-04	4.61E-04	1.15E-03	6.78E-05	5.11E-03	4.12E-03	1.45E-03	N/A	8.67E-05	5.90E-03	6.46E-03	1.51E-01	4.63E-05	1.68E-03	2.98E-04
13	Existing Condition	2023	Weekdays	13	local link 5	Employees (Trucks)	2.76E-04	5.80E-04	1.47E-03	8.91E-05	6.12E-03	4.52E-03	1.88E-03	N/A	1.10E-04	6.19E-03	8.84E-03	1.42E-01	5.70E-05	1.81E-03	3.29E-04
14	Existing Condition	2023	Weekdays	14	local link 6	KC Transfer Trailers	3.61E-03	1.10E-03	1.62E-02	2.77E-03	3.09E-03	1.61E-03	3.31E-02	4.49E-01	2.10E-03	7.30E-02	1.67E+00	5.63E-01	1.01E-03	1.13E-01	7.41E-02
15	Existing Condition	2023	Weekdays	15	local link 7	MRW Self-Haul	2.00E-03	9.43E-04	8.41E-03	1.40E-03	5.81E-03	3.58E-03	1.74E-02	2.09E-01	9.02E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
16	Existing Condition	2023	Weekdays	16	local link 8	MRW Transfer Trucks	3.79E-03	1.42E-03	1.56E-02	2.73E-03	6.45E-03	2.98E-03	3.34E-02	2.09E-01	1.72E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
17	Existing Condition	2023	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	1.00E-04	2.10E-04	5.36E-04	3.19E-05	2.76E-03	2.45E-03	6.84E-04	N/A	4.18E-05	2.65E-02	3.34E-02	4.97E-01	2.02E-04	3.65E-03	7.88E-04
18	Existing Condition	2023	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.74E-03	6.39E-04	7.13E-03	1.26E-03	2.65E-03	1.24E-03	1.54E-02	1.04E-01	7.96E-04	3.33E-02	3.08E-01	2.85E-01	2.70E-04	1.97E-02	1.43E-02
19	Existing Condition	2023	Weekend	3	freeway link 3	Commercial Hauling Trucks	4.68E-02	1.41E-02	2.05E-01	3.48E-02	4.03E-02	1.77E-02	4.37E-01	2.74E+00	2.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
20	Existing Condition	2023	Weekend	4	freeway link 4	Employees (Cars)	9.66E-05	2.02E-04	5.15E-04	3.07E-05	2.69E-03	2.39E-03	6.58E-04	N/A	4.04E-05	1.27E-03	1.63E-03	2.36E-02	9.69E-06	1.59E-04	3.57E-05
21	Existing Condition	2023	Weekend	5	freeway link 5	Employees (Trucks)	1.29E-04	2.75E-04	6.94E-04	4.18E-05	3.17E-03	2.57E-03	8.79E-04	N/A	5.23E-05	1.28E-03	2.42E-03	2.55E-02	1.24E-05	1.67E-04	3.85E-05
22	Existing Condition	2023	Weekend	6	freeway link 6	KC Transfer Trailers	3.30E-03	1.01E-03	1.47E-02	2.53E-03	2.83E-03	1.44E-03	3.02E-02	3.82E-01	1.87E-03	3.04E-02	6.92E-01	2.26E-01	4.31E-04	4.15E-02	2.86E-02
23	Existing Condition	2023	Weekend	7	freeway link 7	MRW Self-Haul	9.23E-04	4.24E-04	3.83E-03	6.46E-04	2.71E-03	1.85E-03	8.03E-03	1.04E-01	4.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
24	Existing Condition	2023	Weekend	8	freeway link 8	MRW Transfer Trucks	3.43E-02	1.19E-02	1.41E-01	2.51E-02	4.30E-02	2.00E-02	3.03E-01	1.58E+00	1.81E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
25	Existing Condition	2023	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	2.19E-04	4.70E-04	1.18E-03	6.91E-05	5.21E-03	4.21E-03	1.48E-03	N/A	8.83E-05	4.52E-02	4.87E-02	1.15E+00	3.58E-04	1.31E-02	2.31E-03
26	Existing Condition	2023	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	3.87E-03	1.45E-03	1.60E-02	2.79E-03	6.49E-03	2.96E-03	3.41E-02	2.13E-01	1.75E-03	8.23E-02	6.52E-01	5.84E-01	4.58E-04	6.10E-02	3.46E-02
27	Existing Condition	2023	Weekend	11	local link 3	Commercial Hauling Trucks	4.68E-02	1.41E-02	2.05E-01	3.48E-02	4.03E-02	1.77E-02	4.37E-01	2.74E+00	2.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
28	Existing Condition	2023	Weekend	12	local link 4	Employees (Cars)	2.21E-04	4.75E-04	1.19E-03	6.98E-05	5.26E-03	4.26E-03	1.49E-03	N/A	8.92E-05	2.43E-03	2.60E-03	6.16E-02	1.94E-05	7.11E-04	1.25E-04
29	Existing Condition	2023	Weekend	13	local link 5	Employees (Trucks)	2.83E-04	5.95E-04	1.51E-03	9.15E-05	6.27E-03	4.65E-03	1.93E-03	N/A	1.13E-04	2.53E-03	3.56E-03	5.79E-02	2.38E-05	7.66E-04	1.38E-04
30	Existing Condition	2023	Weekend	14	local link 6	KC Transfer Trailers	4.04E-03	1.23E-03	1.82E-02	3.12E-03	3.46E-03	1.84E-03	3.72E-02	5.38E-01	2.44E-03	3.29E-02	7.53E-01	2.61E-01	4.43E-04	5.62E-02	3.58E-02
31	Existing Condition	2023	Weekend	15	local link 7	MRW Self-Haul	2.04E-03	9.60E-04	8.58E-03	1.43E-03	5.85E-03	3.59E-03	1.78E-02	2.13E-01	9.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
32	Existing Condition	2023	Weekend	16	local link 8	MRW Transfer Trucks	3.43E-02	1.19E-02	1.41E-01	2.51E-02	4.30E-02	2.00E-02	3.03E-01	1.58E+00	1.81E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
33	No Action	2029	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	2.92E-05	3.35E-05	1.36E-04	9.93E-06	1.13E-03	1.59E-03	2.23E-04	N/A	1.34E-05	4.94E-02	3.28E-02	1.06E+00	4.94E-04	8.58E-03	1.67E-03
34	No Action	2029	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	9.66E-04	3.21E-04	3.98E-03	7.06E-04	1.35E-03	7.40E-04	8.59E-03	4.93E-02	4.19E-04	6.13E-02	5.11E-01	5.36E-01	7.67E-04	3.47E-02	2.25E-02
35	No Action	2029	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.36E-03	3.97E-04	6.55E-03	1.03E-03	1.17E-03	5.90E-04	1.34E-02	1.11E-01	6.57E-04	2.91E-02	5.73E-01	3.02E-01	7.07E-04	3.42E-02	2.02E-02
36	No Action	2029	Weekdays	4	freeway link 4	Employees (Cars)	2.92E-05	3.35E-05	1.36E-04	9.93E-06	1.13E-03	1.59E-03	2.23E-04	N/A	1.34E-05	1.85E-03	1.23E-03	3.99E-02	1.85E-05	3.22E-04	6.28E-05
37	No Action	2029	Weekdays	5	freeway link 5	Employees (Trucks)	3.07E-05	3.01E-05	1.39E-04	1.09E-05	1.09E-03	1.43E-03	2.40E-04	N/A	1.48E-05	1.65E-03	1.63E-03	3.66E-02	2.41E-05	3.45E-04	6.92E-05
38	No Action	2029	Weekdays	6	freeway link 6	KC Transfer Trailers	1.70E-03	5.11E-04	8.30E-03	1.36E-03	1.44E-03	9.51E-04	1.61E-02	1.68E-01	8.71E-04	5.58E-02	1.24E+00	5.68E-01	1.30E-03	8.17E-02	4.42E-02
39	No Action	2029	Weekdays	7	freeway link 7	MRW Self-Haul	4.98E-04	1.77E-04	2.06E-03	3.58E-04	1.24E-03	1.17E-03	4.41E-03	4.93E-02	2.16E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	No Action	2029	Weekdays	8	freeway link 8	MRW Transfer Trucks	9.66E-04	3.21E-04	3.98E-03	7.06E-04	1.35E-03	7.40E-04	8.59E-03	4.93E-02	4.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	No Action	2029	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	5.95E-05	6.84E-05	2.77E-04	2.03E-05	1.97E-03	2.52E-03	4.56E-04	N/A	2.79E-05	7.65E-02	4.09E-02	2.30E+00	8.34E-04	3.33E-02	5.41E-03
42	No Action	2029	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	2.31E-03	8.16E-04	9.78E-03	1.69E-03	3.98E-03	1.96E-03	2.06E-02	1.01E-01	9.86E-04	1.53E-01	1.11E+00	1.03E+00	1.20E-03	1.23E-01	5.38E-02
43	No Action	2029	Weekdays	11	local link 3	Commercial Hauling Trucks	3.30E-03	9.54E-04	1.70E-02	2.53E-03	2.84E-03	1.58E-03	3.36E-02	2.23E-01	1.52E-03	9.98E-02	1.79E+00	9.81E-01	1.42E-03	1.81E-01	6.62E-02
44	No Action	2029	Weekdays	12	local link 4	Employees (Cars)	5.81E-05	6.68E-05	2.70E-04	1.98E-05	1.91E-03	2.42E-03	4.45E-04	N/A	2.72E-05	3.28E-03	1.81E-03	9.97E-02	3.54E-05	1.39E-03	2.28E-04
45	No Action	2029	Weekdays	13	local link 5	Employees (Trucks)	6.37E-05	6.02E-05	2.87E-04	2.27E-05	1.94E-03	2.22E-03	5.00E-04	N/A	3.08E-05	2.99E-03	2.12E-03	8.08E-02	4.42E-05	1.52E-03	2.52E-04
46	No Action	2029	Weekdays	14	local link 6	KC Transfer Trailers	1.87E-03	5.60E-04	9.26E-03	1.50E-03	1.59E-03	1.08E-03	1.78E-02	1.99E-01	9.86E-04	5.42E-02	1.24E+00	5.82E-01	1.21E-03	9.25E-02	4.67E-02
47	No Action	2029	Weekdays	15	local link 7	MRW Self-Haul	1.19E-03	4.42E-04	5.03E-03	8.55E-04	2.97E-03	2.24E-03	1.06E-02	1.01E-01	5.07E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	No Action	2029	Weekdays	16	local link 8	MRW Transfer Trucks	2.31E-03	8.16E-04	9.78E-03	1.69E-03	3.98E-03	1.96E-03	2.06E-02	1.01E-01	9.86E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
49	No Action	2029	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	2.92E-05	3.35E-05	1.36E-04	9.93E-06	1.13E-03	1.59E-03	2.23E-04	N/A	1.34E-05	2.59E-02	1.72E-02	5.59E-01	2.60E-04	4.51E-03	8.79E-04
50	No Action	2029	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	9.66E-04	3.21E-04	3.98E-03	7.06E-04	1.32E-03	6.76E-04	8.59E-03	4.92E-02	4.19E-04	3.10E-02	2.69E-01	2.82E-01	4.03E-04	1.83E-02	1.18E-02
51	No Action	2029	Weekend	3	freeway link 3	Commercial Hauling Trucks	2.47E-02	7.24E-03	1.26E-01	1.90E-02	2.12E-02	1.18E-02	2.48E-01	1.50E+00	1.44E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	No Action	2029	Weekend	4	freeway link 4	Employees (Cars)	2.92E-05	3.35E-05	1.36E-04	9.93E-06	1.13E-03	1.59E-03	2.23E-04	N/A	1.34E-05	7.38E-04	4.91E-04	1.59E-02	7.40E-06	1.29E-04	2.51E-05
53	No Action	2029	Weekend	5	freeway link 5	Employees (Trucks)	3.07E-05	3.01E-05	1.39E-04	1.09E-05	1.08E-03	1.40E-03	2.40E-04	N/A	1.48E-05	6.50E-04	6.52E-04	1.47E-02	9.62E-06	1.38E-04	2.77E-05
54	No Action	2029	Weekend	6	freeway link 6	KC Transfer Trailers	1.70E-03	5.11E-04	8.30E-03	1.36E-03	1.44E-03	9.51E-04	1.61E-02	1.68E-01	8.71E-04	2.23E-02	4.95E-01	2.27E-01	5.21E-04	3.27E-02	1.77E-02
55	No Action	2029	Weekend	7	freeway link 7	MRW Self-Haul	4.98E-04	1.77E-04	2.06E-03	3.58E-04	1.22E-03	1.13E-03	4.41E-03	4.92E-02	2.16E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56	No Action	2029	Weekend	8	freeway link 8	MRW Transfer Trucks	1.99E-02	6.49E-03	8.43E-02	1.48E-02	2.34E-02	1.20E-02	1.79E-01	1.04E+00	1.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57	No Action	2029	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	5.98E-05	6.87E-05	2.78E-04	2.04E-05	1.98E-03	2.53E-03	4.58E-04	N/A	2.81E-05	4.04E-02	2.15E-02	1.21E+00	4.42E-04	1.77E-02	2.87E-03
58	No Action	2029	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	2.34E-03	8.26E-04	9.90E-03	1.71E-03	3.99E-03	1.92E-03	2.09E-02	1.02E-01	9.98E-04	8.03E-02	5.88E-01	5.47E-01	6.35E-04	6.58E-02	2.86E-02
59	No Action	2029	Weekend	11	local link 3	Commercial Hauling Trucks	2.47E-02	7.24E-03	1.26E-01	1.90E-02	2.12E-02	1.18E-02	2.48E-01	1.50E+00	1.44E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60	No Action	2029	Weekend	12	local link 4	Employees (Cars)	5.95E-05	6.84E-05	2.77E-04	2.03E-05	1.97E-03	2.51E-03	4.56E-04	N/A	2.79E-05	1.36E-03	7.26E-04	4.08E-02	1.48E-05	5.90E-04	9.60E-05
61	No Action	2029	Weekend	13	local link 5	Employees (Trucks)	6.51E-05	6.09E-05	2.93E-04	2.32E-05	1.98E-03	2.28E-03	5.12E-04	N/A	3.13E-05	1.22E-03	8.54E-04	3.30E-02	1.85E-05	6.46E-04	1.06E-04
62	No Action	2029	Weekend	14	local link 6	KC Transfer Trailers	2.11E-03	6.29E-04	1.06E-02	1.71E-03	1.78E-03	1.27E-03	2.01E-02	2.38E-01	1.14E-03	2.47E-02	5.75E-01	2.76E-01	5.33E-04	4.71E-02	2.27E-02
63	No Action	2029	Weekend	15	local link 7	MRW Self-Haul	1.20E-03	4.48E-04	5.09E-03	8.66E-04	2.99E-03	2.22E-03	1.07E-02	1.02E-01	5.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64	No Action	2029	Weekend	16	local link 8	MRW Transfer Trucks	1.99E-02	6.49E-03	8.43E-02	1.48E-02	2.34E-02	1.20E-02	1.79E-01	1.04E+00	1.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
65	No Action	2040	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	8.39E-06	0.00E+00	3.20E-05	3.10E-06	4.54E-04	8.02E-04	7.29E-05	N/A	3.90E-06	2.40E-02	2.54E-03	3.56E-01	2.85E-04	6.07E-03	1.04E-03
66	No Action	2040	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	9.59E-06	0.00E+00	2.62E-04	2.27E-05	2.25E-04	3.30E-04	2.07E-04	2.55E-03	4.97E-06	1.06E-02	1.07E-01	2.23E-01	5.91E-04	1.10E-02	2.38E-03
67	No Action	2040	Weekdays	3	freeway link 3	Commercial Hauling Trucks	9.31E-06	0.00E+00	1.42E-03	5.70E-05	1.39E-05	1.85E-04	1.31E-03	3.92E-03	3.02E-06	3.83E-03	1.75E-01	2.11E-01	5.35E-04	1.25E-02	2.21E-03
68	No Action	2040	Weekdays	4	freeway link 4	Employees (Cars)	8.39E-06	0.00E+00	3.20E-05	3.10E-06	4.54E-04	8.02E-04	7.29E-05	N/A	3.90E-06	9.00E-04	9.50E-05	1.33E-02	1.07E-05	2.28E-04	3.92E-05

Operations Emission Factors Summary

Emission Factors Summary

							Overall Emission Factors (grams/mile) - MSATs [1]									Emissions - CAPs (ton/year)					
No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	Naphthalene	1,3-Butadiene	Acetaldehyde	acrolein	benzene	ethyl benzene	formaldehyde	DPM	PAH	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
69	No Action	2040	Weekdays	5	freeway link 5	Employees (Trucks)	1.05E-05	0.00E+00	4.00E-05	3.87E-06	5.49E-04	9.65E-04	9.09E-05	N/A	5.03E-06	1.07E-03	1.39E-04	1.54E-02	1.52E-05	2.53E-04	4.45E-05
70	No Action	2040	Weekdays	6	freeway link 6	KC Transfer Trailers	2.54E-05	0.00E+00	1.81E-03	1.56E-04	1.78E-08	4.86E-04	1.16E-03	1.48E-02	7.88E-06	1.10E-02	4.98E-01	3.91E-01	1.13E-03	4.06E-02	8.24E-03
71	No Action	2040	Weekdays	7	freeway link 7	MRW Self-Haul	8.99E-06	0.00E+00	1.47E-04	1.29E-05	3.40E-04	5.66E-04	1.40E-04	2.55E-03	4.43E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72	No Action	2040	Weekdays	8	freeway link 8	MRW Transfer Trucks	9.59E-06	0.00E+00	2.62E-04	2.27E-05	2.25E-04	3.30E-04	2.07E-04	2.55E-03	4.97E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
73	No Action	2040	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	1.71E-05	0.00E+00	6.53E-05	6.32E-06	7.68E-04	1.24E-03	1.49E-04	N/A	7.61E-06	3.69E-02	3.16E-03	7.67E-01	4.81E-04	2.38E-02	3.48E-03
74	No Action	2040	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	3.70E-05	0.00E+00	9.46E-04	8.23E-05	7.05E-04	7.27E-04	7.63E-04	5.38E-03	1.51E-05	2.46E-02	3.60E-01	3.95E-01	9.00E-04	6.44E-02	1.02E-02
75	No Action	2040	Weekdays	11	local link 3	Commercial Hauling Trucks	3.02E-05	0.00E+00	4.79E-03	1.85E-04	4.87E-05	6.00E-04	4.49E-03	9.24E-03	9.76E-06	1.73E-02	7.77E-01	7.89E-01	1.03E-03	1.09E-01	1.56E-02
76	No Action	2040	Weekdays	12	local link 4	Employees (Cars)	1.67E-05	0.00E+00	6.38E-05	6.17E-06	7.45E-04	1.19E-03	1.45E-04	N/A	7.40E-06	1.58E-03	1.40E-04	3.33E-02	2.04E-05	9.96E-04	1.46E-04
77	No Action	2040	Weekdays	13	local link 5	Employees (Trucks)	2.06E-05	0.00E+00	7.88E-05	7.62E-06	9.04E-04	1.43E-03	1.79E-04	N/A	9.39E-06	1.90E-03	2.00E-04	3.47E-02	2.79E-05	1.13E-03	1.67E-04
78	No Action	2040	Weekdays	14	local link 6	KC Transfer Trailers	3.09E-05	0.00E+00	2.21E-03	1.90E-04	2.19E-08	5.93E-04	1.41E-03	1.75E-02	9.60E-06	1.17E-02	5.43E-01	4.19E-01	1.05E-03	4.98E-02	9.49E-03
79	No Action	2040	Weekdays	15	local link 7	MRW Self-Haul	2.71E-05	0.00E+00	5.06E-04	4.43E-05	7.36E-04	9.81E-04	4.56E-04	5.38E-03	1.13E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
80	No Action	2040	Weekdays	16	local link 8	MRW Transfer Trucks	3.70E-05	0.00E+00	9.46E-04	8.23E-05	7.05E-04	7.27E-04	7.63E-04	5.38E-03	1.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
81	No Action	2040	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	8.39E-06	0.00E+00	3.20E-05	3.10E-06	4.53E-04	7.98E-04	7.29E-05	N/A	3.90E-06	1.26E-02	1.33E-03	1.87E-01	1.50E-04	3.19E-03	5.49E-04
82	No Action	2040	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	9.59E-06	0.00E+00	2.62E-04	2.27E-05	2.02E-04	2.70E-04	2.07E-04	2.55E-03	4.97E-06	4.54E-03	5.63E-02	1.17E-01	3.11E-04	5.77E-03	1.25E-03
83	No Action	2040	Weekend	3	freeway link 3	Commercial Hauling Trucks	2.31E-04	0.00E+00	3.44E-02	1.42E-03	3.31E-04	4.58E-03	3.17E-02	2.45E-02	7.38E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	No Action	2040	Weekend	4	freeway link 4	Employees (Cars)	8.39E-06	0.00E+00	3.20E-05	3.10E-06	4.53E-04	7.98E-04	7.29E-05	N/A	3.90E-06	3.59E-04	3.80E-05	5.33E-03	4.28E-06	9.12E-05	1.57E-05
85	No Action	2040	Weekend	5	freeway link 5	Employees (Trucks)	1.05E-05	0.00E+00	4.00E-05	3.87E-06	5.44E-04	9.47E-04	9.09E-05	N/A	5.03E-06	4.22E-04	5.55E-05	6.18E-03	6.08E-06	1.01E-04	1.78E-05
86	No Action	2040	Weekend	6	freeway link 6	KC Transfer Trailers	2.54E-05	0.00E+00	1.81E-03	1.56E-04	1.78E-08	4.86E-04	1.16E-03	1.48E-02	7.88E-06	4.40E-03	1.99E-01	1.57E-01	4.54E-04	1.62E-02	3.29E-03
87	No Action	2040	Weekend	7	freeway link 7	MRW Self-Haul	8.99E-06	0.00E+00	1.47E-04	1.29E-05	3.28E-04	5.34E-04	1.40E-04	2.55E-03	4.43E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88	No Action	2040	Weekend	8	freeway link 8	MRW Transfer Trucks	1.81E-04	0.00E+00	7.34E-03	6.34E-04	2.59E-03	4.59E-03	5.22E-03	1.88E-02	6.88E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
89	No Action	2040	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	1.72E-05	0.00E+00	6.56E-05	6.35E-06	7.72E-04	1.24E-03	1.49E-04	N/A	7.65E-06	1.95E-02	1.66E-03	4.05E-01	2.55E-04	1.26E-02	1.85E-03
90	No Action	2040	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	3.74E-05	0.00E+00	9.56E-04	8.32E-05	6.88E-04	6.76E-04	7.72E-04	5.43E-03	1.52E-05	1.20E-02	1.91E-01	2.10E-01	4.76E-04	3.45E-02	5.46E-03
91	No Action	2040	Weekend	11	local link 3	Commercial Hauling Trucks	2.31E-04	0.00E+00	3.44E-02	1.42E-03	3.31E-04	4.58E-03	3.17E-02	2.45E-02	7.38E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
92	No Action	2040	Weekend	12	local link 4	Employees (Cars)	1.71E-05	0.00E+00	6.53E-05	6.32E-06	7.67E-04	1.23E-03	1.49E-04	N/A	7.61E-06	6.54E-04	5.62E-05	1.36E-02	8.55E-06	4.22E-04	6.17E-05
93	No Action	2040	Weekend	13	local link 5	Employees (Trucks)	2.11E-05	0.00E+00	8.08E-05	7.82E-06	9.27E-04	1.48E-03	1.83E-04	N/A	9.61E-06	7.80E-04	8.02E-05	1.42E-02	1.17E-05	4.81E-04	7.04E-05
94	No Action	2040	Weekend	14	local link 6	KC Transfer Trailers	3.80E-05	0.00E+00	2.71E-03	2.34E-04	2.61E-08	7.28E-04	1.73E-03	2.13E-02	1.18E-05	5.76E-03	2.68E-01	2.06E-01	4.61E-04	2.67E-02	4.91E-03
95	No Action	2040	Weekend	15	local link 7	MRW Self-Haul	2.73E-05	0.00E+00	5.11E-04	4.48E-05	7.30E-04	9.59E-04	4.61E-04	5.43E-03	1.14E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96	No Action	2040	Weekend	16	local link 8	MRW Transfer Trucks	1.81E-04	0.00E+00	7.34E-03	6.34E-04	2.59E-03	4.59E-03	5.22E-03	1.88E-02	6.88E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
97	Alternative 1	2029	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	2.92E-05	3.35E-05	1.36E-04	9.93E-06	1.13E-03	1.59E-03	2.23E-04	N/A	1.34E-05	4.94E-02	3.28E-02	1.06E+00	4.94E-04	8.58E-03	1.67E-03
98	Alternative 1	2029	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	9.66E-04	3.21E-04	3.98E-03	7.06E-04	1.35E-03	7.40E-04	8.59E-03	4.93E-02	4.19E-04	6.13E-02	5.11E-01	5.36E-01	7.67E-04	3.47E-02	2.25E-02
99	Alternative 1	2029	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.36E-03	3.97E-04	6.55E-03	1.03E-03	1.17E-03	5.90E-04	1.34E-02	1.11E-01	6.57E-04	2.91E-02	5.73E-01	3.02E-01	7.07E-04	3.42E-02	2.02E-02
100	Alternative 1	2029	Weekdays	4	freeway link 4	Employees (Cars)	2.92E-05	3.35E-05	1.36E-04	9.93E-06	1.13E-03	1.59E-03	2.23E-04	N/A	1.34E-05	1.85E-03	1.23E-03	3.99E-02	1.85E-05	3.22E-04	6.28E-05
101	Alternative 1	2029	Weekdays	5	freeway link 5	Employees (Trucks)	3.07E-05	3.01E-05	1.39E-04	1.09E-05	1.09E-03	1.43E-03	2.40E-04	N/A	1.48E-05	1.65E-03	1.63E-03	3.66E-02	2.41E-05	3.45E-04	6.92E-05
102	Alternative 1	2029	Weekdays	6	freeway link 6	KC Transfer Trailers	1.70E-03	5.11E-04	8.30E-03	1.36E-03	1.44E-03	9.51E-04	1.61E-02	1.68E-01	8.71E-04	4.22E-02	9.38E-01	4.30E-01	9.88E-04	6.19E-02	3.35E-02
103	Alternative 1	2029	Weekdays	7	freeway link 7	MRW Self-Haul	4.98E-04	1.77E-04	2.06E-03	3.58E-04	1.24E-03	1.17E-03	4.41E-03	4.93E-02	2.16E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
104	Alternative 1	2029	Weekdays	8	freeway link 8	MRW Transfer Trucks	9.66E-04	3.21E-04	3.98E-03	7.06E-04	1.35E-03	7.40E-04	8.59E-03	4.93E-02	4.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
105	Alternative 1	2029	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	5.95E-05	6.84E-05	2.77E-04	2.03E-05	1.97E-03	2.52E-03	4.56E-04	N/A	2.79E-05	7.65E-02	4.09E-02	2.30E+00	8.34E-04	3.33E-02	5.41E-03
106	Alternative 1	2029	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	2.31E-03	8.16E-04	9.78E-03	1.69E-03	3.98E-03	1.96E-03	2.06E-02	1.01E-01	9.86E-04	1.53E-01	1.11E+00	1.03E+00	1.20E-03	1.23E-01	5.38E-02
107	Alternative 1	2029	Weekdays	11	local link 3	Commercial Hauling Trucks	3.30E-03	9.54E-04	1.70E-02	2.53E-03	2.84E-03	1.58E-03	3.36E-02	2.23E-01	1.52E-03	9.98E-02	1.79E+00	9.81E-01	1.42E-03	1.81E-01	6.62E-02
108	Alternative 1	2029	Weekdays	12	local link 4	Employees (Cars)	5.81E-05	6.68E-05	2.70E-04	1.98E-05	1.91E-03	2.42E-03	4.45E-04	N/A	2.72E-05	3.28E-03	1.81E-03	9.97E-02	3.54E-05	1.39E-03	2.28E-04
109	Alternative 1	2029	Weekdays	13	local link 5	Employees (Trucks)	6.37E-05	6.02E-05	2.87E-04	2.27E-05	1.94E-03	2.22E-03	5.00E-04	N/A	3.08E-05	2.99E-03	2.12E-03	8.08E-02	4.42E-05	1.52E-03	2.52E-04
110	Alternative 1	2029	Weekdays	14	local link 6	KC Transfer Trailers	1.87E-03	5.60E-04	9.26E-03	1.50E-03	1.59E-03	1.08E-03	1.78E-02	1.99E-01	9.86E-04	4.11E-02	9.43E-01	4.41E-01	9.19E-04	7.01E-02	3.54E-02
111	Alternative 1	2029	Weekdays	15	local link 7	MRW Self-Haul	1.19E-03	4.42E-04	5.03E-03	8.55E-04	2.97E-03	2.24E-03	1.06E-02	1.01E-01	5.07E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
112	Alternative 1	2029	Weekdays	16	local link 8	MRW Transfer Trucks	2.31E-03	8.16E-04	9.78E-03	1.69E-03	3.98E-03	1.96E-03	2.06E-02	1.01E-01	9.86E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
113	Alternative 1	2029	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	2.92E-05	3.35E-05	1.36E-04	9.93E-06	1.13E-03	1.59E-03	2.23E-04	N/A	1.34E-05	2.59E-02	1.72E-02	5.59E-01	2.60E-04	4.51E-03	8.79E-04
114	Alternative 1	2029	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	9.66E-04	3.21E-04	3.98E-03	7.06E-04	1.32E-03	6.76E-04	8.59E-03	4.92E-02	4.19E-04	3.10E-02	2.69E-01	2.82E-01	4.03E-04	1.83E-02	1.18E-02
115	Alternative 1	2029	Weekend	3	freeway link 3	Commercial Hauling Trucks	2.47E-02	7.24E-03	1.26E-01	1.90E-02	2.12E-02	1.18E-02	2.48E-01	1.50E+00	1.44E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
116	Alternative 1	2029	Weekend	4	freeway link 4	Employees (Cars)	2.92E-05	3.35E-05	1.36E-04	9.93E-06	1.13E-03	1.59E-03	2.23E-04	N/A	1.34E-05	7.38E-04	4.91E-04	1.59E-02	7.40E-06	1.29E-04	2.51E-05
117	Alternative 1	2029	Weekend	5	freeway link 5	Employees (Trucks)	3.07E-05	3.01E-05	1.39E-04	1.09E-05	1.08E-03	1.40E-03	2.40E-04	N/A	1.48E-05	6.50E-04	6.52E-04	1.47E-02	9.62E-06	1.38E-04	2.77E-05
118	Alternative 1	2029	Weekend	6	freeway link 6	KC Transfer Trailers	1.70E-03	5.11E-04	8.30E-03	1.36E-03	1.44E-03	9.51E-04	1.61E-02	1.68E-01	8.71E-04	1.69E-02	3.75E-01	1.72E-01	3.95E-04	2.48E-02	1.34E-02
119	Alternative 1	2029	Weekend	7	freeway link 7	MRW Self-Haul	4.98E-04	1.77E-04	2.06E-03	3.58E-04	1.22E-03	1.13E-03	4.41E-03	4.92E-02	2.16E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120	Alternative 1	2029	Weekend	8	freeway link 8	MRW Transfer Trucks	1.99E-02	6.49E-03	8.43E-02	1.48E-02	2.34E-02	1.20E-02	1.79E-01	1.04E+00	1.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
121	Alternative 1	2029	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	5.98E-05	6.87E-05	2.78E-04	2.04E-05	1.98E-03	2.53E-03	4.58E-04	N/A	2.81E-05	4.04E-02	2.15E-02	1.21E+00	4.42E-04	1.77E-02	2.87E-03
122	Alternative 1	2029	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	2.34E-03	8.26E-04	9.90E-03	1.71E-03	3.99E-03	1.92E-03	2.09E-02	1.02E-01	9.98E-04	8.03E-02	5.88E-01	5.47E-01	6.35E-04	6.58E-02	2.86E-02
123	Alternative 1	2029	Weekend	11	local link 3	Commercial Hauling Trucks	2.47E-02	7.24E-03	1.26E-01	1.90E-02	2.12E-02	1.18E-02	2.48E-01	1.50E+00	1.44E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
124	Alternative 1	2029	Weekend	12	local link 4	Employees (Cars)	5.95E-05	6.84E-05	2.77E-04	2.03E-05	1.97E-03	2.51E-03	4.56E-04	N/A	2.79E-05	1.36E-03	7.26E-04	4.08E-02	1.48E-05	5.90E-04	9.60E-05
125	Alternative 1	2029	Weekend	13	local link 5	Employees (Trucks)	6.51E-05	6.09E-05	2.93E-04	2.32E-05	1.98E-03	2.28E-03	5.12E-04	N/A	3.13E-05	1.22E-03	8.54E-04	3.30E-02	1.85E-05	6.46E-04	1.06E-04
126	Alternative 1	2029	Weekend	14	local link 6	KC Transfer Trailers	2.11E-03	6.29E-04	1.06E-02	1.71E-03	1.78E-03	1.27E-03	2.01E-02	2.38E-01	1.14E-03	1.87E-02	4.36E-01	2.09E-01	4.04E-04	3.57E-02	1.72E-02
127	Alternative 1	2029	Weekend	15	local link 7	MRW Self-Haul	1.20E-03	4.48E-04	5.09E-03	8.66E-04	2.99E-03	2.22E-03	1.07E-02	1.02E-01	5.13E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
128	Alternative 1	2029	Weekend	16	local link 8	MRW Transfer Trucks	1.99E-02	6.49E-03	8.43E-02	1.48E-02	2.34E-02	1.20E-02	1.79E-01	1.04E+00	1.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129	Alternative 1	2040	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	8.39E-06	0.00E+00	3.20E-05	3.10E-06	4.54E-04	8.02E-04	7.29E-05	N/A	3.90E-06	2.40E-02	2.54E-03	3.56E-01	2.85E-04	6.07E-03	1.04E-03
130	Alternative 1	2040	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	9.59E-06	0.00E+00	2.62E-04	2.27E-05	2.25E-04	3.30E-04	2.07E-04	2.55E-03	4.97E-06	1.06E-02	1.07E-01	2.23E-01	5.91E-04	1.10E-02	2.38E-03
131	Alternative 1	2040	Weekdays	3	freeway link 3	Commercial Hauling Trucks	9.31E-06	0.00E+00	1.42E-03	5.70E-05	1.39E-05	1.85E-04	1.31E-03	3.92E-03	3.02E-06	3.83E-03	1.75E-01	2.11E-01	5.35E-04	1.25E-02	2.21E-03
132	Alternative 1	2040	Weekdays	4	freeway link 4	Employees (Cars)	8.39E-06	0.00E+00	3.20E-05	3.10E-06	4.54E-04	8.02E-04	7.29E-05	N/A	3.90E-06	9.00E-04	9.50E-05	1.33E-02	1.07E-05	2.28E-04	3.92E-05
133	Alternative 1	2040	Weekdays	5	freeway link 5	Employees (Trucks)	1.05E-05	0.00E+00	4.00E-05	3.87E-06	5.49E-04	9.65E-04	9.09E-05	N/A	5.03E-06	1.07E-03	1.39E-04	1.54E-02	1.52E-05	2.53E-04	4.45E-05
134	Alternative 1	2040	Weekdays	6	freeway link 6	KC Transfer Trailers	2.54E-05	0.00E+00	1.81E-03	1.56E-04	1.78E-08	4.86E-04	1.16E-03	1.48E-02	7.88E-06	8.34E-03	3.78E-01	2.96E-01	8.60E-04	3.08E-02	6.24E-03
135	Alternative 1	2040	Weekdays	7	freeway link 7	MRW Self-Haul	8.99E-06	0.00E+00	1.47E-04	1.29E-05	3.40E-04	5.66E-04	1.40E-04	2.55E-03	4.43E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
136	Alternative 1	2040	Weekdays	8	freeway link 8	MRW Transfer Trucks	9.59E-06	0.00E+00	2.62E-04	2.27E-05	2.25E-04	3.30E-04	2.07E-04	2.55E-03	4.97E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Operations Emission Factors Summary

Emission Factors Summary

							Overall Emission Factors (grams/mile) - MSATs [1]									Emissions - CAPs (ton/year)					
No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	Naphthalene	1,3-Butadiene	Acetaldehyde	acrolein	benzene	ethyl benzene	formaldehyde	DPM	PAH	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
137	Alternative 1	2040	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	1.71E-05	0.00E+00	6.53E-05	6.32E-06	7.68E-04	1.24E-03	1.49E-04	N/A	7.61E-06	3.69E-02	3.16E-03	7.67E-01	4.81E-04	2.38E-02	3.48E-03
138	Alternative 1	2040	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	3.70E-05	0.00E+00	9.46E-04	8.23E-05	7.05E-04	7.27E-04	7.63E-04	5.38E-03	1.51E-05	2.46E-02	3.60E-01	3.95E-01	9.00E-04	6.44E-02	1.02E-02
139	Alternative 1	2040	Weekdays	11	local link 3	Commercial Hauling Trucks	3.02E-05	0.00E+00	4.79E-03	1.85E-04	4.87E-05	6.00E-04	4.49E-03	9.24E-03	9.76E-06	1.73E-02	7.77E-01	7.89E-01	1.03E-03	1.09E-01	1.56E-02
140	Alternative 1	2040	Weekdays	12	local link 4	Employees (Cars)	1.67E-05	0.00E+00	6.38E-05	6.17E-06	7.45E-04	1.19E-03	1.45E-04	N/A	7.40E-06	1.58E-03	1.40E-04	3.33E-02	2.04E-05	9.96E-04	1.46E-04
141	Alternative 1	2040	Weekdays	13	local link 5	Employees (Trucks)	2.06E-05	0.00E+00	7.88E-05	7.62E-06	9.04E-04	1.43E-03	1.79E-04	N/A	9.39E-06	1.90E-03	2.00E-04	3.47E-02	2.79E-05	1.13E-03	1.67E-04
142	Alternative 1	2040	Weekdays	14	local link 6	KC Transfer Trailers	3.09E-05	0.00E+00	2.21E-03	1.90E-04	2.19E-08	5.93E-04	1.41E-03	1.75E-02	9.60E-06	8.87E-03	4.11E-01	3.18E-01	7.95E-04	3.77E-02	7.19E-03
143	Alternative 1	2040	Weekdays	15	local link 7	MRW Self-Haul	2.71E-05	0.00E+00	5.06E-04	4.43E-05	7.36E-04	9.81E-04	4.56E-04	5.38E-03	1.13E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
144	Alternative 1	2040	Weekdays	16	local link 8	MRW Transfer Trucks	3.70E-05	0.00E+00	9.46E-04	8.23E-05	7.05E-04	7.27E-04	7.63E-04	5.38E-03	1.51E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
145	Alternative 1	2040	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	8.39E-06	0.00E+00	3.20E-05	3.10E-06	4.53E-04	7.98E-04	7.29E-05	N/A	3.90E-06	1.26E-02	1.33E-03	1.87E-01	1.50E-04	3.19E-03	5.49E-04
146	Alternative 1	2040	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	9.59E-06	0.00E+00	2.62E-04	2.27E-05	2.02E-04	2.70E-04	2.07E-04	2.55E-03	4.97E-06	4.54E-03	5.63E-02	1.17E-01	3.11E-04	5.77E-03	1.25E-03
147	Alternative 1	2040	Weekend	3	freeway link 3	Commercial Hauling Trucks	2.31E-04	0.00E+00	3.44E-02	1.42E-03	3.31E-04	4.58E-03	3.17E-02	2.45E-02	7.38E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
148	Alternative 1	2040	Weekend	4	freeway link 4	Employees (Cars)	8.39E-06	0.00E+00	3.20E-05	3.10E-06	4.53E-04	7.98E-04	7.29E-05	N/A	3.90E-06	3.59E-04	3.80E-05	5.33E-03	4.28E-06	9.12E-05	1.57E-05
149	Alternative 1	2040	Weekend	5	freeway link 5	Employees (Trucks)	1.05E-05	0.00E+00	4.00E-05	3.87E-06	5.44E-04	9.47E-04	9.09E-05	N/A	5.03E-06	4.22E-04	5.55E-05	6.18E-03	6.08E-06	1.01E-04	1.78E-05
150	Alternative 1	2040	Weekend	6	freeway link 6	KC Transfer Trailers	2.54E-05	0.00E+00	1.81E-03	1.56E-04	1.78E-08	4.86E-04	1.16E-03	1.48E-02	7.88E-06	3.33E-03	1.51E-01	1.19E-01	3.44E-04	1.23E-02	2.50E-03
151	Alternative 1	2040	Weekend	7	freeway link 7	MRW Self-Haul	8.99E-06	0.00E+00	1.47E-04	1.29E-05	3.28E-04	5.34E-04	1.40E-04	2.55E-03	4.43E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
152	Alternative 1	2040	Weekend	8	freeway link 8	MRW Transfer Trucks	1.81E-04	0.00E+00	7.34E-03	6.34E-04	2.59E-03	4.59E-03	5.22E-03	1.88E-02	6.88E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
153	Alternative 1	2040	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	1.72E-05	0.00E+00	6.56E-05	6.35E-06	7.72E-04	1.24E-03	1.49E-04	N/A	7.65E-06	1.95E-02	1.66E-03	4.05E-01	2.55E-04	1.26E-02	1.85E-03
154	Alternative 1	2040	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	3.74E-05	0.00E+00	9.56E-04	8.32E-05	6.88E-04	6.76E-04	7.72E-04	5.43E-03	1.52E-05	1.20E-02	1.91E-01	2.10E-01	4.76E-04	3.45E-02	5.46E-03
155	Alternative 1	2040	Weekend	11	local link 3	Commercial Hauling Trucks	2.31E-04	0.00E+00	3.44E-02	1.42E-03	3.31E-04	4.58E-03	3.17E-02	2.45E-02	7.38E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
156	Alternative 1	2040	Weekend	12	local link 4	Employees (Cars)	1.71E-05	0.00E+00	6.53E-05	6.32E-06	7.67E-04	1.23E-03	1.49E-04	N/A	7.61E-06	6.54E-04	5.62E-05	1.36E-02	8.55E-06	4.22E-04	6.17E-05
157	Alternative 1	2040	Weekend	13	local link 5	Employees (Trucks)	2.11E-05	0.00E+00	8.08E-05	7.82E-06	9.27E-04	1.48E-03	1.83E-04	N/A	9.61E-06	7.80E-04	8.02E-05	1.42E-02	1.17E-05	4.81E-04	7.04E-05
158	Alternative 1	2040	Weekend	14	local link 6	KC Transfer Trailers	3.80E-05	0.00E+00	2.71E-03	2.34E-04	2.61E-08	7.28E-04	1.73E-03	2.13E-02	1.18E-05	4.36E-03	2.03E-01	1.56E-01	3.49E-04	2.02E-02	3.72E-03
159	Alternative 1	2040	Weekend	15	local link 7	MRW Self-Haul	2.73E-05	0.00E+00	5.11E-04	4.48E-05	7.30E-04	9.59E-04	4.61E-04	5.43E-03	1.14E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
160	Alternative 1	2040	Weekend	16	local link 8	MRW Transfer Trucks	1.81E-04	0.00E+00	7.34E-03	6.34E-04	2.59E-03	4.59E-03	5.22E-03	1.88E-02	6.88E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
161	Alternative 2	2029	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	2.92E-05	3.36E-05	1.36E-04	9.95E-06	1.13E-03	1.60E-03	2.24E-04	N/A	1.34E-05	1.46E-02	9.65E-03	3.13E-01	1.45E-04	2.55E-03	4.96E-04
162	Alternative 2	2029	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	9.69E-04	3.22E-04	3.99E-03	7.09E-04	1.35E-03	7.44E-04	8.62E-03	4.94E-02	4.20E-04	1.81E-02	1.51E-01	1.58E-01	2.26E-04	1.03E-02	6.64E-03
163	Alternative 2	2029	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.37E-03	4.01E-04	6.64E-03	1.04E-03	1.18E-03	6.01E-04	1.35E-02	1.14E-01	6.67E-04	3.35E-02	6.64E-01	3.48E-01	8.12E-04	4.02E-02	2.36E-02
164	Alternative 2	2029	Weekdays	4	freeway link 4	Employees (Cars)	2.82E-05	3.25E-05	1.31E-04	9.62E-06	1.10E-03	1.56E-03	2.16E-04	N/A	1.30E-05	2.82E-03	1.90E-03	6.05E-02	2.81E-05	4.23E-04	8.65E-05
165	Alternative 2	2029	Weekdays	5	freeway link 5	Employees (Trucks)	2.96E-05	2.91E-05	1.34E-04	1.05E-05	1.06E-03	1.40E-03	2.32E-04	N/A	1.43E-05	2.51E-03	2.54E-03	5.66E-02	3.67E-05	4.53E-04	9.59E-05
166	Alternative 2	2029	Weekdays	6	freeway link 6	KC Transfer Trailers	1.64E-03	4.92E-04	7.98E-03	1.31E-03	1.39E-03	9.14E-04	1.55E-02	1.61E-01	8.39E-04	5.68E-02	1.26E+00	5.70E-01	1.37E-03	7.83E-02	4.44E-02
167	Alternative 2	2029	Weekdays	7	freeway link 7	MRW Self-Haul	4.99E-04	1.78E-04	2.06E-03	3.59E-04	1.24E-03	1.17E-03	4.42E-03	4.94E-02	2.17E-04	5.93E-03	2.91E-02	8.55E-02	6.74E-05	2.33E-03	1.29E-03
168	Alternative 2	2029	Weekdays	8	freeway link 8	MRW Transfer Trucks	9.69E-04	3.22E-04	3.99E-03	7.09E-04	1.35E-03	7.44E-04	8.62E-03	4.94E-02	4.20E-04	7.02E-04	5.84E-03	6.13E-03	8.76E-06	3.99E-04	2.57E-04
169	Alternative 2	2029	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	5.19E-05	5.97E-05	2.41E-04	1.77E-05	1.72E-03	2.15E-03	3.98E-04	N/A	2.35E-05	8.53E-02	5.06E-02	2.39E+00	8.82E-04	3.54E-02	5.69E-03
170	Alternative 2	2029	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	1.67E-03	5.87E-04	7.05E-03	1.22E-03	2.84E-03	1.44E-03	1.49E-02	8.04E-02	7.25E-04	1.44E-01	1.11E+00	1.04E+00	1.30E-03	1.13E-01	5.35E-02
171	Alternative 2	2029	Weekdays	11	local link 3	Commercial Hauling Trucks	2.39E-03	6.93E-04	1.23E-02	1.84E-03	2.06E-03	1.14E-03	2.43E-02	1.93E-01	1.17E-03	8.41E-02	1.62E+00	8.60E-01	1.44E-03	1.41E-01	6.14E-02
172	Alternative 2	2029	Weekdays	12	local link 4	Employees (Cars)	5.26E-05	6.04E-05	2.44E-04	1.79E-05	1.74E-03	2.17E-03	4.02E-04	N/A	2.39E-05	5.42E-03	3.20E-03	1.54E-01	5.63E-05	2.21E-03	3.57E-04
173	Alternative 2	2029	Weekdays	13	local link 5	Employees (Trucks)	5.76E-05	5.58E-05	2.60E-04	2.04E-05	1.76E-03	1.99E-03	4.51E-04	N/A	2.75E-05	4.93E-03	3.78E-03	1.27E-01	7.09E-05	2.43E-03	4.03E-04
174	Alternative 2	2029	Weekdays	14	local link 6	KC Transfer Trailers	1.86E-03	5.58E-04	9.15E-03	1.49E-03	1.58E-03	1.06E-03	1.77E-02	1.90E-01	9.65E-04	4.89E-02	1.10E+00	5.18E-01	1.08E-03	8.21E-02	4.09E-02
175	Alternative 2	2029	Weekdays	15	local link 7	MRW Self-Haul	8.60E-04	3.23E-04	3.64E-03	6.19E-04	2.28E-03	1.80E-03	7.64E-03	8.04E-02	3.74E-04	4.16E-02	2.11E-01	6.23E-01	3.96E-04	2.68E-02	1.07E-02
176	Alternative 2	2029	Weekdays	16	local link 8	MRW Transfer Trucks	1.67E-03	5.87E-04	7.05E-03	1.22E-03	2.84E-03	1.44E-03	1.49E-02	8.04E-02	7.25E-04	1.07E-04	8.30E-04	7.80E-04	9.70E-07	8.41E-05	3.99E-05
177	Alternative 2	2029	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	2.92E-05	3.36E-05	1.36E-04	9.95E-06	1.13E-03	1.59E-03	2.24E-04	N/A	1.34E-05	7.63E-03	5.07E-03	1.65E-01	7.65E-05	1.34E-03	2.61E-04
178	Alternative 2	2029	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	9.69E-04	3.22E-04	3.99E-03	7.09E-04	1.32E-03	6.79E-04	8.62E-03	4.94E-02	4.20E-04	9.16E-03	7.92E-02	8.31E-02	1.19E-04	5.41E-03	3.49E-03
179	Alternative 2	2029	Weekend	3	freeway link 3	Commercial Hauling Trucks	2.47E-02	7.24E-03	1.26E-01	1.90E-02	2.12E-02	1.18E-02	2.48E-01	1.50E+00	1.44E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
180	Alternative 2	2029	Weekend	4	freeway link 4	Employees (Cars)	2.82E-05	3.25E-05	1.31E-04	9.62E-06	1.10E-03	1.56E-03	2.16E-04	N/A	1.30E-05	1.13E-03	7.62E-04	2.42E-02	1.12E-05	1.69E-04	3.46E-05
181	Alternative 2	2029	Weekend	5	freeway link 5	Employees (Trucks)	2.96E-05	2.91E-05	1.34E-04	1.05E-05	1.05E-03	1.38E-03	2.32E-04	N/A	1.43E-05	9.91E-04	1.02E-03	2.26E-02	1.47E-05	1.81E-04	3.83E-05
182	Alternative 2	2029	Weekend	6	freeway link 6	KC Transfer Trailers	1.64E-03	4.92E-04	7.98E-03	1.31E-03	1.39E-03	9.14E-04	1.55E-02	1.61E-01	8.39E-04	2.27E-02	5.03E-01	2.28E-01	5.47E-04	3.13E-02	1.78E-02
183	Alternative 2	2029	Weekend	7	freeway link 7	MRW Self-Haul	4.99E-04	1.78E-04	2.06E-03	3.59E-04	1.23E-03	1.13E-03	4.42E-03	4.94E-02	2.17E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
184	Alternative 2	2029	Weekend	8	freeway link 8	MRW Transfer Trucks	1.99E-02	6.49E-03	8.43E-02	1.48E-02	2.34E-02	1.20E-02	1.79E-01	1.04E+00	1.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
185	Alternative 2	2029	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	5.29E-05	6.08E-05	2.46E-04	1.80E-05	1.74E-03	2.18E-03	4.05E-04	N/A	2.41E-05	4.54E-02	2.67E-02	1.30E+00	4.73E-04	1.86E-02	3.01E-03
186	Alternative 2	2029	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	1.73E-03	6.11E-04	7.33E-03	1.27E-03	2.93E-03	1.44E-03	1.55E-02	8.22E-02	7.50E-04	7.69E-02	6.01E-01	5.66E-01	6.98E-04	6.15E-02	2.89E-02
187	Alternative 2	2029	Weekend	11	local link 3	Commercial Hauling Trucks	2.47E-02	7.24E-03	1.26E-01	1.90E-02	2.12E-02	1.18E-02	2.48E-01	1.50E+00	1.44E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
188	Alternative 2	2029	Weekend	12	local link 4	Employees (Cars)	5.43E-05	6.24E-05	2.52E-04	1.85E-05	1.79E-03	2.23E-03	4.15E-04	N/A	2.49E-05	2.22E-03	1.29E-03	6.54E-02	2.34E-05	9.28E-04	1.51E-04
189	Alternative 2	2029	Weekend	13	local link 5	Employees (Trucks)	5.95E-05	5.72E-05	2.69E-04	2.11E-05	1.81E-03	2.03E-03	4.66E-04	N/A	2.86E-05	2.01E-03	1.52E-03	5.37E-02	2.94E-05	1.02E-03	1.69E-04
190	Alternative 2	2029	Weekend	14	local link 6	KC Transfer Trailers	2.05E-03	6.12E-04	1.03E-02	1.66E-03	1.73E-03	1.24E-03	1.96E-02	2.35E-01	1.12E-03	2.20E-02	5.18E-01	2.46E-01	4.86E-04	4.13E-02	2.04E-02
191	Alternative 2	2029	Weekend	15	local link 7	MRW Self-Haul	8.94E-04	3.36E-04	3.79E-03	6.43E-04	2.34E-03	1.81E-03	7.94E-03	8.22E-02	3.87E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
192	Alternative 2	2029	Weekend	16	local link 8	MRW Transfer Trucks	1.99E-02	6.49E-03	8.43E-02	1.48E-02	2.34E-02	1.20E-02	1.79E-01	1.04E+00	1.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
193	Alternative 2	2040	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	8.40E-06	0.00E+00	3.21E-05	3.10E-06	4.55E-04	8.03E-04	7.31E-05	N/A	3.91E-06	7.07E-03	7.47E-04	1.05E-01	8.41E-05	1.81E-03	3.10E-04
194	Alternative 2	2040	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	9.67E-06	0.00E+00	2.64E-04	2.29E-05	2.27E-04	3.31E-04	2.09E-04	2.56E-03	5.00E-06	3.13E-03	3.17E-02	6.58E-02	1.74E-04	3.27E-03	7.06E-04
195	Alternative 2	2040	Weekdays	3	freeway link 3	Commercial Hauling Trucks	9.71E-06	0.00E+00	1.47E-03	5.95E-05	1.43E-05	1.92E-04	1.35E-03	4.00E-03	3.14E-06	4.53E-03	2.06E-01	2.45E-01	6.14E-04	1.49E-02	2.61E-03
196	Alternative 2	2040	Weekdays	4	freeway link 4	Employees (Cars)	8.13E-06	0.00E+00	3.10E-05	3.00E-06	4.44E-04	7.88E-04	7.06E-05	N/A	3.78E-06	1.37E-03	1.47E-04	2.02E-02	1.62E-05	2.99E-04	5.33E-05
197	Alternative 2	2040	Weekdays	5	freeway link 5	Employees (Trucks)	1.02E-05	0.00E+00	3.89E-05	3.76E-06	5.39E-04	9.48E-04	8.85E-05	N/A	4.91E-06	1.64E-03	2.16E-04	2.39E-02	2.32E-05	3.31E-04	6.07E-05
198	Alternative 2	2040	Weekdays	6	freeway link 6	KC Transfer Trailers	2.40E-05	0.00E+00	1.72E-03	1.48E-04	1.62E-08	4.60E-04	1.09E-03	1.43E-02	7.47E-06	1.10E-02	4.90E-01	3.86E-01	1.19E-03	3.67E-02	7.81E-03
199	Alternative 2	2040	Weekdays	7	freeway link 7	MRW Self-Haul	9.04E-06	0.00E+00	1.48E-04	1.30E-05	3.41E-04	5.67E-04	1.41E-04	2.56E-03	4.45E-06	1.85E-03	5.89E-03	3.10E-02	4.68E-05	9.21E-04	1.84E-04
200	Alternative 2	2040	Weekdays	8	freeway link 8	MRW Transfer Trucks	9.67E-06	0.00E+00	2.64E-04	2.29E-05	2.27E-04	3.31E-04	2.09E-04	2.56E-03	5.00E-06	1.21E-04	1.23E-03	2.55E-03	6.74E-06	1.27E-04	2.74E-05
201	Alternative 2	2040	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	1.49E-05	0.00E+00	5.70E-05	5.52E-06	6.68E-04	1.05E-03	1.30E-04	N/A	6.50E-06	4.09E-02	3.91E-03	7.98E-01	5.09E-04	2.54E-02	3.71E-03
202	Alternative 2	2040	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	2.59E-05	0.00E+00	6.93E-04	6.03E-05	4.99E-04	5.66E-04	5.51E-04	4.06E-03	1.08E-05	2.46E-02	3.39E-01	3.73E-01	9.64E-04	5.46E-02	8.95E-03
203	Alternative 2	2040	Weekdays	11	local link 3	Commercial Hauling Trucks	2.19E-05	0.00E+00	3.44E-03	1.34E-04	3.47E-05	4.35E-04	3.22E-03	6.96E-03	7.08E-06	1.45E-02	6.64E-01	6.66E-01	1.06E-03	7.54E-02	1.12E-02
204	Alternative 2	2040	Weekdays	12	local link 4	Employees (Cars)	1.51E-05	0.00E+00	5.77E-05	5.58E-06	6.75E-04	1.06E-03	1.31E-04	N/A	6.59E-06	2.60E-03	2.47E-04	5.14E-02	3.25E-05	1.58E-03	2.32E-04

Operations Emission Factors Summary

Emission Factors Summary

							Overall Emission Factors (grams/mile) - MSATs [1]									Emissions - CAPs (ton/year)					
No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	Naphthalene	1,3-Butadiene	Acetaldehyde	acrolein	benzene	ethyl benzene	formaldehyde	DPM	PAH	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
205	Alternative 2	2040	Weekdays	13	local link 5	Employees (Trucks)	1.86E-05	0.00E+00	7.12E-05	6.89E-06	8.18E-04	1.28E-03	1.62E-04	N/A	8.42E-06	3.12E-03	3.53E-04	5.44E-02	4.48E-05	1.81E-03	2.67E-04
206	Alternative 2	2040	Weekdays	14	local link 6	KC Transfer Trailers	2.96E-05	0.00E+00	2.11E-03	1.82E-04	2.20E-08	5.67E-04	1.35E-03	1.67E-02	9.18E-06	1.02E-02	4.78E-01	3.72E-01	9.34E-04	4.48E-02	8.43E-03
207	Alternative 2	2040	Weekdays	15	local link 7	MRW Self-Haul	2.04E-05	0.00E+00	3.75E-04	3.29E-05	5.84E-04	8.08E-04	3.41E-04	4.06E-03	8.67E-06	1.19E-02	6.22E-02	2.12E-01	2.67E-04	1.45E-02	2.30E-03
208	Alternative 2	2040	Weekdays	16	local link 8	MRW Transfer Trucks	2.59E-05	0.00E+00	6.93E-04	6.03E-05	4.99E-04	5.66E-04	5.51E-04	4.06E-03	1.08E-05	1.84E-05	2.53E-04	2.79E-04	7.19E-07	4.07E-05	6.68E-06
209	Alternative 2	2040	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	8.40E-06	0.00E+00	3.21E-05	3.10E-06	4.54E-04	7.99E-04	7.31E-05	N/A	3.91E-06	3.71E-03	3.93E-04	5.51E-02	4.42E-05	9.50E-04	1.63E-04
210	Alternative 2	2040	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	9.67E-06	0.00E+00	2.64E-04	2.29E-05	2.03E-04	2.72E-04	2.09E-04	2.56E-03	5.00E-06	1.34E-03	1.67E-02	3.46E-02	9.14E-05	1.72E-03	3.71E-04
211	Alternative 2	2040	Weekend	3	freeway link 3	Commercial Hauling Trucks	2.31E-04	0.00E+00	3.44E-02	1.42E-03	3.31E-04	4.58E-03	3.17E-02	2.45E-02	7.38E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
212	Alternative 2	2040	Weekend	4	freeway link 4	Employees (Cars)	8.13E-06	0.00E+00	3.10E-05	3.00E-06	4.43E-04	7.85E-04	7.06E-05	N/A	3.78E-06	5.47E-04	5.89E-05	8.10E-03	6.50E-06	1.19E-04	2.13E-05
213	Alternative 2	2040	Weekend	5	freeway link 5	Employees (Trucks)	1.02E-05	0.00E+00	3.89E-05	3.76E-06	5.34E-04	9.31E-04	8.85E-05	N/A	4.91E-06	6.44E-04	8.63E-05	9.57E-03	9.28E-06	1.32E-04	2.43E-05
214	Alternative 2	2040	Weekend	6	freeway link 6	KC Transfer Trailers	2.40E-05	0.00E+00	1.72E-03	1.48E-04	1.62E-08	4.60E-04	1.09E-03	1.43E-02	7.47E-06	4.41E-03	1.96E-01	1.54E-01	4.77E-04	1.47E-02	3.13E-03
215	Alternative 2	2040	Weekend	7	freeway link 7	MRW Self-Haul	9.04E-06	0.00E+00	1.48E-04	1.30E-05	3.29E-04	5.35E-04	1.41E-04	2.56E-03	4.45E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
216	Alternative 2	2040	Weekend	8	freeway link 8	MRW Transfer Trucks	1.81E-04	0.00E+00	7.34E-03	6.34E-04	2.59E-03	4.59E-03	5.22E-03	1.88E-02	6.88E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
217	Alternative 2	2040	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	1.52E-05	0.00E+00	5.80E-05	5.61E-06	6.78E-04	1.06E-03	1.32E-04	N/A	6.63E-06	2.18E-02	2.07E-03	4.34E-01	2.73E-04	1.33E-02	1.95E-03
218	Alternative 2	2040	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	2.71E-05	0.00E+00	7.21E-04	6.27E-05	4.98E-04	5.24E-04	5.74E-04	4.24E-03	1.13E-05	1.20E-02	1.85E-01	2.04E-01	5.19E-04	3.02E-02	4.93E-03
219	Alternative 2	2040	Weekend	11	local link 3	Commercial Hauling Trucks	2.31E-04	0.00E+00	3.44E-02	1.42E-03	3.31E-04	4.58E-03	3.17E-02	2.45E-02	7.38E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
220	Alternative 2	2040	Weekend	12	local link 4	Employees (Cars)	1.56E-05	0.00E+00	5.95E-05	5.76E-06	6.94E-04	1.09E-03	1.36E-04	N/A	6.84E-06	1.07E-03	1.00E-04	2.18E-02	1.35E-05	6.64E-04	9.72E-05
221	Alternative 2	2040	Weekend	13	local link 5	Employees (Trucks)	1.92E-05	0.00E+00	7.35E-05	7.11E-06	8.37E-04	1.30E-03	1.67E-04	N/A	8.73E-06	1.27E-03	1.43E-04	2.30E-02	1.85E-05	7.56E-04	1.12E-04
222	Alternative 2	2040	Weekend	14	local link 6	KC Transfer Trailers	3.73E-05	0.00E+00	2.66E-03	2.30E-04	2.50E-08	7.15E-04	1.70E-03	2.11E-02	1.16E-05	5.16E-03	2.38E-01	1.83E-01	4.19E-04	2.28E-02	4.28E-03
223	Alternative 2	2040	Weekend	15	local link 7	MRW Self-Haul	2.11E-05	0.00E+00	3.90E-04	3.42E-05	5.88E-04	7.94E-04	3.53E-04	4.24E-03	8.97E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
224	Alternative 2	2040	Weekend	16	local link 8	MRW Transfer Trucks	1.81E-04	0.00E+00	7.34E-03	6.34E-04	2.59E-03	4.59E-03	5.22E-03	1.88E-02	6.88E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Notes:

N/A = not applicable

1. Emission factors were obtained from MOVES4 Onroad module runs at the Project Scale for King County at t
factors represent the maximum emission rate between winter and summer afternoons.

2. PM emission factors include tire wear and brake wear.

3. Emission factors for MRW Self-haul is the average of cars and single unit shot haul trucks.

Operations Emission Factors Summary

							Emissions - GHGs (metric ton/year)	Emissions - MSATs (ton/year)								
No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	CO_2e	Naphthalene	1,3-Butadiene	Acetaldehyde	acrolein	benzene	ethyl benzene	formaldehyde	DPM	PAH
1	Existing Condition	2023	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	5.18E+01	2.05E-05	4.30E-05	1.09E-04	6.51E-06	5.65E-04	5.02E-04	1.40E-04	N/A	8.53E-06
2	Existing Condition	2023	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	9.71E+01	3.56E-04	1.30E-04	1.46E-03	2.57E-04	5.57E-04	2.69E-04	3.14E-03	2.13E-02	1.63E-04
3	Existing Condition	2023	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.35E+02	2.93E-04	8.77E-05	1.26E-03	2.17E-04	2.52E-04	1.07E-04	2.72E-03	2.60E-02	1.49E-04
4	Existing Condition	2023	Weekdays	4	freeway link 4	Employees (Cars)	4.32E+00	1.67E-06	3.49E-06	8.92E-06	5.31E-07	4.65E-05	4.16E-05	1.14E-05	N/A	6.99E-07
5	Existing Condition	2023	Weekdays	5	freeway link 5	Employees (Trucks)	5.52E+00	2.24E-06	4.76E-06	1.20E-05	7.24E-07	5.49E-05	4.49E-05	1.52E-05	N/A	9.05E-07
6	Existing Condition	2023	Weekdays	6	freeway link 6	KC Transfer Trailers	2.92E+02	6.34E-04	1.95E-04	2.82E-03	4.86E-04	5.43E-04	2.77E-04	5.80E-03	7.34E-02	3.58E-04
7	Existing Condition	2023	Weekdays	7	freeway link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8	Existing Condition	2023	Weekdays	8	freeway link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9	Existing Condition	2023	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	9.20E+01	4.95E-05	1.06E-04	2.66E-04	1.57E-05	1.18E-03	9.54E-04	3.35E-04	N/A	2.00E-05
10	Existing Condition	2023	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	1.63E+02	8.65E-04	3.25E-04	3.58E-03	6.24E-04	1.47E-03	6.81E-04	7.63E-03	4.79E-02	3.92E-04
11	Existing Condition	2023	Weekdays	11	local link 3	Commercial Hauling Trucks	2.76E+02	9.42E-04	2.79E-04	4.17E-03	7.01E-04	8.11E-04	3.65E-04	8.89E-03	7.01E-02	4.56E-04
12	Existing Condition	2023	Weekdays	12	local link 4	Employees (Cars)	8.39E+00	4.55E-06	9.77E-06	2.45E-05	1.44E-06	1.08E-04	8.73E-05	3.08E-05	N/A	1.84E-06
13	Existing Condition	2023	Weekdays	13	local link 5	Employees (Trucks)	1.03E+01	5.85E-06	1.23E-05	3.13E-05	1.89E-06	1.30E-04	9.60E-05	3.98E-05	N/A	2.33E-06
14	Existing Condition	2023	Weekdays	14	local link 6	KC Transfer Trailers	2.72E+02	6.05E-04	1.85E-04	2.71E-03	4.65E-04	5.18E-04	2.70E-04	5.55E-03	7.53E-02	3.53E-04
15	Existing Condition	2023	Weekdays	15	local link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
16	Existing Condition	2023	Weekdays	16	local link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
17	Existing Condition	2023	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	3.61E+01	1.43E-05	2.99E-05	7.63E-05	4.53E-06	3.93E-04	3.49E-04	9.73E-05	N/A	5.95E-06
18	Existing Condition	2023	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	6.77E+01	2.48E-04	9.08E-05	1.01E-03	1.79E-04	3.77E-04	1.77E-04	2.19E-03	1.49E-02	1.13E-04
19	Existing Condition	2023	Weekend	3	freeway link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
20	Existing Condition	2023	Weekend	4	freeway link 4	Employees (Cars)	1.73E+00	6.69E-07	1.40E-06	3.57E-06	2.12E-07	1.86E-05	1.66E-05	4.56E-06	N/A	2.79E-07
21	Existing Condition	2023	Weekend	5	freeway link 5	Employees (Trucks)	2.21E+00	8.97E-07	1.91E-06	4.81E-06	2.89E-07	2.19E-05	1.78E-05	6.09E-06	N/A	3.62E-07
22	Existing Condition	2023	Weekend	6	freeway link 6	KC Transfer Trailers	1.17E+02	2.54E-04	7.78E-05	1.13E-03	1.94E-04	2.17E-04	1.11E-04	2.32E-03	2.93E-02	1.43E-04
23	Existing Condition	2023	Weekend	7	freeway link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
24	Existing Condition	2023	Weekend	8	freeway link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
25	Existing Condition	2023	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	6.49E+01	3.48E-05	7.48E-05	1.87E-04	1.10E-05	8.30E-04	6.70E-04	2.35E-04	N/A	1.41E-05
26	Existing Condition	2023	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	1.15E+02	6.16E-04	2.31E-04	2.54E-03	4.44E-04	1.03E-03	4.71E-04	5.43E-03	3.39E-02	2.79E-04
27	Existing Condition	2023	Weekend	11	local link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
28	Existing Condition	2023	Weekend	12	local link 4	Employees (Cars)	3.52E+00	1.87E-06	4.03E-06	1.01E-05	5.92E-07	4.46E-05	3.61E-05	1.27E-05	N/A	7.56E-07
29	Existing Condition	2023	Weekend	13	local link 5	Employees (Trucks)	4.32E+00	2.40E-06	5.05E-06	1.28E-05	7.76E-07	5.32E-05	3.94E-05	1.63E-05	N/A	9.55E-07
30	Existing Condition	2023	Weekend	14	local link 6	KC Transfer Trailers	1.20E+02	2.71E-04	8.28E-05	1.22E-03	2.09E-04	2.32E-04	1.23E-04	2.50E-03	3.61E-02	1.63E-04
31	Existing Condition	2023	Weekend	15	local link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
32	Existing Condition	2023	Weekend	16	local link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
33	No Action	2029	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	8.79E+01	1.35E-05	1.55E-05	6.26E-05	4.59E-06	5.21E-04	7.36E-04	1.03E-04	N/A	6.20E-06
34	No Action	2029	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.92E+02	4.46E-04	1.48E-04	1.84E-03	3.26E-04	6.22E-04	3.42E-04	3.97E-03	2.28E-02	1.94E-04
35	No Action	2029	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.95E+02	2.44E-04	7.14E-05	1.18E-03	1.84E-04	2.10E-04	1.06E-04	2.40E-03	1.99E-02	1.18E-04
36	No Action	2029	Weekdays	4	freeway link 4	Employees (Cars)	3.29E+00	5.05E-07	5.80E-07	2.35E-06	1.72E-07	1.95E-05	2.76E-05	3.86E-06	N/A	2.32E-07
37	No Action	2029	Weekdays	5	freeway link 5	Employees (Trucks)	4.28E+00	5.31E-07	5.21E-07	2.40E-06	1.88E-07	1.88E-05	2.47E-05	4.15E-06	N/A	2.56E-07
38	No Action	2029	Weekdays	6	freeway link 6	KC Transfer Trailers	3.60E+02	4.31E-04	1.29E-04	2.10E-03	3.44E-04	3.66E-04	2.41E-04	4.07E-03	4.26E-02	2.21E-04
39	No Action	2029	Weekdays	7	freeway link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	No Action	2029	Weekdays	8	freeway link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	No Action	2029	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	1.51E+02	2.84E-05	3.27E-05	1.32E-04	9.69E-06	9.40E-04	1.20E-03	2.18E-04	N/A	1.34E-05
42	No Action	2029	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	3.00E+02	1.11E-03	3.90E-04	4.67E-03	8.08E-04	1.90E-03	9.37E-04	9.86E-03	4.82E-02	4.71E-04
43	No Action	2029	Weekdays	11	local link 3	Commercial Hauling Trucks	3.90E+02	8.09E-04	2.34E-04	4.16E-03	6.20E-04	6.97E-04	3.86E-04	8.24E-03	5.45E-02	3.72E-04
44	No Action	2029	Weekdays	12	local link 4	Employees (Cars)	6.39E+00	1.23E-06	1.42E-06	5.73E-06	4.20E-07	4.06E-05	5.13E-05	9.43E-06	N/A	5.78E-07
45	No Action	2029	Weekdays	13	local link 5	Employees (Trucks)	7.97E+00	1.35E-06	1.28E-06	6.08E-06	4.81E-07	4.11E-05	4.70E-05	1.06E-05	N/A	6.53E-07
46	No Action	2029	Weekdays	14	local link 6	KC Transfer Trailers	3.35E+02	4.14E-04	1.24E-04	2.05E-03	3.33E-04	3.51E-04	2.40E-04	3.94E-03	4.40E-02	2.18E-04
47	No Action	2029	Weekdays	15	local link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
48	No Action	2029	Weekdays	16	local link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
49	No Action	2029	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	4.62E+01	7.08E-06	8.14E-06	3.29E-05	2.41E-06	2.74E-04	3.86E-04	5.42E-05	N/A	3.26E-06
50	No Action	2029	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.01E+02	2.35E-04	7.79E-05	9.67E-04	1.72E-04	3.20E-04	1.64E-04	2.09E-03	1.20E-02	1.02E-04
51	No Action	2029	Weekend	3	freeway link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
52	No Action	2029	Weekend	4	freeway link 4	Employees (Cars)	1.32E+00	2.02E-07	2.32E-07	9.39E-07	6.88E-08	7.80E-06	1.10E-05	1.55E-06	N/A	9.29E-08
53	No Action	2029	Weekend	5	freeway link 5	Employees (Trucks)	1.71E+00	2.12E-07	2.08E-07	9.61E-07	7.53E-08	7.48E-06	9.72E-06	1.66E-06	N/A	1.02E-07
54	No Action	2029	Weekend	6	freeway link 6	KC Transfer Trailers	1.44E+02	1.72E-04	5.18E-05	8.41E-04	1.38E-04	1.46E-04	9.65E-05	1.63E-03	1.70E-02	8.83E-05
55	No Action	2029	Weekend	7	freeway link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
56	No Action	2029	Weekend	8	freeway link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
57	No Action	2029	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	8.00E+01	1.50E-05	1.73E-05	6.98E-05	5.11E-06	4.96E-04	6.35E-04	1.15E-04	N/A	7.05E-06
58	No Action	2029	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	1.59E+02	5.88E-04	2.08E-04	2.49E-03	4.30E-04	1.00E-03	4.82E-04	5.25E-03	2.56E-02	2.51E-04
59	No Action	2029	Weekend	11	local link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
60	No Action	2029	Weekend	12	local link 4	Employees (Cars)	2.68E+00	5.05E-07	5.80E-07	2.35E-06	1.72E-07	1.67E-05	2.13E-05	3.86E-06	N/A	2.37E-07
61	No Action	2029	Weekend	13	local link 5	Employees (Trucks)	3.34E+00	5.52E-07	5.17E-07	2.48E-06	1.97E-07	1.68E-05	1.93E-05	4.34E-06	N/A	2.66E-07
62	No Action	2029	Weekend	14	local link 6	KC Transfer Trailers	1.47E+02	1.86E-04	5.56E-05	9.37E-04	1.51E-04	1.58E-04	1.12E-04	1.78E-03	2.10E-02	1.01E-04
63	No Action	2029	Weekend	15	local link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
64	No Action	2029	Weekend	16	local link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
65	No Action	2040	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	5.08E+01	3.88E-06	0.00E+00	1.48E-05	1.43E-06	2.10E-04	3.71E-04	3.37E-05	N/A	1.80E-06
66	No Action	2040	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.50E+02	4.43E-06	0.00E+00	1.21E-04	1.05E-05	1.04E-04	1.52E-04	9.55E-05	1.18E-03	2.30E-06
67	No Action	2040	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.52E+02	1.67E-06	0.00E+00	2.55E-04	1.02E-05	2.50E-06	3.31E-05	2.36E-04	7.04E-04	5.41E-07
68	No Action	2040	Weekdays	4	freeway link 4	Employees (Cars)	1.91E+00	1.45E-07	0.00E+00	5.54E-07	5.36E-08	7.86E-06	1.39E-05	1.26E-06	N/A	6.75E-08

Operations Emission Factors Summary

							Emissions - GHGs (metric ton/year)	Emissions - MSATs (ton/year)								
No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	CO_2e	Naphthalene	1,3-Butadiene	Acetaldehyde	acrolein	benzene	ethyl benzene	formaldehyde	DPM	PAH
69	No Action	2040	Weekdays	5	freeway link 5	Employees (Trucks)	2.70E+00	1.81E-07	0.00E+00	6.92E-07	6.69E-08	9.51E-06	1.67E-05	1.57E-06	N/A	8.70E-08
70	No Action	2040	Weekdays	6	freeway link 6	KC Transfer Trailers	3.22E+02	6.43E-06	0.00E+00	4.59E-04	3.96E-05	4.52E-09	1.23E-04	2.93E-04	3.75E-03	2.00E-06
71	No Action	2040	Weekdays	7	freeway link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
72	No Action	2040	Weekdays	8	freeway link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
73	No Action	2040	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	8.72E+01	8.18E-06	0.00E+00	3.12E-05	3.02E-06	3.67E-04	5.90E-04	7.11E-05	N/A	3.63E-06
74	No Action	2040	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	2.27E+02	1.77E-05	0.00E+00	4.52E-04	3.93E-05	3.37E-04	3.47E-04	3.65E-04	2.57E-03	7.19E-06
75	No Action	2040	Weekdays	11	local link 3	Commercial Hauling Trucks	2.93E+02	7.39E-06	0.00E+00	1.17E-03	4.52E-05	1.19E-05	1.47E-04	1.10E-03	2.26E-03	2.39E-06
76	No Action	2040	Weekdays	12	local link 4	Employees (Cars)	3.69E+00	3.54E-07	0.00E+00	1.35E-06	1.31E-07	1.58E-05	2.52E-05	3.08E-06	N/A	1.57E-07
77	No Action	2040	Weekdays	13	local link 5	Employees (Trucks)	5.03E+00	4.36E-07	0.00E+00	1.67E-06	1.62E-07	1.92E-05	3.04E-05	3.79E-06	N/A	1.99E-07
78	No Action	2040	Weekdays	14	local link 6	KC Transfer Trailers	2.98E+02	6.85E-06	0.00E+00	4.89E-04	4.22E-05	4.85E-09	1.31E-04	3.12E-04	3.88E-03	2.13E-06
79	No Action	2040	Weekdays	15	local link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
80	No Action	2040	Weekdays	16	local link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
81	No Action	2040	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	2.67E+01	2.04E-06	0.00E+00	7.77E-06	7.52E-07	1.10E-04	1.94E-04	1.77E-05	N/A	9.47E-07
82	No Action	2040	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	7.91E+01	2.33E-06	0.00E+00	6.36E-05	5.52E-06	4.91E-05	6.57E-05	5.02E-05	6.21E-04	1.21E-06
83	No Action	2040	Weekend	3	freeway link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
84	No Action	2040	Weekend	4	freeway link 4	Employees (Cars)	7.62E-01	5.81E-08	0.00E+00	2.22E-07	2.15E-08	3.14E-06	5.53E-06	5.05E-07	N/A	2.70E-08
85	No Action	2040	Weekend	5	freeway link 5	Employees (Trucks)	1.08E+00	7.24E-08	0.00E+00	2.77E-07	2.68E-08	3.77E-06	6.56E-06	6.29E-07	N/A	3.48E-08
86	No Action	2040	Weekend	6	freeway link 6	KC Transfer Trailers	1.29E+02	2.57E-06	0.00E+00	1.84E-04	1.58E-05	1.81E-09	4.93E-05	1.17E-04	1.50E-03	7.99E-07
87	No Action	2040	Weekend	7	freeway link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
88	No Action	2040	Weekend	8	freeway link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
89	No Action	2040	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	4.62E+01	4.32E-06	0.00E+00	1.65E-05	1.59E-06	1.94E-04	3.12E-04	3.75E-05	N/A	1.92E-06
90	No Action	2040	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	1.20E+02	9.40E-06	0.00E+00	2.40E-04	2.09E-05	1.73E-04	1.70E-04	1.94E-04	1.36E-03	3.82E-06
91	No Action	2040	Weekend	11	local link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
92	No Action	2040	Weekend	12	local link 4	Employees (Cars)	1.55E+00	1.45E-07	0.00E+00	5.54E-07	5.36E-08	6.51E-06	1.04E-05	1.26E-06	N/A	6.45E-08
93	No Action	2040	Weekend	13	local link 5	Employees (Trucks)	2.11E+00	1.79E-07	0.00E+00	6.85E-07	6.63E-08	7.86E-06	1.25E-05	1.56E-06	N/A	8.15E-08
94	No Action	2040	Weekend	14	local link 6	KC Transfer Trailers	1.31E+02	3.36E-06	0.00E+00	2.40E-04	2.07E-05	2.31E-09	6.45E-05	1.53E-04	1.89E-03	1.04E-06
95	No Action	2040	Weekend	15	local link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
96	No Action	2040	Weekend	16	local link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
97	Alternative 1	2029	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	8.79E+01	1.35E-05	1.55E-05	6.26E-05	4.59E-06	5.21E-04	7.36E-04	1.03E-04	N/A	6.20E-06
98	Alternative 1	2029	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.92E+02	4.46E-04	1.48E-04	1.84E-03	3.26E-04	6.22E-04	3.42E-04	3.97E-03	2.28E-02	1.94E-04
99	Alternative 1	2029	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.95E+02	2.44E-04	7.14E-05	1.18E-03	1.84E-04	2.10E-04	1.06E-04	2.40E-03	1.99E-02	1.18E-04
100	Alternative 1	2029	Weekdays	4	freeway link 4	Employees (Cars)	3.29E+00	5.05E-07	5.80E-07	2.35E-06	1.72E-07	1.95E-05	2.76E-05	3.86E-06	N/A	2.32E-07
101	Alternative 1	2029	Weekdays	5	freeway link 5	Employees (Trucks)	4.28E+00	5.31E-07	5.21E-07	2.40E-06	1.88E-07	1.88E-05	2.47E-05	4.15E-06	N/A	2.56E-07
102	Alternative 1	2029	Weekdays	6	freeway link 6	KC Transfer Trailers	2.73E+02	3.26E-04	9.80E-05	1.59E-03	2.61E-04	2.77E-04	1.83E-04	3.08E-03	3.22E-02	1.67E-04
103	Alternative 1	2029	Weekdays	7	freeway link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
104	Alternative 1	2029	Weekdays	8	freeway link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
105	Alternative 1	2029	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	1.51E+02	2.84E-05	3.27E-05	1.32E-04	9.69E-06	9.40E-04	1.20E-03	2.18E-04	N/A	1.34E-05
106	Alternative 1	2029	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	3.00E+02	1.11E-03	3.90E-04	4.67E-03	8.08E-04	1.90E-03	9.37E-04	9.86E-03	4.82E-02	4.71E-04
107	Alternative 1	2029	Weekdays	11	local link 3	Commercial Hauling Trucks	3.90E+02	8.09E-04	2.34E-04	4.16E-03	6.20E-04	6.97E-04	3.86E-04	8.24E-03	5.45E-02	3.72E-04
108	Alternative 1	2029	Weekdays	12	local link 4	Employees (Cars)	6.39E+00	1.23E-06	1.42E-06	5.73E-06	4.20E-07	4.06E-05	5.13E-05	9.43E-06	N/A	5.78E-07
109	Alternative 1	2029	Weekdays	13	local link 5	Employees (Trucks)	7.97E+00	1.35E-06	1.28E-06	6.08E-06	4.81E-07	4.11E-05	4.70E-05	1.06E-05	N/A	6.53E-07
110	Alternative 1	2029	Weekdays	14	local link 6	KC Transfer Trailers	2.54E+02	3.14E-04	9.39E-05	1.55E-03	2.52E-04	2.66E-04	1.82E-04	2.98E-03	3.33E-02	1.65E-04
111	Alternative 1	2029	Weekdays	15	local link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
112	Alternative 1	2029	Weekdays	16	local link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
113	Alternative 1	2029	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	4.62E+01	7.08E-06	8.14E-06	3.29E-05	2.41E-06	2.74E-04	3.86E-04	5.42E-05	N/A	3.26E-06
114	Alternative 1	2029	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.01E+02	2.35E-04	7.79E-05	9.67E-04	1.72E-04	3.20E-04	1.64E-04	2.09E-03	1.20E-02	1.02E-04
115	Alternative 1	2029	Weekend	3	freeway link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
116	Alternative 1	2029	Weekend	4	freeway link 4	Employees (Cars)	1.32E+00	2.02E-07	2.32E-07	9.39E-07	6.88E-08	7.80E-06	1.10E-05	1.55E-06	N/A	9.29E-08
117	Alternative 1	2029	Weekend	5	freeway link 5	Employees (Trucks)	1.71E+00	2.12E-07	2.08E-07	9.61E-07	7.53E-08	7.48E-06	9.72E-06	1.66E-06	N/A	1.02E-07
118	Alternative 1	2029	Weekend	6	freeway link 6	KC Transfer Trailers	1.09E+02	1.30E-04	3.92E-05	6.37E-04	1.04E-04	1.11E-04	7.31E-05	1.23E-03	1.29E-02	6.69E-05
119	Alternative 1	2029	Weekend	7	freeway link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
120	Alternative 1	2029	Weekend	8	freeway link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
121	Alternative 1	2029	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	8.00E+01	1.50E-05	1.73E-05	6.98E-05	5.11E-06	4.96E-04	6.35E-04	1.15E-04	N/A	7.05E-06
122	Alternative 1	2029	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	1.59E+02	5.88E-04	2.08E-04	2.49E-03	4.30E-04	1.00E-03	4.82E-04	5.25E-03	2.56E-02	2.51E-04
123	Alternative 1	2029	Weekend	11	local link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
124	Alternative 1	2029	Weekend	12	local link 4	Employees (Cars)	2.68E+00	5.05E-07	5.80E-07	2.35E-06	1.72E-07	1.67E-05	2.13E-05	3.86E-06	N/A	2.37E-07
125	Alternative 1	2029	Weekend	13	local link 5	Employees (Trucks)	3.34E+00	5.52E-07	5.17E-07	2.48E-06	1.97E-07	1.68E-05	1.93E-05	4.34E-06	N/A	2.66E-07
126	Alternative 1	2029	Weekend	14	local link 6	KC Transfer Trailers	1.12E+02	1.41E-04	4.22E-05	7.10E-04	1.14E-04	1.20E-04	8.49E-05	1.35E-03	1.59E-02	7.65E-05
127	Alternative 1	2029	Weekend	15	local link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
128	Alternative 1	2029	Weekend	16	local link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
129	Alternative 1	2040	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	5.08E+01	3.88E-06	0.00E+00	1.48E-05	1.43E-06	2.10E-04	3.71E-04	3.37E-05	N/A	1.80E-06
130	Alternative 1	2040	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	1.50E+02	4.43E-06	0.00E+00	1.21E-04	1.05E-05	1.04E-04	1.52E-04	9.55E-05	1.18E-03	2.30E-06
131	Alternative 1	2040	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.52E+02	1.67E-06	0.00E+00	2.55E-04	1.02E-05	2.50E-06	3.31E-05	2.36E-04	7.04E-04	5.41E-07
132	Alternative 1	2040	Weekdays	4	freeway link 4	Employees (Cars)	1.91E+00	1.45E-07	0.00E+00	5.54E-07	5.36E-08	7.86E-06	1.39E-05	1.26E-06	N/A	6.75E-08
133	Alternative 1	2040	Weekdays	5	freeway link 5	Employees (Trucks)	2.70E+00	1.81E-07	0.00E+00	6.92E-07	6.69E-08	9.51E-06	1.67E-05	1.57E-06	N/A	8.70E-08
134	Alternative 1	2040	Weekdays	6	freeway link 6	KC Transfer Trailers	2.44E+02	4.87E-06	0.00E+00	3.48E-04	3.00E-05	3.42E-09	9.33E-05	2.22E-04	2.84E-03	1.51E-06
135	Alternative 1	2040	Weekdays	7	freeway link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
136	Alternative 1	2040	Weekdays	8	freeway link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Operations Emission Factors Summary

							Emissions - GHGs (metric ton/year)	Emissions - MSATs (ton/year)								
No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	CO_2e	Naphthalene	1,3-Butadiene	Acetaldehyde	acrolein	benzene	ethyl benzene	formaldehyde	DPM	PAH
137	Alternative 1	2040	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	8.72E+01	8.18E-06	0.00E+00	3.12E-05	3.02E-06	3.67E-04	5.90E-04	7.11E-05	N/A	3.63E-06
138	Alternative 1	2040	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	2.27E+02	1.77E-05	0.00E+00	4.52E-04	3.93E-05	3.37E-04	3.47E-04	3.65E-04	2.57E-03	7.19E-06
139	Alternative 1	2040	Weekdays	11	local link 3	Commercial Hauling Trucks	2.93E+02	7.39E-06	0.00E+00	1.17E-03	4.52E-05	1.19E-05	1.47E-04	1.10E-03	2.26E-03	2.39E-06
140	Alternative 1	2040	Weekdays	12	local link 4	Employees (Cars)	3.69E+00	3.54E-07	0.00E+00	1.35E-06	1.31E-07	1.58E-05	2.52E-05	3.08E-06	N/A	1.57E-07
141	Alternative 1	2040	Weekdays	13	local link 5	Employees (Trucks)	5.03E+00	4.36E-07	0.00E+00	1.67E-06	1.62E-07	1.92E-05	3.04E-05	3.79E-06	N/A	1.99E-07
142	Alternative 1	2040	Weekdays	14	local link 6	KC Transfer Trailers	2.26E+02	5.19E-06	0.00E+00	3.70E-04	3.19E-05	3.68E-09	9.94E-05	2.36E-04	2.94E-03	1.61E-06
143	Alternative 1	2040	Weekdays	15	local link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
144	Alternative 1	2040	Weekdays	16	local link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
145	Alternative 1	2040	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	2.67E+01	2.04E-06	0.00E+00	7.77E-06	7.52E-07	1.10E-04	1.94E-04	1.77E-05	N/A	9.47E-07
146	Alternative 1	2040	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	7.91E+01	2.33E-06	0.00E+00	6.36E-05	5.52E-06	4.91E-05	6.57E-05	5.02E-05	6.21E-04	1.21E-06
147	Alternative 1	2040	Weekend	3	freeway link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
148	Alternative 1	2040	Weekend	4	freeway link 4	Employees (Cars)	7.62E-01	5.81E-08	0.00E+00	2.22E-07	2.15E-08	3.14E-06	5.53E-06	5.05E-07	N/A	2.70E-08
149	Alternative 1	2040	Weekend	5	freeway link 5	Employees (Trucks)	1.08E+00	7.24E-08	0.00E+00	2.77E-07	2.68E-08	3.77E-06	6.56E-06	6.29E-07	N/A	3.48E-08
150	Alternative 1	2040	Weekend	6	freeway link 6	KC Transfer Trailers	9.76E+01	1.95E-06	0.00E+00	1.39E-04	1.20E-05	1.37E-09	3.73E-05	8.88E-05	1.14E-03	6.05E-07
151	Alternative 1	2040	Weekend	7	freeway link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
152	Alternative 1	2040	Weekend	8	freeway link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
153	Alternative 1	2040	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	4.62E+01	4.32E-06	0.00E+00	1.65E-05	1.59E-06	1.94E-04	3.12E-04	3.75E-05	N/A	1.92E-06
154	Alternative 1	2040	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	1.20E+02	9.40E-06	0.00E+00	2.40E-04	2.09E-05	1.73E-04	1.70E-04	1.94E-04	1.36E-03	3.82E-06
155	Alternative 1	2040	Weekend	11	local link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
156	Alternative 1	2040	Weekend	12	local link 4	Employees (Cars)	1.55E+00	1.45E-07	0.00E+00	5.54E-07	5.36E-08	6.51E-06	1.04E-05	1.26E-06	N/A	6.45E-08
157	Alternative 1	2040	Weekend	13	local link 5	Employees (Trucks)	2.11E+00	1.79E-07	0.00E+00	6.85E-07	6.63E-08	7.86E-06	1.25E-05	1.56E-06	N/A	8.15E-08
158	Alternative 1	2040	Weekend	14	local link 6	KC Transfer Trailers	9.90E+01	2.55E-06	0.00E+00	1.82E-04	1.57E-05	1.75E-09	4.88E-05	1.16E-04	1.43E-03	7.91E-07
159	Alternative 1	2040	Weekend	15	local link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
160	Alternative 1	2040	Weekend	16	local link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
161	Alternative 2	2029	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	2.59E+01	3.97E-06	4.57E-06	1.85E-05	1.35E-06	1.54E-04	2.17E-04	3.04E-05	N/A	1.83E-06
162	Alternative 2	2029	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	5.66E+01	1.32E-04	4.37E-05	5.43E-04	9.64E-05	1.84E-04	1.01E-04	1.17E-03	6.71E-03	5.72E-05
163	Alternative 2	2029	Weekdays	3	freeway link 3	Commercial Hauling Trucks	2.24E+02	2.80E-04	8.20E-05	1.36E-03	2.12E-04	2.41E-04	1.23E-04	2.76E-03	2.32E-02	1.36E-04
164	Alternative 2	2029	Weekdays	4	freeway link 4	Employees (Cars)	5.00E+00	7.58E-07	8.71E-07	3.52E-06	2.58E-07	2.96E-05	4.20E-05	5.80E-06	N/A	3.48E-07
165	Alternative 2	2029	Weekdays	5	freeway link 5	Employees (Trucks)	6.52E+00	7.95E-07	7.81E-07	3.60E-06	2.82E-07	2.84E-05	3.76E-05	6.21E-06	N/A	3.85E-07
166	Alternative 2	2029	Weekdays	6	freeway link 6	KC Transfer Trailers	3.78E+02	4.38E-04	1.32E-04	2.14E-03	3.50E-04	3.72E-04	2.45E-04	4.14E-03	4.33E-02	2.25E-04
167	Alternative 2	2029	Weekdays	7	freeway link 7	MRW Self-Haul	1.50E+01	2.46E-05	8.76E-06	1.02E-04	1.77E-05	6.12E-05	5.77E-05	2.18E-04	2.44E-03	1.07E-05
168	Alternative 2	2029	Weekdays	8	freeway link 8	MRW Transfer Trucks	2.20E+00	5.11E-06	1.70E-06	2.11E-05	3.74E-06	7.13E-06	3.92E-06	4.55E-05	2.60E-04	2.22E-06
169	Alternative 2	2029	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	1.59E+02	3.19E-05	3.67E-05	1.48E-04	1.09E-05	1.06E-03	1.32E-03	2.44E-04	N/A	1.44E-05
170	Alternative 2	2029	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	3.26E+02	1.02E-03	3.60E-04	4.33E-03	7.49E-04	1.75E-03	8.87E-04	9.14E-03	4.94E-02	4.46E-04
171	Alternative 2	2029	Weekdays	11	local link 3	Commercial Hauling Trucks	3.98E+02	6.81E-04	1.97E-04	3.50E-03	5.22E-04	5.86E-04	3.25E-04	6.92E-03	5.48E-02	3.31E-04
172	Alternative 2	2029	Weekdays	12	local link 4	Employees (Cars)	1.01E+01	2.03E-06	2.34E-06	9.46E-06	6.93E-07	6.72E-05	8.40E-05	1.56E-05	N/A	9.24E-07
173	Alternative 2	2029	Weekdays	13	local link 5	Employees (Trucks)	1.28E+01	2.23E-06	2.16E-06	1.01E-05	7.89E-07	6.80E-05	7.69E-05	1.74E-05	N/A	1.06E-06
174	Alternative 2	2029	Weekdays	14	local link 6	KC Transfer Trailers	2.98E+02	3.76E-04	1.13E-04	1.85E-03	3.02E-04	3.19E-04	2.14E-04	3.57E-03	3.83E-02	1.95E-04
175	Alternative 2	2029	Weekdays	15	local link 7	MRW Self-Haul	8.80E+01	1.92E-04	7.20E-05	8.12E-04	1.38E-04	5.08E-04	4.00E-04	1.70E-03	1.79E-02	8.34E-05
176	Alternative 2	2029	Weekdays	16	local link 8	MRW Transfer Trucks	2.43E-01	7.65E-07	2.69E-07	3.23E-06	5.59E-07	1.30E-06	6.62E-07	6.82E-06	3.69E-05	3.33E-07
177	Alternative 2	2029	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	1.36E+01	2.09E-06	2.40E-06	9.71E-06	7.12E-07	8.07E-05	1.14E-04	1.60E-05	N/A	9.61E-07
178	Alternative 2	2029	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	2.98E+01	6.93E-05	2.30E-05	2.86E-04	5.07E-05	9.47E-05	4.86E-05	6.16E-04	3.53E-03	3.01E-05
179	Alternative 2	2029	Weekend	3	freeway link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
180	Alternative 2	2029	Weekend	4	freeway link 4	Employees (Cars)	2.00E+00	3.03E-07	3.48E-07	1.41E-06	1.03E-07	1.18E-05	1.67E-05	2.32E-06	N/A	1.39E-07
181	Alternative 2	2029	Weekend	5	freeway link 5	Employees (Trucks)	2.61E+00	3.18E-07	3.12E-07	1.44E-06	1.13E-07	1.13E-05	1.48E-05	2.49E-06	N/A	1.54E-07
182	Alternative 2	2029	Weekend	6	freeway link 6	KC Transfer Trailers	1.51E+02	1.75E-04	5.28E-05	8.55E-04	1.40E-04	1.49E-04	9.80E-05	1.66E-03	1.73E-02	8.99E-05
183	Alternative 2	2029	Weekend	7	freeway link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
184	Alternative 2	2029	Weekend	8	freeway link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
185	Alternative 2	2029	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	8.52E+01	1.71E-05	1.96E-05	7.94E-05	5.82E-06	5.64E-04	7.03E-04	1.31E-04	N/A	7.77E-06
186	Alternative 2	2029	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	1.75E+02	5.60E-04	1.97E-04	2.37E-03	4.10E-04	9.47E-04	4.64E-04	5.00E-03	2.66E-02	2.42E-04
187	Alternative 2	2029	Weekend	11	local link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
188	Alternative 2	2029	Weekend	12	local link 4	Employees (Cars)	4.22E+00	8.40E-07	9.65E-07	3.90E-06	2.86E-07	2.76E-05	3.45E-05	6.43E-06	N/A	3.86E-07
189	Alternative 2	2029	Weekend	13	local link 5	Employees (Trucks)	5.29E+00	9.21E-07	8.86E-07	4.16E-06	3.26E-07	2.79E-05	3.13E-05	7.21E-06	N/A	4.42E-07
190	Alternative 2	2029	Weekend	14	local link 6	KC Transfer Trailers	1.34E+02	1.66E-04	4.94E-05	8.34E-04	1.34E-04	1.40E-04	1.00E-04	1.58E-03	1.90E-02	9.03E-05
191	Alternative 2	2029	Weekend	15	local link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
192	Alternative 2	2029	Weekend	16	local link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
193	Alternative 2	2040	Weekdays	1	freeway link 1	Self-Haul Vehicles (Cars)	1.50E+01	1.14E-06	0.00E+00	4.36E-06	4.22E-07	6.18E-05	1.09E-04	9.94E-06	N/A	5.31E-07
194	Alternative 2	2040	Weekdays	2	freeway link 2	Self-Haul Vehicles (Trucks)	4.43E+01	1.32E-06	0.00E+00	3.59E-05	3.12E-06	3.08E-05	4.50E-05	2.84E-05	3.48E-04	6.80E-07
195	Alternative 2	2040	Weekdays	3	freeway link 3	Commercial Hauling Trucks	1.74E+02	1.99E-06	0.00E+00	3.00E-04	1.22E-05	2.92E-06	3.94E-05	2.77E-04	8.18E-04	6.43E-07
196	Alternative 2	2040	Weekdays	4	freeway link 4	Employees (Cars)	2.89E+00	2.18E-07	0.00E+00	8.32E-07	8.05E-08	1.19E-05	2.11E-05	1.89E-06	N/A	1.01E-07
197	Alternative 2	2040	Weekdays	5	freeway link 5	Employees (Trucks)	4.12E+00	2.73E-07	0.00E+00	1.04E-06	1.01E-07	1.45E-05	2.54E-05	2.37E-06	N/A	1.32E-07
198	Alternative 2	2040	Weekdays	6	freeway link 6	KC Transfer Trailers	3.38E+02	6.44E-06	0.00E+00	4.60E-04	3.97E-05	4.33E-09	1.23E-04	2.93E-04	3.82E-03	2.00E-06
199	Alternative 2	2040	Weekdays	7	freeway link 7	MRW Self-Haul	1.07E+01	4.46E-07	0.00E+00	7.30E-06	6.42E-07	1.68E-05	2.80E-05	6.95E-06	1.26E-04	2.20E-07
200	Alternative 2	2040	Weekdays	8	freeway link 8	MRW Transfer Trucks	1.72E+00	5.10E-08	0.00E+00	1.39E-06	1.21E-07	1.20E-06	1.75E-06	1.10E-06	1.35E-05	2.64E-08
201	Alternative 2	2040	Weekdays	9	local link 1	Self-Haul Vehicles (Cars)	9.16E+01	9.18E-06	0.00E+00	3.50E-05	3.39E-06	4.10E-04	6.46E-04	7.98E-05	N/A	3.99E-06
202	Alternative 2	2040	Weekdays	10	local link 2	Self-Haul Vehicles (Trucks)	2.45E+02	1.59E-05	0.00E+00	4.26E-04	3.70E-05	3.07E-04	3.47E-04	3.39E-04	2.50E-03	6.67E-06
203	Alternative 2	2040	Weekdays	11	local link 3	Commercial Hauling Trucks	3.02E+02	6.22E-06	0.00E+00	9.78E-04	3.81E-05	9.87E-06	1.24E-04	9.14E-04	1.98E-03	2.01E-06
204	Alternative 2	2040	Weekdays	12	local link 4	Employees (Cars)	5.85E+00	5.85E-07	0.00E+00	2.23E-06	2.16E-07	2.61E-05	4.11E-05	5.09E-06	N/A	2.55E-07

Operations Emission Factors Summary

							Emissions - GHGs (metric ton/year)	Emissions - MSATs (ton/year)								
No.	Scenario	Year	Day Type	Link ID	Link Description	NERTS Vehicle Classification	CO_2e	Naphthalene	1,3-Butadiene	Acetaldehyde	acrolein	benzene	ethyl benzene	formaldehyde	DPM	PAH
205	Alternative 2	2040	Weekdays	13	local link 5	Employees (Trucks)	8.05E+00	7.20E-07	0.00E+00	2.76E-06	2.67E-07	3.16E-05	4.96E-05	6.26E-06	N/A	3.26E-07
206	Alternative 2	2040	Weekdays	14	local link 6	KC Transfer Trailers	2.65E+02	5.98E-06	0.00E+00	4.27E-04	3.68E-05	4.44E-09	1.15E-04	2.72E-04	3.37E-03	1.86E-06
207	Alternative 2	2040	Weekdays	15	local link 7	MRW Self-Haul	6.11E+01	4.55E-06	0.00E+00	8.36E-05	7.33E-06	1.30E-04	1.80E-04	7.59E-05	9.06E-04	1.93E-06
208	Alternative 2	2040	Weekdays	16	local link 8	MRW Transfer Trucks	1.83E-01	1.19E-08	0.00E+00	3.18E-07	2.76E-08	2.29E-07	2.59E-07	2.53E-07	1.86E-06	4.97E-09
209	Alternative 2	2040	Weekend	1	freeway link 1	Self-Haul Vehicles (Cars)	7.88E+00	6.01E-07	0.00E+00	2.29E-06	2.22E-07	3.24E-05	5.71E-05	5.22E-06	N/A	2.79E-07
210	Alternative 2	2040	Weekend	2	freeway link 2	Self-Haul Vehicles (Trucks)	2.33E+01	6.92E-07	0.00E+00	1.89E-05	1.64E-06	1.45E-05	1.94E-05	1.49E-05	1.83E-04	3.57E-07
211	Alternative 2	2040	Weekend	3	freeway link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
212	Alternative 2	2040	Weekend	4	freeway link 4	Employees (Cars)	1.16E+00	8.72E-08	0.00E+00	3.33E-07	3.22E-08	4.76E-06	8.42E-06	7.58E-07	N/A	4.06E-08
213	Alternative 2	2040	Weekend	5	freeway link 5	Employees (Trucks)	1.65E+00	1.09E-07	0.00E+00	4.17E-07	4.04E-08	5.73E-06	9.98E-06	9.50E-07	N/A	5.27E-08
214	Alternative 2	2040	Weekend	6	freeway link 6	KC Transfer Trailers	1.35E+02	2.58E-06	0.00E+00	1.84E-04	1.59E-05	1.73E-09	4.94E-05	1.17E-04	1.53E-03	8.00E-07
215	Alternative 2	2040	Weekend	7	freeway link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
216	Alternative 2	2040	Weekend	8	freeway link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
217	Alternative 2	2040	Weekend	9	local link 1	Self-Haul Vehicles (Cars)	4.92E+01	4.91E-06	0.00E+00	1.87E-05	1.81E-06	2.19E-04	3.44E-04	4.27E-05	N/A	2.14E-06
218	Alternative 2	2040	Weekend	10	local link 2	Self-Haul Vehicles (Trucks)	1.32E+02	8.75E-06	0.00E+00	2.33E-04	2.03E-05	1.61E-04	1.69E-04	1.86E-04	1.37E-03	3.66E-06
219	Alternative 2	2040	Weekend	11	local link 3	Commercial Hauling Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
220	Alternative 2	2040	Weekend	12	local link 4	Employees (Cars)	2.43E+00	2.41E-07	0.00E+00	9.21E-07	8.92E-08	1.07E-05	1.69E-05	2.10E-06	N/A	1.06E-07
221	Alternative 2	2040	Weekend	13	local link 5	Employees (Trucks)	3.34E+00	2.97E-07	0.00E+00	1.14E-06	1.10E-07	1.29E-05	2.02E-05	2.58E-06	N/A	1.35E-07
222	Alternative 2	2040	Weekend	14	local link 6	KC Transfer Trailers	1.19E+02	3.02E-06	0.00E+00	2.15E-04	1.86E-05	2.02E-09	5.78E-05	1.37E-04	1.71E-03	9.36E-07
223	Alternative 2	2040	Weekend	15	local link 7	MRW Self-Haul	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
224	Alternative 2	2040	Weekend	16	local link 8	MRW Transfer Trucks	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Notes:

N/A = not applicable

1. Emission factors were obtained from MOVES4 Onroad module runs at the Project Scale for King County at t factors represent the maximum emission rate between winter and summer afternoons.

2. PM emission factors include tire wear and brake wear.

3. Emission factors for MRW Self-haul is the average of cars and single unit shot haul trucks.

Project-Specific Vehicle Data

	Alternative 1a, 1b, Kirkland NERTS Site						Alternative 2, Woodinville NERTS Site	
	2023	**2023**	**2029 & 2040**	**2029 & 2040**	**2029 & 2040**	**2029 & 2040**	**2029 & 2040**	**2029 & 2040**
	Existing Weekday	*Existing Weekend*	*No Action Weekday*	*No Action Weekend*	*Action Weekday*	*Action Weekend*	*Action Weekday*	*Action Weekend*
Self Haul								
Daily Volume	186.0	324.0	404.0	531.0	404.0	531.0	404.0	531.0
Daily VMT: Freeway	1425.0	2482.3	3,224.8	4,238.6	3,224.8	4,238.6	949.0	1,247.3
Average Speed (mph): Freeway	45.5	45.5	48.3	48.3	48.3	48.3	48.1	48.1
Daily VMT: Local	1,594.5	2,777.5	3,333.6	4,381.6	3,333.6	4,381.6	4,287.7	5,635.6
Average Speed (mph): Local	16.4	16.0	15.6	15.3	15.6	15.3	22.6	21.7
Commercial								
Daily Volume	71.0	0.0	111.0	0.0	111.0	0.0	111.0	0.0
Daily VMT: Freeway	400.8	0.0	626.6	0.0	626.6	0.0	713.5	0.0
Average Speed (mph): Freeway	48.0	0.0	48.0	0.0	48.0	0.0	47.3	0.0
Daily VMT: Local	546.6	0.0	854.5	0.0	854.5	0.0	992.1	0.0
Average Speed (mph): Local	14.9	0.0	14.9	0.0	14.9	0.0	21.5	0.0
Employees								
Daily Volume	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Daily VMT: Freeway	60.4	60.4	60.4	60.4	60.4	60.4	93.6	93.6
Average Speed (mph): Freeway	48.3	48.3	48.3	48.3	48.3	48.3	51.8	51.8
Daily VMT: Local	74.0	74.0	74.0	74.0	74.0	74.0	135.0	135.0
Average Speed (mph): Local	17.0	15.6	17.0	15.6	17.0	15.6	22.0	20.5
Transfer Trailers								
Daily Volume	25.0	25.0	33.0	33.0	25.0	25.0	25.0	25.0
Daily VMT: Freeway	670.0	670.0	884.4	884.4	670.0	670.0	935.0	935.0
Average Speed (mph): Freeway	40.2	40.2	40.2	40.2	40.2	40.2	43.2	43.2
Daily VMT: Local	585.0	585.0	772.2	772.2	585.0	585.0	705.0	705.0
Average Speed (mph): Local	33.7	28.1	33.7	28.1	33.7	28.1	34.1	29.2
MRW Self-Haul								
Daily Volume	0.0	0.0	0.0	0.0	0.0	0.0	73.3	0.0
Daily VMT: Freeway	0.0	0.0	0.0	0.0	0.0	0.0	172.1	0.0
Average Speed (mph): Freeway	0.0	0.0	0.0	0.0	0.0	0.0	48.1	0.0
Daily VMT: Local	0.0	0.0	0.0	0.0	0.0	0.0	777.7	0.0
Average Speed (mph): Local	0.0	0.0	0.0	0.0	0.0	0.0	22.6	0.0
MRW Transfer Trucks								
Daily Volume	0	0	0	0	0	0	0.4	0
Daily VMT: Freeway	0	0	0.0	0	0	0	18.4	0
Average Speed (mph): Freeway	0	0.0	0.0	0.0	0	0.0	48.1	0.0
Daily VMT: Local	0	0	0.0	0	0	0	1.6	0
Average Speed (mph): Local	0	0.0	0.0	0.0	0	0.0	22.6	0.0
Visitors								
Assumed negligible, do not model								