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# Appendix B2

## Air Quality Assessment

Metrolinx

# Highway 27-Woodbine Station Air Quality Assessment


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**Date:** January, 2020

**Project #:** 60606819

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## Revision History

| Rev # | Date | Revised By: | Revision Description |
|---|---|---|---|
| 0 | July 15, 2019 | Jennifer Routhier | Original Draft 50% |
| 1 | August 23, 2019 | Jennifer Routhier | Original Draft 100% |
| 2 | September 17, 2019 | Jennifer Routhier | Original Final |
| 3 | November 19, 2019 | Jennifer Routhier | Revision in response to MECP Comments |
| 4 | January 22, 2020 | Jennifer Routhier | Revision in response to MECP Comments |

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*AECOM: 2015-04-13*

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# Glossary

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| **1,3-Butadiene** | A colourless gas with mild aromatic or gasoline odour at room temperature. Exposure to 1,3-butadiene by inhalation in humans can result in irritation of the eyes, nasal passages, throat and lungs. |
| **1-hour Average** | The average concentration for a 1-hour period. |
| **24-hour Average** | The average concentration for a 24-hour period. |
| **90th Percentile** | The 90th percentile of a set of data are the value for which 90% of the data points are smaller. |
| **Acrolein** | Colourless liquid with a strong smell. Acrolein may be formed from the breakdown of certain pollutants in outdoor air or from the burning of organic matter including tobacco, or fuels such as gasoline or oil. Acute (short-term) inhalation exposure may result in upper respiratory tract irritation and congestion. |
| **AERMOD** | An advanced steady-state plume dispersion model that has the ability to include building cavity downwash, source emission rates, terrain and meteorological data to predict contaminant ground level concentration. |
| **Ambient Air Quality Criteria (AAQC)** | An AAQC is a desirable concentration of a contaminant in air, based on protection against adverse effects on health or the environment. The adverse effects considered may be health, odour vegetation, soiling, visibility, corrosion or other effects. |
| **Area Sources** | Sources of pollution which emit a contaminant from a specified area. Evaporations from a large spill of volatile liquids are an example of an area source. |
| **Benzene** | A colourless member of the VOCs (volatile organic compounds) family. It is used widely by the chemical industry, and is also found in tobacco smoke, vehicle emissions, and gasoline fumes. Exposure to benzene may increase the risk of developing cancer. |
| **Benzo(a)Pyrene (BaP)** | A member of the polycyclic aromatic hydrocarbons (PAH). |
| **Canadian Council of Ministers of the Environment (CCME**) | The CCME is a group comprised of the environment ministers from the federal, provincial and territorial governments. The CCME seeks to achieve positive environmental results, focusing on issues that are Canada-wide in scope and that require collective attention by a number of governments. |
| **Carbon Dioxide equivalent (CO2e)** | A unit of measurement that defines, for a given amount of greenhouse gas (GHGs), the amount of carbon dioxide ($CO_2$) that would have the same global warming potential (GWP), when measured over a specified timescale. |
| **Carbon Monoxide (CO)** | A colourless, odourless, poisonous gas produced when carbon-containing substances such as coal, oil, gasoline, wood, or natural gas do not burn completely. CO can cause angina in people with heart disease. |
| **Combustion** | Burning, or rapid oxidation, of waste or other fuel material accompanied by the release of exhaust gases and energy in the form of heat and light. |
| **Concentration** | The amount of a pollutant in the air at a given location. |
| **Digital Elevation Model (DEM)** | A digital model of a terrain's surface. The DEMs are used as an input for dispersion modelling. |
| **Dispersion Modelling** | Atmospheric dispersion modelling is the mathematical simulation of how contaminants disperse in the atmosphere. |
| **Emissions** | Contaminant exhausted from a unit or source into the atmosphere. |

| | |
|---|---|
| **Emission Factors** | A measure of the average amount of a contaminant discharged into the atmosphere by a specific process. Emission factors are expressed as the weight of the contaminant divided by a unit weight, volume, distance or duration of process. |
| **Emission Rates** | The weight of a contaminant emitted per unit time (e.g., g/hour). |
| **Exceedance** | Predicted ground-level concentration for a contaminant which is greater than the corresponding regulatory standard for that contaminant. |
| **Formaldehyde** | A colourless and strong-smelling gas that is harmful when inhaled. It's mainly used as a disinfectant and preservative, and in making other compounds (e.g., resins). |
| **Global Warming Potential (GWP)** | An estimate of how much a greenhouse gas can contribute to global warming. Each greenhouse gas has a different ability to trap heat, or global warming potential. To determine how powerful a greenhouse gas is, the gas in question is compared to the global warming potential of carbon dioxide (which, by definition, is 1). On a unit mass basis, the GWP of methane and nitrous oxide trap 23 and 296 times more heat respectively than carbon dioxide. The heat-trapping ability of several ozone-depleting substances is thousands of times more than that of carbon dioxide. |
| **Ground-Level Ozone (O3)** | A colourless and highly irritating gas, and a primary component of smog and is formed by the reaction of volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the presence of sunlight and warm temperatures. Ground-level ozone is harmful to human health and the environment. |
| **Greenhouse Gases (GHG)** | Several important gases in the earth's atmosphere that absorb and emit infrared radiation in the wavelength range emitted by Earth. The most abundant GHGs are: carbon dioxide, methane, nitrous oxide, ozone, other trace gases and water vapour. In excessive concentrations GHGs contribute to global climate change. The six greenhouse gases included under the Kyoto Protocol are: carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), sulphur hexafluoride ($SF_6$), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs). |
| **Hydrocarbons(HC)** | Organic compounds consisting entirely of hydrogen and carbon. They may be emitted into the air by natural sources (e.g., trees) and as a result of fossil and vegetative fuel combustion, fuel volatilization and solvent use. Hydrocarbons are a major contributor to smog. |
| **Motor Vehicles Emission Simulator (MOVES2014)** | The U.S. Environmental Protection Agency EPA's latest program for estimating vehicle emissions due to tailpipe and crankcase emissions, fuel evaporation, and brake and tire wear. |
| **Ministry of Environment, Conservation and Parks (MECP)** | The Ontario Ministry of Environment, recently renamed Ministry of Environment, Conservation and Parks (MECP), from the previously titled Ministry of Environment and Climate Change (MOECC). |
| **Nitrogen Oxides (NOx)** | A generic term for a group of highly reactive gases containing nitrogen and oxygen. NOx includes nitric oxide (NO) and nitrogen dioxide ($NO_2$) gases. The primary sources are motor vehicles, electric utilities, and other industrial, commercial and residential sources that burn fuels. NOx cause a wide variety of health and environmental impacts, including bronchial congestion and scarring of the lungs. They also react with volatile organic compounds when it's sunny and warm, producing ground-level ozone. |
| **Ontario Regulation 419/05 (O.Reg. 419)** | Ontario Regulation 419: Air Pollution-Local Air Quality under the *Environmental Protection Act* is the primary regulatory tool for assessing industrial air emissions. O.Reg. 419 contains air standards for contaminants that are intended to protect local air quality and are legal requirements which emitters in Ontario must meet. |
| **Ozone Limiting Method (OLM)** | A method used to calculate the conversion of nitric oxide (NO) to nitrogen dioxide ($NO_2$). |
| **Particulate Matter (PM)** | Tiny solid or liquid particles that are suspended in air. Particulate matter is produced from |

| | |
|---|---|
| | a wide variety of sources — natural and human-caused, large and small. They are comprised of directly emitted particles, and secondary particles formed in the atmosphere through interactions of directly emitted pollutants such as sulphur oxides, nitrogen oxides, ammonia, and volatile organic compounds. |
| **Point Sources** | Single, stationary sources of pollution, such as a stack or vent. |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | A family of chemicals that are primary by-products of incomplete combustion. PAHs can make breathing more difficult and cause cancer. |
| **Receptors** | The points, defined in the dispersion model that represent the physical locations at which the dispersion model will predict contaminant concentration. |
| **Smog** | Yellow-brown haze that is a mixture of pollutants, mainly ground-level ozone and particulate matter. |
| **Soak Time** | The duration of time a vehicle's engine is at rest prior to being started. |
| **Volatile Organic Compounds (VOCs)** | Organic compounds that high vapour pressure (low boiling point) at room temperature. VOC's contribute to the formation of smog. |

# 1. Introduction

Woodbine Entertainment Group (WEG) has proposed a new GO Station to be developed in partnership with Metrolinx, located at 555 Rexdale Boulevard (Woodbine Racetrack) in the City of Toronto (the Project). The Project has been assessed under the Transit Project Assessment Process (TPAP). For TPAP purposes, Metrolinx is the proponent. WEG will be constructing the Project and will be responsible for the corresponding mitigation and commitments to future work.

AECOM Canada Limited (AECOM) was retained by WEG to undertake an environmental impact assessment for the Highway 27-Woodbine Station Environmental Assessment (EA) per the TPAP. AECOM conducted an Air Quality Assessment (AQA) for the Project. This AQA is one of a number of environmental studies that was completed as a part of the TPAP, under which project impacts have been assessed as prescribed in Ontario Regulation (O. Reg.) 231/08 under the *Environmental Assessment Act.* As part of the TPAP, an Environmental Project Report (EPR) has been prepared for public review and includes the findings of this AQA.

Due to future development and increased demand at the Woodbine Districts, an early stage initiative calls for the expansion of new public transit options to service the area. Metrolinx and WEG have partnered together to develop the proposed Project, which is anticipated to evolve from the proposed GO station into a multi-modal transportation hub that will increase annual visits to the Woodbine Districts to potentially over 16 million. GO Transit currently operates train service along the Kitchener Rail Corridor, from Union Station in Toronto to Kitchener GO Station in Kitchener. The new proposed Project will provide a new station stop along the Kitchener Rail Corridor.

The proposed Project will include:

- Two island platforms (north and south);
- Passenger pick up and drop off (PPUDO);
- Bus loop;
- Passenger plaza;
- Vehicle parking;
- Bicycle storage facility;
- Station building;
- Roadway with direct access to the station building, parking facility and public roadway;
- Electrification enabling infrastructure at the station (e.g. integration of support structures into platform areas and grounding and bonding); and
- New tracks and/or realignment of the existing tracks.

While electrification enabling infrastructure is included as part of the station project requirements, the assessment of electrification and associated operations in the corridor are addressed through the Electrification TPAP and any future addenda to that TPAP. The future breakdown of the diesel-electric fleet for the corridor is a component of the wider GO Expansion project (under development) and is not specific to this station or assessed under this TPAP.

The site is an approximate 17 acres parcel of land located on the southeast corner of Woodbine Districts west of Highway 27 and south of Rexdale Boulevard in the City of Toronto (the Project Site), which is represented by the yellow boundary in **Figure 1-1**. The Project Site encompasses the southeastern portion of the practice racetrack, the southern portion of the southeast stormwater pond, the eastern portion of Entrance Road, the southern portion of Grandstand Entrance Road, a portion of the rail tracks east and west of Highway 27, and the Highway 27

underpass structure. For the purposes of this AQA, the area of investigation and assessment includes the Project Site plus a 500 m buffer (the Study Area). The AQA Study Area is represented by the red boundary in **Figure 1-1**.

This AQA describes the air quality environmental baseline conditions and future anticipated air quality environmental impacts relevant to the Project through assessment according to the Regional Comprehensive Analysis methodology and the Regional Greenhouse Gas (GHG) Emission Impacts methodology outlined in Appendix 3 & 4 of the Ministry of Transportation's *Environmental Guide for Air Quality Impacts and Greenhouse Gas Emissions (June 2012)*[1] (The MTO Guideline). This Study also determines the potential effects on air quality during construction and operation phases of the Project, and provides a mitigation strategy for any issues identified.

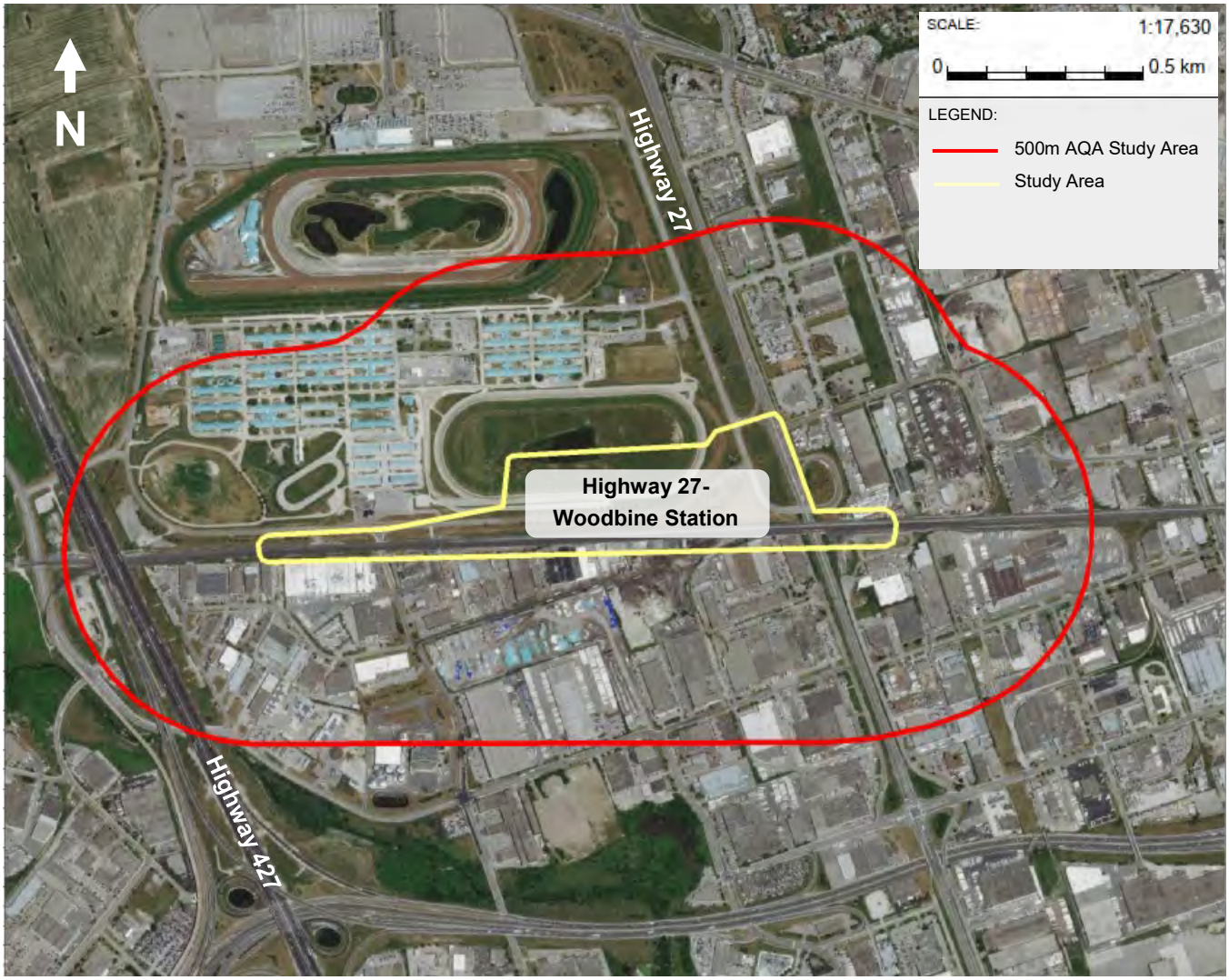



**Figure 1-1: Highway 27-Woodbine Station Limits and AQA 500 m AQA Study Area**

1. *Ministry of Transportation, "Environmental Guide for Assessing and Mitigating the Air Quality Impacts and Greenhouse Gas Emissions of Provincial Transportation Projects" (Environmental Policy Office, 2012),*

# 2. Study Approach & Methodology

The overall objective of the Air Quality Assessment is to determine the local and regional impact of the Highway 27-Woodbine Station (HWS) for a Future Build-Out scenario, encompassing potential worst-case emissions anticipated from the parking, passenger pick-up and drop-off (PPUDO) areas, and bus terminals. Air quality contaminant emissions from Current conditions and Future No-Build conditions are conservatively assumed to be represented by existing historical monitoring data collected at the most representative ambient air monitoring station(s). The closest monitoring station is located at 125 Resources Road, Etobicoke ON directly adjacent to Highway 401 approximately 3.8 km from the Study Area, with others located at 461 Kipling Avenue in Etobicoke and 200 and 223 College Street in Toronto near the intersections of St. George Street and Spadina Road. These stations were conservatively selected to represent background levels of all criteria contaminants for the Current conditions and Future No-Build conditions, assuming traffic emissions are included based on proximity to high-volume road sources such as Highway 401. Modeled impacts from the regional roadways were therefore excluded from assessment within the project assessment area.

No sensitive or critical receptors (i.e. permanent residences, health care facilities, educational institutions, child care facilities, or nursing homes/long-term care facilities) have been identified within the 500 m study area of the Project. A hotel has been identified and is situated at the very limits of the Study area. The impacts to air quality from the rail corridor are not anticipated to be a significant factor due to several factors: the distance and location of the nearest sensitive/critical receptor from the project site, the relatively low idling time expectations, the trend of predominant wind patterns in the area (predominately blowing from north/northwest), and the industrial land use of the surrounding area. For these reasons, the impacts from the rail corridor were not included in this assessment. In addition, Metrolinx will gradually replace Tier 2 and 3 diesel locomotives with Tier 4 diesel locomotives. As per the US EPA Locomotive Exhaust Emission Standards [2], a comparison of Tier 2 and Tier 3 to Tier 4 emission standards are expected to reduce emissions of oxides of nitrogen and particulate matter from diesel locomotives by approximately 70%.

The proposed study scenario is described as follows:

1. Projected Future year Build-out scenario - Assessment of impacts (prediction of worst-case concentration) due to emissions from projected bus, PPUDO and parking lot emissions, including vehicle travel to/from the PPUDO and parking lot areas within the proposed station functional design plan, assessed at the horizon year 2031.

The study will follow the Regional Comprehensive Analysis methodology outlined in Appendix 3 of the Ministry of Transportation's *Environmental Guide for Air Quality Impacts and Greenhouse Gas Emissions* and the Regional Greenhouse Gas (GHG) Emission Impacts methodology outlined in Appendix 4 of the Ministry of Transportation's *Environmental Guide for Air Quality Impacts and Greenhouse Gas Emissions*.

Current conditions and projected Future No-Build are expected to be represented by the historical air quality monitoring data collected at local ambient air monitoring stations. Representative air quality monitoring stations were selected based on the availability of relevant contaminant records, surrounding sources of air quality emission, and proximity to the AQA Study Area. The stations selected are described in detail within Section 3.1 "Existing Ambient Air Quality" and are all within 20 km of the Highway 27-Woodbine Station. Each individual station is located within immediate proximity to significant sources of vehicular traffic emissions such as Highway 401, the

[2] *United States Environmental Protection Agency, Office of Transportation and Air Quality, EPA-420-B-16-024, March 2016, accessed January 2020, https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA09.pdf*

Gardiner Expressway, and the mid-way intersection along College Street between Spadina Road and University Avenue.

The 2031 projected future year build-out scenario was selected for assessment of air quality impacts (prediction of worst-case concentration) due to emissions from projected bus loop idling, passenger pick-up and drop-off (PPUDO) vehicular idling, parking lot cold-start emissions, and vehicular/bus travel to all three areas within the proposed Station Layout Plan, shown in **Figure 2-1**. A closer view of the Highway 27-Woodbine Station main facility building and GO train platform area is shown in **Figure 2-2**.

The Station Layout Plan shows the following sources of air quality contaminant emissions, included in the AQA:

1. Two parking lots to the east and west of the Highway 27-Woodbine Station main facility building containing 698 and 448 parking spots, respectively.
2. One PPUDO area directly to the west of the Highway 27-Woodbine Station main facility building containing 24 vehicle spaces.
3. One bus loop platform containing four (4) bus bays, two of which are dedicated to GO Transit busses, and two of which are dedicated to other potential transit route stops.

The report assesses 4 bus bays with provisions for eight (8) bus bays for construction. The emissions from bus idling was based on anticipated worst-case bus scheduling for existing nearby GO stations, rather than bus bay availability at the Woodbine Station. With an increased number of bus bays, the footprint of the area source representing the bus bays may be expanded within the air dispersion modelling; however, it is not anticipated that this source area expansion will have significant impacts on the modelling results.

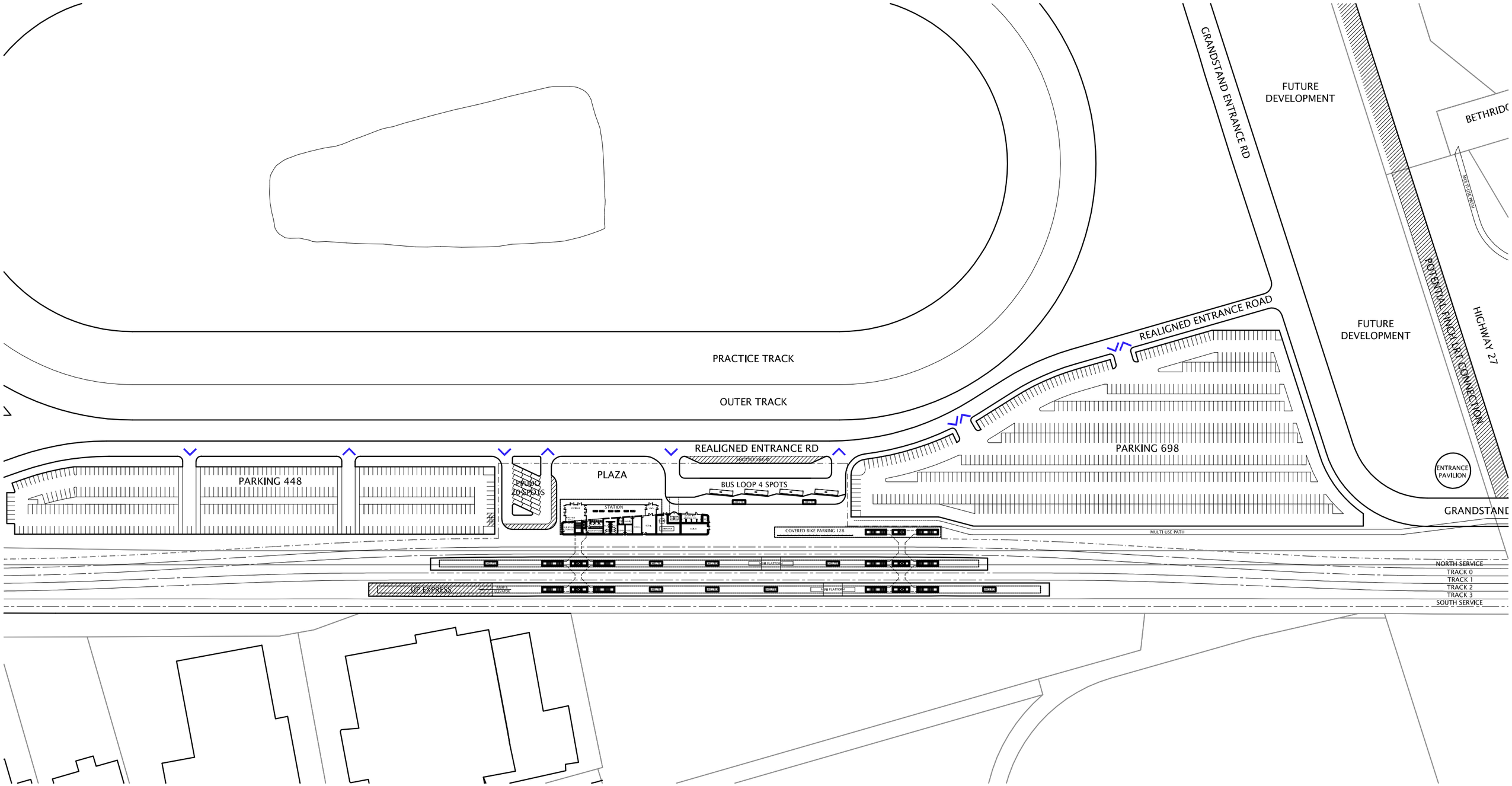



**Figure 2-1: Highway 27-Woodbine Station Site Plan Layout**

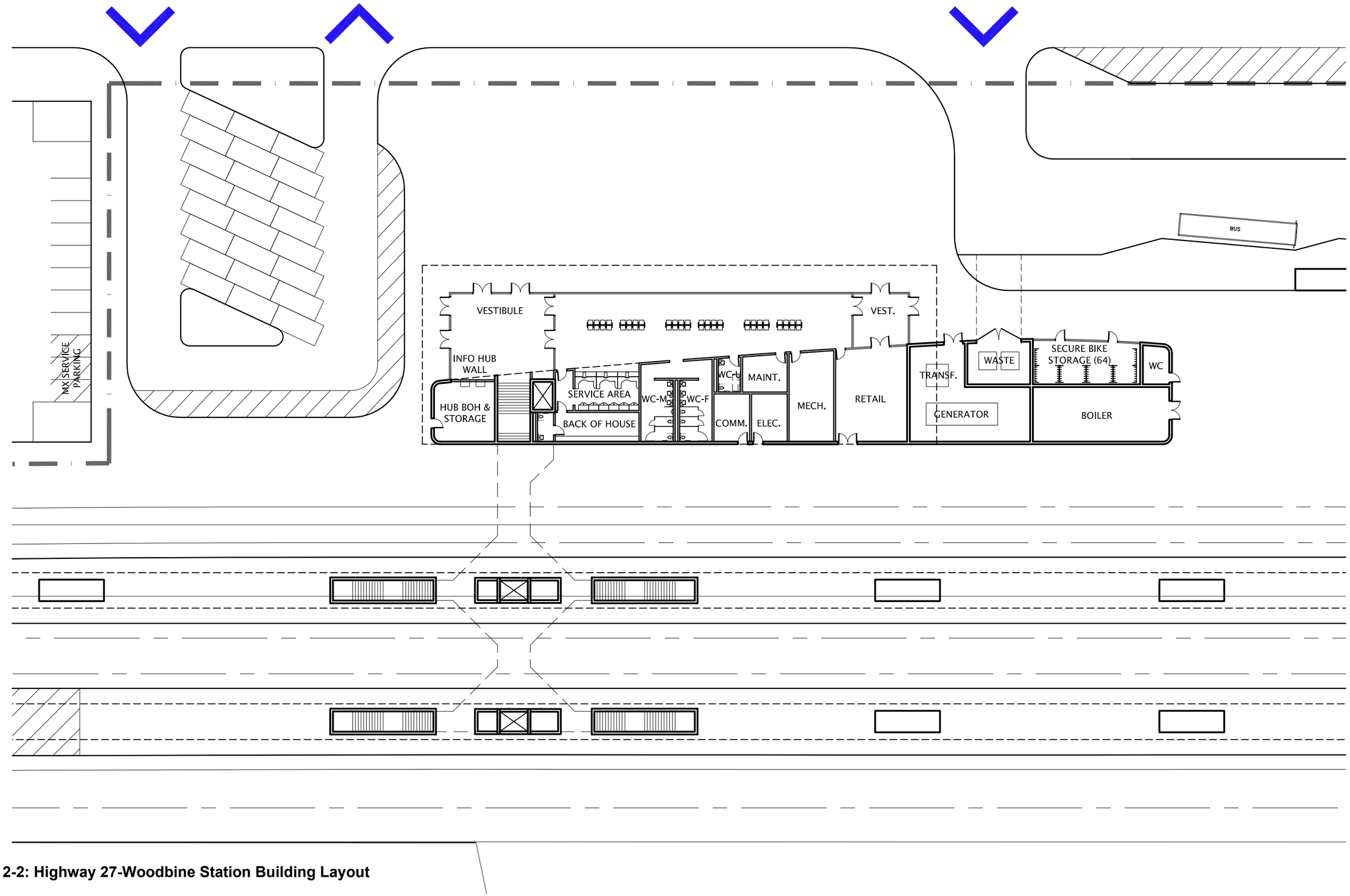



**Figure 2-2: Highway 27-Woodbine Station Building Layout**

## 2.1 AQA Study Area & Representative Receptors

The Highway 27-Woodbine Station EA AQA Study Area is situated along the GO Train Kitchener line between the existing Malton Station and Etobicoke North Station, north east of the intersection of Highway 409 and Highway 427, bounded on the east by Highway 27. The Woodbine Racetrack and supporting facilities are located directly north of the AQA Study Area, just south of Rexdale Boulevard. Land to the east and south of the AQA Study Area are developed with a mixture of commercial and industrial properties, zoned as "Employment Industrial" under Chapter 60 of the City of Toronto zoning by-law No. 569-2013. There are no residentially zoned properties (sensitive receptors) or schools, health-care facilities, or retirement homes (critical receptors) identified within the 500 m AQA Study Area, however a hotel is located at the north-east end of the Assessment Area which was selected for representative assessment.

A grid of receptors was also placed within the AQA Study Area which provides an indication of project impact for any future sensitive receptors within 500 m of the project Study Area. Discrete receptor locations are indicated below and illustrated in **Figure 2-3**. Receptor selection is discussed in further detail in Section 5.1 "Modelling Inputs".

1. Woodbine Hotel & Suites, 30 Vice Regent Blvd, Etobicoke, ON (R1) approximately 390 m from the Study Area boundary and 670 m from the rail corridor.

## 2.2 Assessment of Contaminants

The primary emission sources for this AQA are the vehicular emissions from the parking lots and PPUDO area as well as bus emissions from the bus loop, including all on-site travel to each of these locations within the Highway 27-Woodbine Station. Based on recommendations within The MTO Guideline, the Air Quality Assessment included the following criteria air contaminants (CACs) from vehicle emissions:

1. Nitrogen dioxide, $NO_2$ (assessed over 1-hour, 24-hour, and annual averaging periods);
2. Carbon monoxide, CO (assessed over 1-hour and 8-hour averaging periods);
3. Sulphur Dioxide, $SO_2$ (assessed over 1-hour, 24-hour, and annual averaging period);
4. Particulate matter (<10 microns), $PM_{10}$ (assessed over 24-hour and annual averaging periods);
5. Particulate matter (<2.5 microns), $PM_{2.5}$ (assessed over 24-hour and annual averaging periods);
6. Acetaldehyde (assessed over 24-hour averaging period);
7. Acrolein (assessed over 1-hour and 24-hour averaging periods);
8. Benzene (assessed over 24-hour and annual averaging periods);
9. Benzo(a) pyrene, BaP (assessed over 24-hour and annual averaging periods);
10. Formaldehyde (assessed over 24-hour averaging period); and
11. 1,3-butadiene (assessed over 24-hour and annual averaging periods).

Emissions of the coarse fraction of particulates ($PM_{10}$) are emitted mostly from tire wear, brake wear, and road dust fugitives, whereas the fine fraction ($PM_{2.5}$) is mostly attributed to vehicle emission exhausts. All applicable forms of particulate emissions are included in the assessment.

In addition to the above, impacts of pollutants contributing to the regional GHG levels will be assessed. The pollutants in this assessment will include carbon dioxide ($CO_2$), nitrous oxide ($N_2O$), and methane ($CH_4$). The impacts of these pollutants will be compared to the Ministry of Environment, Conservation and Parks (MECP)

projected transportation emissions for the future build-out year, in units of carbon equivalent, $CO_2e$, as shown in the Ontario's Climate Change Update 2014 document[3].

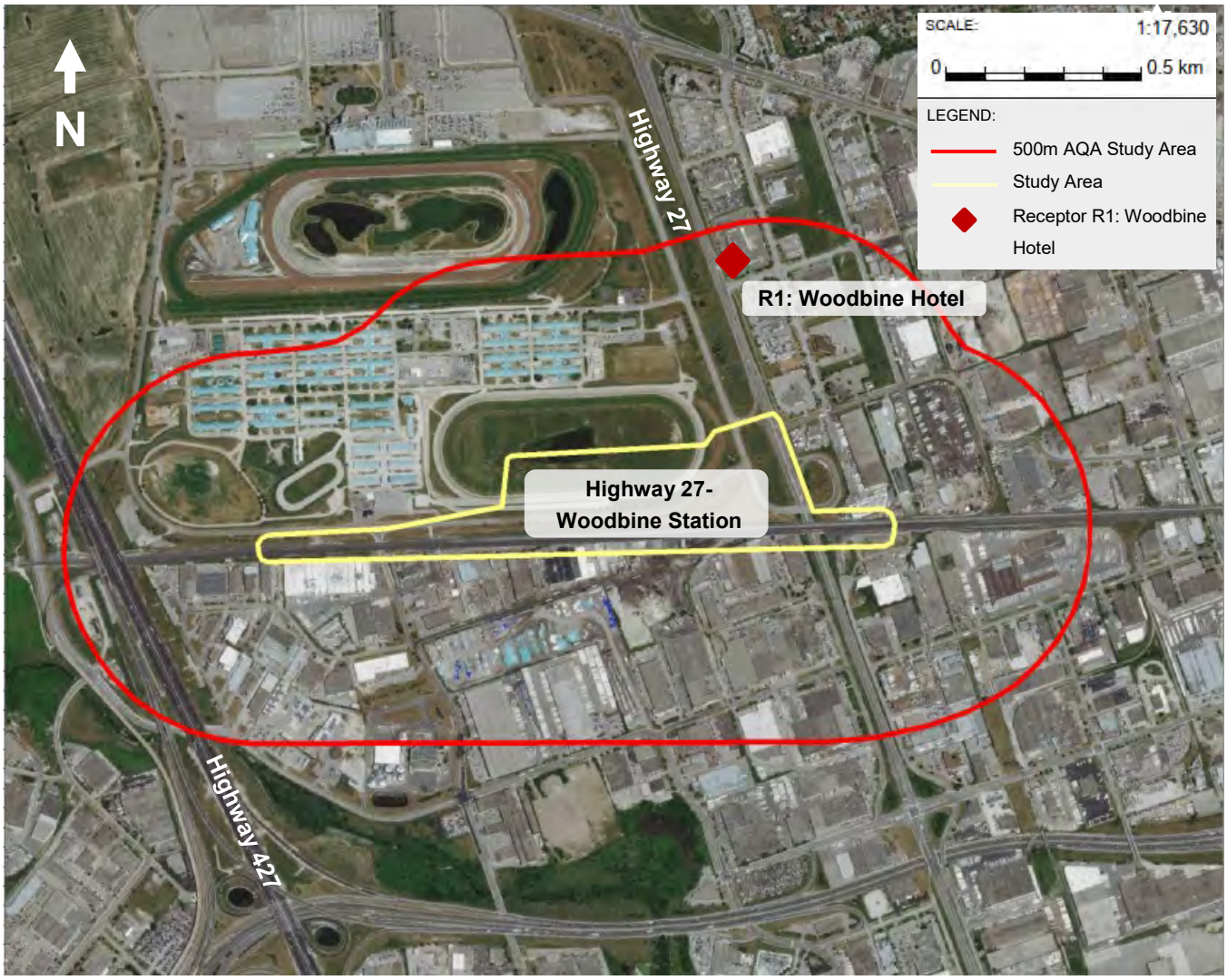



**Figure 2-3: Discrete Receptor Locations within 500 m AQA Study Area**

## 2.3 Relevant Air Quality Guidelines

The applicable standards for these pollutants are regulated by the MECP and Canadian Council of Ministers of the Environment (CCME) as the Ambient Air Quality Criteria (AAQC) and Canadian Ambient Air Quality Standards (CAAQS) respectively, as illustrated in **Table 2-1**.

3. *Ministry of the Environment and Climate Change "Ontario's Climate Change Update 2014" accessed March 24, 2017* https://dr6j45jk9xcmk.cloudfront.net/documents/3618/climate-change-report-2014.pdf

## Table 2-1: Summary of Applicable Guidelines and Standards

| Criteria Air Contaminant (CAC) | Source of Standard | Averaging Period (hr) | Air Quality Threshold Value (µg/m³) |
|---|---|---|---|
| $NO_2$ [1] | AAQC | 1 | 400 |
| | AAQC | 24 | 200 |
| | CAAQS | 1 *(2020)* | 113 |
| | CAAQS | Annual *(2020)* | 32 |
| | CAAQS | 1 *(2025)* | 78 |
| | CAAQS | Annual *(2025)* | 22 |
| CO | AAQC | 1 | 36,200 |
| | AAQC | 8 | 15,700 |
| $SO_2$ [2] | AAQC | 24 | 275 |
| | AAQC | 1 | 100 |
| | AAQC | Annual | 10 |
| | CAAQS | 1 *(2020)* | 183 |
| | CAAQS | Annual *(2020)* | 13 |
| | CAAQS | 1 *(2025)* | 170 |
| | CAAQS | Annual *(2025)* | 10 |
| $PM_{10}$ [3] | AAQC | 24 | 50 |
| $PM_{2.5}$ [4] | CAAQS | 24 *(2015)* | 28 |
| | CAAQS | 24 *(2020)* | 27 |
| | CAAQS | Annual | 8.8 |
| Acetaldehyde | AAQC | 24 | 500 |
| Acrolein | AAQC | 1 | 4.5 |
| | AAQC | 24 | 0.4 |
| Benzene | AAQC | 24 | 2.3 |
| | AAQC | Annual | 0.45 |
| Benzo(a)pyrene | AAQC | 24 | 0.00005 |
| | AAQC | Annual | 0.00001 |
| 1,3-Butadiene | AAQC | 24 | 10 |
| | AAQC | Annual | 2 |
| Formaldehyde | AAQC | 24 | 65 |

*Notes:*

*(1) The CAAQS Air Quality threshold for nitrogen dioxide is based on the 3 year average of the annual 98th percentile of the daily maximum 1-hour average concentrations. The most stringent compliance standard for 2025 was used for assessment.*

*(2) The CAAQS Air Quality threshold for sulphur dioxide is based on the 3 year average of the annual 99th percentile of the daily maximum 1-hour average concentrations. This standard has two separate values for compliance, based on the year. The AAQC Air Quality threshold for sulphur dioxide also has two separate values for compliance, based on the year. The most stringent compliance standards were used for assessment (i.e., 100 µg/m³ for the 1-hour threshold, AAQC; 275 µg/m³ for the 24-hour threshold, AAQC, and 10 µg/m³ for the annual threshold, AAQC and CAAQS (2025)).*

*(3) The value of 50 µg/m³ (24 hr) is an interim AAQC and is provided as a guide for decision making.*

*(4) The Air Quality threshold for fine particulate ($PM_{2.5}$) is based on the 98th percentile ambient measurement (24-hour), annually averaged over three years. The concentration predictions from this Air Quality Assessment are referenced against the most stringent future standard for compliance.*

AAQCs are acceptable effects-based levels in ambient air. Limits are set based on the "limiting effect" and are the lowest concentrations at which an adverse effect may be experienced. Effects considered may be health, odour, vegetation, soiling, visibility, corrosion or others and limits have variable averaging times appropriate for the effect that they are intended to protect against. AAQCs are used for assessing general air quality and the potential for causing an adverse effect. They are set at levels below which adverse health and/or environmental effects are not expected. If a contaminant has more than one AAQC, all must be used for assessment purposes as each represents a different type of effect linked to a particular averaging period.

The CCME has developed Canada-wide standards for a variety of contaminants. These standards are developed jointly by various provincial jurisdictions based on a scientific and risk-based approach. Standards are presented to the Ministers along with a timetable for implementation and monitoring and public reporting programs. Ministers

are responsible for implementing the standards within their own jurisdictions and promote consistency across the country.

Recently, the CCME has developed new standards for fine particulate matter ($PM_{2.5}$), nitrogen dioxide ($NO_2$) and sulphur dioxide ($SO_2$), under the CAAQS. The CAAQS are established as voluntary objectives under the Canadian Environmental Protection Act, 1999.

## 2.4 Emissions Inventory Methodology

Mesoscale air quality impacts are defined as the incremental change in regional emissions of CACs due to the proposed Project alternatives relative to a given existing configuration, for a given future year. Emission inventories estimate the quantities (in mass units) of CACs emitted over a given time period and provide information about contributions from various sources. Emissions are estimated by multiplying emission factors by source activity levels. An emission factor represents the emissions from a single source for a unit of time or distance (e.g., grams of CO per vehicle mile traveled). The source activity is the number of vehicle-miles-traveled (VMT) on a roadway segment in a given time period, such as one day.

The emission inventory for the Highway 27-Woodbine Station EA is developed from the passenger vehicles and transit buses (GO bus and other transit authorities) for the various sources described within the AQA Study Area. The motor vehicle emissions inventory was developed using station design details (i.e. parking lot, bus loop, and PPUDO capacity), representative assumptions of transit scheduling and associated parking lot usage, and emission factors produced from the U.S. EPA emissions modelling software MOVES 2014b for the horizon year of 2031.

The emissions inventory was prepared in accordance with the MTO Guideline for the CACs and GHGs within the AQA Study Area. Annual emissions inventories were prepared for each pollutant for the projected horizon year (2031). A copy of the full inventory in included in **Appendix B**.

The vehicular emissions were estimated using the U.S. EPA emissions modelling software MOVES 2014b (MOVES). This software provides emission rates for a wide variety of source types (i.e., passenger cars, motorcycles, long-haul trucks, etc.), speed bins, road types, and emission types (i.e., running emissions, idling emissions, tire wear, brake wear, etc.). Emission rates were developed for all CACs and GHG compounds from passenger vehicles and transit bus source types (Source IDs 21 & 42).

The U.S. EPA emissions modelling software MOVES calculates emissions from mobile sources using a variety of factors: time span, geographic bounds, vehicle type, road type, and emission or process type. The time span calculates emission using default fleet composition and fuel criteria specific to a pre-selected year, month, hour, and weekday/weekend profile. Fleet composition and fuel criteria are also specific to geographic location, with default database data provided for each county in the United States. For Canada, the closest US County to the AQA Study Area is expected to provide fleet and fuel characteristics as close of a match as possible; therefore, Niagara County in New York State was selected. Since MOVES is developed in the U.S., Canadian-specific county data are not available. It is typical for Canadian air quality transportation environmental assessment projects to assume a similar vehicle fleet and fuel characteristics to that of the closest U.S. based county. This approach has been accepted by the MECP for previously submitted assessments for other transportation projects.

There are thirteen vehicle types and five fuel types in MOVES. The various vehicle types encompass passenger vehicles (motorcycles, cars and trucks); light, medium and heavy commercial trucks; buses (intercity, transit, and school); and other vehicle types such as refuse trucks and motor homes. The fuels include diesel, gasoline, electricity, compressed natural gas (for transit buses only), and Ethanol (E-85) fuel. The percentage of E-85 fuel

used by the Project fleet was eliminated in emissions estimation for this Project as flex-fuel cars and fuelling stations are not readily available in the province as they are in the United States.

Emissions in MOVES are divided into four major categories:

- Running emissions;
- Start emissions;
- Evaporative emissions; and
- Particulate emissions from brake wear and tire wear.

CAC and GHG emissions from the Highway 27-Woodbine Station were estimated using the MOVES2014b County Scale methodology. An averaged 24-hour emission profile was generated for each pollutant, for each vehicle type (passenger car and transit bus). The maximum emissions from January and July were compared and the higher of the two was selected for inclusion in air dispersion modelling, to capture the worst-case emissions from both the coldest (January) and warmest (July) ambient temperatures.

Evaporative emissions include the following the sub-categories: evaporative permeation, fuel vapour venting, fuel leaks, refuelling displacement vapour loss, refuelling spillage loss, vapour loss during running emissions, and vapour loss during idling. All types of evaporative emissions, except long-haul truck idling vapour emissions ("hoteling emissions"), were included within the calculated MOVES running emission factor used in the Air Quality Study.

Cold-start engine CAC and GHG emissions were estimated in MOVES for passenger vehicles from the parking lots within the AQA Study Area. To reflect worst-case emissions from starting cars, it was conservatively assumed that all cars will be starting with cold engine "soak-time," or time spent parked, of 360 to 720 minutes (6 hrs – 12 hrs). Cold-start emissions were assessed for a representative 24-hr period for the months of January and July, and where the comparative higher emission value for each contaminant was selected for inclusion in air dispersion modelling.

Idling emissions from transit busses and passenger vehicles were derived from the MOVES County Scale modelling output using the emission rate at the lowest possible speed bin (0 to 2.5 mph = 4.02 km/hr). A gram per hour-based emission rate was derived by taking the modelled gram per vehicle-kilometre-travelled (G/VKT) emission rate provided by MOVES for the lowest speed bin and deriving the product of this value and the capped rate of travel for this speed bin, 4.02 vehicle-kilometre per hour. Idling rates were estimated in grams per vehicle hour where:

*Idling emission rate = Emissions Factor at Speed Bin 1 * Average speed (4.02 km/hour).*

MOVES emission estimation software can be used to calculate specified idling emission rates, but only for a certain vehicle class type: long-haul combination trucks. It is common practice to use the MOVES calculated emission factor at Speed Bin 1 in combination with the average speed associated with that speed bin to estimate idling emissions from the complete vehicle fleet. Typically, Speed Bin 1 is used to represent highly congested traffic conditions (stop-and-go traffic), which are similar to those conditions of a temporarily idling vehicle.

The emission inventory for the Highway 27-Woodbine Station EA is based on several factors, namely:

1. The Highway 27-Woodbine Station will provide transit service from GO trains, future airport rail service, and other transit authority bus scheduling. Existing representative GO Train, UP Express, and Toronto Transit Commission (TTC) schedules were selected based on proximity to estimate anticipated worst-case future station scheduling, as it would affect parking lot usage.

2. The parking lot emission profile is separated into four periods, determined by representative transit scheduling to indicate Peak AM, Mid-day, Peak PM, and evening worst-case parking lot usage.
3. The AM Peak period (5 AM – 9 AM) includes running emissions from passenger vehicles travelling within the station at 15 km/hr, to both the parking lots and PPUDO areas, assuming the parking lots are both filled to capacity (1,146 vehicles total).
4. The Mid-day period (9 AM – 4 PM) includes running emissions from passenger vehicles travelling within the station at 15 km/hr, to both the parking lots and PPUDO areas, as well as cold-start engine emissions, assuming a fluctuating rate of vehicles arriving/leaving equal to 50% of the total parking capacity (573 vehicles total).
5. The PM Peak period (4 PM – 7 PM) includes running emissions from passenger vehicles travelling within the station at 15 km/hr, to both the parking lots and PPUDO areas, as well as cold-start engine emissions, assuming both parking lots are emptied to capacity (1,146 vehicles total).
6. The Evening period (7 PM – 2 AM) includes running emissions from passenger vehicles travelling within the station at 15 km/hr, to both the parking lots and PPUDO areas, as well as cold-start engine emissions, assuming a fluctuating rate of vehicles arriving/leaving equal to 50% of the total parking capacity (573 vehicles total).
7. The volume of vehicles entering and exiting the parking lots during the four indicated time periods is distributed according to the hourly percentage of predicted combined transit arrivals and departures.

Emissions from the PPUDO area include the idling emissions of vehicles arriving to drop-off or pick-up passengers for a predicted scheduled transit stop. In each case, it is assumed that a maximum idling period of 1 minute per vehicle would be expected, for a lot capacity of twenty-four (24) vehicles. The volume of vehicles idling during an hour directly correlates to the predicted combined transit schedule for the Highway 27-Woodbine Station for both bus and train.

## 2.5 Assumptions

The values contained within this report are based on the best available data and methodologies. In general, predictions of this nature are inherently best estimates only and are associated with uncertainties due to variability in several key inputs and the projections of future activities. There are a few key areas of uncertainty present within the available data which impact the presented results. During the preparation of this assessment methodology, AECOM made several key assumptions to estimate worst-case emissions from the proposed Highway 27-Woodbine Station, as follows:

**Representative Transit Schedule:**

- Future airport rail service is represented by scheduling at Weston station.
- GO Train Schedule is represented by an average of the scheduling from the GO Train Malton & Etobicoke North stations
- Other Transit Authority Bus Schedule is represented by the existing TTC Woodbine Track Loop Station (Route 37)
- Weekday scheduling is assumed to be representative of the station usage.

**Parking Lots:**

- 100% of the engines of the entering vehicles are in hot stable conditions. 100% of the starting car engines of the exiting vehicles have a soak time of 360 min <= 720 minutes.

- There will be 1,146 vehicles using the parking lots during the AM Peak period (6 AM – 9 AM) and PM Peak period (4 PM – 7 PM).
- There will be 573 vehicles (50% total capacity) using the parking lots during the Mid-day period (9 AM – 4 PM) and Evening period (7 PM – 2 AM).
- Cold-start engine emissions will occur during the PM Peak and Evening periods only.
- Vehicles travelling within the parking lots will travel at a maximum speed of 15 km/hr.

**PPUDO Parking:**

- There will be twenty-four (24) parking spaces for the PPUDO lot. An assumed idling time of 1 minute per vehicle is assumed for each scheduled transit arrival (bus or train) over the course of a day of operations (6 AM through 2 AM). AECOM assumed all engines are in hot stable conditions.

**Bus Loop:**

- The four bus bays are reserved for other transit authority usage, following the representative schedule at the TTC Woodbine Track Loop Station (Route 37).

**Ambient Air Monitoring Locations:**

- The AQA scope is limited to the study of impacts from the proposed Highway 27-Woodbine Station design only and will not include contributions from major nearby emission sources (e.g. existing rail corridor, existing roadways, etc.). Existing conditions and Future No-Build conditions are assumed to be represented by the local background air quality data as measured by local NAPS ambient air monitoring stations. The stations were conservatively selected to represent criteria contaminants for the Existing conditions and Future No-Build conditions, assuming traffic emissions are representative based on proximity to both the Highway 27-Woodbine Station (HWS) and to high-volume road sources such as Highway 401.

# 3. Existing Conditions

The AQA for the proposed Highway 27-Woodbine Station was conducted assuming certain existing conditions of the surrounding area were present. Background ambient air conditions were assessed using pre-selected air quality monitoring stations operated by the MECP and the NAPS program.

## 3.1 Existing Ambient Air Quality

The baseline ambient Air Quality was based on publicly available historical data from ambient air quality monitoring stations within Ontario. Data utilized were the latest publicly available at the time of this Air Quality Assessment (July 2019). It was assumed that the historic ambient air quality will be the same for the Future Build scenario. The following NAPS Air Quality monitoring stations were selected as representative of the ambient air quality of the project Study Area:

- Toronto West (NAPS ID 60430);
- Etobicoke South (NAPS ID 60435);
- Gage Institute Station (NAPS ID 60427); and
- Roadside Wallberg (UofT) Station (NAPS ID 60439).

Details of the air quality monitoring stations closest to the Study Area are provided in **Table 3-1**.

**Figure 3-1** presents the locations of the four (4) air quality monitoring stations relative to the AQA Study Area.

A copy of the air quality monitoring data is provided in **Appendix A**.

**Table 3-1: Air Quality NAPS Monitoring Stations' Information**

| | NAPS Monitoring Stations | | | |
|---|---|---|---|---|
| | **Toronto West** | **Etobicoke South** | **Gage Institute** | **Roadside Wallberg (UofT)** |
| **NAPS Number** | 60430 | 60435 | 60427 | 60439 |
| **Address** | 125 Resources Road, Toronto | 461 Kipling Avenue | 223 College Street, Toronto | 200 College Street, Toronto |
| **Latitude** | 43.7094 | 43.6108 | 43.6582 | 43.6590 |
| **Longitude** | -79.5435 | -79.5219 | -79.3972 | -79.3954 |
| **Station Type** | Urban | Urban | Urban | Urban |
| **Pollutants Measured** | $O_3$, CO, $NO_2$, $SO_2$, $PM_{2.5}$, Benzo(a)pyrene (2016 only) | 1,3-butadiene, benzene | Benzo(a)pyrene (2014 only) | Formaldehyde, acetaldehyde, acrolein, benzo(a)pyrene (2015 only) |


**Figure 3-1: NAPS Air Quality Monitoring Stations for AQA**

Ambient monitoring data were utilized for all contaminants as follows in relation to the pollutants and averaging period combinations listed in **Table 3-2**:

- 1 hour, 8 hour, and 24 hour ambient concentrations for the contaminants were obtained from the 90$^{th}$ percentile of hourly measurements from the representative AQ monitoring stations (the average value was calculated from the available years). The 90$^{th}$ percentile of available background data was used following the methodology outlined in the MTO Guideline (2012).
- Annual ambient concentrations for the contaminants were obtained from the mean measurements from the representative AQ monitoring station (the average value was calculated from the available years).

**Table 3-2: Background Ambient Air Quality Concentrations**

| Contaminant | Averaging Period (hr) | Station ID | Station Name | 90$^{th}$ Percentile Concentrations (µg/m$^3$) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | *2014* | *2015* | *2016* | *Maximum* | *Average* |
| $NO_2$ | 1 | 60430 | Toronto West | 59 | 58 | 58 | 59 | 58 |
| | 24 | 60430 | Toronto West | 49 | 48 | 46 | 49 | 47 |
| | Annual | 60430 | Toronto West | 32 | 31 | 30 | 32 | 31 |
| CO | 1 | 60430 | Toronto West | 458 | 458 | 458 | 458 | 458 |
| | 8 | 60430 | Toronto West | 458 | 458 | 344 | 458 | 420 |
| $PM_{10}$ [1] | 24 | 60430 | Toronto West | 28 | 30 | 22 | 30 | 27 |
| $PM_{2.5}$ | 24 | 60430 | Toronto West | 15 | 16 | 12 | 16 | 14 |
| | Annual | 60430 | Toronto West | 9.0 | 9.0 | 7.0 | 9.0 | 8.3 |
| $SO_2$ | 1 | 60430 | Toronto West | 3.9 | 4.7 | 3.1 | 4.7 | 3.9 |

**Table 3-2: Background Ambient Air Quality Concentrations**

| Contaminant | Averaging Period (hr) | Station ID | Station Name | 90th Percentile Concentrations (µg/m³) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | *2014* | *2015* | *2016* | *Maximum* | *Average* |
| | 24 | 60430 | Toronto West | 3.7 | 4.7 | 2.9 | 4.7 | 3.8 |
| | Annual | 60430 | Toronto West | 2.1 | 2.6 | 1.6 | 2.6 | 2.1 |
| Acetaldehyde | 24 | 60439 | Wallberg (UofT) | 1.5 | 2.0 | 1.7 | 2.0 | 1.7 |
| Acrolein | 1[3] | 60439 | Wallberg (UofT) | 0.072 | 0.070 | 0.065 | 0.072 | 0.069 |
| | 24 | 60439 | Wallberg (UofT) | 0.072 | 0.070 | 0.065 | 0.072 | 0.069 |
| Benzene | 24 | 60435 | Etobicoke South | 0.772 | 0.658 | 0.765 | 0.772 | 0.732 |
| | Annual[4] | 60435 | Etobicoke South | 0.481 | 0.542 | 0.498 | 0.542 | 0.507 |
| Benzo(a)pyrene [2] | 24 | 60430/<br>60439/<br>60427 | Toronto West/<br>Wallberg UofT/<br>Gage Institute | -<br>-<br>6.57E-05 | -<br>1.16E-04<br>- | 8.89E-05<br>-<br>- | 1.16E-04 | 9.03E-05 |
| | Annual[4] | 60430/<br>60439/<br>60427 | Toronto West/<br>Wallberg UofT/<br>Gage Institute | -<br>-<br>5.79E-05 | -<br>1.01E-04<br>- | 5.29E-05<br>-<br>- | 1.01E-04 | 7.06E-05 |
| Formaldehyde | 24 | 60439 | Wallberg (UofT) | 2.8 | 1.6 | 2.6 | 2.8 | 2.3 |
| 1,3-Butadiene | 24 | 60435 | Etobicoke South | 0.064 | 0.066 | 0.051 | 0.066 | 0.060 |
| | Annual[4] | 60435 | Etobicoke South | 0.039 | 0.047 | 0.039 | 0.047 | 0.042 |

*Notes:* *(1) $PM_{10}$ was not included in NAPS Station measurements, and therefore was estimated using PM2.5 measurements, assuming a ratio of 1 µg/m³ $PM_{10}$ per 0.54 µg/m³ of $PM_{2.5}$ as per Lall et. al, "Estimation of historical annual $PM_{2.5}$ exposures for health effects assessment", Atmospheric Environment 38 (2004) [4]*

*(2) Measurements for Benzo(a)pyrene from the Toronto West Station were only available for the year 2016, from the Roadside Wallberg (UofT) Station were only available for the year 2015, and from the Gage Institute Station were only available for the year 2014.*

*(3) Measurements are taken as a daily average, background concentrations for the hourly averaging period are assumed to be equal to the 24-hr average.*

*(4) Annual average for VOCs are calculated from the annual average of all days, where measurement gaps less than six days in length are assumed to be equal to the previous reading, and gaps longer than six days are assumed to be equal to the 24-hr 90th percentile of the raw data set.*

The background concentrations for each contaminant were also compared to the applicable Provincial and Federal concentration limits for all time averaging periods. Nitrogen dioxide as shown in **Table 3-3**.

**Table 3-3: Comparison of Background Ambient Air Quality Data to Criteria**

| Contaminant | Averaging Period (hr) | Background Concentration (µg/m³) | Standard Value (µg/m³) | Source of Standard | % of AAQC/ CAAQS Standard |
|---|---|---|---|---|---|
| $NO_2$ | 1 (2025) | 59 | 79 | CAAQS | 75% |
| | 24 | 49 | 200 | AAQC | 24% |
| | **Annual** | **31** | **22.6** | **CAAQS** | **137%** |
| CO | 1 | 458 | 36200 | AAQC | 1% |
| | 8 | 458 | 15700 | AAQC | 3% |
| $SO_2$ | 1 | 4.7 | 100 | AAQC | 5% |
| | 24 | 4.7 | 275 | AAQC | 2% |
| | Annual (2025) | 2.1 | 10 | CAAQS | 21% |
| $PM_{10}$ | 24 | 30 | 50 | AAQC | 59% |
| $PM_{2.5}$ | 24 (2020) | 16 | 27 | CAAQS | 59% |
| | Annual | 8.3 | 8.8 | CAAQS | 95% |
| Acetaldehyde | 24 | 2.0 | 500 | AAQC | 0% |
| Acrolein | 1 | 0.072 | 4.5 | AAQC | 2% |
| | 24 | 0.072 | 0.4 | AAQC | 18% |

*4. Lall, R., M. Kendall, K.Ito and G.D. Thurston, 2004: Estimation of historical annual PM2.5 exposures for health effects assessment (Atmospheric Environment. 38, 2004), 5217-5226.*

**Table 3-3: Comparison of Background Ambient Air Quality Data to Criteria**

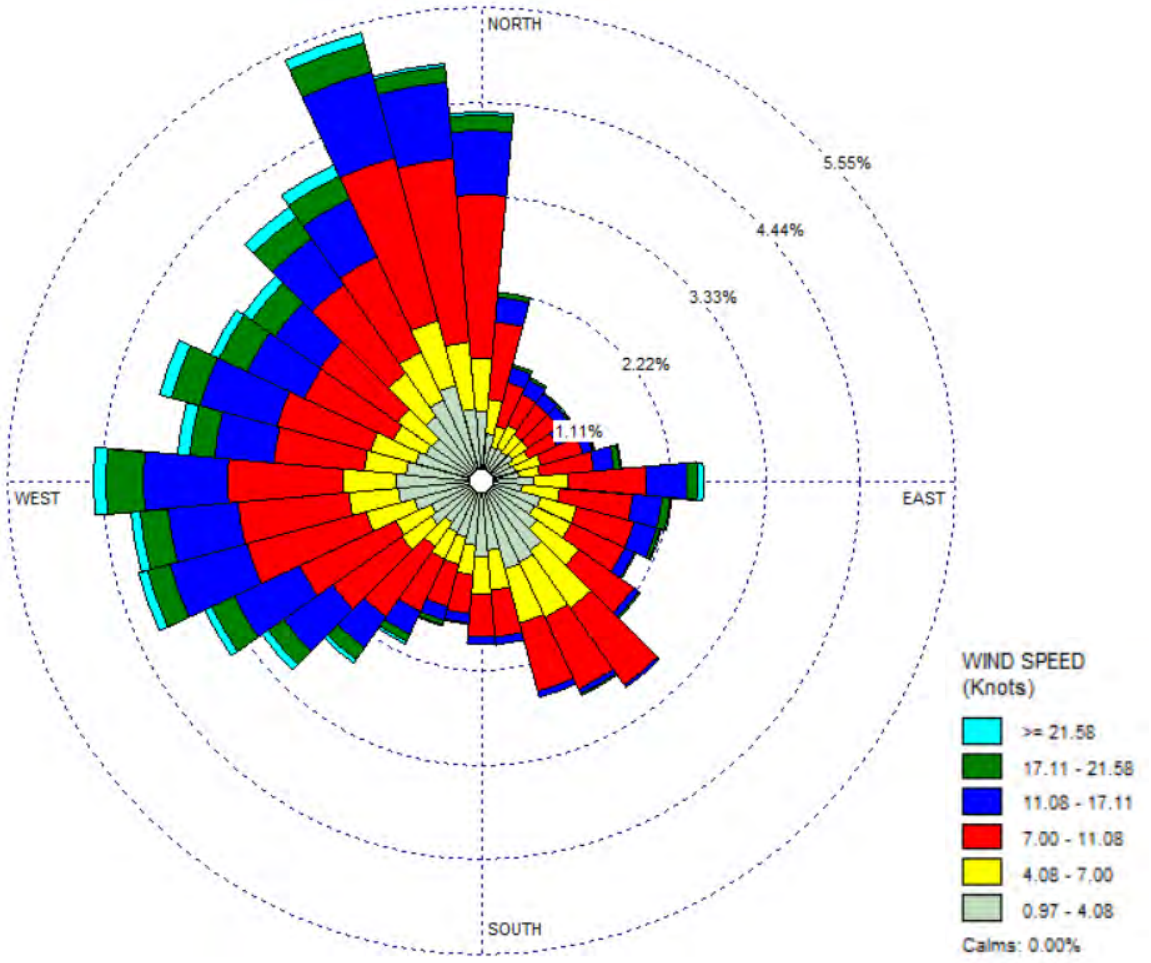
| Contaminant | Averaging Period (hr) | Background Concentration (µg/m³) | Standard Value (µg/m³) | Source of Standard | % of AAQC/ CAAQS Standard |
|---|---|---|---|---|---|
| Benzene | 24 | 0.772 | 2.3 | AAQC | 34% |
| | **Annual** | **0.507** | **0.45** | **AAQC** | **113%** |
| Benzo(a)pyrene | **24** | **1.16E-04** | **0.00005** | **AAQC** | **233%** |
| | **Annual** | **1.01E-04** | **0.00001** | **AAQC** | **1,009%** |
| 1,3-Butadiene | 24 | 0.066 | 10 | AAQC | 1% |
| | Annual | 0.042 | 2 | AAQC | 2% |
| Formaldehyde | 24 | 2.8 | 65 | AAQC | 4% |

*Notes: (1) Exceedances to Air Quality thresholds are shown in* **red**

## 3.2 Meteorological Conditions

The MECP pre-processed Central Urban Region (Toronto, Station #61587) wind rose for the five-year meteorological period showing the wind direction (blowing from) and wind speed is presented in **Figure 3-2**. The wind rose shows that the predominant wind direction is blowing from the north-west.

**Figure 3-2: Wind Rose for Central Urban Region**



# 4. Emission Inventory

## 4.1 MOVES2014a Emission Estimation

The input data required to run MOVES in County Scale and Project Scale are presented in **Table 4-1**. Vehicle emission modelling was limited to internal combustion engine exhaust emissions (tailpipe exhaust only). Where default data included in MOVES2014b were deemed appropriate for the AQA Study Area, the MOVES default data has been used. The default data used was from Niagara County (New York), USA, given the relative proximity to the AQA Study Area.

**Table 4-1: MOVES2014a Input Data**

| | Parameter | Input | Reference |
|---|---|---|---|
| **External Conditions** | *Scale* | County Scale & Project Scale | - |
| | *Representative County* | Niagara County, New York | - |
| | *Calculation Type* | Emission Rates & Inventory | - |
| | *Years of Evaluation* | 2031 | - |
| | *Month of Evaluation* | January and July | - |
| | *Temperature ˚C* | Full set of average hourly temperatures, by month (January or July) | Environment Canada climate data (January/July 2016). Toronto Pearson |
| | *Humidity* | Full set of average hourly humidity readings, by month (January or July) | Environment Canada climate data (January/July 2016). Toronto Pearson |
| **Fuel Options** | *Fuel Types* | Default fuel mix (E85 reassigned to Gasoline) | MOVES2014a Default |
| **Vehicles** | *Vehicle Types* | Transit Busses & Passenger Cars | - |
| **Vehicle Fleet Characteristics** | *Vehicle Age Distribution* | MOVES2014b Default | U.S. EPA |

**Table 4-2** shows the applicable emissions factors for transit busses generated by MOVES, running as County Scale, for the projected build-out year (2031) and the appropriate speed bins for GO busses and other transit authority busses travelling through the Highway 27-Woodbine Station.

**Table 4-2: Year 2031 MOVES2014a Maximum Emission Rate Summary for Bus Loop**

| Pollutant | Running Emissions: Bus Only (g/VKT) 15 km/hr | Idling Emissions: Bus Only (g/veh-hr) |
|---|---|---|
| $NO_X$ | 1.94E+00 | 2.84E+01 |
| CO | 1.36E+00 | 1.79E+01 |
| $PM_{10}$ | 1.05E-02 | 1.46E-01 |
| $PM_{2.5}$ | 1.06E+01 | 5.37E+00 |
| Acetaldehyde | 2.53E+00 | 1.23E+00 |
| Acrolein | 1.14E-02 | 1.63E-01 |
| Benzene | 9.87E-04 | 1.55E-02 |
| Benzo(a)pyrene | 1.64E-03 | 2.45E-02 |
| Formaldehyde | 2.20E-04 | 3.44E-03 |
| 1,3-Butadiene | 2.45E-02 | 3.64E-01 |
| $SO_2$ | 3.25E-06 | 5.75E-05 |
| $CH_4$ | 1.33E+03 | 1.85E+04 |
| $N_2O$ | 8.25E-01 | 1.07E+01 |
| Atmospheric $CO_2$ | 2.08E-02 | 3.33E-01 |

**Table 4-3** shows the applicable emissions factors generated by MOVES for the projected build-out year (2031) and the appropriate speed bins for passenger vehicles travelling through the Highway 27-Woodbine Station.

**Table 4-3: Year 2031 MOVES2014b Maximum Emission Rate Summary for Parking Lots**

| Pollutant | Running Emissions | | Start Emissions | Idling Emissions |
|---|---|---|---|---|
| | Passenger Vehicle 15 km/hr at 7 PM (Parking Lot Peak Hour) | Passenger Vehicle 15 km/hr at 9 AM (PPUDO Peak Hour) | Passenger Vehicle Cold Start (360 - 720 min) | Passenger Vehicle Idling |
| | (g/VKT) | (g/VKT) | (g/start) | (g/vehicle-hr) |
| $NO_X$ | 1.57E-02 | 1.57E-02 | 5.48E-01 | 5.11E-02 |
| CO | 1.18E+00 | 1.03E+00 | 1.55E+01 | 7.65E+00 |
| $SO_2$ | 1.74E-03 | 1.68E-03 | 8.81E-04 | 1.98E-02 |
| $PM_{10}$ | 1.31E+00 | 1.31E+00 | 2.18E-02 | 1.29E+00 |
| $PM_{2.5}$ | 3.06E-01 | 3.06E-01 | 1.93E-02 | 1.87E-01 |
| Acetaldehyde | 3.69E-05 | 3.58E-05 | 2.08E-02 | 2.34E-04 |
| Acrolein | 4.54E-06 | 4.40E-06 | 1.34E-03 | 2.87E-05 |
| Benzene | 3.34E-04 | 3.25E-04 | 3.95E-02 | 2.98E-03 |
| 1,3-Butadiene | 4.29E-08 | 4.16E-08 | 8.93E-03 | 2.72E-07 |
| Formaldehyde | 8.56E-05 | 8.30E-05 | 1.07E-02 | 5.42E-04 |
| Benzo(a)pyrene | 1.36E-06 | 1.36E-06 | 9.83E-06 | 1.46E-05 |
| $CO_2$ | 2.61E+02 | 2.51E+02 | 1.32E+02 | 2.97E+03 |
| $CH_4$ | 1.21E-03 | 1.17E-03 | 5.87E-02 | 7.65E-03 |
| $N_2O$ | 2.46E-03 | 2.46E-03 | 2.21E-02 | 3.94E-02 |

The emission factors output by MOVES were used to calculate an appropriate emission rate to be input into the AERMOD model for assessment, in grams per second (g/s). The representative hourly transit schedule for the station was used to anticipate parking lot, PPUDO, and bus loop maximum hour usage and 24-hour variable distribution of emissions. The associated AERMOD emission rates derived from the MOVES output and combined representative transit schedule is shown in **Table 4-4,** for each modelled source.

**Table 4-4: AERMOD Emission Rate Input Summary by Source ID**

| Pollutant | Maximum Hour AERMOD Emission Rate (g/s) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | AS1 | AS2 | AS3 | AS4 | LVS1 | LVS2 | LVS3 | LVS4 |
| | Parking Lot East | Parking Lot West | PPUDO | Bus Loop (idling) | Entrance/ Exit from Parking Lot East | Entrance/ Exit from Parking Lot West | Entrance/ Exit from PPUDO | Entrance/ Exit from Bus Loop |
| $NO_X$ | 3.75E-02 | 2.41E-02 | 6.73E-03 | 1.18E-01 | 7.31E-04 | 5.88E-04 | 9.38E-04 | 1.40E-03 |
| CO | 1.03E+00 | 6.59E-01 | 9.96E-01 | 7.45E-02 | 5.69E-02 | 4.58E-02 | 7.31E-02 | 9.84E-04 |
| $SO_2$ | 6.21E-05 | 3.98E-05 | 2.31E-03 | 6.09E-04 | 8.19E-05 | 6.59E-05 | 1.05E-04 | 7.59E-06 |
| $PM_{10}$ | 1.43E-03 | 9.16E-04 | 1.42E-01 | 2.24E-02 | 6.08E-02 | 4.88E-02 | 7.80E-02 | 7.66E-03 |
| $PM_{2.5}$ | 1.26E-03 | 8.10E-04 | 2.05E-02 | 5.11E-03 | 1.42E-02 | 1.14E-02 | 1.82E-02 | 1.83E-03 |
| Acetaldehyde | 1.37E-03 | 8.79E-04 | 2.67E-05 | 6.78E-04 | 1.73E-06 | 1.39E-06 | 2.23E-06 | 8.22E-06 |
| Acrolein | 8.84E-05 | 5.67E-05 | 3.27E-06 | 6.44E-05 | 2.13E-07 | 1.71E-07 | 2.73E-07 | 7.14E-07 |
| Benzene | 2.59E-03 | 1.67E-03 | 3.39E-04 | 1.02E-04 | 1.57E-05 | 1.26E-05 | 2.01E-05 | 1.19E-06 |
| 1,3-Butadiene | 5.87E-04 | 3.77E-04 | 3.10E-08 | 1.43E-05 | 2.02E-09 | 1.62E-09 | 2.59E-09 | 1.59E-07 |

**Table 4-4: AERMOD Emission Rate Input Summary by Source ID**

| Pollutant | Maximum Hour AERMOD Emission Rate (g/s) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | AS1 | AS2 | AS3 | AS4 | LVS1 | LVS2 | LVS3 | LVS4 |
| | Parking Lot East | Parking Lot West | PPUDO | Bus Loop (idling) | Entrance/ Exit from Parking Lot East | Entrance/ Exit from Parking Lot West | Entrance/ Exit from PPUDO | Entrance/ Exit from Bus Loop |
| Formaldehyde | 7.10E-04 | 4.56E-04 | 6.18E-05 | 1.51E-03 | 4.02E-06 | 3.23E-06 | 5.16E-06 | 1.77E-05 |
| Benzo(a)pyrene | 6.42E-07 | 4.12E-07 | 1.61E-06 | 2.40E-07 | 6.34E-08 | 5.10E-08 | 8.14E-08 | 2.36E-09 |
| $CO_2$ | 9.30E+00 | 5.97E+00 | 3.46E+02 | 7.69E+01 | 1.23E+01 | 9.86E+00 | 1.57E+01 | 9.63E-01 |
| $CH_4$ | 3.88E-03 | 2.49E-03 | 8.73E-04 | 4.44E-02 | 5.68E-05 | 4.56E-05 | 7.29E-05 | 5.97E-04 |
| $N_2O$ | 1.54E-03 | 9.91E-04 | 4.33E-03 | 1.39E-03 | 1.14E-04 | 9.18E-05 | 1.47E-04 | 1.50E-05 |

The representative combined transit hourly schedule for the Highway 27-Woodbine Station EA is shown in **Table 4-5**. It should be clarified that the finalized assessment of scheduling has yet to be completed for the Highway 27-Woodbine Station, and the transit arrival schedule shown in **Table 4-5** is a conservative estimation based on existing scheduling data from nearby GO transit, airport train service, and TTC transit stations. While emissions from trains were not included within the assessment and modelled impacts for this study, the schedule of bus and train arrivals and departures do affect the anticipated frequency of parking lot usage and PPUDO vehicle idling. This study assumed that train and bus arrivals and departures would coincide with a full PPUDO vehicle idling use for passengers being picked up or dropped off and assumed that the rate of filling and emptying of the Park-n-Ride lot during the Station operation hours would coincide with the frequency of train or bus arrival and departure scheduling.

**Table 4-5: Predicted Highway 27-Woodbine Station EA 2031 Hourly Transit Schedule**

| Hour | GO Train Stops at HWS per hour | Future Airport Train Service Stops at HWS per hour | Other Bus Stops at HWS per hour | Total Bus & Train Combined Transit Stops at HWS | Total Ridership | Bus-based Hourly Distribution per Period (%) | Total Transit-based Hourly Distribution per Period (%) | Ridership-based Hourly Distribution per Period (%) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 8 | 2 | 10 | 360 | 11% | 14% | 15% |
| 2 | 0 | 2 | 2 | 4 | 132 | 11% | 6% | 5% |
| 3 | 0 | 0 | 0 | 0 | 0 | 0% | 0% | 0% |
| 4 | 0 | 0 | 0 | 0 | 0 | 0% | 0% | 0% |
| 5 | 0 | 0 | 0 | 0 | 0 | 0% | 0% | 0% |
| 6 | 0 | 6 | 0 | 6 | 228 | 0% | 0% | 13% |
| 7 | 3 | 8 | 2 | 13 | 495 | 25% | 32% | 28% |
| 8 | 2 | 8 | 3 | 13 | 478 | 38% | 32% | 27% |
| 9 | 4 | 8 | 3 | 15 | 568 | 38% | 37% | 32% |
| 10 | 2 | 8 | 5 | 15 | 534 | 15% | 15% | 15% |
| 11 | 2 | 8 | 4 | 14 | 506 | 12% | 14% | 14% |
| 12 | 2 | 8 | 5 | 15 | 534 | 15% | 15% | 15% |
| 13 | 2 | 8 | 4 | 14 | 506 | 12% | 14% | 14% |
| 14 | 2 | 8 | 5 | 15 | 534 | 15% | 15% | 15% |
| 15 | 2 | 8 | 5 | 15 | 534 | 15% | 15% | 15% |

**Table 4-5: Predicted Highway 27-Woodbine Station EA 2031 Hourly Transit Schedule**

| Hour | GO Train Stops at HWS per hour | Future Airport Train Service Stops at HWS per hour | Other Bus Stops at HWS per hour | Total Bus & Train Combined Transit Stops at HWS | Total Ridership | Bus-based Hourly Distribution per Period (%) | Total Transit-based Hourly Distribution per Period (%) | Ridership-based Hourly Distribution per Period (%) |
|---|---|---|---|---|---|---|---|---|
| 16 | 2 | 8 | 5 | 15 | 534 | 15% | 15% | 15% |
| 17 | 4 | 8 | 5 | 17 | 602 | 33% | 35% | 36% |
| 18 | 2 | 8 | 5 | 15 | 534 | 33% | 32% | 32% |
| 19 | 2 | 8 | 5 | 15 | 534 | 33% | 32% | 32% |
| 20 | 1 | 8 | 3 | 12 | 433 | 17% | 17% | 18% |
| 21 | 0 | 8 | 3 | 11 | 388 | 17% | 16% | 16% |
| 22 | 0 | 8 | 3 | 11 | 388 | 17% | 16% | 16% |
| 23 | 0 | 8 | 3 | 11 | 388 | 17% | 16% | 16% |
| 24 | 0 | 8 | 2 | 10 | 360 | 11% | 14% | 15% |

*Notes: (1) Peak AM period is highlighted yellow, mid-day period is highlighted red, peak PM period is highlighted green and evening period is highlighted blue.*

## 4.2 Annual GHG and Criteria Air Contaminants Inventory

Annual emissions from each identified source at the Highway 27-Woodbine Station were estimated using the AERMOD emission rates in grams per second, multiplied by the predicted annual rate of emission for each source. Annual emissions were also calculated based on the predicted number of vehicles idling periods correlating to the hourly number of representative transit arrivals.

**Table 4-6** shows the predicted annual emissions for all CACs assessed for the Highway 27-Woodbine Station during the 2031 build-out scenario. **Table 4-7** shows the predicted annual emissions for all GHGs assessed for the Highway 27-Woodbine Station during the 2031 build-out scenario.

## Table 4-6: Annual Summary of CAC Emissions

| Pollutant | Annual CAC Emissions (tonnes/year) | | | | |
|---|---|---|---|---|---|
| | Parking Lot East | Parking Lot West | PPUDO | Bus Loop | Total |
| $NO_X$ | 2.86E-01 | 2.30E-01 | 1.50E-01 | 2.33E+00 | 3.00E+00 |
| CO | 8.38E+00 | 6.71E+00 | 2.03E+01 | 1.47E+00 | 3.69E+01 |
| $SO_2$ | 1.32E-03 | 1.06E-03 | 4.93E-02 | 1.18E-02 | 6.35E-02 |
| $PM_{10}$ | 6.76E-01 | 5.43E-01 | 4.65E+00 | 5.84E-01 | 6.45E+00 |
| $PM_{2.5}$ | 1.65E-01 | 1.33E-01 | 8.20E-01 | 1.35E-01 | 1.25E+00 |
| Acetaldehyde | 1.05E-02 | 8.37E-03 | 5.98E-04 | 1.33E-02 | 3.28E-02 |
| Acrolein | 6.80E-04 | 5.40E-04 | 7.33E-05 | 1.27E-03 | 2.56E-03 |
| Benzene | 2.01E-02 | 1.60E-02 | 7.43E-03 | 2.01E-03 | 4.55E-02 |
| 1,3-Butadiene | 4.51E-03 | 3.58E-03 | 6.94E-07 | 2.82E-04 | 8.37E-03 |
| Formaldehyde | 5.47E-03 | 4.35E-03 | 1.39E-03 | 2.98E-02 | 4.10E-02 |
| Benzo(a)pyrene | 5.67E-06 | 4.50E-06 | 3.57E-05 | 4.71E-06 | 5.06E-05 |

## Table 4-7: Annual Summary of GHG Emissions

| Pollutant | Annual CAC Emissions (tonnes/year) | | | | |
|---|---|---|---|---|---|
| | Parking Lot East | Parking Lot West | PPUDO | Bus Loop | Total |
| $CO_2$ | 1.99E+02 | 1.60E+02 | 7.37E+03 | 1.49E+03 | 9.22E+03 |
| $CH_4$ | 3.03E-02 | 2.41E-02 | 1.95E-02 | 8.76E-01 | 9.50E-01 |
| $N_2O$ | 1.25E-02 | 1.00E-02 | 9.47E-02 | 2.73E-02 | 1.45E-01 |

# 5. Air Dispersion Modelling

The calculated emissions and road traffic for each pollutant per link were modelled using AERMOD, an emission dispersion model developed by the U.S. EPA and approved by the MECP and MTO for transportation-based Air Quality Assessments for stationary sources (i.e., parking lots). The model is capable of predicting impacts from a variety of source types, including stationary sources (e.g., stacks), line sources (e.g., roads), stationary volume sources (e.g., pile unloading), and area sources (e.g., parking lots).

AERMOD predicts contaminant impacts using the Gaussian dispersion model in conjunction with hourly meteorological data. A five-year meteorological data set was pre-processed by the MECP for direct use in AERMOD for the years 1996-2000 using raw meteorological data from the surface and upper air meteorological stations located closest to the Study Area.

Emissions sources within the AERMOD model are based on road traffic and idling emissions from on-site roads within the project Study Area, including:

- Bus travel on-site entering and exiting the Bus Loop area (including GO Busses and other transit authority busses);
- Passenger vehicle travel on-site accessing both parking lots and the PPUDO area;
- The two parking lots to the east and west of the station main facility building; and
- The PPUDO area directly west of the station main facility building.

For each link and source, an hourly profile of emissions and traffic data was input into the model, along with other pertinent information such as road width per link, and the area of the parking lots. Release heights and plume widths were calculated in accordance with U.S. EPA's recommended methodologies.

## 5.1 Modelling Inputs

Appendix D shows a detailed series of AERMOD input tables describing the specific inputs including source dimensions used in this modelling assessment. The input tables are shown for the contaminant $PM_{10}$, however all input parameters remain the same for the modelling of the other contaminants, except for the emission rates which are detailed in Section 4 above.

### *5.1.1 Meteorology*

Five years of pre-processed publicly available regional meteorological data from 1996 – 2000 for Central Region (Toronto) Suburban land use were obtained from the Ministry of Environment, Conservation and Parks (MECP) website. Suburban land use is defined as 45% commercial/industrial, 45% low intensity residential, and 10% shrubland, which closest matches the description of the land use surrounding the Highway 27-Woodbine Station. The meteorological data (surface) was collected at Pearson Airport in Toronto and the upper data was collected at the Buffalo station. The MECP pre-processed publicly available meteorological data has previously been accepted by the MECP for Environmental Air Quality Assessments for other transportation projects.

### *5.1.2 Terrain*

Terrain data is publicly available from the Ministry of Environment, Conservation and Parks (MECP) for the AQA Study Area in the form of Digital Elevation Model (DEM) files. The DEM files used for this project were 0872_3.DEM and 0873_3.DEM.

### *5.1.3 Identified Receptors*

The MTO Guideline (2012) as well as Metrolinx's internal document "Recommended Approach for Assessing and Mitigating Air Quality Impacts and Greenhouse Gases of Metrolinx Public Transit Projects" identifies two types of receptors:

- Sensitive (residences); and
- Critical (hospitals, retirement homes, child care centres, and similar institution buildings).

Receptors within the Air Quality Assessment Area are expected to be the most susceptible to potential Air Quality impacts.

No sensitive receptors (residences) or critical receptors (school, daycare, long term care) were located within the AQA Study Area, however a hotel is located in the north-west corner of the AQA Study Area which was selected as a representative sensitive receptor. In addition, a grid of receptors was included to identify immediate transit station impacts and impacts on potential future residential development within the AQA Study Area. The receptor grid and discrete receptors are shown in **Figure 5-1**.

**Figure 5-1: AQA AERMOD Modelling Receptor Locations**

The locations (in UTM co-ordinates) and descriptions of the receptors are summarized in **Table 5-1**. A flagpole height of 1.5 m has been chosen to represent worst-case receptor impacts, representing the nearest window opening on the ground floor. As all sources of emission at the Highway 27-Woodbine Station are at ground level, it is anticipated that dispersed point of impingement (POI) impacts would not increase with elevation in the same way they may with elevated sources of emission, such as a vertical exhaust stack.

**Table 5-1: Discrete Receptor Locations (in UTM System)**

| Receptor ID | X-Co-ordinate (m East) | Y-Co-ordinate (m North) | Receptor Description | Distance from Highway 27-Woodbine Station Boundary (m) | Receptor Height (m) |
|---|---|---|---|---|---|
| R1 | 613413.15 | 4840837.83 | Woodbine Hotel & Suites | 390 | 1.5 |

## 5.2 $NO_2$ Assessment using Ozone Limiting Method (OLM)

The concentration of nitrogen dioxide ($NO_2$) in the atmosphere is affected by the reaction of nitrous oxide (NO) with ozone ($O_3$), which is a by-product of mobile vehicle fuel combustion. The atmospheric reaction of NO with ozone is demonstrated as follows:

$$NO + O_3 \rightarrow NO_2 + O_2$$

It is assumed that the rate of conversion of NO to $NO_2$ is controlled by the availability of ozone in the ambient atmosphere. This principle is called the “ozone limiting method” (OLM). Using the same principles, given a high enough concentration of ozone in the ambient atmosphere, all of the emitted NO emissions will convert to $NO_2$ and disperse in the same way as other inert combustion products from mobile vehicles.

According to NOx studies done by the U.S. EPA, emissions of NOx from combustion are primarily in the form of NO (U.S. EPA, 1999). Modelled concentrations of NOx were therefore used along with ambient measured concentrations of background ozone levels from nearby MECP and Environment Canada monitoring stations to calculate the concentrations of $NO_2$ at a given sensitive receptor. The Québec Ministry of the Sustainable Development, Environment, and Parks published a technical guide for calculating atmospheric concentration of $NO_2$ using the OLM method (Couture, 2008), described as follows:

- If the concentration (part per million, ppm) of NO is lower than that of ozone ([NO] < [$O_3$] or, more precisely, [$O_3$ > 0.9 [NOX]), then we assume that all of NO was converted to NO2 : [$NO_2$] = [$NO_X$]
- If the concentration (ppm) of NO is greater than that of ozone ([NO] > [$O_3$]), then the concentration of NO equal to the concentration (ppm) of ozone is converted to NO2 : [NO2] = [$O_3$] + 0.1* [$NO_X$]

The concentration of ambient ozone was taken as the average of the maximum 90$^{th}$ percentile values (2014 to 2016) for measured ozone concentrations at the NAPS Toronto West Station (NAPS ID 60430) as shown in **Table 5-2**. The NAPS Toronto West Station is located 3 km east of the AQA Study Area. Based on proximity, it was chosen as the most representative station for the ozone background level assessment.

**Table 5-2: Local Ambient Ozone Levels**

| Contaminant | Averaging Period (hr) | Data Source | 90th Percentile Concentrations (µg/m$^3$) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 2014 | 2015 | 2016 | 2017 | Average |
| $O_3$ | 1 | NAPS | 77 | 77 | 79 | No Data | 77 |
| | 24 | NAPS | 65 | 65 | 65 | No Data | 65 |
| | Annual | NAPS | 41 | 41 | 43 | No Data | 42 |

The modelled maximum receptor grid and discrete receptor (Woodbine Hotel) concentrations of $NO_X$ for the project future build-out conditions (2031) and the resulting calculated $NO_2$ concentration using the OLM method are shown below in **Table 5-3** and **Table 5-4**.

**Table 5-3: $NO_2$ Calculation Using OLM Method: Max POI**

| Year | Averaging Period (hr) | Modelled NOx Concentration (µg/m$^3$) | Modelled NOx Concentration (ppb) | Background $O_3$ Concentration (ppb) | OLM $NO_2$ Concentration (ppb) | OLM $NO_2$ Concentration (µg/m$^3$) | Highest POI Location [UTM X, UTM Y] |
|---|---|---|---|---|---|---|---|
| 2031 | 1 | 57.451 | 30.55 | 77 | 30.55 | 57.45 | [613146.47, 4840104.20] |
| | 24 | 30.701 | 16.33 | 65 | 16.33 | 30.70 | [613146.47, 4840104.20] |
| | Annual | 8.032 | 4.27 | 42 | 4.27 | 8.03 | [613176.38, 4840104.98] |

**Table 5-4: $NO_2$ Calculation Using OLM Method: R1**

| Year | Averaging Period (hr) | Modelled NOx Concentration (µg/m$^3$) | Modelled NOx Concentration (ppb) | Background $O_3$ Concentration (ppb) | OLM $NO_2$ Concentration (ppb) | OLM $NO_2$ Concentration (µg/m$^3$) | POI Location |
|---|---|---|---|---|---|---|---|
| 2031 | 1 | 5.643 | 3.00 | 77 | 3.00 | 5.64 | R1: Woodbine Hotel |
| | 24 | 2.450 | 1.30 | 65 | 1.30 | 2.45 | R1: Woodbine Hotel |
| | Annual | 0.281 | 0.15 | 42 | 0.15 | 0.28 | R1: Woodbine Hotel |

# 6. Air Quality Impact Assessment

## 6.1 Assessment of Modelling Results through "Comprehensive Analysis"

### *6.1.1 Predicted Cumulative Concentrations*

The highest predicted contaminant concentrations output by AERMOD for the maximum point of impingement (POI) location with the AQA Study Area and the Woodbine Hotel are summarized in **Table 6-1** and **Table 6-2** respectively, along with the background concentrations for each contaminant per averaging period and the resulting cumulative concentrations. These cumulative concentrations are compared to the applicable Air Quality Threshold. Predicted exceedances are highlighted red. The UTM coordinates of the maximum receptor POI from the receptor grid is included in **Table 6-1**.

**Table 6-1: Cumulative Concentrations – Future Build-Out Conditions (2031): Max POI**

| Contaminant | Averaging Period (hr) | Background Concentration (µg/m$^3$) | Maximum Modelled Concentration (µg/m$^3$) | Location of Maximum Concentration UTM [X m, Y m] | Cumulative Concentration (µg/m$^3$) | AAQC/ CAAQS Standard (µg/m$^3$) | % of AAQC/ CAAQS Standard | Cumulative % of AAQC/ CAAQS Standard |
|---|---|---|---|---|---|---|---|---|
| $NO_2$ | 1 (2025) | 59 | 57 | [613146.47, 4840104.20] | 117 | 79 | 73% | **148%** |
| | 24 | 49 | 31 | [613146.47, 4840104.20] | 79 | 200 | 15% | 40% |
| | Annual(4) | 31 | 8.0 | [613176.38, 4840104.98] | 39 | 22.6 | 36% | **173%** |
| CO | 1 | 458 | 917 | [612996.93, 4840100.26] | 1,375 | 36200 | 3% | 4% |
| | 8 | 458 | 705 | [613026.84, 4840101.05] | 1,164 | 15700 | 4% | 7% |
| $SO_2$ | 1 | 4.7 | 2.0 | [612996.93, 4840100.26] | 6.7 | 100 | 2% | 7% |
| | 24 | 4.7 | 0.879 | [613026.84, 4840101.05] | 5.6 | 275 | 0% | 2% |
| | Annual(4) (2025) | 2.1 | 0.185 | [613026.84, 4840101.05] | 2.3 | 10 | 2% | 23% |
| $PM_{10}$ | 24 | 30 | 58 | [613026.84, 4840101.05] | 88 | 50 | **117%** | **176%** |
| $PM_{2.5}$ | 24 (2020) | 16 | 9.0 | [613036.84, 4840101.05] | 25 | 27 | 33% | 92% |
| | Annual(4) | 8.3 | 2.2 | [613026.84, 4840101.05] | 11 | 8.8 | 25% | **120%** |
| Acetaldehyde | 24 | 2.0 | 0.605 | [612734.01, 4840211.74] | 2.6 | 500 | 0% | 1% |

**Table 6-1: Cumulative Concentrations – Future Build-Out Conditions (2031): Max POI**

| Contaminant | Averaging Period (hr) | Background Concentration (µg/m³) | Maximum Modelled Concentration (µg/m³) | Location of Maximum Concentration UTM [X m, Y m] | Cumulative Concentration (µg/m³) | AAQC/ CAAQS Standard (µg/m³) | % of AAQC/ CAAQS Standard | Cumulative % of AAQC/ CAAQS Standard |
|---|---|---|---|---|---|---|---|---|
| Acrolein | 1 | 0.072 | 0.057 | [612734.01, 4840211.74] | 0.129 | 4.5 | 1% | 3% |
| | 24 | 0.072 | 0.040 | [612734.01, 4840211.74] | 0.112 | 0.4 | 10% | 28% |
| Benzene | 24 | 0.772 | 1.1 | [612734.01, 4840211.74] | 1.9 | 2.3 | 49% | 83% |
| | Annual(4) | 0.507 | 0.246 | [612763.12, 4840217.36] | 0.753 | 0.45 | 55% | **167%** |
| Benzo(a)pyrene | 24 | 1.16E-04 | 0.00064 | [613026.84, 4840101.05] | 0.0008 | 0.00005 | **1,280%** | **1,513%** |
| | Annual(4) | 1.01E-04 | 0.00014 | [613026.84, 4840101.05] | 0.0002 | 0.00001 | **1,400%** | **2,409%** |
| 1,3-Butadiene | 24 | 0.066 | 0.250 | [612734.01, 4840211.74] | 0.316 | 10 | 2% | 3% |
| | Annual(4) | 0.042 | 0.054 | [612763.12, 4840217.36] | 0.096 | 2 | 3% | 5% |
| Formaldehyde | 24 | 2.8 | 0.407 | [613146.47, 4840104.20] | 3.2 | 65 | 1% | 5% |

*Notes:* *(1) NO2 is represented using the MOVES emissions rate for NOX, converted to NO2 using the ozone limiting method (OLM)*

*(2) Air Quality Threshold for fine particulate (PM2.5) is based on the 98th percentile ambient measurement (24-hour), annually averaged over three years. This standard is referenced from the appropriate year of the Canadian Ambient Air Quality Standards (CAAQs): The CAAQs are voluntary objectives.*

*(3) 1 hour, 8 hour, and 24 hour ambient concentrations for the contaminants were obtained from the 90th percentile of hourly measurements from representative Air Quality monitoring stations. Annual ambient concentrations for the contaminants were obtained from the mean measurements from the representative Air Quality monitoring stations.*

*(4) Location of highest POI impact are shown in isopleth figures compiled in Appendix D. Note that annual maximum impacts reflected in Appendix D are a reflection of the average of all five years of meteorological data, rather than the highest predicted impact of each of the five year's individual annual average, as reflected in the table here.*

*(5) Exceedances to Air Quality thresholds are shown in* **red**

The contaminants which are predicted to exceed their associated Air Quality Thresholds are as follows:

1. $NO_2$: Within the 1-hr averaging period threshold, with relatively equal contributions from both the background ambient air quality and modelled concentration from the Highway 27-Woodbine Station source emissions. The location of highest impact is on the southern edge of the AQA Study Area as per Figure 1 in Appendix D.

2. $NO_2$: Within the annual averaging period threshold, with the greatest contribution from background ambient air quality data. The location of highest impact is on the southern edge of the AQA Study Area as per Figure 3 in Appendix D.

3. $PM_{10}$: Within the 24-hr averaging period threshold, with the greatest contribution from the modelled concentration from the Highway 27-Woodbine Station source emissions. The location of highest impact is on the southern edge of the AQA Study Area as per Figure 9 in Appendix D.

4. $PM_{2.5}$: Within the annual averaging period thresholds, with the greatest contribution from the background ambient air quality data. The location of highest impact is on the southern edge of the AQA Study Area as per Figure 11 in Appendix D.

5. Benzene: Within the annual averaging period threshold, with the greatest contribution from the background ambient air quality data. The location of highest impact is on the southern edge of the AQA Study Area as per Figure 16 in Appendix D.

6. Benzo(a)pyrene: Within the 24-hr and annual averaging period thresholds, with the greatest contribution from both the 24-hr and annual averaging period thresholds from the Highway 27-Woodbine Station source emissions. The location of highest impact is on the southern edge of the AQA Study Area as per Figures 17 and 18 in Appendix D.

In all cases with the exception of $NO_2$ in the 1-hr averaging period and $PM_{10}$ in the 24-hr averaging period, the background concentration was the major contributor in combination with the modelled concentration of each contaminant. In these cases, the ambient air data levels were measured above the AAQC or CAAQs Air Quality threshold.

The location of the maximum modelled concentration is illustrated in Figures 1 through 21 of **Appendix D**. The location of the maximum modeled concentration in 14 of the models was located at the southern border of the station boundary, south of the bus loop and PPUDO idling areas. Contaminants with a maximum modelled concentration on the southern boundary of the station include: formaldehyde, benzo(a)pyrene, particulate matter (both $PM_{2.5}$ and $PM_{10}$), sulphur dioxide, carbon monoxide, and nitrogen dioxide. The other location for the maximum modelled concentration of the remaining contaminants was along the north-western side of the station boundary, close to the west parking lot area of idling or vehicle starting emissions and emissions from any vehicles entering or exiting the west parking lot area.

**Table 6-2: Cumulative Concentrations – Future Build-Out Conditions (2031): R1**

| Contaminant | Averaging Period (hr) | Background Concentration (µg/m³) | Maximum Modelled Concentration (µg/m³) | Cumulative Concentration (µg/m³) | AAQC/ CAAQS Standard (µg/m³) | % of AAQC/ CAAQS Standard | Cumulative% of AAQC/ CAAQS Standard |
|---|---|---|---|---|---|---|---|
| $NO_2$ | 1 (2025) | 59 | 5.6 | 65 | 79 | 7% | 82% |
| | 24 | 49 | 2.4 | 51 | 200 | 1% | 25% |
| | Annual | 31 | 0.281 | 31 | 22.6 | 1% | **138%** |
| CO | 1 | 458 | 85 | 543 | 36200 | 0.2% | 1% |
| | 8 | 458 | 65 | 523 | 15700 | 0.4% | 3% |
| $SO_2$ | 1 | 4.7 | 0.126 | 4.8 | 100 | 0.1% | 5% |
| | 24 | 4.7 | 0.035 | 4.7 | 275 | 0.01% | 2% |
| | Annual (2025) | 2.1 | 0.004 | 2.1 | 10 | 0.04% | 21% |
| $PM_{10}$ | 24 | 30 | 2.6 | 32 | 50 | 5% | 65% |
| $PM_{2.5}$ | 24 (2020) | 16 | 0.468 | 16 | 27 | 2% | 61% |
| | Annual | 8.3 | 0.118 | 8.5 | 8.8 | 1% | 96% |
| Acetaldehyde | 24 | 2.0 | 0.041 | 2.0 | 500 | 0.01% | 0.4% |
| Acrolein | 1 | 0.072 | 0.007 | 0.079 | 4.5 | 0.2% | 2% |
| | 24 | 0.072 | 0.003 | 0.075 | 0.4 | 1% | 19% |
| Benzene | 24 | 0.772 | 0.066 | 0.838 | 2.3 | 3% | 36% |
| | Annual | 0.507 | 0.007 | 0.514 | 0.45 | 2% | **114%** |
| Benzo(a)pyrene | 24 | 1.16E-04 | 3.00E-05 | 0.0001 | 0.00005 | 60% | **293%** |
| | Annual | 1.01E-04 | 0.00E+00 | 0.0001 | 0.00001 | 0.00% | **1,009%** |

**Table 6-2: Cumulative Concentrations – Future Build-Out Conditions (2031): R1**

| Contaminant | Averaging Period (hr) | Background Concentration (µg/m$^3$) | Maximum Modelled Concentration (µg/m$^3$) | Cumulative Concentration (µg/m$^3$) | AAQC/ CAAQS Standard (µg/m$^3$) | % of AAQC/ CAAQS Standard | Cumulative% of AAQC/ CAAQS Standard |
|---|---|---|---|---|---|---|---|
| 1,3-Butadiene | 24 | 0.066 | 0.014 | 0.080 | 10 | 0.14% | 1% |
| | Annual | 0.042 | 0.002 | 0.043 | 2 | 0.08% | 2% |
| Formaldehyde | 24 | 2.8 | 0.037 | 2.8 | 65 | 0.06% | 4% |

*Notes: (1) $NO_2$ is represented using the MOVES emissions rate for $NO_X$, converted to $NO_2$ using the ozone limiting method (OLM)*

*(2) Air Quality Threshold for fine particulate ($PM_{2.5}$) is based on the 98$^{th}$ percentile ambient measurement (24-hour), annually averaged over three years. This standard is referenced from the appropriate year of the Canadian Ambient Air Quality Standards (CAAQs): The CAAQs are voluntary objectives.*

*(3) 1 hour, 8 hour, and 24 hour ambient concentrations for the contaminants were obtained from the 90th percentile of hourly measurements from representative Air Quality monitoring stations. Annual ambient concentrations for the contaminants were obtained from the mean measurements from the representative Air Quality monitoring stations*

*(4) Exceedances to Air Quality thresholds are shown in* **red**

The contaminants which are predicted to exceed their associated Air Quality Thresholds are as follows:

1. $NO_2$: Within the annual averaging period threshold, with the greatest contribution from background ambient air quality data.
2. Benzene: Within the annual averaging period thresholds, with the greatest contribution from background ambient air quality data.
3. Benzo(a)pyrene: Within the 24-hr and annual averaging period thresholds, with the greatest contribution from both the 24-hr and annual averaging period thresholds from the background ambient air quality data.

In all cases the background concentration was the major contributor in combination with the modelled concentration of each contaminant. In these cases, the ambient air data levels were measured above the AAQC or CAAQs Air Quality threshold.

To show the percent increase for the Future Build-Out of the Highway 27-Woodbine Station in comparison to the representative Existing Conditions and Future No-Build conditions, **Table 6-3** compares the cumulative concentration impacts at the discrete receptor R1 within the AQA Study Area against the background concentration values measured within the area for the last three years. Since sources of traffic emission exterior to the AQA Study Area and rail emissions from the Kitchener GO rail corridor were excluded from the modelling, the background concentrations values are representative of the worst-case Existing Conditions and Future Build-Out air quality for the Highway 27-Woodbine Station.

**Table 6-3: Comparison of HWS Cumulative POI Concentration and Representative Existing Conditions/Future No-Build Conditions (Ambient Background Concentrations)**

| Contaminant | Averaging Period (hr) | Representative Existing Conditions/ Future No-Build Conditions ($\mu g/m^3$) | Cumulative Concentration (R1) ($\mu g/m^3$) | % Increase |
|---|---|---|---|---|
| $NO_2$ | 1 (2025) | 59 | 65 | 10% |
| | 24 | 49 | 51 | 5% |
| | Annual | 31.0 | 31.3 | 1% |
| CO | 1 | 458 | 543 | 18% |
| | 8 | 458 | 523 | 14% |
| $SO_2$ | 1 | 4.71 | 4.84 | 3% |
| | 24 | 4.71 | 4.75 | 1% |
| | Annual (2025) | 2.1 | 2.1 | 0% |
| $PM_{10}$ | 24 | 30 | 32 | 9% |
| $PM_{2.5}$ | 24 (2020) | 16.0 | 16.5 | 3% |
| | Annual | 8.3 | 8.5 | 1% |
| Acetaldehyde | 24 | 1.99 | 2.04 | 2% |
| Acrolein | 1 | 0.072 | 0.079 | 10% |
| | 24 | 0.072 | 0.075 | 4% |
| Benzene | 24 | 0.772 | 0.838 | 9% |
| | Annual | 0.507 | 0.514 | 1% |
| Benzo(a)pyrene | 24 | 1.16E-04 | 1.46E-04 | 26% |
| | Annual | 1.01E-04 | 1.01E-04 | 0% |
| 1,3-Butadiene | 24 | 0.066 | 0.080 | 21% |
| | Annual | 0.042 | 0.043 | 4% |
| Formaldehyde | 24 | 2.8 | 2.8 | 1% |

### *6.1.2 Cumulative Frequency Analysis*

A cumulative frequency analysis was conducted to estimate the potential period of exposure for the predicted 24-hour averaged $PM_{10}$, and benzo (a) pyrene concentrations and the 1-hour averaged $NO_2$ concentrations for the worst-case impacted receptor as represented in **Table 6-1**. These contaminants are predicted to exceed their respective Air Quality thresholds at the most impacted receptor in the modelling.

Each of the following figures show the percentage of time the most impacted receptor is experiencing concentrations of $PM_{10}$, benzo (a) pyrene, and $NO_2$ from both the contribution from Highway 27-Woodbine Station and the background ambient air quality concentration, in relation to the respective air quality thresholds. These figures should be viewed as a visual aide representing the relative impacts from each of these contributing sources.

### *6.1.2.1 1-Hour Average $NO_2$ Impacts*

**Figure 6-1** shows the cumulative frequency analysis curve representing the percentage of time at which the most impacted receptor is experiencing any given concentration of $NO_2$ averaged over 1-hour, in relation to the Air Quality threshold.

The figure also illustrates the separate contribution of sources from the HWS and from the background Air Quality. The figure shows the following:

- HWS is contributing more than 40% of the cumulative concentration, less than 6% of the time.
- HWS is contributing less than 10% of the cumulative concentration, more than 30% of the time.
- The cumulative concentration is less than the AAQC Air Quality threshold of 79 µg/m$^3$ less than 15% of the time.

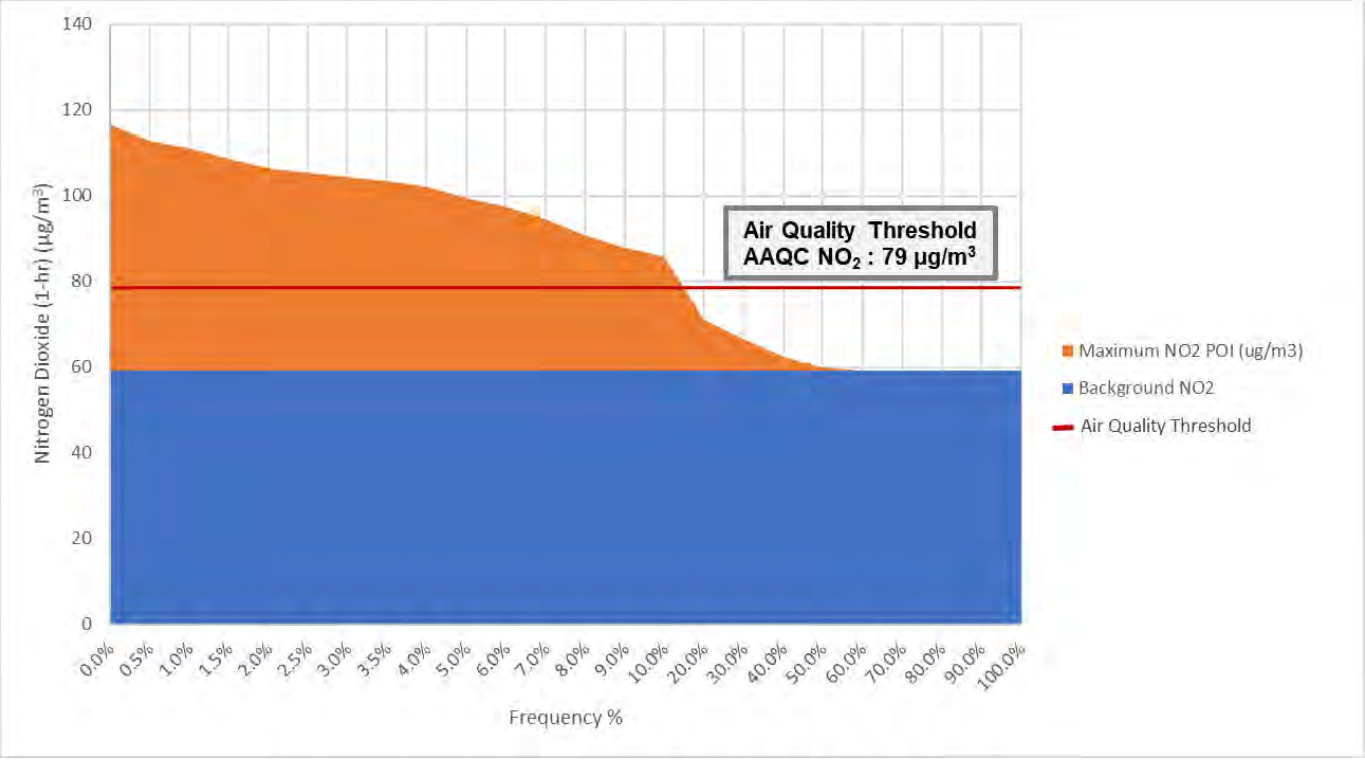



**Figure 6-1: Cumulative Frequency Analysis (Most Impacted Receptor) 1-hr $NO_2$**

### *6.1.2.2 24-Hour Average $PM_{10}$ Impacts*

**Figure 6-2** shows the cumulative frequency analysis curve representing the percentage of time at which the most impacted receptor is experiencing any given concentration of $PM_{10}$ averaged over 24-hours, in relation to the Air Quality threshold.

The figure also illustrates the separate contribution of sources from the HWS and from the background Air Quality. The figure shows the following:

- HWS is contributing more than 50% of the cumulative concentration, less than 30% of the time.
- HWS is contributing less than 10% of the cumulative concentration, more than 90% of the time.
- The cumulative concentration is less than the AAQC Air Quality threshold of 50 µg/m$^3$ 50% of the time.

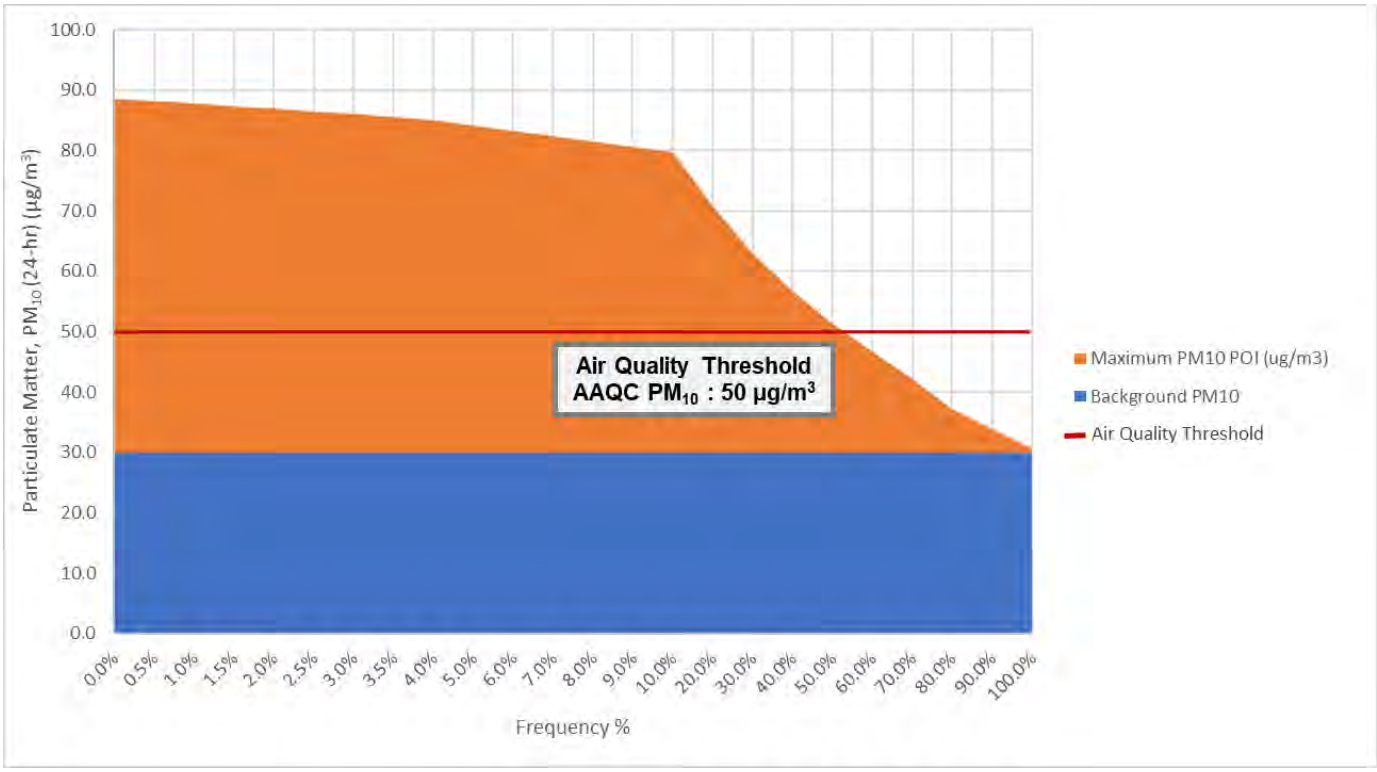



**Figure 6-2: Cumulative Frequency Analysis (Most Impacted Receptor) 24-hr $PM_{10}$**

### *6.1.2.3 24-Hour Average Benzo(a)Pyrene Impacts*

**Figure 6-3** shows the cumulative frequency analysis curve representing the percentage of time at which the most impacted receptor is experiencing any given concentration of benzo(a)pyrene averaged over 24-hours, in relation to the Air Quality threshold.

The figure also illustrates the separate contribution of sources from the HWS and from the background Air Quality. The figure shows the following:

- HWS is contributing more than 50% of the cumulative concentration, more than 60% of the time.
- HWS is contributing less than 10% of the cumulative concentration, more than 90% of the time.
- The cumulative concentration is more than the AAQC Air Quality threshold of 0.00005 µg/m$^3$ 100% of the time.

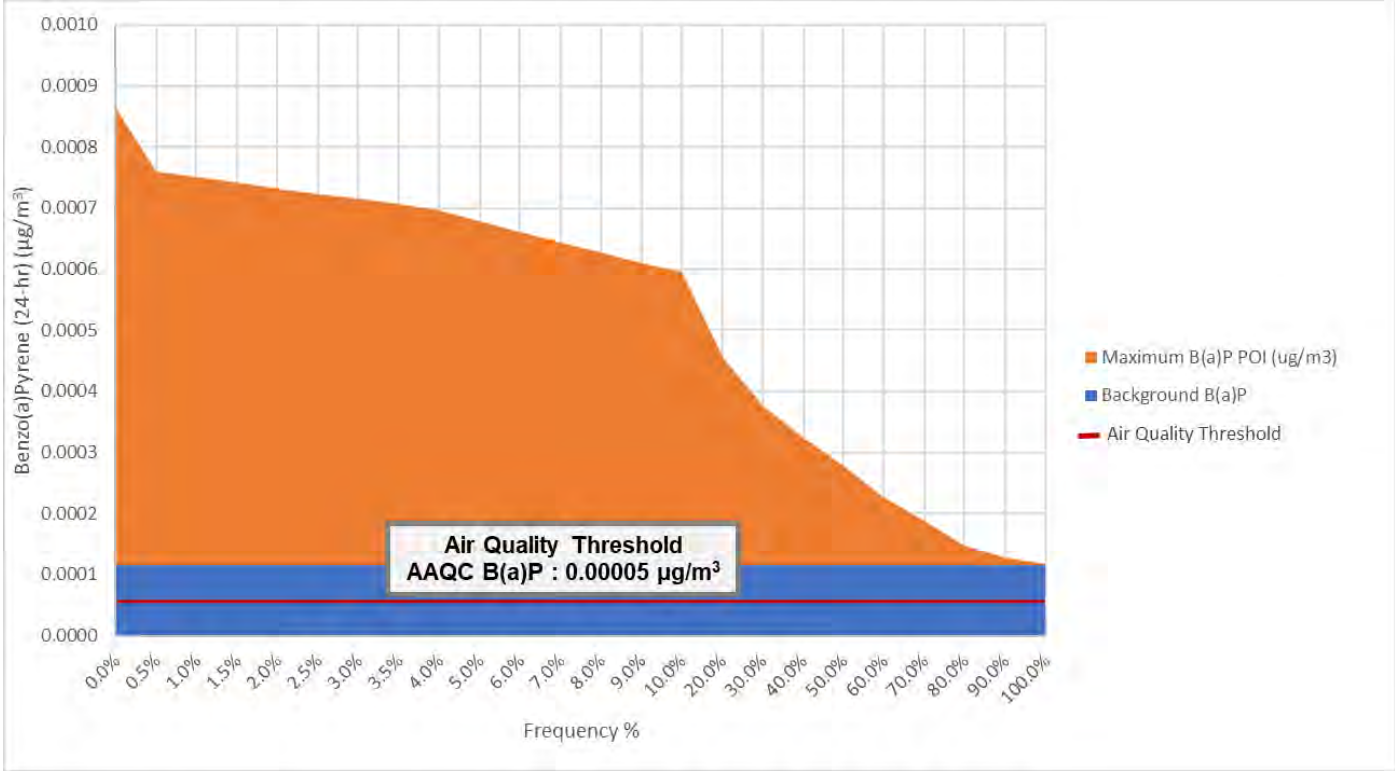



**Figure 6-3: Cumulative Frequency Analysis (Most Impacted Receptor) 24-hr B(a)P**

### *6.1.2.4 24-Hour Average Benzo(a)Pyrene Impacts: R1 – Woodbine Hotel*

**Figure 6-4** shows the cumulative frequency analysis curve representing the percentage of time at which the receptor located at the Woodbine Hotel is experiencing any given concentration of benzo(a)pyrene averaged over 24-hours, in relation to the Air Quality threshold.

The figure also illustrates the separate contribution of sources from the HWS and from the background Air Quality. The figure shows the following:

- HWS is contributing more than 20% of the cumulative concentration, less than 1% of the time.
- HWS is contributing less than 0% of the cumulative concentration, more than 50% of the time.
- The cumulative concentration is more than the AAQC Air Quality threshold of 0.00005 µg/m$^3$ 100% of the time.

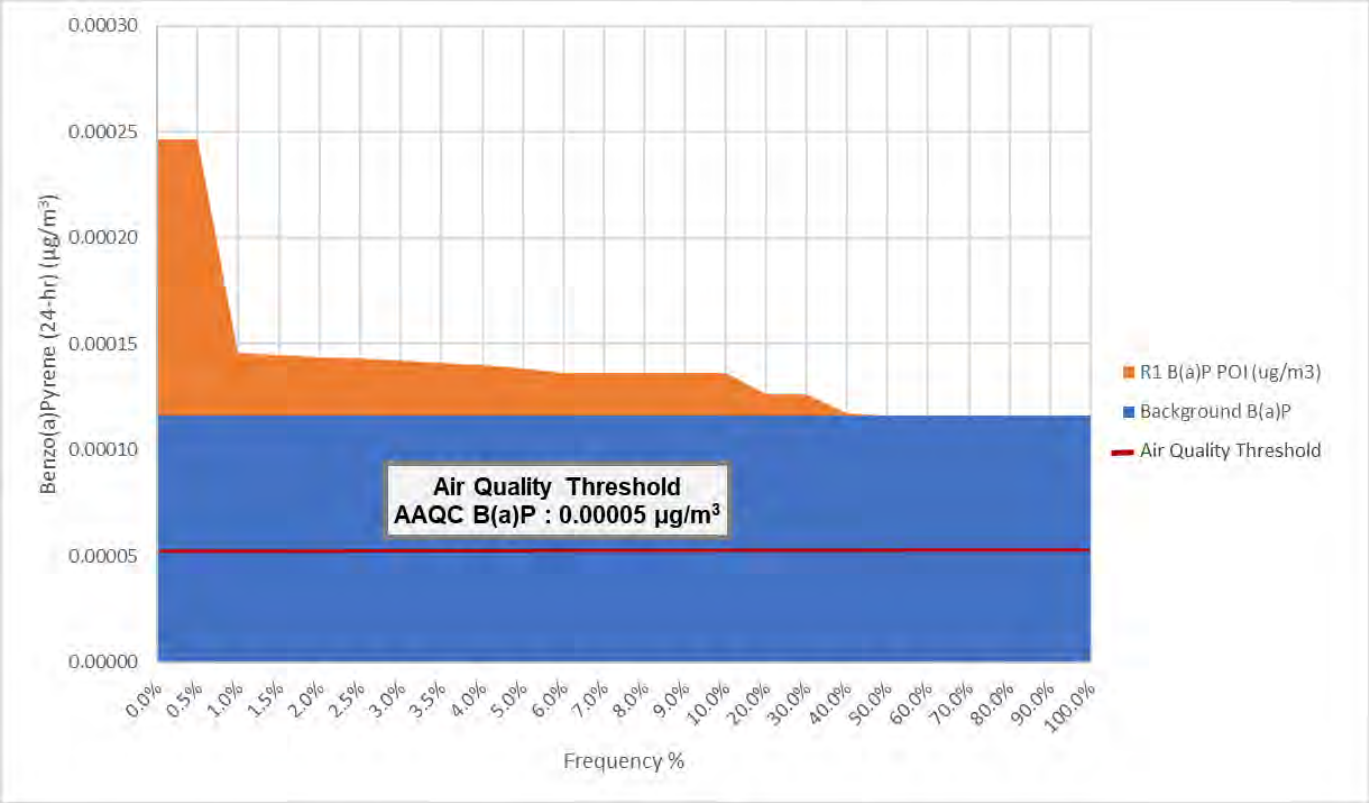



**Figure 6-4: Cumulative Frequency Analysis (R1 – Woodbine Hotel) 24-hr B(a)P**

## 6.2 Assessment of Modelling Results through "Regional Analysis"

An emission burden analysis was conducted to estimate the total annual amount of pollutants and GHG emissions from the Highway 27-Woodbine Station projected build-out in order to determine the station's regional impact. This analysis was conducted by comparing the net emissions from the station to the transportation sector emissions in Ontario and Canada. The analysis focused on criteria air contaminants $NO_2$, CO, $SO_2$, and $PM_{2.5}$ which are contributors to smog, as well as GHGs.

**Table 6-4** provides the relative contributions of the Highway 27-Woodbine Station to the Ontario and Canada transportation sector for similar sources, defined by the Environment Canada Air Pollutant Emission Inventory (APEI) as "Light duty gasoline vehicles."

**Table 6-4: Regional Emissions CAC Burden Analysis**

| Contaminant | Annual Emissions Build-Out (2031) (tonnes) | Mobile (Transportation) Emissions (2017) [1] | | Ontario Project Contributions | Canada Project Contributions |
|---|---|---|---|---|---|
| | | Ontario (2017) (tonnes) | Canada (2017) (tonnes) | | |
| $NO_X$ | 3.00E+00 | 14,485 | 44,000 | 0.02% | 0.01% |
| CO | 3.69E+01 | 163,124 | 490,000 | 0.02% | 0.01% |
| $SO_2$ | 6.35E-02 | 214 | 520 | 0.03% | 0.01% |
| $PM_{2.5}$ | 1.25E+00 | 351 | 1,100 | 0.36% | 0.11% |

## 6.3 GHG Assessment

Mobile vehicles emit the following GHGs in significant amounts:

- Carbon dioxide ($CO_2$);
- Methane ($CH_4$); and
- Nitrous oxide ($N_2O$).

Total GHG emissions were calculated using a combination of MOVES emission rates and total annual vehicle usage projections for the Highway 27-Woodbine Station sources of air quality contaminant emissions. MOVES is capable of calculating atmospheric carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$) emissions varying with vehicle class, speed, and emission process type (i.e., running emissions, starting emissions, etc.). Annual total GHG emissions were calculated by combining the grams per second (g/s) emission rates derived from MOVES County Scale output for each of the GHG pollutants with the projected annual source vehicle usage to extrapolate an annual emission.

Individual greenhouse gases have differing abilities to absorb heat in the atmosphere. These varying heat absorption properties are quantified by an individual global warming potential (GWP) factor for each contaminant which converts the mass of a GHG to the representative equivalent mass of $CO_2$ ($CO_{2\,eq}$). The GWPs are calculated based on the amount of heat trapping potential that would result from the emission of 1 kg of a given GHG to the emission of 1 kg of $CO_2$. GWPs for various GHG compounds are defined by Environment Canada in their *Technical Guidance on Reporting Greenhouse Gas Emissions* (2016) document, summarized for compounds of interest below in **Table 6-5**.

**Table 6-5: Greenhouse Gas 100-year GWP**

| Greenhouse Gas | 100-year GWP |
|---|---|
| Carbon dioxide ($CO_2$) | 1 |
| Methane ($CH_4$) | 25 |
| Nitrous oxide ($N_2O$) | 298 |

Currently there are no GHG emission standards in Canada or the United States on a per-source basis. However, Ontario's Climate Change Update, published in 2014[5], outlines GHG targets for various industrial sectors, including the Transportation sector. Figure 11 of the 2014 Climate Change Update report shows historical and projected

5. *Ministry of the Environment and Climate Change, 2017: "Ontario's Climate Change Update 2014" accessed March 24, 2017* https://dr6j45jk9xcmk.cloudfront.net/documents/3618/climate-change-report-2014.pdf

megatons (Mt) of $CO_{2\ eq}$ produced by the transportation sector. The Project contributions of GHG in the Air Quality Assessment year (2021) were compared to the projected $CO_{2\ eq}$ contributions from the Ontario Transportation sector, shown below in **Table 6-6**.

**Table 6-6: Greenhouse Gas Project Contribution Regional Assessment**

| Contaminant | Future Build-Out (2031) (Mt) [1] | Ontario 2031 Projected GHG Emissions for the Transportation Sector [3] (Mt CO2 eq.) | % Future Build-Out Project Contribution |
|---|---|---|---|
| $CO_2$ | 0.0092 | - | - |
| Methane ($CH_4$) | 9.50E-07 | - | - |
| Nitrous Oxide ($N_2O$) | 1.45E-07 | - | - |
| $CO_2$ equivalent [2] | 0.0093 | 56 | 0.02% |

*Notes: (1) Mt = Megatons*
*(2) $CO_{2\ eq}$. was calculated for the Build-Out Condition using GWP conversion for $N_2O$ and $CH_4$ (298 and 25, respectively)*
*(3) Ministry of the Environment and Climate Change: "Ontario's Climate Change Update, 2014", Figure 11, Page 23.*

As shown above in **Table 6-6** the Project GHG contributions are negligible compared to the total Transportation sector's projected 2031 $CO_{2eq}$ emissions.

## 6.4 Construction Air Quality Impacts

Construction activity creates and releases fine particulates and traces of other vapours (fugitive dust) into the surrounding community. Emissions from construction activity will be temporary and unlikely to have long-lasting effects on the surrounding area.

Fugitive dust emissions can result from movement of construction equipment and transport of materials to and from a construction site. Fugitive dust would generally be a problem during periods of intense construction activity and would be accentuated by windy and/or dry conditions.

Construction activities which potentially prove most impactful to the local Air Quality include, but are not limited to:

- Clearing and grubbing;
- Grading and rock blasting;
- Road and surface paving;
- Storage of granular material;
- Structure construction/deconstruction; and
- Mobile on-site equipment.

Construction activities will result in temporary traffic disruption and detour, which can lead to increased traffic congestion, thereby increasing motor vehicle exhaust emissions on nearby roadways, and could result in elevated localized pollutant concentrations.

Compared with emissions from other motor vehicle sources in the Air Quality Assessment Area, emissions from construction equipment and trucks are generally insignificant with respect to compliance with the Provincial and Federal ambient Air Quality standards.

#### *6.4.1.1 Construction Equipment and Vehicle Exhaust*

Environment Canada adopted amendments to the Off-Road Compression-Ignition Engine Emission Regulations which align Canadian emission standards with the U.S. EPA Tier 4 standards for non-road engines, including the emission limits, testing methods and effective dates. The Regulations Amending the Off-Road Compression-Ignition Engine Emission Regulations (the Amendments) impose stricter standards and new requirements starting with engines of the 2012 and later model years.

All equipment and vehicles should be kept properly maintained and repaired to minimize exhaust emissions, including odours.

Excessive idling of vehicles and equipment (greater than five minutes) should be minimized. Other potential mitigation measures may include the use of alternative-fuelled or electric equipment where feasible.

#### *6.4.1.2 Fugitive Dust*

Implementing good practices including wetting exposed earth areas; covering dust-producing materials during transport; and limiting construction activities during high wind conditions will minimize the impacts of fugitive dust. Potential mitigation measures that may be employed by the construction contractor to reduce fugitive dust issues include:

- Seeding, paving, covering, wetting, or otherwise treating disturbed soil surfaces;
- Minimizing storage and unnecessary transfers of spoils and debris on-site;
- Using wind screens or fences;
- Covering all truckloads of dust-producing material;
- Removing all loose or unsecured debris or materials from empty trucks prior to leaving the site;
- Reducing traffic speeds on any unpaved surfaces;
- Vacuum sweeping or watering of all paved surfaces and roadways on which equipment and truck traffic enter and leave the construction areas;
- Using wheel washes and truck washes at site egresses; and
- Modifying work schedules when weather conditions could lead to adverse impacts (e.g., very dry soil and high winds).

## 6.5 Summary of Potential Effects and Mitigation Measures

### *6.5.1 Proposed Mitigation for Construction Activity*

Exposure to construction-related emissions can be mitigated by the following:

- Ensuring all mobile equipment is in good condition, properly and regularly maintained, and compliant with applicable federal and provincial regulations for off-road diesel engines;
- Ensuring all machinery is maintained and operated in accordance with manufacturer’s specification;
- Locating stationary equipment (generators, compressors, etc.) as far away from sensitive receptors as practical;
- Minimizing idling time and posting signage to this effect around the construction site;
- Ensuring stationary and mobile equipment are not operated during early morning (before 6 AM, or sunrise) or evening periods (after 8 PM, or sunset) as often as practical;
- Implementing the use of non-chloride dust suppressants;
- Implementing a Dust Management Plan (DMP) for the duration of the construction phase, which includes practices to minimize fine particulate release from mobile equipment, materials handling, and wind erosion; and

- Ensuring that the areas most impacted by particulate levels are vegetated (i.e., tree planting) to reduce the cumulative particulate impacts.

Site supervisors during the construction phase should monitor the site for wind direction and weather conditions to ensure that high-impact activities be reduced when the wind is blowing consistently towards nearby sensitive receptors. The site supervisor should also monitor for visible fugitive dust and take action to determine the root-cause in order to counteract this. Specific details to this effect should be included in the construction site DMP. It is further recommended that mitigation measures detailed in "*Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities (March 2005)"* prepared by Cheminfo for Environment Canada be implemented, where practical.

### *6.5.2 Potential Mitigation for Project Contribution*

The individual impacts from the parking lot, PPUDO, and bus loop source emissions from the HWS on the local air quality are a result of contributions from both idling vehicles and low-speed travelling vehicles within the AQA Study Area. These emissions are in most cases comparatively low to the ambient background air quality levels measured within the region and are seen to dissipate dramatically with distance from the emission source, as all sources at the HWS are low-level release with little upward dispersion capacity.

Potential mitigation of the HWS emission impacts may be achieved by implementing an anti-idling or restricted idling policy within the PPUDO area and parking lots which would limit the number of minutes a vehicle is allowed to remain in idle during a passenger pick-up or drop-off. Electric vehicles and fuel-efficient vehicle implementation into an existing vehicle fleet will also provide significant CAC and GHG reduction in the short to medium term. The introduction and increasing popularity and affordability of hybrid and full electric vehicles, as well as transit authority led initiatives to increase the percentage of fuel efficient and hybrid busses within their vehicle fleet will continue to reduce emission impacts from vehicles using the HWS within the future.

As suggested within the construction mitigation section, areas affected by air born particulates may be benefited by introducing vegetation (*e.g.* trees, shrubbery, etc.) to help reduce cumulative particulate impacts during the operational phase.

The new facility will be screened for the requirement to obtain an approval from the Ministry of Environment, Conservation and Parks via an Environmental Compliance Approval (ECA) or an Environmental Activity and Sector Registration (EASR) during detailed design, which will include any on-site air emissions sources, such as emergency generators or similar NOx emitting sources.

# 7. Conclusion

AECOM Canada Limited (AECOM) was retained by Woodbine Entertainment Group (WEG) to conduct an Air Quality Assessment (AQA) as part of the proposed Highway 27-Woodbine Station Environmental Assessment (EA) (the Project), located at 555 Rexdale Boulevard in the City of Toronto. The AQA study is one of a number of environmental studies that will be completed as a part of the Transit Project Assessment Process (TPAP), under which project impacts will be assessed as prescribed in Ontario Regulation (O. Reg.) 231/08 under the *Environmental Assessment Act.* As part of the TPAP, an Environmental Project Report (EPR) will be prepared for public review and will include the findings of this AQA.

The AQA was conducted by establishing background ambient air quality levels using the closest most representative monitoring stations for all criteria air contaminants which were assumed to be representative of Existing Conditions and Future No-Build conditions for the Highway 27-Woodbine Station (HWS). The contributions from parking lot, passenger pick-up and drop-off (PPUDO), and bus loop vehicle idling starts, and low-speed on-site travel were assessed, modelled, and added to the established background conditions to predict Future Build-Out project cumulative impacts on the surrounding assessment area, which was taken as a 500 metre boundary from the project study area.

The modelled impacts were assessed at both the maximum point of impingement (POI) location within a grid of receptors representing any possible future sensitive receptor location and at the single discrete representative sensitive receptor location within the 500 metre assessment area which was identified as a hotel approximately 390 metres north of the station study area boundary. The maximum POI location was most often located directly on the southern boundary of the station study area.

The following contaminants were identified to have a modelled exceedance of the current or future Air Quality thresholds for the averaging periods identified below:

1. $NO_2$: Within the 1-hr averaging period threshold, with relatively equal contributions from both the background ambient air quality and modelled concentration from the Highway 27-Woodbine Station source emissions. The location of highest impact is on the southern edge of the AQA Study Area as per Figure 1 in Appendix D.
2. $NO_2$: Within the annual averaging period threshold, with the greatest contribution from background ambient air quality data. The location of highest impact is on the southern edge of the AQA Study Area as per Figure 3 in Appendix D.
3. $PM_{10}$: Within the 24-hr averaging period threshold, with the greatest contribution from the modelled concentration from the Highway 27-Woodbine Station source emissions. The location of highest impact is on the southern edge of the AQA Study Area as per Figure 9 in Appendix D.
4. $PM_{2.5}$: Within the annual averaging period thresholds, with the greatest contribution from the background ambient air quality data. The location of highest impact is on the southern edge of the AQA Study Area as per Figure 11 in Appendix D.
5. Benzene: Within the annual averaging period threshold, with the greatest contribution from the background ambient air quality data. The location of highest impact is on the southern edge of the AQA Study Area as per Figure 16 in Appendix D.
6. Benzo(a)pyrene: Within the 24-hr and annual averaging period thresholds, with the greatest contribution from both the 24-hr and annual averaging period thresholds from the Highway 27-Woodbine Station source

emissions. The location of highest impact is on the southern edge of the AQA Study Area as per Figures 17 and 18 in Appendix D.

These results were for the worst-case maximum POI location within a grid of receptors. Impacts at the identified discrete receptor in exceedance of the current or future Air Quality thresholds for their respective averaging periods are identified below:

1. $NO_2$: Within the annual averaging period threshold, with the greatest contribution from background ambient air quality data.
2. $PM_{2.5}$: Within the annual averaging period thresholds, with the greatest contribution from background ambient air quality data.
3. Benzene: Within the annual averaging period thresholds, with the greatest contribution from background ambient air quality data.
4. Benzo(a)pyrene: Within the 24-hr and annual averaging period thresholds, with the greatest contribution from both the 24-hr and annual averaging period thresholds from the background ambient air quality data.

A cumulative frequency analysis was conducted on contaminants exceeding the respective Air Quality thresholds for any averaging period other than the annual averaging period. The results of these cumulative frequency analyses include the following:

1. The cumulative concentration of $NO_2$ at the 1-hour averaging period is less than the AAQC Air Quality threshold of 79 µg/m$^3$ less than 15% of the time.
2. The cumulative concentration of $PM_{10}$ at the 24-hour averaging period is less than the AAQC Air Quality threshold of 50 µg/m$^3$ 50% of the time, however is also contributing less than 10% of the cumulative concentration more than 90% of the time.
3. The cumulative concentration of benzo(a)pyrene for the 24-hour averaging period is more than the AAQC Air Quality threshold of 0.00005 µg/m$^3$ 100% of the time, and is contributing more than 50% of the cumulative concentration more than 60% of the time.

Potential mitigation suggestions for the HWS emission contribution have been included in this report to potentially lessen the station impact to the local and regional air quality.

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# Appendix A

## Background Air Quality Monitoring Data

**Appendix A: Background Air Quality Monitoring Data**

***Summary of NAPS Monitoring Data for the Highway 27-Woodbine Station***

| | |
|---|---|
| NOx MW = | 46 |
| SO2 MW = | 64 |
| CO MW = | 28 |

1. 90th percentile data taken as representative background data concentration
2. Averaging periods selected according to AAQC standards (MECP) and CAAQ standards
3. Unit conversions carried out using standard U.S. EPA air quality methodology
4. Closest monitoring station (Toronto West, ID 60430) was taken as representative data set, unless missing
5. Next closest stations are: Etobicoke South (ID 60435), Gage Institute (ID 60427), Roadside Wallberg (ID 60439)
6. $PM_{10}$ 90th percentile calcualted from Lang et. all (2004)

| Contaminant | NAPS ID | Avg. Period | Units | 90th percentile (2014) | Annual Mean (2014) | 90th percentile (2015) | Annual Mean (2015) | 90th percentile (2016) | Annual Mean (2016) | 90th Percentile Max | 90th Percentile Average |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogen Oxides (NOx) | 60430 | 1-hr | µg/m3 | 59.1 | -- | 58.1 | -- | 57.6 | -- | 59.076 | 58.260 |
| | | 24-hr | µg/m3 | 48.5 | -- | 48.2 | -- | 45.5 | -- | 48.540 | 47.411 |
| | | Annual | µg/m3 | -- | 32.2 | -- | 31.2 | -- | 29.5 | 32.172 | 30.980 |
| Sulphur Dioxide ($SO_2$) | 60430 | 1-hr | µg/m3 | 3.9 | -- | 4.7 | -- | 3.1 | -- | 4.712 | 3.926 |
| | | 24-hr | µg/m3 | 3.7 | -- | 4.7 | -- | 2.9 | -- | 4.712 | 3.752 |
| | | Annual | µg/m3 | -- | 2.1 | -- | 2.6 | -- | 1.6 | 2.618 | 2.094 |
| Particulates ($PM_{2.5}$) | 60430 | 24-hr | µg/m3 | 15 | -- | 16 | -- | 12 | -- | 16.000 | 14.333 |
| | | Annual | µg/m3 | -- | 9 | -- | 9 | -- | 7 | 9.000 | 8.333 |
| ($PM_{10}$) [1] | 60430 | 24-hr | µg/m3 | 28 | -- | 30 | -- | 22 | -- | 29.630 | 26.543 |
| Carbon Monoxide (CO) | 60430 | 8-hr | µg/m3 | 458 | -- | 458 | -- | 344 | -- | 458.078 | 419.905 |
| | | 1-hr | µg/m3 | 458 | -- | 458 | -- | 458 | -- | 458.078 | 458.078 |
| Benzo(a)pyrene | 60430, | 24-hr | µg/m3 | 6.57E-05 | -- | 1.16E-04 | -- | 8.89E-05 | -- | 0.000 | 0.000 |
| | 60439, | Annual | µg/m3 | -- | 5.79E-05 | -- | 1.01E-04 | -- | 5.29E-05 | 1.01E-04 | 7.06E-05 |
| Formaldehyde | 60439 | 24 hr | µg/m3 | 2.801 | -- | 1.639 | -- | 2.599 | -- | 2.801 | 2.346 |
| | | Annual | µg/m3 | -- | 2.316 | -- | 0.829 | -- | 1.554 | 2.316 | 1.566 |
| Acetaldehyde | 60439 | 24 hr | µg/m3 | 1.532 | -- | 1.995 | -- | 1.654 | -- | 1.995 | 1.727 |
| | | Annual | µg/m3 | -- | 1.258 | -- | 1.111 | -- | 0.995 | 1.258 | 1.121 |
| Acrolein | 60439 | 24-hr | µg/m3 | 0.072 | -- | 0.070 | -- | 0.065 | -- | 0.072 | 0.069 |
| | | Annual | µg/m3 | -- | 0.059 | -- | 0.043 | -- | 0.038 | 0.059 | 0.047 |
| 1, 3-Butadiene | 60435 | 24-hr | µg/m3 | 0.064 | -- | 0.066 | -- | 0.051 | -- | 0.066 | 0.060 |
| | | Annual | µg/m3 | -- | 0.039 | -- | 0.047 | -- | 0.039 | 0.047 | 0.042 |
| Benzene | 60435 | 24-hr | µg/m3 | 0.772 | -- | 0.658 | -- | 0.765 | -- | 0.772 | 0.732 |
| | | Annual | µg/m3 | -- | 0.481 | -- | 0.542 | -- | 0.498 | 0.542 | 0.507 |

Notes:

[1] PM converesion from $PM_{2.5}$ to $PM_{10}$ of 0.54 is sourced from the Atmospheric Environment Journal issue 38 (2004), pg 5217-5226, "Estimation of historial annual PM2.5 exposures for health effects assessment" by Lall R., Kendall, M., Ito K., and Thurston G.

[2] US EPA conversion reference: Environmenal Science and Technology Briefs for Citizens "Understanding Units of Measurement"
https://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/display.files/fileid/14285

[5] CAAQ Standards for particulates, sulphur dioxide, and nitrogen oxides are found at the following links:
Particulates (PM2.5) https://www.ccme.ca/files/current_priorities/aqms_elements/caaqs_and_azmf.pdf
Sulphur Dioxide (SO2) https://www.ccme.ca/en/resources/air/air/sulphur-dioxide.html
Nitrogen Oxides (NOx) https://www.ccme.ca/en/current_priorities/air/caaqs.html

[6] The AAQC Standards from the MECP can be found at the following links:
https://www.ontario.ca/page/ontarios-ambient-air-quality-criteria-sorted-contaminant-name

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# Appendix B

## Emission Rate Inventory Summary

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 1-1: Emission Rate Summary (Maximum: HR 17)**

| Pollutant | Emission Rate (g/s) | | | |
|---|---|---|---|---|
| | AS1 | AS2 | LVS1 | LVS2 |
| | Parking Lot East | Parking Lot West | Entrance/Exit from Parking Lot East | Entrance/Exit from Parking Lot West |
| NOX | 0.037532514 | 0.024089636 | 0.000730965 | 0.000587504 |
| CO | 1.027326532 | 0.659372903 | 0.056948077 | 0.045771324 |
| SO2 | 6.20541E-05 | 3.98284E-05 | 8.19365E-05 | 6.58555E-05 |
| PM10 | 0.001426804 | 0.000915771 | 0.06076238 | 0.048837024 |
| PM2.5 | 0.0012623 | 0.000810187 | 0.014213608 | 0.011424014 |
| Acetaldehyde | 0.001369843 | 0.000879212 | 1.73413E-06 | 1.39378E-06 |
| Acrolein | 8.83556E-05 | 5.67096E-05 | 2.12871E-07 | 1.71093E-07 |
| Benzene | 0.002594987 | 0.001665551 | 1.56839E-05 | 1.26058E-05 |
| 1,3-Butadiene | 0.000586651 | 0.000376532 | 2.01561E-09 | 1.62002E-09 |
| Formaldehyde | 0.000709755 | 0.000455545 | 4.01806E-06 | 3.22947E-06 |
| Benzo(a)pyrene | 6.42108E-07 | 4.12126E-07 | 6.34377E-08 | 5.09873E-08 |
| CO2 | 9.296542287 | 5.966835164 | 12.26286955 | 9.856132225 |
| CH4 | 0.003876267 | 0.002487919 | 5.67704E-05 | 4.56285E-05 |
| N2O | 0.001544287 | 0.000991176 | 0.000114226 | 9.18078E-05 |

**Table 1-2: Annual Emissions Summary**

| Pollutant | Annual CAC Emissions (tonnes/year) | | | |
|---|---|---|---|---|
| | AS1 | AS2 | LVS1 | LVS2 |
| NOX | 2.78E-01 | 2.23E-01 | 8.00E-03 | 6.43E-03 |
| CO | 7.83E+00 | 6.27E+00 | 5.50E-01 | 4.42E-01 |
| SO2 | 4.60E-04 | 3.66E-04 | 8.65E-04 | 6.95E-04 |
| PM10 | 1.10E-02 | 8.77E-03 | 6.65E-01 | 5.34E-01 |
| PM2.5 | 9.77E-03 | 7.76E-03 | 1.56E-01 | 1.25E-01 |
| Acetaldehyde | 1.05E-02 | 8.35E-03 | 1.85E-05 | 1.49E-05 |
| Acrolein | 6.78E-04 | 5.38E-04 | 2.26E-06 | 1.82E-06 |
| Benzene | 2.00E-02 | 1.58E-02 | 1.67E-04 | 1.34E-04 |
| 1,3-Butadiene | 4.51E-03 | 3.58E-03 | 2.14E-08 | 1.72E-08 |
| Formaldehyde | 5.42E-03 | 4.31E-03 | 4.28E-05 | 3.44E-05 |
| Benzo(a)pyrene | 4.97E-06 | 3.95E-06 | 6.94E-07 | 5.58E-07 |
| CO2 | 6.98E+01 | 5.55E+01 | 1.29E+02 | 1.04E+02 |
| CH4 | 2.97E-02 | 2.36E-02 | 6.03E-04 | 4.85E-04 |
| N2O | 1.13E-02 | 9.04E-03 | 1.25E-03 | 1.00E-03 |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 2: Hourly Distribution (Period) & HWS Ridership**

| Hour | Hourly Distribution per Period (%) | Total Ridership | Number of Transit Stops at HWS |
|---|---|---|---|
| 1 | 15% | 360 | 10 |
| 2 | 5% | 132 | 4 |
| 3 | 0% | 0 | 0 |
| 4 | 0% | 0 | 0 |
| 5 | 0% | 0 | 0 |
| 6 | 13% | 228 | 6 |
| 7 | 28% | 495 | 13 |
| 8 | 27% | 478 | 13 |
| 9 | 32% | 568 | 15 |
| 10 | 15% | 534 | 15 |
| 11 | 14% | 506 | 14 |
| 12 | 15% | 534 | 15 |
| 13 | 14% | 506 | 14 |
| 14 | 15% | 534 | 15 |
| 15 | 15% | 534 | 15 |
| 16 | 15% | 534 | 15 |
| 17 | 36% | 602 | 17 |
| 18 | 32% | 534 | 15 |
| 19 | 32% | 534 | 15 |
| 20 | 18% | 433 | 12 |
| 21 | 16% | 388 | 11 |
| 22 | 16% | 388 | 11 |
| 23 | 16% | 388 | 11 |
| 24 | 15% | 360 | 10 |
| **MAX** | | **602** | **17** |

AM Peak Period = 5 AM - 9 AM
Mid-day Period = 9 AM - 4 PM
PM Peak Period = 4 PM - 7 PM
Evening Period = 7 PM - 2 AM

**Table 3: Number of Starts per Source per Hour**

| Hour | No. Starts (veh-start/hr) | |
|---|---|---|
| | AS1 | AS2 |
| | Parking Lot East | Parking Lot West |
| 1 | 51 | 33 |
| 2 | 19 | 12 |
| 3 | 0 | 0 |
| 4 | 0 | 0 |
| 5 | 0 | 0 |
| 6 | 0 | 0 |
| 7 | 0 | 0 |
| 8 | 0 | 0 |
| 9 | 0 | 0 |
| 10 | 51 | 65 |
| 11 | 48 | 62 |
| 12 | 51 | 65 |
| 13 | 48 | 62 |
| 14 | 51 | 65 |
| 15 | 51 | 65 |
| 16 | 51 | 65 |
| 17 | 251 | 161 |
| 18 | 223 | 143 |
| 19 | 223 | 143 |
| 20 | 62 | 40 |
| 21 | 55 | 35 |
| 22 | 55 | 35 |
| 23 | 55 | 35 |
| 24 | 51 | 33 |
| **MAX** | **251** | **161** |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 4: Source VKT per Hour**

| Hour | Veh-km travelled (VKT/hr) | |
|---|---|---|
| | LVS1 | LVS2 |
| | Entrance/Exit from Parking Lot East | Entrance/Exit from Parking Lot West |
| 1 | 34 | 27 |
| 2 | 13 | 10 |
| 3 | 0 | 0 |
| 4 | 0 | 0 |
| 5 | 0 | 0 |
| 6 | 60 | 48 |
| 7 | 130 | 105 |
| 8 | 126 | 101 |
| 9 | 149 | 120 |
| 10 | 34 | 27 |
| 11 | 32 | 26 |
| 12 | 34 | 27 |
| 13 | 32 | 26 |
| 14 | 34 | 27 |
| 15 | 34 | 27 |
| 16 | 34 | 27 |
| 17 | 167 | 135 |
| 18 | 149 | 120 |
| 19 | 149 | 120 |
| 20 | 41 | 33 |
| 21 | 37 | 30 |
| 22 | 37 | 30 |
| 23 | 37 | 30 |
| 24 | 34 | 27 |
| **MAX** | **167** | **135** |

AM Peak Period = 5 AM - 9 AM
Mid-day Period = 9 AM - 4 PM
PM Peak Period = 4 PM - 7 PM
Evening Period = 7 PM - 2 AM

**Table 5: Hourly Distribution (AERMOD INPUT)**

| Hour | Hourly Distribution Starts (%) | Hourly Distribution VKT (%) |
|---|---|---|
| 1 | 0.20 | 0.20 |
| 2 | 0.07 | 0.07 |
| 3 | 0.00 | 0.00 |
| 4 | 0.00 | 0.00 |
| 5 | 0.00 | 0.00 |
| 6 | 0.00 | 0.36 |
| 7 | 0.00 | 0.78 |
| 8 | 0.00 | 0.75 |
| 9 | 0.00 | 0.89 |
| 10 | 0.20 | 0.20 |
| 11 | 0.19 | 0.19 |
| 12 | 0.20 | 0.20 |
| 13 | 0.19 | 0.19 |
| 14 | 0.20 | 0.20 |
| 15 | 0.20 | 0.20 |
| 16 | 0.20 | 0.20 |
| 17 | 1.00 | 1.00 |
| 18 | 0.89 | 0.89 |
| 19 | 0.89 | 0.89 |
| 20 | 0.25 | 0.25 |
| 21 | 0.22 | 0.22 |
| 22 | 0.22 | 0.22 |
| 23 | 0.22 | 0.22 |
| 24 | 0.20 | 0.20 |
| **MAX HR** | **17** | **17** |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 6-9: Hourly Emission Rates**
**T6.1 - AS1: Parking Lot East**

| Hour | MOVES Emission Rate (g/start) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.554526 | 15.9727 | 0.0008149 | 0.0214491 | 0.0189759 | 0.0200532 | 0.0012918 | 0.0380238 | 0.0085967 | 0.0103355 | 9.6551E-06 | 122.083 | 0.0567476 | 0.0221068 |
| 2 | 0.554228 | 15.9497 | 0.0013355 | 0.0291769 | 0.0258126 | 0.0279022 | 0.0017899 | 0.0530679 | 0.0120008 | 0.0141341 | 1.3134E-05 | 200.076 | 0.0776693 | 0.0221068 |
| 3 | 0.557393 | 16.1962 | 0.0012452 | 0.0324164 | 0.0286785 | 0.0309014 | 0.0019733 | 0.0589635 | 0.0133375 | 0.0153601 | 1.4592E-05 | 186.56 | 0.0846017 | 0.0221068 |
| 4 | 0.559702 | 16.3789 | 0.0008844 | 0.0217817 | 0.01927 | 0.0196459 | 0.0012684 | 0.0371897 | 0.008407 | 0.0102202 | 9.8054E-06 | 132.5 | 0.0560672 | 0.0221068 |
| 5 | 0.561042 | 16.4863 | 0.0022049 | 0.0409795 | 0.0362541 | 0.0381558 | 0.0024462 | 0.0725984 | 0.0164181 | 0.0192838 | 1.8448E-05 | 330.333 | 0.106012 | 0.0221068 |
| 6 | 0.562905 | 16.6366 | 0.0021696 | 0.0403235 | 0.0356738 | 0.0375157 | 0.0024076 | 0.071328 | 0.0161298 | 0.0190402 | 1.8153E-05 | 325.05 | 0.104687 | 0.0221068 |
| 7 | 0.563501 | 16.6852 | 0.0021025 | 0.0391813 | 0.0346632 | 0.0364365 | 0.0023394 | 0.0692533 | 0.0156602 | 0.0185274 | 1.7639E-05 | 314.993 | 0.101874 | 0.0221068 |
| 8 | 0.563203 | 16.6609 | 0.0021642 | 0.0402027 | 0.0355669 | 0.0376648 | 0.0024176 | 0.0716042 | 0.0161921 | 0.0191272 | 1.8099E-05 | 324.245 | 0.105189 | 0.0221068 |
| 9 | 0.563873 | 16.7155 | 0.0015953 | 0.0316678 | 0.0280162 | 0.0295348 | 0.0019003 | 0.0560514 | 0.0126734 | 0.0151472 | 1.4257E-05 | 239.004 | 0.0832808 | 0.0221068 |
| 10 | 0.56 | 16.4027 | 0.0011283 | 0.0252647 | 0.0223515 | 0.0239898 | 0.0015447 | 0.0455019 | 0.0102876 | 0.0123434 | 1.1374E-05 | 169.047 | 0.0678577 | 0.0221068 |
| 11 | 0.553707 | 15.9096 | 0.0009756 | 0.0226713 | 0.0200572 | 0.021366 | 0.0013777 | 0.0404837 | 0.0091523 | 0.0110572 | 1.0205E-05 | 146.162 | 0.060655 | 0.0221068 |
| 12 | 0.547973 | 15.476 | 0.0008871 | 0.021107 | 0.0186733 | 0.0200504 | 0.0012932 | 0.0379839 | 0.0085871 | 0.0103871 | 9.5003E-06 | 132.905 | 0.0569021 | 0.0221068 |
| 13 | 0.541941 | 15.0356 | 0.0007642 | 0.0189466 | 0.016762 | 0.0180353 | 0.0011649 | 0.0341318 | 0.0077156 | 0.0093963 | 8.5272E-06 | 114.487 | 0.0513801 | 0.0221068 |
| 14 | 0.537621 | 14.7299 | 0.0007019 | 0.0176332 | 0.0156001 | 0.0169742 | 0.0010973 | 0.0321021 | 0.0072564 | 0.0088763 | 7.9355E-06 | 105.147 | 0.048481 | 0.0221068 |
| 15 | 0.534716 | 14.5287 | 0.0008752 | 0.0202331 | 0.0179003 | 0.0195384 | 0.0012601 | 0.037017 | 0.0083685 | 0.0101174 | 9.1052E-06 | 131.122 | 0.055227 | 0.0221068 |
| 16 | 0.535163 | 14.5594 | 0.000751 | 0.0178383 | 0.0157816 | 0.0170034 | 0.0011 | 0.0321416 | 0.0072651 | 0.0089158 | 8.0275E-06 | 112.512 | 0.0486258 | 0.0221068 |
| 17 | 0.537286 | 14.7064 | 0.0008883 | 0.020425 | 0.0180701 | 0.0196096 | 0.0012648 | 0.0371478 | 0.008398 | 0.0101603 | 9.1919E-06 | 133.082 | 0.0554896 | 0.0221068 |
| 18 | 0.54317 | 15.1241 | 0.0009415 | 0.0216001 | 0.0191097 | 0.0205087 | 0.0013221 | 0.0388672 | 0.008787 | 0.0106013 | 9.7216E-06 | 141.05 | 0.0579918 | 0.0221068 |
| 19 | 0.548345 | 15.5038 | 0.0008813 | 0.0218457 | 0.0193268 | 0.0208161 | 0.0013402 | 0.0394853 | 0.0089274 | 0.0107061 | 9.8328E-06 | 132.035 | 0.0586967 | 0.0221068 |
| 20 | 0.550654 | 15.6768 | 0.0008179 | 0.0217621 | 0.0192528 | 0.0210564 | 0.0013538 | 0.0399811 | 0.0090402 | 0.0107681 | 9.7955E-06 | 122.531 | 0.0591447 | 0.0221068 |
| 21 | 0.552664 | 15.8296 | 0.0008991 | 0.0233402 | 0.020649 | 0.0223779 | 0.0014375 | 0.0425186 | 0.0096145 | 0.0114007 | 1.0506E-05 | 134.696 | 0.0626411 | 0.0221068 |
| 22 | 0.555531 | 16.0506 | 0.0008916 | 0.0232523 | 0.0205713 | 0.0218181 | 0.0014024 | 0.0414347 | 0.009369 | 0.0111464 | 1.0467E-05 | 133.58 | 0.0612464 | 0.0221068 |
| 23 | 0.560558 | 16.4474 | 0.0010254 | 0.0252941 | 0.0223775 | 0.0239359 | 0.0015369 | 0.0454937 | 0.0102874 | 0.0121719 | 1.1387E-05 | 153.628 | 0.0669956 | 0.0221068 |
| 24 | 0.560558 | 16.4474 | 0.0010254 | 0.0252941 | 0.0223775 | 0.0239359 | 0.0015369 | 0.0454937 | 0.0102874 | 0.0121719 | 1.1387E-05 | 204.464 | 0.0669956 | 0.0221068 |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 6-9: Hourly Emission Rates**
**T6.2 - AS1: Parking Lot East**

| Hour | Emission Rate (g/s) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0079024 | 0.2276224 | 1.161E-05 | 0.000305665 | 0.00027042 | 0.0002858 | 1.841E-05 | 0.0005419 | 0.0001225 | 0.0001473 | 1.3759E-07 | 1.73977 | 0.0008087 | 0.000315 |
| 2 | 0.002896 | 0.0833414 | 6.978E-06 | 0.000152457 | 0.000134878 | 0.0001458 | 9.352E-06 | 0.0002773 | 6.271E-05 | 7.385E-05 | 6.8627E-08 | 1.0454495 | 0.0004058 | 0.0001155 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0.0078735 | 0.2306193 | 1.586E-05 | 0.000355218 | 0.000314259 | 0.0003373 | 2.172E-05 | 0.0006397 | 0.0001446 | 0.0001735 | 1.5991E-07 | 2.3767739 | 0.0009541 | 0.0003108 |
| 11 | 0.0073768 | 0.2119576 | 1.3E-05 | 0.000302041 | 0.000267214 | 0.0002847 | 1.835E-05 | 0.0005393 | 0.0001219 | 0.0001473 | 1.3596E-07 | 1.9472609 | 0.0008081 | 0.0002945 |
| 12 | 0.0077044 | 0.2175901 | 1.247E-05 | 0.000296761 | 0.000262544 | 0.0002819 | 1.818E-05 | 0.000534 | 0.0001207 | 0.000146 | 1.3357E-07 | 1.8686231 | 0.0008 | 0.0003108 |
| 13 | 0.0072201 | 0.2003136 | 1.018E-05 | 0.000252418 | 0.000223314 | 0.0002403 | 1.552E-05 | 0.0004547 | 0.0001028 | 0.0001252 | 1.136E-07 | 1.5252669 | 0.0006845 | 0.0002945 |
| 14 | 0.0075589 | 0.2071 | 9.868E-06 | 0.00024792 | 0.000219335 | 0.0002387 | 1.543E-05 | 0.0004514 | 0.000102 | 0.0001248 | 1.1157E-07 | 1.4783501 | 0.0006816 | 0.0003108 |
| 15 | 0.007518 | 0.2042712 | 1.231E-05 | 0.000284474 | 0.000251675 | 0.0002747 | 1.772E-05 | 0.0005205 | 0.0001177 | 0.0001422 | 1.2802E-07 | 1.8435544 | 0.0007765 | 0.0003108 |
| 16 | 0.0075243 | 0.2047028 | 1.056E-05 | 0.000250804 | 0.000221887 | 0.0002391 | 1.547E-05 | 0.0004519 | 0.0001021 | 0.0001254 | 1.1287E-07 | 1.5819008 | 0.0006837 | 0.0003108 |
| **17** | **0.0375325** | **1.0273265** | **6.205E-05** | **0.001426804** | **0.0012623** | **0.0013698** | **8.836E-05** | **0.002595** | **0.0005867** | **0.0007098** | **6.4211E-07** | **9.2965423** | **0.0038763** | **0.0015443** |
| 18 | 0.0336855 | 0.9379448 | 5.839E-05 | 0.001339564 | 0.001185118 | 0.0012719 | 8.199E-05 | 0.0024104 | 0.0005449 | 0.0006575 | 6.029E-07 | 8.7474375 | 0.0035965 | 0.001371 |
| 19 | 0.0340065 | 0.9614925 | 5.466E-05 | 0.001354795 | 0.001198582 | 0.0012909 | 8.312E-05 | 0.0024487 | 0.0005536 | 0.000664 | 6.098E-07 | 8.1883581 | 0.0036402 | 0.001371 |
| 20 | 0.0094385 | 0.2687073 | 1.402E-05 | 0.000373012 | 0.000330002 | 0.0003609 | 2.32E-05 | 0.0006853 | 0.000155 | 0.0001846 | 1.679E-07 | 2.1002356 | 0.0010138 | 0.0003789 |
| 21 | 0.0084884 | 0.2431285 | 1.381E-05 | 0.000358485 | 0.00031715 | 0.0003437 | 2.208E-05 | 0.000653 | 0.0001477 | 0.0001751 | 1.6136E-07 | 2.0688098 | 0.0009621 | 0.0003395 |
| 22 | 0.0085325 | 0.2465228 | 1.369E-05 | 0.000357134 | 0.000315957 | 0.0003351 | 2.154E-05 | 0.0006364 | 0.0001439 | 0.0001712 | 1.6076E-07 | 2.051669 | 0.0009407 | 0.0003395 |
| 23 | 0.0086097 | 0.2526173 | 1.575E-05 | 0.000388495 | 0.000343698 | 0.0003676 | 2.36E-05 | 0.0006987 | 0.000158 | 0.0001869 | 1.7489E-07 | 2.3595884 | 0.001029 | 0.0003395 |
| 24 | 0.0079884 | 0.2343872 | 1.461E-05 | 0.000360459 | 0.000318895 | 0.0003411 | 2.19E-05 | 0.0006483 | 0.0001466 | 0.0001735 | 1.6227E-07 | 2.9137581 | 0.0009547 | 0.000315 |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 6-9: Hourly Emission Rates**
**T6.3 - AS1: Parking Lot East**

| Hour | Annual Emissions (tonnes/year) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0103837 | 0.2990958 | 1.526E-05 | 0.000401644 | 0.000355332 | 0.0003755 | 2.419E-05 | 0.000712 | 0.000161 | 0.0001935 | 1.808E-07 | 2.2860578 | 0.0010626 | 0.000414 |
| 2 | 0.0038053 | 0.1095105 | 9.169E-06 | 0.000200328 | 0.000177229 | 0.0001916 | 1.229E-05 | 0.0003644 | 8.24E-05 | 9.704E-05 | 9.0175E-08 | 1.3737207 | 0.0005333 | 0.0001518 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0.0103458 | 0.3030338 | 2.085E-05 | 0.000466756 | 0.000412936 | 0.0004432 | 2.854E-05 | 0.0008406 | 0.0001901 | 0.000228 | 2.1012E-07 | 3.1230809 | 0.0012536 | 0.0004084 |
| 11 | 0.0096932 | 0.2785122 | 1.708E-05 | 0.000396882 | 0.00035112 | 0.000374 | 2.412E-05 | 0.0007087 | 0.0001602 | 0.0001936 | 1.7865E-07 | 2.5587008 | 0.0010618 | 0.000387 |
| 12 | 0.0101236 | 0.2859134 | 1.639E-05 | 0.000389944 | 0.000344982 | 0.0003704 | 2.389E-05 | 0.0007017 | 0.0001586 | 0.0001919 | 1.7551E-07 | 2.4553708 | 0.0010512 | 0.0004084 |
| 13 | 0.0094872 | 0.2632121 | 1.338E-05 | 0.000331678 | 0.000293434 | 0.0003157 | 2.039E-05 | 0.0005975 | 0.0001351 | 0.0001645 | 1.4928E-07 | 2.0042007 | 0.0008995 | 0.000387 |
| 14 | 0.0099323 | 0.2721295 | 1.297E-05 | 0.000325767 | 0.000288206 | 0.0003136 | 2.027E-05 | 0.0005931 | 0.0001341 | 0.000164 | 1.4661E-07 | 1.942552 | 0.0008957 | 0.0004084 |
| 15 | 0.0098787 | 0.2684124 | 1.617E-05 | 0.000373799 | 0.000330701 | 0.000361 | 2.328E-05 | 0.0006839 | 0.0001546 | 0.0001869 | 1.6821E-07 | 2.4224305 | 0.0010203 | 0.0004084 |
| 16 | 0.0098869 | 0.2689795 | 1.387E-05 | 0.000329556 | 0.000291559 | 0.0003141 | 2.032E-05 | 0.0005938 | 0.0001342 | 0.0001647 | 1.4831E-07 | 2.0786176 | 0.0008983 | 0.0004084 |
| 17 | 0.0493177 | 1.3499071 | 8.154E-05 | 0.00187482 | 0.001658663 | 0.0018 | 0.0001161 | 0.0034098 | 0.0007709 | 0.0009326 | 8.4373E-07 | 12.215657 | 0.0050934 | 0.0020292 |
| 18 | 0.0442628 | 1.2324595 | 7.672E-05 | 0.001760187 | 0.001557245 | 0.0016712 | 0.0001077 | 0.0031673 | 0.0007161 | 0.0008639 | 7.9221E-07 | 11.494133 | 0.0047257 | 0.0018015 |
| 19 | 0.0446845 | 1.2634012 | 7.182E-05 | 0.001780201 | 0.001574937 | 0.0016963 | 0.0001092 | 0.0032176 | 0.0007275 | 0.0008724 | 8.0127E-07 | 10.759502 | 0.0047832 | 0.0018015 |
| 20 | 0.0124021 | 0.3530814 | 1.842E-05 | 0.000490138 | 0.000433622 | 0.0004742 | 3.049E-05 | 0.0009005 | 0.0002036 | 0.0002425 | 2.2062E-07 | 2.7597096 | 0.0013321 | 0.0004979 |
| 21 | 0.0111538 | 0.3194708 | 1.814E-05 | 0.000471049 | 0.000416735 | 0.0004516 | 2.901E-05 | 0.0008581 | 0.000194 | 0.0002301 | 2.1203E-07 | 2.7184161 | 0.0012642 | 0.0004462 |
| 22 | 0.0112116 | 0.323931 | 1.799E-05 | 0.000469275 | 0.000415167 | 0.0004403 | 2.83E-05 | 0.0008362 | 0.0001891 | 0.000225 | 2.1124E-07 | 2.6958931 | 0.0012361 | 0.0004462 |
| 23 | 0.0113131 | 0.3319392 | 2.069E-05 | 0.000510482 | 0.00045162 | 0.0004831 | 3.102E-05 | 0.0009181 | 0.0002076 | 0.0002457 | 2.2981E-07 | 3.1004991 | 0.0013521 | 0.0004462 |
| 24 | 0.0104967 | 0.3079848 | 1.92E-05 | 0.000473643 | 0.000419029 | 0.0004482 | 2.878E-05 | 0.0008519 | 0.0001926 | 0.0002279 | 2.1322E-07 | 3.8286782 | 0.0012545 | 0.000414 |
| **SUM** | **0.2783792** | **7.8309741** | **0.0004597** | **0.011046149** | **0.009772517** | **0.0105242** | **0.0006779** | **0.0199553** | **0.0045116** | **0.0054243** | **4.9718E-06** | **69.81722** | **0.0297177** | **0.0112643** |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 6-9: Hourly Emission Rates**
**T7.1 - AS2: Parking Lot West**

| Hour | MOVES Emission Rate (g/start) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.554526 | 15.9727 | 0.0008149 | 0.0214491 | 0.0189759 | 0.0200532 | 0.0012918 | 0.0380238 | 0.0085967 | 0.0103355 | 9.6551E-06 | 122.083 | 0.0567476 | 0.0221068 |
| 2 | 0.554228 | 15.9497 | 0.0013355 | 0.0291769 | 0.0258126 | 0.0279022 | 0.0017899 | 0.0530679 | 0.0120008 | 0.0141341 | 1.3134E-05 | 200.076 | 0.0776693 | 0.0221068 |
| 3 | 0.557393 | 16.1962 | 0.0012452 | 0.0324164 | 0.0286785 | 0.0309014 | 0.0019733 | 0.0589635 | 0.0133375 | 0.0153601 | 1.4592E-05 | 186.56 | 0.0846017 | 0.0221068 |
| 4 | 0.559702 | 16.3789 | 0.0008844 | 0.0217817 | 0.01927 | 0.0196459 | 0.0012684 | 0.0371897 | 0.008407 | 0.0102202 | 9.8054E-06 | 132.5 | 0.0560672 | 0.0221068 |
| 5 | 0.561042 | 16.4863 | 0.0022049 | 0.0409795 | 0.0362541 | 0.0381558 | 0.0024462 | 0.0725984 | 0.0164181 | 0.0192838 | 1.8448E-05 | 330.333 | 0.106012 | 0.0221068 |
| 6 | 0.562905 | 16.6366 | 0.0021696 | 0.0403235 | 0.0356738 | 0.0375157 | 0.0024076 | 0.071328 | 0.0161298 | 0.0190402 | 1.8153E-05 | 325.05 | 0.104687 | 0.0221068 |
| 7 | 0.563501 | 16.6852 | 0.0021025 | 0.0391813 | 0.0346632 | 0.0364365 | 0.0023394 | 0.0692533 | 0.0156602 | 0.0185274 | 1.7639E-05 | 314.993 | 0.101874 | 0.0221068 |
| 8 | 0.563203 | 16.6609 | 0.0021642 | 0.0402027 | 0.0355669 | 0.0376648 | 0.0024176 | 0.0716042 | 0.0161921 | 0.0191272 | 1.8099E-05 | 324.245 | 0.105189 | 0.0221068 |
| 9 | 0.563873 | 16.7155 | 0.0015953 | 0.0316678 | 0.0280162 | 0.0295348 | 0.0019003 | 0.0560514 | 0.0126734 | 0.0151472 | 1.4257E-05 | 239.004 | 0.0832808 | 0.0221068 |
| 10 | 0.56 | 16.4027 | 0.0011283 | 0.0252647 | 0.0223515 | 0.0239898 | 0.0015447 | 0.0455019 | 0.0102876 | 0.0123434 | 1.1374E-05 | 169.047 | 0.0678577 | 0.0221068 |
| 11 | 0.553707 | 15.9096 | 0.0009756 | 0.0226713 | 0.0200572 | 0.021366 | 0.0013777 | 0.0404837 | 0.0091523 | 0.0110572 | 1.0205E-05 | 146.162 | 0.060655 | 0.0221068 |
| 12 | 0.547973 | 15.476 | 0.0008871 | 0.021107 | 0.0186733 | 0.0200504 | 0.0012932 | 0.0379839 | 0.0085871 | 0.0103871 | 9.5003E-06 | 132.905 | 0.0569021 | 0.0221068 |
| 13 | 0.541941 | 15.0356 | 0.0007642 | 0.0189466 | 0.016762 | 0.0180353 | 0.0011649 | 0.0341318 | 0.0077156 | 0.0093963 | 8.5272E-06 | 114.487 | 0.0513801 | 0.0221068 |
| 14 | 0.537621 | 14.7299 | 0.0007019 | 0.0176332 | 0.0156001 | 0.0169742 | 0.0010973 | 0.0321021 | 0.0072564 | 0.0088763 | 7.9355E-06 | 105.147 | 0.048481 | 0.0221068 |
| 15 | 0.534716 | 14.5287 | 0.0008752 | 0.0202331 | 0.0179003 | 0.0195384 | 0.0012601 | 0.037017 | 0.0083685 | 0.0101174 | 9.1052E-06 | 131.122 | 0.055227 | 0.0221068 |
| 16 | 0.535163 | 14.5594 | 0.000751 | 0.0178383 | 0.0157816 | 0.0170034 | 0.0011 | 0.0321416 | 0.0072651 | 0.0089158 | 8.0275E-06 | 112.512 | 0.0486258 | 0.0221068 |
| 17 | 0.537286 | 14.7064 | 0.0008883 | 0.020425 | 0.0180701 | 0.0196096 | 0.0012648 | 0.0371478 | 0.008398 | 0.0101603 | 9.1919E-06 | 133.082 | 0.0554896 | 0.0221068 |
| 18 | 0.54317 | 15.1241 | 0.0009415 | 0.0216001 | 0.0191097 | 0.0205087 | 0.0013221 | 0.0388672 | 0.008787 | 0.0106013 | 9.7216E-06 | 141.05 | 0.0579918 | 0.0221068 |
| 19 | 0.548345 | 15.5038 | 0.0008813 | 0.0218457 | 0.0193268 | 0.0208161 | 0.0013402 | 0.0394853 | 0.0089274 | 0.0107061 | 9.8328E-06 | 132.035 | 0.0586967 | 0.0221068 |
| 20 | 0.550654 | 15.6768 | 0.0008179 | 0.0217621 | 0.0192528 | 0.0210564 | 0.0013538 | 0.0399811 | 0.0090402 | 0.0107681 | 9.7955E-06 | 122.531 | 0.0591447 | 0.0221068 |
| 21 | 0.552664 | 15.8296 | 0.0008991 | 0.0233402 | 0.020649 | 0.0223779 | 0.0014375 | 0.0425186 | 0.0096145 | 0.0114007 | 1.0506E-05 | 134.696 | 0.0626411 | 0.0221068 |
| 22 | 0.555531 | 16.0506 | 0.0008916 | 0.0232523 | 0.0205713 | 0.0218181 | 0.0014024 | 0.0414347 | 0.009369 | 0.0111464 | 1.0467E-05 | 133.58 | 0.0612464 | 0.0221068 |
| 23 | 0.560558 | 16.4474 | 0.0010254 | 0.0252941 | 0.0223775 | 0.0239359 | 0.0015369 | 0.0454937 | 0.0102874 | 0.0121719 | 1.1387E-05 | 153.628 | 0.0669956 | 0.0221068 |
| 24 | 0.560558 | 16.4474 | 0.0010254 | 0.0252941 | 0.0223775 | 0.0239359 | 0.0015369 | 0.0454937 | 0.0102874 | 0.0121719 | 1.1387E-05 | 204.464 | 0.0669956 | 0.0221068 |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 6-9: Hourly Emission Rates**
**T7.2 - AS2: Parking Lot West**

| Hour | Emission Rate (g/s) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.005072 | 0.1460957 | 7.453E-06 | 0.000196186 | 0.000173565 | 0.0001834 | 1.182E-05 | 0.0003478 | 7.863E-05 | 9.453E-05 | 8.8311E-08 | 1.1166432 | 0.000519 | 0.0002022 |
| 2 | 0.0018587 | 0.0534913 | 4.479E-06 | 9.7852E-05 | 8.6569E-05 | 9.358E-05 | 6.003E-06 | 0.000178 | 4.025E-05 | 4.74E-05 | 4.4047E-08 | 0.6710049 | 0.0002605 | 7.414E-05 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0.010107 | 0.2960386 | 2.036E-05 | 0.000455981 | 0.000403403 | 0.000433 | 2.788E-05 | 0.0008212 | 0.0001857 | 0.0002228 | 2.0527E-07 | 3.0509877 | 0.0012247 | 0.000399 |
| 11 | 0.0094694 | 0.2720831 | 1.668E-05 | 0.00038772 | 0.000343015 | 0.0003654 | 2.356E-05 | 0.0006923 | 0.0001565 | 0.0001891 | 1.7453E-07 | 2.4996357 | 0.0010373 | 0.0003781 |
| 12 | 0.0098899 | 0.2793134 | 1.601E-05 | 0.000380943 | 0.000337019 | 0.0003619 | 2.334E-05 | 0.0006855 | 0.000155 | 0.0001875 | 1.7146E-07 | 2.398691 | 0.001027 | 0.000399 |
| 13 | 0.0092682 | 0.2571361 | 1.307E-05 | 0.000324021 | 0.000286661 | 0.0003084 | 1.992E-05 | 0.0005837 | 0.000132 | 0.0001607 | 1.4583E-07 | 1.9579357 | 0.0008787 | 0.0003781 |
| 14 | 0.0097031 | 0.2658476 | 1.267E-05 | 0.000318247 | 0.000281553 | 0.0003064 | 1.98E-05 | 0.0005794 | 0.000131 | 0.0001602 | 1.4322E-07 | 1.8977101 | 0.000875 | 0.000399 |
| 15 | 0.0096506 | 0.2622163 | 1.58E-05 | 0.00036517 | 0.000323068 | 0.0003526 | 2.274E-05 | 0.0006681 | 0.000151 | 0.0001826 | 1.6433E-07 | 2.3665111 | 0.0009967 | 0.000399 |
| 16 | 0.0096587 | 0.2627704 | 1.355E-05 | 0.000321949 | 0.000284829 | 0.0003069 | 1.985E-05 | 0.0005801 | 0.0001311 | 0.0001609 | 1.4488E-07 | 2.0306348 | 0.0008776 | 0.000399 |
| **17** | **0.0240896** | **0.6593729** | **3.983E-05** | **0.000915771** | **0.000810187** | **0.0008792** | **5.671E-05** | **0.0016656** | **0.0003765** | **0.0004555** | **4.1213E-07** | **5.9668352** | **0.0024879** | **0.0009912** |
| 18 | 0.0216205 | 0.6020047 | 3.748E-05 | 0.000859778 | 0.000760649 | 0.0008163 | 5.262E-05 | 0.0015471 | 0.0003498 | 0.000422 | 3.8696E-07 | 5.6144011 | 0.0023083 | 0.0008799 |
| 19 | 0.0218265 | 0.6171184 | 3.508E-05 | 0.000869554 | 0.00076929 | 0.0008286 | 5.335E-05 | 0.0015717 | 0.0003553 | 0.0004261 | 3.9139E-07 | 5.2555651 | 0.0023364 | 0.0008799 |
| 20 | 0.0060579 | 0.1724654 | 8.998E-06 | 0.000239412 | 0.000211806 | 0.0002316 | 1.489E-05 | 0.0004398 | 9.945E-05 | 0.0001185 | 1.0776E-07 | 1.3480022 | 0.0006507 | 0.0002432 |
| 21 | 0.0054482 | 0.1560481 | 8.863E-06 | 0.000230088 | 0.000203558 | 0.0002206 | 1.417E-05 | 0.0004191 | 9.478E-05 | 0.0001124 | 1.0357E-07 | 1.3278321 | 0.0006175 | 0.0002179 |
| 22 | 0.0054764 | 0.1582267 | 8.79E-06 | 0.000229221 | 0.000202792 | 0.0002151 | 1.383E-05 | 0.0004085 | 9.236E-05 | 0.0001099 | 1.0318E-07 | 1.3168306 | 0.0006038 | 0.0002179 |
| 23 | 0.005526 | 0.1621383 | 1.011E-05 | 0.000249349 | 0.000220597 | 0.000236 | 1.515E-05 | 0.0004485 | 0.0001014 | 0.00012 | 1.1225E-07 | 1.5144636 | 0.0006604 | 0.0002179 |
| 24 | 0.0051272 | 0.1504376 | 9.379E-06 | 0.000231355 | 0.000204678 | 0.0002189 | 1.406E-05 | 0.0004161 | 9.409E-05 | 0.0001113 | 1.0415E-07 | 1.8701485 | 0.0006128 | 0.0002022 |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 6-9: Hourly Emission Rates**
**T7.3 - AS2: Parking Lot West**

| Hour | Annual Emissions (tonnes/year) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0066646 | 0.1919698 | 9.794E-06 | 0.000257789 | 0.000228064 | 0.000241 | 1.553E-05 | 0.000457 | 0.0001033 | 0.0001242 | 1.1604E-07 | 1.4672692 | 0.000682 | 0.0002657 |
| 2 | 0.0024424 | 0.0702876 | 5.885E-06 | 0.000128578 | 0.000113752 | 0.000123 | 7.888E-06 | 0.0002339 | 5.289E-05 | 6.229E-05 | 5.7878E-08 | 0.8817004 | 0.0003423 | 9.742E-05 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10 | 0.0132806 | 0.3889947 | 2.676E-05 | 0.00059916 | 0.000530072 | 0.0005689 | 3.663E-05 | 0.0010791 | 0.000244 | 0.0002927 | 2.6973E-07 | 4.0089978 | 0.0016093 | 0.0005243 |
| 11 | 0.0124428 | 0.3575171 | 2.192E-05 | 0.000509465 | 0.000450721 | 0.0004801 | 3.096E-05 | 0.0009097 | 0.0002057 | 0.0002485 | 2.2933E-07 | 3.2845213 | 0.001363 | 0.0004968 |
| 12 | 0.0129953 | 0.3670178 | 2.104E-05 | 0.000500559 | 0.000442843 | 0.0004755 | 3.067E-05 | 0.0009008 | 0.0002036 | 0.0002463 | 2.253E-07 | 3.15188 | 0.0013494 | 0.0005243 |
| 13 | 0.0121784 | 0.3378768 | 1.717E-05 | 0.000425764 | 0.000376672 | 0.0004053 | 2.618E-05 | 0.000767 | 0.0001734 | 0.0002112 | 1.9162E-07 | 2.5727275 | 0.0011546 | 0.0004968 |
| 14 | 0.0127498 | 0.3493238 | 1.664E-05 | 0.000418176 | 0.000369961 | 0.0004025 | 2.602E-05 | 0.0007613 | 0.0001721 | 0.0002105 | 1.8819E-07 | 2.4935911 | 0.0011497 | 0.0005243 |
| 15 | 0.0126809 | 0.3445523 | 2.076E-05 | 0.000479834 | 0.000424511 | 0.0004634 | 2.988E-05 | 0.0008779 | 0.0001985 | 0.0002399 | 2.1593E-07 | 3.1095956 | 0.0013097 | 0.0005243 |
| 16 | 0.0126915 | 0.3452803 | 1.781E-05 | 0.00042304 | 0.000374265 | 0.0004032 | 2.609E-05 | 0.0007622 | 0.0001723 | 0.0002114 | 1.9038E-07 | 2.6682542 | 0.0011532 | 0.0005243 |
| 17 | 0.0316538 | 0.866416 | 5.233E-05 | 0.001203323 | 0.001064586 | 0.0011553 | 7.452E-05 | 0.0021885 | 0.0004948 | 0.0005986 | 5.4153E-07 | 7.8404214 | 0.0032691 | 0.0013024 |
| 18 | 0.0284094 | 0.7910342 | 4.924E-05 | 0.001129748 | 0.000999493 | 0.0010727 | 6.915E-05 | 0.0020329 | 0.0004596 | 0.0005545 | 5.0847E-07 | 7.3773231 | 0.0030331 | 0.0011562 |
| 19 | 0.02868 | 0.8108936 | 4.61E-05 | 0.001142593 | 0.001010848 | 0.0010887 | 7.01E-05 | 0.0020652 | 0.0004669 | 0.00056 | 5.1428E-07 | 6.9058125 | 0.00307 | 0.0011562 |
| 20 | 0.0079601 | 0.2266196 | 1.182E-05 | 0.000314587 | 0.000278313 | 0.0003044 | 1.957E-05 | 0.000578 | 0.0001307 | 0.0001557 | 1.416E-07 | 1.7712749 | 0.000855 | 0.0003196 |
| 21 | 0.0071589 | 0.2050472 | 1.165E-05 | 0.000302335 | 0.000267475 | 0.0002899 | 1.862E-05 | 0.0005508 | 0.0001245 | 0.0001477 | 1.3609E-07 | 1.7447714 | 0.0008114 | 0.0002864 |
| 22 | 0.007196 | 0.2079099 | 1.155E-05 | 0.000301196 | 0.000266468 | 0.0002826 | 1.817E-05 | 0.0005367 | 0.0001214 | 0.0001444 | 1.3558E-07 | 1.7303154 | 0.0007933 | 0.0002864 |
| 23 | 0.0072611 | 0.2130498 | 1.328E-05 | 0.000327645 | 0.000289865 | 0.0003101 | 1.991E-05 | 0.0005893 | 0.0001333 | 0.0001577 | 1.475E-07 | 1.9900051 | 0.0008678 | 0.0002864 |
| 24 | 0.0067371 | 0.197675 | 1.232E-05 | 0.000304 | 0.000268947 | 0.0002877 | 1.847E-05 | 0.0005468 | 0.0001236 | 0.0001463 | 1.3685E-07 | 2.4573751 | 0.0008052 | 0.0002657 |
| **SUM** | **0.2231828** | **6.2714653** | **0.0003661** | **0.00876779** | **0.007756854** | **0.0083543** | **0.0005383** | **0.015837** | **0.0035805** | **0.0043118** | **3.9463E-06** | **55.455836** | **0.0236183** | **0.0090373** |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 6-9: Hourly Emission Rates**
**T8.1 - LVS1: Entrance/Exit from Parking Lot East**

| Hour | MOVES Emission Rate (g/VKT) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0157116 | 0.934684 | 0.0016371 | 1.306046841 | 0.305512387 | 3.525E-05 | 4.308E-06 | 0.0003191 | 4.08E-08 | 8.142E-05 | 1.3638E-06 | 245.015 | 0.0011485 | 0.0024552 |
| 2 | 0.0157116 | 0.901854 | 0.001623 | 1.306046841 | 0.305512887 | 3.525E-05 | 4.278E-06 | 0.0003171 | 4.051E-08 | 8.142E-05 | 1.364E-06 | 242.908 | 0.0011403 | 0.0024552 |
| 3 | 0.0157116 | 0.867383 | 0.0016083 | 1.306047841 | 0.305513387 | 3.525E-05 | 4.246E-06 | 0.0003154 | 4.021E-08 | 8.142E-05 | 1.3643E-06 | 240.697 | 0.0011318 | 0.0024552 |
| 4 | 0.0157116 | 0.845666 | 0.001599 | 1.306047841 | 0.305513687 | 3.525E-05 | 4.226E-06 | 0.0003141 | 4.002E-08 | 8.142E-05 | 1.3644E-06 | 239.303 | 0.0011264 | 0.0024552 |
| 5 | 0.0157116 | 0.84061 | 0.0015968 | 1.306048841 | 0.305513987 | 3.525E-05 | 4.222E-06 | 0.0003137 | 3.998E-08 | 8.142E-05 | 1.3646E-06 | 238.979 | 0.0011252 | 0.0024552 |
| 6 | 0.0157116 | 0.84061 | 0.0015968 | 1.306048841 | 0.305513987 | 3.525E-05 | 4.222E-06 | 0.0003137 | 3.998E-08 | 8.142E-05 | 1.3646E-06 | 238.979 | 0.0011252 | 0.0024552 |
| 7 | 0.0157116 | 0.862638 | 0.0016062 | 1.306047841 | 0.305513387 | 3.525E-05 | 4.242E-06 | 0.000315 | 4.017E-08 | 8.142E-05 | 1.3643E-06 | 240.392 | 0.0011306 | 0.0024552 |
| 8 | 0.0157116 | 0.942059 | 0.0016403 | 1.306046841 | 0.305512287 | 3.525E-05 | 4.315E-06 | 0.0003194 | 4.086E-08 | 8.145E-05 | 1.3637E-06 | 245.488 | 0.0011503 | 0.0024552 |
| 9 | 0.0157116 | 1.03198 | 0.0016788 | 1.306045841 | 0.305511787 | 3.583E-05 | 4.398E-06 | 0.0003247 | 4.165E-08 | 8.302E-05 | 1.3635E-06 | 251.258 | 0.0011726 | 0.0024552 |
| 10 | 0.0157116 | 1.09777 | 0.001707 | 1.306045841 | 0.305511787 | 3.632E-05 | 4.459E-06 | 0.0003287 | 4.222E-08 | 8.417E-05 | 1.3635E-06 | 255.479 | 0.0011889 | 0.0024552 |
| 11 | 0.0157116 | 1.13623 | 0.0017235 | 1.306045841 | 0.305511787 | 3.661E-05 | 4.494E-06 | 0.0003311 | 4.256E-08 | 8.483E-05 | 1.3635E-06 | 257.946 | 0.0011985 | 0.0024552 |
| 12 | 0.0157116 | 1.19409 | 0.0017483 | 1.306045841 | 0.305511787 | 3.705E-05 | 4.548E-06 | 0.0003345 | 4.306E-08 | 8.584E-05 | 1.3635E-06 | 261.659 | 0.0012128 | 0.0024552 |
| 13 | 0.0157116 | 1.21603 | 0.0017577 | 1.306045841 | 0.305511787 | 3.721E-05 | 4.568E-06 | 0.000336 | 4.325E-08 | 8.623E-05 | 1.3636E-06 | 263.067 | 0.0012183 | 0.0024552 |
| 14 | 0.0157116 | 1.2281 | 0.0017629 | 1.306045841 | 0.305511787 | 3.73E-05 | 4.579E-06 | 0.0003372 | 4.336E-08 | 8.644E-05 | 1.3636E-06 | 263.841 | 0.0012212 | 0.0024552 |
| 15 | 0.0157116 | 1.242 | 0.0017689 | 1.306045841 | 0.305511787 | 3.741E-05 | 4.592E-06 | 0.0003382 | 4.348E-08 | 8.668E-05 | 1.3636E-06 | 264.733 | 0.0012247 | 0.0024552 |
| 16 | 0.0157116 | 1.22692 | 0.0017624 | 1.306045841 | 0.305511787 | 3.73E-05 | 4.578E-06 | 0.0003376 | 4.335E-08 | 8.642E-05 | 1.3636E-06 | 263.765 | 0.001221 | 0.0024552 |
| 17 | 0.0157116 | 1.22406 | 0.0017612 | 1.306045841 | 0.305511787 | 3.727E-05 | 4.576E-06 | 0.0003371 | 4.332E-08 | 8.637E-05 | 1.3636E-06 | 263.582 | 0.0012202 | 0.0024552 |
| 18 | 0.0157116 | 1.21223 | 0.0017561 | 1.306045841 | 0.305511787 | 3.718E-05 | 4.565E-06 | 0.0003363 | 4.322E-08 | 8.616E-05 | 1.3636E-06 | 262.823 | 0.0012173 | 0.0024552 |
| 19 | 0.0157116 | 1.18085 | 0.0017427 | 1.306045841 | 0.305511787 | 3.695E-05 | 4.536E-06 | 0.0003343 | 4.295E-08 | 8.561E-05 | 1.3635E-06 | 260.809 | 0.0012095 | 0.0024552 |
| 20 | 0.0157116 | 1.10205 | 0.0017089 | 1.306045841 | 0.305511787 | 3.636E-05 | 4.463E-06 | 0.0003295 | 4.226E-08 | 8.424E-05 | 1.3635E-06 | 255.753 | 0.00119 | 0.0024552 |
| 21 | 0.0157116 | 1.0545 | 0.0016885 | 1.306045841 | 0.305511787 | 3.6E-05 | 4.419E-06 | 0.0003265 | 4.184E-08 | 8.341E-05 | 1.3635E-06 | 252.702 | 0.0011782 | 0.0024552 |
| 22 | 0.0157116 | 1.02238 | 0.0016747 | 1.306045841 | 0.305511787 | 3.576E-05 | 4.389E-06 | 0.0003242 | 4.156E-08 | 8.285E-05 | 1.3635E-06 | 250.641 | 0.0011702 | 0.0024552 |
| 23 | 0.0157116 | 0.984018 | 0.0016583 | 1.306045841 | 0.305511787 | 3.547E-05 | 4.354E-06 | 0.000322 | 4.123E-08 | 8.218E-05 | 1.3635E-06 | 248.18 | 0.0011607 | 0.0024552 |
| 24 | 0.0157116 | 0.957999 | 0.0016471 | 1.306046841 | 0.305512087 | 3.527E-05 | 4.33E-06 | 0.0003204 | 4.1E-08 | 8.173E-05 | 1.3636E-06 | 246.51 | 0.0011543 | 0.0024552 |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 6-9: Hourly Emission Rates**
**T8.2 - LVS1: Entrance/Exit from Parking Lot East**

| Hour | Emission Rate (g/s) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0001491 | 0.0088711 | 1.554E-05 | 0.012395659 | 0.002899611 | 3.345E-07 | 4.089E-08 | 3.029E-06 | 3.872E-10 | 7.728E-07 | 1.2943E-08 | 2.3254315 | 1.09E-05 | 2.33E-05 |
| 2 | 5.468E-05 | 0.0031385 | 5.648E-06 | 0.004545075 | 0.001063192 | 1.227E-07 | 1.489E-08 | 1.103E-06 | 1.41E-10 | 2.833E-07 | 4.7468E-09 | 0.8453258 | 3.968E-06 | 8.544E-06 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0.0002615 | 0.0139904 | 2.658E-05 | 0.021736699 | 0.005084699 | 5.866E-07 | 7.026E-08 | 5.221E-06 | 6.653E-10 | 1.355E-06 | 2.2711E-08 | 3.9773509 | 1.873E-05 | 4.086E-05 |
| 7 | 0.0005677 | 0.0311697 | 5.804E-05 | 0.047191481 | 0.011039128 | 1.274E-06 | 1.533E-07 | 1.138E-05 | 1.451E-09 | 2.942E-06 | 4.9296E-08 | 8.6860941 | 4.085E-05 | 8.871E-05 |
| 8 | 0.0005482 | 0.0328704 | 5.723E-05 | 0.045570728 | 0.010659968 | 1.23E-06 | 1.506E-07 | 1.114E-05 | 1.426E-09 | 2.842E-06 | 4.7583E-08 | 8.5655939 | 4.014E-05 | 8.567E-05 |
| 9 | 0.0006514 | 0.0427877 | 6.961E-05 | 0.054150949 | 0.012667054 | 1.486E-06 | 1.824E-07 | 1.346E-05 | 1.727E-09 | 3.442E-06 | 5.6533E-08 | 10.417597 | 4.862E-05 | 0.0001018 |
| 10 | 0.0001471 | 0.0102794 | 1.598E-05 | 0.012229622 | 0.002860768 | 3.401E-07 | 4.175E-08 | 3.078E-06 | 3.954E-10 | 7.881E-07 | 1.2768E-08 | 2.392268 | 1.113E-05 | 2.299E-05 |
| 11 | 0.0001394 | 0.0100816 | 1.529E-05 | 0.011588369 | 0.002710765 | 3.249E-07 | 3.988E-08 | 2.937E-06 | 3.776E-10 | 7.527E-07 | 1.2098E-08 | 2.2887201 | 1.063E-05 | 2.178E-05 |
| 12 | 0.0001471 | 0.0111813 | 1.637E-05 | 0.012229622 | 0.002860768 | 3.469E-07 | 4.259E-08 | 3.132E-06 | 4.032E-10 | 8.038E-07 | 1.2768E-08 | 2.4501366 | 1.136E-05 | 2.299E-05 |
| 13 | 0.0001394 | 0.0107897 | 1.56E-05 | 0.011588369 | 0.002710765 | 3.302E-07 | 4.053E-08 | 2.982E-06 | 3.838E-10 | 7.651E-07 | 1.2099E-08 | 2.3341581 | 1.081E-05 | 2.178E-05 |
| 14 | 0.0001471 | 0.0114997 | 1.651E-05 | 0.012229622 | 0.002860768 | 3.493E-07 | 4.288E-08 | 3.158E-06 | 4.06E-10 | 8.094E-07 | 1.2768E-08 | 2.4705686 | 1.144E-05 | 2.299E-05 |
| 15 | 0.0001471 | 0.0116299 | 1.656E-05 | 0.012229622 | 0.002860768 | 3.503E-07 | 4.3E-08 | 3.167E-06 | 4.071E-10 | 8.116E-07 | 1.2768E-08 | 2.4789211 | 1.147E-05 | 2.299E-05 |
| 16 | 0.0001471 | 0.0114887 | 1.65E-05 | 0.012229622 | 0.002860768 | 3.492E-07 | 4.287E-08 | 3.161E-06 | 4.059E-10 | 8.092E-07 | 1.2768E-08 | 2.4698569 | 1.143E-05 | 2.299E-05 |
| **17** | **0.000731** | **0.0569481** | **8.194E-05** | **0.06076238** | **0.014213608** | **1.734E-06** | **2.129E-07** | **1.568E-05** | **2.016E-09** | **4.018E-06** | **6.3438E-08** | **12.26287** | **5.677E-05** | **0.0001142** |
| 18 | 0.0006489 | 0.0500688 | 7.253E-05 | 0.053943659 | 0.012618565 | 1.536E-06 | 1.885E-07 | 1.389E-05 | 1.785E-09 | 3.559E-06 | 5.6319E-08 | 10.855388 | 5.028E-05 | 0.0001014 |
| 19 | 0.0006489 | 0.0487727 | 7.198E-05 | 0.053943659 | 0.012618565 | 1.526E-06 | 1.873E-07 | 1.381E-05 | 1.774E-09 | 3.536E-06 | 5.6318E-08 | 10.772204 | 4.996E-05 | 0.0001014 |
| 20 | 0.0001794 | 0.0125805 | 1.951E-05 | 0.014909212 | 0.00348758 | 4.15E-07 | 5.095E-08 | 3.761E-06 | 4.824E-10 | 9.616E-07 | 1.5565E-08 | 2.9195573 | 1.358E-05 | 2.803E-05 |
| 21 | 0.0001607 | 0.0107867 | 1.727E-05 | 0.013359756 | 0.00312513 | 3.682E-07 | 4.52E-08 | 3.34E-06 | 4.28E-10 | 8.532E-07 | 1.3947E-08 | 2.5849299 | 1.205E-05 | 2.511E-05 |
| 22 | 0.0001607 | 0.0104581 | 1.713E-05 | 0.013359756 | 0.00312513 | 3.658E-07 | 4.49E-08 | 3.316E-06 | 4.252E-10 | 8.475E-07 | 1.3947E-08 | 2.5638476 | 1.197E-05 | 2.511E-05 |
| 23 | 0.0001607 | 0.0100657 | 1.696E-05 | 0.013359756 | 0.00312513 | 3.628E-07 | 4.454E-08 | 3.294E-06 | 4.217E-10 | 8.407E-07 | 1.3947E-08 | 2.5386737 | 1.187E-05 | 2.511E-05 |
| 24 | 0.0001491 | 0.0090923 | 1.563E-05 | 0.012395659 | 0.002899608 | 3.348E-07 | 4.109E-08 | 3.041E-06 | 3.891E-10 | 7.757E-07 | 1.2942E-08 | 2.3396205 | 1.096E-05 | 2.33E-05 |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 6-9: Hourly Emission Rates**
**T8.3 - LVS1: Entrance/Exit from Parking Lot East**

| Hour | Annual Emissions (tonnes/year) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0001959 | 0.0116566 | 2.042E-05 | 0.016287896 | 0.003810088 | 4.396E-07 | 5.373E-08 | 3.98E-06 | 5.088E-10 | 1.015E-06 | 1.7008E-08 | 3.0556169 | 1.432E-05 | 3.062E-05 |
| 2 | 7.185E-05 | 0.004124 | 7.422E-06 | 0.005972229 | 0.001397035 | 1.612E-07 | 1.956E-08 | 1.45E-06 | 1.852E-10 | 3.723E-07 | 6.2373E-09 | 1.1107581 | 5.214E-06 | 1.123E-05 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0.0003436 | 0.0183833 | 3.492E-05 | 0.028562022 | 0.006681295 | 7.708E-07 | 9.232E-08 | 6.861E-06 | 8.742E-10 | 1.781E-06 | 2.9842E-08 | 5.226239 | 2.461E-05 | 5.369E-05 |
| 7 | 0.000746 | 0.040957 | 7.626E-05 | 0.062009605 | 0.014505414 | 1.673E-06 | 2.014E-07 | 1.496E-05 | 1.907E-09 | 3.866E-06 | 6.4775E-08 | 11.413528 | 5.368E-05 | 0.0001166 |
| 8 | 0.0007203 | 0.0431917 | 7.52E-05 | 0.059879937 | 0.014007198 | 1.616E-06 | 1.978E-07 | 1.464E-05 | 1.873E-09 | 3.734E-06 | 6.2524E-08 | 11.25519 | 5.274E-05 | 0.0001126 |
| 9 | 0.000856 | 0.056223 | 9.146E-05 | 0.071154347 | 0.016644509 | 1.952E-06 | 2.396E-07 | 1.769E-05 | 2.269E-09 | 4.523E-06 | 7.4284E-08 | 13.688722 | 6.388E-05 | 0.0001338 |
| 10 | 0.0001933 | 0.0135071 | 2.1E-05 | 0.016069724 | 0.003759049 | 4.469E-07 | 5.486E-08 | 4.044E-06 | 5.195E-10 | 1.036E-06 | 1.6777E-08 | 3.1434402 | 1.463E-05 | 3.021E-05 |
| 11 | 0.0001832 | 0.0132472 | 2.009E-05 | 0.015227117 | 0.003561945 | 4.269E-07 | 5.24E-08 | 3.86E-06 | 4.962E-10 | 9.891E-07 | 1.5897E-08 | 3.0073782 | 1.397E-05 | 2.863E-05 |
| 12 | 0.0001933 | 0.0146922 | 2.151E-05 | 0.016069724 | 0.003759049 | 4.558E-07 | 5.596E-08 | 4.115E-06 | 5.298E-10 | 1.056E-06 | 1.6777E-08 | 3.2194795 | 1.492E-05 | 3.021E-05 |
| 13 | 0.0001832 | 0.0141776 | 2.049E-05 | 0.015227117 | 0.003561945 | 4.339E-07 | 5.326E-08 | 3.918E-06 | 5.043E-10 | 1.005E-06 | 1.5898E-08 | 3.0670837 | 1.42E-05 | 2.863E-05 |
| 14 | 0.0001933 | 0.0151107 | 2.169E-05 | 0.016069724 | 0.003759049 | 4.59E-07 | 5.634E-08 | 4.149E-06 | 5.335E-10 | 1.064E-06 | 1.6777E-08 | 3.2463271 | 1.503E-05 | 3.021E-05 |
| 15 | 0.0001933 | 0.0152817 | 2.176E-05 | 0.016069724 | 0.003759049 | 4.603E-07 | 5.65E-08 | 4.162E-06 | 5.35E-10 | 1.066E-06 | 1.6777E-08 | 3.2573024 | 1.507E-05 | 3.021E-05 |
| 16 | 0.0001933 | 0.0150962 | 2.168E-05 | 0.016069724 | 0.003759049 | 4.589E-07 | 5.633E-08 | 4.154E-06 | 5.334E-10 | 1.063E-06 | 1.6777E-08 | 3.245392 | 1.502E-05 | 3.021E-05 |
| 17 | 0.0009605 | 0.0748298 | 0.0001077 | 0.079841768 | 0.018676681 | 2.279E-06 | 2.797E-07 | 2.061E-05 | 2.649E-09 | 5.28E-06 | 8.3357E-08 | 16.113411 | 7.46E-05 | 0.0001501 |
| 18 | 0.0008527 | 0.0657904 | 9.531E-05 | 0.070881969 | 0.016580794 | 2.018E-06 | 2.477E-07 | 1.825E-05 | 2.346E-09 | 4.676E-06 | 7.4003E-08 | 14.26398 | 6.607E-05 | 0.0001332 |
| 19 | 0.0008527 | 0.0640873 | 9.458E-05 | 0.070881969 | 0.016580794 | 2.005E-06 | 2.462E-07 | 1.814E-05 | 2.331E-09 | 4.646E-06 | 7.4002E-08 | 14.154676 | 6.564E-05 | 0.0001332 |
| 20 | 0.0002357 | 0.0165308 | 2.563E-05 | 0.019590704 | 0.004582681 | 5.453E-07 | 6.694E-08 | 4.942E-06 | 6.339E-10 | 1.264E-06 | 2.0453E-08 | 3.8362983 | 1.785E-05 | 3.683E-05 |
| 21 | 0.0002112 | 0.0141737 | 2.27E-05 | 0.017554719 | 0.004106421 | 4.839E-07 | 5.94E-08 | 4.389E-06 | 5.624E-10 | 1.121E-06 | 1.8327E-08 | 3.3965979 | 1.584E-05 | 3.3E-05 |
| 22 | 0.0002112 | 0.0137419 | 2.251E-05 | 0.017554719 | 0.004106421 | 4.806E-07 | 5.9E-08 | 4.358E-06 | 5.587E-10 | 1.114E-06 | 1.8327E-08 | 3.3688958 | 1.573E-05 | 3.3E-05 |
| 23 | 0.0002112 | 0.0132263 | 2.229E-05 | 0.017554719 | 0.004106421 | 4.767E-07 | 5.852E-08 | 4.328E-06 | 5.542E-10 | 1.105E-06 | 1.8327E-08 | 3.3358172 | 1.56E-05 | 3.3E-05 |
| 24 | 0.0001959 | 0.0119473 | 2.054E-05 | 0.016287896 | 0.003810085 | 4.399E-07 | 5.4E-08 | 3.996E-06 | 5.113E-10 | 1.019E-06 | 1.7006E-08 | 3.0742613 | 1.439E-05 | 3.062E-05 |
| **SUM** | **0.0079977** | **0.5499758** | **0.0008651** | **0.664817351** | **0.155514969** | **1.848E-05** | **2.262E-06** | **0.000167** | **2.142E-08** | **4.28E-05** | **6.9415E-07** | **129.48039** | **0.000603** | **0.0012498** |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 6-9: Hourly Emission Rates**
**T9.1 - LVS2: Entrance/Exit from Parking Lot West**

| Hour | MOVES Emission Rate (g/VKT) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0157116 | 0.934684 | 0.0016371 | 1.306046841 | 0.305512387 | 3.525E-05 | 4.308E-06 | 0.0003191 | 4.08E-08 | 8.142E-05 | 1.3638E-06 | 245.015 | 0.0011485 | 0.0024552 |
| 2 | 0.0157116 | 0.901854 | 0.001623 | 1.306046841 | 0.305512887 | 3.525E-05 | 4.278E-06 | 0.0003171 | 4.051E-08 | 8.142E-05 | 1.364E-06 | 242.908 | 0.0011403 | 0.0024552 |
| 3 | 0.0157116 | 0.867383 | 0.0016083 | 1.306047841 | 0.305513387 | 3.525E-05 | 4.246E-06 | 0.0003154 | 4.021E-08 | 8.142E-05 | 1.3643E-06 | 240.697 | 0.0011318 | 0.0024552 |
| 4 | 0.0157116 | 0.845666 | 0.001599 | 1.306047841 | 0.305513687 | 3.525E-05 | 4.226E-06 | 0.0003141 | 4.002E-08 | 8.142E-05 | 1.3644E-06 | 239.303 | 0.0011264 | 0.0024552 |
| 5 | 0.0157116 | 0.84061 | 0.0015968 | 1.306048841 | 0.305513987 | 3.525E-05 | 4.222E-06 | 0.0003137 | 3.998E-08 | 8.142E-05 | 1.3646E-06 | 238.979 | 0.0011252 | 0.0024552 |
| 6 | 0.0157116 | 0.84061 | 0.0015968 | 1.306048841 | 0.305513987 | 3.525E-05 | 4.222E-06 | 0.0003137 | 3.998E-08 | 8.142E-05 | 1.3646E-06 | 238.979 | 0.0011252 | 0.0024552 |
| 7 | 0.0157116 | 0.862638 | 0.0016062 | 1.306047841 | 0.305513387 | 3.525E-05 | 4.242E-06 | 0.000315 | 4.017E-08 | 8.142E-05 | 1.3643E-06 | 240.392 | 0.0011306 | 0.0024552 |
| 8 | 0.0157116 | 0.942059 | 0.0016403 | 1.306046841 | 0.305512287 | 3.525E-05 | 4.315E-06 | 0.0003194 | 4.086E-08 | 8.145E-05 | 1.3637E-06 | 245.488 | 0.0011503 | 0.0024552 |
| 9 | 0.0157116 | 1.03198 | 0.0016788 | 1.306045841 | 0.305511787 | 3.583E-05 | 4.398E-06 | 0.0003247 | 4.165E-08 | 8.302E-05 | 1.3635E-06 | 251.258 | 0.0011726 | 0.0024552 |
| 10 | 0.0157116 | 1.09777 | 0.001707 | 1.306045841 | 0.305511787 | 3.632E-05 | 4.459E-06 | 0.0003287 | 4.222E-08 | 8.417E-05 | 1.3635E-06 | 255.479 | 0.0011889 | 0.0024552 |
| 11 | 0.0157116 | 1.13623 | 0.0017235 | 1.306045841 | 0.305511787 | 3.661E-05 | 4.494E-06 | 0.0003311 | 4.256E-08 | 8.483E-05 | 1.3635E-06 | 257.946 | 0.0011985 | 0.0024552 |
| 12 | 0.0157116 | 1.19409 | 0.0017483 | 1.306045841 | 0.305511787 | 3.705E-05 | 4.548E-06 | 0.0003345 | 4.306E-08 | 8.584E-05 | 1.3635E-06 | 261.659 | 0.0012128 | 0.0024552 |
| 13 | 0.0157116 | 1.21603 | 0.0017577 | 1.306045841 | 0.305511787 | 3.721E-05 | 4.568E-06 | 0.000336 | 4.325E-08 | 8.623E-05 | 1.3636E-06 | 263.067 | 0.0012183 | 0.0024552 |
| 14 | 0.0157116 | 1.2281 | 0.0017629 | 1.306045841 | 0.305511787 | 3.73E-05 | 4.579E-06 | 0.0003372 | 4.336E-08 | 8.644E-05 | 1.3636E-06 | 263.841 | 0.0012212 | 0.0024552 |
| 15 | 0.0157116 | 1.242 | 0.0017689 | 1.306045841 | 0.305511787 | 3.741E-05 | 4.592E-06 | 0.0003382 | 4.348E-08 | 8.668E-05 | 1.3636E-06 | 264.733 | 0.0012247 | 0.0024552 |
| 16 | 0.0157116 | 1.22692 | 0.0017624 | 1.306045841 | 0.305511787 | 3.73E-05 | 4.578E-06 | 0.0003376 | 4.335E-08 | 8.642E-05 | 1.3636E-06 | 263.765 | 0.001221 | 0.0024552 |
| 17 | 0.0157116 | 1.22406 | 0.0017612 | 1.306045841 | 0.305511787 | 3.727E-05 | 4.576E-06 | 0.0003371 | 4.332E-08 | 8.637E-05 | 1.3636E-06 | 263.582 | 0.0012202 | 0.0024552 |
| 18 | 0.0157116 | 1.21223 | 0.0017561 | 1.306045841 | 0.305511787 | 3.718E-05 | 4.565E-06 | 0.0003363 | 4.322E-08 | 8.616E-05 | 1.3636E-06 | 262.823 | 0.0012173 | 0.0024552 |
| 19 | 0.0157116 | 1.18085 | 0.0017427 | 1.306045841 | 0.305511787 | 3.695E-05 | 4.536E-06 | 0.0003343 | 4.295E-08 | 8.561E-05 | 1.3635E-06 | 260.809 | 0.0012095 | 0.0024552 |
| 20 | 0.0157116 | 1.10205 | 0.0017089 | 1.306045841 | 0.305511787 | 3.636E-05 | 4.463E-06 | 0.0003295 | 4.226E-08 | 8.424E-05 | 1.3635E-06 | 255.753 | 0.00119 | 0.0024552 |
| 21 | 0.0157116 | 1.0545 | 0.0016885 | 1.306045841 | 0.305511787 | 3.6E-05 | 4.419E-06 | 0.0003265 | 4.184E-08 | 8.341E-05 | 1.3635E-06 | 252.702 | 0.0011782 | 0.0024552 |
| 22 | 0.0157116 | 1.02238 | 0.0016747 | 1.306045841 | 0.305511787 | 3.576E-05 | 4.389E-06 | 0.0003242 | 4.156E-08 | 8.285E-05 | 1.3635E-06 | 250.641 | 0.0011702 | 0.0024552 |
| 23 | 0.0157116 | 0.984018 | 0.0016583 | 1.306045841 | 0.305511787 | 3.547E-05 | 4.354E-06 | 0.000322 | 4.123E-08 | 8.218E-05 | 1.3635E-06 | 248.18 | 0.0011607 | 0.0024552 |
| 24 | 0.0157116 | 0.957999 | 0.0016471 | 1.306046841 | 0.305512087 | 3.527E-05 | 4.33E-06 | 0.0003204 | 4.1E-08 | 8.173E-05 | 1.3636E-06 | 246.51 | 0.0011543 | 0.0024552 |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 6-9: Hourly Emission Rates**
**T9.2 - LVS2: Entrance/Exit from Parking Lot West**

| Hour | Emission Rate (g/s) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0001199 | 0.00713 | 1.249E-05 | 0.00996286 | 0.002330527 | 2.689E-07 | 3.287E-08 | 2.434E-06 | 3.112E-10 | 6.211E-07 | 1.0403E-08 | 1.8690372 | 8.761E-06 | 1.873E-05 |
| 2 | 4.395E-05 | 0.0025225 | 4.54E-06 | 0.003653049 | 0.000854528 | 9.859E-08 | 1.197E-08 | 8.869E-07 | 1.133E-10 | 2.277E-07 | 3.8152E-09 | 0.6794203 | 3.19E-06 | 6.867E-06 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0.0002102 | 0.0112446 | 2.136E-05 | 0.017470607 | 0.004086765 | 4.715E-07 | 5.647E-08 | 4.196E-06 | 5.348E-10 | 1.089E-06 | 1.8254E-08 | 3.1967474 | 1.505E-05 | 3.284E-05 |
| 7 | 0.0004563 | 0.0250523 | 4.665E-05 | 0.037929578 | 0.008872565 | 1.024E-06 | 1.232E-07 | 9.148E-06 | 1.167E-09 | 2.365E-06 | 3.9621E-08 | 6.9813424 | 3.283E-05 | 7.13E-05 |
| 8 | 0.0004406 | 0.0264192 | 4.6E-05 | 0.036626918 | 0.00856782 | 9.885E-07 | 1.21E-07 | 8.956E-06 | 1.146E-09 | 2.284E-06 | 3.8244E-08 | 6.8844919 | 3.226E-05 | 6.885E-05 |
| 9 | 0.0005236 | 0.0343901 | 5.595E-05 | 0.043523167 | 0.010180991 | 1.194E-06 | 1.466E-07 | 1.082E-05 | 1.388E-09 | 2.767E-06 | 4.5437E-08 | 8.3730168 | 3.908E-05 | 8.182E-05 |
| 10 | 0.0001182 | 0.0082619 | 1.285E-05 | 0.00982941 | 0.002299307 | 2.734E-07 | 3.356E-08 | 2.474E-06 | 3.178E-10 | 6.334E-07 | 1.0262E-08 | 1.9227563 | 8.948E-06 | 1.848E-05 |
| 11 | 0.000112 | 0.008103 | 1.229E-05 | 0.00931401 | 0.002178744 | 2.611E-07 | 3.205E-08 | 2.361E-06 | 3.035E-10 | 6.05E-07 | 9.724E-09 | 1.8395309 | 8.547E-06 | 1.751E-05 |
| 12 | 0.0001182 | 0.0089868 | 1.316E-05 | 0.00982941 | 0.002299307 | 2.788E-07 | 3.423E-08 | 2.517E-06 | 3.241E-10 | 6.461E-07 | 1.0262E-08 | 1.9692675 | 9.128E-06 | 1.848E-05 |
| 13 | 0.000112 | 0.0086721 | 1.254E-05 | 0.00931401 | 0.002178744 | 2.654E-07 | 3.258E-08 | 2.396E-06 | 3.085E-10 | 6.149E-07 | 9.7241E-09 | 1.8760511 | 8.688E-06 | 1.751E-05 |
| 14 | 0.0001182 | 0.0092428 | 1.327E-05 | 0.00982941 | 0.002299307 | 2.808E-07 | 3.446E-08 | 2.538E-06 | 3.263E-10 | 6.505E-07 | 1.0262E-08 | 1.9856894 | 9.191E-06 | 1.848E-05 |
| 15 | 0.0001182 | 0.0093474 | 1.331E-05 | 0.00982941 | 0.002299307 | 2.815E-07 | 3.456E-08 | 2.546E-06 | 3.272E-10 | 6.523E-07 | 1.0262E-08 | 1.9924027 | 9.217E-06 | 1.848E-05 |
| 16 | 0.0001182 | 0.0092339 | 1.326E-05 | 0.00982941 | 0.002299307 | 2.807E-07 | 3.446E-08 | 2.541E-06 | 3.262E-10 | 6.504E-07 | 1.0262E-08 | 1.9851175 | 9.189E-06 | 1.848E-05 |
| **17** | **0.0005875** | **0.0457713** | **6.586E-05** | **0.048837024** | **0.011424014** | **1.394E-06** | **1.711E-07** | **1.261E-05** | **1.62E-09** | **3.229E-06** | **5.0987E-08** | **9.8561322** | **4.563E-05** | **9.181E-05** |
| 18 | 0.0005216 | 0.0402422 | 5.83E-05 | 0.04335656 | 0.010142018 | 1.234E-06 | 1.515E-07 | 1.116E-05 | 1.435E-09 | 2.86E-06 | 4.5266E-08 | 8.7248861 | 4.041E-05 | 8.151E-05 |
| 19 | 0.0005216 | 0.0392005 | 5.785E-05 | 0.04335656 | 0.010142018 | 1.227E-06 | 1.506E-07 | 1.11E-05 | 1.426E-09 | 2.842E-06 | 4.5265E-08 | 8.6580277 | 4.015E-05 | 8.151E-05 |
| 20 | 0.0001442 | 0.0101114 | 1.568E-05 | 0.011983098 | 0.0028031 | 3.336E-07 | 4.095E-08 | 3.023E-06 | 3.877E-10 | 7.729E-07 | 1.251E-08 | 2.3465587 | 1.092E-05 | 2.253E-05 |
| 21 | 0.0001292 | 0.0086696 | 1.388E-05 | 0.010737741 | 0.002511785 | 2.96E-07 | 3.633E-08 | 2.684E-06 | 3.44E-10 | 6.858E-07 | 1.121E-08 | 2.077606 | 9.687E-06 | 2.019E-05 |
| 22 | 0.0001292 | 0.0084056 | 1.377E-05 | 0.010737741 | 0.002511785 | 2.94E-07 | 3.609E-08 | 2.666E-06 | 3.417E-10 | 6.812E-07 | 1.121E-08 | 2.0606613 | 9.621E-06 | 2.019E-05 |
| 23 | 0.0001292 | 0.0080902 | 1.363E-05 | 0.010737741 | 0.002511785 | 2.916E-07 | 3.58E-08 | 2.647E-06 | 3.39E-10 | 6.757E-07 | 1.121E-08 | 2.0404281 | 9.543E-06 | 2.019E-05 |
| 24 | 0.0001199 | 0.0073079 | 1.256E-05 | 0.00996286 | 0.002330525 | 2.691E-07 | 3.303E-08 | 2.444E-06 | 3.128E-10 | 6.235E-07 | 1.0402E-08 | 1.8804415 | 8.805E-06 | 1.873E-05 |

**Appendix B: Emission Rate Inventory Summary**
***Parking Lot Emission Rate Calcualtions***

**Table 6-9: Hourly Emission Rates**
**T9.3 - LVS2: Entrance/Exit from Parking Lot West**

| Hour | Annual Emissions (tonnes/year) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0001575 | 0.0093688 | 1.641E-05 | 0.013091198 | 0.003062312 | 3.533E-07 | 4.319E-08 | 3.199E-06 | 4.089E-10 | 8.161E-07 | 1.367E-08 | 2.4559149 | 1.151E-05 | 2.461E-05 |
| 2 | 5.774E-05 | 0.0033146 | 5.965E-06 | 0.004800106 | 0.00112285 | 1.295E-07 | 1.572E-08 | 1.165E-06 | 1.489E-10 | 2.992E-07 | 5.0131E-09 | 0.8927583 | 4.191E-06 | 9.024E-06 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0.0002762 | 0.0147754 | 2.807E-05 | 0.022956378 | 0.005370009 | 6.195E-07 | 7.42E-08 | 5.514E-06 | 7.027E-10 | 1.431E-06 | 2.3985E-08 | 4.2005261 | 1.978E-05 | 4.316E-05 |
| 7 | 0.0005996 | 0.0329187 | 6.129E-05 | 0.049839466 | 0.01165855 | 1.345E-06 | 1.619E-07 | 1.202E-05 | 1.533E-09 | 3.107E-06 | 5.2062E-08 | 9.173484 | 4.314E-05 | 9.369E-05 |
| 8 | 0.000579 | 0.0347148 | 6.044E-05 | 0.048127771 | 0.011258115 | 1.299E-06 | 1.59E-07 | 1.177E-05 | 1.506E-09 | 3.001E-06 | 5.0253E-08 | 9.0462224 | 4.239E-05 | 9.047E-05 |
| 9 | 0.000688 | 0.0451886 | 7.351E-05 | 0.057189441 | 0.013377822 | 1.569E-06 | 1.926E-07 | 1.422E-05 | 1.824E-09 | 3.635E-06 | 5.9705E-08 | 11.002144 | 5.135E-05 | 0.0001075 |
| 10 | 0.0001554 | 0.0108561 | 1.688E-05 | 0.012915845 | 0.00302129 | 3.592E-07 | 4.41E-08 | 3.25E-06 | 4.175E-10 | 8.323E-07 | 1.3484E-08 | 2.5265018 | 1.176E-05 | 2.428E-05 |
| 11 | 0.0001472 | 0.0106473 | 1.615E-05 | 0.01223861 | 0.00286287 | 3.431E-07 | 4.212E-08 | 3.102E-06 | 3.988E-10 | 7.95E-07 | 1.2777E-08 | 2.4171437 | 1.123E-05 | 2.301E-05 |
| 12 | 0.0001554 | 0.0118087 | 1.729E-05 | 0.012915845 | 0.00302129 | 3.664E-07 | 4.497E-08 | 3.308E-06 | 4.259E-10 | 8.489E-07 | 1.3484E-08 | 2.5876175 | 1.199E-05 | 2.428E-05 |
| 13 | 0.0001472 | 0.0113951 | 1.647E-05 | 0.01223861 | 0.00286287 | 3.487E-07 | 4.281E-08 | 3.149E-06 | 4.053E-10 | 8.08E-07 | 1.2777E-08 | 2.4651312 | 1.142E-05 | 2.301E-05 |
| 14 | 0.0001554 | 0.012145 | 1.743E-05 | 0.012915845 | 0.00302129 | 3.689E-07 | 4.529E-08 | 3.335E-06 | 4.288E-10 | 8.548E-07 | 1.3485E-08 | 2.6091959 | 1.208E-05 | 2.428E-05 |
| 15 | 0.0001554 | 0.0122825 | 1.749E-05 | 0.012915845 | 0.00302129 | 3.699E-07 | 4.541E-08 | 3.345E-06 | 4.3E-10 | 8.572E-07 | 1.3485E-08 | 2.6180172 | 1.211E-05 | 2.428E-05 |
| 16 | 0.0001554 | 0.0121333 | 1.743E-05 | 0.012915845 | 0.00302129 | 3.688E-07 | 4.527E-08 | 3.338E-06 | 4.287E-10 | 8.546E-07 | 1.3485E-08 | 2.6084443 | 1.207E-05 | 2.428E-05 |
| 17 | 0.000772 | 0.0601435 | 8.653E-05 | 0.06417185 | 0.015011155 | 1.831E-06 | 2.248E-07 | 1.656E-05 | 2.129E-09 | 4.244E-06 | 6.6997E-08 | 12.950958 | 5.996E-05 | 0.0001206 |
| 18 | 0.0006853 | 0.0528782 | 7.66E-05 | 0.05697052 | 0.013326611 | 1.622E-06 | 1.991E-07 | 1.467E-05 | 1.885E-09 | 3.758E-06 | 5.9479E-08 | 11.4645 | 5.31E-05 | 0.0001071 |
| 19 | 0.0006853 | 0.0515094 | 7.602E-05 | 0.05697052 | 0.013326611 | 1.612E-06 | 1.978E-07 | 1.458E-05 | 1.873E-09 | 3.734E-06 | 5.9478E-08 | 11.376648 | 5.276E-05 | 0.0001071 |
| 20 | 0.0001894 | 0.0132864 | 2.06E-05 | 0.01574579 | 0.003683274 | 4.383E-07 | 5.38E-08 | 3.972E-06 | 5.095E-10 | 1.016E-06 | 1.6439E-08 | 3.0833781 | 1.435E-05 | 2.96E-05 |
| 21 | 0.0001697 | 0.0113919 | 1.824E-05 | 0.014109392 | 0.003300486 | 3.889E-07 | 4.774E-08 | 3.527E-06 | 4.52E-10 | 9.011E-07 | 1.473E-08 | 2.7299743 | 1.273E-05 | 2.652E-05 |
| 22 | 0.0001697 | 0.0110449 | 1.809E-05 | 0.014109392 | 0.003300486 | 3.863E-07 | 4.742E-08 | 3.503E-06 | 4.49E-10 | 8.951E-07 | 1.473E-08 | 2.707709 | 1.264E-05 | 2.652E-05 |
| 23 | 0.0001697 | 0.0106305 | 1.791E-05 | 0.014109392 | 0.003300486 | 3.832E-07 | 4.704E-08 | 3.479E-06 | 4.454E-10 | 8.878E-07 | 1.473E-08 | 2.6811225 | 1.254E-05 | 2.652E-05 |
| 24 | 0.0001575 | 0.0096025 | 1.651E-05 | 0.013091198 | 0.003062309 | 3.536E-07 | 4.34E-08 | 3.212E-06 | 4.11E-10 | 8.192E-07 | 1.3668E-08 | 2.4709001 | 1.157E-05 | 2.461E-05 |
| **SUM** | **0.006428** | **0.4420364** | **0.0006954** | **0.534338859** | **0.124993264** | **1.486E-05** | **1.818E-06** | **0.0001342** | **1.721E-08** | **3.44E-05** | **5.5792E-07** | **104.06829** | **0.0004847** | **0.0010045** |

## Appendix B: Emission Rate Inventory Summary

***Bus Loop Emission Rate Calcualtions***

**Table 1: Emission Rate Summary (Maximum: HR 19)**

| Pollutant | Emission Rate (g/s) | |
|---|---|---|
| | AS4 | LVS4 |
| | Bus Loop (idling) | Entrance/Exit from Bus Loop |
| NOX | 0.118388233 | 0.001404565 |
| CO | 0.074533536 | 0.000983547 |
| SO2 | 0.000609323 | 7.59358E-06 |
| PM10 | 0.022370119 | 0.007658413 |
| PM2.5 | 0.005105766 | 0.00183183 |
| Acetaldehyde | 0.000677727 | 8.21516E-06 |
| Acrolein | 6.44146E-05 | 7.14245E-07 |
| Benzene | 0.00010227 | 1.18967E-06 |
| 1,3-Butadiene | 1.43374E-05 | 1.58976E-07 |
| Formaldehyde | 0.001514747 | 1.77343E-05 |
| Benzo(a)pyrene | 2.39783E-07 | 2.35503E-09 |
| CO2 | 76.92098958 | 0.962764583 |
| CH4 | 0.044436481 | 0.000596623 |
| N2O | 0.001387139 | 1.50187E-05 |

**Table 1-2: Annual Emissions Summary**

| Pollutant | Annual CAC Emissions (tonnes/year) | |
|---|---|---|
| | AS4 | LVS4 |
| NOX | 2.30E+00 | 2.73E-02 |
| CO | 1.45E+00 | 1.91E-02 |
| SO2 | 1.17E-02 | 1.46E-04 |
| PM10 | 4.35E-01 | 1.49E-01 |
| PM2.5 | 9.93E-02 | 3.56E-02 |
| Acetaldehyde | 1.32E-02 | 1.60E-04 |
| Acrolein | 1.25E-03 | 1.39E-05 |
| Benzene | 1.99E-03 | 2.31E-05 |
| 1,3-Butadiene | 2.79E-04 | 3.09E-06 |
| Formaldehyde | 2.95E-02 | 3.45E-04 |
| Benzo(a)pyrene | 4.66E-06 | 4.58E-08 |
| CO2 | 1.47E+03 | 1.85E+01 |
| CH4 | 8.64E-01 | 1.16E-02 |
| N2O | 2.70E-02 | 2.92E-04 |

**Table 2: Hourly Distribution (Period) & HWS Bus Loop Schedule**

| Hour | Hourly Distribution per Period (%) | Total Bus Stops at WRTS per hour |
|---|---|---|
| 1 | 11% | 2 |
| 2 | 11% | 2 |
| 3 | 0% | 0 |
| 4 | 0% | 0 |
| 5 | 0% | 0 |
| 6 | 0% | 0 |
| 7 | 25% | 2 |
| 8 | 38% | 3 |
| 9 | 38% | 3 |
| 10 | 15% | 5 |
| 11 | 12% | 4 |
| 12 | 15% | 5 |
| 13 | 12% | 4 |
| 14 | 15% | 5 |
| 15 | 15% | 5 |
| 16 | 15% | 5 |
| 17 | 33% | 5 |
| 18 | 33% | 5 |
| 19 | 33% | 5 |
| 20 | 17% | 3 |
| 21 | 17% | 3 |
| 22 | 17% | 3 |
| 23 | 17% | 3 |
| 24 | 11% | 2 |
| **MAX** | | **5** |

AM Peak Period = 6 AM - 9 AM
Mid-day Period = 9 AM - 4 PM
PM Peak Period = 4 PM - 7 PM
Evening Period = 7 PM - 2 AM

**Appendix B: Emission Rate Inventory Summary**
***Bus Loop Emission Rate Calcualtions***

**Table 3: Source Quantification per hour**

| Hour | (min-idling/hr) | (bus-VKT/hr) |
|---|---|---|
| | AS4 | LVS4 |
| | Bus Loop (idling) | Entrance/Exit from Bus Loop |
| 1 | 6 | 1.04 |
| 2 | 6 | 1.04 |
| 3 | 0 | 0.00 |
| 4 | 0 | 0.00 |
| 5 | 0 | 0.00 |
| 6 | 0 | 0.00 |
| 7 | 6 | 1.04 |
| 8 | 9 | 1.56 |
| 9 | 9 | 1.56 |
| 10 | 15 | 2.61 |
| 11 | 12 | 2.08 |
| 12 | 15 | 2.61 |
| 13 | 12 | 2.08 |
| 14 | 15 | 2.61 |
| 15 | 15 | 2.61 |
| 16 | 15 | 2.61 |
| 17 | 15 | 2.61 |
| 18 | 15 | 2.61 |
| 19 | 15 | 2.61 |
| 20 | 9 | 1.56 |
| 21 | 9 | 1.56 |
| 22 | 9 | 1.56 |
| 23 | 9 | 1.56 |
| 24 | 6 | 1.04 |
| **MAX** | **15** | **2.61** |

AM Peak Period = 6 AM - 9 AM
Mid-day Period = 9 AM - 4 PM
PM Peak Period = 4 PM - 7 PM
Evening Period = 7 PM - 2 AM

**Table 4: Hourly Distribution (AERMOD INPUT)**

| Hour | Hourly Distribution (%) |
|---|---|
| 1 | 0.40 |
| 2 | 0.40 |
| 3 | 0.00 |
| 4 | 0.00 |
| 5 | 0.00 |
| 6 | 0.00 |
| 7 | 0.40 |
| 8 | 0.60 |
| 9 | 0.60 |
| 10 | 1.00 |
| 11 | 0.80 |
| 12 | 1.00 |
| 13 | 0.80 |
| 14 | 1.00 |
| 15 | 1.00 |
| 16 | 1.00 |
| 17 | 1.00 |
| 18 | 1.00 |
| 19 | 1.00 |
| 20 | 0.60 |
| 21 | 0.60 |
| 22 | 0.60 |
| 23 | 0.60 |
| 24 | 0.40 |
| **MAX HR** | **19** |

**Appendix B: Emission Rate Inventory Summary**
***Bus Loop Emission Rate Calcualtions***

**Table 5-6: Hourly Emission Rates**
**T5.1 - AS4: Bus Loop (idling)**

| Hour | MOVES Emission Rate (g/veh-hr) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 28.413176 | 17.888049 | 0.1368621 | 5.3688286 | 1.22538783 | 0.1626544 | 0.0154595 | 0.0245282 | 0.003441 | 0.3635394 | 5.7548E-05 | 17279.09 | 10.664755 | 0.3329134 |
| 2 | 28.413176 | 17.888049 | 0.1356118 | 5.3688286 | 1.22538783 | 0.1626544 | 0.0154595 | 0.0245288 | 0.003441 | 0.3635394 | 5.7549E-05 | 17121.497 | 10.664755 | 0.3329134 |
| 3 | 28.413176 | 17.888049 | 0.1342993 | 5.3688286 | 1.22538783 | 0.1626544 | 0.0154595 | 0.0245287 | 0.003441 | 0.3635394 | 5.755E-05 | 16955.964 | 10.664755 | 0.3329134 |
| 4 | 28.413176 | 17.888049 | 0.1334724 | 5.3688286 | 1.22538783 | 0.1626544 | 0.0154595 | 0.0245286 | 0.003441 | 0.3635394 | 5.755E-05 | 16851.704 | 10.664755 | 0.3329134 |
| 5 | 28.413176 | 17.888049 | 0.1332796 | 5.3688286 | 1.22538783 | 0.1626544 | 0.0154595 | 0.0245279 | 0.003441 | 0.3635394 | 5.755E-05 | 16827.404 | 10.664755 | 0.3329134 |
| 6 | 28.413176 | 17.888049 | 0.1332796 | 5.3688286 | 1.22538783 | 0.1626544 | 0.0154595 | 0.0245278 | 0.003441 | 0.3635394 | 5.755E-05 | 16827.404 | 10.664755 | 0.3329134 |
| 7 | 28.413176 | 17.888049 | 0.1341189 | 5.3688286 | 1.22538783 | 0.1626544 | 0.0154595 | 0.0245284 | 0.003441 | 0.3635394 | 5.755E-05 | 16933.228 | 10.664755 | 0.3329134 |
| 8 | 28.413176 | 17.888049 | 0.1371432 | 5.3688286 | 1.22538783 | 0.1626544 | 0.0154595 | 0.0245299 | 0.003441 | 0.3635394 | 5.7548E-05 | 17314.498 | 10.664755 | 0.3329134 |
| 9 | 28.413176 | 17.888049 | 0.1405677 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245298 | 0.003441 | 0.3635394 | 5.7548E-05 | 17746.295 | 10.664755 | 0.3329134 |
| 10 | 28.413176 | 17.888049 | 0.1430732 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245316 | 0.003441 | 0.3635394 | 5.7548E-05 | 18062.163 | 10.664755 | 0.3329134 |
| 11 | 28.413176 | 17.888049 | 0.1445376 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245354 | 0.003441 | 0.3635394 | 5.7548E-05 | 18246.783 | 10.664755 | 0.3329134 |
| 12 | 28.413176 | 17.888049 | 0.1467411 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245374 | 0.003441 | 0.3635394 | 5.7548E-05 | 18524.596 | 10.664755 | 0.3329134 |
| 13 | 28.413176 | 17.888049 | 0.1475772 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245378 | 0.003441 | 0.3635394 | 5.7548E-05 | 18629.939 | 10.664755 | 0.3329134 |
| 14 | 28.413176 | 17.888049 | 0.1480364 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245403 | 0.003441 | 0.3635394 | 5.7548E-05 | 18687.883 | 10.664755 | 0.3329134 |
| 15 | 28.413176 | 17.888049 | 0.1485661 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245401 | 0.003441 | 0.3635394 | 5.7548E-05 | 18754.65 | 10.664755 | 0.3329134 |
| 16 | 28.413176 | 17.888049 | 0.1479919 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245375 | 0.003441 | 0.3635394 | 5.7548E-05 | 18682.229 | 10.664755 | 0.3329134 |
| 17 | 28.413176 | 17.888049 | 0.1478828 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245402 | 0.003441 | 0.3635394 | 5.7548E-05 | 18668.515 | 10.664755 | 0.3329134 |
| 18 | 28.413176 | 17.888049 | 0.1474321 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245434 | 0.003441 | 0.3635394 | 5.7548E-05 | 18611.693 | 10.664755 | 0.3329134 |
| 19 | 28.413176 | 17.888049 | 0.1462375 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245447 | 0.003441 | 0.3635394 | 5.7548E-05 | 18461.038 | 10.664755 | 0.3329134 |
| 20 | 28.413176 | 17.888049 | 0.143236 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.024543 | 0.003441 | 0.3635394 | 5.7548E-05 | 18082.694 | 10.664755 | 0.3329134 |
| 21 | 28.413176 | 17.888049 | 0.1414251 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245425 | 0.003441 | 0.3635394 | 5.7548E-05 | 17854.405 | 10.664755 | 0.3329134 |
| 22 | 28.413176 | 17.888049 | 0.140202 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245435 | 0.003441 | 0.3635394 | 5.7548E-05 | 17700.14 | 10.664755 | 0.3329134 |
| 23 | 28.413176 | 17.888049 | 0.1387412 | 5.3688286 | 1.22538382 | 0.1626544 | 0.0154595 | 0.0245428 | 0.003441 | 0.3635394 | 5.7548E-05 | 17515.961 | 10.664755 | 0.3329134 |
| 24 | 28.413176 | 17.888049 | 0.1377499 | 5.3688286 | 1.22538783 | 0.1626544 | 0.0154595 | 0.0245287 | 0.003441 | 0.3635394 | 5.7548E-05 | 17391.049 | 10.664755 | 0.3329134 |

Note: [1] Idling EF = g/VKT x 4.01 km/hr
(i.e. MOVES EF x lowest speed bin cap)

**Appendix B: Emission Rate Inventory Summary**
***Bus Loop Emission Rate Calcualtions***

**Table 5-6: Hourly Emission Rates**
**T5.2 - AS4: Bus Loop (idling)**

| Hour | Emission Rate (g/s) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0473553 | 0.0298134 | 0.0002281 | 0.008948048 | 0.002042313 | 0.0002711 | 2.577E-05 | 4.088E-05 | 5.735E-06 | 0.0006059 | 9.5914E-08 | 28.798483 | 0.0177746 | 0.0005549 |
| 2 | 0.0473553 | 0.0298134 | 0.000226 | 0.008948048 | 0.002042313 | 0.0002711 | 2.577E-05 | 4.088E-05 | 5.735E-06 | 0.0006059 | 9.5915E-08 | 28.535828 | 0.0177746 | 0.0005549 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0.0473553 | 0.0298134 | 0.0002235 | 0.008948048 | 0.002042313 | 0.0002711 | 2.577E-05 | 4.088E-05 | 5.735E-06 | 0.0006059 | 9.5917E-08 | 28.222046 | 0.0177746 | 0.0005549 |
| 8 | 0.0710329 | 0.0447201 | 0.0003429 | 0.013422072 | 0.00306347 | 0.0004066 | 3.865E-05 | 6.132E-05 | 8.602E-06 | 0.0009088 | 1.4387E-07 | 43.286246 | 0.0266619 | 0.0008323 |
| 9 | 0.0710329 | 0.0447201 | 0.0003514 | 0.013422072 | 0.00306346 | 0.0004066 | 3.865E-05 | 6.132E-05 | 8.602E-06 | 0.0009088 | 1.4387E-07 | 44.365738 | 0.0266619 | 0.0008323 |
| 10 | 0.1183882 | 0.0745335 | 0.0005961 | 0.022370119 | 0.005105766 | 0.0006777 | 6.441E-05 | 0.0001022 | 1.434E-05 | 0.0015147 | 2.3978E-07 | 75.259012 | 0.0444365 | 0.0013871 |
| 11 | 0.0947106 | 0.0596268 | 0.0004818 | 0.017896095 | 0.004084613 | 0.0005422 | 5.153E-05 | 8.178E-05 | 1.147E-05 | 0.0012118 | 1.9183E-07 | 60.822611 | 0.0355492 | 0.0011097 |
| 12 | 0.1183882 | 0.0745335 | 0.0006114 | 0.022370119 | 0.005105766 | 0.0006777 | 6.441E-05 | 0.0001022 | 1.434E-05 | 0.0015147 | 2.3978E-07 | 77.185817 | 0.0444365 | 0.0013871 |
| 13 | 0.0947106 | 0.0596268 | 0.0004919 | 0.017896095 | 0.004084613 | 0.0005422 | 5.153E-05 | 8.179E-05 | 1.147E-05 | 0.0012118 | 1.9183E-07 | 62.099796 | 0.0355492 | 0.0011097 |
| 14 | 0.1183882 | 0.0745335 | 0.0006168 | 0.022370119 | 0.005105766 | 0.0006777 | 6.441E-05 | 0.0001023 | 1.434E-05 | 0.0015147 | 2.3978E-07 | 77.86618 | 0.0444365 | 0.0013871 |
| 15 | 0.1183882 | 0.0745335 | 0.000619 | 0.022370119 | 0.005105766 | 0.0006777 | 6.441E-05 | 0.0001023 | 1.434E-05 | 0.0015147 | 2.3978E-07 | 78.144374 | 0.0444365 | 0.0013871 |
| 16 | 0.1183882 | 0.0745335 | 0.0006166 | 0.022370119 | 0.005105766 | 0.0006777 | 6.441E-05 | 0.0001022 | 1.434E-05 | 0.0015147 | 2.3978E-07 | 77.842621 | 0.0444365 | 0.0013871 |
| 17 | 0.1183882 | 0.0745335 | 0.0006162 | 0.022370119 | 0.005105766 | 0.0006777 | 6.441E-05 | 0.0001023 | 1.434E-05 | 0.0015147 | 2.3978E-07 | 77.785479 | 0.0444365 | 0.0013871 |
| 18 | 0.1183882 | 0.0745335 | 0.0006143 | 0.022370119 | 0.005105766 | 0.0006777 | 6.441E-05 | 0.0001023 | 1.434E-05 | 0.0015147 | 2.3978E-07 | 77.548722 | 0.0444365 | 0.0013871 |
| **19** | **0.1183882** | **0.0745335** | **0.0006093** | **0.022370119** | **0.005105766** | **0.0006777** | **6.441E-05** | **0.0001023** | **1.434E-05** | **0.0015147** | **2.3978E-07** | **76.92099** | **0.0444365** | **0.0013871** |
| 20 | 0.0710329 | 0.0447201 | 0.0003581 | 0.013422072 | 0.00306346 | 0.0004066 | 3.865E-05 | 6.136E-05 | 8.602E-06 | 0.0009088 | 1.4387E-07 | 45.206735 | 0.0266619 | 0.0008323 |
| 21 | 0.0710329 | 0.0447201 | 0.0003536 | 0.013422072 | 0.00306346 | 0.0004066 | 3.865E-05 | 6.136E-05 | 8.602E-06 | 0.0009088 | 1.4387E-07 | 44.636012 | 0.0266619 | 0.0008323 |
| 22 | 0.0710329 | 0.0447201 | 0.0003505 | 0.013422072 | 0.00306346 | 0.0004066 | 3.865E-05 | 6.136E-05 | 8.602E-06 | 0.0009088 | 1.4387E-07 | 44.25035 | 0.0266619 | 0.0008323 |
| 23 | 0.0710329 | 0.0447201 | 0.0003469 | 0.013422072 | 0.00306346 | 0.0004066 | 3.865E-05 | 6.136E-05 | 8.602E-06 | 0.0009088 | 1.4387E-07 | 43.789902 | 0.0266619 | 0.0008323 |
| 24 | 0.0473553 | 0.0298134 | 0.0002296 | 0.008948048 | 0.002042313 | 0.0002711 | 2.577E-05 | 4.088E-05 | 5.735E-06 | 0.0006059 | 9.5913E-08 | 28.985082 | 0.0177746 | 0.0005549 |

**Appendix B: Emission Rate Inventory Summary**
***Bus Loop Emission Rate Calcualtions***

**Table 5-6: Hourly Emission Rates**
**T5.3 - AS4: Bus Loop (idling)**

| Hour | Annual Emissions (tonnes/year) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0622249 | 0.0391748 | 0.0002997 | 0.011757735 | 0.002683599 | 0.0003562 | 3.386E-05 | 5.372E-05 | 7.536E-06 | 0.0007962 | 1.2603E-07 | 37.841207 | 0.0233558 | 0.0007291 |
| 2 | 0.0622249 | 0.0391748 | 0.000297 | 0.011757735 | 0.002683599 | 0.0003562 | 3.386E-05 | 5.372E-05 | 7.536E-06 | 0.0007962 | 1.2603E-07 | 37.496078 | 0.0233558 | 0.0007291 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0.0622249 | 0.0391748 | 0.0002937 | 0.011757735 | 0.002683599 | 0.0003562 | 3.386E-05 | 5.372E-05 | 7.536E-06 | 0.0007962 | 1.2603E-07 | 37.083768 | 0.0233558 | 0.0007291 |
| 8 | 0.0933373 | 0.0587622 | 0.0004505 | 0.017636602 | 0.004025399 | 0.0005343 | 5.078E-05 | 8.058E-05 | 1.13E-05 | 0.0011942 | 1.8905E-07 | 56.878127 | 0.0350337 | 0.0010936 |
| 9 | 0.0933373 | 0.0587622 | 0.0004618 | 0.017636602 | 0.004025386 | 0.0005343 | 5.078E-05 | 8.058E-05 | 1.13E-05 | 0.0011942 | 1.8904E-07 | 58.296579 | 0.0350337 | 0.0010936 |
| 10 | 0.1555621 | 0.0979371 | 0.0007833 | 0.029394337 | 0.006708976 | 0.0008905 | 8.464E-05 | 0.0001343 | 1.884E-05 | 0.0019904 | 3.1507E-07 | 98.890341 | 0.0583895 | 0.0018227 |
| 11 | 0.1244497 | 0.0783497 | 0.0006331 | 0.023515469 | 0.005367181 | 0.0007124 | 6.771E-05 | 0.0001075 | 1.507E-05 | 0.0015923 | 2.5206E-07 | 79.92091 | 0.0467116 | 0.0014582 |
| 12 | 0.1555621 | 0.0979371 | 0.0008034 | 0.029394337 | 0.006708976 | 0.0008905 | 8.464E-05 | 0.0001343 | 1.884E-05 | 0.0019904 | 3.1507E-07 | 101.42216 | 0.0583895 | 0.0018227 |
| 13 | 0.1244497 | 0.0783497 | 0.0006464 | 0.023515469 | 0.005367181 | 0.0007124 | 6.771E-05 | 0.0001075 | 1.507E-05 | 0.0015923 | 2.5206E-07 | 81.599132 | 0.0467116 | 0.0014582 |
| 14 | 0.1555621 | 0.0979371 | 0.0008105 | 0.029394337 | 0.006708976 | 0.0008905 | 8.464E-05 | 0.0001344 | 1.884E-05 | 0.0019904 | 3.1507E-07 | 102.31616 | 0.0583895 | 0.0018227 |
| 15 | 0.1555621 | 0.0979371 | 0.0008134 | 0.029394337 | 0.006708976 | 0.0008905 | 8.464E-05 | 0.0001344 | 1.884E-05 | 0.0019904 | 3.1507E-07 | 102.68171 | 0.0583895 | 0.0018227 |
| 16 | 0.1555621 | 0.0979371 | 0.0008103 | 0.029394337 | 0.006708976 | 0.0008905 | 8.464E-05 | 0.0001343 | 1.884E-05 | 0.0019904 | 3.1507E-07 | 102.2852 | 0.0583895 | 0.0018227 |
| 17 | 0.1555621 | 0.0979371 | 0.0008097 | 0.029394337 | 0.006708976 | 0.0008905 | 8.464E-05 | 0.0001344 | 1.884E-05 | 0.0019904 | 3.1507E-07 | 102.21012 | 0.0583895 | 0.0018227 |
| 18 | 0.1555621 | 0.0979371 | 0.0008072 | 0.029394337 | 0.006708976 | 0.0008905 | 8.464E-05 | 0.0001344 | 1.884E-05 | 0.0019904 | 3.1507E-07 | 101.89902 | 0.0583895 | 0.0018227 |
| 19 | 0.1555621 | 0.0979371 | 0.0008007 | 0.029394337 | 0.006708976 | 0.0008905 | 8.464E-05 | 0.0001344 | 1.884E-05 | 0.0019904 | 3.1507E-07 | 101.07418 | 0.0583895 | 0.0018227 |
| 20 | 0.0933373 | 0.0587622 | 0.0004705 | 0.017636602 | 0.004025386 | 0.0005343 | 5.078E-05 | 8.062E-05 | 1.13E-05 | 0.0011942 | 1.8904E-07 | 59.40165 | 0.0350337 | 0.0010936 |
| 21 | 0.0933373 | 0.0587622 | 0.0004646 | 0.017636602 | 0.004025386 | 0.0005343 | 5.078E-05 | 8.062E-05 | 1.13E-05 | 0.0011942 | 1.8904E-07 | 58.651719 | 0.0350337 | 0.0010936 |
| 22 | 0.0933373 | 0.0587622 | 0.0004606 | 0.017636602 | 0.004025386 | 0.0005343 | 5.078E-05 | 8.063E-05 | 1.13E-05 | 0.0011942 | 1.8904E-07 | 58.14496 | 0.0350337 | 0.0010936 |
| 23 | 0.0933373 | 0.0587622 | 0.0004558 | 0.017636602 | 0.004025386 | 0.0005343 | 5.078E-05 | 8.062E-05 | 1.13E-05 | 0.0011942 | 1.8904E-07 | 57.539931 | 0.0350337 | 0.0010936 |
| 24 | 0.0622249 | 0.0391748 | 0.0003017 | 0.011757735 | 0.002683599 | 0.0003562 | 3.386E-05 | 5.372E-05 | 7.536E-06 | 0.0007962 | 1.2603E-07 | 38.086398 | 0.0233558 | 0.0007291 |
| **SUM** | **2.3023196** | **1.4494686** | **0.0116737** | **0.435036181** | **0.099292899** | **0.0131799** | **0.0012527** | **0.0019883** | **0.0002788** | **0.0294576** | **4.6631E-06** | **1473.7194** | **0.8641651** | **0.026976** |

**Appendix B: Emission Rate Inventory Summary**
***Bus Loop Emission Rate Calcualtions***

**Table 5-6: Hourly Emission Rates**
**T6.1 - LVS4: Entrance/Exit from Bus Loop**

| Hour | MOVES Emission Rate (g/VKT) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 1.94105 | 1.35922 | 0.0098731 | 10.58360376 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016431 | 0.0002197 | 0.024508 | 3.2546E-06 | 1251.94 | 0.824508 | 0.0207552 |
| 2 | 1.94105 | 1.35922 | 0.0097903 | 10.58360376 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016431 | 0.0002197 | 0.024508 | 3.2546E-06 | 1241.47 | 0.824508 | 0.0207552 |
| 3 | 1.94105 | 1.35922 | 0.0097034 | 10.58360376 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016431 | 0.0002197 | 0.024508 | 3.2547E-06 | 1230.47 | 0.824508 | 0.0207552 |
| 4 | 1.94105 | 1.35922 | 0.0096487 | 10.58360376 | 2.531512652 | 0.011353 | 0.0009871 | 0.0016431 | 0.0002197 | 0.024508 | 3.2547E-06 | 1223.54 | 0.824508 | 0.0207552 |
| 5 | 1.94105 | 1.35922 | 0.0096359 | 10.58360376 | 2.531512652 | 0.011353 | 0.0009871 | 0.001643 | 0.0002197 | 0.024508 | 3.2547E-06 | 1221.93 | 0.824508 | 0.0207552 |
| 6 | 1.94105 | 1.35922 | 0.0096359 | 10.58360376 | 2.531512652 | 0.011353 | 0.0009871 | 0.001643 | 0.0002197 | 0.024508 | 3.2547E-06 | 1221.93 | 0.824508 | 0.0207552 |
| 7 | 1.94105 | 1.35922 | 0.0096914 | 10.58360376 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016431 | 0.0002197 | 0.024508 | 3.2547E-06 | 1228.96 | 0.824508 | 0.0207552 |
| 8 | 1.94105 | 1.35922 | 0.0098917 | 10.58360376 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016432 | 0.0002197 | 0.024508 | 3.2546E-06 | 1254.3 | 0.824508 | 0.0207552 |
| 9 | 1.94105 | 1.35922 | 0.0101185 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016432 | 0.0002197 | 0.024508 | 3.2546E-06 | 1282.99 | 0.824508 | 0.0207552 |
| 10 | 1.94105 | 1.35922 | 0.0102844 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016433 | 0.0002197 | 0.024508 | 3.2546E-06 | 1303.99 | 0.824508 | 0.0207552 |
| 11 | 1.94105 | 1.35922 | 0.0103814 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016435 | 0.0002197 | 0.024508 | 3.2546E-06 | 1316.26 | 0.824508 | 0.0207552 |
| 12 | 1.94105 | 1.35922 | 0.0105273 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016436 | 0.0002197 | 0.024508 | 3.2546E-06 | 1334.72 | 0.824508 | 0.0207552 |
| 13 | 1.94105 | 1.35922 | 0.0105827 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016436 | 0.0002197 | 0.024508 | 3.2546E-06 | 1341.73 | 0.824508 | 0.0207552 |
| 14 | 1.94105 | 1.35922 | 0.0106131 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016438 | 0.0002197 | 0.024508 | 3.2546E-06 | 1345.58 | 0.824508 | 0.0207552 |
| 15 | 1.94105 | 1.35922 | 0.0106482 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016438 | 0.0002197 | 0.024508 | 3.2546E-06 | 1350.02 | 0.824508 | 0.0207552 |
| 16 | 1.94105 | 1.35922 | 0.0106102 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016436 | 0.0002197 | 0.024508 | 3.2546E-06 | 1345.2 | 0.824508 | 0.0207552 |
| 17 | 1.94105 | 1.35922 | 0.010603 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016438 | 0.0002197 | 0.024508 | 3.2546E-06 | 1344.29 | 0.824508 | 0.0207552 |
| 18 | 1.94105 | 1.35922 | 0.0105731 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.001644 | 0.0002197 | 0.024508 | 3.2546E-06 | 1340.52 | 0.824508 | 0.0207552 |
| 19 | 1.94105 | 1.35922 | 0.010494 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016441 | 0.0002197 | 0.024508 | 3.2546E-06 | 1330.5 | 0.824508 | 0.0207552 |
| 20 | 1.94105 | 1.35922 | 0.0102952 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.001644 | 0.0002197 | 0.024508 | 3.2546E-06 | 1305.35 | 0.824508 | 0.0207552 |
| 21 | 1.94105 | 1.35922 | 0.0101753 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016439 | 0.0002197 | 0.024508 | 3.2546E-06 | 1290.18 | 0.824508 | 0.0207552 |
| 22 | 1.94105 | 1.35922 | 0.0100943 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.001644 | 0.0002197 | 0.024508 | 3.2546E-06 | 1279.93 | 0.824508 | 0.0207552 |
| 23 | 1.94105 | 1.35922 | 0.0099976 | 10.58360276 | 2.531511652 | 0.011353 | 0.0009871 | 0.001644 | 0.0002197 | 0.024508 | 3.2546E-06 | 1267.69 | 0.824508 | 0.0207552 |
| 24 | 1.94105 | 1.35922 | 0.0099319 | 10.58360376 | 2.531511652 | 0.011353 | 0.0009871 | 0.0016431 | 0.0002197 | 0.024508 | 3.2546E-06 | 1259.39 | 0.824508 | 0.0207552 |

Note: [1] Idling EF = g/VKT x 4.01 km/hr
(i.e. MOVES EF x lowest speed bin cap)

**Appendix B: Emission Rate Inventory Summary**
***Bus Loop Emission Rate Calcualtions***

**Table 5-6: Hourly Emission Rates**
**T6.2- LVS4: Entrance/Exit from Bus Loop**

| Hour | Emission Rate (g/s) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0005618 | 0.0003934 | 2.858E-06 | 0.003063365 | 0.000732732 | 3.286E-06 | 2.857E-07 | 4.756E-07 | 6.359E-08 | 7.094E-06 | 9.4203E-10 | 0.3623671 | 0.0002386 | 6.007E-06 |
| 2 | 0.0005618 | 0.0003934 | 2.834E-06 | 0.003063365 | 0.000732732 | 3.286E-06 | 2.857E-07 | 4.756E-07 | 6.359E-08 | 7.094E-06 | 9.4204E-10 | 0.3593366 | 0.0002386 | 6.007E-06 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0.0005618 | 0.0003934 | 2.805E-06 | 0.003063365 | 0.000732732 | 3.286E-06 | 2.857E-07 | 4.756E-07 | 6.359E-08 | 7.094E-06 | 9.4205E-10 | 0.3557156 | 0.0002386 | 6.007E-06 |
| 8 | 0.0008427 | 0.0005901 | 4.295E-06 | 0.004595048 | 0.001099098 | 4.929E-06 | 4.285E-07 | 7.134E-07 | 9.539E-08 | 1.064E-05 | 1.413E-09 | 0.5445753 | 0.000358 | 9.011E-06 |
| 9 | 0.0008427 | 0.0005901 | 4.393E-06 | 0.004595048 | 0.001099098 | 4.929E-06 | 4.285E-07 | 7.134E-07 | 9.539E-08 | 1.064E-05 | 1.413E-09 | 0.5570315 | 0.000358 | 9.011E-06 |
| 10 | 0.0014046 | 0.0009835 | 7.442E-06 | 0.007658413 | 0.00183183 | 8.215E-06 | 7.142E-07 | 1.189E-06 | 1.59E-07 | 1.773E-05 | 2.355E-09 | 0.9435817 | 0.0005966 | 1.502E-05 |
| 11 | 0.0011237 | 0.0007868 | 6.01E-06 | 0.00612673 | 0.001465464 | 6.572E-06 | 5.714E-07 | 9.514E-07 | 1.272E-07 | 1.419E-05 | 1.884E-09 | 0.7619683 | 0.0004773 | 1.201E-05 |
| 12 | 0.0014046 | 0.0009835 | 7.618E-06 | 0.007658413 | 0.00183183 | 8.215E-06 | 7.142E-07 | 1.189E-06 | 1.59E-07 | 1.773E-05 | 2.355E-09 | 0.9658182 | 0.0005966 | 1.502E-05 |
| 13 | 0.0011237 | 0.0007868 | 6.126E-06 | 0.00612673 | 0.001465464 | 6.572E-06 | 5.714E-07 | 9.515E-07 | 1.272E-07 | 1.419E-05 | 1.884E-09 | 0.7767126 | 0.0004773 | 1.201E-05 |
| 14 | 0.0014046 | 0.0009835 | 7.68E-06 | 0.007658413 | 0.00183183 | 8.215E-06 | 7.142E-07 | 1.189E-06 | 1.59E-07 | 1.773E-05 | 2.355E-09 | 0.9736766 | 0.0005966 | 1.502E-05 |
| 15 | 0.0014046 | 0.0009835 | 7.705E-06 | 0.007658413 | 0.00183183 | 8.215E-06 | 7.142E-07 | 1.189E-06 | 1.59E-07 | 1.773E-05 | 2.355E-09 | 0.9768895 | 0.0005966 | 1.502E-05 |
| 16 | 0.0014046 | 0.0009835 | 7.678E-06 | 0.007658413 | 0.00183183 | 8.215E-06 | 7.142E-07 | 1.189E-06 | 1.59E-07 | 1.773E-05 | 2.355E-09 | 0.9734017 | 0.0005966 | 1.502E-05 |
| 17 | 0.0014046 | 0.0009835 | 7.672E-06 | 0.007658413 | 0.00183183 | 8.215E-06 | 7.142E-07 | 1.189E-06 | 1.59E-07 | 1.773E-05 | 2.355E-09 | 0.9727432 | 0.0005966 | 1.502E-05 |
| 18 | 0.0014046 | 0.0009835 | 7.651E-06 | 0.007658413 | 0.00183183 | 8.215E-06 | 7.142E-07 | 1.19E-06 | 1.59E-07 | 1.773E-05 | 2.355E-09 | 0.9700152 | 0.0005966 | 1.502E-05 |
| **19** | **0.0014046** | **0.0009835** | **7.594E-06** | **0.007658413** | **0.00183183** | **8.215E-06** | **7.142E-07** | **1.19E-06** | **1.59E-07** | **1.773E-05** | **2.355E-09** | **0.9627646** | **0.0005966** | **1.502E-05** |
| 20 | 0.0008427 | 0.0005901 | 4.47E-06 | 0.004595048 | 0.001099098 | 4.929E-06 | 4.285E-07 | 7.138E-07 | 9.539E-08 | 1.064E-05 | 1.413E-09 | 0.5667395 | 0.000358 | 9.011E-06 |
| 21 | 0.0008427 | 0.0005901 | 4.418E-06 | 0.004595048 | 0.001099098 | 4.929E-06 | 4.285E-07 | 7.137E-07 | 9.539E-08 | 1.064E-05 | 1.413E-09 | 0.5601532 | 0.000358 | 9.011E-06 |
| 22 | 0.0008427 | 0.0005901 | 4.383E-06 | 0.004595048 | 0.001099098 | 4.929E-06 | 4.285E-07 | 7.138E-07 | 9.539E-08 | 1.064E-05 | 1.413E-09 | 0.5557029 | 0.000358 | 9.011E-06 |
| 23 | 0.0008427 | 0.0005901 | 4.341E-06 | 0.004595048 | 0.001099098 | 4.929E-06 | 4.285E-07 | 7.138E-07 | 9.539E-08 | 1.064E-05 | 1.413E-09 | 0.5503887 | 0.000358 | 9.011E-06 |
| 24 | 0.0005618 | 0.0003934 | 2.875E-06 | 0.003063365 | 0.000732732 | 3.286E-06 | 2.857E-07 | 4.756E-07 | 6.359E-08 | 7.094E-06 | 9.4202E-10 | 0.3645234 | 0.0002386 | 6.007E-06 |

**Appendix B: Emission Rate Inventory Summary**
***Bus Loop Emission Rate Calcualtions***

**Table 5-6: Hourly Emission Rates**
**T6.3- LVS4: Entrance/Exit from Bus Loop**

| Hour | Annual Emissions (tonnes/year) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0007382 | 0.000517 | 3.755E-06 | 0.004025262 | 0.00096281 | 4.318E-06 | 3.754E-07 | 6.249E-07 | 8.356E-08 | 9.321E-06 | 1.2378E-09 | 0.4761503 | 0.0003136 | 7.894E-06 |
| 2 | 0.0007382 | 0.000517 | 3.724E-06 | 0.004025262 | 0.00096281 | 4.318E-06 | 3.754E-07 | 6.249E-07 | 8.356E-08 | 9.321E-06 | 1.2378E-09 | 0.4721683 | 0.0003136 | 7.894E-06 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0.0007382 | 0.000517 | 3.686E-06 | 0.004025262 | 0.00096281 | 4.318E-06 | 3.754E-07 | 6.249E-07 | 8.356E-08 | 9.321E-06 | 1.2379E-09 | 0.4674104 | 0.0003136 | 7.894E-06 |
| 8 | 0.0011074 | 0.0007754 | 5.643E-06 | 0.006037893 | 0.001444215 | 6.477E-06 | 5.631E-07 | 9.374E-07 | 1.253E-07 | 1.398E-05 | 1.8567E-09 | 0.7155719 | 0.0004704 | 1.184E-05 |
| 9 | 0.0011074 | 0.0007754 | 5.773E-06 | 0.006037892 | 0.001444215 | 6.477E-06 | 5.631E-07 | 9.374E-07 | 1.253E-07 | 1.398E-05 | 1.8567E-09 | 0.7319394 | 0.0004704 | 1.184E-05 |
| 10 | 0.0018456 | 0.0012924 | 9.779E-06 | 0.010063154 | 0.002407025 | 1.079E-05 | 9.385E-07 | 1.562E-06 | 2.089E-07 | 2.33E-05 | 3.0945E-09 | 1.2398663 | 0.000784 | 1.973E-05 |
| 11 | 0.0014765 | 0.0010339 | 7.897E-06 | 0.008050523 | 0.00192562 | 8.636E-06 | 7.508E-07 | 1.25E-06 | 1.671E-07 | 1.864E-05 | 2.4756E-09 | 1.0012263 | 0.0006272 | 1.579E-05 |
| 12 | 0.0018456 | 0.0012924 | 1.001E-05 | 0.010063154 | 0.002407025 | 1.079E-05 | 9.385E-07 | 1.563E-06 | 2.089E-07 | 2.33E-05 | 3.0945E-09 | 1.2690851 | 0.000784 | 1.973E-05 |
| 13 | 0.0014765 | 0.0010339 | 8.05E-06 | 0.008050523 | 0.00192562 | 8.636E-06 | 7.508E-07 | 1.25E-06 | 1.671E-07 | 1.864E-05 | 2.4756E-09 | 1.0206003 | 0.0006272 | 1.579E-05 |
| 14 | 0.0018456 | 0.0012924 | 1.009E-05 | 0.010063154 | 0.002407025 | 1.079E-05 | 9.385E-07 | 1.563E-06 | 2.089E-07 | 2.33E-05 | 3.0945E-09 | 1.2794111 | 0.000784 | 1.973E-05 |
| 15 | 0.0018456 | 0.0012924 | 1.012E-05 | 0.010063154 | 0.002407025 | 1.079E-05 | 9.385E-07 | 1.563E-06 | 2.089E-07 | 2.33E-05 | 3.0945E-09 | 1.2836328 | 0.000784 | 1.973E-05 |
| 16 | 0.0018456 | 0.0012924 | 1.009E-05 | 0.010063154 | 0.002407025 | 1.079E-05 | 9.385E-07 | 1.563E-06 | 2.089E-07 | 2.33E-05 | 3.0945E-09 | 1.2790498 | 0.000784 | 1.973E-05 |
| 17 | 0.0018456 | 0.0012924 | 1.008E-05 | 0.010063154 | 0.002407025 | 1.079E-05 | 9.385E-07 | 1.563E-06 | 2.089E-07 | 2.33E-05 | 3.0945E-09 | 1.2781845 | 0.000784 | 1.973E-05 |
| 18 | 0.0018456 | 0.0012924 | 1.005E-05 | 0.010063154 | 0.002407025 | 1.079E-05 | 9.385E-07 | 1.563E-06 | 2.089E-07 | 2.33E-05 | 3.0945E-09 | 1.2745999 | 0.000784 | 1.973E-05 |
| 19 | 0.0018456 | 0.0012924 | 9.978E-06 | 0.010063154 | 0.002407025 | 1.079E-05 | 9.385E-07 | 1.563E-06 | 2.089E-07 | 2.33E-05 | 3.0945E-09 | 1.2650727 | 0.000784 | 1.973E-05 |
| 20 | 0.0011074 | 0.0007754 | 5.873E-06 | 0.006037892 | 0.001444215 | 6.477E-06 | 5.631E-07 | 9.379E-07 | 1.253E-07 | 1.398E-05 | 1.8567E-09 | 0.7446956 | 0.0004704 | 1.184E-05 |
| 21 | 0.0011074 | 0.0007754 | 5.805E-06 | 0.006037892 | 0.001444215 | 6.477E-06 | 5.631E-07 | 9.379E-07 | 1.253E-07 | 1.398E-05 | 1.8567E-09 | 0.7360412 | 0.0004704 | 1.184E-05 |
| 22 | 0.0011074 | 0.0007754 | 5.759E-06 | 0.006037892 | 0.001444215 | 6.477E-06 | 5.631E-07 | 9.379E-07 | 1.253E-07 | 1.398E-05 | 1.8567E-09 | 0.7301937 | 0.0004704 | 1.184E-05 |
| 23 | 0.0011074 | 0.0007754 | 5.704E-06 | 0.006037892 | 0.001444215 | 6.477E-06 | 5.631E-07 | 9.379E-07 | 1.253E-07 | 1.398E-05 | 1.8567E-09 | 0.7232108 | 0.0004704 | 1.184E-05 |
| 24 | 0.0007382 | 0.000517 | 3.777E-06 | 0.004025262 | 0.00096281 | 4.318E-06 | 3.754E-07 | 6.249E-07 | 8.356E-08 | 9.321E-06 | 1.2378E-09 | 0.4789838 | 0.0003136 | 7.894E-06 |
| **SUM** | **0.0273149** | **0.0191272** | **0.0001457** | **0.148934683** | **0.035623964** | **0.0001598** | **1.389E-05** | **2.313E-05** | **3.092E-06** | **0.0003449** | **4.5799E-08** | **18.467094** | **0.0116026** | **0.0002921** |

## Appendix B: Emission Rate Inventory Summary

***PPUDO Emission Rate Calcualtions***

**Table 1: Emission Rate Summary (Maximum: HR 17)**

| Pollutant | Emission Rate (g/s) | |
|---|---|---|
| | AS3 | LVS3 |
| | PPUDO | Entrance/Exit from PPUDO |
| NOX | 0.006729113 | 0.000938454 |
| CO | 0.995880292 | 0.073113104 |
| SO2 | 0.002311779 | 0.000105195 |
| PM10 | 0.142003323 | 0.078010118 |
| PM2.5 | 0.020541012 | 0.018248219 |
| Acetaldehyde | 2.66717E-05 | 2.22637E-06 |
| Acrolein | 3.27406E-06 | 2.73296E-07 |
| Benzene | 0.000338944 | 2.01359E-05 |
| 1,3-Butadiene | 3.10178E-08 | 2.58775E-09 |
| Formaldehyde | 6.17994E-05 | 5.15861E-06 |
| Benzo(a)pyrene | 1.60646E-06 | 8.14448E-08 |
| CO2 | 345.9878125 | 15.74375286 |
| CH4 | 0.000872668 | 7.28849E-05 |
| N2O | 0.004331968 | 0.00014665 |

**Table 1-2: Annual Emissions Summary**

| Pollutant | Annual CAC Emissions (tonnes/year) | |
|---|---|---|
| | AS3 | LVS3 |
| NOX | 1.30E-01 | 1.98E-02 |
| CO | 1.90E+01 | 1.39E+00 |
| SO2 | 4.71E-02 | 2.16E-03 |
| PM10 | 3.00E+00 | 1.65E+00 |
| PM2.5 | 4.34E-01 | 3.86E-01 |
| Acetaldehyde | 5.53E-04 | 4.60E-05 |
| Acrolein | 6.77E-05 | 5.63E-06 |
| Benzene | 7.02E-03 | 4.16E-04 |
| 1,3-Butadiene | 6.41E-07 | 5.34E-08 |
| Formaldehyde | 1.28E-03 | 1.07E-04 |
| Benzo(a)pyrene | 3.40E-05 | 1.72E-06 |
| CO2 | 7.05E+03 | 3.23E+02 |
| CH4 | 1.80E-02 | 1.50E-03 |
| N2O | 9.16E-02 | 3.10E-03 |

**Table 2: Hourly Distribution (Period) & HWS Ridership**

| Hour | Hourly Distribution per Period (%) | Number of Transit Stops at WRTS |
|---|---|---|
| 1 | 14% | 10 |
| 2 | 6% | 4 |
| 3 | 0 | 0 |
| 4 | 0 | 0 |
| 5 | 0 | 0 |
| 6 | 0 | 6 |
| 7 | 32% | 13 |
| 8 | 32% | 13 |
| 9 | 37% | 15 |
| 10 | 15% | 15 |
| 11 | 14% | 14 |
| 12 | 15% | 15 |
| 13 | 14% | 14 |
| 14 | 15% | 15 |
| 15 | 15% | 15 |
| 16 | 15% | 15 |
| 17 | 35% | 17 |
| 18 | 32% | 15 |
| 19 | 32% | 15 |
| 20 | 17% | 12 |
| 21 | 16% | 11 |
| 22 | 16% | 11 |
| 23 | 16% | 11 |
| 24 | 14% | 10 |
| **MAX** | | **17** |

AM Peak Period = 6 AM - 9 AM
Mid-day Period = 9 AM - 4 PM
PM Peak Period = 4 PM - 7 PM
Evening Period = 7 PM - 2 AM

**Appendix B: Emission Rate Inventory Summary**
***PPUDO Emission Rate Calcualtions***

**Table 3: Source Quantification per hour**

| Hour | (min-idling/hr) | VKT/hr |
|---|---|---|
| | AS3 | LVS3 |
| | PPUDO | Entrance/Exit from PPUDO |
| 1 | 240 | 130 |
| 2 | 96 | 52 |
| 3 | 0 | 0 |
| 4 | 0 | 0 |
| 5 | 0 | 0 |
| 6 | 144 | 78 |
| 7 | 312 | 169 |
| 8 | 312 | 169 |
| 9 | 360 | 195 |
| 10 | 360 | 195 |
| 11 | 336 | 182 |
| 12 | 360 | 195 |
| 13 | 336 | 182 |
| 14 | 360 | 195 |
| 15 | 360 | 195 |
| 16 | 360 | 195 |
| 17 | 396 | 215 |
| 18 | 360 | 195 |
| 19 | 360 | 195 |
| 20 | 288 | 156 |
| 21 | 264 | 143 |
| 22 | 264 | 143 |
| 23 | 264 | 143 |
| 24 | 240 | 130 |
| **MAX** | **396** | **215** |

AM Peak Period = 6 AM - 9 AM
Mid-day Period = 9 AM - 4 PM
PM Peak Period = 4 PM - 7 PM
Evening Period = 7 PM - 2 AM

**Table 4: Hourly Distribut (AERMOD INPUT)**

| Hour | Hourly Distribution (%) |
|---|---|
| 1 | 0.61 |
| 2 | 0.24 |
| 3 | 0.00 |
| 4 | 0.00 |
| 5 | 0.00 |
| 6 | 0.36 |
| 7 | 0.79 |
| 8 | 0.79 |
| 9 | 0.91 |
| 10 | 0.91 |
| 11 | 0.85 |
| 12 | 0.91 |
| 13 | 0.85 |
| 14 | 0.91 |
| 15 | 0.91 |
| 16 | 0.91 |
| 17 | 1.00 |
| 18 | 0.91 |
| 19 | 0.91 |
| 20 | 0.73 |
| 21 | 0.67 |
| 22 | 0.67 |
| 23 | 0.67 |
| 24 | 0.61 |
| **MAX HR** | **17** |

**Appendix B: Emission Rate Inventory Summary**
***PPUDO Emission Rate Calcualtions***

**Table 5-6: Hourly Emission Rates** Note: [1] Idling EF = g/VKT x 4.01 km/hr
**T5.1 - AS3: PPUDO Idling** (i.e. MOVES EF x lowest speed bin cap)

| Hour | MOVES Emission Rate (g/veh-hr) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0491734 | 6.9318063 | 0.0192126 | 1.29094732 | 0.186742492 | 0.0002312 | 2.82E-05 | 0.0029377 | 2.671E-07 | 0.000534 | 1.4607E-05 | 2875.4186 | 0.0075125 | 0.0393815 |
| 2 | 0.0491734 | 6.6911261 | 0.019008 | 1.29095133 | 0.186747304 | 0.0002312 | 2.802E-05 | 0.0029213 | 2.655E-07 | 0.000534 | 1.4609E-05 | 2844.7983 | 0.0074647 | 0.0393815 |
| 3 | 0.0491734 | 6.4384159 | 0.0187932 | 1.29095935 | 0.186752116 | 0.0002312 | 2.783E-05 | 0.0029109 | 2.637E-07 | 0.000534 | 1.4612E-05 | 2812.6541 | 0.0074146 | 0.0393815 |
| 4 | 0.0491734 | 6.2791788 | 0.0186578 | 1.29096336 | 0.186755324 | 0.0002312 | 2.771E-05 | 0.0029009 | 2.626E-07 | 0.000534 | 1.4614E-05 | 2792.3956 | 0.0073831 | 0.0393815 |
| 5 | 0.0491734 | 6.2420863 | 0.0186263 | 1.29096737 | 0.186758933 | 0.0002312 | 2.769E-05 | 0.002898 | 2.623E-07 | 0.000534 | 1.4615E-05 | 2787.6638 | 0.0073757 | 0.0393815 |
| 6 | 0.0491734 | 6.2420863 | 0.0186263 | 1.29096737 | 0.186758933 | 0.0002312 | 2.769E-05 | 0.002898 | 2.623E-07 | 0.000534 | 1.4615E-05 | 2787.6638 | 0.0073757 | 0.0393815 |
| 7 | 0.0491734 | 6.4036492 | 0.0187636 | 1.29095935 | 0.186752918 | 0.0002312 | 2.781E-05 | 0.0029075 | 2.635E-07 | 0.000534 | 1.4612E-05 | 2808.219 | 0.0074077 | 0.0393815 |
| 8 | 0.0491734 | 6.9859012 | 0.0192586 | 1.29094732 | 0.186741289 | 0.0002312 | 2.824E-05 | 0.0029379 | 2.675E-07 | 0.000534 | 1.4606E-05 | 2882.2958 | 0.0075232 | 0.0393815 |
| 9 | 0.0510669 | 7.6452254 | 0.0198191 | 1.2909393 | 0.186736477 | 0.000234 | 2.872E-05 | 0.0029782 | 2.721E-07 | 0.0005422 | 1.4604E-05 | 2966.1689 | 0.007654 | 0.0393815 |
| 10 | 0.0547325 | 8.1275482 | 0.0202291 | 1.2909393 | 0.186736477 | 0.0002369 | 2.908E-05 | 0.0030093 | 2.755E-07 | 0.0005489 | 1.4604E-05 | 3027.538 | 0.0077496 | 0.0393815 |
| 11 | 0.0565735 | 8.4094512 | 0.0204687 | 1.2909393 | 0.186736477 | 0.0002386 | 2.929E-05 | 0.0030281 | 2.775E-07 | 0.0005528 | 1.4604E-05 | 3063.4195 | 0.0078056 | 0.0393815 |
| 12 | 0.0596247 | 8.8337092 | 0.0208293 | 1.2909393 | 0.186736477 | 0.0002411 | 2.96E-05 | 0.0030536 | 2.804E-07 | 0.0005587 | 1.4604E-05 | 3117.39 | 0.0078897 | 0.0393815 |
| 13 | 0.0605835 | 8.9945904 | 0.0209661 | 1.2909393 | 0.186736477 | 0.0002421 | 2.972E-05 | 0.0030681 | 2.816E-07 | 0.000561 | 1.4604E-05 | 3137.8451 | 0.0079216 | 0.0393815 |
| 14 | 0.0612912 | 9.083051 | 0.0210413 | 1.2909393 | 0.186736477 | 0.0002426 | 2.979E-05 | 0.003081 | 2.822E-07 | 0.0005622 | 1.4604E-05 | 3149.1091 | 0.0079392 | 0.0393815 |
| 15 | 0.0620191 | 9.1849852 | 0.021128 | 1.2909393 | 0.186736477 | 0.0002433 | 2.986E-05 | 0.0030902 | 2.829E-07 | 0.0005636 | 1.4604E-05 | 3162.0655 | 0.0079594 | 0.0393815 |
| 16 | 0.0615611 | 9.0744295 | 0.021034 | 1.2909393 | 0.186736477 | 0.0002426 | 2.978E-05 | 0.0030873 | 2.821E-07 | 0.0005621 | 1.4604E-05 | 3148.0104 | 0.0079375 | 0.0393815 |
| 17 | 0.0611738 | 9.0534572 | 0.0210162 | 1.2909393 | 0.186736477 | 0.0002425 | 2.976E-05 | 0.0030813 | 2.82E-07 | 0.0005618 | 1.4604E-05 | 3145.3438 | 0.0079333 | 0.0393815 |
| 18 | 0.06094 | 8.9666808 | 0.0209424 | 1.2909393 | 0.186736477 | 0.0002419 | 2.97E-05 | 0.0030744 | 2.814E-07 | 0.0005606 | 1.4604E-05 | 3134.3082 | 0.0079161 | 0.0393815 |
| 19 | 0.0597157 | 8.7366672 | 0.0207469 | 1.2909393 | 0.186736477 | 0.0002406 | 2.953E-05 | 0.0030572 | 2.798E-07 | 0.0005574 | 1.4604E-05 | 3105.0312 | 0.0078705 | 0.0393815 |
| 20 | 0.0551243 | 8.1589064 | 0.0202557 | 1.2909393 | 0.186736477 | 0.0002371 | 2.91E-05 | 0.0030199 | 2.757E-07 | 0.0005493 | 1.4604E-05 | 3031.5239 | 0.0077559 | 0.0393815 |
| 21 | 0.0527371 | 7.810277 | 0.0199593 | 1.2909393 | 0.186736477 | 0.000235 | 2.885E-05 | 0.0029962 | 2.733E-07 | 0.0005445 | 1.4604E-05 | 2987.1733 | 0.0076867 | 0.0393815 |
| 22 | 0.0510353 | 7.5748098 | 0.0197592 | 1.2909393 | 0.186736477 | 0.0002336 | 2.867E-05 | 0.0029754 | 2.716E-07 | 0.0005412 | 1.4604E-05 | 2957.2226 | 0.00764 | 0.0393815 |
| 23 | 0.0491734 | 7.2935083 | 0.0195201 | 1.2909393 | 0.186736477 | 0.0002319 | 2.846E-05 | 0.002959 | 2.697E-07 | 0.0005373 | 1.4604E-05 | 2921.4414 | 0.0075842 | 0.0393815 |
| 24 | 0.0491734 | 7.1027526 | 0.0193579 | 1.29094331 | 0.186738883 | 0.0002312 | 2.832E-05 | 0.0029471 | 2.683E-07 | 0.0005346 | 1.4605E-05 | 2897.1729 | 0.0075464 | 0.0393815 |

Note: [1] Idling EF = g/VKT x 4.01 km/hr
(i.e. MOVES EF x lowest speed bin cap)

**Appendix B: Emission Rate Inventory Summary**
***PPUDO Emission Rate Calcualtions***

**Table 5-6: Hourly Emission Rates**
**T5.2- AS3: PPUDO Idling**

| Hour | Emission Rate (g/s) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0032782 | 0.4621204 | 0.0012808 | 0.086063155 | 0.012449499 | 1.541E-05 | 1.88E-06 | 0.0001958 | 1.781E-08 | 3.56E-05 | 9.7379E-07 | 191.69457 | 0.0005008 | 0.0026254 |
| 2 | 0.0013113 | 0.17843 | 0.0005069 | 0.034425369 | 0.004979928 | 6.164E-06 | 7.472E-07 | 7.79E-05 | 7.079E-09 | 1.424E-05 | 3.8958E-07 | 75.861287 | 0.0001991 | 0.0010502 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0.0019669 | 0.2496835 | 0.0007451 | 0.051638695 | 0.007470357 | 9.247E-06 | 1.107E-06 | 0.0001159 | 1.049E-08 | 2.136E-05 | 5.8462E-07 | 111.50655 | 0.000295 | 0.0015753 |
| 7 | 0.0042617 | 0.5549829 | 0.0016262 | 0.111883144 | 0.016185253 | 2.003E-05 | 2.41E-06 | 0.000252 | 2.283E-08 | 4.628E-05 | 1.2664E-06 | 243.37898 | 0.000642 | 0.0034131 |
| 8 | 0.0042617 | 0.6054448 | 0.0016691 | 0.111882101 | 0.016184245 | 2.003E-05 | 2.447E-06 | 0.0002546 | 2.319E-08 | 4.628E-05 | 1.2659E-06 | 249.79897 | 0.000652 | 0.0034131 |
| 9 | 0.0051067 | 0.7645225 | 0.0019819 | 0.12909393 | 0.018673648 | 2.34E-05 | 2.872E-06 | 0.0002978 | 2.721E-08 | 5.422E-05 | 1.4604E-06 | 296.61689 | 0.0007654 | 0.0039382 |
| 10 | 0.0054732 | 0.8127548 | 0.0020229 | 0.12909393 | 0.018673648 | 2.369E-05 | 2.908E-06 | 0.0003009 | 2.755E-08 | 5.489E-05 | 1.4604E-06 | 302.7538 | 0.000775 | 0.0039382 |
| 11 | 0.0052802 | 0.7848821 | 0.0019104 | 0.120487668 | 0.017428738 | 2.227E-05 | 2.734E-06 | 0.0002826 | 2.59E-08 | 5.16E-05 | 1.363E-06 | 285.91915 | 0.0007285 | 0.0036756 |
| 12 | 0.0059625 | 0.8833709 | 0.0020829 | 0.12909393 | 0.018673648 | 2.411E-05 | 2.96E-06 | 0.0003054 | 2.804E-08 | 5.587E-05 | 1.4604E-06 | 311.739 | 0.000789 | 0.0039382 |
| 13 | 0.0056545 | 0.8394951 | 0.0019568 | 0.120487668 | 0.017428738 | 2.26E-05 | 2.774E-06 | 0.0002864 | 2.628E-08 | 5.236E-05 | 1.3631E-06 | 292.86554 | 0.0007394 | 0.0036756 |
| 14 | 0.0061291 | 0.9083051 | 0.0021041 | 0.12909393 | 0.018673648 | 2.426E-05 | 2.979E-06 | 0.0003081 | 2.822E-08 | 5.622E-05 | 1.4604E-06 | 314.91091 | 0.0007939 | 0.0039382 |
| 15 | 0.0062019 | 0.9184985 | 0.0021128 | 0.12909393 | 0.018673648 | 2.433E-05 | 2.986E-06 | 0.000309 | 2.829E-08 | 5.636E-05 | 1.4604E-06 | 316.20655 | 0.0007959 | 0.0039382 |
| 16 | 0.0061561 | 0.907443 | 0.0021034 | 0.12909393 | 0.018673648 | 2.426E-05 | 2.978E-06 | 0.0003087 | 2.821E-08 | 5.621E-05 | 1.4604E-06 | 314.80104 | 0.0007937 | 0.0039382 |
| **17** | **0.0067291** | **0.9958803** | **0.0023118** | **0.142003323** | **0.020541012** | **2.667E-05** | **3.274E-06** | **0.0003389** | **3.102E-08** | **6.18E-05** | **1.6065E-06** | **345.98781** | **0.0008727** | **0.004332** |
| 18 | 0.006094 | 0.8966681 | 0.0020942 | 0.12909393 | 0.018673648 | 2.419E-05 | 2.97E-06 | 0.0003074 | 2.814E-08 | 5.606E-05 | 1.4604E-06 | 313.43082 | 0.0007916 | 0.0039382 |
| 19 | 0.0059716 | 0.8736667 | 0.0020747 | 0.12909393 | 0.018673648 | 2.406E-05 | 2.953E-06 | 0.0003057 | 2.798E-08 | 5.574E-05 | 1.4604E-06 | 310.50312 | 0.000787 | 0.0039382 |
| 20 | 0.0044099 | 0.6527125 | 0.0016205 | 0.103275144 | 0.014938918 | 1.897E-05 | 2.328E-06 | 0.0002416 | 2.206E-08 | 4.395E-05 | 1.1683E-06 | 242.52191 | 0.0006205 | 0.0031505 |
| 21 | 0.0038674 | 0.5727536 | 0.0014637 | 0.094668882 | 0.013694008 | 1.723E-05 | 2.115E-06 | 0.0002197 | 2.004E-08 | 3.993E-05 | 1.071E-06 | 219.05938 | 0.0005637 | 0.002888 |
| 22 | 0.0037426 | 0.5554861 | 0.001449 | 0.094668882 | 0.013694008 | 1.713E-05 | 2.103E-06 | 0.0002182 | 1.992E-08 | 3.969E-05 | 1.0709E-06 | 216.86299 | 0.0005603 | 0.002888 |
| 23 | 0.0036061 | 0.5348573 | 0.0014315 | 0.094668882 | 0.013694008 | 1.7E-05 | 2.087E-06 | 0.000217 | 1.978E-08 | 3.94E-05 | 1.0709E-06 | 214.23904 | 0.0005562 | 0.002888 |
| 24 | 0.0032782 | 0.4735168 | 0.0012905 | 0.086062887 | 0.012449259 | 1.541E-05 | 1.888E-06 | 0.0001965 | 1.789E-08 | 3.564E-05 | 9.7367E-07 | 193.14486 | 0.0005031 | 0.0026254 |

**Appendix B: Emission Rate Inventory Summary**
***PPUDO Emission Rate Calcualtions***

**Table 5-6: Hourly Emission Rates**
**T5.3- AS3: PPUDO Idling**

| Hour | Annual Emissions (tonnes/year) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0043076 | 0.6072262 | 0.001683 | 0.113086985 | 0.016358642 | 2.025E-05 | 2.47E-06 | 0.0002573 | 2.34E-08 | 4.678E-05 | 1.2796E-06 | 251.88667 | 0.0006581 | 0.0034498 |
| 2 | 0.001723 | 0.2344571 | 0.000666 | 0.045234935 | 0.006543626 | 8.1E-06 | 9.818E-07 | 0.0001024 | 9.302E-09 | 1.871E-05 | 5.1191E-07 | 99.681731 | 0.0002616 | 0.0013799 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0.0025846 | 0.3280841 | 0.000979 | 0.067853245 | 0.00981605 | 1.215E-05 | 1.455E-06 | 0.0001523 | 1.379E-08 | 2.807E-05 | 7.6819E-07 | 146.51961 | 0.0003877 | 0.0020699 |
| 7 | 0.0055999 | 0.7292476 | 0.0021368 | 0.147014451 | 0.021267422 | 2.633E-05 | 3.167E-06 | 0.0003311 | 3E-08 | 6.081E-05 | 1.6641E-06 | 319.79998 | 0.0008436 | 0.0044848 |
| 8 | 0.0055999 | 0.7955544 | 0.0021932 | 0.147013081 | 0.021266098 | 2.633E-05 | 3.216E-06 | 0.0003346 | 3.047E-08 | 6.081E-05 | 1.6634E-06 | 328.23584 | 0.0008567 | 0.0044848 |
| 9 | 0.0067102 | 1.0045826 | 0.0026042 | 0.169629424 | 0.024537173 | 3.075E-05 | 3.774E-06 | 0.0003913 | 3.576E-08 | 7.124E-05 | 1.9189E-06 | 389.7546 | 0.0010057 | 0.0051747 |
| 10 | 0.0071918 | 1.0679598 | 0.0026581 | 0.169629424 | 0.024537173 | 3.113E-05 | 3.821E-06 | 0.0003954 | 3.62E-08 | 7.213E-05 | 1.919E-06 | 397.81849 | 0.0010183 | 0.0051747 |
| 11 | 0.0069382 | 1.0313351 | 0.0025103 | 0.158320796 | 0.022901362 | 2.926E-05 | 3.592E-06 | 0.0003714 | 3.403E-08 | 6.78E-05 | 1.791E-06 | 375.69776 | 0.0009573 | 0.0048298 |
| 12 | 0.0078347 | 1.1607494 | 0.002737 | 0.169629424 | 0.024537173 | 3.169E-05 | 3.89E-06 | 0.0004012 | 3.685E-08 | 7.342E-05 | 1.919E-06 | 409.62505 | 0.0010367 | 0.0051747 |
| 13 | 0.00743 | 1.1030966 | 0.0025713 | 0.158320796 | 0.022901362 | 2.969E-05 | 3.645E-06 | 0.0003763 | 3.453E-08 | 6.88E-05 | 1.7911E-06 | 384.82532 | 0.0009715 | 0.0048298 |
| 14 | 0.0080537 | 1.1935129 | 0.0027648 | 0.169629424 | 0.024537173 | 3.188E-05 | 3.914E-06 | 0.0004048 | 3.708E-08 | 7.388E-05 | 1.919E-06 | 413.79294 | 0.0010432 | 0.0051747 |
| 15 | 0.0081493 | 1.2069071 | 0.0027762 | 0.169629424 | 0.024537173 | 3.196E-05 | 3.924E-06 | 0.0004061 | 3.717E-08 | 7.406E-05 | 1.919E-06 | 415.4954 | 0.0010459 | 0.0051747 |
| 16 | 0.0080891 | 1.19238 | 0.0027639 | 0.169629424 | 0.024537173 | 3.188E-05 | 3.913E-06 | 0.0004057 | 3.707E-08 | 7.386E-05 | 1.919E-06 | 413.64857 | 0.001043 | 0.0051747 |
| 17 | 0.0088421 | 1.3085867 | 0.0030377 | 0.186592366 | 0.02699089 | 3.505E-05 | 4.302E-06 | 0.0004454 | 4.076E-08 | 8.12E-05 | 2.1109E-06 | 454.62799 | 0.0011467 | 0.0056922 |
| 18 | 0.0080075 | 1.1782219 | 0.0027518 | 0.169629424 | 0.024537173 | 3.179E-05 | 3.903E-06 | 0.000404 | 3.697E-08 | 7.366E-05 | 1.919E-06 | 411.8481 | 0.0010402 | 0.0051747 |
| 19 | 0.0078466 | 1.1479981 | 0.0027261 | 0.169629424 | 0.024537173 | 3.161E-05 | 3.88E-06 | 0.0004017 | 3.676E-08 | 7.324E-05 | 1.919E-06 | 408.0011 | 0.0010342 | 0.0051747 |
| 20 | 0.0057947 | 0.8576642 | 0.0021293 | 0.135703539 | 0.019629738 | 2.492E-05 | 3.059E-06 | 0.0003174 | 2.898E-08 | 5.775E-05 | 1.5352E-06 | 318.67379 | 0.0008153 | 0.0041398 |
| 21 | 0.0050817 | 0.7525983 | 0.0019233 | 0.124394911 | 0.017993927 | 2.264E-05 | 2.78E-06 | 0.0002887 | 2.633E-08 | 5.247E-05 | 1.4072E-06 | 287.84402 | 0.0007407 | 0.0037948 |
| 22 | 0.0049178 | 0.7299087 | 0.001904 | 0.124394911 | 0.017993927 | 2.251E-05 | 2.763E-06 | 0.0002867 | 2.618E-08 | 5.215E-05 | 1.4072E-06 | 284.95797 | 0.0007362 | 0.0037948 |
| 23 | 0.0047384 | 0.7028025 | 0.001881 | 0.124394911 | 0.017993927 | 2.234E-05 | 2.743E-06 | 0.0002851 | 2.599E-08 | 5.177E-05 | 1.4072E-06 | 281.51009 | 0.0007308 | 0.0037948 |
| 24 | 0.0043076 | 0.6222011 | 0.0016958 | 0.113086634 | 0.016358326 | 2.025E-05 | 2.481E-06 | 0.0002582 | 2.351E-08 | 4.683E-05 | 1.2794E-06 | 253.79234 | 0.0006611 | 0.0034498 |
| **SUM** | **0.1297482** | **18.955074** | **0.0470927** | **3.002446952** | **0.434312681** | **0.0005525** | **6.767E-05** | **0.0070172** | **6.411E-07** | **0.0012794** | **3.3968E-05** | **7048.0374** | **0.0180343** | **0.0915928** |

**Appendix B: Emission Rate Inventory Summary**
***PPUDO Emission Rate Calcualtions***

**Table 5-6: Hourly Emission Rates**
**T6.1 - LVS3: Entrance/Exit from PPUDO**

| Hour | MOVES Emission Rate (g/VKT) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0157116 | 0.934684 | 0.0016371 | 1.306046841 | 0.305512387 | 3.525E-05 | 4.308E-06 | 0.0003191 | 4.08E-08 | 8.142E-05 | 1.3638E-06 | 245.015 | 0.0011485 | 0.0024552 |
| 2 | 0.0157116 | 0.901854 | 0.001623 | 1.306046841 | 0.305512887 | 3.525E-05 | 4.278E-06 | 0.0003171 | 4.051E-08 | 8.142E-05 | 1.364E-06 | 242.908 | 0.0011403 | 0.0024552 |
| 3 | 0.0157116 | 0.867383 | 0.0016083 | 1.306047841 | 0.305513387 | 3.525E-05 | 4.246E-06 | 0.0003154 | 4.021E-08 | 8.142E-05 | 1.3643E-06 | 240.697 | 0.0011318 | 0.0024552 |
| 4 | 0.0157116 | 0.845666 | 0.001599 | 1.306047841 | 0.305513687 | 3.525E-05 | 4.226E-06 | 0.0003141 | 4.002E-08 | 8.142E-05 | 1.3644E-06 | 239.303 | 0.0011264 | 0.0024552 |
| 5 | 0.0157116 | 0.84061 | 0.0015968 | 1.306048841 | 0.305513987 | 3.525E-05 | 4.222E-06 | 0.0003137 | 3.998E-08 | 8.142E-05 | 1.3646E-06 | 238.979 | 0.0011252 | 0.0024552 |
| 6 | 0.0157116 | 0.84061 | 0.0015968 | 1.306048841 | 0.305513987 | 3.525E-05 | 4.222E-06 | 0.0003137 | 3.998E-08 | 8.142E-05 | 1.3646E-06 | 238.979 | 0.0011252 | 0.0024552 |
| 7 | 0.0157116 | 0.862638 | 0.0016062 | 1.306047841 | 0.305513387 | 3.525E-05 | 4.242E-06 | 0.000315 | 4.017E-08 | 8.142E-05 | 1.3643E-06 | 240.392 | 0.0011306 | 0.0024552 |
| 8 | 0.0157116 | 0.942059 | 0.0016403 | 1.306046841 | 0.305512287 | 3.525E-05 | 4.315E-06 | 0.0003194 | 4.086E-08 | 8.145E-05 | 1.3637E-06 | 245.488 | 0.0011503 | 0.0024552 |
| 9 | 0.0157116 | 1.03198 | 0.0016788 | 1.306045841 | 0.305511787 | 3.583E-05 | 4.398E-06 | 0.0003247 | 4.165E-08 | 8.302E-05 | 1.3635E-06 | 251.258 | 0.0011726 | 0.0024552 |
| 10 | 0.0157116 | 1.09777 | 0.001707 | 1.306045841 | 0.305511787 | 3.632E-05 | 4.459E-06 | 0.0003287 | 4.222E-08 | 8.417E-05 | 1.3635E-06 | 255.479 | 0.0011889 | 0.0024552 |
| 11 | 0.0157116 | 1.13623 | 0.0017235 | 1.306045841 | 0.305511787 | 3.661E-05 | 4.494E-06 | 0.0003311 | 4.256E-08 | 8.483E-05 | 1.3635E-06 | 257.946 | 0.0011985 | 0.0024552 |
| 12 | 0.0157116 | 1.19409 | 0.0017483 | 1.306045841 | 0.305511787 | 3.705E-05 | 4.548E-06 | 0.0003345 | 4.306E-08 | 8.584E-05 | 1.3635E-06 | 261.659 | 0.0012128 | 0.0024552 |
| 13 | 0.0157116 | 1.21603 | 0.0017577 | 1.306045841 | 0.305511787 | 3.721E-05 | 4.568E-06 | 0.000336 | 4.325E-08 | 8.623E-05 | 1.3636E-06 | 263.067 | 0.0012183 | 0.0024552 |
| 14 | 0.0157116 | 1.2281 | 0.0017629 | 1.306045841 | 0.305511787 | 3.73E-05 | 4.579E-06 | 0.0003372 | 4.336E-08 | 8.644E-05 | 1.3636E-06 | 263.841 | 0.0012212 | 0.0024552 |
| 15 | 0.0157116 | 1.242 | 0.0017689 | 1.306045841 | 0.305511787 | 3.741E-05 | 4.592E-06 | 0.0003382 | 4.348E-08 | 8.668E-05 | 1.3636E-06 | 264.733 | 0.0012247 | 0.0024552 |
| 16 | 0.0157116 | 1.22692 | 0.0017624 | 1.306045841 | 0.305511787 | 3.73E-05 | 4.578E-06 | 0.0003376 | 4.335E-08 | 8.642E-05 | 1.3636E-06 | 263.765 | 0.001221 | 0.0024552 |
| 17 | 0.0157116 | 1.22406 | 0.0017612 | 1.306045841 | 0.305511787 | 3.727E-05 | 4.576E-06 | 0.0003371 | 4.332E-08 | 8.637E-05 | 1.3636E-06 | 263.582 | 0.0012202 | 0.0024552 |
| 18 | 0.0157116 | 1.21223 | 0.0017561 | 1.306045841 | 0.305511787 | 3.718E-05 | 4.565E-06 | 0.0003363 | 4.322E-08 | 8.616E-05 | 1.3636E-06 | 262.823 | 0.0012173 | 0.0024552 |
| 19 | 0.0157116 | 1.18085 | 0.0017427 | 1.306045841 | 0.305511787 | 3.695E-05 | 4.536E-06 | 0.0003343 | 4.295E-08 | 8.561E-05 | 1.3635E-06 | 260.809 | 0.0012095 | 0.0024552 |
| 20 | 0.0157116 | 1.10205 | 0.0017089 | 1.306045841 | 0.305511787 | 3.636E-05 | 4.463E-06 | 0.0003295 | 4.226E-08 | 8.424E-05 | 1.3635E-06 | 255.753 | 0.00119 | 0.0024552 |
| 21 | 0.0157116 | 1.0545 | 0.0016885 | 1.306045841 | 0.305511787 | 3.6E-05 | 4.419E-06 | 0.0003265 | 4.184E-08 | 8.341E-05 | 1.3635E-06 | 252.702 | 0.0011782 | 0.0024552 |
| 22 | 0.0157116 | 1.02238 | 0.0016747 | 1.306045841 | 0.305511787 | 3.576E-05 | 4.389E-06 | 0.0003242 | 4.156E-08 | 8.285E-05 | 1.3635E-06 | 250.641 | 0.0011702 | 0.0024552 |
| 23 | 0.0157116 | 0.984018 | 0.0016583 | 1.306045841 | 0.305511787 | 3.547E-05 | 4.354E-06 | 0.000322 | 4.123E-08 | 8.218E-05 | 1.3635E-06 | 248.18 | 0.0011607 | 0.0024552 |
| 24 | 0.0157116 | 0.957999 | 0.0016471 | 1.306046841 | 0.305512087 | 3.527E-05 | 4.33E-06 | 0.0003204 | 4.1E-08 | 8.173E-05 | 1.3636E-06 | 246.51 | 0.0011543 | 0.0024552 |

Note: [1] Idling EF = g/VKT x 4.01 km/hr
(i.e. MOVES EF x lowest speed bin cap)

**Appendix B: Emission Rate Inventory Summary**
***PPUDO Emission Rate Calcualtions***

**Table 5-6: Hourly Emission Rates**
**T6.2 - LVS3: Entrance/Exit from PPUDO**

| Hour | Emission Rate (g/s) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0005688 | 0.0338356 | 5.926E-05 | 0.047278896 | 0.011059548 | 1.276E-06 | 1.56E-07 | 1.155E-05 | 1.477E-09 | 2.947E-06 | 4.9368E-08 | 8.869543 | 4.157E-05 | 8.888E-05 |
| 2 | 0.0002275 | 0.0130588 | 2.35E-05 | 0.018911558 | 0.004423827 | 5.104E-07 | 6.195E-08 | 4.591E-06 | 5.866E-10 | 1.179E-06 | 1.9751E-08 | 3.5173078 | 1.651E-05 | 3.555E-05 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0.0003413 | 0.018258 | 3.468E-05 | 0.028367381 | 0.006635764 | 7.656E-07 | 9.169E-08 | 6.814E-06 | 8.683E-10 | 1.768E-06 | 2.9639E-08 | 5.1906239 | 2.444E-05 | 5.333E-05 |
| 7 | 0.0007394 | 0.0405957 | 7.559E-05 | 0.061462611 | 0.01437746 | 1.659E-06 | 1.996E-07 | 1.482E-05 | 1.89E-09 | 3.832E-06 | 6.4204E-08 | 11.312848 | 5.321E-05 | 0.0001155 |
| 8 | 0.0007394 | 0.0443333 | 7.719E-05 | 0.061462564 | 0.014377408 | 1.659E-06 | 2.031E-07 | 1.503E-05 | 1.923E-09 | 3.833E-06 | 6.4177E-08 | 11.552665 | 5.413E-05 | 0.0001155 |
| 9 | 0.0008531 | 0.0560365 | 9.116E-05 | 0.070918289 | 0.01658929 | 1.946E-06 | 2.388E-07 | 1.763E-05 | 2.261E-09 | 4.508E-06 | 7.4038E-08 | 13.643309 | 6.367E-05 | 0.0001333 |
| 10 | 0.0008531 | 0.0596089 | 9.269E-05 | 0.070918289 | 0.01658929 | 1.972E-06 | 2.421E-07 | 1.785E-05 | 2.293E-09 | 4.57E-06 | 7.4039E-08 | 13.87251 | 6.456E-05 | 0.0001333 |
| 11 | 0.0007963 | 0.0575841 | 8.735E-05 | 0.066190403 | 0.015483337 | 1.856E-06 | 2.278E-07 | 1.678E-05 | 2.157E-09 | 4.299E-06 | 6.9104E-08 | 13.072703 | 6.074E-05 | 0.0001244 |
| 12 | 0.0008531 | 0.0648391 | 9.493E-05 | 0.070918289 | 0.01658929 | 2.012E-06 | 2.469E-07 | 1.816E-05 | 2.338E-09 | 4.661E-06 | 7.404E-08 | 14.208084 | 6.586E-05 | 0.0001333 |
| 13 | 0.0007963 | 0.0616284 | 8.908E-05 | 0.066190403 | 0.015483337 | 1.886E-06 | 2.315E-07 | 1.703E-05 | 2.192E-09 | 4.37E-06 | 6.9105E-08 | 13.332236 | 6.174E-05 | 0.0001244 |
| 14 | 0.0008531 | 0.0666858 | 9.573E-05 | 0.070918289 | 0.01658929 | 2.026E-06 | 2.487E-07 | 1.831E-05 | 2.354E-09 | 4.693E-06 | 7.4041E-08 | 14.326566 | 6.631E-05 | 0.0001333 |
| 15 | 0.0008531 | 0.0674406 | 9.605E-05 | 0.070918289 | 0.01658929 | 2.031E-06 | 2.493E-07 | 1.837E-05 | 2.361E-09 | 4.707E-06 | 7.4041E-08 | 14.375002 | 6.65E-05 | 0.0001333 |
| 16 | 0.0008531 | 0.0666218 | 9.57E-05 | 0.070918289 | 0.01658929 | 2.025E-06 | 2.486E-07 | 1.833E-05 | 2.354E-09 | 4.692E-06 | 7.4041E-08 | 14.32244 | 6.63E-05 | 0.0001333 |
| **17** | **0.0009385** | **0.0731131** | **0.0001052** | **0.078010118** | **0.018248219** | **2.226E-06** | **2.733E-07** | **2.014E-05** | **2.588E-09** | **5.159E-06** | **8.1445E-08** | **15.743753** | **7.288E-05** | **0.0001466** |
| 18 | 0.0008531 | 0.0658241 | 9.536E-05 | 0.070918289 | 0.01658929 | 2.019E-06 | 2.479E-07 | 1.826E-05 | 2.347E-09 | 4.678E-06 | 7.4041E-08 | 14.271289 | 6.61E-05 | 0.0001333 |
| 19 | 0.0008531 | 0.0641202 | 9.463E-05 | 0.070918289 | 0.01658929 | 2.006E-06 | 2.463E-07 | 1.815E-05 | 2.332E-09 | 4.649E-06 | 7.404E-08 | 14.161929 | 6.568E-05 | 0.0001333 |
| 20 | 0.0006825 | 0.0478731 | 7.423E-05 | 0.056734631 | 0.013271432 | 1.579E-06 | 1.939E-07 | 1.431E-05 | 1.836E-09 | 3.659E-06 | 5.9231E-08 | 11.10991 | 5.169E-05 | 0.0001067 |
| 21 | 0.0006256 | 0.0419902 | 6.724E-05 | 0.052006745 | 0.012165479 | 1.433E-06 | 1.76E-07 | 1.3E-05 | 1.666E-09 | 3.321E-06 | 5.4295E-08 | 10.062594 | 4.692E-05 | 9.777E-05 |
| 22 | 0.0006256 | 0.0407112 | 6.669E-05 | 0.052006745 | 0.012165479 | 1.424E-06 | 1.748E-07 | 1.291E-05 | 1.655E-09 | 3.299E-06 | 5.4294E-08 | 9.9805246 | 4.66E-05 | 9.777E-05 |
| 23 | 0.0006256 | 0.0391836 | 6.603E-05 | 0.052006745 | 0.012165479 | 1.412E-06 | 1.734E-07 | 1.282E-05 | 1.642E-09 | 3.273E-06 | 5.4294E-08 | 9.8825276 | 4.622E-05 | 9.777E-05 |
| 24 | 0.0005688 | 0.0346796 | 5.963E-05 | 0.047278896 | 0.011059538 | 1.277E-06 | 1.567E-07 | 1.16E-05 | 1.484E-09 | 2.959E-06 | 4.9362E-08 | 8.923662 | 4.178E-05 | 8.888E-05 |

**Appendix B: Emission Rate Inventory Summary**
***PPUDO Emission Rate Calcualtions***

**Table 5-6: Hourly Emission Rates**
**T6.3 - LVS3: Entrance/Exit from PPUDO**

| Hour | Annual Emissions (tonnes/year) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NOx | CO | SO2 | PM10 | PM2.5 | Acetalde. | Acrolein | Benzene | 1,3-Butadi. | Formalde. | BaP | CO2 | CH4 | N2O |
| | Pol. ID 3 | Pol. ID 2 | Pol. ID 31 | Pol. ID 9100 | Pol. ID 9110 | Pol. ID 26 | Pol. ID 27 | Pol. ID 20 | Pol. ID 24 | Pol. ID 25 | Pol. ID 974 | Pol. ID 90 | Pol. ID 5 | Pol. ID 6 |
| 1 | 0.0007474 | 0.0444599 | 7.787E-05 | 0.062124469 | 0.014532247 | 1.677E-06 | 2.049E-07 | 1.518E-05 | 1.941E-09 | 3.873E-06 | 6.487E-08 | 11.65458 | 5.463E-05 | 0.0001168 |
| 2 | 0.0002989 | 0.0171593 | 3.088E-05 | 0.024849788 | 0.005812908 | 6.706E-07 | 8.14E-08 | 6.033E-06 | 7.708E-10 | 1.549E-06 | 2.5953E-08 | 4.6217425 | 2.17E-05 | 4.671E-05 |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 0.0004484 | 0.0239911 | 4.557E-05 | 0.037274738 | 0.008719394 | 1.006E-06 | 1.205E-07 | 8.953E-06 | 1.141E-09 | 2.324E-06 | 3.8946E-08 | 6.8204798 | 3.211E-05 | 7.007E-05 |
| 7 | 0.0009716 | 0.0533428 | 9.932E-05 | 0.080761871 | 0.018891982 | 2.18E-06 | 2.623E-07 | 1.948E-05 | 2.484E-09 | 5.035E-06 | 8.4364E-08 | 14.865082 | 6.991E-05 | 0.0001518 |
| 8 | 0.0009716 | 0.058254 | 0.0001014 | 0.08076181 | 0.018891914 | 2.18E-06 | 2.668E-07 | 1.975E-05 | 2.527E-09 | 5.037E-06 | 8.4328E-08 | 15.180202 | 7.113E-05 | 0.0001518 |
| 9 | 0.001121 | 0.073632 | 0.0001198 | 0.093186632 | 0.021798327 | 2.556E-06 | 3.138E-07 | 2.317E-05 | 2.972E-09 | 5.923E-06 | 9.7285E-08 | 17.927309 | 8.367E-05 | 0.0001752 |
| 10 | 0.001121 | 0.0783261 | 0.0001218 | 0.093186632 | 0.021798327 | 2.592E-06 | 3.181E-07 | 2.345E-05 | 3.013E-09 | 6.005E-06 | 9.7287E-08 | 18.228478 | 8.483E-05 | 0.0001752 |
| 11 | 0.0010463 | 0.0756656 | 0.0001148 | 0.08697419 | 0.020345105 | 2.438E-06 | 2.993E-07 | 2.205E-05 | 2.834E-09 | 5.649E-06 | 9.0802E-08 | 17.177532 | 7.981E-05 | 0.0001635 |
| 12 | 0.001121 | 0.0851986 | 0.0001247 | 0.093186632 | 0.021798327 | 2.643E-06 | 3.245E-07 | 2.386E-05 | 3.073E-09 | 6.125E-06 | 9.7289E-08 | 18.669422 | 8.653E-05 | 0.0001752 |
| 13 | 0.0010463 | 0.0809797 | 0.0001171 | 0.08697419 | 0.020345105 | 2.478E-06 | 3.042E-07 | 2.238E-05 | 2.88E-09 | 5.742E-06 | 9.0804E-08 | 17.518558 | 8.113E-05 | 0.0001635 |
| 14 | 0.001121 | 0.0876252 | 0.0001258 | 0.093186632 | 0.021798327 | 2.662E-06 | 3.267E-07 | 2.406E-05 | 3.094E-09 | 6.167E-06 | 9.729E-08 | 18.825108 | 8.714E-05 | 0.0001752 |
| 15 | 0.001121 | 0.0886169 | 0.0001262 | 0.093186632 | 0.021798327 | 2.669E-06 | 3.276E-07 | 2.413E-05 | 3.102E-09 | 6.185E-06 | 9.729E-08 | 18.888752 | 8.738E-05 | 0.0001752 |
| 16 | 0.001121 | 0.087541 | 0.0001257 | 0.093186632 | 0.021798327 | 2.661E-06 | 3.267E-07 | 2.409E-05 | 3.093E-09 | 6.166E-06 | 9.729E-08 | 18.819686 | 8.712E-05 | 0.0001752 |
| 17 | 0.0012331 | 0.0960706 | 0.0001382 | 0.102505295 | 0.02397816 | 2.925E-06 | 3.591E-07 | 2.646E-05 | 3.4E-09 | 6.778E-06 | 1.0702E-07 | 20.687291 | 9.577E-05 | 0.0001927 |
| 18 | 0.001121 | 0.0864929 | 0.0001253 | 0.093186632 | 0.021798327 | 2.653E-06 | 3.257E-07 | 2.4E-05 | 3.084E-09 | 6.147E-06 | 9.729E-08 | 18.752474 | 8.686E-05 | 0.0001752 |
| 19 | 0.001121 | 0.0842539 | 0.0001243 | 0.093186632 | 0.021798327 | 2.636E-06 | 3.236E-07 | 2.385E-05 | 3.064E-09 | 6.108E-06 | 9.7289E-08 | 18.608774 | 8.63E-05 | 0.0001752 |
| 20 | 0.0008968 | 0.0629052 | 9.754E-05 | 0.074549306 | 0.017438662 | 2.075E-06 | 2.547E-07 | 1.881E-05 | 2.412E-09 | 4.808E-06 | 7.7829E-08 | 14.598422 | 6.792E-05 | 0.0001401 |
| 21 | 0.0008221 | 0.0551751 | 8.835E-05 | 0.068336863 | 0.01598544 | 1.884E-06 | 2.312E-07 | 1.708E-05 | 2.189E-09 | 4.364E-06 | 7.1343E-08 | 13.222248 | 6.165E-05 | 0.0001285 |
| 22 | 0.0008221 | 0.0534945 | 8.763E-05 | 0.068336863 | 0.01598544 | 1.871E-06 | 2.297E-07 | 1.696E-05 | 2.175E-09 | 4.335E-06 | 7.1343E-08 | 13.114409 | 6.123E-05 | 0.0001285 |
| 23 | 0.0008221 | 0.0514872 | 8.677E-05 | 0.068336863 | 0.01598544 | 1.856E-06 | 2.278E-07 | 1.685E-05 | 2.157E-09 | 4.3E-06 | 7.1342E-08 | 12.985641 | 6.073E-05 | 0.0001285 |
| 24 | 0.0007474 | 0.0455689 | 7.835E-05 | 0.062124469 | 0.014532232 | 1.678E-06 | 2.06E-07 | 1.524E-05 | 1.95E-09 | 3.888E-06 | 6.4862E-08 | 11.725692 | 5.49E-05 | 0.0001168 |
| **SUM** | **0.0198422** | **1.3902405** | **0.0021575** | **1.649403771** | **0.385830646** | **4.599E-05** | **5.635E-06** | **0.0004158** | **5.336E-08** | **0.0001065** | **1.7221E-06** | **322.89188** | **0.0015024** | **0.0031007** |

**Appendix B: Emission Rate Inventory Summary**

***Re-Suspended Particulate Matter Emission Rate Calculations***

**Annual Kilometers Travelled**

27010 VKT travelled annually by busses at the Woodbine Racetrack Transit Station

2181056 VKT travelled annually by cars at the Woodbine Racetrack Transit Station

**Summary of Highway 27-Woodbine Station On-site Re-suspended PM Emissions**

| | | | | k | w | sL | E | |
|---|---|---|---|---|---|---|---|---|
| Contaminant | Vehicle Types | Scenario/Year | ADT Category | Particulate Size Multiplier (g/VKT) | Average Vehicle Weight (tons)[3,4] | Silt loading (g/m$^2$) | Re-Suspended PM (g/VKT) | Re-Suspended PM (tonnes/year) |
| $PM_{10}$ | Transit Bus | 2031 Bus Traffic | less than 500 | 0.62 | 24 | 0.6 | 9.9989 | 0.27 |
| $PM_{2.5}$ | Transit Bus | 2031 Bus Traffic | | 0.15 | 24 | 0.6 | 2.4191 | 0.07 |
| $PM_{10}$ | Passenger Vehicle | 2031 Car Traffic | | 0.62 | 3 | 0.6 | 1.1945 | 2.61 |
| $PM_{2.5}$ | Passenger Vehicle | 2031 Car Traffic | | 0.15 | 3 | 0.6 | 0.2890 | 0.63 |

Notes:

(1) Emission facors based on Equation 13.2.1 US EPA AP42 Chapter 13:

E = k (sL)0.91 x (W)1.02

where: E = particulate emission factor (having units matching the units of k),

k = particle size multiplier for particle size range and units of interest (see below),

sL = road surface silt loading (grams per square meter) (g/m2), and

W = average weight (tons) of the vehicles traveling the road

*Revised Nov 18, 2017 using EPA's updated equation*

AECOM Imagine it. Delivered.

# Appendix C

## Schedules for Representative Transit (Bus and Rail)

**Hourly Distribution of Bus/Train Stops at Highway 27-Woodbine Station (Weekday)**
**(Assumed based on closest GO Station/TTC Station Schedules)**

| | | |
|---|---|---|
| Average GO Bus Capacity: | 49 | *Assumed average of single/double GO Bus at 60% vehicle capacity* |
| Average 'Other' Bus Capacity: | 28 | *Assumed seating only capacity at 60% vehicle capacity* |
| Average Future GO Train Capacity: | 45 | *Assumed based on 2018 daily ridership of Malton Station* |
| Average Future Airport Train Service Capacity: | 38 | *Assumed based on 2018 daily ridership of Weston UP Express Station* |
| Total Parking Capacity: | 1170 | *From Latest Station Layout Plan (June 2019): combined Parking Lots + PPUDO (at capacity)* |

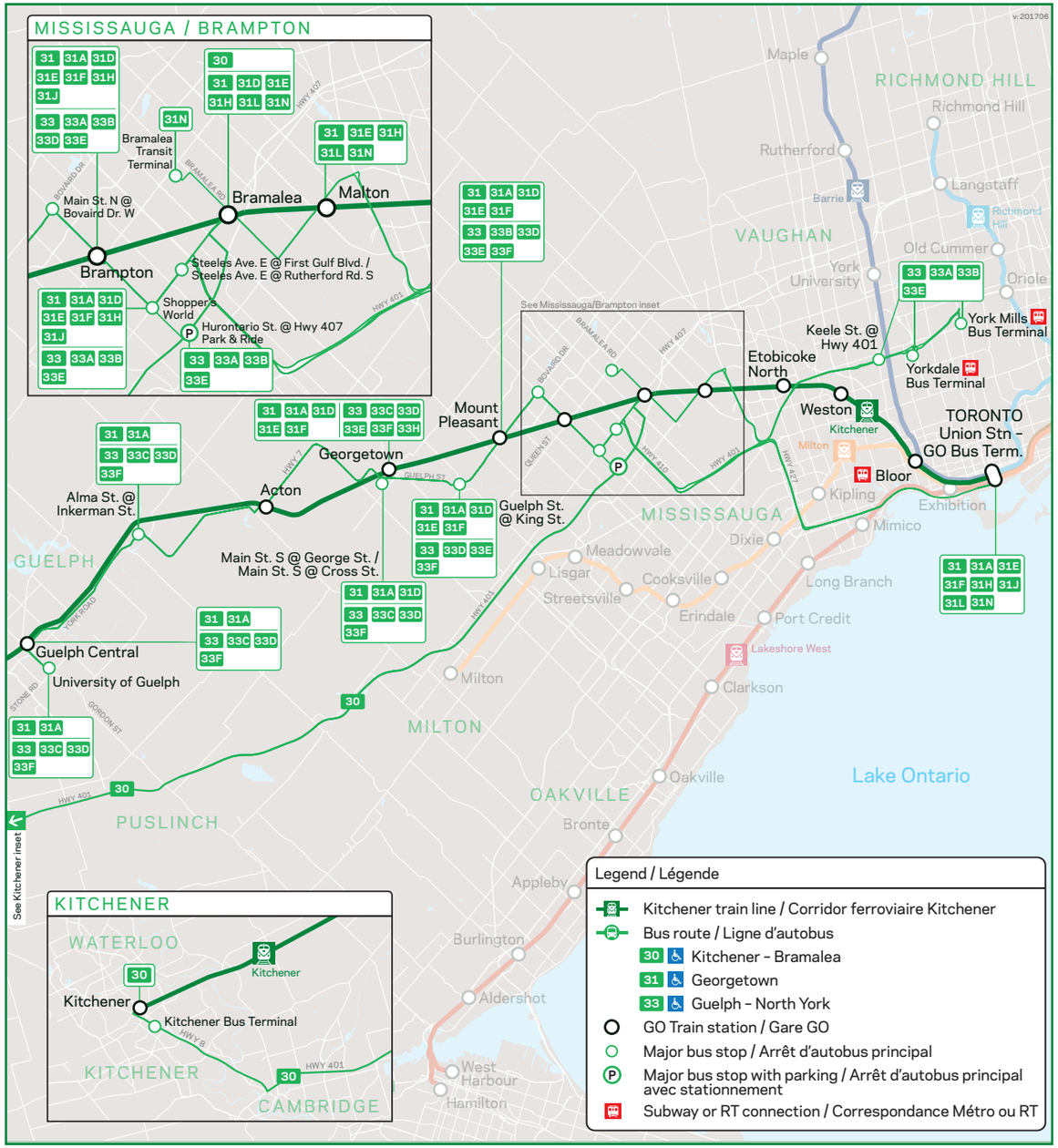
| Hour | GO Bus | Other Bus | Airport Train | GO Train | TOTAL | Total Ridership | % of TOTAL | % Parking Capacity |
|---|---|---|---|---|---|---|---|---|
| 2:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0% | 0% |
| 3:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0% | 0% |
| 4:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0% | 0% |
| 5:00 | 0 | 0 | 6 | 0 | 6 | 228 | 2% | 19% |
| 6:00 | 0 | 2 | 8 | 3 | 13 | 495 | 5% | 42% |
| 7:00 | 0 | 3 | 8 | 2 | 13 | 478 | 5% | 41% |
| 8:00 | 0 | 3 | 8 | 4 | 15 | 568 | 6% | 49% |
| 9:00 | 0 | 5 | 8 | 2 | 15 | 534 | 6% | 46% |
| 10:00 | 0 | 4 | 8 | 2 | 14 | 506 | 5% | 43% |
| 11:00 | 0 | 5 | 8 | 2 | 15 | 534 | 6% | 46% |
| 12:00 | 0 | 4 | 8 | 2 | 14 | 506 | 5% | 43% |
| 13:00 | 0 | 5 | 8 | 2 | 15 | 534 | 6% | 46% |
| 14:00 | 0 | 5 | 8 | 2 | 15 | 534 | 6% | 46% |
| 15:00 | 0 | 5 | 8 | 2 | 15 | 534 | 6% | 46% |
| 16:00 | 0 | 5 | 8 | 4 | 17 | 602 | 6% | 51% |
| 17:00 | 0 | 5 | 8 | 2 | 15 | 534 | 6% | 46% |
| 18:00 | 0 | 5 | 8 | 2 | 15 | 534 | 6% | 46% |
| 19:00 | 0 | 3 | 8 | 1 | 12 | 433 | 5% | 37% |
| 20:00 | 0 | 3 | 8 | 0 | 11 | 388 | 4% | 33% |
| 21:00 | 0 | 3 | 8 | 0 | 11 | 388 | 4% | 33% |
| 22:00 | 0 | 3 | 8 | 0 | 11 | 388 | 4% | 33% |
| 23:00 | 0 | 2 | 8 | 0 | 10 | 360 | 4% | 31% |
| 0:00 | 0 | 2 | 8 | 0 | 10 | 360 | 4% | 31% |
| 1:00 | 0 | 2 | 2 | 0 | 4 | 132 | 2% | 11% |

| **Total** | **Transit Stops** | **Ridership** |
|---|---|---|
| Peak AM: | 41 | 1541 |
| Peak PM: | 47 | 1670 |
| Mid-day: | 103 | 3682 |
| Evening: | 69 | 2449 |

# 30-31-33

Route number
Nombre d'itinéraire

## Kitchener




## CONTACT US

1-888-438-6646
416-869-3200
TTY/ATS:
1-800-387-3652

gotransit.com/schedules

@GOtransitKT

See Something?
Say Something.
24/7 Transit Safety Dispatch:
1-877-297-0642

prestocard.ca

Sign-up for email or text alerts/ Inscrivez-vous pour recevoir des alertes par courriel ou message texte.
gotransit.com/OnTheGO

30-05-2019

# Kitchener

GO Train and Bus Schedule/
Horaire des trains et des autobus GO

METROLINX

**KT** **30** **31** **33**

- Kitchener
- Guelph
- Rockwood
- Acton
- Georgetown
- Brampton
- Toronto

**Daily / Quotidiennement**
Includes GO Bus routes 30, 31, and 33 / Inclut les routes 30, 31, et 33 d'autobus GO

**Effective / À partir de:**
**29** JUNE JUIN **2019**

# How to read our schedules

## Step 1
Find the station or terminal you are departing from. Stops are listed across the top in the order they are served.

## Step 2
The upper left corner tells you what day the schedule is for and the direction of travel.

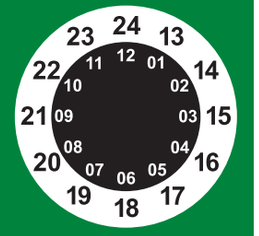
## Step 3
Look across the rows for available departure times.

## Step 4
Not all trains or buses stop at every station. If you see → the train or bus will not stop at that station.

**Schedule times shown in 24-hour clock**

Midnight to noon
00 01 - 12 00

Noon to midnight
12 01 - 24 00




## Legend

- Train trips
- Bus trips
- → Trip does not serve this location.
- ↓ Check below for connecting trips.
- GO Train service is accessible to passengers using mobility devices at this location.
- GO Bus service is accessible to passengers using mobility devices at this location.
- GO Train & GO Bus service is accessible to passengers using mobility devices at this location.
- P Parking available.

## Notes

**D** Stops to let off passengers on request only.

**b** Trip holds for connection from bus.

**c** Trip continues to and terminates at Bramalea Transit Terminal.

**h** Trip holds for connection.

**S** GO Bus services GO Station from bus stop on street.

**Sat** Trip operates on Saturdays ONLY.

**Sun** Trip Operates on Sundays ONLY.

## Bicycles

**1.** Bicycles are not allowed in Union Station or on-board trains during morning rush hour (6:30-9:30) and evening rush hour (15:30-18:30), Monday to Friday.

**2.** Foldable bicycles are allowed on-board trains at all times.

For the latest schedule information and updates, please visit gotransit.com/schedules.



# Comment lire nos horaires

## Étape 1
Trouvez votre gare ou terminus de départ. La liste des arrêts est donnée en haut dans l'ordre dans lequel ils sont desservis.

## Étape 2
Le coin supérieur gauche vous indique le jour pour lequel l'horaire est donné et la direction de circulation.

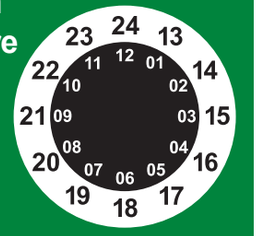
## Étape 3
Regardez dans les rangées pour obtenir les heures de départ offertes.

## Étape 4
Les trains ou les autobus ne s'arrêtent pas tous à chaque gare. Si vous voyez le symbole → le train ou l'autobus ne s'arrêtera pas à cette gare.

**Indications selon un système horaire de 24 heures**

De minuit à midi:
00 01 - 12 00

De midi à minuit:
12 01 - 24 00




## Légende

- Horaire des trains
- Horaire des autobus
- → Trajet ne sert pas cette station.
- ↓ correspondance cidessous.
- Service de trains GO accessible aux personnes utilisant des aides à la mobilité à cet endroit.
- Service d'autobus GO accessible aux personnes utilisant des aides à la mobilité à cet endroit.
- Les services de trains et d'autobus GO sont accessibles aux utilisateurs d'un appareil d'aide à la mobilité à cet endroit.
- P Stationnement disponible.

## Notes

**D** Arrêt sur demande seulement.

**b** Le départ de l'autobus est retardé pour assurer la connexion de l'autobus.

**c** Le parcours s'arrête au terminus Bramalea Transit Terminal.

**h** Le départ de l'autobus est retardé pour assurer la correspondance.

**S** Les autobus GO desservent la gare à partir de l'arrêt situé sur la rue.

**Sat** Service offert les samedisSEULEMENT.

**Sun** Service offert les dimanche SEULEMENT.

## Vélos

**1.** Les vélos ne sont pas autorisés dans la gare Union ou à bord des trains du lundi au vendredi, pendant l'heure de pointe (6:30-9:30) et pendant l'heure de pointe du soir (15:30-18:30).

**2.** Les vélos pliables sont permis à bord des trains en tout temps.

Pour consulter les horaires les plus récents et les mises à jour, veuillez visiter gotransit.com/schedules.

## Monday to Friday (except holidays)
## Du lundi au vendredi (sauf les jours fériés)

### EASTBOUND EN DIRECTION EST

| Route Number / Numéro du trajet | Trip Number / Numéro du parcours | Zone → | Kitchener 27 Dp<br>Kitchener GO | Kitchener 27<br>Kitchener Bus Terminal | Guelph 39<br>University of Guelph | Guelph 39<br>Guelph Central GO | Rockwood 38<br>Alma St. @ Inkerman St. | Acton 37<br>Acton GO | Georgetown 35<br>Main St. S. @ George St. | Georgetown 35<br>Georgetown GO | Georgetown 35<br>Guelph St. @ King St. | Brampton 34<br>Mount Pleasant GO | Brampton 33<br>Main St. N @ Bovaird Dr. W. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31E | 31020 | | | | | | | | | 04 05 | 04 12 | 04 20 | 04 26 |
| 31F | 31030 | | | | | | | | | 04 40 | 04 47 | 04 55 | 05 01 |
| 31L | 31040 | | | | | | | | | | | | |
| 30 | 30020 | | 04 39 | 04 44 | → | → | → | → | → | → | → | → | → |
| | 3402 | | | | | | | | | | | 05 38 | → |
| 33E | 33050 | | | | | | | | | 04 55 | 05 02 | 05 10 | 05 18 |
| 33A | 33070 | | | | | | | | | | | | |
| 33 | 33080 | | | | 04 42 | 04 47 | 05 00 | 05 11S | 05 23 | 05 32 | 05 40 | 05 50↓ | 05 58 |
| | 3602 | | | | | | | | | 05 47 | → | 05 56 | → |
| 33A | 33100 | | | | | | | | | | | | |
| 33E | 33110 | | | | | | | | | 06 00 | 06 08 | 06 18 | 06 27 |
| | 3802 | | 05 15 | → | → | 05 39 | → | 05 56 | → | 06 14 | → | 06 23 | → |
| 33A | 33120 | | | | | | | | | | | | |
| 33C | 33140 | | | | 05 29 | 05 39 | 05 52 | 06 03S | 06 15 | 06 24 | | | |
| 33E | 33143 | | | | | | | | | 06 30 | 06 38 | 06 48 | 06 57 |
| | 3902 | | 05 40 | → | → | 06 04 | → | 06 21 | → | 06 39 | → | 06 48 | → |
| 33A | 33160 | | | | | | | | | | | | |
| 33E | 33170 | | | | | | | | | 07 00 | 07 08 | 07 18 | 07 27 |
| | 3854 | | 06 05 | → | → | 06 29 | → | 06 46 | → | 07 04 | → | 07 13 | → |
| | 3606 | | | | | | | | | 07 14 | → | 07 23 | → |
| 33 | 33200 | | | | 06 30 | 06 40 | 06 53 | 07 04S | 07 18 | 07 30↓ | 07 38 | 07 50 | 07 59 |
| | 3306 | | | | | | | | | | | | |
| | 3904 | | 06 45 | → | → | 07 09 | → | 07 26 | → | 07 44 | → | 07 53 | → |
| | 3108 | | | | | | | | | | | | |
| | 3806 | | 07 10 | → | → | 07 34 | → | 07 51 | → | 08 09 | → | 08 18 | → |
| 33 | 33240 | | | | 07 25 | 07 35 | 07 48 | 07 59S | 08 13 | 08 25 | 08 33 | 08 45↓ | 08 54 |
| 30 | 30180 | | 07 39 | 07 46 | → | → | → | → | → | → | → | → | → |
| | 3410 | | | | | | | | | | | 09 00 | → |
| 33 | 33280 | | | | 08 25 | 08 35 | 08 48 | 08 59S | 09 11 | 09 20 | 09 28 | 09 40↓ | 09 49 |
| 30 | 30230 | | 08 39 | 08 46 | → | → | → | → | → | → | → | → | → |
| | 3412 | | | | | | | | | | | 09 55 | → |
| 33 | 33320 | | | | 09 30 | 09 40 | 09 53 | 10 04S | 10 16 | 10 25 | 10 33 | 10 45↓ | 10 54 |
| 30 | 30270 | | 09 44 | 09 51 | → | → | → | → | → | → | → | → | → |



## Monday to Friday (except holidays)
## Du lundi au vendredi (sauf les jours fériés)

### EASTBOUND EN DIRECTION EST

| Route Number / Numéro du trajet | Trip Number / Numéro du parcours | Brampton 33<br>Brampton GO | Brampton 33<br>Shopper's World | Brampton 22<br>Hurontario St. @ Hwy. 407 | Brampton 33<br>Steeles Ave. E. @ First Gulf Blvd. | Brampton 32<br>Bramalea GO | Mississauga 31<br>Malton GO | North York 5 D<br>Keele St. @ Hwy. 401 | North York 5<br>Yorkdale Bus Terminal | North York 5 Ar<br>York Mills Bus Terminal | Etobicoke 4<br>Etobicoke North GO | Toronto 4<br>Weston GO | Toronto 2<br>Bloor GO | Toronto 2 Ar<br>Union Station |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31E | 31020 | 04 35 | 04 39 | → | 04 44 | 04 50 | 05 00 | → | → | → | → | → | → | 05 30 |
| 31F | 31030 | 05 10 | 05 14 | → | 05 19 | → | → | → | → | → | → | → | → | 05 50 |
| 31L | 31040 | | | | | 05 10 | 05 20 | → | → | → | → | → | → | 05 50 |
| 30 | 30020 | → | → | → | → | 05 39↓ | | | | | | | | |
| | 3402 | 05 45 | → | → | → | 05 54 | 06 00 | → | → | → | 06 06 | 06 12 | 06 20 | 06 32 |
| 33E | 33050 | 05 30 | 05 36 | 05 40 | → | → | → | 06 00 | 06 05 | 06 15 | | | | |
| 33A | 33070 | 06 00 | 06 08 | 06 15 | → | → | → | 06 40 | 06 45 | 06 55 | | | | |
| 33 | 33080 | 06 10 | 06 18 | 06 25 | → | → | → | 06 50 | 06 55 | 07 05 | | | | |
| | 3602 | 06 03 | → | → | → | 06 12 | 06 18 | → | → | → | 06 24 | 06 30 | 06 38 | 06 50 |
| 33A | 33100 | 06 30 | 06 38 | 06 45 | → | → | → | 07 10 | 07 15 | 07 25 | | | | |
| 33E | 33110 | 06 40 | 06 48 | 06 55 | → | → | → | 07 25 | 07 30 | 07 40 | | | | |
| | 3802 | 06 30 | → | → | → | 06 40 | 06 46 | → | → | → | 06 52 | 06 58 | 07 06 | 07 18 |
| 33A | 33120 | 07 00 | 07 08 | 07 15 | → | → | → | 07 45 | 07 50 | 08 00 | | | | |
| 33C | 33140 | | | | | | | | | | | | | |
| 33E | 33143 | 07 10 | 07 18 | 07 25 | → | → | → | 07 55 | 08 00 | 08 10 | | | | |
| | 3902 | 06 55 | → | → | → | 07 05 | 07 11 | → | → | → | 07 17 | 07 23 | 07 31 | 07 43 |
| 33A | 33160 | 07 30 | 07 38 | 07 46 | → | → | → | 08 20 | 08 25 | 08 35 | | | | |
| 33E | 33170 | 07 40 | 07 48 | 07 56 | → | → | → | 08 30 | 08 35 | 08 45 | | | | |
| | 3854 | 07 20 | → | → | → | 07 30 | → | → | → | → | → | → | → | 07 56 |
| | 3606 | 07 30 | → | → | → | 07 40 | 07 46 | → | → | → | 07 52 | 07 58 | 08 06 | 08 18 |
| 33 | 33200 | 08 15 | 08 23 | 08 31 | → | → | → | 09 05 | 09 10 | 09 20 | | | | |
| | 3306 | | | | | 07 55 | 08 01 | → | → | → | 08 07 | 08 13 | 08 21 | 08 33 |
| | 3904 | 08 00 | → | → | → | 08 10 | 08 16 | → | → | → | 08 22 | 08 28 | 08 36 | 08 48 |
| | 3108 | | | | | 08 27 | 08 33 | → | → | → | 08 39 | 08 45 | 08 53 | 09 05 |
| | 3806 | 08 25 | → | → | → | 08 35 | 08 41 | → | → | → | 08 47 | 08 53 | 09 01 | 09 13 |
| 33 | 33240 | 09 10 | 09 18 | 09 25 | → | → | → | 09 50 | 09 55 | 10 05 | | | | |
| 30 | 30180 | → | → | → | → | 08 59↓ | | | | | | | | |
| | 3410 | 09 07 | → | → | → | 09 14 | 09 21 | → | → | → | 09 27 | 09 32 | 09 39 | 09 51 |
| 33 | 33280 | 10 05 | 10 11 | 10 17 | → | → | → | 10 40 | 10 45 | 10 55 | | | | |
| 30 | 30230 | → | → | → | → | 09 54↓ | | | | | | | | |
| | 3412 | 10 02 | → | → | → | 10 09 | 10 16 | → | → | → | 10 22 | 10 27 | 10 34 | 10 46 |
| 33 | 33320 | 11 10 | 11 16 | 11 22 | → | → | → | 11 45 | 11 50 | 12 00 | | | | |
| 30 | 30270 | → | → | → | → | 10 59↓ | | | | | | | | |

## Monday to Friday (except holidays)
## Du lundi au vendredi (sauf les jours fériés)

### EASTBOUND EN DIRECTION EST

| Route Number / Numéro du trajet | Trip Number / Numéro du parcours | Zone → | Kitchener 27 Dp | Kitchener 27 | Guelph 39 | Guelph 39 | Rockwood 38 | Acton 37 | Georgetown 35 | Georgetown 35 | Georgetown 35 | Brampton 34 | Brampton 33 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Kitchener GO | Kitchener Bus Terminal | University of Guelph | Guelph Central GO | Alma St. @ Inkerman St. | Acton GO | Main St. S. @ George St. | Georgetown GO | Guelph St. @ King St. | Mount Pleasant GO | Main St. N @ Bovaird Dr. W. |
| | 3414 | | | | | | | | | | | 11 00 | → |
| 33 | 33360 | | | | 10 30 | 10 40 | 10 53 | 11 04S | 11 16 | 11 25 | 11 33 | 11 45↓ | 11 54 |
| 30 | 30310 | | 10 44 | 10 51 | → | → | → | → | → | → | → | → | → |
| | 3416 | | | | | | | | | | | 12 00 | → |
| 33 | 33400 | | | | 11 30 | 11 40 | 11 53 | 12 04S | 12 16 | 12 25 | 12 33 | 12 45↓ | 12 54 |
| 33A | 33420 | | | | | | | | | | | | |
| 30 | 30350 | | 11 44 | 11 51 | → | → | → | → | → | → | → | → | → |
| | 3418 | | | | | | | | | | | 13 00 | → |
| 33 | 33440 | | | | 12 30 | 12 40 | 12 53 | 13 04S | 13 16 | 13 25 | 13 33 | 13 45↓ | 13 54 |
| 33A | 33460 | | | | | | | | | | | | |
| 30 | 30390 | | 12 44 | 12 51 | → | → | → | → | → | → | → | → | → |
| | 3420 | | | | | | | | | | | 14 00 | → |
| 33 | 33480 | | | | 13 30 | 13 40 | 13 53 | 14 04S | 14 16 | 14 25 | 14 33 | 14 45↓ | 14 54 |
| 30 | 30430 | | 13 39 | 13 46 | → | → | → | → | → | → | → | → | → |
| | 3422 | | | | | | | | | | | 15 00 | → |
| 33A | 33520 | | | | | | | | | | | | |
| 33D | 33530 | | | | 14 20 | 14 30 | 14 43 | 14 54S | 15 06 | 15 15 | 15 23 | 15 37↓ | 15 46 |
| 30 | 30460 | | 14 31 | 14 38 | → | → | → | → | → | → | → | → | → |
| | 3474 | | | | | | | | | | | 15 52 | → |
| 33A | 33532 | | | | | | | | | | | | |
| 31J | 31570 | | | | | | | | | | | | |
| 33A | 33580 | | | | | | | | | | | | |
| 31L | 31580 | | | | | | | | | | | | |
| 31A | 31600 | | | | 15 15 | 15 25 | 15 39 | 15 53S | 16 08 | 16 20 | 16 28 | 16 40 | 16 51 |
| 33A | 33610 | | | | | | | | | | | | |
| 30 | 30540 | | 15 50 | 15 57 | → | → | → | → | → | → | → | → | → |
| 31L | 31610 | | | | | | | | | | | | |
| 31J | 31630 | | | | | | | | | | | | |
| 30 | 30570 | | 16 15 | 16 22 | → | → | → | → | → | → | → | → | → |
| 31L | 31640 | | | | | | | | | | | | |
| 33A | 33640 | | | | | | | | | | | | |
| 31A | 31660 | | | | 16 15 | 16 25 | 16 39 | 16 53S | 17 08 | 17 20 | 17 28 | 17 40 | 17 51 |
| 33A | 33670 | | | | | | | | | | | | |



## Monday to Friday (except holidays)
## Du lundi au vendredi (sauf les jours fériés)

### EASTBOUND EN DIRECTION EST

| Route Number / Numéro du trajet | Trip Number / Numéro du parcours | Brampton 33 | Brampton 33 | Brampton 22 | Brampton 33 | Brampton 32 | Mississauga 31 | North York 5 | North York 5 | North York 5 Ar | Etobicoke 4 | Toronto 4 | Toronto 2 | Toronto 2 Ar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Brampton GO | Shopper's World | Hurontario St. @ Hwy. 407 | Steeles Ave. E. @ First Gulf Blvd. | Bramalea GO | Malton GO | D Keele St. @ Hwy. 401 | Yorkdale Bus Terminal | York Mills Bus Terminal | Etobicoke North GO | Weston GO | Bloor GO | Union Station |
| | 3414 | 11 07 | → | → | → | 11 14 | 11 21 | → | → | → | 11 27 | 11 32 | 11 39 | 11 51 |
| 33 | 33360 | 12 10 | 12 16 | 12 22 | → | → | → | 12 45 | 12 50 | 13 00 | | | | |
| 30 | 30310 | → | → | → | → | 11 59↓ | | | | | | | | |
| | 3416 | 12 07 | → | → | → | 12 14 | 12 21 | → | → | → | 12 27 | 12 32 | 12 39 | 12 51 |
| 33 | 33400 | 13 10 | 13 16 | 13 22 | → | → | → | 13 45 | 13 50 | 14 00 | | | | |
| 33A | 33420 | 13 40 | 13 46 | 13 52 | → | → | → | 14 15 | 14 20 | 14 30 | | | | |
| 30 | 30350 | → | → | → | → | 12 59↓ | | | | | | | | |
| | 3418 | 13 07 | → | → | → | 13 14 | 13 21 | → | → | → | 13 27 | 13 32 | 13 39 | 13 51 |
| 33 | 33440 | 14 10 | 14 16 | 14 22 | → | → | → | 14 45 | 14 50 | 15 00 | | | | |
| 33A | 33460 | 14 40 | 14 48 | 14 55 | → | → | → | 15 20 | 15 25 | 15 35 | | | | |
| 30 | 30390 | → | → | → | → | 13 59↓ | | | | | | | | |
| | 3420 | 14 07 | → | → | → | 14 14 | 14 21 | → | → | → | 14 27 | 14 32 | 14 39 | 14 51 |
| 33 | 33480 | 15 10 | 15 18 | 15 25 | → | → | → | 15 50 | 15 55 | 16 05 | | | | |
| 30 | 30430 | → | → | → | → | 14 59↓ | | | | | | | | |
| | 3422 | 15 07 | → | → | → | 15 14 | 15 21 | → | → | → | 15 27 | 15 32 | 15 39 | 15 51 |
| 33A | 33520 | 15 40 | 15 48 | 15 55 | → | → | → | 16 20 | 16 25 | 16 40 | | | | |
| 33D | 33530 | 16 00 | | | | | | | | | | | | |
| 30 | 30460 | → | → | → | → | 15 51↓ | | | | | | | | |
| | 3474 | 15 59 | → | → | → | 16 06 | 16 13 | → | → | → | → | → | → | 16 39 |
| 33A | 33532 | 16 10 | 16 18 | 16 25 | → | → | → | 16 55 | 17 00 | 17 15 | | | | |
| 31J | 31570 | 16 35b | 16 43 | → | 16 50 | → | → | → | → | → | → | → | → | 17 50 |
| 33A | 33580 | 16 40 | 16 48 | 16 55 | → | → | → | 17 30 | 17 35 | 17 50 | | | | |
| 31L | 31580 | | | | | 16 45 | 16 55 | → | → | → | → | → | → | 17 50 |
| 31A | 31600 | 17 05 | 17 13 | → | 17 20 | → | → | → | → | → | → | → | → | 18 20 |
| 33A | 33610 | 17 10 | 17 18 | 17 25 | → | → | → | 18 00 | 18 05 | 18 20 | | | | |
| 30 | 30540 | → | → | → | → | 17 10↓ | | | | | | | | |
| 31L | 31610 | | | | | 17 15h | 17 25 | → | → | → | → | → | → | 18 20 |
| 31J | 31630 | 17 35 | 17 41 | → | 17 50 | → | → | → | → | → | → | → | → | 18 50 |
| 30 | 30570 | → | → | → | → | 17 40↓ | | | | | | | | |
| 31L | 31640 | | | | | 17 45h | 17 55 | → | → | → | → | → | → | 18 50 |
| 33A | 33640 | 17 40 | 17 48 | 17 55 | → | → | → | 18 30 | 18 35 | 18 45 | | | | |
| 31A | 31660 | 18 05 | 18 11 | → | 18 20 | → | → | → | → | → | → | → | → | 19 15 |
| 33A | 33670 | 18 10 | 18 18 | 18 25 | → | → | → | 18 55 | 19 00 | 19 10 | | | | |

## Monday to Friday (except holidays)
## Du lundi au vendredi (sauf les jours fériés)

### EASTBOUND EN DIRECTION EST

| Route Number / Numéro du trajet | Trip Number / Numéro du parcours | Zone → | Kitchener 27 Dp | Kitchener 27 | Guelph 39 | Guelph 39 | Rockwood 38 | Acton 37 | Georgetown 35 | Georgetown 35 | Georgetown 35 | Brampton 34 | Brampton 33 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Kitchener GO | Kitchener Bus Terminal | University of Guelph | Guelph Central GO | Alma St. @ Inkerman St. | Acton GO | Main St. S. @ George St. | Georgetown GO | Guelph St. @ King St. | Mount Pleasant GO | Main St. N @ Bovaird Dr. W. |
| 30 | 30590 | | 16 45 | 16 52 | → | → | → | → | → | → | → | → | → |
| 31L | 31670 | | | | | | | | | | | | |
| 31J | 31680 | | | | | | | | | | | | |
| 30 | 30620 | | 17 15 | 17 22 | → | → | → | → | → | → | → | → | → |
| 31L | 31690 | | | | | | | | | | | | |
| 31A | 31700 | | | | 17 20 | 17 30 | 17 44 | 17 55S | 18 10 | 18 20 | 18 28 | 18 40 | 18 51 |
| 33A | 33710 | | | | | | | | | | | | |
| 30 | 30660 | | 17 50 | 17 57 | → | → | → | → | → | → | → | → | → |
| 31L | 31710 | | | | | | | | | | | | |
| 31J | 31720 | | | | | | | | | | | | |
| 31L | 31730 | | | | | | | | | | | | |
| 31A | 31750 | | | | 18 30 | 18 40 | 18 54 | 19 05S | 19 20 | 19 30 | 19 38 | 19 45 | 19 55 |
| 33A | 33750 | | | | | | | | | | | | |
| 30 | 30700 | | 18 55 | 19 02 | → | → | → | → | → | → | → | → | → |
| 31L | 31740 | | | | | | | | | | | | |
| 31H | 31760 | | | | | | | | | | | | |
| 30 | 30740 | | 20 05 | 20 12 | → | → | → | → | → | → | → | → | → |
| 31E | 31780 | | | | | | | | | 20 30 | 20 37 | 20 45 | 20 51 |
| 33A | 33790 | | | | | | | | | | | | |
| 31H | 31800 | | | | | | | | | | | | |
| 30 | 30790 | | 21 10 | 21 15 | → | → | → | → | → | → | → | → | → |
| 31 | 31820 | | | | 20 30 | 20 40 | 20 54 | 21 05S | 21 20 | 21 30 | 21 37 | 21 45 | 21 51 |
| 33A | 33820 | | | | | | | | | | | | |
| 31H | 31840 | | | | | | | | | | | | |
| 30 | 30830 | | 22 10 | 22 15 | → | → | → | → | → | → | → | → | → |
| 31E | 31850 | | | | | | | | | 22 30 | 22 37 | 22 45 | 22 51 |
| 33A | 33850 | | | | | | | | | | | | |
| 31H | 31870 | | | | | | | | | | | | |
| 31E | 31880 | | | | | | | | | 23 30 | 23 37 | 23 45 | 23 51 |
| 33A | 33890 | | | | | | | | | | | | |
| 31E | 31910 | | | | | | | | | 00 30 | 00 37 | 00 45 | 00 51 |



## Monday to Friday (except holidays)
## Du lundi au vendredi (sauf les jours fériés)

### EASTBOUND EN DIRECTION EST

| Route Number / Numéro du trajet | Trip Number / Numéro du parcours | Brampton 33 | Brampton 33 | Brampton 22 | Brampton 33 | Brampton 32 | Mississauga 31 | North York 5 D | North York 5 | North York 5 Ar | Etobicoke 4 | Toronto 4 | Toronto 2 | Toronto 2 Ar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Brampton GO | Shopper's World | Hurontario St. @ Hwy. 407 | Steeles Ave. E. @ First Gulf Blvd. | Bramalea GO | Malton GO | Keele St. @ Hwy. 401 | Yorkdale Bus Terminal | York Mills Bus Terminal | Etobicoke North GO | Weston GO | Bloor GO | Union Station |
| 30 | 30590 | → | → | → | → | 18 10↓ | | | | | | | | |
| 31L | 31670 | | | | | 18 15h | 18 25 | → | → | → | → | → | → | 19 15 |
| 31J | 31680 | 18 35 | 18 40 | → | 18 45 | → | → | → | → | → | → | → | → | 19 30 |
| 30 | 30620 | → | → | → | → | 18 40↓ | | | | | | | | |
| 31L | 31690 | | | | | 18 45h | 18 55 | → | → | → | → | → | → | 19 35 |
| 31A | 31700 | 19 05 | 19 10 | → | 19 15 | → | → | → | → | → | → | → | → | 19 55 |
| 33A | 33710 | 19 10 | 19 16 | 19 22 | → | → | → | 19 45 | 19 50 | 20 00 | | | | |
| 30 | 30660 | → | → | → | → | 19 10↓ | | | | | | | | |
| 31L | 31710 | | | | | 19 15h | 19 25 | → | → | → | → | → | → | 20 00 |
| 31J | 31720 | 19 35 | 19 40 | → | 19 45 | → | → | → | → | → | → | → | → | 20 20 |
| 31L | 31730 | | | | | 19 45 | 19 55 | → | → | → | → | → | → | 20 30 |
| 31A | 31750 | 20 05 | 20 10 | → | 20 15 | → | → | → | → | → | → | → | → | 20 45 |
| 33A | 33750 | 20 10 | 20 16 | 20 22 | → | → | → | 20 45 | 20 50 | 21 00 | | | | |
| 30 | 30700 | → | → | → | → | 20 10↓ | | | | | | | | |
| 31L | 31740 | | | | | 20 15h | 20 25 | → | → | → | → | → | → | 20 55 |
| 31H | 31760 | 20 35 | 20 40 | → | 20 45 | 20 50 | 21 00 | → | → | → | → | → | → | 21 30 |
| 30 | 30740 | → | → | → | → | 21 15↓ | | | | | | | | |
| 31E | 31780 | 21 05 | 21 10 | → | 21 15 | 21 20h | 21 30 | → | → | → | → | → | → | 22 00 |
| 33A | 33790 | 21 10 | 21 15 | 21 20 | → | → | → | 21 40 | 21 45 | 21 55 | | | | |
| 31H | 31800 | 21 35 | 21 40 | → | 21 45 | 21 50 | 22 00 | → | → | → | → | → | → | 22 30 |
| 30 | 30790 | → | → | → | → | 22 15↓ | | | | | | | | |
| 31 | 31820 | 22 05 | 22 10 | → | 22 15 | 22 20h | 22 30 | → | → | → | → | → | → | 23 00 |
| 33A | 33820 | 22 10 | 22 15 | 22 20 | → | → | → | 22 40 | 22 45 | 22 55 | | | | |
| 31H | 31840 | 22 35 | 22 40 | → | 22 45 | 22 50 | 23 00 | → | → | → | → | → | → | 23 30 |
| 30 | 30830 | → | → | → | → | 23 15↓ | | | | | | | | |
| 31E | 31850 | 23 05 | 23 10 | → | 23 15 | 23 20h | 23 30 | → | → | → | → | → | → | 00 00 |
| 33A | 33850 | 23 10 | 23 15 | 23 20 | → | → | → | 23 40 | 23 45 | 23 55 | | | | |
| 31H | 31870 | 23 35 | 23 40 | → | 23 45 | 23 50 | 00 00 | → | → | → | → | → | → | 00 30 |
| 31E | 31880 | 00 05 | 00 10 | → | 00 15 | 00 20 | 00 30 | → | → | → | → | → | → | 01 00 |
| 33A | 33890 | 00 10 | 00 15 | 00 20 | → | → | → | 00 40 | 00 45 | 00 55 | | | | |
| 31E | 31910 | 01 05 | 01 10 | → | 01 15 | 01 20 | 01 30 | → | → | → | → | → | → | 02 00 |

## Monday to Friday (except holidays)
## Du lundi au vendredi (sauf les jours fériés)

### WESTBOUND EN DIRECTION OUEST

| Route Number / Numéro du trajet | Trip Number / Numéro du parcours | Zone→ | Toronto 2 Dp Union Station | Toronto 2 Bloor GO | Toronto 4 Weston GO | Etobicoke 4 Etobicoke North GO | North York 5 York Mills Bus Terminal | North York 5 Yorkdale Bus Terminal | North York 5 Keele St. @ Hwy. 401 | Mississauga 31 Malton GO | Brampton 32 Bramalea GO | Brampton 33 Steeles Ave. E @ Rutherford Road S. | Brampton 22 Hurontario St. @ Hwy. 407 | Brampton 33 Shopper's World |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33D | 33081 | | | | | | | | | | | | | |
| 31 | 31101 | | 05 50 | → | → | → | → | → | → | 06 15 | 06 25↓ | 06 32 | → | 06 35 |
| 30 | 30101 | | | | | | | | | | 06 30h | → | → | → |
| 31 | 31151 | | 06 20 | → | → | → | → | → | → | 06 45 | 07 00↓ | 07 07 | → | 07 12 |
| 30 | 30131 | | | | | | | | | | 07 05h | → | → | → |
| 33A | 33151 | | | | | | 06 30 | 06 40 | 06 45 | → | → | → | 07 05 | 07 10 |
| 33A | 33181 | | | | | | 07 00 | 07 12 | 07 17 | → | → | → | 07 40 | 07 45 |
| 31H | 31191 | | 06 50 | → | → | → | → | → | → | 07 20 | 07 35↓ | 07 42 | → | 07 47 |
| 30 | 30171 | | | | | | | | | | 07 40h | → | → | → |
| 33A | 33211 | | | | | | 07 30 | 07 42 | 07 47 | → | → | → | 08 10 | 08 15 |
| 31 | 31221 | | 07 20 | → | → | → | → | → | → | 07 55 | 08 10↓ | 08 17 | → | 08 22 |
| 30 | 30211 | | | | | | | | | | 08 15h | → | → | → |
| 33A | 33241 | | | | | | 08 00 | 08 12 | 08 17 | → | → | → | 08 40 | 08 45 |
| 31H | 31241 | | 07 50 | → | → | → | → | → | → | 08 30 | 08 45↓ | 08 52 | → | 08 57 |
| 30 | 30231 | | | | | | | | | | 08 50h | → | → | → |
| 33B | 33261 | | | | | | 08 30 | 08 42 | 08 47 | → | → | → | 09 10 | 09 15 |
| | 3411 | | 08 55 | 09 05 | 09 11 | 09 16 | → | → | → | 09 22 | 09 29↓ | → | → | → |
| 30 | 30261 | | | | | | | | | | 09 39h | → | → | → |
| 33F | 33263 | | | | | | | | | | | | | |
| 33A | 33271 | | | | | | 09 00 | 09 12 | 09 17 | → | → | → | 09 40 | 09 45 |
| 33B | 33291 | | | | | | 09 30 | 09 40 | 09 45 | → | → | → | 10 05 | 10 10 |
| | 3413 | | 09 48 | 09 58 | 10 04 | 10 09 | → | → | → | 10 15 | 10 22↓ | → | → | → |
| 30 | 30301 | | | | | | | | | | 10 32h | → | → | → |
| 33A | 33311 | | | | | | 10 00 | 10 10 | 10 15 | → | → | → | 10 35 | 10 40 |
| 33F | 33293 | | | | | | | | | | | | | |
| 33B | 33331 | | | | | | 10 30 | 10 40 | 10 45 | → | → | → | 11 05 | 11 10 |
| | 3415 | | 10 53 | 11 03 | 11 09 | 11 14 | → | → | → | 11 20 | 11 27↓ | → | → | → |
| 30 | 30341 | | | | | | | | | | 11 37h | → | → | → |
| 33F | 33333 | | | | | | | | | | | | | |
| 33B | 33371 | | | | | | 11 30 | 11 40 | 11 45 | → | → | → | 12 05 | 12 10 |
| | 3417 | | 11 53 | 12 03 | 12 09 | 12 14 | → | → | → | 12 20 | 12 27↓ | → | → | → |
| 30 | 30381 | | | | | | | | | | 12 37h | → | → | → |
| 33F | 33373 | | | | | | | | | | | | | |
| | 3419 | | 12 53 | 13 03 | 13 09 | 13 14 | → | → | → | 13 20 | 13 27↓ | → | → | → |
| 30 | 30421 | | | | | | | | | | 13 37h | → | → | → |
| 33B | 33411 | | | | | | 12 30 | 12 40 | 12 45 | → | → | → | 13 05 | 13 10 |
| 33F | 33413 | | | | | | | | | | | | | |
| | 3421 | | 13 53 | 14 03 | 14 09 | 14 14 | → | → | → | 14 20 | 14 27↓ | → | → | → |



## Monday to Friday (except holidays)
## Du lundi au vendredi (sauf les jours fériés)

### WESTBOUND EN DIRECTION OUEST

| Route Number / Numéro du trajet | Trip Number / Numéro du parcours | Brampton 33 Brampton GO | Brampton 33 Bovaird Dr. W. @ Hurontario St. | Brampton 34 Mount Pleasant GO | Georgetown 35 Guelph St. @ King St. | Georgetown 35 Georgetown GO | Georgetown 35 Main St. S. @ Cross St. | Acton 37 Acton GO | Rockwood 38 Alma St. @ Inkerman St. | Guelph 39 Guelph Central GO | Guelph 39 University of Guelph | Kitchener 27 Kitchener Bus Terminal | Kitchener 27 Ar Kitchener GO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33D | 33081 | 06 15 | 06 22 | 06 30 | 06 36 | 06 46 | 06 53 | 07 05S | 07 15 | 07 35S | 07 45 | | |
| 31 | 31101 | 06 45 | 06 51 | 07 05 | 07 10 | 07 20 | 07 27 | 07 40S | 07 52 | 08 10S | 08 20 | | |
| 30 | 30101 | → | → | → | → | → | → | → | → | → | → | 07 27 | 07 35 |
| 31 | 31151 | 07 25b | 07 31 | 07 45 | 07 50 | 08 05 | 08 12 | 08 25S | 08 37 | 08 55S | 09 05 | | |
| 30 | 30131 | → | → | → | → | → | → | → | → | → | → | 08 07 | 08 15 |
| 33A | 33151 | 07 20 | | | | | | | | | | | |
| 33A | 33181 | 07 55 | | | | | | | | | | | |
| 31H | 31191 | 08 00 | | | | | | | | | | | |
| 30 | 30171 | → | → | → | → | → | → | → | → | → | → | 08 47 | 08 55 |
| 33A | 33211 | 08 25 | | | | | | | | | | | |
| 31 | 31221 | 08 35 | 08 41 | 08 55 | 09 00 | 09 15 | 09 22 | 09 35S | 09 47 | 10 05S | 10 15 | | |
| 30 | 30211 | → | → | → | → | → | → | → | → | → | → | 09 22 | 09 30 |
| 33A | 33241 | 08 55 | | | | | | | | | | | |
| 31H | 31241 | 09 10 | | | | | | | | | | | |
| 30 | 30231 | → | → | → | → | → | → | → | → | → | → | 09 52 | 10 00 |
| 33B | 33261 | 09 25 | 09 32 | 09 45 | | | | | | | | | |
| | 3411 | 09 36 | → | 09 44↓ | | | | | | | | | |
| 30 | 30261 | → | → | → | → | → | → | → | → | → | → | 10 41 | 10 49 |
| 33F | 33263 | | | 09 52h | 09 58 | 10 08 | 07 46 | 10 27S | 10 37 | 10 57S | 11 07 | | |
| 33A | 33271 | 09 55 | | | | | | | | | | | |
| 33B | 33291 | 10 20 | 10 27 | 10 40 | | | | | | | | | |
| | 3413 | 10 29 | → | 10 37↓ | | | | | | | | | |
| 30 | 30301 | → | → | → | → | → | → | → | → | → | → | 11 34 | 11 42 |
| 33A | 33311 | 10 50 | | | | | | | | | | | |
| 33F | 33293 | | | 10 45h | 10 51 | 11 01 | 11 08 | 11 20S | 11 30 | 11 50S | 12 00 | | |
| 33B | 33331 | 11 20 | 11 27 | 11 40 | | | | | | | | | |
| | 3415 | 11 34 | → | 11 42↓ | | | | | | | | | |
| 30 | 30341 | → | → | → | → | → | → | → | → | → | → | 12 39 | 12 47 |
| 33F | 33333 | | | 11 50h | 11 56 | 12 06 | 12 13 | 12 25S | 12 35 | 12 55S | 13 05 | | |
| 33B | 33371 | 12 20 | 12 27 | 12 40 | | | | | | | | | |
| | 3417 | 12 34 | → | 12 42↓ | | | | | | | | | |
| 30 | 30381 | → | → | → | → | → | → | → | → | → | → | 13 39 | 13 47 |
| 33F | 33373 | | | 12 50h | 12 56 | 13 06 | 13 13 | 13 25S | 13 35 | 13 55S | 14 05 | | |
| | 3419 | 13 34 | → | 13 42 | | | | | | | | | |
| 30 | 30421 | → | → | → | → | → | → | → | → | → | → | 14 39 | 14 47 |
| 33B | 33411 | 13 25 | 13 32 | 13 45 | | | | | | | | | |
| 33F | 33413 | | | 13 50h | 13 56 | 14 06 | 14 13 | 14 25S | 14 35 | 14 55S | 15 05 | | |
| | 3421 | 14 34 | → | 14 42 | | | | | | | | | |

Monday to Friday (except holidays)

Du lundi au vendredi (sauf les jours fériés)

WESTBOUND EN DIRECTION OUEST

| Route Number / Numéro du trajet | Zone→ | Toronto 2 Dp | Toronto 2 | Toronto 4 | Etobicoke 4 | North York 5 | North York 5 | North York 5 | Mississauga 31 | Brampton 32 | Brampton 33 | Brampton 22 | Brampton 33 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trip Number / Numéro du parcours | | Union Station | Bloor GO | Weston GO | Etobicoke North GO | York Mills Bus Terminal | Yorkdale Bus Terminal | Keele St. @ Hwy. 401 | Malton GO | Bramalea GO | Steeles Ave. E @ Rutherford Road S. | Hurontario St. @ Hwy. 407 | Shopper's World |
| 30 | 30461 | | | | | | | | | 14 37h | → | → | → |
| 33B | 33451 | | | | | 13 30 | 13 40 | 13 45 | → | → | → | 14 05 | 14 10 |
| 33F | 33453 | | | | | | | | | | | | |
| | 3423 | 14 53 | 15 03 | 15 09 | 15 14 | → | → | → | 15 20 | 15 27↓ | → | → | → |
| 30 | 30511 | | | | | | | | | 15 37h | → | → | → |
| 33 | 33501 | | | | | 14 30 | 14 42 | 14 47 | → | → | → | 15 10 | 15 15 |
| | 3823 | 15 35 | 15 45 | 15 54 | 16 01 | → | → | → | 16 08 | 16 16 | → | → | → |
| 33E | 33541 | | | | | 15 00 | 15 12 | 15 17 | → | → | → | 15 45 | 15 50 |
| 33C | 33543 | | | | | | | | | | | | |
| 33E | 33571 | | | | | 15 30 | 15 42 | 15 47 | → | → | → | 16 15 | 16 20 |
| 33E | 33601 | | | | | 16 00 | 16 12 | 16 17 | → | → | → | 16 45 | 16 50 |
| | 3675 | 16 13 | → | → | 16 33 | → | → | → | 16 40 | 16 48 | → | → | → |
| | 3225 | 16 32 | 16 42 | 16 48 | 16 53 | → | → | → | 16 58 | 17 08 | | | |
| | 3975 | 16 50 | → | → | → | → | → | → | → | 17 18 | → | → | → |
| 33C | 33603 | | | | | | | | | | | | |
| | 3627 | 17 02 | 17 12 | 17 21 | 17 28 | → | → | → | 17 35 | 17 43 | → | → | → |
| 33E | 33641 | | | | | 16 30 | 16 42 | 16 47 | → | → | → | 17 15 | 17 20 |
| 33E | 33671 | | | | | 16 50 | 17 02 | 17 07 | → | → | → | 17 35 | 17 40 |
| | 3827 | 17 27 | 17 37 | 17 46 | 17 53 | → | → | → | 18 00 | 18 08 | → | → | → |
| | 3927 | 18 00 | 18 10 | 18 19 | 18 26 | → | → | → | 18 33 | 18 41 | → | → | → |
| 33E | 33681 | | | | | 17 10 | 17 22 | 17 27 | → | → | → | 18 00 | 18 05 |
| 33C | 33683 | | | | | | | | | | | | |
| 33E | 33691 | | | | | 17 30 | 17 42 | 17 47 | → | → | → | 18 15 | 18 20 |
| 33E | 33701 | | | | | 18 00 | 18 12 | 18 17 | → | → | → | 18 45 | 18 50 |
| | 3929 | 18 50 | 19 00 | 19 09 | 19 16 | → | → | → | 19 23 | 19 31 | → | → | → |
| 33 | 33721 | | | | | 18 30 | 18 40 | 18 45 | → | → | → | 19 10 | 19 15 |
| 31F | 31731 | 19 15 | → | → | → | → | → | → | → | → | 19 45 | → | 19 49 |
| 31N | 31735 | 19 15 | → | → | → | → | → | → | 19 40 | c19 55 | | | |
| 31F | 31751 | 19 20 | → | → | → | → | → | → | → | → | 19 50 | → | 19 54 |
| 31N | 31755 | 19 20 | → | → | → | → | → | → | 19 45 | c20 00 | | | |
| 31F | 31761 | 19 35 | → | → | → | → | → | → | → | → | 20 05 | → | 20 09 |
| 33A | 33761 | | | | | 19 30 | 19 40 | 19 45 | → | → | → | 20 05 | 20 10 |
| 31N | 31763 | 19 35 | → | → | → | → | → | → | 20 00 | c20 15 | | | |
| 31F | 31765 | 19 45 | → | → | → | → | → | → | → | → | 20 12 | → | 20 16 |
| 31N | 31767 | 19 50 | → | → | → | → | → | → | 20 15 | c20 30↓ | | | |
| 30 | 30761 | | | | | | | | | 20 40h | → | → | → |
| 31F | 31771 | 20 00 | → | → | → | → | → | → | → | → | 20 27 | → | 20 31 |

Monday to Friday (except holidays)

Du lundi au vendredi (sauf les jours fériés)

WESTBOUND EN DIRECTION OUEST

| Route Number / Numéro du trajet | Brampton 33 | Brampton 33 | Brampton 34 | Georgetown 35 | Georgetown 35 | Georgetown 35 | Acton 37 | Rockwood 38 | Guelph 39 | Guelph 39 | Kitchener 27 | Kitchener 27 Ar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trip Number / Numéro du parcours | Brampton GO | Bovaird Dr. W. @ Hurontario St. | Mount Pleasant GO | Guelph St. @ King St. | Georgetown GO | Main St. S. @ Cross St. | Acton GO | Alma St. @ Inkerman St. | Guelph Central GO | University of Guelph | Kitchener Bus Terminal | Kitchener GO |
| 30461 | → | → | → | → | → | → | → | → | → | → | 15 44 | 15 52 |
| 33451 | 14 25 | 14 32 | 14 45 | | | | | | | | | |
| 33453 | | | 14 50h | 14 56 | 15 10 | 15 17 | 15 30S | 15 40 | 16 00S | 16 15 | | |
| 3423 | 15 34 | → | 15 42 | | | | | | | | | |
| 30511 | → | → | → | → | → | → | → | → | → | → | 16 49 | 16 57 |
| 33501 | 15 30 | 15 37 | 15 50h | 15 56 | 16 10 | 16 17 | 16 30S | 16 40 | 17 00S | 17 15 | | |
| 3823 | 16 24 | → | 16 30 | → | 16 42↓ | → | 16 56 | → | 17 11 | → | → | 17 43 |
| 33541 | 16 05 | 16 12 | 16 25 | 16 31 | 16 45 | | | | | | | |
| 33543 | | | | | 16 52h | 16 59 | 17 12S | 17 22 | 17 42S | 17 57 | | |
| 33571 | 16 35 | 16 42 | 16 55 | 17 01 | 17 15 | | | | | | | |
| 33601 | 17 10 | 17 17 | 17 30 | 17 36 | 17 50 | | | | | | | |
| 3675 | 16 57 | → | 17 03 | → | 17 15 | | | | | | | |
| 3225 | | | | | | | | | | | | |
| 3975 | 17 27 | → | 17 33 | → | 17 45↓ | → | 17 59 | → | 18 14 | → | → | 18 46 |
| 33603 | | | | | 17 55h | 18 00 | 18 12S | 18 23 | 18 40S | 18 55 | | |
| 3627 | 17 52 | → | 17 58 | → | 18 10 | | | | | | | |
| 33641 | 17 40 | 17 49 | 18 00 | 18 06 | 18 20 | | | | | | | |
| 33671 | 18 00 | 18 09 | 18 20 | 18 26 | 18 40 | | | | | | | |
| 3827 | 18 17 | → | 18 23 | → | 18 35 | → | 18 50 | → | 19 05 | → | → | 19 39 |
| 3927 | 18 50 | → | 18 56 | → | 19 06↓ | → | 19 20 | → | 19 38 | → | → | 20 07 |
| 33681 | 18 25 | 18 34 | 18 45 | 18 51 | 19 05 | | | | | | | |
| 33683 | | | | | 19 16h | 19 21 | 19 33S | 19 44 | 20 01S | 20 11 | | |
| 33691 | 18 40 | 18 49 | 19 00 | 19 06 | 19 20 | | | | | | | |
| 33701 | 19 05 | 19 12 | 19 25 | 19 31 | 19 45 | | | | | | | |
| 3929 | 19 40 | → | 19 46 | → | 19 56↓ | → | 20 10 | → | 20 25 | → | → | 20 57 |
| 33721 | 19 30 | 19 39 | 19 47 | 19 53 | 20 11h | 20 16 | 20 28S | 20 39 | 20 56S | 21 06 | | |
| 31731 | 20 05 | 20 11 | 20 25 | 20 30 | 20 45 | | | | | | | |
| 31735 | | | | | | | | | | | | |
| 31751 | 20 10b | 20 16 | 20 30 | 20 35 | 20 50 | | | | | | | |
| 31755 | | | | | | | | | | | | |
| 31761 | 20 25 | 20 31 | 20 45 | 20 50 | 21 05 | | | | | | | |
| 33761 | 20 25 | | | | | | | | | | | |
| 31763 | | | | | | | | | | | | |
| 31765 | 20 30 | 20 36 | 20 50 | 20 55 | 21 10 | | | | | | | |
| 31767 | | | | | | | | | | | | |
| 30761 | → | → | → | → | → | → | → | → | → | → | 21 37 | 21 45 |
| 31771 | 20 45 | 20 51 | 21 03 | 21 08 | 21 20 | | | | | | | |

Monday to Friday (except holidays)

Du lundi au vendredi (sauf les jours fériés)

WESTBOUND EN DIRECTION OUEST

| Route Number / Numéro du trajet | Trip Number / Numéro du parcours | Zone → | Toronto 2 Dp Union Station | Toronto 2 Bloor GO | Toronto 4 Weston GO | Etobicoke 4 Etobicoke North GO | North York 5 York Mills Bus Terminal | North York 5 Yorkdale Bus Terminal | North York 5 Keele St. @ Hwy. 401 | Mississauga 31 Malton GO | Brampton 32 Bramalea GO | Brampton 33 Steeles Ave. E @ Rutherford Road S. | Brampton 22 Hurontario St. @ Hwy. 407 | Brampton 33 Shopper's World |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31N | 31775 | | 20 05 | → | → | → | → | → | → | 20 30 | c20 45 | | | |
| 31F | 31773 | | 20 10 | → | → | → | → | → | → | → | → | 20 37 | → | 20 41 |
| 31F | 31781 | | 20 20 | → | → | → | → | → | → | → | → | 20 47 | → | 20 51 |
| 31N | 31785 | | 20 20 | → | → | → | → | → | → | 20 45 | 21 00 | | | |
| 31N | 31795 | | 20 35 | → | → | → | → | → | → | 21 00 | c21 15 | | | |
| 31F | 31791 | | 20 35 | → | → | → | → | → | → | → | → | 21 02 | → | 21 06 |
| 33A | 33791 | | | | | | 20 30 | 20 40 | 20 45 | → | → | → | 21 05 | 21 10 |
| 31A | 31801 | | 20 45 | → | → | → | → | → | → | → | → | 21 12 | → | 21 16 |
| 31N | 31805 | | 20 50 | → | → | → | → | → | → | 21 15 | c2130↓ | | | |
| 30 | 30801 | | | | | | | | | | 21 35h | → | → | → |
| 31F | 31811 | | 20 55 | → | → | → | → | → | → | → | → | 21 22 | → | 21 26 |
| 31N | 31815 | | 21 10 | → | → | → | → | → | → | 21 35 | c21 50 | | | |
| 31F | 31813 | | 21 10 | → | → | → | → | → | → | → | → | 21 37 | → | 21 41 |
| 31F | 31821 | | 21 20 | → | → | → | → | → | → | → | → | 21 47 | → | 21 51 |
| 31N | 31825 | | 21 30 | → | → | → | → | → | → | 21 55 | c22 10 | | | |
| 33A | 33831 | | | | | | 21 30 | 21 40 | 21 45 | → | → | → | 22 05 | 22 10 |
| 31F | 31831 | | 21 30 | → | → | → | → | → | → | → | → | 21 57 | → | 22 01 |
| 31F | 31833 | | 21 45 | → | → | → | → | → | → | → | → | 22 12 | → | 22 16 |
| 31N | 31835 | | 21 50 | → | → | → | → | → | → | 22 15 | c2230↓ | | | |
| 30 | 30841 | | | | | | | | | | 22 35h | → | → | → |
| 31F | 31841 | | 22 00 | → | → | → | → | → | → | → | → | 22 27 | → | 22 31 |
| 31N | 31845 | | 22 10 | → | → | → | → | → | → | 22 35 | c22 50 | | | |
| 31F | 31851 | | 22 20 | → | → | → | → | → | → | → | → | 22 47 | → | 22 51 |
| 31N | 31861 | | 22 30 | → | → | → | → | → | → | 22 55 | c23 10 | | | |
| 33A | 33861 | | | | | | 22 30 | 22 40 | 22 45 | → | → | → | 23 05 | 23 09 |
| 31F | 31871 | | 22 50 | → | → | → | → | → | → | → | → | 23 17 | → | 23 21 |
| 31N | 31875 | | 23 00 | → | → | → | → | → | → | 23 25 | c2340↓ | | | |
| 30 | 30871 | | | | | | | | | | 23 45h | → | → | → |
| 31F | 31881 | | 23 20 | → | → | → | → | → | → | → | → | 23 47 | → | 23 51 |
| 31N | 31891 | | 23 30 | → | → | → | → | → | → | 23 55 | c00 05 | | | |
| 33A | 33891 | | | | | | 23 30 | 23 40 | 23 45 | → | → | → | 00 05 | 00 09 |
| 31A | 31901 | | 23 50 | → | → | → | → | → | → | → | → | 00 17 | → | 00 21 |
| 31N | 31911 | | 00 00 | → | → | → | → | → | → | 00 25 | c00 35 | | | |
| 33A | 33921 | | | | | | 00 30 | 00 40 | 00 45 | → | → | → | 01 05 | 01 09 |
| 31E | 31921 | | 00 30 | → | → | → | → | → | → | 00 55 | 01 05 | 01 10 | → | 01 14 |
| 33A | 33951 | | | | | | 01 30 | 01 40 | 01 45 | → | → | → | 02 05 | 02 09 |
| 31E | 31951 | | 01 30 | → | → | → | → | → | → | 01 55 | 02 05 | 02 10 | → | 02 14 |
| 31E | 31961 | | 02 30 | → | → | → | → | → | → | 02 55 | 03 05 | 03 10 | → | 03 14 |



Monday to Friday (except holidays)

Du lundi au vendredi (sauf les jours fériés)

WESTBOUND EN DIRECTION OUEST

| Route Number / Numéro du trajet | Trip Number / Numéro du parcours | Brampton 33 Brampton GO | Brampton 33 Bovaird Dr. W. @ Hurontario St. | Brampton 34 Mount Pleasant GO | Georgetown 35 Guelph St. @ King St. | Georgetown 35 Georgetown GO | Georgetown 35 Main St. S. @ Cross St. | Acton 37 Acton GO | Rockwood 38 Alma St. @ Inkerman St. | Guelph 39 Guelph Central GO | Guelph 39 University of Guelph | Kitchener 27 Kitchener Bus Terminal | Kitchener 27 Ar Kitchener GO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31N | 31775 | | | | | | | | | | | | |
| 31F | 31773 | 20 55 | 21 01 | 21 13 | 21 18 | 21 30 | | | | | | | |
| 31F | 31781 | 21 05 | 21 11 | 21 23 | 21 28 | 21 40 | | | | | | | |
| 31N | 31785 | | | | | | | | | | | | |
| 31N | 31795 | | | | | | | | | | | | |
| 31F | 31791 | 21 20 | 21 26 | 21 38 | 21 43 | 21 55 | | | | | | | |
| 33A | 33791 | 21 20 | | | | | | | | | | | |
| 31A | 31801 | 21 30 | 21 36 | 21 48 | 21 53 | 22 05 | 22 10 | 22 22S | 22 33 | 22 45S | 22 55 | | |
| 31N | 31805 | | | | | | | | | | | | |
| 30 | 30801 | → | → | → | → | → | → | → | → | → | → | 22 32 | 22 40 |
| 31F | 31811 | 21 40 | 21 46 | 21 58 | 22 03 | 22 15 | | | | | | | |
| 31N | 31815 | | | | | | | | | | | | |
| 31F | 31813 | 21 55 | 22 01 | 22 13 | 22 18 | 22 30 | | | | | | | |
| 31F | 31821 | 22 05 | 22 11 | 22 23 | 22 28 | 22 40 | | | | | | | |
| 31N | 31825 | | | | | | | | | | | | |
| 33A | 33831 | 22 20 | | | | | | | | | | | |
| 31F | 31831 | 22 10 | 22 16 | 22 28 | 22 33 | 22 45 | | | | | | | |
| 31F | 31833 | 22 25 | 22 31 | 22 43 | 22 48 | 23 00 | | | | | | | |
| 31N | 31835 | | | | | | | | | | | | |
| 30 | 30841 | → | → | → | → | → | → | → | → | → | → | 23 27 | 23 35 |
| 31F | 31841 | 22 40 | 22 46 | 22 58 | 23 03 | 23 15 | | | | | | | |
| 31N | 31845 | | | | | | | | | | | | |
| 31F | 31851 | 23 00 | 23 06 | 23 18 | 23 23 | 23 35 | | | | | | | |
| 31N | 31861 | | | | | | | | | | | | |
| 33A | 33861 | 23 15 | | | | | | | | | | | |
| 31F | 31871 | 23 30 | 23 36 | 23 48 | 23 53 | 00 05 | | | | | | | |
| 31N | 31875 | | | | | | | | | | | | |
| 30 | 30871 | → | → | → | → | → | → | → | → | → | → | 00 37 | 00 45 |
| 31F | 31881 | 00 00 | 00 06 | 00 18 | 00 23 | 00 35 | | | | | | | |
| 31N | 31891 | | | | | | | | | | | | |
| 33A | 33891 | 00 15 | | | | | | | | | | | |
| 31A | 31901 | 00 30 | 00 36 | 00 45 | 00 50 | 01 00 | 01 05 | 01 17S | 01 28 | 01 40S | 01 50 | | |
| 31N | 31911 | | | | | | | | | | | | |
| 33A | 33921 | 01 15 | | | | | | | | | | | |
| 31E | 31921 | 01 20 | 01 26D | 01 35D | 01 40D | 01 50D | | | | | | | |
| 33A | 33951 | 02 15 | | | | | | | | | | | |
| 31E | 31951 | 02 20 | 02 26D | 02 35D | 02 40D | 02 50D | | | | | | | |
| 31E | 31961 | 03 20 | 03 25D | 03 30D | 03 35D | 03 45D | | | | | | | |

## Saturday and Sunday
## Samedi et dimanche

### EASTBOUND / EN DIRECTION EST

| Route Number<br>Numéro du trajet | Trip Number<br>Numéro du parcours | Zone→ | | Guelph 39 Dp<br>University of Guelph | Guelph 39<br>Guelph Central GO | Rockwood 38<br>Alma St. @ Inkerman St. | Acton 37<br>Acton GO | Georgetown 35<br>Main St. S. @ George St. | Georgetown 35<br>Georgetown GO | Georgetown 35<br>Guelph St. @ King St. | Brampton 34<br>Mount Pleasant GO | Brampton 33<br>Main St. N @ Bovaird Dr. W. | Brampton 33<br>Brampton GO | Brampton 33<br>Shopper's World | Brampton 33<br>Steeles Ave. E. @ First Gulf Blvd. | Brampton 32<br>Bramalea GO | Mississauga 31<br>Malton GO | Toronto 2 Ar<br>Union Station Bus Terminal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31E | 31090 | | | 05 00 | 05 07 | 05 12 | 05 19 | 05 30 | 05 35 | 05 40 | 05 45 | 05 55 | 06 20 | | | | | |
| 31E | 31150 | | | 06 00 | 06 07 | 06 12 | 06 19 | 06 30 | 06 35 | 06 40 | 06 45 | 06 55 | 07 20 | | | | | |
| 31F | 31170 | Sat | | 06 30 | 06 37 | 06 42 | 06 49 | 07 00 | 07 05 | 07 10 | → | → | 07 40 | | | | | |
| 31F | 31202 | | | 07 00 | 07 07 | 07 12 | 07 19 | 07 30 | 07 35 | 07 40 | → | → | 08 10 | | | | | |
| 31L | 31210 | | | | | | | | | | 07 45 | 07 55 | 08 25 | | | | | |
| 31F | 31222 | | | 07 30 | 07 37 | 07 42 | 07 49 | 08 00 | 08 05 | 08 10 | → | → | 08 45 | | | | | |
| 31L | 31230 | | | | | | | | | | 08 15 | 08 25 | 08 55 | | | | | |
| 31A | 31242 | | 07 00 | 07 10 | 07 23 | 07 34S | 07 46 | 07 55 | 08 03 | 08 10 | 08 17 | 08 30 | 08 35 | 08 40 | → | → | 09 15 | |
| 31L | 31250 | | | | | | | | | | 08 45 | 08 55 | 09 25 | | | | | |
| 31F | 31270 | | | 08 25 | 08 33 | 08 40 | 08 47 | 09 00 | 09 05 | 09 10 | → | → | 09 45 | | | | | |
| 31L | 31280 | | | | | | | | | | 09 15 | 09 25 | 09 55 | | | | | |
| 31F | 31292 | | | 08 55 | 09 03 | 09 10 | 09 17 | 09 30 | 09 35 | 09 40 | → | → | 10 20 | | | | | |
| 31L | 31300 | | | | | | | | | | 09 45 | 09 55 | 10 30 | | | | | |
| 31F | 31310 | | | 09 25 | 09 33 | 09 40 | 09 47 | 10 00 | 10 05 | 10 15 | → | → | 10 55 | | | | | |
| 31L | 31320 | | | | | | | | | | 10 15 | 10 25 | 11 05 | | | | | |
| 31A | 31332 | | 08 55 | 09 05 | 09 18 | 09 29S | 09 41 | 09 50 | 09 58 | 10 06 | 10 15 | 10 30 | 10 35 | 10 45 | → | → | 11 30 | |
| 31L | 31340 | | | | | | | | | | 10 45 | 10 55 | 11 35 | | | | | |
| 31F | 31350 | | | 10 20 | 10 28 | 10 36 | 10 45 | 11 00 | 11 05 | 11 15 | → | → | 12 00 | | | | | |
| 31L | 31360 | | | | | | | | | | 11 15 | 11 25 | 12 05 | | | | | |
| 31F | 31372 | | | 10 50 | 10 58 | 11 06 | 11 15 | 11 30 | 11 35 | 11 45 | → | → | 12 30 | | | | | |
| 31L | 31380 | | | | | | | | | | 11 45 | 11 55 | 12 35 | | | | | |
| 31F | 31390 | | | 11 20 | 11 28 | 11 36 | 11 45 | 12 00 | 12 05 | 12 15 | → | → | 13 00 | | | | | |
| 31L | 31400 | | | | | | | | | | 12 15 | 12 25 | 13 05 | | | | | |
| 31A | 31412 | | 10 55 | 11 05 | 11 18 | 11 29S | 11 41 | 11 50 | 11 58 | 12 06 | 12 15 | 12 30 | 12 35 | 12 45 | → | → | 13 30 | |
| 31L | 31420 | | | | | | | | | | 12 45 | 12 55 | 13 35 | | | | | |
| 31F | 31430 | | | 12 20 | 12 28 | 12 36 | 12 45 | 13 00 | 13 05 | 13 15 | → | → | 14 00 | | | | | |
| 31L | 31450 | | | | | | | | | | 13 15 | 13 25 | 14 05 | | | | | |
| 31F | 31452 | | | 12 50 | 12 58 | 13 06 | 13 15 | 13 30 | 13 35 | 13 45 | → | → | 14 30 | | | | | |
| 31L | 31460 | | | | | | | | | | 13 45 | 13 55 | 14 35 | | | | | |



## Saturday and Sunday
## Samedi et dimanche

### EASTBOUND / EN DIRECTION EST

| Route Number<br>Numéro du trajet | Trip Number<br>Numéro du parcours | Zone→ | | Guelph 39 Dp<br>University of Guelph | Guelph 39<br>Guelph Central GO | Rockwood 38<br>Alma St. @ Inkerman St. | Acton 37<br>Acton GO | Georgetown 35<br>Main St. S. @ George St. | Georgetown 35<br>Georgetown GO | Georgetown 35<br>Guelph St. @ King St. | Brampton 34<br>Mount Pleasant GO | Brampton 33<br>Main St. N @ Bovaird Dr. W. | Brampton 33<br>Brampton GO | Brampton 33<br>Shopper's World | Brampton 33<br>Steeles Ave. E. @ First Gulf Blvd. | Brampton 32<br>Bramalea GO | Mississauga 31<br>Malton GO | Toronto 2 Ar<br>Union Station Bus Terminal |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31F | 31472 | | | | | | | | 13 20 | 13 28 | 13 36 | 13 45 | 14 00 | 14 05 | 14 15 | → | → | 15 00 |
| 31L | 31480 | | | | | | | | | | | | | | | 14 15 | 14 25 | 15 05 |
| 31A | 31492 | | 12 50 | 13 00 | 13 13 | 13 24S | 13 38 | | 13 50 | 13 58 | 14 06 | 14 15 | 14 30 | 14 35 | 14 45 | → | → | 15 30 |
| 31L | 31510 | | | | | | | | | | | | | | | 14 45 | 14 55 | 15 35 |
| 31F | 31522 | | | | | | | | 14 20 | 14 28 | 14 36 | 14 45 | 15 00 | 15 05 | 15 15 | → | → | 16 00 |
| 31L | 31540 | | | | | | | | | | | | | | | 15 15 | 15 25 | 16 05 |
| 31F | 31552 | | | | | | | | 14 50 | 14 58 | 15 06 | 15 15 | 15 30 | 15 35 | 15 45 | → | → | 16 30 |
| 31L | 31570 | | | | | | | | | | | | | | | 15 45 | 15 55 | 16 35 |
| 31F | 31582 | | | | | | | | 15 20 | 15 28 | 15 36 | 15 45 | 16 00 | 16 05 | 16 15 | → | → | 17 00 |
| 31L | 31600 | | | | | | | | | | | | | | | 16 15 | 16 25 | 17 05 |
| 31A | 31612 | | 14 50 | 15 00 | 15 13 | 15 24S | 15 38 | | 15 50 | 15 58 | 16 06 | 16 15 | 16 30 | 16 35 | 16 45 | → | → | 17 30 |
| 31L | 31630 | | | | | | | | | | | | | | | 16 45 | 16 55 | 17 35 |
| 31F | 31640 | | | | | | | | 16 20 | 16 28 | 16 36 | 16 45 | 17 00 | 17 05 | 17 15 | → | → | 18 00 |
| 31L | 31660 | | | | | | | | | | | | | | | 17 15 | 17 25 | 18 05 |
| 31F | 31672 | | | | | | | | 16 50 | 16 58 | 17 06 | 17 15 | 17 30 | 17 35 | 17 45 | → | → | 18 30 |
| 31L | 31680 | | | | | | | | | | | | | | | 17 45 | 17 55 | 18 35 |
| 31F | 31690 | | | | | | | | 17 20 | 17 28 | 17 36 | 17 45 | 18 00 | 18 05 | 18 15 | → | → | 19 00 |
| 31L | 31700 | | | | | | | | | | | | | | | 18 15 | 18 25 | 19 05 |
| 31A | 31712 | | 16 55 | 17 05 | 17 18 | 17 29S | 17 43 | | 17 55 | 18 03 | 18 10 | 18 18 | 18 30 | 18 35 | 18 45 | → | → | 19 30 |
| 31L | 31720 | | | | | | | | | | | | | | | 18 45 | 18 55 | 19 35 |
| 31F | 31742 | | | | | | | | 18 55 | 19 03 | 19 10 | 19 18 | 19 30 | 19 35 | 19 45 | → | → | 20 25 |
| 31L | 31750 | | | | | | | | | | | | | | | 19 45 | 19 55 | 20 30 |
| 31A | 31782 | | 19 00 | 19 10 | 19 23 | 19 34S | 19 46 | | 19 55 | 20 03 | 20 10 | 20 18 | 20 30 | 20 35 | 20 40 | → | → | 21 20 |
| 31L | 31790 | | | | | | | | | | | | | | | 20 45 | 20 55 | 21 30 |
| 31E | 31830 | | | | | | | | 20 55 | 21 03 | 21 10 | 21 18 | 21 30 | 21 35 | 21 40 | 21 50 | 22 00 | 22 30 |
| 31 | 31860 | | 21 00 | 21 10 | 21 23 | 21 34S | 21 46 | | 21 55 | 22 03 | 22 10 | 22 18 | 22 30 | 22 35 | 22 40 | 22 45 | 22 55 | 23 25 |
| 31E | 31890 | | | | | | | | 23 00 | 23 07 | 23 12 | 23 19 | 23 30 | 23 35 | 23 40 | 23 45 | 23 55 | 00 25 |
| 31E | 31920 | | | | | | | | 00 00 | 00 07 | 00 12 | 00 19 | 00 30 | 00 35 | 00 40 | 00 45 | 00 55 | 01 25 |

## Saturday and Sunday
## Samedi et dimanche

### WESTBOUND / EN DIRECTION OUEST

| Route Number / Numéro du trajet | Trip Number / Numéro du parcours | Zone→ | Exception 1 | Toronto Union Station Bus Terminal Dp | Mississauga Malton GO | Brampton Bramalea GO | Brampton Steeles Ave. E @ Rutherford Road S. | Brampton Shopper's World | Brampton Brampton GO | Brampton Bovaird Dr. W. @ Hurontario St. | Brampton Mount Pleasant GO | Georgetown Guelph St. @ King St. | Georgetown Georgetown GO | Georgetown Main St. S. @ Cross St. | Acton Acton GO | Rockwood Alma St. @ Inkerman St. | Guelph Guelph Central GO | Guelph University of Guelph Ar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2 | 31 | 32 | 33 | 33 | 33 | 33 | 34 | 35 | 35 | 35 | 37 | 38 | 39 | 39 |
| 31 | 31161 | | | 07 30 | 07 55 | 08 05 | 08 10 | 08 14 | 08 25 | 08 31 | 08 40 | 08 45 | 08 55 | 09 03 | 09 16S | 09 28 | 09 45 | 10 00 |
| 31L | 31221 | | | 08 30 | 08 55 | 09 05 | | | | | | | | | | | | |
| 31F | 31233 | | | 08 50 | → | → | 09 15 | 09 19 | 09 30 | 09 36 | 09 45 | 09 50 | 10 05 | | | | | |
| 31L | 31271 | | | 09 00 | 09 25 | 09 40 | | | | | | | | | | | | |
| 31F | 31253 | | | 09 20 | → | → | 09 45 | 09 49 | 10 00 | 10 06 | 10 15 | 10 20 | 10 35 | | | | | |
| 31L | 31261 | | | 09 30 | 09 55 | 10 10 | | | | | | | | | | | | |
| 31A | 31273 | | | 09 50 | → | → | 10 17 | 10 21 | 10 35 | 10 41 | 10 50 | 10 55 | 11 05 | 11 13 | 11 26S | 11 38 | 11 55 | 12 10 |
| 31L | 31291 | | | 10 00 | 10 25 | 10 40 | | | | | | | | | | | | |
| 31L | 31301 | | | 10 30 | 10 55 | 11 10 | | | | | | | | | | | | |
| 31F | 31313 | | | 10 50 | → | → | 11 17 | 11 21 | 11 35 | 11 41 | 11 50 | 11 55 | 12 10 | | | | | |
| 31L | 31331 | | | 11 00 | 11 25 | 11 40 | | | | | | | | | | | | |
| 31F | 31333 | | | 11 20 | → | → | 11 47 | 11 51 | 12 05 | 12 11 | 12 20 | 12 25 | 12 40 | | | | | |
| 31L | 31341 | | | 11 30 | 11 55 | 12 15 | | | | | | | | | | | | |
| 31A | 31353 | | | 11 50 | → | → | 12 22 | 12 26 | 12 40 | 12 46 | 12 55 | 13 00 | 13 10 | 13 18 | 1331S | 13 43 | 14 00 | 14 15 |
| 31L | 31361 | | | 12 00 | 12 25 | 12 45 | | | | | | | | | | | | |
| 31F | 31373 | | | 12 20 | → | → | 12 52 | 12 56 | 13 10 | 13 16 | 13 25 | 13 30 | 13 45 | | | | | |
| 31L | 31381 | | | 12 30 | 12 55 | 13 15 | | | | | | | | | | | | |
| 31F | 31393 | | | 12 50 | → | → | 13 22 | 13 26 | 13 40 | 13 46 | 13 55 | 14 00 | 14 15 | | | | | |
| 31L | 31391 | | | 13 00 | 13 25 | 13 45 | | | | | | | | | | | | |
| 31F | 31413 | | | 13 20 | → | → | 13 52 | 13 56 | 14 10 | 14 16 | 14 25 | 14 30 | 14 45 | | | | | |
| 31L | 31421 | | | 13 30 | 13 55 | 14 15 | | | | | | | | | | | | |
| 31A | 31433 | | | 13 50 | → | → | 14 22 | 14 26 | 14 40 | 14 47 | 14 57 | 15 03 | 15 15 | 15 23 | 15 36S | 15 48 | 16 05 | 16 20 |
| 31L | 31441 | | | 14 00 | 14 25 | 14 45 | | | | | | | | | | | | |
| 31F | 31453 | | | 14 20 | → | → | 14 52 | 14 56 | 15 10 | 15 17 | 15 27 | 15 33 | 15 50 | | | | | |
| 31L | 31461 | | | 14 30 | 14 55 | 15 15 | | | | | | | | | | | | |
| 31F | 31473 | | | 14 50 | → | → | 15 22 | 15 26 | 15 40 | 15 47 | 15 57 | 16 03 | 16 20 | | | | | |
| 31L | 31481 | | | 15 00 | 15 25 | 15 45 | | | | | | | | | | | | |
| 31F | 31503 | | | 15 20 | → | → | 15 52 | 15 56 | 16 10 | 16 17 | 16 27 | 16 33 | 16 50 | | | | | |
| 31L | 31511 | | | 15 30 | 15 55 | 16 15 | | | | | | | | | | | | |
| 31A | 31533 | | | 15 50 | → | → | 16 22 | 16 26 | 16 40 | 16 47 | 16 57 | 17 03 | 17 15 | 17 23 | 17 36S | 17 48 | 18 05 | 18 20 |



## Saturday and Sunday
## Samedi et dimanche

### WESTBOUND / EN DIRECTION OUEST

| Route Number / Numéro du trajet | Trip Number / Numéro du parcours | Zone→ | Exception 1 | Toronto Union Station Bus Terminal Dp | Mississauga Malton GO | Brampton Bramalea GO | Brampton Steeles Ave. E @ Rutherford Road S. | Brampton Shopper's World | Brampton Brampton GO | Brampton Bovaird Dr. W. @ Hurontario St. | Brampton Mount Pleasant GO | Georgetown Guelph St. @ King St. | Georgetown Georgetown GO | Georgetown Main St. S. @ Cross St. | Acton Acton GO | Rockwood Alma St. @ Inkerman St. | Guelph Guelph Central GO | Guelph University of Guelph Ar |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2 | 31 | 32 | 33 | 33 | 33 | 33 | 34 | 35 | 35 | 35 | 37 | 38 | 39 | 39 |
| 31L | 31541 | | | 16 00 | 16 25 | 16 45 | | | | | | | | | | | | |
| 31F | 31563 | | | 16 20 | → | → | 16 52 | 16 56 | 17 15 | 17 22 | 17 32 | 17 38 | 17 55 | | | | | |
| 31L | 31571 | | | 16 30 | 17 00 | 17 20 | | | | | | | | | | | | |
| 31F | 31593 | | | 16 50 | → | → | 17 22 | 17 26 | 17 45 | 17 52 | 18 02 | 18 08 | 18 25 | | | | | |
| 31L | 31601 | | | 17 00 | 17 30 | 17 50 | | | | | | | | | | | | |
| 31F | 31623 | | | 17 20 | → | → | 17 52 | 17 56 | 18 15 | 18 22 | 18 32 | 18 38 | 18 55 | | | | | |
| 31L | 31631 | | | 17 30 | 18 00 | 18 20 | | | | | | | | | | | | |
| 31A | 31653 | | | 17 50 | → | → | 18 22 | 18 26 | 18 40 | 18 47 | 18 57 | 19 03 | 19 15 | 19 23 | 1936S | 19 48 | 20 05 | 20 20 |
| 31L | 31661 | | | 18 00 | 18 30 | 18 50 | | | | | | | | | | | | |
| 31F | 31673 | | | 18 20 | → | → | 18 52 | 18 56 | 19 10 | 19 17 | 19 27 | 19 33 | 19 50 | | | | | |
| 31L | 31681 | | | 18 30 | 18 55 | 19 15 | | | | | | | | | | | | |
| 31F | 31693 | | | 18 50 | → | → | 19 22 | 19 26 | 19 40 | 19 47 | 19 57 | 20 03 | 20 20 | | | | | |
| 31L | 31701 | | | 19 00 | 19 25 | 19 45 | | | | | | | | | | | | |
| 31F | 31713 | | | 19 20 | → | → | 19 52 | 19 56 | 20 10 | 20 16 | 20 25 | 20 30 | 20 45 | | | | | |
| 31L | 31721 | | | 19 30 | 19 55 | 20 15 | | | | | | | | | | | | |
| 31A | 31733 | | | 19 50 | → | → | 20 22 | 20 26 | 20 40 | 20 46 | 20 55 | 21 00 | 21 10 | 21 18 | 2131S | 21 43 | 22 00 | 22 15 |
| 31F | 31751 | | | 20 20 | → | → | 20 50 | 20 54 | 21 05 | 21 11 | 21 20 | 21 25 | 21 40 | | | | | |
| 31L | 31761 | | | 20 30 | 20 55 | 21 10 | | | | | | | | | | | | |
| 31F | 31773 | | | 20 50 | → | → | 21 20 | 21 24 | 21 35 | 21 41 | 21 50 | 21 55 | 22 10 | | | | | |
| 31F | 31791 | | | 21 20 | → | → | 21 50 | 21 54 | 22 05 | 22 11 | 22 20 | 22 25 | 22 40 | | | | | |
| 31L | 31801 | | | 21 30 | 21 55 | 22 10 | | | | | | | | | | | | |
| 31A | 31813 | | | 21 50 | → | → | 22 20 | 22 24 | 22 35 | 22 41 | 22 50 | 22 55 | 23 05 | 23 13 | 2326S | 23 38 | 23 55 | 00 10 |
| 31L | 31831 | | | 22 30 | 22 55 | 23 10 | | | | | | | | | | | | |
| 31F | 31841 | | | 22 50 | → | → | 23 20 | 23 24 | 23 35 | 23 41 | 23 50 | 23 55 | 00 10 | | | | | |
| 31L | 31851 | | | 23 00 | 23 25 | 23 35 | | | | | | | | | | | | |
| 31 | 31861 | | | 23 30 | 23 55 | 00 05 | 00 10 | 00 14 | 00 25 | 00 31 | 00 40 | 00 45 | 00 55 | 01 03 | 01 16 | 01 28 | 01 45 | 02 00 |
| 31E | 31881 | | | 00 00 | 00 25 | 00 35 | 00 40 | 00 44 | 00 50 | D00 56 | D01 05 | D01 10 | D01 25 | | | | | |
| 31E | 31891 | | | 00 30 | 00 55 | 01 05 | 01 10 | 01 14 | 01 20 | D01 26 | D01 35 | D01 40 | D01 55 | | | | | |
| 31E | 31921 | | | 01 30 | 01 55 | 02 05 | 02 10 | 02 14 | 02 20 | D02 26 | D02 35 | D02 40 | D02 55 | | | | | |
| 31E | 31951 | | | 02 30 | 02 55 | 03 05 | 03 10 | 03 14 | 03 20 | D03 26 | D03 35 | D03 40 | D03 55 | | | | | |

# Woodbine Race Track Loop

## 37 ISLINGTON

### Stop Number 13938 A

**Branch Legend**

- A 37A ISLINGTON To WOODBINE and HUMBERWOOD via REXDALE BLVD
- B 37B ISLINGTON To STEELES
- N 337 ISLINGTON BLUE NIGHT ISLINGTON To STEELES

**Effective June 23, 2019**

### Monday through Friday

| | | | |
|---|---|---|---|
| 6 am | A 6:16 | A 6:33 | A 6:57 |
| 7 am | A 7:21 | A 7:45 | |
| 8 am | A 8:09 | A 8:33 | A 8:57 |
| 9 am | A 9:21 | A 9:41 | |
| 10 am | A 10:01 | A 10:21 | A 10:41 |
| 11 am | A 11:01 | A 11:21 | A 11:41 |
| noon | A 12:01 | A 12:21 | A 12:41 |
| 1 pm | A 1:01 | A 1:21 | A 1:41 |
| 2 pm | A 2:01 | A 2:21 | A 2:41 |

| | | | | | |
|---|---|---|---|---|---|
| 3 pm | A 3:01 | A 3:21 | A 3:41 | | |
| 4 pm | A 4:01 | A 4:20 | A 4:42 | | |
| 5 pm | A 5:04 | A 5:26 | A 5:48 | | |
| 6 pm | A 6:10 | A 6:32 | A 6:54 | | |
| 7 pm | A 7:17 | A 7:41 | | | |
| 8 pm | A 8:04 | A 8:24 | A 8:44 | | |
| 9 pm | A 9:04 | A 9:24 | A 9:44 | | |
| 10 pm | A 10:04 | A 10:24 | A 10:44 | | |
| 11 pm | A 11:07 | A 11:33 | A 11:59 | | |
| 12 am | A 12:25 | A 12:51 | | | |
| 1 am | A 1:17 | A 1:42 | | | |

**Saturday**

| | | | | | |
|---|---|---|---|---|---|
| 6 am | A 6:22 | | | | |
| 7 am | A 7:00 | A 7:24 | A 7:48 | | |
| 8 am | A 8:12 | A 8:36 | | | |
| 9 am | A 9:00 | A 9:18 | A 9:36 | A 9:50 | |
| 10 am | A 10:05 | A 10:18 | A 10:31 | A 10:44 | A 10:57 |
| 11 am | A 11:10 | A 11:23 | A 11:36 | A 11:49 | |

| | | | | | |
|---|---|---|---|---|---|
| noon | A 12:02 | A 12:15 | A 12:30 | A 12:46 | |
| 1 pm | A 1:02 | A 1:16 | A 1:30 | A 1:44 | A 1:58 |
| 2 pm | A 2:12 | A 2:26 | A 2:40 | A 2:54 | |
| 3 pm | A 3:08 | A 3:22 | A 3:36 | A 3:50 | |
| 4 pm | A 4:04 | A 4:18 | A 4:32 | A 4:46 | |
| 5 pm | A 5:00 | A 5:14 | A 5:28 | A 5:42 | A 5:56 |
| 6 pm | A 6:10 | A 6:24 | A 6:38 | A 6:52 | |
| 7 pm | A 7:05 | A 7:19 | A 7:34 | A 7:52 | |
| 8 pm | A 8:12 | A 8:32 | A 8:52 | | |
| 9 pm | A 9:12 | A 9:32 | A 9:52 | | |
| 10 pm | A 10:13 | A 10:34 | A 10:54 | | |
| 11 pm | A 11:14 | A 11:34 | A 11:54 | | |
| 12 am | A 12:14 | A 12:33 | A 12:53 | | |
| 1 am | A 1:15 | A 1:45 | | | |

**Sunday**

| | | | | | |
|---|---|---|---|---|---|
| 6 am | A 6:22 | A 6:46 | | | |
| 7 am | A 7:10 | A 7:34 | A 7:58 | | |
| 8 am | A 8:22 | A 8:42 | A 8:55 | | |

| | | | | | |
|---|---|---|---|---|---|
| 9 am | A 9:07 | A 9:20 | A 9:33 | A 9:45 | A 9:57 |
| 10 am | A 10:10 | A 10:23 | A 10:36 | A 10:49 | |
| 11 am | A 11:02 | A 11:15 | A 11:28 | A 11:42 | A 11:55 |
| noon | A 12:08 | A 12:21 | A 12:34 | A 12:47 | |
| 1 pm | A 1:01 | A 1:15 | A 1:28 | A 1:40 | A 1:52 |
| 2 pm | A 2:04 | A 2:16 | A 2:28 | A 2:40 | A 2:52 |
| 3 pm | A 3:04 | A 3:16 | A 3:28 | A 3:40 | A 3:52 |
| 4 pm | A 4:04 | A 4:16 | A 4:28 | A 4:40 | A 4:52 |
| 5 pm | A 5:04 | A 5:16 | A 5:28 | A 5:40 | A 5:52 |
| 6 pm | A 6:04 | A 6:16 | A 6:28 | A 6:40 | A 6:52 |
| 7 pm | A 7:06 | A 7:26 | A 7:46 | | |
| 8 pm | A 8:05 | A 8:25 | A 8:45 | | |
| 9 pm | A 9:05 | A 9:25 | A 9:45 | | |
| 10 pm | A 10:05 | A 10:27 | A 10:58 | | |
| 11 pm | A 11:28 | A 11:58 | | | |
| 12 am | A 12:28 | A 12:58 | | | |
| 1 am | A 1:28 | A 1:58 | | | |

**Holiday**

**Call 416-393-INFO (416-393-4636) for more information on available service.**

METROLINX

# WESTON STATION
# TRAIN SCHEDULE

## WESTON STATION

Seven days a week

Early morning trains

| TO PEARSON | TO UNION |
|---|---|
| 05:09 | 05:38 |
| 05:24 | 05:53 |
| 05:44 | 06:08 |

Then every 15 minutes until…

Last train

| TO PEARSON | TO UNION |
|---|---|
| 01:14 | 01:08 |

Travel time to Pearson: 11 mins

**1.844.GET.ON.UP**
**UPEXPRESS.COM**

UP Union Pearson Express

# RIDERSHIP PERFORMANCE YEAR TO DATE (YTD)

GO Train and UP Express
April 2018 to November 2018

## FISCAL YTD RIDERSHIP - GO & UP EXPRESS TOTAL NETWORK

Overall Ridership: 52.5 M
GO Train Ridership: 38.8 M 6.3%
GO Bus Share: 22%

**BARRIE** — Ridership: 2.1 M | Avg. Daily 8.6 K 20.8%

**KITCHENER** — Ridership: 2.5 M | Avg. Daily 14.3 K 8.8%

**MILTON** — Ridership: 2.7 M | Avg. Daily 15.6 K 6.2%

**UP EXPRESS** — Ridership: 2.8 M 16.1%

**RICHMOND HILL** — Ridership: 991.4 K | Avg. Daily 5.7 K 7.7%

**STOUFFVILLE** — Ridership: 1.6 M | Avg. Daily 9.1 K 9.2%

**UNION GO TRAIN** — Total 18.4 M | Avg. Daily 75.2 K 6.2%

**LAKESHORE WEST** — Ridership: 7.8 M | Avg. Daily 31.9 K 2.7%

**LAKESHORE EAST** — Ridership: 5.3 M | Avg. Daily 21.6 K 4.5%

### TRAIN LINES

- Lakeshore West
- Niagara
- Milton
- Kitchener
- Barrie
- Richmond Hill
- Stouffville
- Lakeshore East
- Union Pearson Express

### RIDERSHIP CHANGE

- > 15%
- 10.1% to 15%
- 5.1% to 10%
- 0% to 5%
- < 0%
- Ridership
- Construction

SIMCOE
LAKE SIMCOE
YORK
WATERLOO
WELLINGTON
PEEL
HALTON
BRANTFORD
HAMILTON
TORONTO
DURHAM
NIAGARA

ALLANDALE — Total 74 K | Avg. Daily 301 1.4%
Barrie South — Total 105 K | Avg. Daily 431 6.2%
Bradford — Total 103 K | Avg. Daily 422 14.6%
E. Gwillimbury — Total 141 K | Avg. Daily 574 20.1%
Newmarket — Total 123 K | Avg. Daily 501 14.9%
Aurora — Total 527 K | Avg. Daily 2.2 K 30.5%
King City — Total 167 K | Avg. Daily 683 22.5%
Maple — Total 443 K | Avg. Daily 1.8 K 13.9%
Rutherford — Total 329 K | Avg. Daily 1.3 K 10.4%
York University — Total 35 K | Avg. Daily 144 -6.5%
Downsview Park — Total 69 K | Avg. Daily 280
Weston — Total 202 K | Avg. Daily 1.2 K 23.2%
Bloor — Total 316.2 K 20.7%
PEARSON AIRPORT — Total 854.7 K 17.2%
Union — Total 1.4 M 14.8%

KITCHENER — Total 41 K | Avg. Daily 237 5.4%
Guelph — Total 45 K | Avg. Daily 260 14.9%
Acton — Total 19 K | Avg. Daily 108 10.4%
Georgetown — Total 103 K | Avg. Daily 589 -2.8%
Mt. Pleasant — Total 581 K | Avg. Daily 3.3 K 17.1%
Brampton — Total 436 K | Avg. Daily 2.5 K 4.9%
Bramalea — Total 576 K | Avg. Daily 3.3 K 1.1%
Malton — Total 213 K | Avg. Daily 1.2 K 1.1%
Etobicoke N. — Total 121 K | Avg. Daily 693 7.5%
Lisgar — Total 152 K | Avg. Daily 868 8.8%
Meadowvale — Total 339 K | Avg. Daily 1.9 K 4.6%
MILTON — Total 429 K | Avg. Daily 2.5 K 6.5%
Streetsville — Total 466 K | Avg. Daily 2.7 K 5.7%
Erindale — Total 458 K | Avg. Daily 2.6 K 14.3%
Dixie — Total 210 K | Avg. Daily 1.2 K 19.8%
Cooksville — Total 499 K | Avg. Daily 2.8 K -7.2%
Kipling — Total 178 K | Avg. Daily 1 K 18.2%
Exhibition — Total 784 K | Avg. Daily 3.2 K 3.5%
Mimico — Total 335 K | Avg. Daily 1.4 K 5.5%
Long Branch — Total 354 K | Avg. Daily 1.4 K 8.3%
Port Credit — Total 657 K | Avg. Daily 2.7 K -0.3%
Clarkson — Total 1.2 M | Avg. Daily 5 K 2.8%
Oakville — Total 1.3 M | Avg. Daily 5.4 K 3.6%
Bronte — Total 750 K | Avg. Daily 3.1 K 1.9%
Appleby — Total 705 K | Avg. Daily 2.9 K 1.2%
Aldershot — Total 658 K | Avg. Daily 2.7 K 0.3%
Burlington — Total 735 K | Avg. Daily 3 K 4.7%
HAMILTON — Total 252 K | Avg. Daily 1.4 K -0.7%
WEST HARBOUR — Total 10 K | Avg. Daily 58 6.3%
St. Catharines — Total 3 K | Avg. Daily 18 5.4%
NIAGARA FALLS — Total 25 K 171%

LINCOLNVILLE — Total 33 K | Avg. Daily 191 -8.5%
Stouffville — Total 110 K | Avg. Daily 629 2.9%
Mount Joy — Total 310 K | Avg. Daily 1.8 K 10.4%
Markham — Total 155 K | Avg. Daily 888 4%
Centennial — Total 177 K | Avg. Daily 1 K 7.1%
Unionville — Total 435 K | Avg. Daily 2.5 K 7.1%
Milliken — Total 195 K | Avg. Daily 1.1 K 18.7%
Agincourt — Total 134 K | Avg. Daily 767 15.2%
Kennedy — Total 50 K | Avg. Daily 285 28.2%
GORMLEY — Total 104 K | Avg. Daily 597 16.9%
Richmond Hill — Total 444 K | Avg. Daily 2.5 K 3.2%
Langstaff — Total 276 K | Avg. Daily 1.6 K 6.6%
Old Cummer — Total 97 K | Avg. Daily 552 22%
Oriole — Total 70 K | Avg. Daily 402 12.5%
Guildwood — Total 242 K | Avg. Daily 991 4.2%
Rouge Hill — Total 520 K | Avg. Daily 2.1 K 3.5%
Pickering — Total 907 K | Avg. Daily 3.7 K 4.3%
Ajax — Total 907 K | Avg. Daily 3.7 K 2.9%
Whitby — Total 1 M | Avg. Daily 4.2 K 2.8%
OSHAWA — Total 856 K | Avg. Daily 3.5 K 4%
Eglinton — Total 299 K | Avg. Daily 1.2 K 11.9%
Scarborough — Total 225 K | Avg. Daily 920 9%
Danforth — Total 291 K | Avg. Daily 1.2 K 9.5%

# TORONTO TRANSIT COMMISSION

Ridership statistics for surface routes, as of April 2014

| Route | | Day | Customers per day | Vehicles in morning peak period | Vehicles in afternoon peak period | Hours per day | Kilometres per day | Note |
|---|---|---|---|---|---|---|---|---|
| 192 | Airport Rocket | Mo-Fr | 4,700 | 4 | 6 | 95 | 3,400 | |
| 192 | Airport Rocket | Sat | 3,700 | - | - | 75 | 3,200 | |
| 192 | Airport Rocket | Sun | 4,200 | - | - | 65 | 2,800 | |
| 117 | Alness | Mo-Fr | 2,300 | 4 | 4 | 45 | 760 | |
| 117 | Alness | Sat | - | - | - | - | - | No service |
| 117 | Alness | Sun | - | - | - | - | - | No service |
| 99 | Arrow Rd | Mo-Fr | 210 | - | - | 15 | 340 | |
| 99 | Arrow Rd | Sat | 240 | - | - | 20 | 460 | |
| 99 | Arrow Rd | Sun | 360 | - | - | 20 | 450 | |
| 5 | Avenue Rd | Mo-Fr | 2,100 | 4 | 3 | 45 | 650 | |
| 5 | Avenue Rd | Sat | 760 | - | - | 30 | 520 | |
| 5 | Avenue Rd | Sun | 400 | - | - | 20 | 310 | |
| 61 | Avenue Rd North | Mo-Fr | 4,000 | 5 | 4 | 65 | 960 | |
| 61 | Avenue Rd North | Sat | 1,500 | - | - | 35 | 560 | |
| 61 | Avenue Rd North | Sun | 1,100 | - | - | 25 | 450 | |
| 7 | Bathurst | Mo-Fr | 27,300 | 13 | 16 | 250 | 4,300 | |
| 7 | Bathurst | Sat | 18,600 | - | - | 230 | 4,400 | |
| 7 | Bathurst | Sun | 15,800 | - | - | 175 | 3,400 | |
| 511 | Bathurst | Mo-Fr | 17,400 | 12 | 12 | 235 | 2,800 | |
| 511 | Bathurst | Sat | 12,900 | - | - | 210 | 2,600 | |
| 511 | Bathurst | Sun | 9,300 | - | - | 130 | 1,700 | |
| 160 | Bathurst North | Mo-Fr | 3,600 | 4 | 4 | 60 | 1,200 | |
| 160 | Bathurst North | Sat | 1,500 | - | - | 25 | 540 | |
| 160 | Bathurst North | Sun | 1,300 | - | - | 20 | 420 | |
| 6 | Bay | Mo-Fr | 10,300 | 19 | 13 | 185 | 2,300 | |
| 6 | Bay | Sat | 3,300 | - | - | 85 | 1,100 | |
| 6 | Bay | Sun | 2,000 | - | - | 80 | 930 | |
| 11 | Bayview | Mo-Fr | 10,400 | 13 | 11 | 175 | 2,900 | |
| 11 | Bayview | Sat | 4,900 | - | - | 95 | 1,900 | |
| 11 | Bayview | Sun | 3,700 | - | - | 80 | 1,700 | |
| 9 | Bellamy | Mo-Fr | 4,300 | 5 | 5 | 80 | 1,800 | |
| 9 | Bellamy | Sat | 2,400 | - | - | 50 | 1,100 | |
| 9 | Bellamy | Sun | 1,400 | - | - | 30 | 730 | |
| 17 | Birchmount | Mo-Fr | 12,500 | 13 | 11 | 160 | 3,500 | |
| 17 | Birchmount | Sat | 4,900 | - | - | 80 | 2,000 | |
| 17 | Birchmount | Sun | 2,700 | - | - | 60 | 1,500 | |
| 49 | Bloor West | Mo-Fr | 3,100 | 4 | 3 | 45 | 890 | |
| 49 | Bloor West | Sat | 1,100 | - | - | 20 | 460 | |
| 49 | Bloor West | Sun | 750 | - | - | 15 | 330 | |
| 21 | Brimley | Mo-Fr | 9,000 | 9 | 9 | 135 | 2,800 | |
| 21 | Brimley | Sat | 5,100 | - | - | 80 | 1,600 | |
| 21 | Brimley | Sun | 3,500 | - | - | 75 | 1,600 | |
| 8 | Broadview | Mo-Fr | 920 | 1 | 1 | 20 | 340 | |
| 8 | Broadview | Sat | 600 | - | - | 15 | 290 | |
| 8 | Broadview | Sun | 690 | - | - | 15 | 250 | |
| 50 | Burnhamthorpe | Mo-Fr | 2,700 | 4 | 3 | 50 | 900 | |
| 50 | Burnhamthorpe | Sat | 1,400 | - | - | 30 | 630 | |
| 50 | Burnhamthorpe | Sun | 850 | - | - | 25 | 530 | |
| 120 | Calvington | Mo-Fr | 1,400 | 2 | 2 | 35 | 700 | |
| 120 | Calvington | Sat | 850 | - | - | 35 | 700 | |
| 120 | Calvington | Sun | 700 | - | - | 30 | 590 | |

| Route | | Day | Customers per day | Vehicles in morning peak period | Vehicles in afternoon peak period | Hours per day | Kilometres per day | Note |
|---|---|---|---|---|---|---|---|---|
| 506 | Carlton | Mo-Fr | 39,700 | 32 | 27 | 455 | 6,500 | |
| 506 | Carlton | Sat | 25,800 | - | - | 350 | 5,200 | |
| 506 | Carlton | Sun | 16,900 | - | - | 245 | 4,000 | |
| 172 | Cherry Street | Mo-Fr | 1,200 | 3 | 3 | 50 | 600 | |
| 172 | Cherry Street | Sat | 810 | - | - | 30 | 420 | |
| 172 | Cherry Street | Sun | 760 | - | - | 25 | 300 | |
| 126 | Christie | Mo-Fr | 2,800 | 2 | 2 | 30 | 370 | |
| 126 | Christie | Sat | 1,500 | - | - | 20 | 260 | |
| 126 | Christie | Sun | 1,300 | - | - | 20 | 230 | |
| 20 | Cliffside | Mo-Fr | 6,300 | 6 | 6 | 85 | 1,600 | |
| 20 | Cliffside | Sat | 3,800 | - | - | 65 | 1,100 | |
| 20 | Cliffside | Sun | 2,300 | - | - | 35 | 740 | |
| 87 | Cosburn | Mo-Fr | 9,400 | 10 | 10 | 130 | 2,200 | |
| 87 | Cosburn | Sat | 4,000 | - | - | 55 | 960 | |
| 87 | Cosburn | Sun | 2,700 | - | - | 30 | 590 | |
| 22 | Coxwell | Mo-Fr | 6,300 | 3 | 3 | 65 | 930 | |
| 22 | Coxwell | Sat | 6,400 | - | - | 85 | 1,300 | |
| 22 | Coxwell | Sun | 4,000 | - | - | 60 | 890 | |
| 42 | Cummer | Mo-Fr | 8,700 | 14 | 12 | 165 | 3,800 | |
| 42 | Cummer | Sat | 3,300 | - | - | 85 | 2,000 | |
| 42 | Cummer | Sun | 2,700 | - | - | 65 | 1,600 | |
| 113 | Danforth | Mo-Fr | 4,500 | 4 | 4 | 60 | 960 | |
| 113 | Danforth | Sat | 3,800 | - | - | 50 | 860 | |
| 113 | Danforth | Sun | 2,800 | - | - | 45 | 720 | |
| 127 | Davenport | Mo-Fr | 1,900 | 3 | 2 | 45 | 740 | |
| 127 | Davenport | Sat | 1,300 | - | - | 40 | 680 | |
| 127 | Davenport | Sun | 820 | - | - | 25 | 470 | |
| 28 | Davisville | Mo-Fr | - | - | - | - | - | See 11 Bayview |
| 28 | Davisville | Sat | 400 | - | - | 10 | 210 | |
| 28 | Davisville | Sun | - | - | - | - | - | See 11 Bayview |
| 23 | Dawes | Mo-Fr | 5,800 | 6 | 4 | 70 | 960 | |
| 23 | Dawes | Sat | 4,100 | - | - | 55 | 750 | |
| 23 | Dawes | Sun | 2,500 | - | - | 40 | 540 | |
| 25 | Don Mills | Mo-Fr | 38,000 | 34 | 34 | 450 | 8,600 | |
| 25 | Don Mills | Sat | 22,300 | - | - | 285 | 5,900 | |
| 25 | Don Mills | Sun | 19,500 | - | - | 240 | 5,000 | |
| 108 | Downsview | Mo-Fr | 6,900 | 8 | 7 | 110 | 2,300 | |
| 108 | Downsview | Sat | 4,700 | - | - | 85 | 1,900 | |
| 108 | Downsview | Sun | 3,600 | - | - | 65 | 1,500 | |
| 101 | Downsview Park | Mo-Fr | 320 | 1 | 1 | 15 | 300 | Operates May-Sept only |
| 101 | Downsview Park | Sat | 390 | - | - | 15 | 250 | |
| 101 | Downsview Park | Sun | 320 | - | - | 15 | 240 | |
| 142 | Downtown/Avenue Rd Express | Mo-Fr | 260 | 3 | 3 | 15 | 260 | |
| 142 | Downtown/Avenue Rd Express | Sat | - | - | - | - | - | No service |
| 142 | Downtown/Avenue Rd Express | Sun | - | - | - | - | - | No service |
| 143 | Downtown/Beach Express | Mo-Fr | 420 | 3 | 3 | 15 | 340 | |
| 143 | Downtown/Beach Express | Sat | - | - | - | - | - | No service |
| 143 | Downtown/Beach Express | Sun | - | - | - | - | - | No service |
| 144 | Downtown/Don Valley Express | Mo-Fr | 690 | 9 | 4 | 30 | 770 | |
| 142 | Downtown/Avenue Rd Express | Sat | - | - | - | - | - | No service |
| 142 | Downtown/Avenue Rd Express | Sun | - | - | - | - | - | No service |

| Route | | Day | Customers per day | Vehicles in morning peak period | Vehicles in afternoon peak period | Hours per day | Kilometres per day | Note |
|---|---|---|---|---|---|---|---|---|
| 145 | Downtown/Humber Bay Express | Mo-Fr | 250 | 3 | 3 | 15 | 360 | |
| 145 | Downtown/Humber Bay Express | Sat | - | - | - | - | - | No service |
| 145 | Downtown/Humber Bay Express | Sun | - | - | - | - | - | No service |
| 141 | Downtown/Mt Pleasant Express | Mo-Fr | 160 | 3 | 2 | 10 | 170 | |
| 141 | Downtown/Mt Pleasant Express | Sat | - | - | - | - | - | No service |
| 141 | Downtown/Mt Pleasant Express | Sun | - | - | - | - | - | No service |
| 502 | Downtowner | Mo-Fr | 3,900 | 7 | 7 | 80 | 1,100 | |
| 502 | Downtowner | Sat | - | - | - | - | - | No service |
| 502 | Downtowner | Sun | - | - | - | - | - | No service |
| 125 | Drewry | Mo-Fr | 3,500 | 5 | 3 | 50 | 800 | |
| 125 | Drewry | Sat | 1,300 | - | - | 30 | 500 | |
| 125 | Drewry | Sun | 1,300 | - | - | 15 | 280 | |
| 29 | Dufferin | Mo-Fr | 44,000 | 31 | 33 | 550 | 8,900 | |
| 29 | Dufferin | Sat | 39,000 | - | - | 520 | 8,100 | |
| 29 | Dufferin | Sun | 27,100 | - | - | 345 | 6,000 | |
| 105 | Dufferin North | Mo-Fr | 5,000 | 5 | 7 | 80 | 1,800 | |
| 105 | Dufferin North | Sat | 2,400 | - | - | 50 | 1,200 | |
| 105 | Dufferin North | Sun | 1,500 | - | - | 30 | 720 | |
| 505 | Dundas | Mo-Fr | 32,500 | 19 | 20 | 315 | 4,100 | |
| 505 | Dundas | Sat | 22,600 | - | - | 325 | 4,000 | |
| 505 | Dundas | Sun | 15,800 | - | - | 240 | 3,300 | |
| 26 | Dupont | Mo-Fr | 3,900 | 5 | 6 | 80 | 1,300 | |
| 26 | Dupont | Sat | 1,300 | - | - | 50 | 870 | |
| 26 | Dupont | Sun | 1,100 | - | - | 35 | 640 | |
| 111 | East Mall | Mo-Fr | 6,500 | 5 | 6 | 90 | 2,100 | |
| 111 | East Mall | Sat | 3,800 | - | - | 70 | 1,600 | |
| 111 | East Mall | Sun | 2,500 | - | - | 55 | 1,300 | |
| 34 | Eglinton East | Mo-Fr | 28,100 | 22 | 22 | 310 | 5,400 | |
| 34 | Eglinton East | Sat | 18,200 | - | - | 205 | 4,000 | |
| 34 | Eglinton East | Sun | 11,200 | - | - | 130 | 2,600 | |
| 32 | Eglinton West | Mo-Fr | 38,100 | 51 | 38 | 620 | 10,600 | |
| 32 | Eglinton West | Sat | 25,200 | - | - | 380 | 6,300 | |
| 32 | Eglinton West | Sun | 18,900 | - | - | 250 | 4,600 | |
| 15 | Evans | Mo-Fr | 2,600 | 4 | 4 | 55 | 1,200 | |
| 15 | Evans | Sat | 1,200 | - | - | 30 | 660 | |
| 15 | Evans | Sun | 810 | - | - | 20 | 450 | |
| 104 | Faywood | Mo-Fr | 3,500 | 4 | 4 | 65 | 1,300 | |
| 104 | Faywood | Sat | 2,100 | - | - | 55 | 1,200 | |
| 104 | Faywood | Sun | 1,600 | - | - | 35 | 840 | |
| 39 | Finch East | Mo-Fr | 23,800 | 34 | 28 | 445 | 10,300 | |
| 39 | Finch East | Sat | 18,100 | - | - | 235 | 5,500 | |
| 39 | Finch East | Sun | 17,400 | - | - | 200 | 4,800 | |
| 199 | Finch Rocket | Mo-Fr | 19,100 | 32 | 22 | 325 | 8,300 | |
| 199 | Finch Rocket | Sat | 8,200 | - | - | 150 | 4,000 | |
| 199 | Finch Rocket | Sun | 6,600 | - | - | 100 | 2,800 | |
| 36 | Finch West | Mo-Fr | 42,500 | 42 | 37 | 565 | 11,200 | |
| 36 | Finch West | Sat | 26,600 | - | - | 345 | 7,400 | |
| 36 | Finch West | Sun | 19,500 | - | - | 315 | 7,600 | |
| 139 | Finch-Don Mills | Mo-Fr | 2,000 | 4 | 4 | 35 | 730 | |
| 139 | Finch-Don Mills | Sat | - | - | - | - | - | No service |
| 139 | Finch-Don Mills | Sun | - | - | - | - | - | No service |

| Route | | Day | Customers per day | Vehicles in morning peak period | Vehicles in afternoon peak period | Hours per day | Kilometres per day | Note |
|---|---|---|---|---|---|---|---|---|
| 100 | Flemingdon Park | Mo-Fr | 15,100 | 23 | 15 | 280 | 5,500 | |
| 100 | Flemingdon Park | Sat | 12,500 | - | - | 165 | 3,500 | |
| 100 | Flemingdon Park | Sun | 7,200 | - | - | 135 | 2,800 | |
| 33 | Forest Hill | Mo-Fr | 660 | 1 | 1 | 15 | 200 | |
| 33 | Forest Hill | Sat | - | - | - | - | - | No service |
| 33 | Forest Hill | Sun | - | - | - | - | - | No service |
| 135 | Gerrard | Mo-Fr | 2,600 | 2 | 2 | 35 | 660 | |
| 135 | Gerrard | Sat | 1,400 | - | - | 25 | 460 | |
| 135 | Gerrard | Sun | 640 | - | - | 10 | 240 | |
| 14 | Glencairn | Mo-Fr | 2,800 | 4 | 3 | 45 | 700 | |
| 14 | Glencairn | Sat | 1,400 | - | - | 35 | 610 | |
| 14 | Glencairn | Sun | 1,200 | - | - | 30 | 560 | |
| 122 | Graydon Hall | Mo-Fr | 4,400 | 6 | 5 | 75 | 1,500 | |
| 122 | Graydon Hall | Sat | 1,300 | - | - | 35 | 770 | |
| 122 | Graydon Hall | Sun | 830 | - | - | 30 | 660 | |
| 31 | Greenwood | Mo-Fr | 3,600 | 2 | 3 | 40 | 560 | |
| 31 | Greenwood | Sat | 1,900 | - | - | 20 | 310 | |
| 31 | Greenwood | Sun | 1,500 | - | - | 20 | 260 | |
| 509 | Harbourfront | Mo-Fr | 11,600 | 7 | 8 | 120 | 2,000 | |
| 509 | Harbourfront | Sat | 5,400 | - | - | 90 | 1,400 | |
| 509 | Harbourfront | Sun | 4,900 | - | - | 75 | 1,200 | |
| 38 | Highland Creek | Mo-Fr | 12,400 | 8 | 10 | 155 | 3,600 | |
| 38 | Highland Creek | Sat | 4,600 | - | - | 120 | 2,900 | |
| 38 | Highland Creek | Sun | 3,200 | - | - | 90 | 2,200 | |
| 191 | Highway 27 Rocket | Mo-Fr | 12,900 | 15 | 18 | 220 | 6,600 | |
| 191 | Highway 27 Rocket | Sat | 4,100 | - | - | 95 | 3,200 | |
| 191 | Highway 27 Rocket | Sun | 2,600 | - | - | 65 | 2,200 | |
| 169 | Huntingwood | Mo-Fr | 1,700 | 4 | 3 | 60 | 1,200 | |
| 169 | Huntingwood | Sat | 770 | - | - | 50 | 870 | |
| 169 | Huntingwood | Sun | - | - | - | - | - | See 10 Van Horne |
| 37 | Islington | Mo-Fr | 17,600 | 20 | 17 | 260 | 5,400 | |
| 37 | Islington | Sat | 9,700 | - | - | 185 | 4,400 | |
| 37 | Islington | Sun | 7,600 | - | - | 165 | 3,900 | |
| 110 | Islington South | Mo-Fr | 9,300 | 10 | 10 | 140 | 2,600 | |
| 110 | Islington South | Sat | 4,400 | - | - | 75 | 1,600 | |
| 110 | Islington South | Sun | 3,100 | - | - | 65 | 1,400 | |
| 35 | Jane | Mo-Fr | 31,100 | 24 | 25 | 360 | 6,600 | |
| 35 | Jane | Sat | 16,500 | - | - | 240 | 4,700 | |
| 35 | Jane | Sun | 18,200 | - | - | 175 | 3,600 | |
| 195 | Jane Rocket | Mo-Fr | 12,400 | 10 | 11 | 155 | 3,300 | |
| 195 | Jane Rocket | Sat | 9,500 | - | - | 115 | 2,700 | |
| 195 | Jane Rocket | Sun | 6,000 | - | - | 100 | 2,300 | |
| 83 | Jones | Mo-Fr | 2,600 | 4 | 3 | 60 | 690 | |
| 83 | Jones | Sat | 1,500 | - | - | 40 | 490 | |
| 83 | Jones | Sun | 1,200 | - | - | 35 | 430 | |
| 40 | Junction | Mo-Fr | 4,900 | 4 | 4 | 60 | 850 | |
| 40 | Junction | Sat | 3,300 | - | - | 50 | 780 | |
| 40 | Junction | Sun | 2,400 | - | - | 40 | 640 | |
| 41 | Keele | Mo-Fr | 24,100 | 23 | 25 | 355 | 6,300 | |
| 41 | Keele | Sat | 16,900 | - | - | 245 | 4,500 | |
| 41 | Keele | Sun | 11,900 | - | - | 190 | 3,500 | |

| Route | | Day | Customers per day | Vehicles in morning peak period | Vehicles in afternoon peak period | Hours per day | Kilometres per day | Note |
|---|---|---|---|---|---|---|---|---|
| 107 | Keele North | Mo-Fr | 4,200 | 13 | 11 | 155 | 3,300 | |
| 107 | Keele North | Sat | 1,200 | - | - | 60 | 1,300 | |
| 107 | Keele North | Sun | 730 | - | - | 40 | 1,100 | |
| 43 | Kennedy | Mo-Fr | 16,000 | 13 | 13 | 225 | 4,100 | |
| 43 | Kennedy | Sat | 8,300 | - | - | 155 | 3,200 | |
| 43 | Kennedy | Sun | 8,800 | - | - | 120 | 2,600 | |
| 504 | King | Mo-Fr | 64,600 | 52 | 48 | 675 | 9,100 | |
| 504 | King | Sat | 39,000 | - | - | 395 | 5,800 | |
| 504 | King | Sun | 27,300 | - | - | 285 | 4,400 | |
| 12 | Kingston Rd | Mo-Fr | 9,300 | 11 | 9 | 145 | 2,700 | |
| 12 | Kingston Rd | Sat | 4,100 | - | - | 70 | 1,400 | |
| 12 | Kingston Rd | Sun | 2,800 | - | - | 60 | 1,200 | |
| 503 | Kingston Rd | Mo-Fr | 2,300 | 6 | 6 | 30 | 440 | |
| 503 | Kingston Rd | Sat | - | - | - | - | - | No service |
| 503 | Kingston Rd | Sun | - | - | - | - | - | No service |
| 45 | Kipling | Mo-Fr | 17,600 | 21 | 23 | 290 | 7,300 | |
| 45 | Kipling | Sat | 9,900 | - | - | 135 | 3,500 | |
| 45 | Kipling | Sun | 6,300 | - | - | 105 | 2,600 | |
| 44 | Kipling South | Mo-Fr | 11,400 | 10 | 10 | 125 | 2,400 | |
| 44 | Kipling South | Sat | 3,500 | - | - | 50 | 1,100 | |
| 44 | Kipling South | Sun | 2,100 | - | - | 30 | 720 | |
| 508 | Lake Shore | Mo-Fr | 2,100 | 3 | 6 | 30 | 270 | |
| 508 | Lake Shore | Sat | - | - | - | - | - | No service |
| 508 | Lake Shore | Sun | - | - | - | - | - | No service |
| 30 | Lambton | Mo-Fr | 2,700 | 3 | 3 | 50 | 910 | |
| 30 | Lambton | Sat | 1,800 | - | - | 40 | 760 | |
| 30 | Lambton | Sun | 1,300 | - | - | 30 | 530 | |
| 47 | Lansdowne | Mo-Fr | 15,400 | 14 | 10 | 190 | 3,200 | |
| 47 | Lansdowne | Sat | 10,700 | - | - | 140 | 2,200 | |
| 47 | Lansdowne | Sun | 7,200 | - | - | 115 | 1,900 | |
| 54 | Lawrence East | Mo-Fr | 33,700 | 41 | 37 | 560 | 11,600 | |
| 54 | Lawrence East | Sat | 20,900 | - | - | 305 | 6,500 | |
| 54 | Lawrence East | Sun | 14,800 | - | - | 265 | 5,900 | |
| 52 | Lawrence West | Mo-Fr | 43,900 | 38 | 45 | 635 | 12,000 | |
| 52 | Lawrence West | Sat | 24,500 | - | - | 435 | 8,700 | |
| 52 | Lawrence West | Sun | 17,200 | - | - | 360 | 7,500 | |
| 162 | Lawrence-Donway | Mo-Fr | 710 | 2 | 2 | 25 | 550 | |
| 162 | Lawrence-Donway | Sat | - | - | - | - | - | No service |
| 162 | Lawrence-Donway | Sun | - | - | - | - | - | No service |
| 56 | Leaside | Mo-Fr | 3,800 | 5 | 4 | 60 | 1,000 | |
| 56 | Leaside | Sat | 1,600 | - | - | 30 | 460 | |
| 56 | Leaside | Sun | 980 | - | - | 15 | 360 | |
| 51 | Leslie | Mo-Fr | 4,000 | 7 | 7 | 95 | 2,100 | |
| 51 | Leslie | Sat | 1,500 | - | - | 55 | 1,400 | |
| 51 | Leslie | Sun | 1,300 | - | - | 45 | 1,100 | |
| 64 | Main | Mo-Fr | 6,300 | 4 | 4 | 60 | 800 | |
| 64 | Main | Sat | 2,800 | - | - | 35 | 450 | |
| 64 | Main | Sun | 2,100 | - | - | 25 | 370 | |
| 59 | Maple Leaf | Mo-Fr | 2,600 | 6 | 6 | 85 | 1,600 | |
| 59 | Maple Leaf | Sat | 1,200 | - | - | 50 | 980 | |
| 59 | Maple Leaf | Sun | 730 | - | - | 40 | 740 | |

| Route | | Day | Customers per day | Vehicles in morning peak period | Vehicles in afternoon peak period | Hours per day | Kilometres per day | Note |
|---|---|---|---|---|---|---|---|---|
| 102 | Markham Rd | Mo-Fr | 25,200 | 20 | 21 | 305 | 6,300 | |
| 102 | Markham Rd | Sat | 12,800 | - | - | 200 | 4,200 | |
| 102 | Markham Rd | Sun | 8,500 | - | - | 170 | 3,600 | |
| 46 | Martin Grove | Mo-Fr | 7,000 | 9 | 9 | 140 | 3,200 | |
| 46 | Martin Grove | Sat | 3,300 | - | - | 90 | 2,200 | |
| 46 | Martin Grove | Sun | 2,300 | - | - | 75 | 1,900 | |
| 16 | McCowan | Mo-Fr | 11,300 | 8 | 7 | 130 | 2,500 | |
| 16 | McCowan | Sat | 6,200 | - | - | 95 | 2,000 | |
| 16 | McCowan | Sun | 4,800 | - | - | 65 | 1,300 | |
| 129 | McCowan North | Mo-Fr | 15,300 | 15 | 15 | 220 | 4,500 | |
| 129 | McCowan North | Sat | 9,800 | - | - | 135 | 2,700 | |
| 129 | McCowan North | Sun | 7,300 | - | - | 85 | 2,000 | |
| 130 | Middlefield | Mo-Fr | 2,000 | 3 | 3 | 40 | 900 | |
| 130 | Middlefield | Sat | 1,300 | - | - | 30 | 620 | |
| 130 | Middlefield | Sun | 850 | - | - | 25 | 550 | |
| 57 | Midland | Mo-Fr | 11,700 | 13 | 10 | 155 | 3,300 | |
| 57 | Midland | Sat | 5,500 | - | - | 80 | 1,900 | |
| 57 | Midland | Sun | 3,900 | - | - | 50 | 1,200 | |
| 132 | Milner | Mo-Fr | 2,900 | 4 | 4 | 50 | 1,400 | |
| 132 | Milner | Sat | 1,200 | - | - | 30 | 790 | |
| 132 | Milner | Sun | 590 | - | - | 20 | 550 | |
| 116 | Morningside | Mo-Fr | 23,000 | 28 | 30 | 415 | 9,900 | |
| 116 | Morningside | Sat | 12,200 | - | - | 240 | 6,400 | |
| 116 | Morningside | Sun | 6,800 | - | - | 195 | 5,100 | |
| 62 | Mortimer | Mo-Fr | 2,800 | 3 | 3 | 45 | 790 | |
| 62 | Mortimer | Sat | 1,600 | - | - | 35 | 600 | |
| 62 | Mortimer | Sun | 1,400 | - | - | 35 | 580 | |
| 171 | Mt Dennis | Mo-Fr | 510 | 1 | 1 | 20 | 420 | |
| 171 | Mt Dennis | Sat | 310 | - | - | 20 | 400 | |
| 171 | Mt Dennis | Sun | 320 | - | - | 20 | 420 | |
| 74 | Mt Pleasant | Mo-Fr | 1,200 | 2 | 2 | 20 | 300 | |
| 74 | Mt Pleasant | Sat | 430 | - | - | 15 | 180 | |
| 74 | Mt Pleasant | Sun | 330 | - | - | 10 | 150 | |
| 103 | Mt Pleasant North | Mo-Fr | 1,600 | 2 | 2 | 35 | 470 | |
| 103 | Mt Pleasant North | Sat | 800 | - | - | 35 | 440 | |
| 103 | Mt Pleasant North | Sun | 480 | - | - | 25 | 330 | |
| 133 | Neilson | Mo-Fr | 10,800 | 8 | 11 | 160 | 3,500 | |
| 133 | Neilson | Sat | 7,500 | - | - | 140 | 3,200 | |
| 133 | Neilson | Sun | 5,300 | - | - | 100 | 2,400 | |
| 131 | Nugget | Mo-Fr | 6,200 | 12 | 11 | 130 | 2,900 | |
| 131 | Nugget | Sat | 2,700 | - | - | 55 | 1,300 | |
| 131 | Nugget | Sun | 1,600 | - | - | 35 | 850 | |
| 70 | O'Connor | Mo-Fr | 8,000 | 7 | 7 | 110 | 1,800 | |
| 70 | O'Connor | Sat | 4,200 | - | - | 80 | 1,700 | |
| 70 | O'Connor | Sun | 3,400 | - | - | 60 | 1,200 | |
| 63 | Ossington | Mo-Fr | 22,100 | 17 | 15 | 255 | 3,700 | |
| 63 | Ossington | Sat | 14,600 | - | - | 215 | 3,000 | |
| 63 | Ossington | Sun | 12,100 | - | - | 165 | 2,500 | |
| 72 | Pape | Mo-Fr | 6,900 | 5 | 5 | 90 | 1,400 | |
| 72 | Pape | Sat | 4,400 | - | - | 65 | 1,100 | |
| 72 | Pape | Sun | 4,000 | - | - | 45 | 750 | |

| Route | | Day | Customers per day | Vehicles in morning peak period | Vehicles in afternoon peak period | Hours per day | Kilometres per day | Note |
|---|---|---|---|---|---|---|---|---|
| 65 | Parliament | Mo-Fr | 4,600 | 2 | 4 | 50 | 570 | |
| 65 | Parliament | Sat | 2,400 | - | - | 35 | 410 | |
| 65 | Parliament | Sun | 2,500 | - | - | 25 | 300 | |
| 67 | Pharmacy | Mo-Fr | 5,500 | 6 | 6 | 85 | 1,800 | |
| 67 | Pharmacy | Sat | 2,700 | - | - | 65 | 1,400 | |
| 67 | Pharmacy | Sun | 1,700 | - | - | 40 | 950 | |
| 167 | Pharmacy North | Mo-Fr | 1,300 | 2 | 2 | 30 | 590 | |
| 167 | Pharmacy North | Sat | 530 | - | - | 30 | 620 | |
| 167 | Pharmacy North | Sun | - | - | - | - | - | No service |
| 66 | Prince Edward | Mo-Fr | 4,700 | 5 | 5 | 75 | 1,500 | |
| 66 | Prince Edward | Sat | 2,800 | - | - | 50 | 1,100 | |
| 66 | Prince Edward | Sun | 2,100 | - | - | 45 | 920 | |
| 134 | Progress | Mo-Fr | 7,300 | 8 | 7 | 115 | 2,300 | |
| 134 | Progress | Sat | 2,700 | - | - | 65 | 1,500 | |
| 134 | Progress | Sun | 1,300 | - | - | 35 | 810 | |
| 501 | Queen | Mo-Fr | 52,200 | 36 | 34 | 595 | 9,100 | |
| 501 | Queen | Sat | 28,000 | - | - | 525 | 7,900 | |
| 501 | Queen | Sun | 19,600 | - | - | 400 | 6,400 | |
| 80 | Queensway | Mo-Fr | 2,300 | 3 | 3 | 50 | 1,200 | |
| 80 | Queensway | Sat | 1,900 | - | - | 45 | 1,100 | |
| 80 | Queensway | Sun | 900 | - | - | 25 | 610 | |
| 109 | Ranee | Mo-Fr | 5,300 | 3 | 5 | 65 | 1,100 | |
| 109 | Ranee | Sat | 3,500 | - | - | 50 | 880 | |
| 109 | Ranee | Sun | 2,900 | - | - | 40 | 720 | |
| 48 | Rathburn | Mo-Fr | 2,400 | 4 | 4 | 55 | 1,300 | |
| 48 | Rathburn | Sat | 860 | - | - | 30 | 710 | |
| 48 | Rathburn | Sun | 730 | - | - | 25 | 620 | |
| 161 | Rogers Rd | Mo-Fr | 6,500 | 7 | 7 | 110 | 1,800 | |
| 161 | Rogers Rd | Sat | 4,900 | - | - | 105 | 1,800 | |
| 161 | Rogers Rd | Sun | 3,300 | - | - | 80 | 1,400 | |
| 82 | Rosedale | Mo-Fr | 1,500 | 1 | 1 | 20 | 310 | |
| 82 | Rosedale | Sat | 730 | - | - | 15 | 270 | |
| 82 | Rosedale | Sun | 280 | - | - | 10 | 240 | |
| 73 | Royal York | Mo-Fr | 8,900 | 11 | 9 | 155 | 3,400 | |
| 73 | Royal York | Sat | 6,600 | - | - | 130 | 3,100 | |
| 73 | Royal York | Sun | 4,000 | - | - | 75 | 1,800 | |
| 76 | Royal York South | Mo-Fr | 9,600 | 9 | 9 | 125 | 2,300 | |
| 76 | Royal York South | Sat | 4,700 | - | - | 60 | 1,300 | |
| 76 | Royal York South | Sun | 3,400 | - | - | 45 | 1,100 | |
| 71 | Runnymede | Mo-Fr | 3,800 | 4 | 4 | 70 | 1,300 | |
| 71 | Runnymede | Sat | 3,700 | - | - | 80 | 1,400 | |
| 71 | Runnymede | Sun | 2,100 | - | - | 50 | 980 | |
| 86 | Scarborough | Mo-Fr | 16,000 | 28 | 18 | 305 | 7,100 | |
| 86 | Scarborough | Sat | 10,600 | - | - | 215 | 5,100 | |
| 86 | Scarborough | Sun | 6,300 | - | - | 155 | 3,900 | |
| 190 | Scarborough Centre Rocket | Mo-Fr | 10,000 | 10 | 13 | 145 | 3,000 | |
| 190 | Scarborough Centre Rocket | Sat | 6,300 | - | - | 90 | 2,000 | |
| 190 | Scarborough Centre Rocket | Sun | 4,500 | - | - | 60 | 1,400 | |
| 79 | Scarlett Rd | Mo-Fr | 8,500 | 14 | 11 | 160 | 3,100 | |
| 79 | Scarlett Rd | Sat | 4,400 | - | - | 85 | 1,700 | |
| 79 | Scarlett Rd | Sun | 2,600 | - | - | 60 | 1,200 | |

| Route | | Day | Customers per day | Vehicles in morning peak period | Vehicles in afternoon peak period | Hours per day | Kilometres per day | Note |
|---|---|---|---|---|---|---|---|---|
| 85 | Sheppard East | Mo-Fr | 29,000 | 30 | 28 | 445 | 9,200 | |
| 85 | Sheppard East | Sat | 21,400 | - | - | 330 | 7,200 | |
| 85 | Sheppard East | Sun | 15,700 | - | - | 270 | 6,300 | |
| 84 | Sheppard West | Mo-Fr | 19,200 | 18 | 14 | 225 | 4,600 | |
| 84 | Sheppard West | Sat | 13,500 | - | - | 160 | 3,600 | |
| 84 | Sheppard West | Sun | 10,600 | - | - | 120 | 3,000 | |
| 75 | Sherbourne | Mo-Fr | 7,500 | 8 | 8 | 120 | 1,500 | |
| 75 | Sherbourne | Sat | 4,000 | - | - | 65 | 900 | |
| 75 | Sherbourne | Sun | 1,400 | - | - | 35 | 520 | |
| 123 | Shorncliffe | Mo-Fr | 6,100 | 5 | 5 | 90 | 1,900 | |
| 123 | Shorncliffe | Sat | 4,300 | - | - | 75 | 1,800 | |
| 123 | Shorncliffe | Sun | 3,700 | - | - | 70 | 1,600 | |
| 115 | Silver Hills | Mo-Fr | 1,100 | 2 | 2 | 30 | 600 | |
| 115 | Silver Hills | Sat | 510 | - | - | 20 | 430 | |
| 115 | Silver Hills | Sun | 350 | - | - | 15 | 370 | |
| 88 | South Leaside | Mo-Fr | 4,500 | 8 | 7 | 95 | 1,700 | |
| 88 | South Leaside | Sat | 1,700 | - | - | 50 | 900 | |
| 88 | South Leaside | Sun | 1,200 | - | - | 35 | 670 | |
| 510 | Spadina | Mo-Fr | 43,900 | 17 | 23 | 350 | 4,500 | |
| 510 | Spadina | Sat | 28,600 | - | - | 305 | 4,100 | |
| 510 | Spadina | Sun | 21,800 | - | - | 250 | 3,500 | |
| 78 | St Andrews | Mo-Fr | 1,800 | 3 | 2 | 30 | 590 | |
| 78 | St Andrews | Sat | 840 | - | - | 20 | 390 | |
| 78 | St Andrews | Sun | 640 | - | - | 15 | 340 | |
| 512 | St Clair | Mo-Fr | 38,200 | 25 | 20 | 350 | 4,800 | |
| 512 | St Clair | Sat | 23,500 | - | - | 240 | 3,500 | |
| 512 | St Clair | Sun | 16,500 | - | - | 180 | 2,600 | |
| 53 | Steeles East | Mo-Fr | 28,300 | 42 | 42 | 560 | 12,100 | |
| 53 | Steeles East | Sat | 15,100 | - | - | 260 | 5,700 | |
| 53 | Steeles East | Sun | 12,500 | - | - | 235 | 5,200 | |
| 60 | Steeles West | Mo-Fr | 26,700 | 35 | 35 | 445 | 8,800 | |
| 60 | Steeles West | Sat | 15,500 | - | - | 225 | 5,300 | |
| 60 | Steeles West | Sun | 11,300 | - | - | 170 | 4,100 | |
| 124 | Sunnybrook | Mo-Fr | 5,000 | 5 | 5 | 60 | 800 | |
| 124 | Sunnybrook | Sat | 1,100 | - | - | 20 | 340 | |
| 124 | Sunnybrook | Sun | 620 | - | - | 15 | 260 | |
| 77 | Swansea | Mo-Fr | 2,900 | 3 | 2 | 40 | 640 | |
| 77 | Swansea | Sat | 1,700 | - | - | 20 | 380 | |
| 77 | Swansea | Sun | 1,200 | - | - | 20 | 330 | |
| 168 | Symington | Mo-Fr | 8,300 | 9 | 7 | 120 | 1,900 | |
| 168 | Symington | Sat | 6,000 | - | - | 95 | 1,400 | |
| 168 | Symington | Sun | 4,900 | - | - | 80 | 1,200 | |
| 81 | Thorncliffe Park | Mo-Fr | 6,000 | 6 | 4 | 70 | 1,300 | |
| 81 | Thorncliffe Park | Sat | 4,600 | - | - | 65 | 1,200 | |
| 81 | Thorncliffe Park | Sun | 3,100 | - | - | 45 | 810 | |
| 10 | Van Horne | Mo-Fr | 1,200 | 2 | 3 | 25 | 490 | |
| 10 | Van Horne | Sat | - | - | - | - | - | See 169 Huntingwood |
| 10 | Van Horne | Sun | 390 | - | - | 10 | 190 | |
| 90 | Vaughan | Mo-Fr | 6,600 | 6 | 5 | 75 | 1,100 | |
| 90 | Vaughan | Sat | 3,800 | - | - | 50 | 700 | |
| 90 | Vaughan | Sun | 2,900 | - | - | 35 | 540 | |

| Route | | Day | Customers per day | Vehicles in morning peak period | Vehicles in afternoon peak period | Hours per day | Kilometres per day | Note |
|---|---|---|---|---|---|---|---|---|
| 24 | Victoria Park | Mo-Fr | 24,800 | 25 | 21 | 325 | 6,400 | |
| 24 | Victoria Park | Sat | 15,700 | - | - | 180 | 3,800 | |
| 24 | Victoria Park | Sun | 10,800 | - | - | 155 | 3,400 | |
| 224 | Victoria Park North | Mo-Fr | 2,100 | 6 | 6 | 65 | 1,600 | |
| 224 | Victoria Park North | Sat | - | - | - | - | - | No service |
| 224 | Victoria Park North | Sun | - | - | - | - | - | No service |
| 68 | Warden | Mo-Fr | 17,900 | 20 | 16 | 235 | 5,000 | |
| 68 | Warden | Sat | 10,300 | - | - | 140 | 3,200 | |
| 68 | Warden | Sun | 6,500 | - | - | 115 | 2,600 | |
| 69 | Warden South | Mo-Fr | 5,500 | 4 | 3 | 65 | 1,200 | |
| 69 | Warden South | Sat | 2,700 | - | - | 40 | 870 | |
| 69 | Warden South | Sun | 2,100 | - | - | 35 | 750 | |
| 55 | Warren Park | Mo-Fr | 1,300 | 1 | 1 | 20 | 360 | |
| 55 | Warren Park | Sat | 840 | - | - | 20 | 360 | |
| 55 | Warren Park | Sun | 620 | - | - | 15 | 300 | |
| 94 | Wellesley | Mo-Fr | 9,400 | 7 | 6 | 110 | 1,500 | |
| 94 | Wellesley | Sat | 5,000 | - | - | 80 | 1,200 | |
| 94 | Wellesley | Sun | 3,900 | - | - | 60 | 850 | |
| 112 | West Mall | Mo-Fr | 7,700 | 13 | 10 | 160 | 3,500 | |
| 112 | West Mall | Sat | 3,300 | - | - | 75 | 1,900 | |
| 112 | West Mall | Sun | 1,700 | - | - | 45 | 1,100 | |
| 89 | Weston | Mo-Fr | 15,200 | 18 | 13 | 215 | 3,400 | |
| 89 | Weston | Sat | 10,200 | - | - | 145 | 2,500 | |
| 89 | Weston | Sun | 8,400 | - | - | 120 | 2,100 | |
| 165 | Weston Rd North | Mo-Fr | 23,400 | 24 | 21 | 345 | 7,500 | |
| 165 | Weston Rd North | Sat | 13,500 | - | - | 230 | 5,200 | |
| 165 | Weston Rd North | Sun | 7,800 | - | - | 155 | 3,900 | |
| 98 | Willowdale-Senlac | Mo-Fr | 2,700 | 4 | 4 | 55 | 1,200 | |
| 98 | Willowdale-Senlac | Sat | 1,200 | - | - | 40 | 830 | |
| 98 | Willowdale-Senlac | Sun | 880 | - | - | 30 | 720 | |
| 96 | Wilson | Mo-Fr | 23,900 | 28 | 24 | 395 | 8,800 | |
| 96 | Wilson | Sat | 16,100 | - | - | 285 | 6,700 | |
| 96 | Wilson | Sun | 10,100 | - | - | 180 | 4,200 | |
| 91 | Woodbine | Mo-Fr | 6,100 | 9 | 7 | 110 | 2,100 | |
| 91 | Woodbine | Sat | 2,700 | - | - | 75 | 1,600 | |
| 91 | Woodbine | Sun | 1,800 | - | - | 60 | 1,400 | |
| 92 | Woodbine South | Mo-Fr | 3,700 | 3 | 3 | 40 | 620 | |
| 92 | Woodbine South | Sat | 3,700 | - | - | 45 | 680 | |
| 92 | Woodbine South | Sun | 1,900 | - | - | 35 | 600 | |
| 97 | Yonge | Mo-Fr | 4,500 | 9 | 9 | 135 | 2,100 | |
| 97 | Yonge | Sat | 3,100 | - | - | 110 | 1,700 | |
| 97 | Yonge | Sun | 2,300 | - | - | 85 | 1,400 | |
| 95 | York Mills | Mo-Fr | 27,500 | 40 | 33 | 470 | 10,400 | |
| 95 | York Mills | Sat | 15,100 | - | - | 230 | 5,400 | |
| 95 | York Mills | Sun | 10,400 | - | - | 175 | 4,200 | |
| 106 | York University | Mo-Fr | 7,700 | 9 | 7 | 125 | 2,300 | |
| 106 | York University | Sat | 4,900 | - | - | 100 | 2,000 | |
| 106 | York University | Sun | 3,200 | - | - | 75 | 1,500 | |
| 196 | York University Rocket | Mo-Fr | 21,900 | 24 | 23 | 355 | 8,300 | |
| 196 | York University Rocket | Sat | 2,700 | - | - | 60 | 1,400 | |
| 196 | York University Rocket | Sun | 1,900 | - | - | 35 | 940 | |

| Route | | Day | Customers per day | Vehicles in morning peak period | Vehicles in afternoon peak period | Hours per day | Kilometres per day | Note |
|---|---|---|---|---|---|---|---|---|
| **Blue Night Network** | | | | | | | | |
| 310 | Bathurst | Mo-Fr | 500 | - | - | 10 | 300 | |
| 310 | Bathurst | Sat | 930 | - | - | 20 | 440 | |
| 310 | Bathurst | Sun | 780 | - | - | 40 | 990 | |
| 300 | Bloor-Danforth | Mo-Fr | 2,500 | - | - | 80 | 2,200 | |
| 300 | Bloor-Danforth | Sat | 2,800 | - | - | 55 | 1,500 | |
| 300 | Bloor-Danforth | Sun | 3,000 | - | - | 120 | 3,100 | |
| 306 | Carlton | Mo-Fr | 610 | - | - | 25 | 480 | |
| 306 | Carlton | Sat | 1,300 | - | - | 30 | 550 | |
| 306 | Carlton | Sun | 1,800 | - | - | 25 | 460 | |
| 322 | Coxwell | Mo-Fr | 140 | - | - | 05 | 180 | |
| 322 | Coxwell | Sat | 160 | - | - | 05 | 170 | |
| 322 | Coxwell | Sun | 150 | - | - | 15 | 410 | |
| 302 | Danforth Rd-McCowan | Mo-Fr | 350 | - | - | 10 | 270 | |
| 302 | Danforth Rd-McCowan | Sat | 290 | - | - | 05 | 240 | |
| 302 | Danforth Rd-McCowan | Sun | 280 | - | - | 15 | 450 | |
| 303 | Don Mills | Mo-Fr | 260 | - | - | 10 | 270 | |
| 303 | Don Mills | Sat | 360 | - | - | 10 | 280 | |
| 303 | Don Mills | Sun | 270 | - | - | 10 | 280 | |
| 329 | Dufferin | Mo-Fr | 300 | - | - | 10 | 220 | |
| 329 | Dufferin | Sat | 450 | - | - | 10 | 210 | |
| 329 | Dufferin | Sun | 490 | - | - | 10 | 210 | |
| 305 | Eglinton East | Mo-Fr | 330 | - | - | 15 | 420 | |
| 305 | Eglinton East | Sat | 480 | - | - | 15 | 420 | |
| 305 | Eglinton East | Sun | 370 | - | - | 20 | 610 | |
| 307 | Eglinton West | Mo-Fr | 250 | - | - | 15 | 370 | |
| 307 | Eglinton West | Sat | 550 | - | - | 15 | 380 | |
| 307 | Eglinton West | Sun | 280 | - | - | 15 | 380 | |
| 308 | Finch East | Mo-Fr | 200 | - | - | 10 | 250 | |
| 308 | Finch East | Sat | 380 | - | - | 10 | 250 | |
| 308 | Finch East | Sun | 420 | - | - | 10 | 250 | |
| 309 | Finch West | Mo-Fr | 550 | - | - | 10 | 320 | |
| 309 | Finch West | Sat | 640 | - | - | 10 | 320 | |
| 309 | Finch West | Sun | 390 | - | - | 10 | 320 | |
| 311 | Islington | Mo-Fr | 310 | - | - | 15 | 450 | |
| 311 | Islington | Sat | 210 | - | - | 15 | 410 | |
| 311 | Islington | Sun | 190 | - | - | 25 | 680 | |
| 313 | Jane | Mo-Fr | 430 | - | - | 10 | 240 | |
| 313 | Jane | Sat | 390 | - | - | 10 | 240 | |
| 313 | Jane | Sun | 380 | - | - | 10 | 240 | |
| 354 | Lawrence East | Mo-Fr | 250 | - | - | 15 | 400 | |
| 354 | Lawrence East | Sat | 260 | - | - | 15 | 450 | |
| 354 | Lawrence East | Sun | 470 | - | - | 25 | 660 | |
| 352 | Lawrence West | Mo-Fr | 110 | - | - | 05 | 150 | |
| 352 | Lawrence West | Sat | 110 | - | - | 05 | 150 | |
| 352 | Lawrence West | Sun | 100 | - | - | 05 | 150 | |
| 316 | Ossington | Mo-Fr | 250 | - | - | 10 | 160 | |
| 316 | Ossington | Sat | 210 | - | - | 05 | 150 | |
| 316 | Ossington | Sun | 170 | - | - | 05 | 150 | |
| 301 | Queen | Mo-Fr | 720 | - | - | 40 | 770 | |
| 301 | Queen | Sat | 1,500 | - | - | 40 | 770 | |
| 301 | Queen | Sun | 2,100 | - | - | 40 | 750 | |
| 385 | Sheppard East | Mo-Fr | 200 | - | - | 10 | 270 | |
| 385 | Sheppard East | Sat | 210 | - | - | 10 | 310 | |
| 385 | Sheppard East | Sun | 200 | - | - | 10 | 310 | |
| 312 | St Clair | Mo-Fr | 180 | - | - | 05 | 170 | |
| 312 | St Clair | Sat | 200 | - | - | 05 | 140 | |
| 312 | St Clair | Sun | 170 | - | - | 05 | 160 | |

| Route | | Day | Customers per day | Vehicles in morning peak period | Vehicles in afternoon peak period | Hours per day | Kilometres per day | Note |
|---|---|---|---|---|---|---|---|---|
| 353 | Steeles East | Mo-Fr | 60 | - | - | 05 | 190 | |
| 353 | Steeles East | Sat | 110 | - | - | 05 | 270 | |
| 353 | Steeles East | Sun | 170 | - | - | 10 | 380 | |
| 324 | Victoria Park | Mo-Fr | 220 | - | - | 05 | 200 | |
| 324 | Victoria Park | Sat | 220 | - | - | 10 | 240 | |
| 324 | Victoria Park | Sun | 280 | - | - | 15 | 380 | |
| 319 | Wilson | Mo-Fr | 200 | - | - | 15 | 420 | |
| 319 | Wilson | Sat | 390 | - | - | 15 | 430 | |
| 319 | Wilson | Sun | 280 | - | - | 15 | 390 | |
| 320 | Yonge | Mo-Fr | 2,400 | - | - | 100 | 2,500 | |
| 320 | Yonge | Sat | 3,400 | - | - | 95 | 2,400 | |
| 320 | Yonge | Sun | 4,500 | - | - | 165 | 4,100 | |
| 321 | York Mills | Mo-Fr | 430 | - | - | 15 | 420 | |
| 321 | York Mills | Sat | 470 | - | - | 15 | 510 | |
| 321 | York Mills | Sun | 330 | - | - | 25 | 770 | |

**Notes:**

Ridership information is from detailed manual passenger counts that are taken approximately every other year, or from automatic passenger counting equipment on some buses.

Many other counts are taken each year but do not include all-day ridership information, and are not included here.

Scheduled hours and km are current to April 2014, except where noted.

Buses are used on all routes, except on routes 501-512, 301, and 306, where streetcars are used.

Ridership includes contract services outside of Toronto.

AECOM Imagine it. Delivered.

# Appendix D

## AERMOD Input & Isopleth Figures

# Control Pathway



## Dispersion Options

**Titles**

C:\Lakes\AERMOD View\WRTS
WRTS 9100 Run (PM10)

**Dispersion Options**

☑ Regulatory Default ☐ Non-Default Options

**Dispersion Coefficient**

Urban — Population:
Name (Optional):
Roughness Length:

**Output Type**

☑ Concentration
☐ Total Deposition (Dry & Wet)
☐ Dry Deposition
☐ Wet Deposition

**Plume Depletion**

☐ Dry Removal
☐ Wet Removal

**Output Warnings**

☐ No Output Warnings
☐ Non-fatal Warnings for Non-sequential Met Data

## Pollutant / Averaging Time / Terrain Options

**Pollutant Type**

PM10

**Averaging Time Options**

Hours: ☑ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 6 ☑ 8 ☐ 12 ☑ 24

☐ Month ☐ Period ☑ Annual

**Exponential Decay**

Half-life of 4 hrs will be used

**Terrain Height Options**

☐ Flat ☑ Elevated

SO: Meters
RE: Meters
TG: Meters

**Flagpole Receptors**

☑ Yes ☐ No

Default Height = 1.50 m

# Control Pathway



## Optional Files

| Re-Start File | Init File | Multi-Year Analyses | Event Input File | Error Listing File |
|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ■ |

### Detailed Error Listing File

Filename: WRTS_9100_v3.err

# Meteorology Pathway



## Met Input Data

### Surface Met Data

Filename: Central_Suburban\Toronto_suburban_16216.SFC
Format Type: Default AERMET format

### Profile Met Data

Filename: Central_Suburban\Toronto_suburban_16216.PFL
Format Type: Default AERMET format

### Wind Speed

☐ Wind Speeds are Vector Mean (Not Scalar Means)

### Wind Direction

Rotation Adjustment [deg]:

### Potential Temperature Profile

Base Elevation above MSL (for Primary Met Tower): 173.00 [m]

### Meteorological Station Data

| Stations | Station No. | Year | X Coordinate [m] | Y Coordinate [m] | Station Name |
|---|---|---|---|---|---|
| Surface | | 1996 | | | TORONTO |
| Upper Air | | 1996 | | | BUFFALO |

## Data Period

### Data Period to Process

Start Date: 1/1/1996 Start Hour: 1 End Date: 12/31/2000 End Hour: 24

## Wind Speed Categories

| Stability Category | Wind Speed [m/s] | Stability Category | Wind Speed [m/s] |
|---|---|---|---|
| A | 1.54 | D | 8.23 |
| B | 3.09 | E | 10.8 |
| C | 5.14 | F | No Upper Bound |

# Source Pathway - Source Inputs



## Area Sources

| Source Type | Source ID | X Coordinate [m] | Y Coordinate [m] | Base Elevation (Optional) | Release Height [m] | Emission Rate [g/ (s-m^2)] | Length of X Side [m] | Length of Y Side [m] | Orientation Angle from North [deg] | Initial Vertical Dim. [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| AREA | AS4 | 613098.91 | 4840195.59 | 166.63 | 3.00 | 0.00003 | 80.61 | 8.44 | -1.92 | 0.00 |
| | | Bus Loop (idling) | | | | | | | | |

# Source Pathway - Source Inputs



### Polygon Area Sources

**Source Type:** AREA POLY

**Source:** AS1 (Parking Lot East)

| Base Elevation (Optional) | Release Height [m] | Emission Rate [g/ (s-m^2)] | Initial Vertical Dim. [m] | Number of Vertices (or sides) | X Coordinate for Vertices [m] | Y Coordinate for Vertices [m] |
|---|---|---|---|---|---|---|
| 170.00 | 0.50 | 6.68E-8 | 0.00 | 18 | 613422.47 | 4840300.10 |
| | | 6.68E-8 | | | 613383.43 | 4840299.48 |
| | | 6.68E-8 | | | 613307.21 | 4840275.31 |
| | | 6.68E-8 | | | 613292.85 | 4840268.91 |
| | | 6.68E-8 | | | 613279.42 | 4840262.64 |
| | | 6.68E-8 | | | 613252.56 | 4840244.73 |
| | | 6.68E-8 | | | 613238.23 | 4840236.22 |
| | | 6.68E-8 | | | 613188.53 | 4840221.00 |
| | | 6.68E-8 | | | 613183.61 | 4840217.86 |
| | | 6.68E-8 | | | 613182.71 | 4840211.15 |
| | | 6.68E-8 | | | 613183.61 | 4840188.76 |
| | | 6.68E-8 | | | 613233.30 | 4840190.10 |
| | | 6.68E-8 | | | 613252.56 | 4840185.18 |
| | | 6.68E-8 | | | 613472.84 | 4840191.00 |
| | | 6.68E-8 | | | 613472.84 | 4840198.16 |
| | | 6.68E-8 | | | 613462.10 | 4840207.12 |
| | | 6.68E-8 | | | 613455.38 | 4840214.73 |
| | | 6.68E-8 | | | 613451.35 | 4840221.45 |

# Source Pathway - Source Inputs



**Source Type:** AREA POLY
**Source:** AS2 (Parking Lot West)

| Base Elevation (Optional) | Release Height [m] | Emission Rate [g/ (s-m^2)] | Initial Vertical Dim. [m] | Number of Vertices (or sides) | X Coordinate for Vertices [m] | Y Coordinate for Vertices [m] |
|---|---|---|---|---|---|---|
| 166.12 | 0.50 | 8.95E-8 | 0.00 | 10 | 612980.71 | 4840211.65 |
| | | 8.95E-8 | | | 612742.92 | 4840205.18 |
| | | 8.95E-8 | | | 612711.86 | 4840196.76 |
| | | 8.95E-8 | | | 612708.30 | 4840195.47 |
| | | 8.95E-8 | | | 612710.57 | 4840189.97 |
| | | 8.95E-8 | | | 612705.71 | 4840189.65 |
| | | 8.95E-8 | | | 612706.04 | 4840172.50 |
| | | 8.95E-8 | | | 612710.57 | 4840172.50 |
| | | 8.95E-8 | | | 612710.57 | 4840166.35 |
| | | 8.95E-8 | | | 612982.32 | 4840173.79 |

**Source Type:** AREA POLY
**Source:** AS3 (PPUDO)

| Base Elevation (Optional) | Release Height [m] | Emission Rate [g/ (s-m^2)] | Initial Vertical Dim. [m] | Number of Vertices (or sides) | X Coordinate for Vertices [m] | Y Coordinate for Vertices [m] |
|---|---|---|---|---|---|---|
| 166.00 | 0.50 | 0.00041 | 0.00 | 4 | 612991.71 | 4840213.59 |
| | | 0.00041 | | | 612991.71 | 4840191.26 |
| | | 0.00041 | | | 613007.56 | 4840184.79 |
| | | 0.00041 | | | 613006.91 | 4840207.44 |

# Source Pathway - Source Inputs



## Line Volume Sources

**Source Type:** LINE VOLUME

**Source:** LVS1 (Entrance/Exit from Parking Lot East)

| Length of Side [m] | Emission Rate [g/ s] | Building Height [m] | X Coordinate for Points [m] | Y Coordinate for points [m] | Base Elevation [m] | Release Height [m] |
|---|---|---|---|---|---|---|
| 14.00 | 0.06076 | Surface-Based | 613419.42 | 4840319.53 | 169.84 | 1.70 |
| | | | 613307.90 | 4840283.50 | 168.89 | 1.70 |
| | | | 613281.64 | 4840271.83 | 168.66 | 1.70 |
| | | | 613240.81 | 4840247.04 | 168.00 | 1.70 |
| | | | 613251.02 | 4840230.99 | 168.00 | 1.70 |
| | | | 613435.96 | 4840238.22 | 169.85 | 1.70 |
| | | | 613446.65 | 4840210.90 | 169.86 | 1.70 |
| | | | 613192.52 | 4840201.40 | 167.85 | 1.70 |

**Source Type:** LINE VOLUME

**Source:** LVS2 (Entrance/Exit from Parking Lot West)

| Length of Side [m] | Emission Rate [g/ s] | Building Height [m] | X Coordinate for Points [m] | Y Coordinate for points [m] | Base Elevation [m] | Release Height [m] |
|---|---|---|---|---|---|---|
| 14.00 | 0.04884 | Surface-Based | 613419.30 | 4840320.28 | 169.96 | 1.70 |
| | | | 613332.49 | 4840290.96 | 169.00 | 1.70 |
| | | | 613306.22 | 4840282.59 | 168.89 | 1.70 |
| | | | 613279.95 | 4840270.40 | 168.62 | 1.70 |
| | | | 613225.89 | 4840238.42 | 167.98 | 1.70 |
| | | | 613195.05 | 4840229.28 | 167.49 | 1.70 |
| | | | 613176.78 | 4840226.62 | 167.27 | 1.70 |
| | | | 613077.79 | 4840223.19 | 166.00 | 1.70 |
| | | | 612807.00 | 4840217.88 | 167.06 | 1.70 |
| | | | 612807.00 | 4840199.64 | 167.11 | 1.70 |
| | | | 612732.61 | 4840196.73 | 168.00 | 1.70 |
| | | | 612719.48 | 4840190.89 | 168.00 | 1.70 |
| | | | 612720.21 | 4840177.03 | 168.00 | 1.70 |
| | | | 612973.31 | 4840183.60 | 166.00 | 1.70 |

# Source Pathway - Source Inputs



**Source Type:** LINE VOLUME
**Source:** LVS3 (Entrance/Exit from PPUDO)

| Length of Side [m] | Emission Rate [g/ s] | Building Height [m] | X Coordinate for Points [m] | Y Coordinate for points [m] | Base Elevation [m] | Release Height [m] |
|---|---|---|---|---|---|---|
| 14.00 | 0.07801 | Surface-Based | 613419.47 | 4840320.71 | 169.96 | 1.70 |
| | | | 613306.29 | 4840282.35 | 168.89 | 1.70 |
| | | | 613280.88 | 4840271.06 | 168.65 | 1.70 |
| | | | 613225.75 | 4840239.21 | 167.97 | 1.70 |
| | | | 613193.71 | 4840229.18 | 167.48 | 1.70 |
| | | | 613179.14 | 4840226.59 | 167.30 | 1.70 |
| | | | 612988.21 | 4840221.71 | 166.00 | 1.70 |
| | | | 612988.94 | 4840182.31 | 166.00 | 1.70 |
| | | | 613012.33 | 4840182.03 | 166.00 | 1.70 |
| | | | 613011.74 | 4840221.94 | 166.00 | 1.70 |

**Source Type:** LINE VOLUME
**Source:** LVS4 (Entrance/Exit from Bus Loop)

| Length of Side [m] | Emission Rate [g/ s] | Building Height [m] | X Coordinate for Points [m] | Y Coordinate for points [m] | Base Elevation [m] | Release Height [m] |
|---|---|---|---|---|---|---|
| 14.00 | 0.00766 | Surface-Based | 613419.74 | 4840320.18 | 169.96 | 3.40 |
| | | | 613306.44 | 4840282.81 | 168.89 | 3.40 |
| | | | 613280.99 | 4840271.08 | 168.65 | 3.40 |
| | | | 613226.87 | 4840239.24 | 167.98 | 3.40 |
| | | | 613193.20 | 4840229.22 | 167.47 | 3.40 |
| | | | 613179.40 | 4840226.92 | 167.31 | 3.40 |
| | | | 613081.06 | 4840224.31 | 166.21 | 3.40 |
| | | | 613082.40 | 4840202.79 | 166.02 | 3.40 |
| | | | 613175.19 | 4840205.93 | 167.08 | 3.40 |
| | | | 613174.74 | 4840226.55 | 167.25 | 3.40 |

# Source Pathway - Source Inputs



### Volume Sources Generated from Line Sources

| Line Source ID | Volume Source ID | X Coordinate [m] | Y Coordinate [m] | Base Elevation [m] | Release Height [m[ | Emission Rate [g/s] | Length of Side [m] | Building Height [m] | Initial Lateral Dimencion [m] | Initial Vertical Dimencion [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| LVS1 | L0001367 | 613412.76 | 4840317.38 | 170.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001368 | 613399.44 | 4840313.08 | 169.65 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001369 | 613386.12 | 4840308.77 | 169.20 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001370 | 613372.79 | 4840304.47 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001371 | 613359.47 | 4840300.16 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001372 | 613346.15 | 4840295.86 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001373 | 613332.83 | 4840291.55 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001374 | 613319.51 | 4840287.25 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001375 | 613306.25 | 4840282.77 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001376 | 613293.46 | 4840277.08 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001377 | 613280.73 | 4840271.27 | 168.69 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001378 | 613268.76 | 4840264.01 | 168.29 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001379 | 613256.80 | 4840256.74 | 168.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001380 | 613244.83 | 4840249.48 | 168.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001381 | 613245.80 | 4840239.19 | 168.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001382 | 613255.29 | 4840231.16 | 168.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001383 | 613269.28 | 4840231.70 | 168.31 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001384 | 613283.27 | 4840232.25 | 168.78 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001385 | 613297.26 | 4840232.80 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001386 | 613311.25 | 4840233.34 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001387 | 613325.24 | 4840233.89 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001388 | 613339.23 | 4840234.44 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001389 | 613353.21 | 4840234.98 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001390 | 613367.20 | 4840235.53 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |

# Source Pathway - Source Inputs

**AERMOD**

| Line Source ID | Volume Source ID | X Coordinate [m] | Y Coordinate [m] | Base Elevation [m] | Release Height [m[ | Emission Rate [g/s] | Length of Side [m] | Building Height [m] | Initial Lateral Dimencion [m] | Initial Vertical Dimencion [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| LVS1 | L0001391 | 613381.19 | 4840236.08 | 169.01 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001392 | 613395.18 | 4840236.62 | 169.11 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001393 | 613409.17 | 4840237.17 | 169.23 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001394 | 613423.16 | 4840237.72 | 169.58 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001395 | 613436.40 | 4840237.11 | 169.91 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001396 | 613441.50 | 4840224.07 | 170.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001397 | 613446.60 | 4840211.04 | 170.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001398 | 613432.80 | 4840210.39 | 169.76 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001399 | 613418.81 | 4840209.86 | 169.29 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001400 | 613404.82 | 4840209.34 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001401 | 613390.83 | 4840208.82 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001402 | 613376.84 | 4840208.29 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001403 | 613362.85 | 4840207.77 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001404 | 613348.86 | 4840207.25 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001405 | 613334.87 | 4840206.73 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001406 | 613320.88 | 4840206.20 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001407 | 613306.89 | 4840205.68 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001408 | 613292.90 | 4840205.16 | 169.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001409 | 613278.91 | 4840204.63 | 168.63 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001410 | 613264.92 | 4840204.11 | 168.16 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001411 | 613250.93 | 4840203.59 | 168.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001412 | 613236.94 | 4840203.06 | 168.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001413 | 613222.95 | 4840202.54 | 168.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001414 | 613208.96 | 4840202.02 | 168.00 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001415 | 613194.97 | 4840201.50 | 167.83 | 1.70 | 0.00124 | 14.00 | Surface-Based | 6.51 | 1.58 |

# Source Pathway - Source Inputs

**AERMOD**

| Line Source ID | Volume Source ID | X Coordinate [m] | Y Coordinate [m] | Base Elevation [m] | Release Height [m[ | Emission Rate [g/s] | Length of Side [m] | Building Height [m] | Initial Lateral Dimencion [m] | Initial Vertical Dimencion [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| LVS2 | L0001416 | 613412.67 | 4840318.04 | 170.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001417 | 613399.40 | 4840313.56 | 169.65 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001418 | 613386.14 | 4840309.08 | 169.20 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001419 | 613372.87 | 4840304.60 | 169.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001420 | 613359.61 | 4840300.12 | 169.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001421 | 613346.35 | 4840295.64 | 169.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001422 | 613333.08 | 4840291.16 | 169.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001423 | 613319.75 | 4840286.90 | 169.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001424 | 613306.41 | 4840282.64 | 169.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001425 | 613293.70 | 4840276.78 | 169.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001426 | 613281.00 | 4840270.89 | 168.70 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001427 | 613268.89 | 4840263.86 | 168.30 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001428 | 613256.84 | 4840256.73 | 168.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001429 | 613244.80 | 4840249.61 | 168.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001430 | 613232.75 | 4840242.48 | 168.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001431 | 613220.10 | 4840236.71 | 168.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001432 | 613206.68 | 4840232.73 | 168.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001433 | 613193.20 | 4840229.01 | 167.77 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001434 | 613179.35 | 4840226.99 | 167.31 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001435 | 613165.38 | 4840226.22 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001436 | 613151.39 | 4840225.74 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001437 | 613137.40 | 4840225.26 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001438 | 613123.41 | 4840224.77 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001439 | 613109.41 | 4840224.29 | 166.98 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001440 | 613095.42 | 4840223.80 | 166.51 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |

# Source Pathway - Source Inputs

**AERMOD**

| Line Source ID | Volume Source ID | X Coordinate [m] | Y Coordinate [m] | Base Elevation [m] | Release Height [m[ | Emission Rate [g/s] | Length of Side [m] | Building Height [m] | Initial Lateral Dimencion [m] | Initial Vertical Dimencion [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| LVS2 | L0001441 | 613081.43 | 4840223.32 | 166.05 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001442 | 613067.44 | 4840222.99 | 166.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001443 | 613053.44 | 4840222.72 | 166.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001444 | 613039.44 | 4840222.44 | 166.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001445 | 613025.44 | 4840222.17 | 166.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001446 | 613011.45 | 4840221.89 | 166.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001447 | 612997.45 | 4840221.62 | 166.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001448 | 612983.45 | 4840221.34 | 166.16 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001449 | 612969.45 | 4840221.07 | 166.48 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001450 | 612955.46 | 4840220.79 | 166.69 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001451 | 612941.46 | 4840220.52 | 166.68 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001452 | 612927.46 | 4840220.24 | 166.70 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001453 | 612913.46 | 4840219.97 | 166.85 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001454 | 612899.47 | 4840219.69 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001455 | 612885.47 | 4840219.42 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001456 | 612871.47 | 4840219.14 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001457 | 612857.48 | 4840218.87 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001458 | 612843.48 | 4840218.60 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001459 | 612829.48 | 4840218.32 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001460 | 612815.48 | 4840218.05 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001461 | 612807.00 | 4840212.36 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001462 | 612805.72 | 4840199.59 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001463 | 612791.73 | 4840199.05 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001464 | 612777.74 | 4840198.50 | 167.08 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001465 | 612763.75 | 4840197.95 | 167.54 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |

# Source Pathway - Source Inputs

AERMOD

| Line Source ID | Volume Source ID | X Coordinate [m] | Y Coordinate [m] | Base Elevation [m] | Release Height [m[ | Emission Rate [g/s] | Length of Side [m] | Building Height [m] | Initial Lateral Dimencion [m] | Initial Vertical Dimencion [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| LVS2 | L0001466 | 612749.76 | 4840197.40 | 168.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001467 | 612735.78 | 4840196.85 | 168.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001468 | 612722.71 | 4840192.33 | 168.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001469 | 612720.03 | 4840180.45 | 168.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001470 | 612730.78 | 4840177.31 | 168.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001471 | 612744.78 | 4840177.67 | 168.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001472 | 612758.78 | 4840178.03 | 167.71 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001473 | 612772.77 | 4840178.40 | 167.24 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001474 | 612786.77 | 4840178.76 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001475 | 612800.76 | 4840179.12 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001476 | 612814.76 | 4840179.49 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001477 | 612828.75 | 4840179.85 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001478 | 612842.75 | 4840180.21 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001479 | 612856.74 | 4840180.57 | 167.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001480 | 612870.74 | 4840180.94 | 166.98 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001481 | 612884.73 | 4840181.30 | 166.69 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001482 | 612898.73 | 4840181.66 | 166.41 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001483 | 612912.72 | 4840182.03 | 166.23 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001484 | 612926.72 | 4840182.39 | 166.05 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001485 | 612940.71 | 4840182.75 | 166.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001486 | 612954.71 | 4840183.12 | 166.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001487 | 612968.70 | 4840183.48 | 166.00 | 1.70 | 0.00068 | 14.00 | Surface-Based | 6.51 | 1.58 |

| Line Source ID | Volume Source ID | X Coordinate [m] | Y Coordinate [m] | Base Elevation [m] | Release Height [m[ | Emission Rate [g/s] | Length of Side [m] | Building Height [m] | Initial Lateral Dimencion [m] | Initial Vertical Dimencion [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| LVS3 | L0001488 | 613412.84 | 4840318.46 | 170.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |

# Source Pathway - Source Inputs

**AERMOD**

| Line Source ID | Volume Source ID | X Coordinate [m] | Y Coordinate [m] | Base Elevation [m] | Release Height [m[ | Emission Rate [g/s] | Length of Side [m] | Building Height [m] | Initial Lateral Dimencion [m] | Initial Vertical Dimencion [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| LVS3 | L0001489 | 613399.58 | 4840313.97 | 169.65 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001490 | 613386.32 | 4840309.47 | 169.21 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001491 | 613373.06 | 4840304.98 | 169.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001492 | 613359.81 | 4840300.49 | 169.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001493 | 613346.55 | 4840296.00 | 169.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001494 | 613333.29 | 4840291.50 | 169.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001495 | 613320.03 | 4840287.01 | 169.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001496 | 613306.77 | 4840282.52 | 169.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001497 | 613293.96 | 4840276.87 | 169.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001498 | 613281.16 | 4840271.19 | 168.71 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001499 | 613269.03 | 4840264.21 | 168.30 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001500 | 613256.90 | 4840257.21 | 168.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001501 | 613244.78 | 4840250.20 | 168.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001502 | 613232.66 | 4840243.20 | 168.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001503 | 613220.00 | 4840237.41 | 168.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001504 | 613206.64 | 4840233.23 | 168.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001505 | 613193.27 | 4840229.10 | 167.78 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001506 | 613179.49 | 4840226.65 | 167.32 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001507 | 613165.50 | 4840226.24 | 167.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001508 | 613151.50 | 4840225.88 | 167.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001509 | 613137.51 | 4840225.52 | 167.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001510 | 613123.51 | 4840225.17 | 167.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001511 | 613109.51 | 4840224.81 | 166.98 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001512 | 613095.52 | 4840224.45 | 166.52 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001513 | 613081.52 | 4840224.09 | 166.05 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |

# Source Pathway - Source Inputs

**AERMOD**

| Line Source ID | Volume Source ID | X Coordinate [m] | Y Coordinate [m] | Base Elevation [m] | Release Height [m[ | Emission Rate [g/s] | Length of Side [m] | Building Height [m] | Initial Lateral Dimencion [m] | Initial Vertical Dimencion [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| LVS3 | L0001514 | 613067.53 | 4840223.74 | 166.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001515 | 613053.53 | 4840223.38 | 166.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001516 | 613039.54 | 4840223.02 | 166.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001517 | 613025.54 | 4840222.66 | 166.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001518 | 613011.55 | 4840222.30 | 166.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001519 | 612997.55 | 4840221.95 | 166.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001520 | 612988.30 | 4840217.05 | 166.03 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001521 | 612988.56 | 4840203.05 | 166.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001522 | 612988.82 | 4840189.06 | 166.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001523 | 612996.19 | 4840182.22 | 166.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001524 | 613010.19 | 4840182.06 | 166.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001525 | 613012.16 | 4840193.89 | 166.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001526 | 613011.95 | 4840207.89 | 166.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |
| | L0001527 | 613011.74 | 4840221.89 | 166.00 | 1.70 | 0.00195 | 14.00 | Surface-Based | 6.51 | 1.58 |

| Line Source ID | Volume Source ID | X Coordinate [m] | Y Coordinate [m] | Base Elevation [m] | Release Height [m[ | Emission Rate [g/s] | Length of Side [m] | Building Height [m] | Initial Lateral Dimencion [m] | Initial Vertical Dimencion [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| LVS4 | L0001528 | 613413.10 | 4840317.99 | 170.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001529 | 613399.80 | 4840313.60 | 169.66 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001530 | 613386.50 | 4840309.22 | 169.22 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001531 | 613373.21 | 4840304.83 | 169.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001532 | 613359.91 | 4840300.45 | 169.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001533 | 613346.62 | 4840296.06 | 169.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001534 | 613333.32 | 4840291.68 | 169.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001535 | 613320.03 | 4840287.29 | 169.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001536 | 613306.73 | 4840282.91 | 169.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |

# Source Pathway - Source Inputs

AERMOD

| Line Source ID | Volume Source ID | X Coordinate [m] | Y Coordinate [m] | Base Elevation [m] | Release Height [m[ | Emission Rate [g/s] | Length of Side [m] | Building Height [m] | Initial Lateral Dimencion [m] | Initial Vertical Dimencion [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| LVS4 | L0001537 | 613294.00 | 4840277.08 | 169.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001538 | 613281.29 | 4840271.22 | 168.71 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001539 | 613269.21 | 4840264.15 | 168.31 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001540 | 613257.14 | 4840257.05 | 168.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001541 | 613245.07 | 4840249.95 | 168.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001542 | 613233.01 | 4840242.85 | 168.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001543 | 613220.28 | 4840237.28 | 168.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001544 | 613206.86 | 4840233.28 | 168.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001545 | 613193.44 | 4840229.29 | 167.78 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001546 | 613179.64 | 4840226.96 | 167.32 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001547 | 613165.65 | 4840226.55 | 167.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001548 | 613151.65 | 4840226.18 | 167.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001549 | 613137.66 | 4840225.81 | 167.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001550 | 613123.66 | 4840225.44 | 167.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001551 | 613109.67 | 4840225.07 | 166.99 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001552 | 613095.67 | 4840224.70 | 166.52 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001553 | 613081.68 | 4840224.32 | 166.06 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001554 | 613081.89 | 4840210.95 | 166.06 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001555 | 613088.22 | 4840202.99 | 166.27 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001556 | 613102.21 | 4840203.46 | 166.74 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001557 | 613116.20 | 4840203.94 | 167.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001558 | 613130.20 | 4840204.41 | 167.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001559 | 613144.19 | 4840204.88 | 167.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001560 | 613158.18 | 4840205.35 | 167.00 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |
| | L0001561 | 613172.17 | 4840205.83 | 167.07 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |

# Source Pathway - Source Inputs

**AERMOD**

| Line Source ID | Volume Source ID | X Coordinate [m] | Y Coordinate [m] | Base Elevation [m] | Release Height [m[ | Emission Rate [g/s] | Length of Side [m] | Building Height [m] | Initial Lateral Dimencion [m] | Initial Vertical Dimencion [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| LVS4 | L0001562 | 613174.95 | 4840216.91 | 167.17 | 3.40 | 0.00022 | 14.00 | Surface-Based | 6.51 | 3.16 |

# Source Pathway



## Building Downwash Information

Option not in use

## Emission Rate Units for Output

**For Concentration**

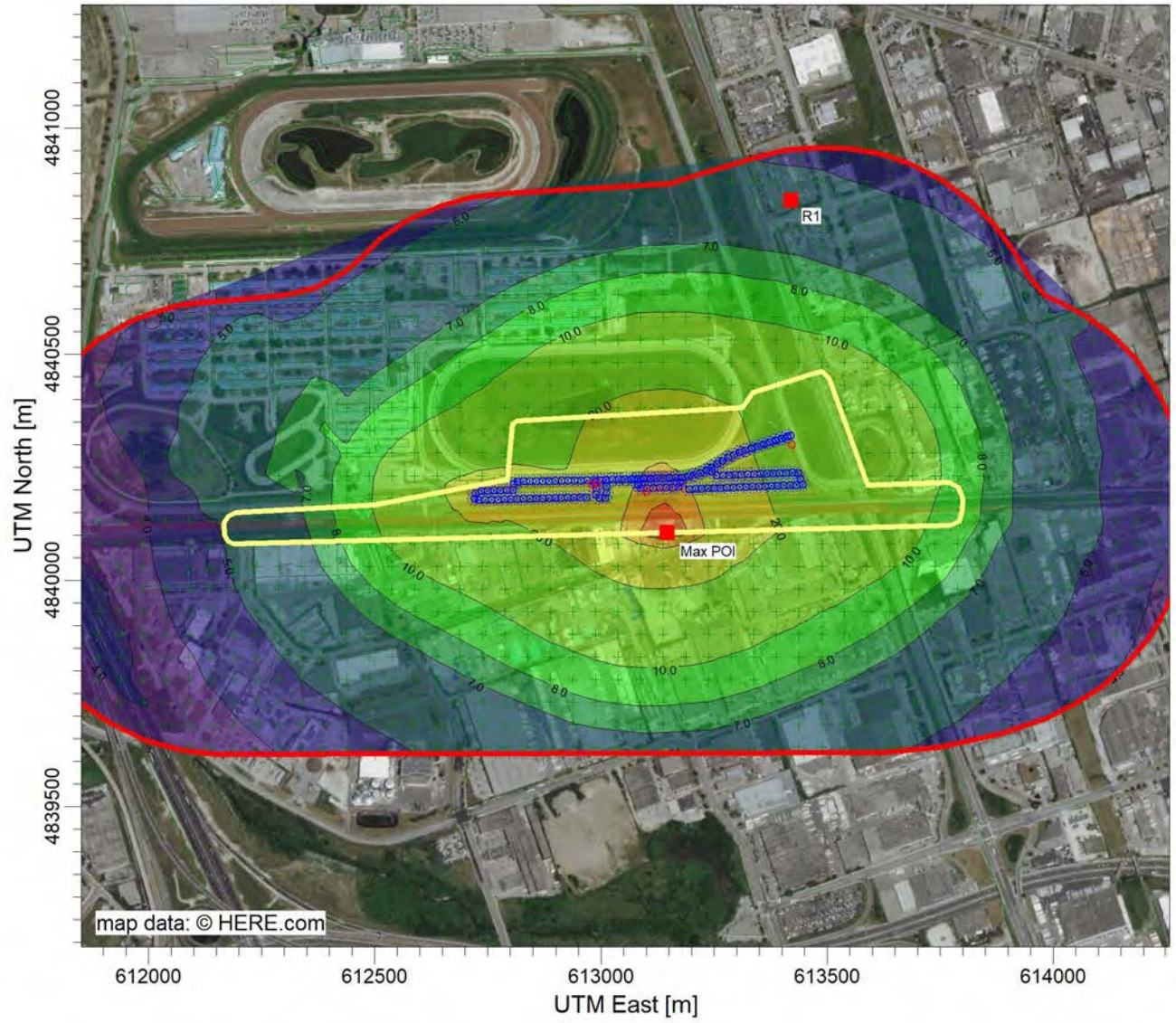
| | |
|---|---|
| Unit Factor: | 1E6 |
| Emission Unit Label: | GRAMS/SEC |
| Concentration Unit Label: | MICROGRAMS/M**3 |

## Source Groups

| Source Group ID: | List of Sources in Group (Source Range or Single Sources) |
|---|---|
| PPUDO | AS3<br>LVS3 |
| PL_W | AS2<br>LVS2 |
| PL_E | AS1<br>LVS1 |
| BUS | AS4<br>LVS4 |
| ALL | All Sources Included |

PROJECT TITLE:

**Appendix D - Figure 1**
**NOx 1-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

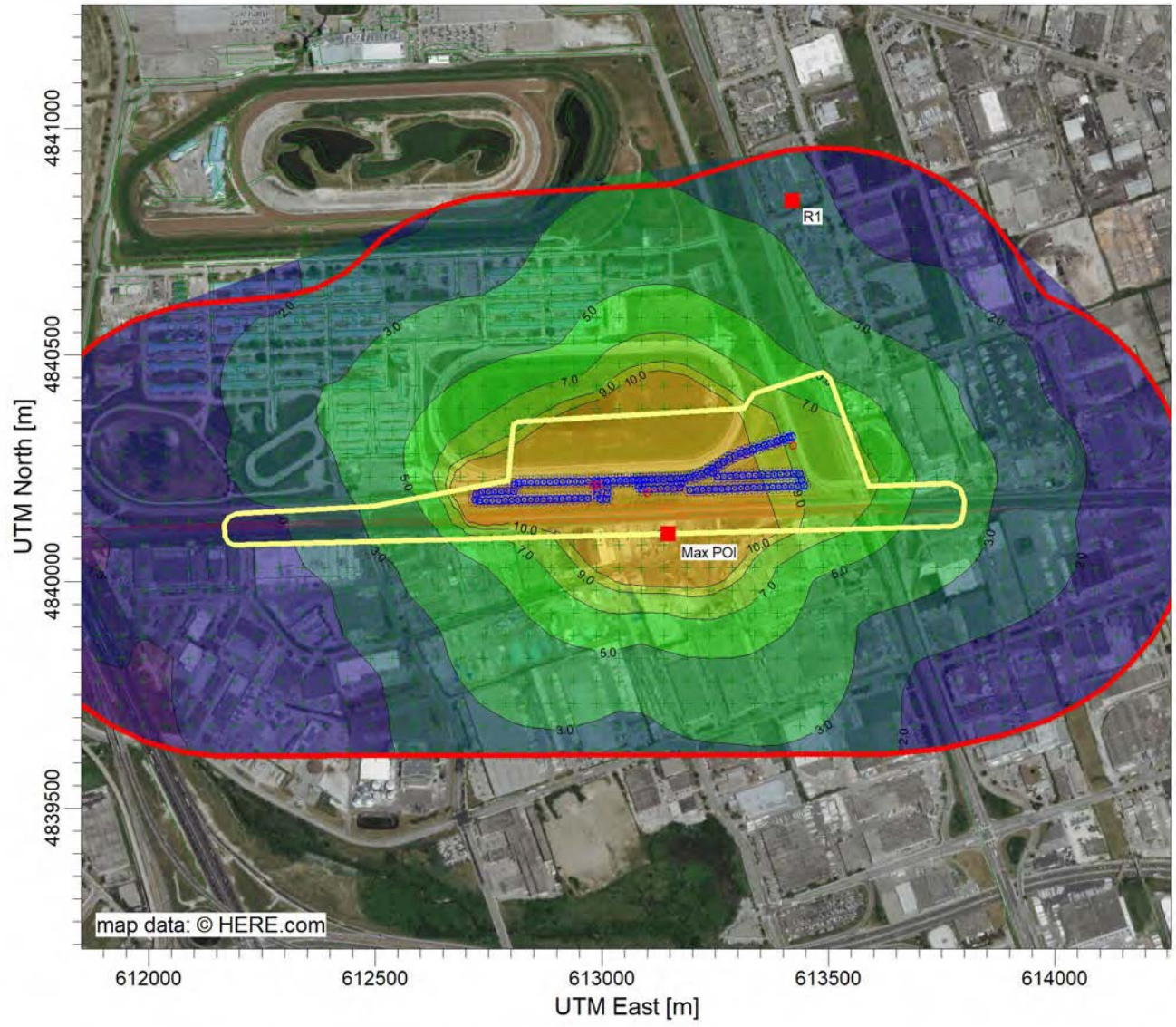
Max: 57.5 [ug/m^3] at (613146.47, 4840104.20)

2.8 4.0 5.0 7.0 8.0 10.0 20.0 40.0 50.0 57.5

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:15,137 — 0 — 0.5 km | |
| | MAX: **57.5 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 2**
**NOx 24-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

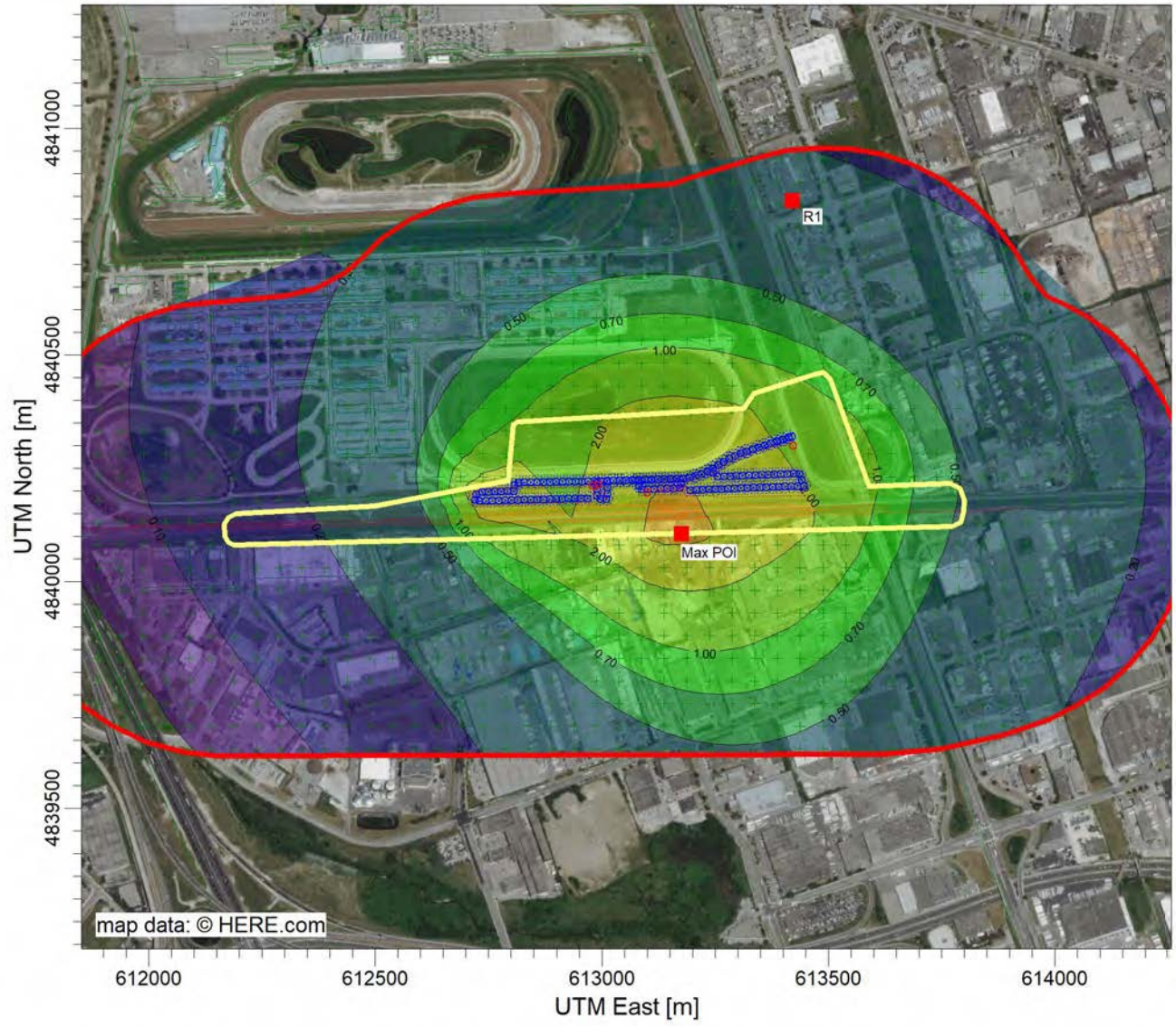
Max: 30.7 [ug/m^3] at (613146.47, 4840104.20)

0.7 1.0 2.0 3.0 5.0 7.0 9.0 10.0 30.0 30.7

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:15,137 — 0 — 0.5 km | |
| | MAX: **30.7 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 3**
**NOx Annual Isopleth**




PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

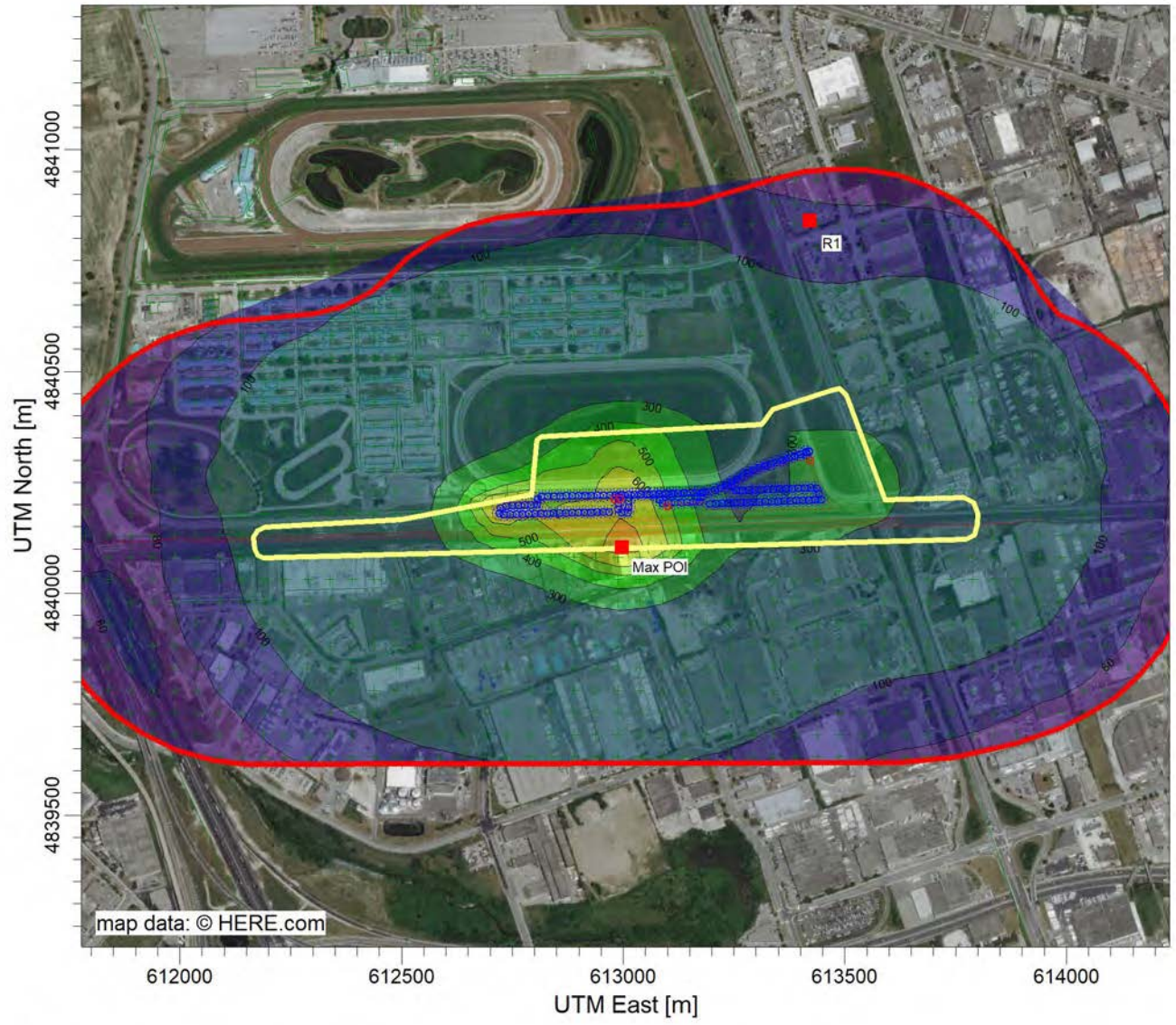
Max: 7.08 [ug/m^3] at (613176.38, 4840104.98)

0.07 0.10 0.20 0.50 0.70 1.00 2.00 5.00 7.00 7.08

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:15,137 — 0 — 0.5 km | |
| | MAX: **7.08 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 4**
**CO 1-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

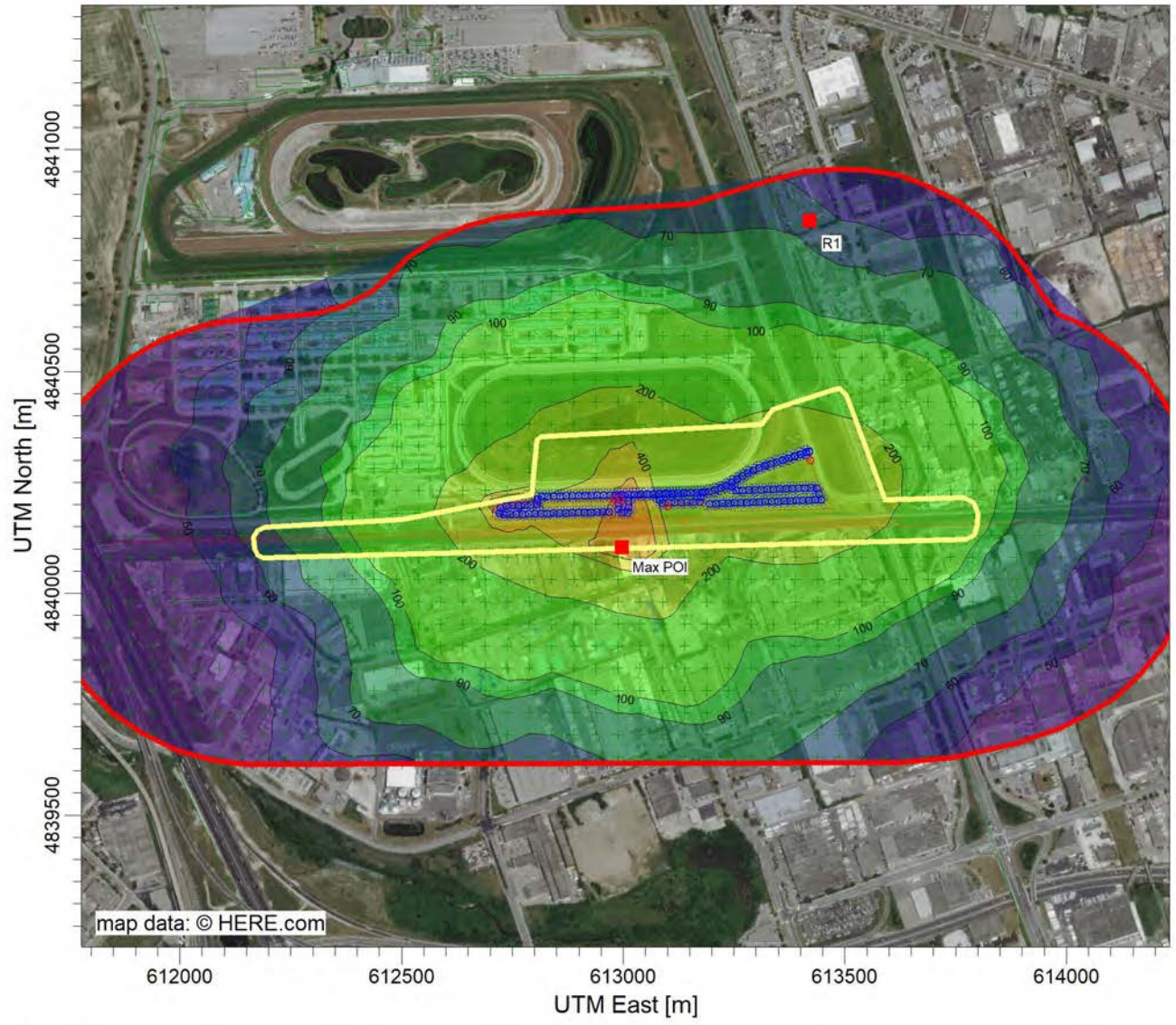
Max: 917 [ug/m^3] at (612996.93, 4840100.26)

57 80 100 300 400 500 600 800 900 917

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:15,442 — 0 — 0.5 km | |
| | MAX: **917 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 5**
**CO 8-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 8-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

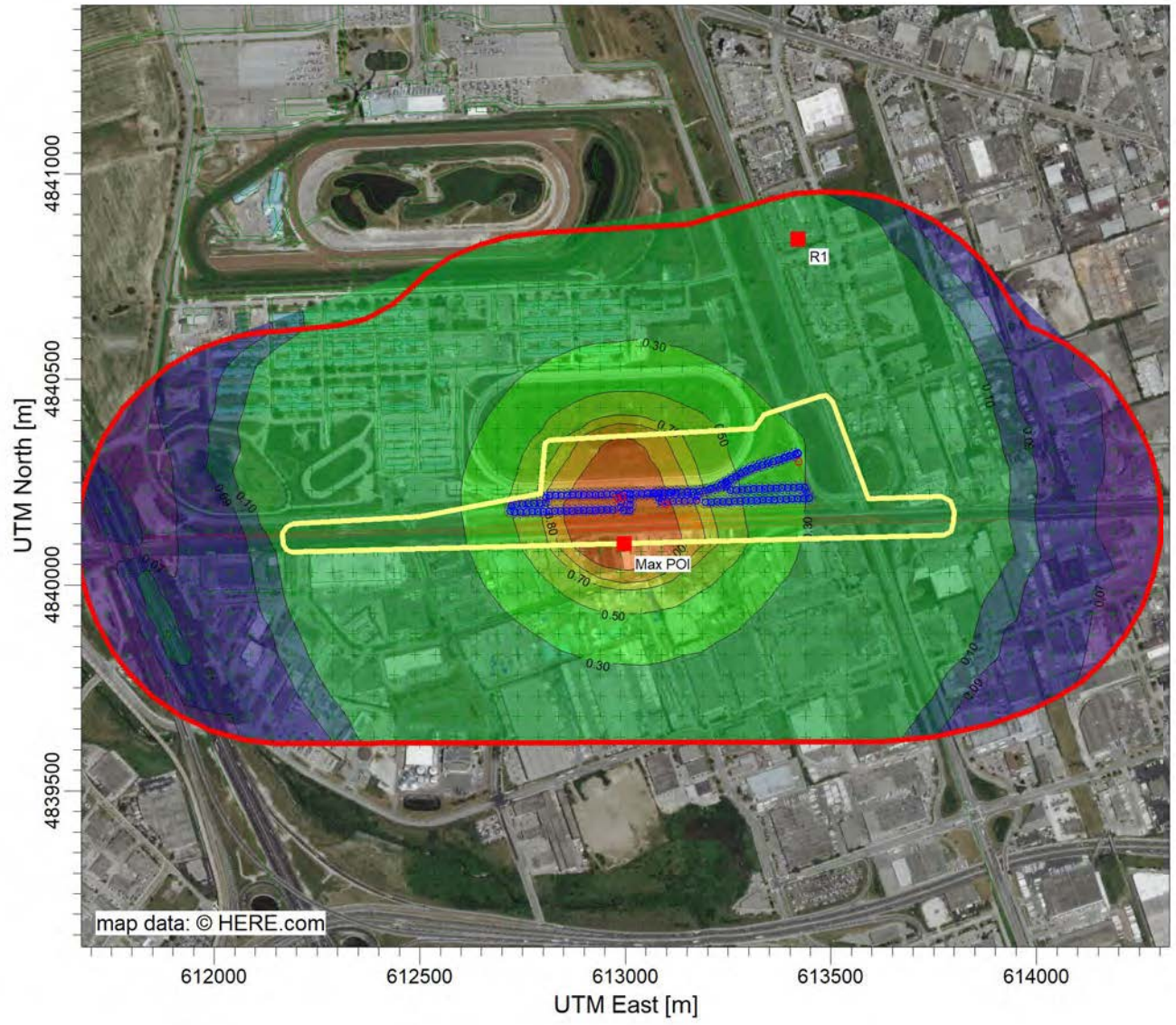
Max: 705 [ug/m^3] at (613026.84, 4840101.05)

26 50 60 70 90 100 200 400 500 700 705

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:15,442 — 0 — 0.5 km | |
| | MAX: **705 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 6**
**SO2 1-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

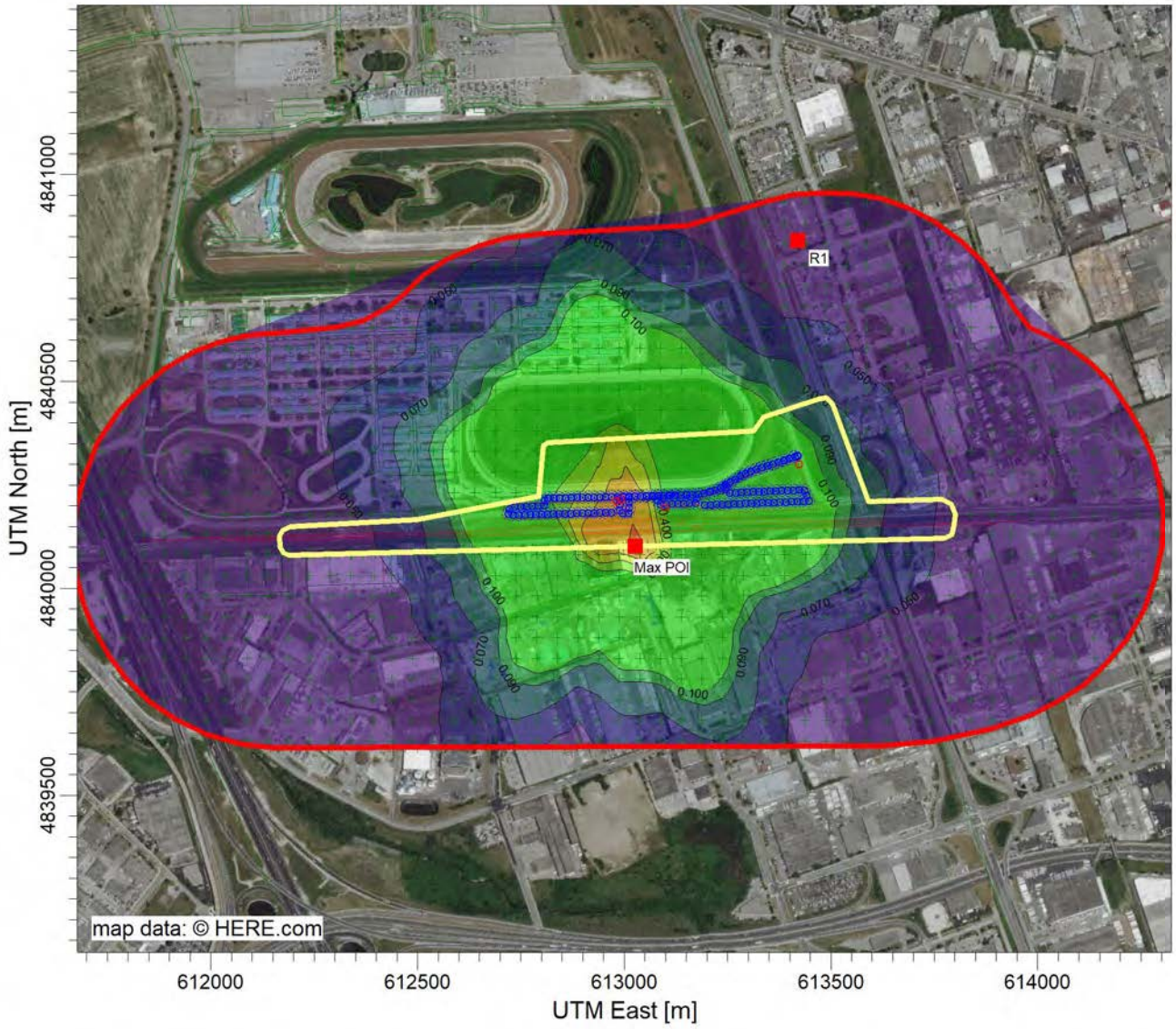
Max: 1.95 [ug/m^3] at (612996.93, 4840100.26)

0.05 0.07 0.09 0.10 0.30 0.50 0.70 0.80 1.00 1.95

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:16,649 (0 — 0.5 km) | |
| | MAX: **1.95 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 7**
**SO2 24-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

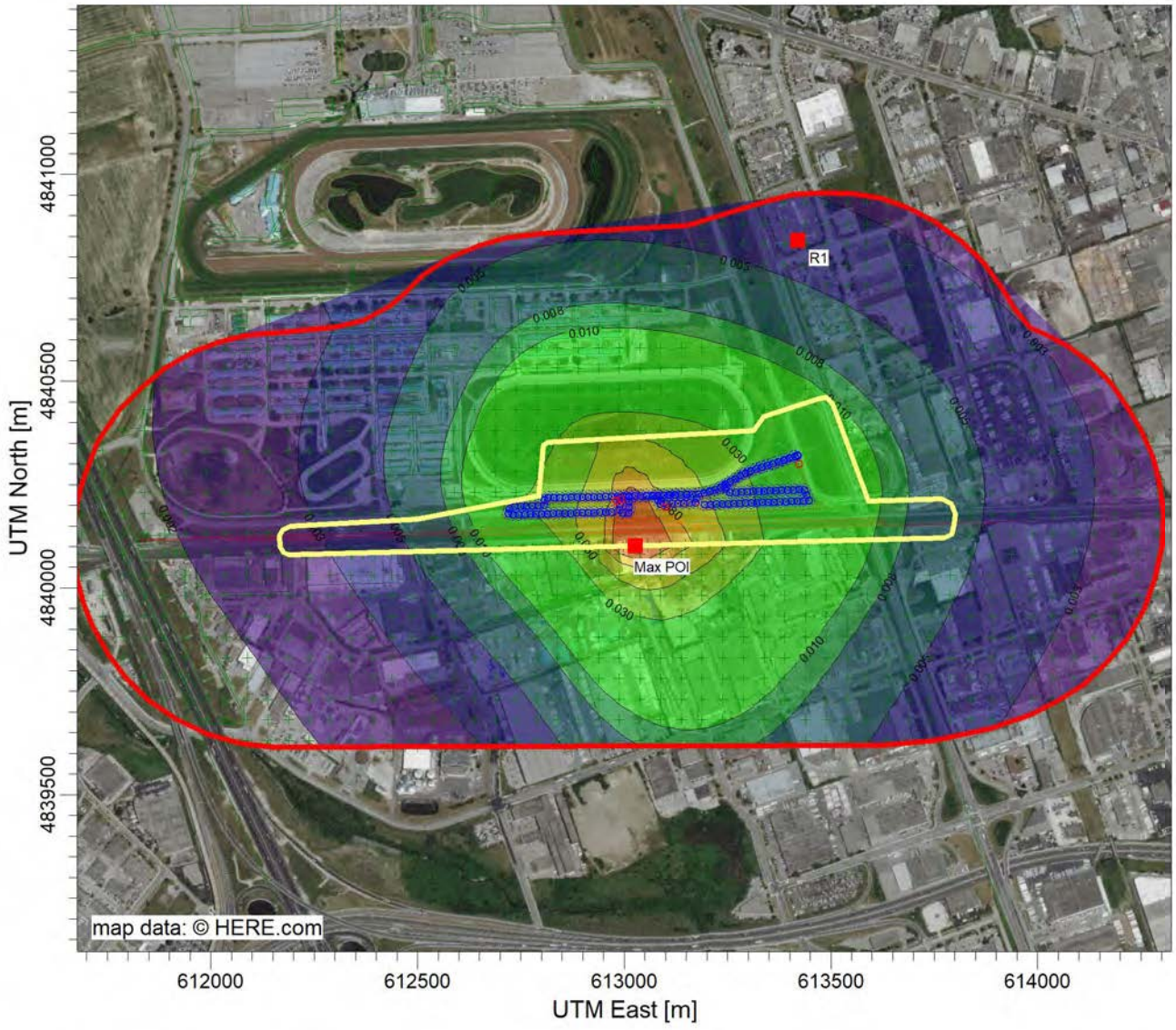
Max: 0.879 [ug/m^3] at (613026.84, 4840101.05)

0.013 0.050 0.070 0.090 0.100 0.400 0.500 0.600 0.800 0.879

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:16,647 — 0 — 0.5 km | |
| | MAX: **0.879 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 8**
**SO2 Annual Isopleth**




PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

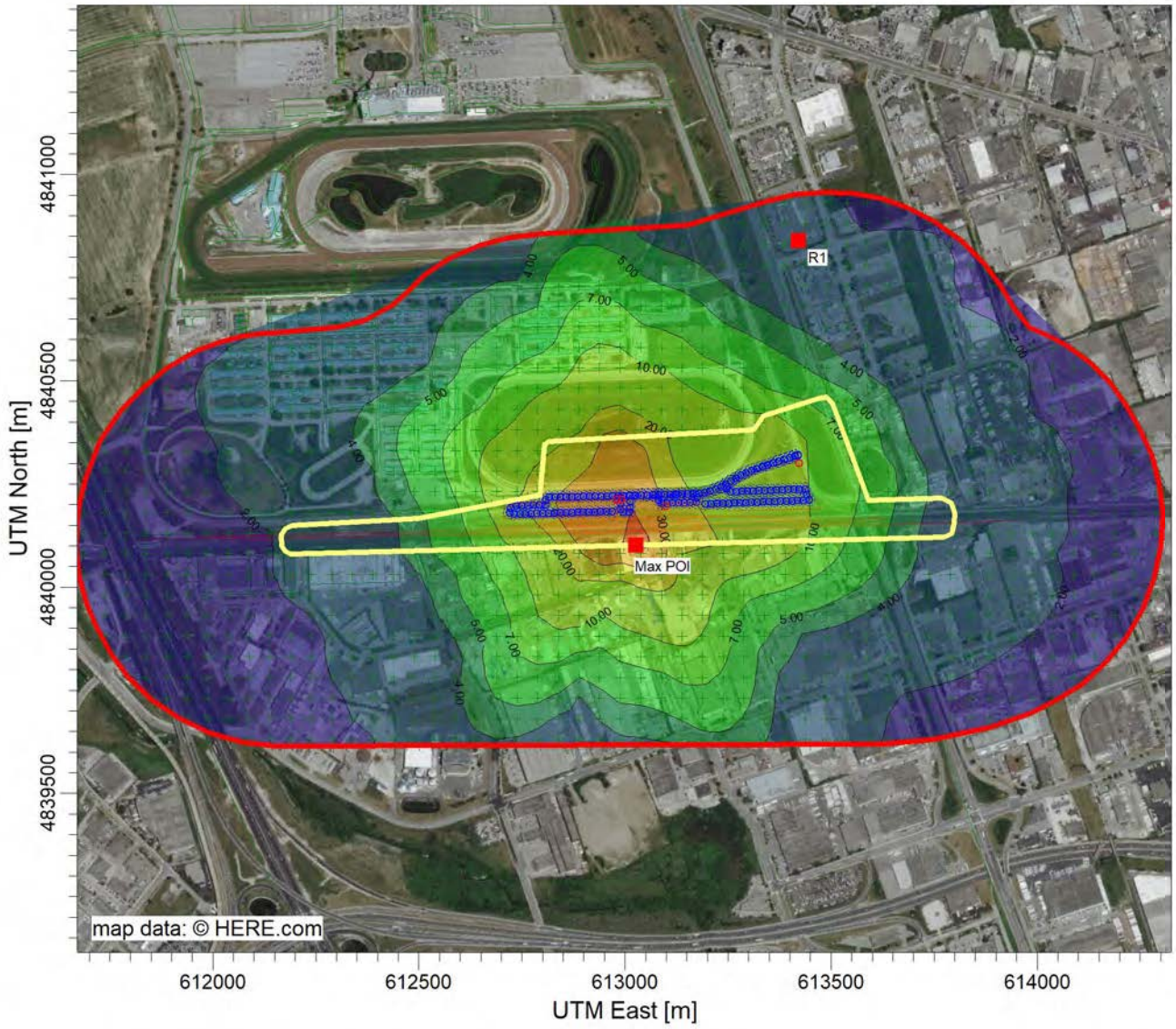
Max: 0.159 [ug/m^3] at (613026.84, 4840101.05)

0.002 0.003 0.005 0.008 0.010 0.030 0.050 0.080 0.100 0.159

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:16,647 (0 — 0.5 km) | |
| | MAX: **0.159 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 9**
**PM10 24-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

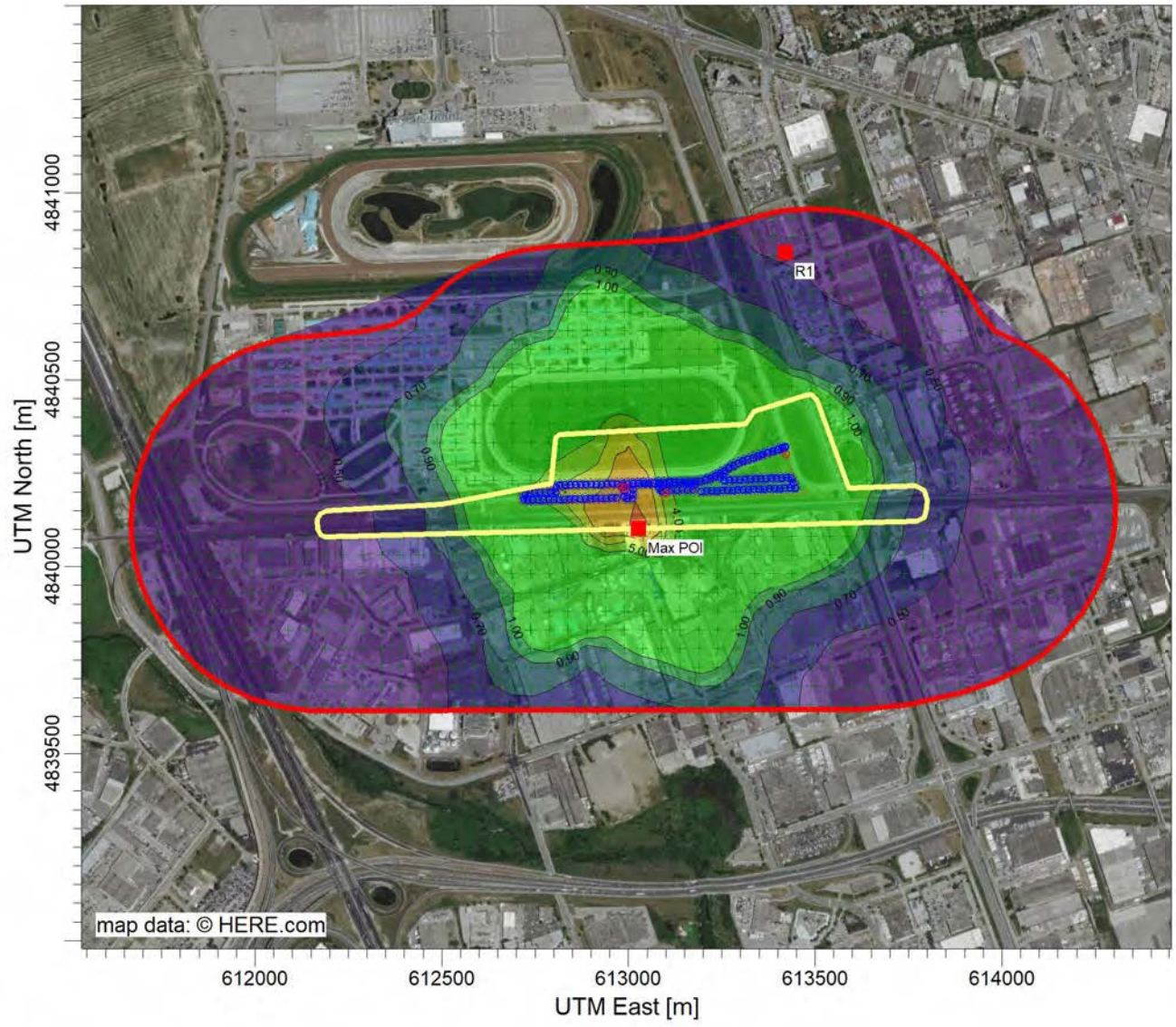
Max: 58.46 [ug/m^3] at (613026.84, 4840101.05)

0.95 1.00 2.00 4.00 5.00 7.00 10.00 20.00 30.00 50.00 58.46

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:16,697 — 0 — 0.5 km | |
| | MAX: **58.46 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 10**
**PM2.5 24-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

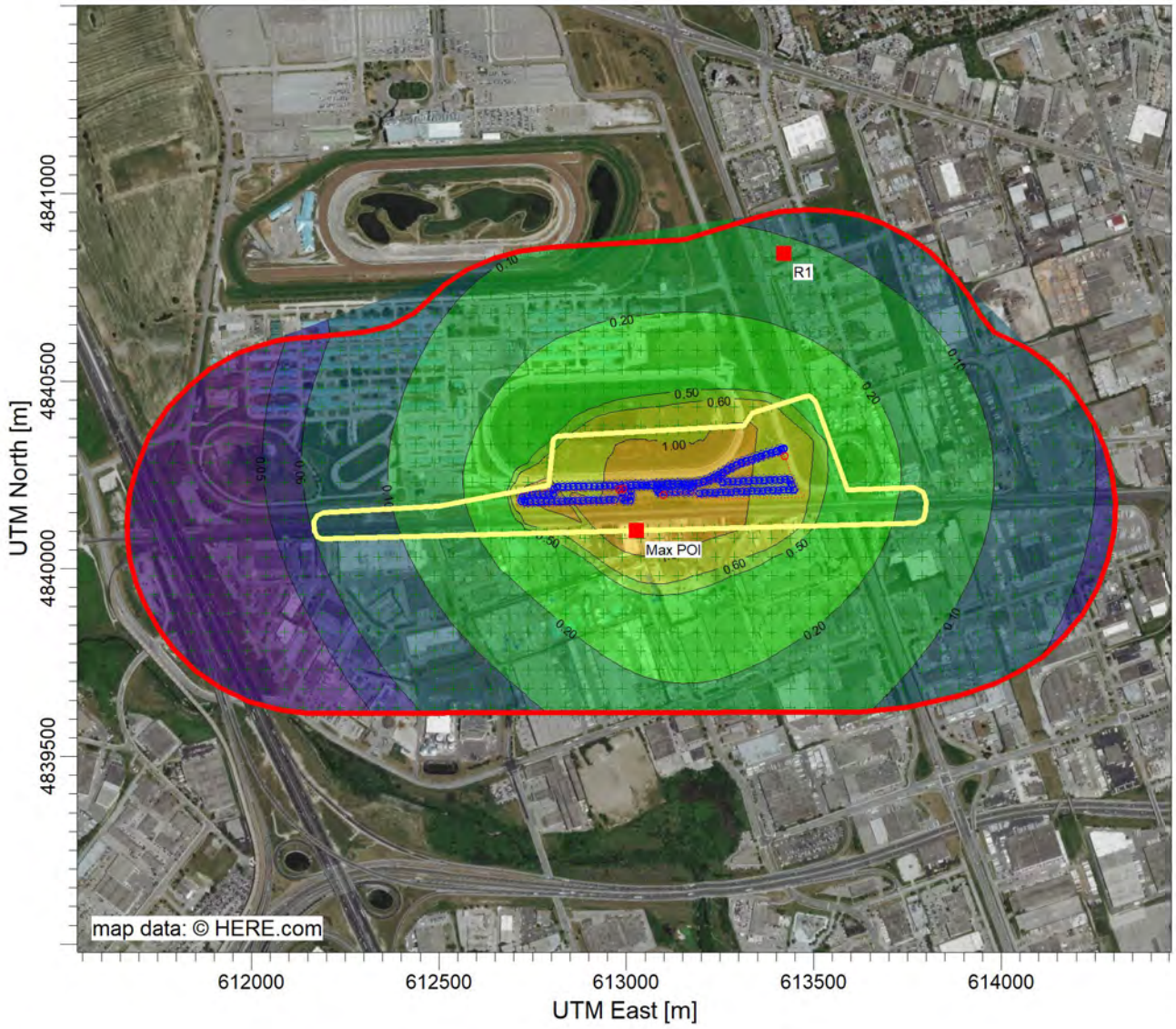
Max: 8.96 [ug/m^3] at (613026.84, 4840101.05)

0.17 0.50 0.70 0.90 1.00 4.00 5.00 6.00 8.00 8.96

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:18,357 — 0 — 0.5 km | |
| | MAX: **8.96 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 11**
**PM2.5 Annual Isopleth**




PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

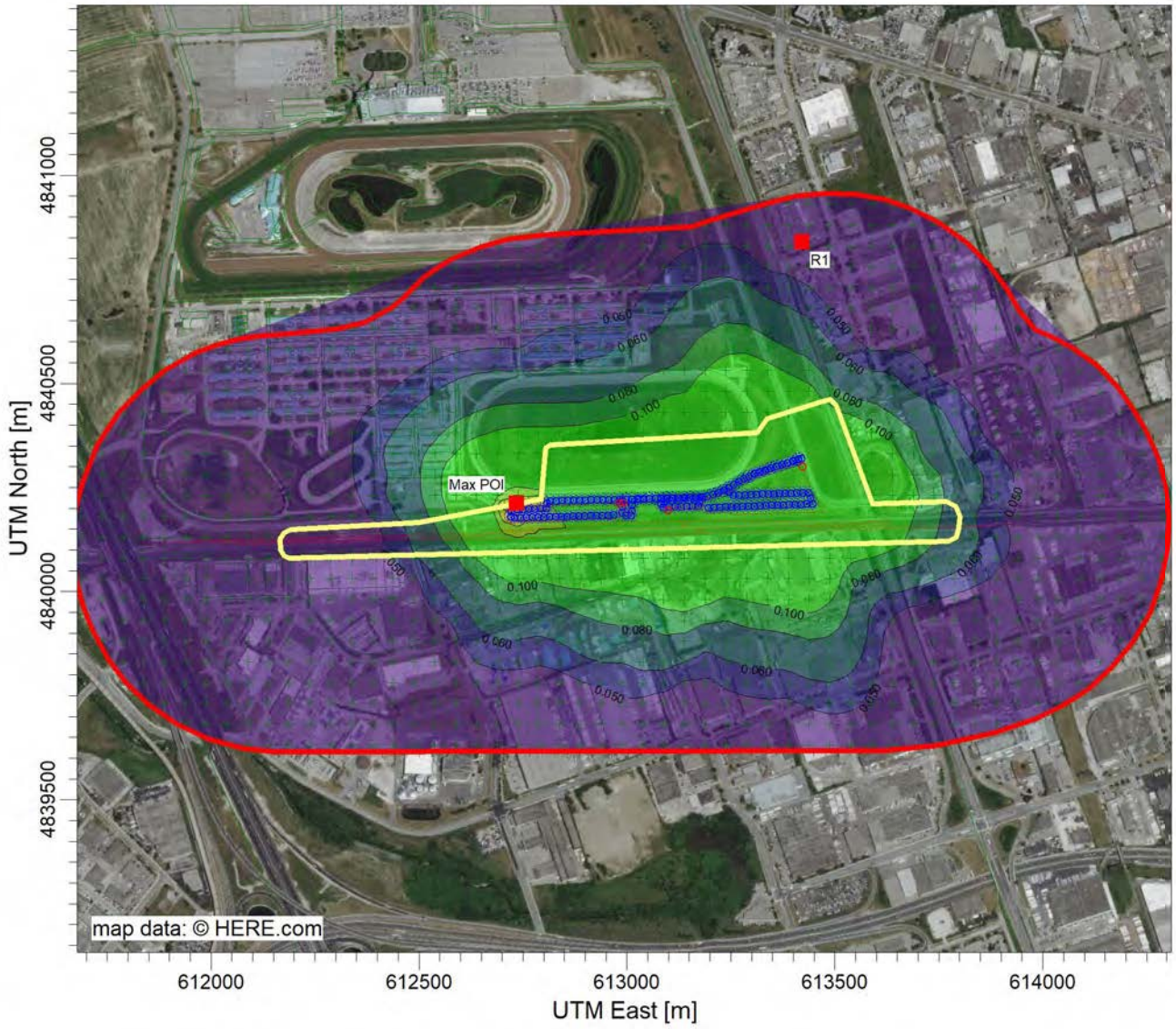
Max: 2.06 [ug/m^3] at (613026.84, 4840101.05)

0.03 0.05 0.06 0.10 0.20 0.50 0.60 1.00 2.00 2.06

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:18,357 — 0 — 0.5 km | |
| | MAX: **2.06 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 12**
**Acetaldehyde 24-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

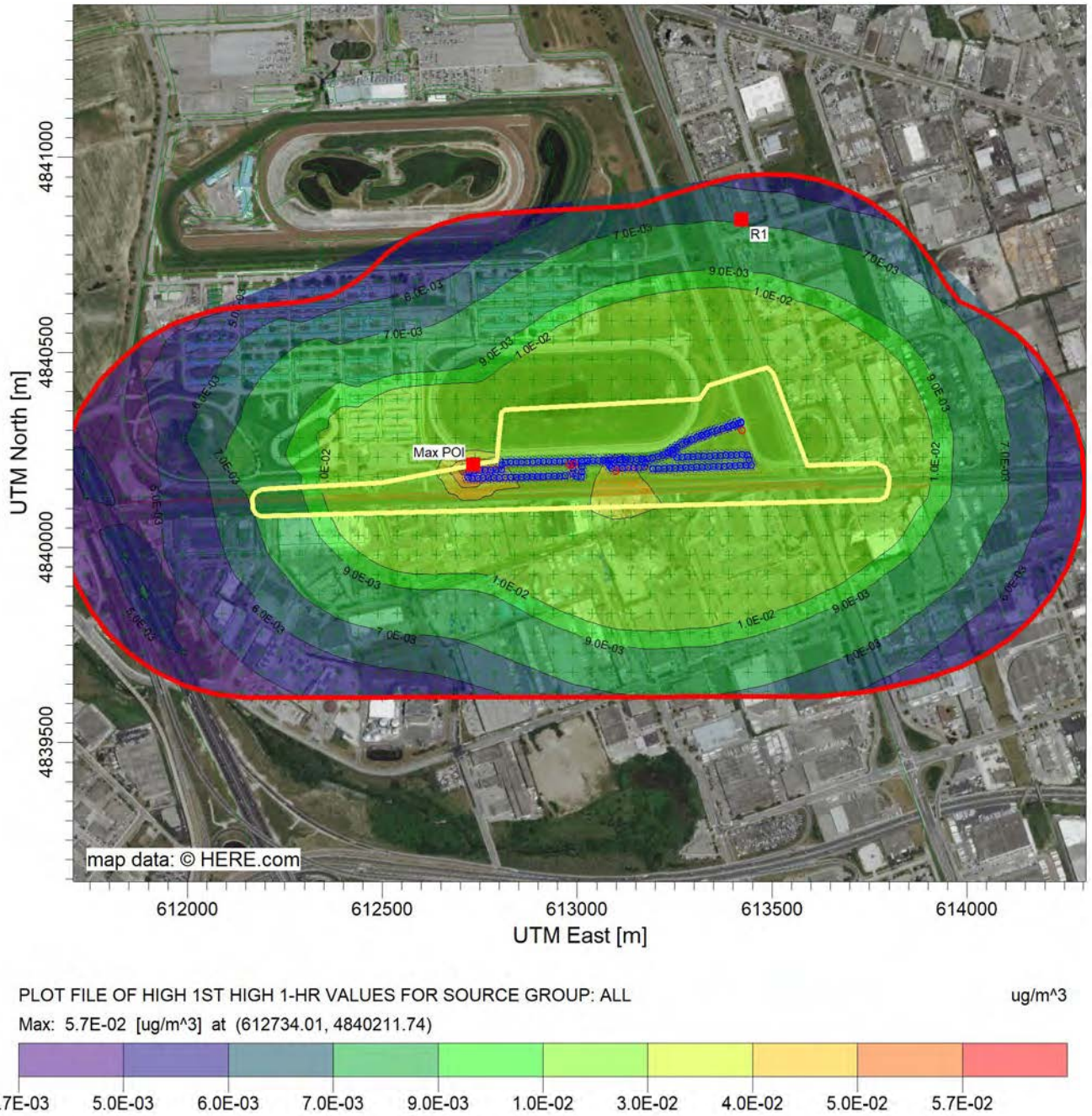
Max: 0.605 [ug/m^3] at (612734.01, 4840211.74)

0.013 0.050 0.060 0.080 0.100 0.300 0.400 0.500 0.600 0.605

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:16,548 — 0 — 0.5 km | |
| | MAX: **0.605 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 13**
**Acrolein 1-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

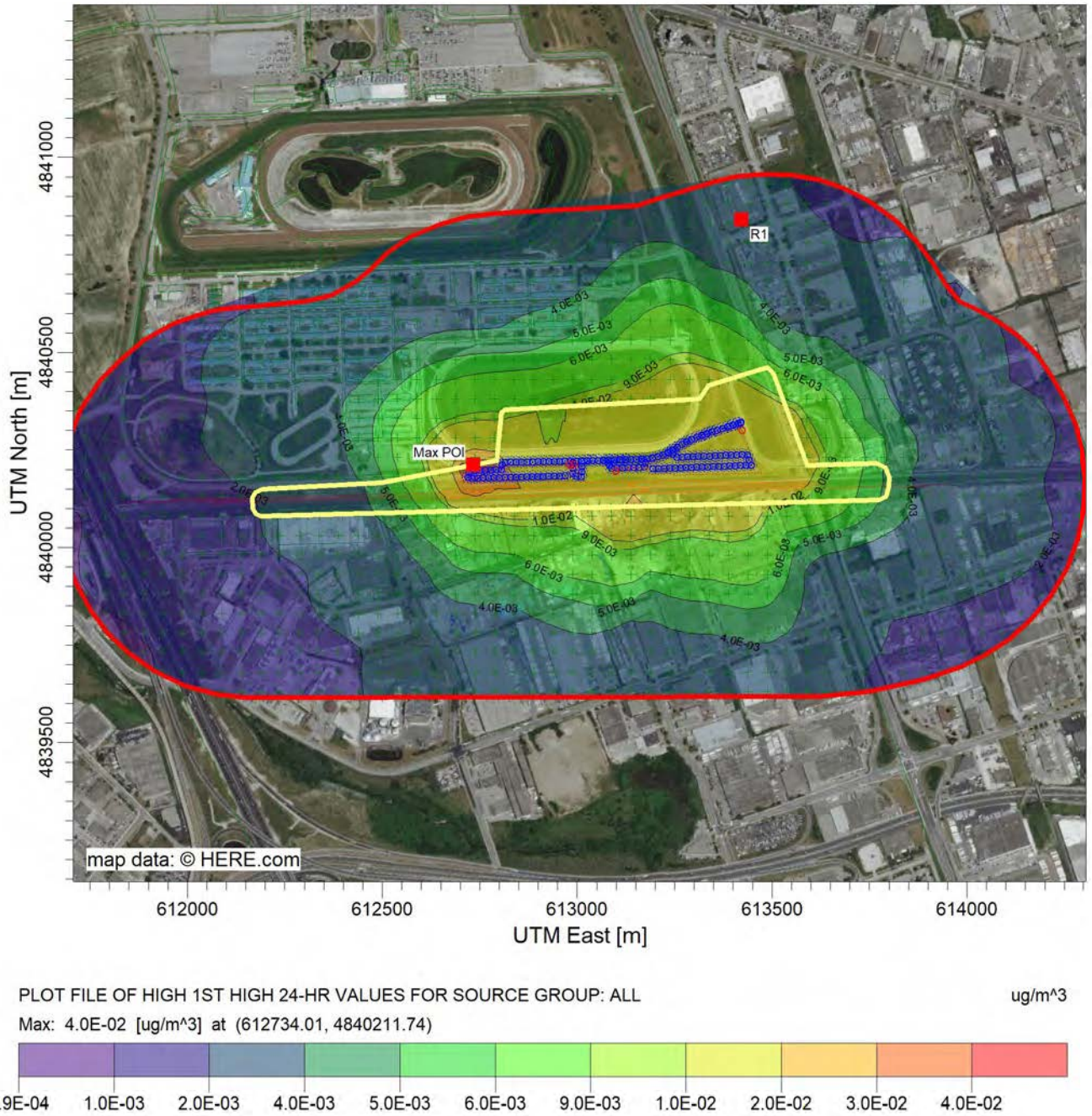
Max: 5.7E-02 [ug/m^3] at (612734.01, 4840211.74)

3.7E-03 5.0E-03 6.0E-03 7.0E-03 9.0E-03 1.0E-02 3.0E-02 4.0E-02 5.0E-02 5.7E-02

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:16,345 — 0 — 0.5 km | |
| | MAX: **5.7E-02 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 14**
**Acrolein 24-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL

ug/m^3

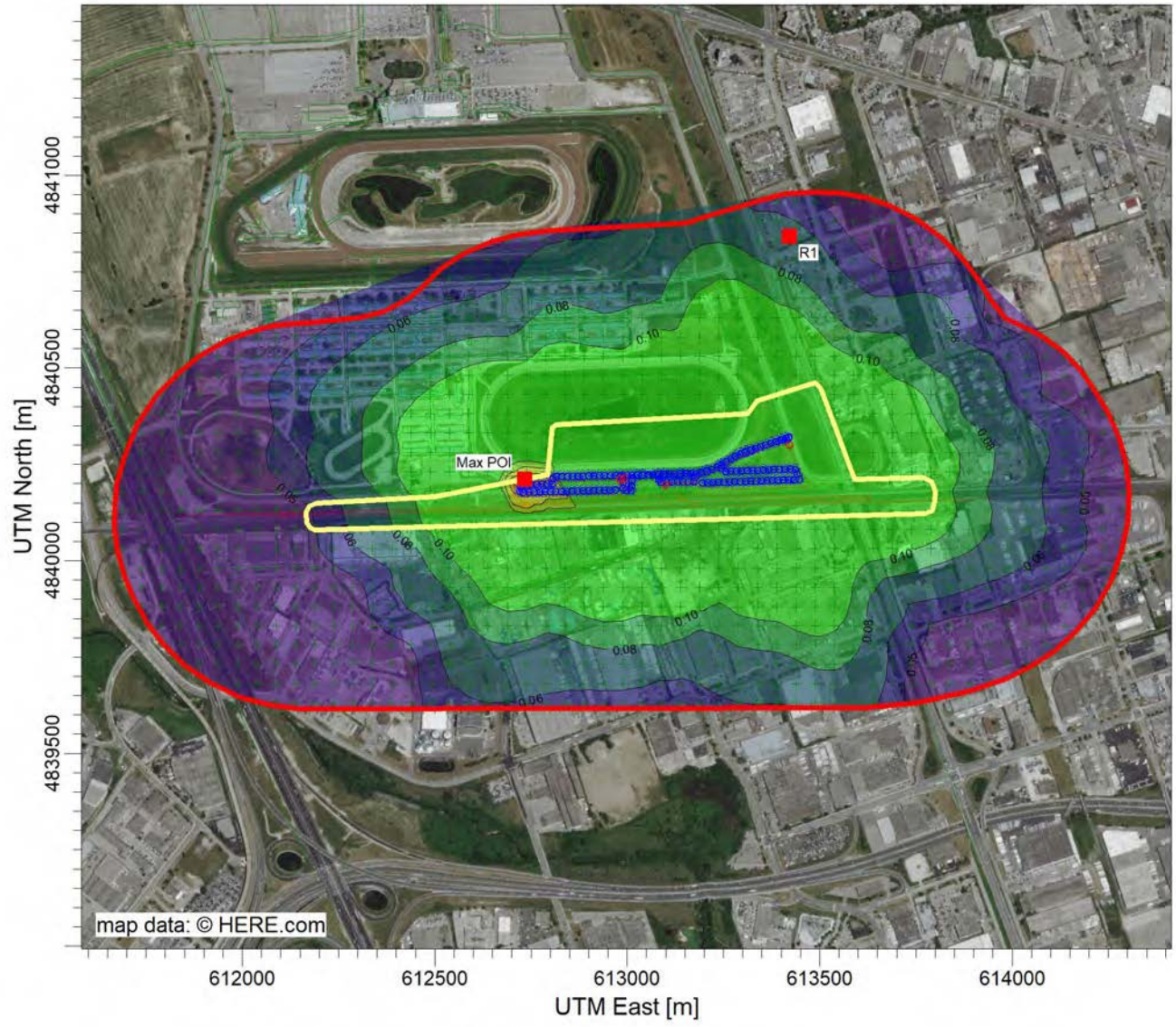
Max: 4.0E-02 [ug/m^3] at (612734.01, 4840211.74)

8.9E-04 1.0E-03 2.0E-03 4.0E-03 5.0E-03 6.0E-03 9.0E-03 1.0E-02 2.0E-02 3.0E-02 4.0E-02

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:16,345 (0 — 0.5 km) | |
| | MAX: **4.0E-02 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 15**
**Benzene 24-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

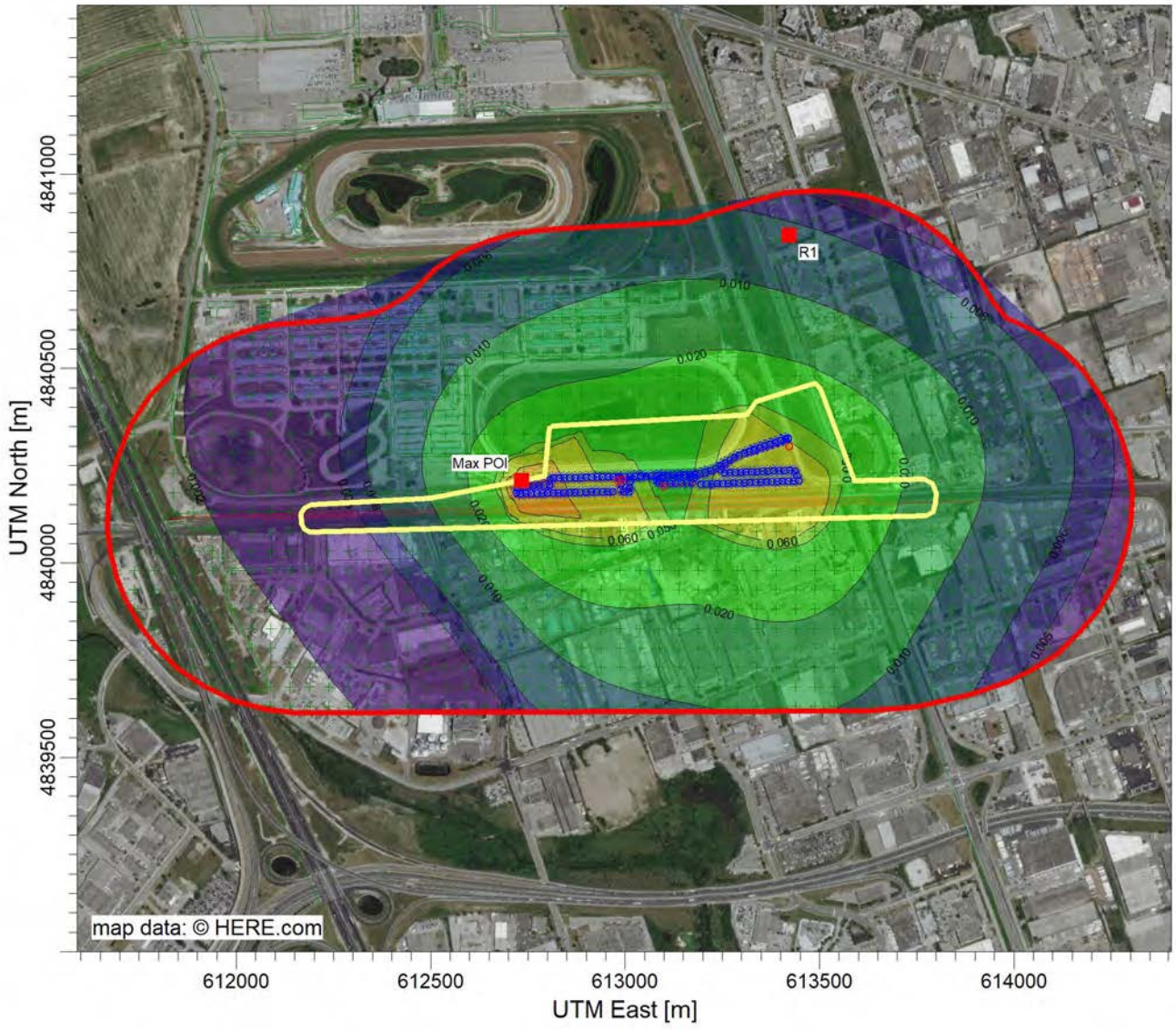
Max: 1.13 [ug/m^3] at (612734.01, 4840211.74)

0.02 0.05 0.06 0.08 0.10 0.50 0.60 0.80 1.00 1.13

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:17,809 — 0 — 0.5 km | |
| | MAX: **1.13 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 16**
**Benzene Annual Isopleth**




PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

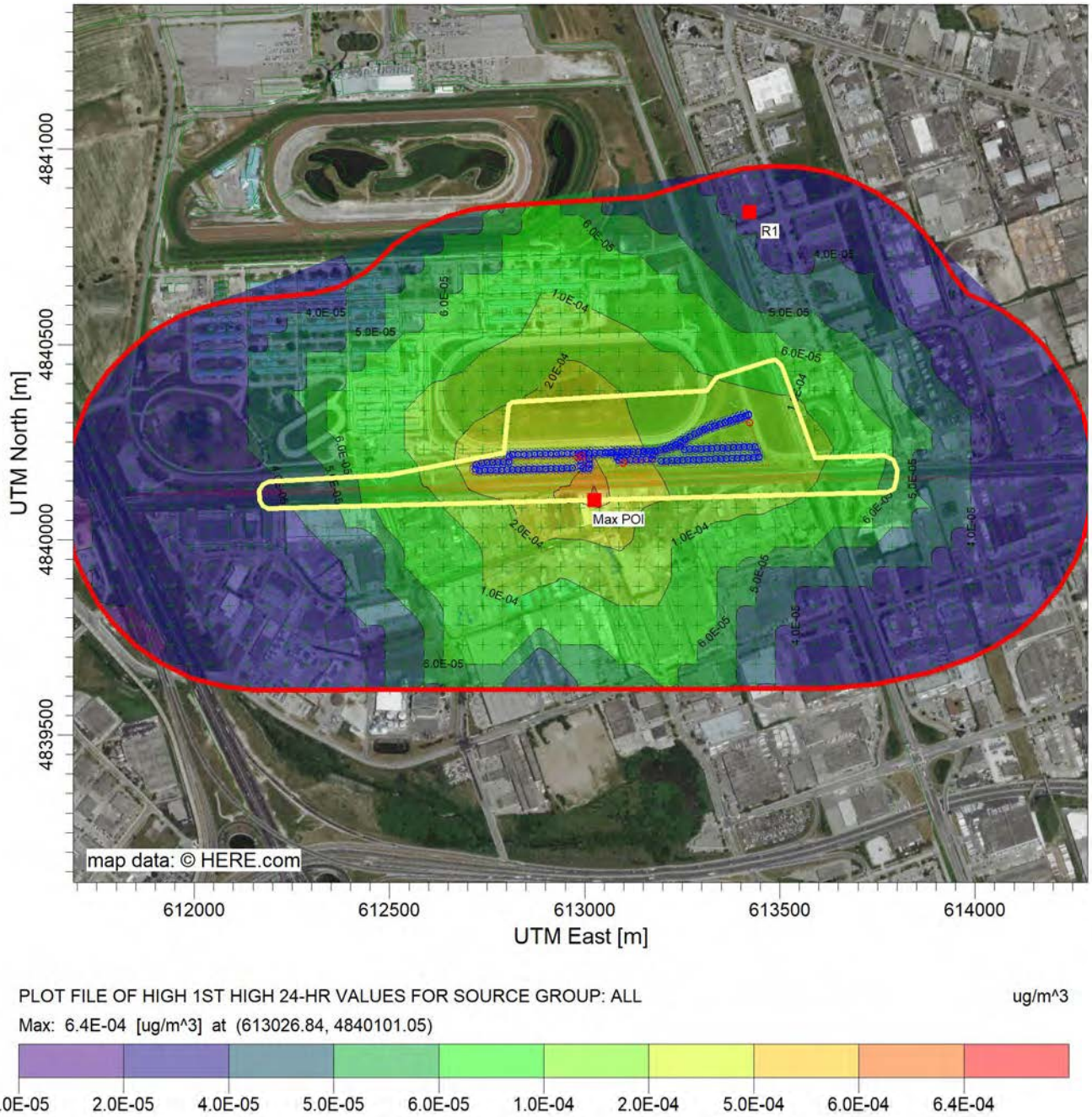
Max: 0.235 [ug/m^3] at (612763.12, 4840217.36)

0.002 0.005 0.006 0.010 0.020 0.050 0.060 0.100 0.200 0.235

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:17,701 — 0 — 0.5 km | |
| | MAX: **0.235 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

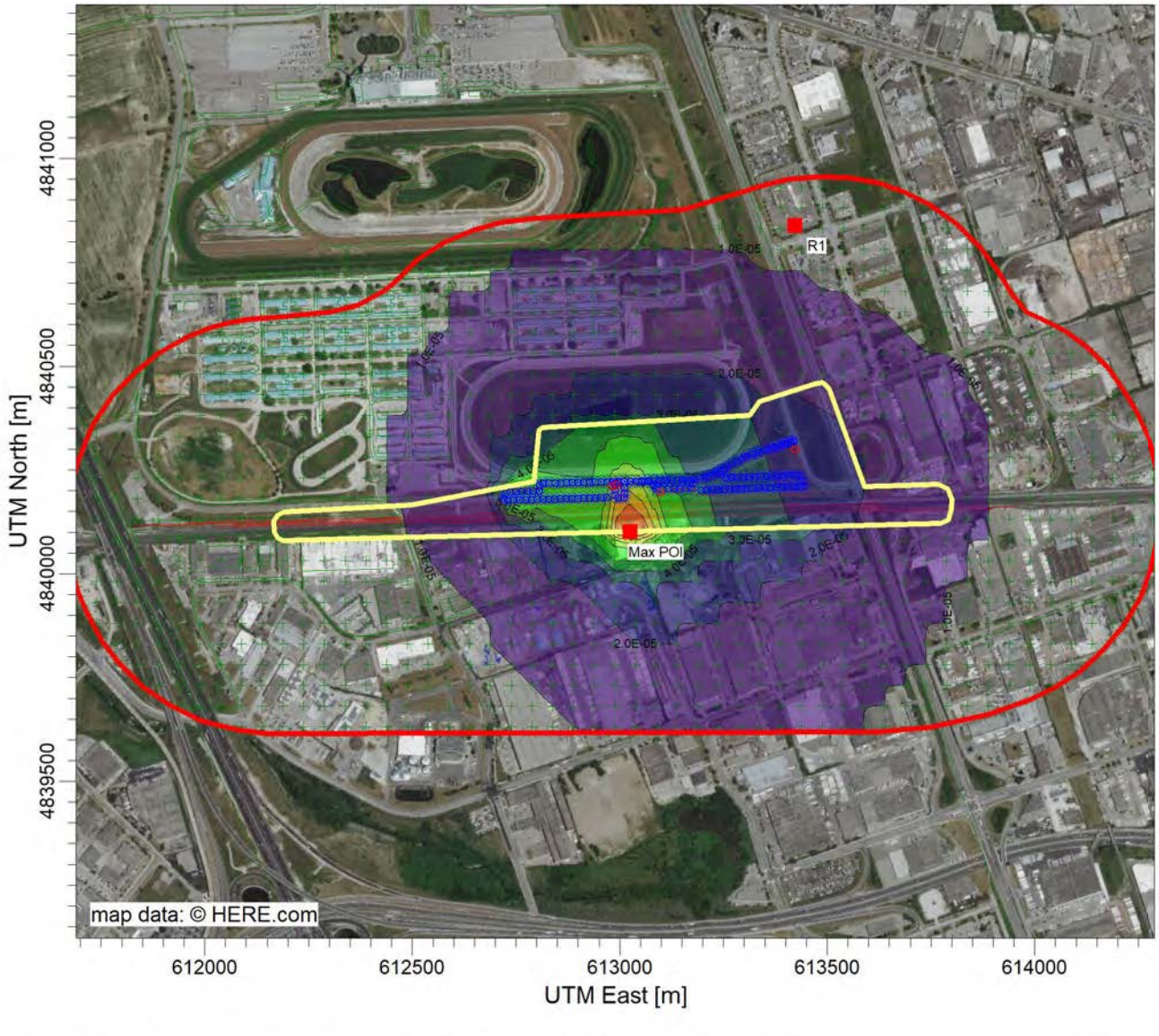
**Appendix D - Figure 17**
**Benzo(a)pyrene 24-Hour Isopleth**




| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:16,345 — 0 — 0.5 km | |
| | MAX: **6.4E-04 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 18**
**Benzo(a)pyrene Annual Isopleth**




PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

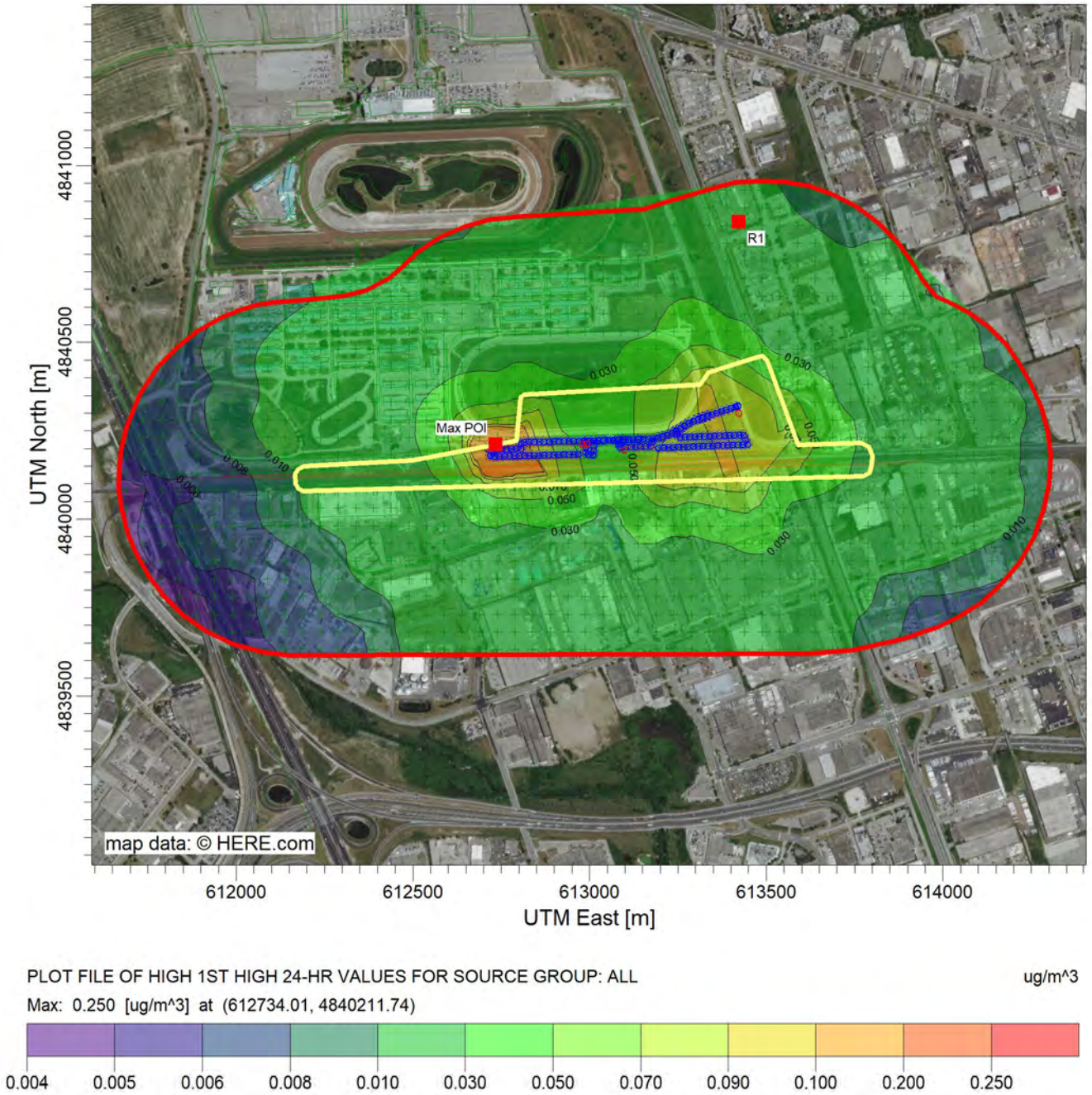
Max: 1.2E-04 [ug/m^3] at (613026.84, 4840101.05)

1.0E-05 2.0E-05 3.0E-05 4.0E-05 5.0E-05 7.0E-05 8.0E-05 9.0E-05 1.0E-04 1.2E-04

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:16,345 — 0 — 0.5 km | |
| | MAX: **1.2E-04 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 19**
**1,3-Butadiene 24-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

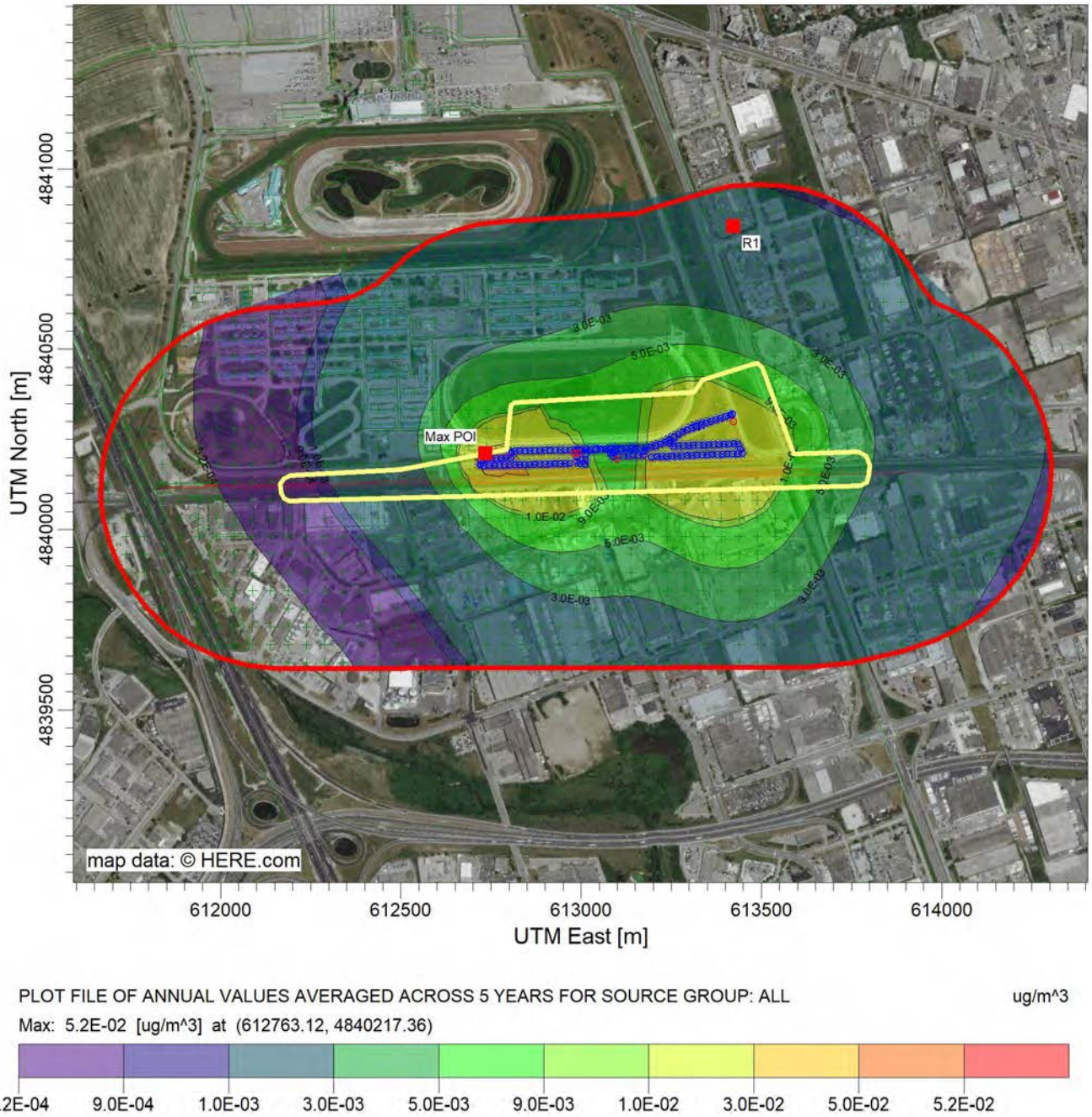
Max: 0.250 [ug/m^3] at (612734.01, 4840211.74)

0.004 0.005 0.006 0.008 0.010 0.030 0.050 0.070 0.090 0.100 0.200 0.250

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:17,701 (0 — 0.5 km) | |
| | MAX: **0.250 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 20**
**1,3-Butadiene Annual Isopleth**




PLOT FILE OF ANNUAL VALUES AVERAGED ACROSS 5 YEARS FOR SOURCE GROUP: ALL ug/m^3

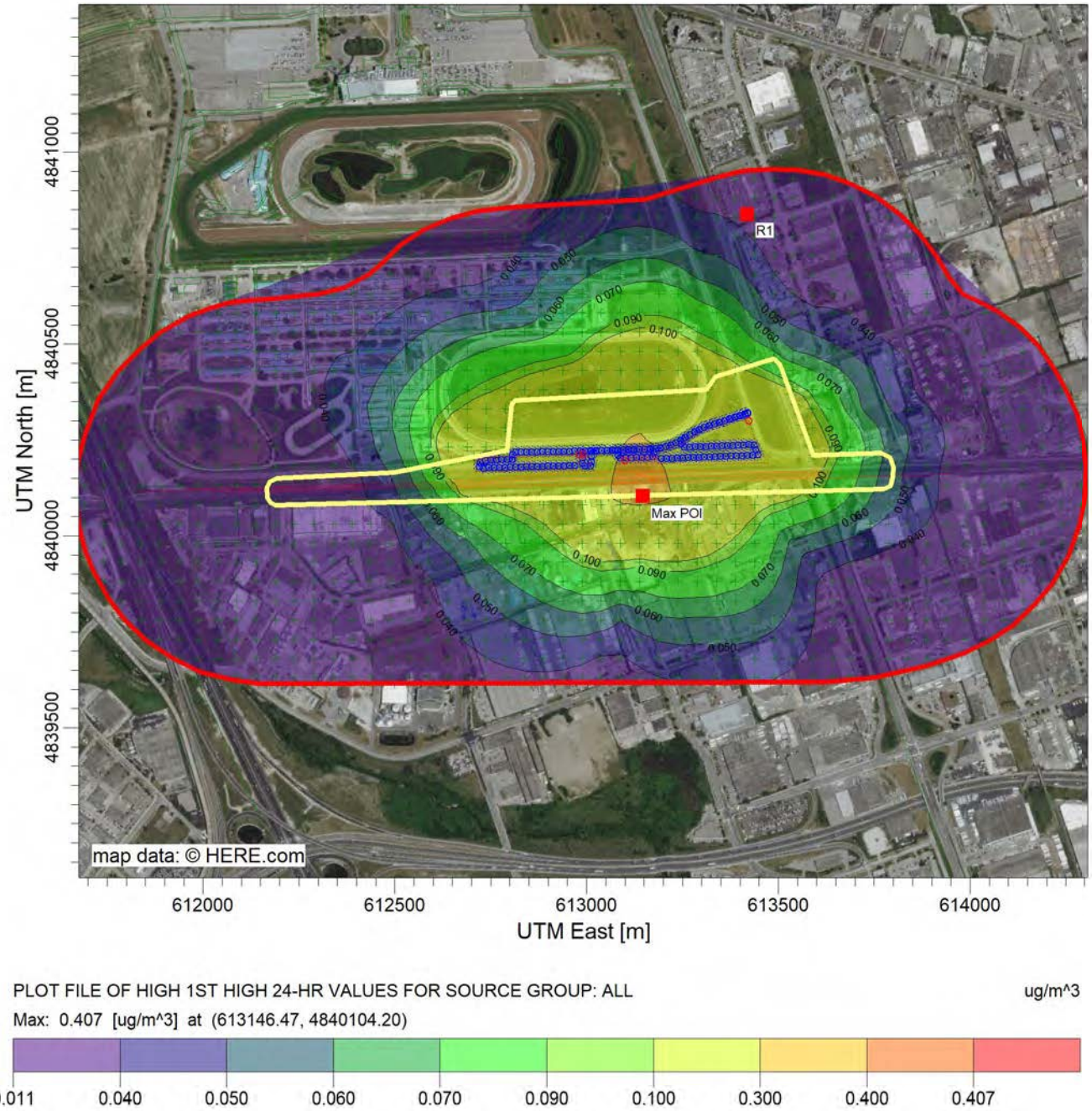
Max: 5.2E-02 [ug/m^3] at (612763.12, 4840217.36)

5.2E-04 9.0E-04 1.0E-03 3.0E-03 5.0E-03 9.0E-03 1.0E-02 3.0E-02 5.0E-02 5.2E-02

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:17,697 — 0 — 0.5 km | |
| | MAX: **5.2E-02 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

PROJECT TITLE:

**Appendix D - Figure 21**
**Formaldehyde 24-Hour Isopleth**




PLOT FILE OF HIGH 1ST HIGH 24-HR VALUES FOR SOURCE GROUP: ALL ug/m^3

Max: 0.407 [ug/m^3] at (613146.47, 4840104.20)

0.011 0.040 0.050 0.060 0.070 0.090 0.100 0.300 0.400 0.407

| | | | |
|---|---|---|---|
| COMMENTS: | SOURCES: **8** | COMPANY NAME: **AECOM Canada Ltd.** | |
| | RECEPTORS: **1416** | MODELER: **JR** | AECOM |
| | OUTPUT TYPE: **Concentration** | SCALE: 1:16,548 — 0 — 0.5 km | |
| | MAX: **0.407 ug/m^3** | DATE: **8/23/2019** | PROJECT NO.: **60606819** |

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