Air Quality Report

Rhode Island Long Range Transportation Plan 2035 Update

Prepared for **Rhode Island Department of Administration**
Statewide Planning Program
Providence, Rhode Island

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Acknowledgements

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- Rhode Island Department of Administration
- Rhode Island Department of Transportation
- Rhode Island Public Transit Authority
- Rhode Island Department of Environmental Management
- Federal Highway Administration
- Federal Transit Administration
- United States Environmental Protection Agency
- Vanasse Hangen Brustlin, Inc.

Many individuals from these agencies and firms also contributed with "behind the scenes" technical and administrative efforts, as well.

Executive Summary

As part of its transportation planning process, the State of Rhode Island has conducted an air quality analysis for the Long Range Transportation Plan 2035 Update. The air quality analysis included a statewide analysis for ozone. The results of the air quality analyses demonstrate that Rhode Island's Long Range Transportation Plan 2035 Update (LRTP Update) meets the federal transportation conformity requirements.

In response to the Federal Highway Administration (FHWA) and Environmental Protection Agency (EPA) guidance, Rhode Island has made substantial improvements in the calculation of on-road air quality emissions for Transportation Improvement Programs (TIPs) and Long Range Transportation Plans (Plans). The general modeling process involved two major inputs, traffic and emission factor data. The traffic data were obtained from the Rhode Island Statewide Model (RISM). The RISM was updated to include additional roadways, modeling zones, and current planning assumptions. Consistent with federal guidance, the model's traffic data were adjusted to account for the following factors, Highway Performance Monitoring System, seasonal adjustment for pollutants, and peak and off-peak period speed characteristics.

The vehicle emission factors were derived using the EPA's latest mobile source emission factor model, MOBILE 6.2, and reflect Rhode Island-specific conditions, such as the vehicle registration distribution and the statewide Inspection and Maintenance (I/M) Program. The traffic and emission factor data were calculated on a link-by-link basis in the EPA's Air Information Retrieval System (AIRS) format, which is consistent with air quality analyses for previous TIPs and Plans.

The results of the air quality analyses demonstrate that, statewide, the Long Range Transportation Plan 2035 Update emissions are below the 2009 Rhode Island State Implementation Plan's mobile source emission budgets of 22.75 tons per day (tpd) of volatile organic compounds and 25.29 tpd of oxides of nitrogen for all future years.

1.0 Background

1.1 Transportation Conformity Process

The 1990 Clean Air Act Amendments (CAAA) requires that states develop State Implementation Plans (SIPs) for improving and maintaining air quality. These plans state that evaluations must be made for the potential reduction of Volatile Organic Compounds (VOCs), Oxides of Nitrogen (NO_X), and Carbon Monoxide (CO). States must also submit several revisions of the SIP towards the finalization of the reduction evaluation. The requirements of the CAAA established significant new challenges to transportation and air quality modelers to improve traffic and emission estimates from on-road mobile sources. These challenges include projecting emission inventories for the SIP process and calculating the changes in emissions from Transportation Improvement Programs (TIPs) and Long Range Transportation Plans (Plans).

The transportation conformity of TIPs and Plans is required by the CAAA section 176(c) (42 U.S.C. 7506(c)) to ensure that federal funding and approval are given to highway and transit projects that are consistent with the air quality goals established by the Rhode Island SIP. Transportation Conformity means that highway and transit activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the National Ambient Air Quality Standards (NAAQS).

The 1990 CAAA established new requirements for transportation plans, programs, and projects. The EPA published a final rule in the November 24, 1993 Federal Register (58 FR 62188) that finalized the procedures to be followed by the United States Department of Transportation (USDOT) in determining conformity of transportation plans, programs, and projects. Most recently, FHWA and EPA issued on July 1, 2004 and May 6, 2005 conformity rule changes to the transportation planning and conformity processes, as a result of enactment of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). SAFETEA-LU and the CAAA emphasize that estimates of emissions from transportation plans and programs must be consistent with the SIP. This integration of transportation and air quality planning is intended to ensure that the mobile source emission budgets established in the SIP are enforced. The conformity regulations require that nonattainment and maintenance areas prepare air quality analyses for TIPs and Transportation Plans for key CAAA years. The CAAA define a "nonattainment area" as a locality where air pollution levels for one or more pollutants persistently exceed NAAQS. Maintenance areas were previously nonattainment areas, but now meet NAAQS.

Ozone is not emitted directly by mobile sources. It is formed in a complex chemical process that occurs when precursor emissions of VOCs and NO_X react in the presence of sunlight and heat. Because heat and sunlight are important factors in ozone formation, violations of the ozone standard occur almost exclusively during summer periods. While both pollutants (VOC and NO_X) play significant roles in ozone formation, previous EPA requirements have focused on reducing VOC as the most effective strategy to achieve the ozone standard. However, the CAAA requires that states develop SIPs that evaluate reductions in both VOC and NO_X emissions. The mobile source emission factors and traffic data used to calculate on-road mobile source emissions must be adjusted to represent specific conditions during the pollutant season, for ozone (typically summer). The State of Rhode Island is in attainment for CO and therefore CO was not evaluated as part of the conformity assessment.

The CAAA establish a new perspective in addressing ground-level ozone, one of the most significant air quality problems. One of the key features of the law is that it "classifies" nonattainment areas with similar pollution levels. The purpose of this classification system is to match pollution control requirements and attainment deadlines with the severity of an area's air quality problem. These classifications include moderate, serious, severe, and extreme. This system was designed to solve the nonattainment problems in the country by imposing a combination of prescribed measures dependent on the severity of the air quality problems, while giving the states ultimate responsibility and flexibility to solve the problem.

The entire state of Rhode Island has been classified as “Moderate” nonattainment area for ozone. This designation requires that the air quality analysis use the best available land use, traffic model, and emissions model to calculate yearly emission that can be compared to the SIP mobile source budgets. It should be noted that based upon the 2009, 2010, and 2011 ozone monitoring data, EPA is in the process of re-designating Rhode Island to attainment.

The CAAA require states to submit numerous SIP revisions, which must include measures to reduce air pollutants. Several of these SIP revisions specifically address the mobile source contribution to the ozone problem. On April 30, 2008, the Rhode Island Department of Environmental Management has submitted the Rhode Island 8-Hour Ozone Reasonable Further Progress SIP to EPA, which contains projected 2008 and 2009 inventories and requested 2008 and 2009 mobile source emissions budgets. Currently, the mobile source emission budgets are for 2009.

The most recent Rhode Island 2009 mobile source emission budgets are defined in the Rhode Island State Attainment Plan for the One-Hour Ozone National Ambient Air Quality Standard. The mobile source emission budgets for VOC and NO_X are shown in Table 1.

Table 1
Rhode Island Mobile Source Emission Budgets (Tons per Day)

Pollutant	2009 Budget
Volatile Organic Compounds	22.75
Nitrogen Oxides	25.29

2.0 Long Range Transportation Plan 2035 Update

The LRTP Update is part of Rhode Island's transportation planning process. The State Planning Council adopts the long range transportation plan as an element of the State Guide Plan. As projects in the long range plan advance to implementation, they are programmed in the Transportation Improvement Program (TIP) for study, design, and construction, provided they attain environmental permits and other necessary clearances.

The purpose of the LRTP Update is to set forth the state's long-term program for transportation projects and other transportation activities. The LRTP Update is prepared according to State Planning Council Rule IX, "Transportation Planning and Public Involvement Procedures." The Transportation Advisory Committee (TAC) works with the Statewide Planning Program in soliciting public input in developing a draft LRTP Update. Following public and agency review, the draft LRTP Update is approved by the State Planning Council, and forwarded to federal funding agencies; the FHWA and the FTA.

Prior to final approval, projects in the LRTP Update are subjected to the transportation air quality conformity analysis. Details on all projects included in the current or draft LRTP Update are reviewed with state agencies (RIDOT and RIDEM), to recommend which "regionally significant" projects should be included in the air quality analysis. The regionally significant projects and their estimated year of completion that were included in the "Build" condition of the conformity modeling process for the LRTP 2035 are presented in Table 2. The estimated year of completion was used to determine which air quality years that the projects traffic impacts were to occur.

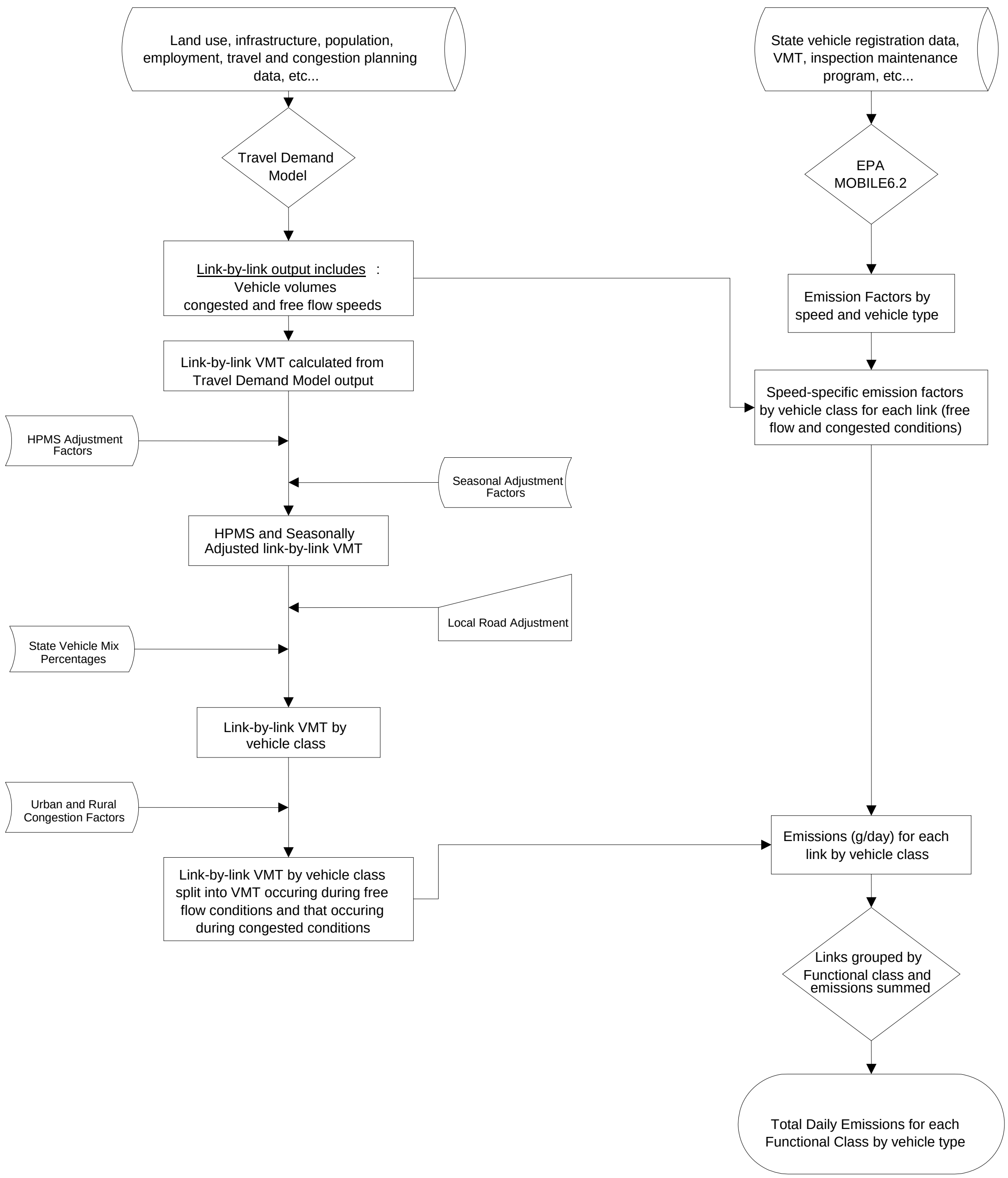
Table 2
Long Range Transportation Plan 2035 Update Roadway Projects

Year in Service	Project
2013	Waterfront Drive, South of Dexter Road
2014	Sakonnet River Bridge
2015	Reconstruction of Two Mile Corner
2016	Apponaug Bypass
2016	Pell Bridge Ramps
2018	Route 403 Ramps (Remaining 3 ramps)
2020	Main Street Conversion
2020	Route 10 North to Route 6 West
2020	Route 10/Route 6
2020	Route 116/ 146 Reconstruction
2025	Route 95/ Route 4
2025	I-195 Interchange Taunton and Warren Avenue
2035	Route 1/Route 4 Bypasses
2035	Route 146 Sayles Hill Road Intersection

3.0 General Modeling Process

The general modeling process utilized involved two major inputs: link-by-link traffic data from the Rhode Island Statewide Model (RISM) and emission factors derived using the EPA's MOBILE 6.2 emission factor model. The link-by-link traffic data includes daily vehicle volumes as well as free flow and congested speeds over each link. The vehicle volumes are combined with the link lengths in order to determine the daily vehicle miles traveled (VMT) over the link. The VMT is then multiplied by the appropriate speed-specific emission factors in order to arrive at the total daily emissions for each link. The final step is to group the links by functional class in order to arrive at the total daily emissions for each functional class. Figure 1 presents the general modeling process used.

Figure 1
General Modeling Process



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4.0 Traffic Data Assumptions

The following outlines the assumptions made for the traffic data that was used for the Long Range Transportation Plan 2035 Update. This includes assumption made in the travel demand model; the most recent planning assumptions for population, employment, and travel; the years of analysis; and finally the traffic adjustments implemented related to HPMS, seasonal adjustment factors, and congestion factors.

4.1 Travel Demand Model

Link-based travel demand models were used as the source of travel forecasts for determining on-road mobile emissions in the LRTP Update air quality analyses. The models are capable of providing vehicle-miles-traveled (VMT) by functional classification, speed, direction, and time-of-day, resulting in more refined estimates than possible using the Highway Performance Monitoring System (HPMS). The application of a travel demand model to determine VMT also has the advantage of simulating LRTP Update projects that are not in the existing highway system.

The Rhode Island Department of Administration (DOA) updated the Rhode Island Statewide Model (RISM) in 2009. These updates include improving the roadway network, incorporating 2000 Census land use data (population, household, and employment) and updating the future land use data (population, household, and employment) based upon projections from DOA.

For the purpose of developing VMT estimates, the RISM was calibrated to current traffic conditions. A key calibration task was a comparison, by functional classification, to the HPMS data. Population and employment data were also updated based upon data supplied by the 2000 Census, the Massachusetts Statewide Model, the Connecticut Statewide Model, and forecasts from the DOA. Employment forecasts were developed at the census tract level and population forecasts were developed at the town level. These data were allocated to reflect growth in land use activity and its location in the state.

The RISM model was built on a TransCAD software platform, version 2.0. There have been several new versions of the TransCAD software since then, which required conversion of data and a recording of all modeling procedures. The RISM model is now current in software version 4.8, and capable of generating VMT that are post-processed for input to the emissions model MOBILE 6.2.

The model features and characteristics follow:

- Network - the link-based network was built from the U.S. Census Topologically Integrated Geographic Encoding and Reference (TIGER) file. The network was recently updated to be geographically consistent with the official Rhode Island roadway layer. The LRTP projects were also coded into the network.

- Census Geography – As part of the latest model update, the traffic analysis zones (TAZs) are based on 2000 Census block group or smaller for Rhode Island, Connecticut, and Massachusetts. To improve model accuracy, particularly at external stations, communities surrounding Rhode Island were included in the TAZ structure. There are a total of 904 TAZs in Rhode Island, 286 TAZs in Massachusetts, and 67 TAZs in Connecticut.
- Socioeconomic Database - The land use was updated to match the 2000 Census data for population and households. In addition, existing 2000 Census tract employment numbers were incorporated into the current TAZ structure.
- Trip Generation - trip productions and attractions were estimated for TAZs by applying person trip rates from the 1999 National Cooperative Highway Research Program, Report 365: Travel Estimation Techniques for Urban Planning (NCHRP Report 365). This is an updated version of the 1989 National Cooperative Highway Research Program, Report 187: Quick Response Urban Travel Estimation Techniques and Transferable Parameters, (NCHRP Report 187). The NCHRP Report 365 differs considerably from NCHRP Report 187 and suggests the use of a cross-classification process rather than the regression techniques suggested in NCHRP Report 187. NCHRP Report 365 is generally regarded as the standard for a core model structure within the profession. The quick response system (QRS) techniques and default values were used as parameters in the trip generation phase. The Report 365 process uses a cross-classification method for predicting household productions. Prior to this update, the RISM used a regression form of trip generation for trip productions.
- Trip Purpose - the updated RISM, like its predecessor, has three trip purposes: home-based work (HBW) home-based non-work (HBNW), and non-home-based (NHB).
- Trip Distribution - the gravity model technique was used to distribute trips between pairs of TAZs. Adjustments were made to the travel time factors to reflect changes in travel characteristics that have occurred since 1990.
- Mode Split - the number of auto trips forecast considered the varying auto occupancy rates for each trip purpose.
- Trip Assignment - prior to assigning trips to the network, the non-transit person trips were converted to vehicle trips. An equilibrium assignment was used to load trip interchanges between TAZs.
- Calibration/Validation - assigned link volumes were compared to available count locations and appropriate adjustments made to model components. Because RISM model does not include local roads in the network, the percentage of local VMT from 2009 HPMS data was used to adjust future network model runs to account for travel on local roads.

In summary, the RISM was used to develop daily VMT estimates for each year of analysis for statewide ozone. Figure 2, presented in the following sections, illustrate VMT estimates output from the RISM that were used for the LRTP Update air quality analysis.

4.2 Latest Planning Assumptions

Section 93.110 of the conformity rule requires that the latest planning assumptions be used in conformity determinations. The conformity analysis performed for the Long Range Transportation Plan used the most currently available estimates of population, employment, and travel. The latest version (version 5.0r3) of the popular modeling package TransCAD was used to run the RISM. The modeling process followed standard practice by using a four-step model process. Trip generation used the latest techniques as defined in NCHRP Report 365. This method uses a 20-cell cross-classification matrix of households by household size and auto availability as the basis for calculating trip productions. Area type was added to the trip generation process by considering the location of the household (urban, suburban, or rural) in the trip generation process.

Trip distribution used a gravity model equation, which is the most common for travel demand models. The gravity model was calibrated by adjusting the friction factors in the distribution equation to achieve the proper volume of traffic assigned to the network while maintaining consistency with trip length frequency distributions as reported by the Census and as reported in survey data from Report 365. Auto occupancy rates were derived from Report 365 and other occupancy studies conducted in New England. Traffic assignment was conducted using an equilibrium distribution model, which is the most common assignment model used. This assignment process recomputed travel paths based on congestion.

4.3 Years of Analysis

The years of analysis selected for the transportation conformity analysis included:

- 2012,
- 2015,
- 2025, and
- 2035.

These years were selected in consultation with DOT, DEM, FHWA, and EPA. The year 2012 was selected to represent existing conditions. The year 2035 was selected because it represents the last year of the traffic demand model. Finally, 2015 and 2025 were included as interim years because EPA and FHWA require that there not be more than 10 years between any two analysis years.

4.4 Traffic Adjustments

Three adjustments were made to the data before predicting vehicle emissions. First, the data were calibrated to the state HPMS system. Next, a seasonal adjustment factor was applied to determine appropriate daily VMT. Finally, a congestion factor was applied to divide the daily VMT into peak and off-peak periods.

a. Highway Performance Monitoring System

The travel demand model output data were first calibrated to the 2009 HPMS traffic data. The RIDOT collects sample data from roads throughout the state for FHWA reporting requirements. This calibration ensured the appropriateness of the assumptions used in the RISM.

b. Seasonal Adjustment Factors

The travel demand model provides average annual daily traffic (AADT) data for model output. The air quality analyses require the use of traffic data for the time of year consistent with the appropriate pollutant season. Seasonal Adjustment Factors (SAF) were applied to convert average annual daily traffic (AADT) model output to the appropriate typical months for the ozone season (summer). Since ozone formation peaks during warm summer months, AADT values were converted to July for statewide ozone analyses. The SAFs for each functional class, by season, and by county are presented in Table 3.

Table 3
Seasonal Adjustment Factors

	Seasonal Summer (Ozone) Adjustment Factor				
Functional Class	Providence County	Bristol County	Kent County	Newport County	Washington County
Rural					
Interstates	1.095	1.095	1.095	1.187	1.187
Principal Arterials	1.046	1.046	1.046	1.095	1.095
Minor Arterials	1.168	1.168	1.168	1.095	1.095
Major Collectors	1.067	1.067	1.067	1.592	1.592
Minor Collectors	1.095	1.095	1.095	1.095	1.095
Local	1.095	1.095	1.095	1.095	1.095
Urban					
Interstates	1.031	1.126	1.126	1.209	1.209
Other F&E	1.009	1.009	1.009	1.190	1.190
Principal Arterials	1.047	0.998	0.998	1.151	1.527
Minor Arterials	1.095	1.095	1.095	1.053	1.053
Collectors	1.095	1.095	1.095	1.095	1.095
Local	1.095	1.095	1.095	1.095	1.095

c. Congestion Factor (Peak /Off-Peak Speeds)

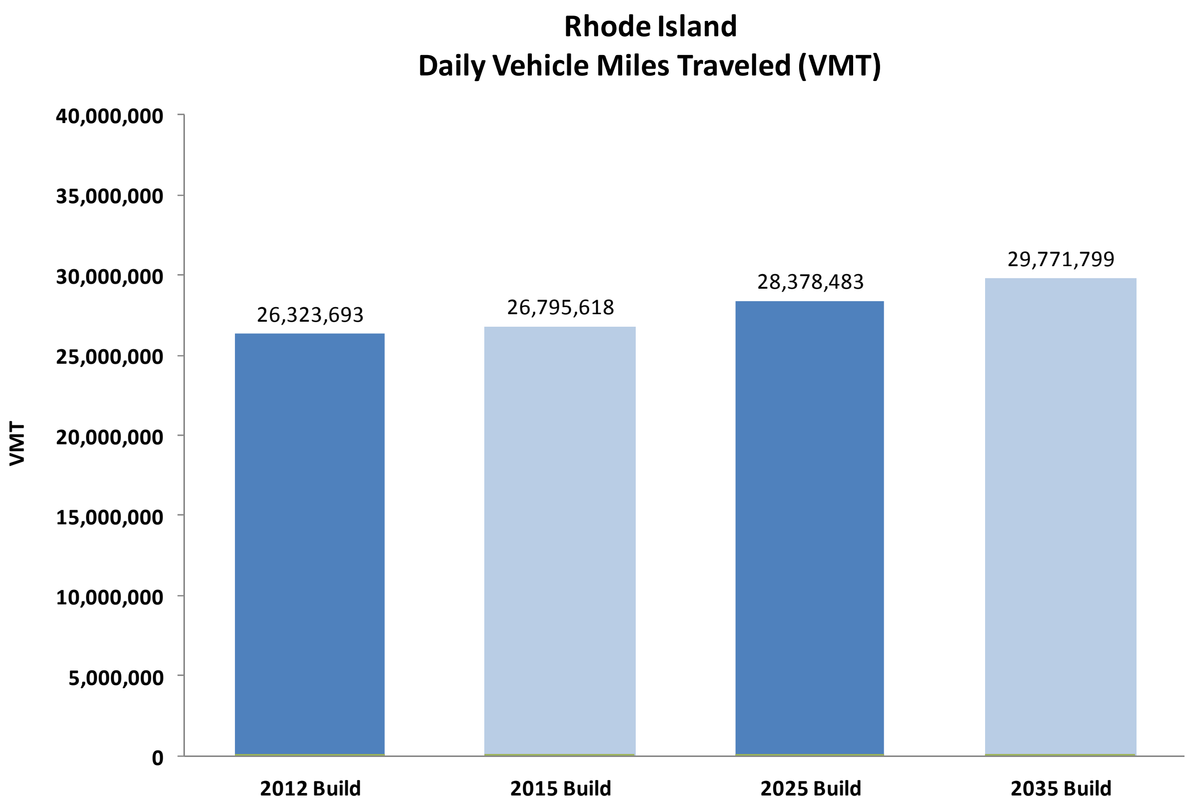
The Transportation Conformity Rule (40 CFR Parts 51 and 93) requires that emissions estimates be based on both peak and off-peak speeds in serious, severe, and extreme nonattainment area with populations over 200,000**.** A congestion factor derived from the 1990 National Personal Transportation Study, which documented the percent of vehicle trips made by hour by trip purpose, was applied to the model VMT data based on time-of-day, functional class, and county. Through the use of this congestion factor, a percentage of the VMT could be assigned a reduced congested travel speed for purposes of the emission calculations. These calculations were performed on a link-by-link basis.

Table 4
Congestion Factors

County	Congestion Factor by Roadway Type Urban	Rural
Bristol County	0.55	0.45
Kent County	0.55	0.45
Newport County	0.55	0.45
Providence County	0.55	0.45
Washington County	0.55	0.45

Figure 2 presented below, illustrates VMT estimates output from the RISM that were used for the benchmark years of the LRTP Update air quality analysis.

Figure 2
Rhode Island Statewide Vehicle Miles Traveled



5.0 Emissions Data

The following outlines the emissions data assumptions including the source of emission factors and the corresponding emission calculations.

5.1 Emission Factors

All vehicle emission factors used in the Long Range Transportation Plan air quality analysis were obtained using the latest version of EPA's MOBILE 6.2 emissions model. MOBILE 6.2 calculates VOC, and NO_X, emission factors from motor vehicles in grams per vehicle-mile for existing and future years. Emission rates calculated in the analysis were adjusted to reflect Rhode Island-specific conditions such as age distribution from Rhode Island's vehicle registration data and the statewide Inspection and Maintenance (I/M) Program. The MOBILE 6.2 input parameters were developed through an iterative consultation process with RIDEM and EPA staff.

5.2 Emission Calculations

The emission calculations were based upon matching the roadway speeds with the MOBILE 6.2 emission factors for each vehicle type on a link-by-link basis. The RISM provides congested and uncongested speeds for each roadway link. The first step was to desegregate the total vehicle miles traveled (VMT) for each link by vehicle type by applying the RI statewide VMT mix percentages. The VMT were then further divided into VMT occurring during free flow conditions and during congested conditions. The roadway link emissions were calculated by multiplying the VMT by the corresponding speed-specific and vehicle-specific emission factor. These emissions calculations were then aggregated by functional class to produce statewide summertime ozone emissions estimates for each year of concern**.** The Long Range Transportation Plan air quality analysis modeled four scenarios for two pollutants, the ozone precursor emissions of VOC and NO_X. These scenarios included:

- 2012 Existing,
- 2015 Build,
- 2025 Build, and
- 2035 Build.

6.0 Results

The conformity air quality analysis produced emissions estimates for the four scenarios. These emission estimates cover the Rhode Island statewide ozone nonattainment area.

6.1 Ozone

The results of the VOC and NO_X emission estimates were compared to the 2009 mobile source emission budgets to determine whether the Long Range Transportation Plan is in conformance. Figures 3 and 4, and Table 5 present the results of the 2012 existing, 2015, 2020, and 2035 build scenarios and the 2009 mobile source emission budget.

Figure 3
Long Range Transportation Plan Air Quality Analysis: Rhode Island Statewide VOC Emissions

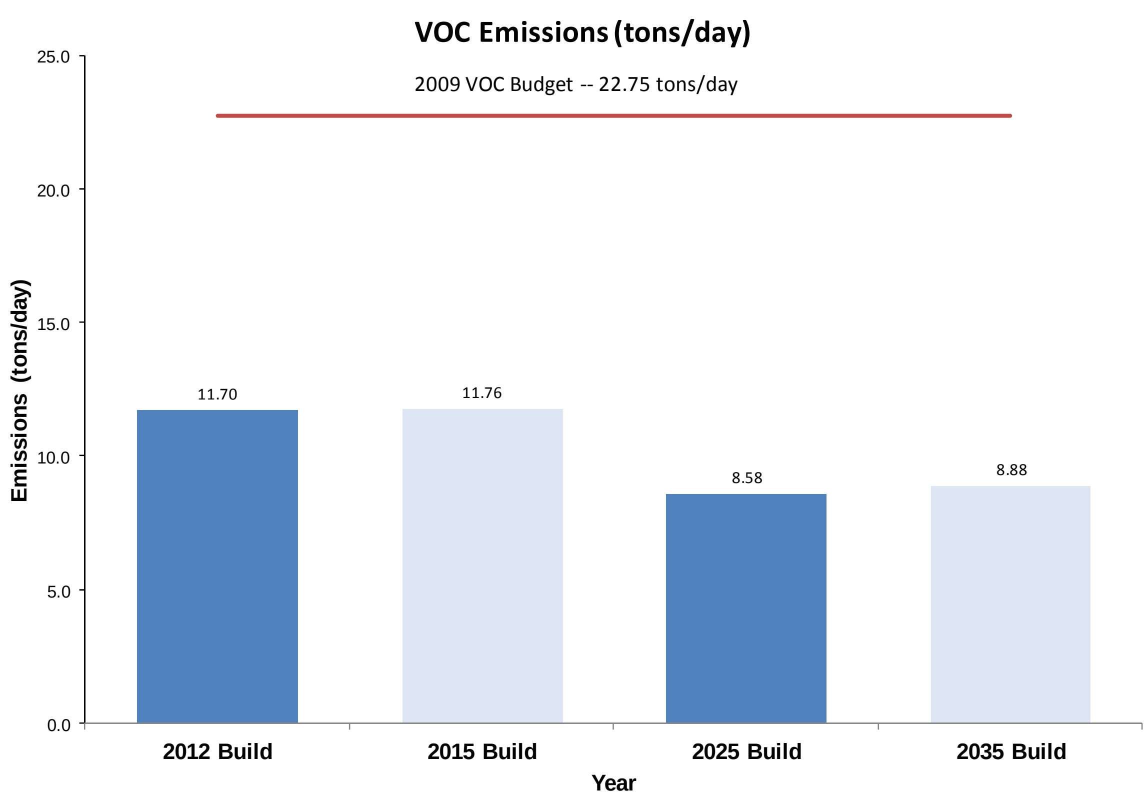


Figure 4
Long Range Transportation Plan Air Quality Analysis: Rhode Island Statewide NO_X Emissions

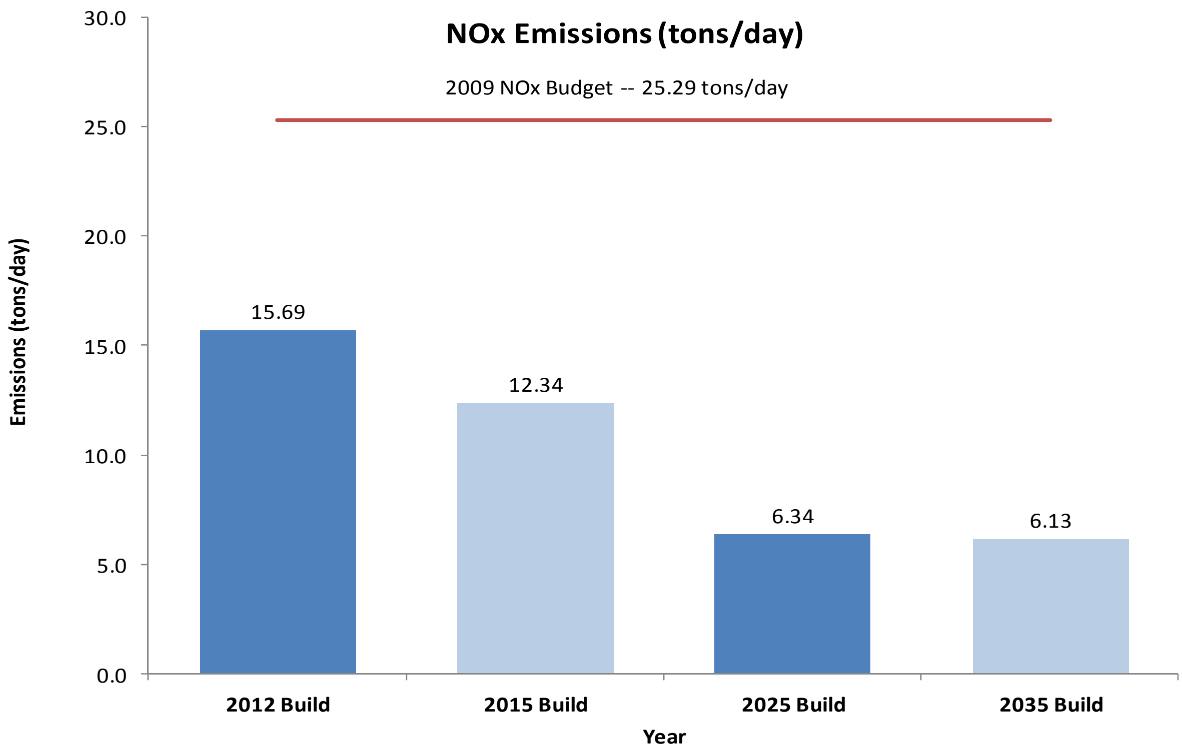


Table 5
TIP Conformity Air Quality Analysis:
Rhode Island Statewide Ozone Results

	Daily Vehicle Miles Traveled (VMT)	VOC (tons/day)	NO_X (tons/day)
2009 SIP Budget	---	22.75	25.29
2012 Build	26,323,693	11.70	15.69
2015 Build	26,795,618	11.76	12.34
2025 Build	28,378,483	8.58	6.34
2035 Build	29,771,799	8.88	6.13

6.2 Emission Trends

The results of the air quality analysis for the Long Range Transportation Plan demonstrate that in general, emissions of VOCs and NO_X emissions are reduced over time. This is primarily due to the reductions in EPA's emission factor model MOBILE6.2. MOBILE6.2 is based in part upon the Federal Motor Vehicle Emission Control Program (FMVECP, new car standards) and the Corporate Average Fuel Economy (CAFE, the sales weighted average fuel economy, expressed in miles per gallon, of a manufacturer's fleet sales in the United States). New car standards have resulted in today's cars being 97% cleaner than 1970 models. Similarly, the CAFE standards have doubled since the mid 1970s. Today's cars are running cleaner with better mileage. Future cars will continue to get cleaner, probably with the use of alternative fuels, and will be required to meet higher CAFE standards resulting in future emission trends that will continue to be reduced.

Climate Change

The air quality analysis for the Long Range Transportation Plan 2035 Update was prepared using mobile source emission factors based upon meteorological data from the SIP that represents worst-case ozone days from 1990. One of the key meteorological parameters is temperature. Since 1990, our awareness and understanding of global warming has increased significantly as warnings from the scientific community become louder with the continued buildup of human-related greenhouse gases. Global emissions of carbon dioxide will likely have an effect on temperatures and other meteorological parameters, which could impact future air quality modeling and results. It is important to note that Rhode Island's future mobile source emissions are substantially below the current SIP emission budgets and any potential changes in temperatures as a result of climate change will not result in excessive mobile source emissions. It is expected that DEM and EPA will continue to evaluate mobile source emissions as part of emission budgets for future SIPs.

Conclusion

The State of Rhode Island has conducted an air quality analysis for the Long Range Transportation Plan 2035 Update, as part of its transportation planning process. The air quality analysis included a statewide analysis for ozone precursor emissions of (volatile organic compounds (VOCs) and oxides of nitrogen (NO_X)).

In response to the Federal Highway Administration (FHWA) and Environmental Protection Agency (EPA) guidance, Rhode Island has develop a Long Range Transportation Plan 2035 Update that includes projects to reduce vehicle miles of travel and improve traffic flow. The air quality analysis evaluated the on-road air quality emissions for the Long Range Transportation Plan 2035 Update.

The general modeling process involved two major inputs, traffic and emission factor data. The traffic data were obtained from the Rhode Island Statewide Model (RISM). The RISM was updated to include additional roadways, modeling zones, and current planning assumptions. Consistent with federal guidance, the model's traffic data were adjusted to account for the following factors, Highway Performance Monitoring System, seasonal adjustment for pollutants, and peak and off-peak period speed characteristics.

The vehicle emission factors were derived using the EPA's latest mobile source emission factor model, MOBILE 6.2, and reflect Rhode Island-specific conditions, such as the vehicle registration distribution and the statewide Inspection and Maintenance (I/M) Program. The traffic and emission factor data were calculated on a link-by-link basis in the EPA's Air Information Retrieval System (AIRS) format, which is consistent with air quality analyses conducted for previous Transportation Conformity and State Implementation Plan (SIP) evaluations.

The air quality analysis performed for the Long Range Transportation Plan 2035 Update demonstrates that it conforms to the Rhode Island State Implementation Plan, the Clean Air Act Amendments, and the Transportation Conformity requirements.

The air quality analysis demonstrates that the mobile source emissions of ozone precursor (volatile organic compounds (VOCs) and oxides of nitrogen (NO_X)) for 2012 Existing, 2015 Build, 2025 Build, and 2035 Build conditions fall below the statewide 2009 SIP mobile source emission budgets of 22.75 tons per day (tpd) of volatile organic compounds and 25.29 tpd of oxides of nitrogen for all future years.

APPENDIX

MOBILE 6.2 Emissions Files

- Ozone Input Files
- Ozone Output Summary

VMT and Emissions Tables

LRTP Update Projects
Statewide – Ozone

- 2012 Existing
- 2015 Build
- 2025 Build
- 2035 Build

MOBILE 6.2 Emissions Files:

Ozone Input Files

2012 MOBILE 6.2 Input File – Ozone

```
MOBILE6 INPUT FILE :
> Run for Rhode Island 2012 Ozone (Summer) Conditions
* This text is for annotating this file and is otherwise ignored.
POLLUTANTS          : HC NOX CO
DATABASE OUTPUT     :
WITH FIELDNAMES     :
AGGREGATED OUTPUT   :
EMISSIONS TABLE     : 12RIOZ.TB1
REPORT FILE         : 12RIOZ.out

RUN DATA
> Rhode Island run with Stage II refueling 2012;
> National LEV start 1999,  Tier 2 start 2004.
* Rhode Island runs for 2012.
EXPRESS HC AS VOC   :
EXPAND EVAPORATIVE :
REG DIST            : RI2012VR.prn
94+ LDG IMP         : NLEVNE.D
I/M DESC FILE       : REVRIIM.d
STAGE II REFUELING :
95 3 84. 84.
FUEL PROGRAM        : 2 N
FUEL RVP            : 6.8
MIN/MAX TEMP        : 67. 88.
* Adjusted VMT mix for 2012
VMT FRACTIONS       :
0.5302 0.0719 0.2395 0.0645 0.0297 0.0129 0.0013 0.0011
0.0008 0.0029 0.0034 0.0037 0.0132 0.0007 0.0003 0.0239

SCENARIO RECORD     : Scenario Title : RI speed 2.5
> 2012 Speed 2.5 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2012
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : Scenario Title : RI speed 3
> 2012 Speed 3 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2012
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 3 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : Scenario Title : RI speed 4
> 2012 Speed 4 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2012
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 4 Arterial 0.0 100.0 0.0 0.0

… through

SCENARIO RECORD     : Scenario Title : RI speed 60.7 (= maximum allowed freeway speed)
> 2012 Speed 60.7 mph (Freeway)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2012
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 60.7 Freeway 92.0 0.0 0.0 8.0
```

2015 MOBILE 6.2 Input File – Ozone

```
MOBILE6 INPUT FILE :
> Run for Rhode Island 2015 Ozone (Summer) Conditions
* This text is for annotating this file and is otherwise ignored.
POLLUTANTS          : HC NOX CO
DATABASE OUTPUT     :
WITH FIELDNAMES     :
AGGREGATED OUTPUT   :
EMISSIONS TABLE     : 15RIOZ.TB1
REPORT FILE         : 15RIOZ.out

RUN DATA
> Rhode Island run with Stage II refueling 2015;
> National LEV start 1999,  Tier 2 start 2004.
* Rhode Island runs for 2015.
EXPRESS HC AS VOC   :
EXPAND EVAPORATIVE :
REG DIST            : RI2015VR.prn
94+ LDG IMP         : NLEVNE.D
I/M DESC FILE       : REVRIIM.d
STAGE II REFUELING :
95 3 84. 84.
FUEL PROGRAM        : 2 N
FUEL RVP            : 6.8
MIN/MAX TEMP        : 67. 88.
* Adjusted VMT mix for 2015
VMT FRACTIONS       :
0.5062  0.0760  0.2530  0.0686  0.0316  0.0131  0.0013  0.0011
0.0008  0.0029  0.0035  0.0037  0.0133  0.0007  0.0003  0.0239

SCENARIO RECORD     : Scenario Title : RI speed 2.5
> 2015 Speed 2.5 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2015
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : Scenario Title : RI speed 3
> 2015 Speed 3 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2015
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 3 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : Scenario Title : RI speed 4
> 2015 Speed 4 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2015
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 4 Arterial 0.0 100.0 0.0 0.0


….through….


SCENARIO RECORD     : Scenario Title : RI speed 60.7 (= maximum allowed freeway speed)
> 2015 Speed 60.7 mph (Freeway)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2015
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 60.7 Freeway 92.0 0.0 0.0 8.0


END OF RUN          :
```

2025 MOBILE 6.2 Input File – Ozone

```
MOBILE6 INPUT FILE :
> Run for Rhode Island 2035 Ozone (Summer) Conditions
* This text is for annotating this file and is otherwise ignored.
POLLUTANTS          : HC NOX CO
DATABASE OUTPUT     :
WITH FIELDNAMES     :
AGGREGATED OUTPUT   :
EMISSIONS TABLE     : 35RIOZ.TB1
REPORT FILE         : 35RIOZ.out

RUN DATA
> Rhode Island run with Stage II refueling 2035;
> National LEV start 1999,  Tier 2 start 2004.
* Rhode Island runs for 2035.
EXPRESS HC AS VOC   :
EXPAND EVAPORATIVE :
REG DIST            : RI2025VR.prn
94+ LDG IMP         : NLEVNE.D
I/M DESC FILE       : REVRIIM.d
STAGE II REFUELING :
95 3 84. 84.
FUEL PROGRAM        : 2 N
FUEL RVP            : 6.8
MIN/MAX TEMP        : 67. 88.
* Adjusted VMT mix for 2035
VMT FRACTIONS       :
0.4819  0.0800  0.2662  0.0726  0.0334  0.0136  0.0013  0.0011
0.0008  0.0030  0.0036  0.0039  0.0138  0.0007  0.0003  0.0238

SCENARIO RECORD     : Scenario Title : RI speed 2.5
> 2035 Speed 2.5 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2035
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : Scenario Title : RI speed 3
> 2035 Speed 3 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2035
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 3 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : Scenario Title : RI speed 4
> 2035 Speed 4 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2035
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 4 Arterial 0.0 100.0 0.0 0.0

… through…

SCENARIO RECORD     : Scenario Title : RI speed 60.7 (= maximum allowed freeway speed)
> 2035 Speed 60.7 mph (Freeway)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2035
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 60.7 Freeway 92.0 0.0 0.0 8.0
```

2035 MOBILE 6.2 Input File – Ozone

```
MOBILE6 INPUT FILE :
> Run for Rhode Island 2035 Ozone (Summer) Conditions
* This text is for annotating this file and is otherwise ignored.
POLLUTANTS          : HC NOX CO
DATABASE OUTPUT     :
WITH FIELDNAMES     :
AGGREGATED OUTPUT   :
EMISSIONS TABLE     : 35RIOZ.TB1
REPORT FILE         : 35RIOZ.out

RUN DATA
> Rhode Island run with Stage II refueling 2035;
> National LEV start 1999,  Tier 2 start 2004.
* Rhode Island runs for 2035.
EXPRESS HC AS VOC   :
EXPAND EVAPORATIVE :
REG DIST            : RI2025VR.prn
94+ LDG IMP         : NLEVNE.D
I/M DESC FILE       : REVRIIM.d
STAGE II REFUELING :
95 3 84. 84.
FUEL PROGRAM        : 2 N
FUEL RVP            : 6.8
MIN/MAX TEMP        : 67. 88.
* Adjusted VMT mix for 2035
VMT FRACTIONS       :
0.4819  0.0800  0.2662  0.0726  0.0334  0.0136  0.0013  0.0011
0.0008  0.0030  0.0036  0.0039  0.0138  0.0007  0.0003  0.0238

SCENARIO RECORD     : Scenario Title : RI speed 2.5
> 2035 Speed 2.5 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2035
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : Scenario Title : RI speed 3
> 2035 Speed 3 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2035
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 3 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD     : Scenario Title : RI speed 4
> 2035 Speed 4 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2035
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 4 Arterial 0.0 100.0 0.0 0.0

… through

SCENARIO RECORD     : Scenario Title : RI speed 60.7 (= maximum allowed freeway speed)
> 2035 Speed 60.7 mph (Freeway)
* This text is for annotating this file and is otherwise ignored.
CALENDAR YEAR       : 2035
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 60.7 Freeway 92.0 0.0 0.0 8.0
```

```
I/M PROGRAM        : 1 2000 2002 2 TRC IM240
I/M CUTPOINTS      : 1 RICUTP.D
I/M EFFECTIVENESS  : 0.75 0.75 0.75
I/M MODEL YEARS    : 1 1975 2050
I/M VEHICLES       : 1 22222 11111111 1
I/M STRINGENCY     : 1 20.0
I/M COMPLIANCE     : 1 96.0
I/M WAIVER RATES   : 1 3.0 3.0
I/M EXEMPTION AGE  : 1 25
I/M GRACE PERIOD   : 1 2

I/M PROGRAM        : 2 2003 2050 2 TRC IM240
I/M CUTPOINTS      : 2 RICUTP.D
I/M MODEL YEARS    : 2 1975 1995
I/M VEHICLES       : 2 22222 11111111 1
I/M STRINGENCY     : 2 20.0
I/M COMPLIANCE     : 2 96.0
I/M WAIVER RATES   : 2 3.0 3.0
I/M EXEMPTION AGE  : 2 25
I/M GRACE PERIOD   : 2 2

I/M PROGRAM        : 3 2003 2050 2 TRC EVAP OBD
I/M MODEL YEARS    : 3 1996 2050
I/M VEHICLES       : 3 22222 11111111 1
I/M STRINGENCY     : 3 20.0
I/M COMPLIANCE     : 3 96.0
I/M WAIVER RATES   : 3 3.0 3.0
I/M EXEMPTION AGE  : 3 25
I/M GRACE PERIOD   : 3 2

I/M PROGRAM        : 4 2003 2050 2 T/O OBD I/M
I/M MODEL YEARS    : 4 1996 2050
I/M VEHICLES       : 4 22222 11111111 1
I/M STRINGENCY     : 4 20.0
I/M COMPLIANCE     : 4 96.0
I/M WAIVER RATES   : 4 3.0 3.0
I/M EXEMPTION AGE  : 4 25
I/M GRACE PERIOD   : 4 2
```

```
*Convert MOBILE5 Registration Fractions to MOBILE6-Based Registration Fractions
*
*Calendar Year:         2025.000User-Input
*
*MOBILE5b Reg Fractions
*          0.024   0.071   0.076   0.067   0.065   0.067   0.060   0.067   0.060   0.058
*          0.055   0.048   0.053   0.055   0.046   0.038   0.026   0.017   0.010   0.006
*          0.003   0.002   0.002   0.002   0.022
*          0.011   0.047   0.059   0.051   0.061   0.063   0.040   0.049   0.063   0.051
*          0.039   0.039   0.041   0.063   0.080   0.066   0.052   0.031   0.022   0.013
*          0.008   0.006   0.004   0.006   0.035
*          0.040   0.093   0.084   0.081   0.065   0.066   0.056   0.069   0.059   0.041
*          0.028   0.022   0.035   0.052   0.058   0.032   0.029   0.021   0.014   0.007
*          0.004   0.002   0.002   0.009   0.031
*          0.024   0.080   0.860   0.078   0.042   0.067   0.040   0.064   0.040   0.029
*          0.022   0.017   0.029   0.050   0.058   0.048   0.049   0.032   0.024   0.014
*          0.009   0.009   0.014   0.009   0.066
*          0.024   0.071   0.076   0.067   0.065   0.067   0.060   0.067   0.060   0.058
*          0.055   0.048   0.053   0.055   0.046   0.038   0.026   0.017   0.010   0.006
*          0.003   0.002   0.002   0.002   0.022
*          0.011   0.047   0.059   0.051   0.061   0.063   0.040   0.049   0.063   0.051
*          0.039   0.039   0.041   0.063   0.080   0.066   0.052   0.031   0.022   0.013
*          0.008   0.006   0.004   0.006   0.035
*          0.040   0.093   0.084   0.081   0.065   0.066   0.056   0.069   0.059   0.041
*          0.028   0.022   0.035   0.052   0.058   0.032   0.029   0.021   0.014   0.007
*          0.004   0.002   0.002   0.009   0.031
*          0.044   0.049   0.038   0.033   0.030   0.028   0.031   0.025   0.016   0.020
*          0.026   0.660   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000
*          0.000   0.000   0.000   0.000   0.000
*
*
* MOBILE6 Vehicle Classes:
*  1  LDV    Light-Duty Vehicles (Passenger Cars)
*  2  LDT1   Light-Duty Trucks 1 (0-6,000 lbs. GVWR, 0-3750 lbs. LVW)
*  3  LDT2   Light Duty Trucks 2 (0-6,000 lbs. GVWR, 3751-5750 lbs. LVW)
*  4  LDT3   Light Duty Trucks 3 (6,001-8500 lbs. GVWR, 0-3750 lbs. LVW)
*  5  LDT4   Light Duty Trucks 4 (6,001-8500 lbs. GVWR, 3751-5750 lbs. LVW)
*  6  HDV2B  Class 2b Heavy Duty Vehicles (8501-10,000 lbs. GVWR)
*  7  HDV3   Class 3 Heavy Duty Vehicles (10,001-14,000 lbs. GVWR)
*  8  HDV4   Class 4 Heavy Duty Vehicles (14,001-16,000 lbs. GVWR)
*  9  HDV5   Class 5 Heavy Duty Vehicles (16,001-19,500 lbs. GVWR)
* 10  HDV6   Class 6 Heavy Duty Vehicles (19,501-26,000 lbs. GVWR)
* 11  HDV7   Class 7 Heavy Duty Vehicles (26,001-33,000 lbs. GVWR)
* 12  HDV8A  Class 8a Heavy Duty Vehicles (33,001-60,000 lbs. GVWR)
* 13  HDV8B  Class 8b Heavy Duty Vehicles (>60,000 lbs. GVWR)
* 14  HDBS   School Busses
* 15  HDBT   Transit and Urban Busses
* 16  MC     Motorcycles (All)
*
REG DIST
*                        RESULTING MOBILE6-BASED REGISTRATION FRACTIONS
*
*MOBILE6 REGISTRATION FRACTIONS BY VEHICLE CLASS AND AGE
* LDV          M5 LDGV
       1   0.024   0.071   0.076   0.067   0.065   0.067   0.060   0.067   0.060   0.058
           0.055   0.048   0.053   0.055   0.046   0.038   0.026   0.017   0.010   0.006
           0.003   0.002   0.002   0.002   0.022
* LDT1         M5 LDGT1
       2   0.011   0.047   0.059   0.051   0.061   0.063   0.040   0.049   0.063   0.051
           0.039   0.039   0.041   0.063   0.080   0.066   0.052   0.031   0.022   0.013
           0.008   0.006   0.004   0.006   0.035
* LDT2         M5 LDGT1
       3   0.011   0.047   0.059   0.051   0.061   0.063   0.040   0.049   0.063   0.051
           0.039   0.039   0.041   0.063   0.080   0.066   0.052   0.031   0.022   0.013
           0.008   0.006   0.004   0.006   0.035
* LDT3         M5 LDGT2
       4   0.040   0.093   0.084   0.081   0.065   0.066   0.056   0.069   0.059   0.041
           0.028   0.022   0.035   0.052   0.058   0.032   0.029   0.021   0.014   0.007
           0.004   0.002   0.002   0.009   0.031
* LDT4         M5 LDGT2
       5   0.040   0.093   0.084   0.081   0.065   0.066   0.056   0.069   0.059   0.041
           0.028   0.022   0.035   0.052   0.058   0.032   0.029   0.021   0.014   0.007
           0.004   0.002   0.002   0.009   0.031
* HDV2B        M5 HDVs (Combined HDGV and HDDV)
       6   0.032   0.087   0.461   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV3         M5 HDVs (Combined HDGV and HDDV)
       7   0.032   0.087   0.461   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV4         M5 HDVs (Combined HDGV and HDDV)
       8   0.032   0.087   0.461   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV5         M5 HDVs (Combined HDGV and HDDV)
       9   0.032   0.087   0.461   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV6         M5 HDVs (Combined HDGV and HDDV)
      10   0.032   0.087   0.461   0.080   0.054   0.066   0.048   0.067   0.050   0.035
```



```
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV7         M5 HDVs (Combined HDGV and HDDV)
      11   0.032   0.087   0.461   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV8a        M5 HDVs (Combined HDGV and HDDV)
      12   0.032   0.087   0.461   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV8b        M5 HDVs (Combined HDGV and HDDV)
      13   0.032   0.087   0.461   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDBS         M5 HDVs (Combined HDGV and HDDV)
      14   0.032   0.087   0.461   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDBT         M5 HDDVs
      15   0.040   0.093   0.084   0.081   0.065   0.066   0.056   0.069   0.059   0.041
           0.028   0.022   0.035   0.052   0.058   0.032   0.029   0.021   0.014   0.007
           0.004   0.002   0.002   0.009   0.031
* Motorcycles  M5 MC
      16   0.044   0.049   0.038   0.033   0.030   0.028   0.031   0.025   0.016   0.020
           0.026   0.660   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000
           0.000   0.000   0.000   0.000   0.000
```

```
*Convert MOBILE5 Registration Fractions to MOBILE6-Based Registration Fractions
*
*Calendar Year:         2015.000User-Input
*
*MOBILE5b Reg Fractions
*          0.024   0.071   0.076   0.067   0.065   0.067   0.060   0.067   0.060   0.058
*          0.055   0.048   0.053   0.055   0.046   0.038   0.026   0.017   0.010   0.006
*          0.003   0.002   0.002   0.002   0.022
*          0.011   0.047   0.059   0.051   0.061   0.063   0.040   0.049   0.063   0.051
*          0.039   0.039   0.041   0.063   0.080   0.066   0.052   0.031   0.022   0.013
*          0.008   0.006   0.004   0.006   0.035
*          0.040   0.093   0.084   0.081   0.065   0.066   0.056   0.069   0.059   0.041
*          0.028   0.022   0.035   0.052   0.058   0.032   0.029   0.021   0.014   0.007
*          0.004   0.002   0.002   0.009   0.031
*          0.024   0.080   0.860   0.078   0.042   0.067   0.040   0.064   0.040   0.029
*          0.022   0.017   0.029   0.050   0.058   0.048   0.049   0.032   0.024   0.014
*          0.009   0.009   0.014   0.009   0.066
*          0.024   0.071   0.076   0.067   0.065   0.067   0.060   0.067   0.060   0.058
*          0.055   0.048   0.053   0.055   0.046   0.038   0.026   0.017   0.010   0.006
*          0.003   0.002   0.002   0.002   0.022
*          0.011   0.047   0.059   0.051   0.061   0.063   0.040   0.049   0.063   0.051
*          0.039   0.039   0.041   0.063   0.080   0.066   0.052   0.031   0.022   0.013
*          0.008   0.006   0.004   0.006   0.035
*          0.040   0.093   0.084   0.081   0.065   0.066   0.056   0.069   0.059   0.041
*          0.028   0.022   0.035   0.052   0.058   0.032   0.029   0.021   0.014   0.007
*          0.004   0.002   0.002   0.009   0.031
*          0.044   0.049   0.038   0.033   0.030   0.028   0.031   0.025   0.016   0.020
*          0.026   0.660   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000
*          0.000   0.000   0.000   0.000   0.000
*
*
* MOBILE6 Vehicle Classes:
*  1  LDV    Light-Duty Vehicles (Passenger Cars)
*  2  LDT1   Light-Duty Trucks 1 (0-6,000 lbs. GVWR, 0-3750 lbs. LVW)
*  3  LDT2   Light Duty Trucks 2 (0-6,000 lbs. GVWR, 3751-5750 lbs. LVW)
*  4  LDT3   Light Duty Trucks 3 (6,001-8500 lbs. GVWR, 0-3750 lbs. LVW)
*  5  LDT4   Light Duty Trucks 4 (6,001-8500 lbs. GVWR, 3751-5750 lbs. LVW)
*  6  HDV2B  Class 2b Heavy Duty Vehicles (8501-10,000 lbs. GVWR)
*  7  HDV3   Class 3 Heavy Duty Vehicles (10,001-14,000 lbs. GVWR)
*  8  HDV4   Class 4 Heavy Duty Vehicles (14,001-16,000 lbs. GVWR)
*  9  HDV5   Class 5 Heavy Duty Vehicles (16,001-19,500 lbs. GVWR)
* 10  HDV6   Class 6 Heavy Duty Vehicles (19,501-26,000 lbs. GVWR)
* 11  HDV7   Class 7 Heavy Duty Vehicles (26,001-33,000 lbs. GVWR)
* 12  HDV8A  Class 8a Heavy Duty Vehicles (33,001-60,000 lbs. GVWR)
* 13  HDV8B  Class 8b Heavy Duty Vehicles (>60,000 lbs. GVWR)
* 14  HDBS   School Busses
* 15  HDBT   Transit and Urban Busses
* 16  MC     Motorcycles (All)
*
REG DIST
*                       RESULTING MOBILE6-BASED REGISTRATION FRACTIONS
*
*MOBILE6 REGISTRATION FRACTIONS BY VEHICLE CLASS AND AGE
* LDV          M5 LDGV
       1   0.024   0.071   0.076   0.067   0.065   0.067   0.060   0.067   0.060   0.058
           0.055   0.048   0.053   0.055   0.046   0.038   0.026   0.017   0.010   0.006
           0.003   0.002   0.002   0.002   0.022
* LDT1         M5 LDGT1
       2   0.011   0.047   0.059   0.051   0.061   0.063   0.040   0.049   0.063   0.051
           0.039   0.039   0.041   0.063   0.080   0.066   0.052   0.031   0.022   0.013
           0.008   0.006   0.004   0.006   0.035
* LDT2         M5 LDGT1
       3   0.011   0.047   0.059   0.051   0.061   0.063   0.040   0.049   0.063   0.051
           0.039   0.039   0.041   0.063   0.080   0.066   0.052   0.031   0.022   0.013
           0.008   0.006   0.004   0.006   0.035
* LDT3         M5 LDGT2
       4   0.040   0.093   0.084   0.081   0.065   0.066   0.056   0.069   0.059   0.041
           0.028   0.022   0.035   0.052   0.058   0.032   0.029   0.021   0.014   0.007
           0.004   0.002   0.002   0.009   0.031
* LDT4         M5 LDGT2
       5   0.040   0.093   0.084   0.081   0.065   0.066   0.056   0.069   0.059   0.041
           0.028   0.022   0.035   0.052   0.058   0.032   0.029   0.021   0.014   0.007
           0.004   0.002   0.002   0.009   0.031
* HDV2B        M5 HDVs (Combined HDGV and HDDV)
       6   0.032   0.087   0.459   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV3         M5 HDVs (Combined HDGV and HDDV)
       7   0.032   0.087   0.459   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV4         M5 HDVs (Combined HDGV and HDDV)
       8   0.032   0.087   0.459   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV5         M5 HDVs (Combined HDGV and HDDV)
       9   0.032   0.087   0.459   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV6         M5 HDVs (Combined HDGV and HDDV)
      10   0.032   0.087   0.459   0.080   0.054   0.066   0.048   0.067   0.050   0.035
```



```
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV7         M5 HDVs (Combined HDGV and HDDV)
      11   0.032   0.087   0.459   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV8a        M5 HDVs (Combined HDGV and HDDV)
      12   0.032   0.087   0.459   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDV8b        M5 HDVs (Combined HDGV and HDDV)
      13   0.032   0.087   0.459   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDBS         M5 HDVs (Combined HDGV and HDDV)
      14   0.032   0.087   0.459   0.080   0.054   0.066   0.048   0.067   0.050   0.035
           0.025   0.020   0.032   0.051   0.058   0.040   0.039   0.026   0.019   0.010
           0.006   0.005   0.008   0.009   0.048
* HDBT         M5 HDDVs
      15   0.040   0.093   0.084   0.081   0.065   0.066   0.056   0.069   0.059   0.041
           0.028   0.022   0.035   0.052   0.058   0.032   0.029   0.021   0.014   0.007
           0.004   0.002   0.002   0.009   0.031
* Motorcycles  M5 MC
      16   0.044   0.049   0.038   0.033   0.030   0.028   0.031   0.025   0.016   0.020
           0.026   0.660   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000
           0.000   0.000   0.000   0.000   0.000
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*Convert MOBILE5 Registration Fractions to MOBILE6-Based Registration Fractions
*
*Calendar Year:         2012.000User-Input
*
*MOBILE5b Reg Fractions
*          0.049   0.079   0.083   0.082   0.084   0.081   0.077   0.056   0.050   0.051
*          0.050   0.054   0.047   0.037   0.024   0.019   0.014   0.015   0.011   0.008
*          0.006   0.005   0.004   0.003   0.010
*          0.063   0.084   0.084   0.084   0.084   0.069   0.059   0.044   0.036   0.031
*          0.030   0.053   0.047   0.046   0.036   0.028   0.017   0.022   0.017   0.014
*          0.009   0.008   0.008   0.005   0.025
*          0.054   0.072   0.072   0.072   0.072   0.052   0.050   0.034   0.054   0.031
*          0.028   0.080   0.084   0.049   0.039   0.030   0.018   0.023   0.018   0.015
*          0.009   0.008   0.009   0.006   0.026
*          0.023   0.047   0.047   0.047   0.047   0.038   0.033   0.021   0.026   0.029
*          0.034   0.064   0.054   0.058   0.051   0.038   0.043   0.041   0.035   0.029
*          0.021   0.022   0.022   0.014   0.117
*          0.049   0.079   0.083   0.082   0.084   0.081   0.077   0.056   0.050   0.051
*          0.050   0.054   0.047   0.037   0.024   0.019   0.014   0.015   0.011   0.008
*          0.006   0.005   0.004   0.003   0.010
*          0.063   0.084   0.084   0.084   0.084   0.069   0.059   0.044   0.036   0.031
*          0.030   0.053   0.047   0.046   0.036   0.028   0.017   0.022   0.017   0.014
*          0.009   0.008   0.008   0.005   0.025
*          0.034   0.067   0.067   0.067   0.067   0.073   0.061   0.040   0.041   0.051
*          0.053   0.066   0.055   0.057   0.045   0.019   0.023   0.028   0.024   0.016
*          0.011   0.009   0.007   0.005   0.016
*          0.144   0.168   0.135   0.109   0.088   0.070   0.056   0.045   0.036   0.029
*          0.023   0.097   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000
*          0.000   0.000   0.000   0.000   0.000
*
*
* MOBILE6 Vehicle Classes:
*  1  LDV    Light-Duty Vehicles (Passenger Cars)
*  2  LDT1   Light-Duty Trucks 1 (0-6,000 lbs. GVWR, 0-3750 lbs. LVW)
*  3  LDT2   Light Duty Trucks 2 (0-6,000 lbs. GVWR, 3751-5750 lbs. LVW)
*  4  LDT3   Light Duty Trucks 3 (6,001-8500 lbs. GVWR, 0-3750 lbs. LVW)
*  5  LDT4   Light Duty Trucks 4 (6,001-8500 lbs. GVWR, 3751-5750 lbs. LVW)
*  6  HDV2B  Class 2b Heavy Duty Vehicles (8501-10,000 lbs. GVWR)
*  7  HDV3   Class 3 Heavy Duty Vehicles (10,001-14,000 lbs. GVWR)
*  8  HDV4   Class 4 Heavy Duty Vehicles (14,001-16,000 lbs. GVWR)
*  9  HDV5   Class 5 Heavy Duty Vehicles (16,001-19,500 lbs. GVWR)
* 10  HDV6   Class 6 Heavy Duty Vehicles (19,501-26,000 lbs. GVWR)
* 11  HDV7   Class 7 Heavy Duty Vehicles (26,001-33,000 lbs. GVWR)
* 12  HDV8A  Class 8a Heavy Duty Vehicles (33,001-60,000 lbs. GVWR)
* 13  HDV8B  Class 8b Heavy Duty Vehicles (>60,000 lbs. GVWR)
* 14  HDBS   School Busses
* 15  HDBT   Transit and Urban Busses
* 16  MC     Motorcycles (All)
*
REG DIST
*                       RESULTING MOBILE6-BASED REGISTRATION FRACTIONS
*
*MOBILE6 REGISTRATION FRACTIONS BY VEHICLE CLASS AND AGE
* LDV           M5 LDGV
       1   0.049   0.079   0.083   0.082   0.084   0.081   0.077   0.056   0.050   0.051
           0.050   0.054   0.047   0.037   0.024   0.019   0.014   0.015   0.011   0.008
           0.006   0.005   0.004   0.003   0.010
* LDT1          M5 LDGT1
       2   0.063   0.084   0.084   0.084   0.084   0.069   0.059   0.044   0.036   0.031
           0.030   0.053   0.047   0.046   0.036   0.028   0.017   0.022   0.017   0.014
           0.009   0.008   0.008   0.005   0.025
* LDT2          M5 LDGT1
       3   0.063   0.084   0.084   0.084   0.084   0.069   0.059   0.044   0.036   0.031
           0.030   0.053   0.047   0.046   0.036   0.028   0.017   0.022   0.017   0.014
           0.009   0.008   0.008   0.005   0.025
* LDT3          M5 LDGT2
       4   0.054   0.072   0.072   0.072   0.072   0.052   0.050   0.034   0.054   0.031
           0.028   0.080   0.084   0.049   0.039   0.030   0.018   0.023   0.018   0.015
           0.009   0.008   0.009   0.006   0.026
* LDT4          M5 LDGT2
       5   0.054   0.072   0.072   0.072   0.072   0.052   0.050   0.034   0.054   0.031
           0.028   0.080   0.084   0.049   0.039   0.030   0.018   0.023   0.018   0.015
           0.009   0.008   0.009   0.006   0.026
* HDV2B         M5 HDVs (Combined HDGV and HDDV)
       6   0.029   0.057   0.057   0.057   0.057   0.056   0.047   0.031   0.034   0.040
           0.044   0.065   0.055   0.057   0.048   0.028   0.033   0.034   0.029   0.022
           0.016   0.015   0.014   0.009   0.065
* HDV3          M5 HDVs (Combined HDGV and HDDV)
       7   0.029   0.057   0.057   0.057   0.057   0.056   0.047   0.031   0.034   0.040
           0.044   0.065   0.055   0.057   0.048   0.028   0.033   0.034   0.029   0.022
           0.016   0.015   0.014   0.009   0.065
* HDV4          M5 HDVs (Combined HDGV and HDDV)
       8   0.029   0.057   0.057   0.057   0.057   0.056   0.047   0.031   0.034   0.040
           0.044   0.065   0.055   0.057   0.048   0.028   0.033   0.034   0.029   0.022
           0.016   0.015   0.014   0.009   0.065
* HDV5          M5 HDVs (Combined HDGV and HDDV)
       9   0.029   0.057   0.057   0.057   0.057   0.056   0.047   0.031   0.034   0.040
           0.044   0.065   0.055   0.057   0.048   0.028   0.033   0.034   0.029   0.022
           0.016   0.015   0.014   0.009   0.065
* HDV6          M5 HDVs (Combined HDGV and HDDV)
      10   0.029   0.057   0.057   0.057   0.057   0.056   0.047   0.031   0.034   0.040
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           0.044   0.065   0.055   0.057   0.048   0.028   0.033   0.034   0.029   0.022
           0.016   0.015   0.014   0.009   0.065
* HDV7          M5 HDVs (Combined HDGV and HDDV)
      11   0.029   0.057   0.057   0.057   0.057   0.056   0.047   0.031   0.034   0.040
           0.044   0.065   0.055   0.057   0.048   0.028   0.033   0.034   0.029   0.022
           0.016   0.015   0.014   0.009   0.065
* HDV8a         M5 HDVs (Combined HDGV and HDDV)
      12   0.029   0.057   0.057   0.057   0.057   0.056   0.047   0.031   0.034   0.040
           0.044   0.065   0.055   0.057   0.048   0.028   0.033   0.034   0.029   0.022
           0.016   0.015   0.014   0.009   0.065
* HDV8b         M5 HDVs (Combined HDGV and HDDV)
      13   0.029   0.057   0.057   0.057   0.057   0.056   0.047   0.031   0.034   0.040
           0.044   0.065   0.055   0.057   0.048   0.028   0.033   0.034   0.029   0.022
           0.016   0.015   0.014   0.009   0.065
* HDBS          M5 HDVs (Combined HDGV and HDDV)
      14   0.029   0.057   0.057   0.057   0.057   0.056   0.047   0.031   0.034   0.040
           0.044   0.065   0.055   0.057   0.048   0.028   0.033   0.034   0.029   0.022
           0.016   0.015   0.014   0.009   0.065
* HDBT          M5 HDDVs
      15   0.034   0.067   0.067   0.067   0.067   0.073   0.061   0.040   0.041   0.051
           0.053   0.066   0.055   0.057   0.045   0.019   0.023   0.028   0.024   0.016
           0.011   0.009   0.007   0.005   0.016
* Motorcycles   M5 MC
      16   0.144   0.168   0.135   0.109   0.088   0.070   0.056   0.045   0.036   0.029
           0.023   0.097   0.000   0.000   0.000   0.000   0.000   0.000   0.000   0.000
           0.000   0.000   0.000   0.000   0.000
```

MOBILE 6.2 Emissions Files:

Ozone Output Summary

2012 MOBILE 6.2 Output File – Ozone

Arterial			Freeway		
Vehicle Speed (mph)	VOC (g/veh-mile)	Nox (g/veh-mile)	Vehicle Speed (mph)	VOC (g/veh-mile)	Nox (g/veh-mile)
2.5	3.06	1.10	2.7	2.84	1.07
3	2.46	1.05	3	2.52	1.05
4	1.72	1.00	4	1.78	0.99
5	1.28	0.96	5	1.34	0.96
6	1.11	0.90	6	1.11	0.90
7	0.98	0.86	7	0.98	0.84
8	0.89	0.83	8	0.88	0.80
9	0.82	0.81	9	0.81	0.76
10	0.76	0.79	10	0.75	0.74
11	0.72	0.76	11	0.70	0.71
12	0.69	0.74	12	0.67	0.68
13	0.67	0.72	13	0.64	0.66
14	0.64	0.70	14	0.62	0.64
15	0.62	0.68	15	0.60	0.62
16	0.60	0.67	16	0.58	0.61
17	0.59	0.66	17	0.57	0.60
18	0.57	0.64	18	0.55	0.60
19	0.56	0.63	19	0.54	0.60
20	0.54	0.62	20	0.53	0.60
21	0.53	0.62	21	0.52	0.59
22	0.53	0.61	22	0.52	0.59
23	0.52	0.60	23	0.51	0.59
24	0.51	0.60	24	0.51	0.59
25	0.50	0.59	25	0.50	0.59
26	0.50	0.59	26	0.49	0.59
27	0.49	0.58	27	0.49	0.59
28	0.49	0.58	28	0.49	0.59
29	0.48	0.57	29	0.48	0.59
30	0.48	0.57	30	0.48	0.59
31	0.47	0.57	31	0.47	0.58
32	0.47	0.57	32	0.47	0.58
33	0.46	0.56	33	0.47	0.58
34	0.46	0.56	34	0.46	0.58
35	0.46	0.56	35	0.46	0.58
36	0.45	0.56	36	0.46	0.59
37	0.45	0.57	37	0.45	0.59
38	0.45	0.57	38	0.45	0.59
39	0.45	0.57	39	0.45	0.59
40	0.44	0.57	40	0.45	0.59
41	0.44	0.58	41	0.44	0.60
42	0.44	0.58	42	0.44	0.60
43	0.44	0.58	43	0.44	0.61
44	0.44	0.59	44	0.44	0.61
45	0.44	0.59	45	0.44	0.61
46	0.43	0.59	46	0.44	0.62
47	0.43	0.60	47	0.43	0.62
48	0.43	0.60	48	0.43	0.63
49	0.43	0.61	49	0.43	0.64
50	0.43	0.61	50	0.43	0.64
51	0.43	0.62	51	0.43	0.65
52	0.43	0.63	52	0.43	0.66
53	0.42	0.63	53	0.43	0.67
54	0.42	0.64	54	0.43	0.68
55	0.42	0.64	55	0.43	0.68
56	0.42	0.65	56	0.43	0.69
57	0.42	0.66	57	0.43	0.70
58	0.42	0.67	58	0.43	0.72
59	0.42	0.68	59	0.43	0.73
60	0.42	0.69	60	0.43	0.74
61	0.43	0.70	60.7	0.43	0.75
62	0.43	0.71	60.7	0.43	0.75
63	0.43	0.72	60.7	0.43	0.75
64	0.43	0.74	60.7	0.43	0.75
65	0.43	0.75	60.7	0.43	0.75

NOTE: Emission factors were calculated by MOBILE6.2 and represent a composite vehicle type during winter conditions.

2015 MOBILE 6.2 Output File – Ozone

	Arterial			Freeway	
Vehicle Speed (mph)	**VOCs** Emission Factor (g/veh-mile)	**NOx** Emission Factor (g/veh-mile)	Vehicle Speed (mph)	**VOCs** Emission Factor (g/veh-mile)	**NOx** Emission Factor (g/veh-mile)
2.5	2.87	0.87	2.7	2.66	0.85
3	2.32	0.84	3	2.37	0.83
4	1.64	0.79	4	1.69	0.78
5	1.24	0.76	5	1.29	0.75
6	1.07	0.72	6	1.07	0.70
7	0.96	0.68	7	0.95	0.65
8	0.87	0.66	8	0.86	0.61
9	0.80	0.64	9	0.79	0.59
10	0.75	0.62	10	0.73	0.56
11	0.71	0.60	11	0.69	0.54
12	0.68	0.58	12	0.66	0.52
13	0.65	0.56	13	0.63	0.50
14	0.63	0.55	14	0.60	0.48
15	0.61	0.54	15	0.58	0.46
16	0.59	0.53	16	0.57	0.45
17	0.57	0.52	17	0.55	0.45
18	0.56	0.51	18	0.54	0.45
19	0.55	0.50	19	0.53	0.45
20	0.53	0.49	20	0.52	0.45
21	0.52	0.49	21	0.51	0.45
22	0.52	0.48	22	0.51	0.45
23	0.51	0.48	23	0.50	0.45
24	0.50	0.47	24	0.50	0.45
25	0.49	0.47	25	0.49	0.45
26	0.49	0.46	26	0.49	0.45
27	0.48	0.46	27	0.48	0.45
28	0.48	0.46	28	0.48	0.45
29	0.47	0.45	29	0.47	0.45
30	0.47	0.45	30	0.47	0.45
31	0.46	0.45	31	0.46	0.45
32	0.46	0.45	32	0.46	0.45
33	0.46	0.45	33	0.46	0.45
34	0.45	0.44	34	0.45	0.45
35	0.45	0.44	35	0.45	0.45
36	0.45	0.44	36	0.45	0.45
37	0.44	0.45	37	0.45	0.45
38	0.44	0.45	38	0.44	0.46
39	0.44	0.45	39	0.44	0.46
40	0.44	0.45	40	0.44	0.46
41	0.44	0.45	41	0.44	0.46
42	0.43	0.45	42	0.44	0.46
43	0.43	0.46	43	0.43	0.47
44	0.43	0.46	44	0.43	0.47
45	0.43	0.46	45	0.43	0.47
46	0.43	0.46	46	0.43	0.47
47	0.43	0.47	47	0.43	0.48
48	0.43	0.47	48	0.43	0.48
49	0.42	0.47	49	0.43	0.48
50	0.42	0.47	50	0.43	0.49
51	0.42	0.48	51	0.42	0.49
52	0.42	0.48	52	0.42	0.50
53	0.42	0.49	53	0.42	0.50
54	0.42	0.49	54	0.43	0.51
55	0.42	0.49	55	0.43	0.51
56	0.42	0.50	56	0.43	0.52
57	0.42	0.50	57	0.43	0.52
58	0.42	0.51	58	0.43	0.53
59	0.42	0.51	59	0.43	0.53
60	0.43	0.52	60	0.44	0.54
61	0.43	0.52	60.7	0.44	0.54
62	0.43	0.53			
63	0.43	0.53			
64	0.43	0.54			
65	0.43	0.54			

NOTE: Emission factors were calculated by MOBILE6.2 and represent a composite vehicle type during summer conditions.

2025 MOBILE 6.2 Output File – Ozone

	Arterial			Freeway	
Vehicle Speed (mph)	**VOCs** Emission Factor (g/veh-mile)	**NOx** Emission Factor (g/veh-mile)	Vehicle Speed (mph)	**VOCs** Emission Factor (g/veh-mile)	**NOx** Emission Factor (g/veh-mile)
2.5	2.87	0.87	2.7	2.66	0.85
3	2.32	0.84	3	2.37	0.83
4	1.64	0.79	4	1.69	0.78
5	1.24	0.76	5	1.29	0.75
6	1.07	0.72	6	1.07	0.70
7	0.96	0.68	7	0.95	0.65
8	0.87	0.66	8	0.86	0.61
9	0.80	0.64	9	0.79	0.59
10	0.75	0.62	10	0.73	0.56
11	0.71	0.60	11	0.69	0.54
12	0.68	0.58	12	0.66	0.52
13	0.65	0.56	13	0.63	0.50
14	0.63	0.55	14	0.60	0.48
15	0.61	0.54	15	0.58	0.46
16	0.59	0.53	16	0.57	0.45
17	0.57	0.52	17	0.55	0.45
18	0.56	0.51	18	0.54	0.45
19	0.55	0.50	19	0.53	0.45
20	0.53	0.49	20	0.52	0.45
21	0.52	0.49	21	0.51	0.45
22	0.52	0.48	22	0.51	0.45
23	0.51	0.48	23	0.50	0.45
24	0.50	0.47	24	0.50	0.45
25	0.49	0.47	25	0.49	0.45
26	0.49	0.46	26	0.49	0.45
27	0.48	0.46	27	0.48	0.45
28	0.48	0.46	28	0.48	0.45
29	0.47	0.45	29	0.47	0.45
30	0.47	0.45	30	0.47	0.45
31	0.46	0.45	31	0.46	0.45
32	0.46	0.45	32	0.46	0.45
33	0.46	0.45	33	0.46	0.45
34	0.45	0.44	34	0.45	0.45
35	0.45	0.44	35	0.45	0.45
36	0.45	0.44	36	0.45	0.45
37	0.44	0.45	37	0.45	0.45
38	0.44	0.45	38	0.44	0.46
39	0.44	0.45	39	0.44	0.46
40	0.44	0.45	40	0.44	0.46
41	0.44	0.45	41	0.44	0.46
42	0.43	0.45	42	0.44	0.46
43	0.43	0.46	43	0.43	0.47
44	0.43	0.46	44	0.43	0.47
45	0.43	0.46	45	0.43	0.47
46	0.43	0.46	46	0.43	0.47
47	0.43	0.47	47	0.43	0.48
48	0.43	0.47	48	0.43	0.48
49	0.42	0.47	49	0.43	0.48
50	0.42	0.47	50	0.43	0.49
51	0.42	0.48	51	0.42	0.49
52	0.42	0.48	52	0.42	0.50
53	0.42	0.49	53	0.42	0.50
54	0.42	0.49	54	0.43	0.51
55	0.42	0.49	55	0.43	0.51
56	0.42	0.50	56	0.43	0.52
57	0.42	0.50	57	0.43	0.52
58	0.42	0.51	58	0.43	0.53
59	0.42	0.51	59	0.43	0.53
60	0.43	0.52	60	0.44	0.54
61	0.43	0.52	60.7	0.44	0.54
62	0.43	0.53			
63	0.43	0.53			
64	0.43	0.54			
65	0.43	0.54			

NOTE: Emission factors were calculated by MOBILE6.2 and represent a composite vehicle type during summer conditions.

2035 MOBILE 6.2 Output File – Ozone

Arterial			Freeway		
Vehicle Speed (mph)	VOC (g/veh-mile)	Nox (g/veh-mile)	Vehicle Speed (mph)	VOC (g/veh-mile)	Nox (g/veh-mile)
2.5	2.28	0.40	2.7	2.11	0.39
3	1.84	0.38	3	1.88	0.38
4	1.28	0.36	4	1.32	0.35
5	0.95	0.35	5	0.99	0.34
6	0.81	0.32	6	0.82	0.32
7	0.72	0.31	7	0.72	0.29
8	0.65	0.30	8	0.64	0.27
9	0.59	0.29	9	0.58	0.26
10	0.55	0.28	10	0.54	0.25
11	0.52	0.27	11	0.50	0.24
12	0.49	0.26	12	0.48	0.23
13	0.47	0.25	13	0.45	0.22
14	0.45	0.24	14	0.44	0.21
15	0.44	0.24	15	0.42	0.20
16	0.42	0.23	16	0.40	0.20
17	0.41	0.23	17	0.39	0.20
18	0.40	0.23	18	0.38	0.20
19	0.38	0.22	19	0.37	0.20
20	0.38	0.22	20	0.37	0.20
21	0.37	0.22	21	0.36	0.20
22	0.36	0.21	22	0.35	0.20
23	0.35	0.21	23	0.35	0.20
24	0.35	0.21	24	0.34	0.20
25	0.34	0.21	25	0.34	0.20
26	0.34	0.21	26	0.34	0.20
27	0.33	0.20	27	0.33	0.20
28	0.33	0.20	28	0.33	0.20
29	0.32	0.20	29	0.32	0.20
30	0.32	0.20	30	0.32	0.20
31	0.32	0.20	31	0.32	0.20
32	0.31	0.20	32	0.31	0.20
33	0.31	0.20	33	0.31	0.20
34	0.31	0.20	34	0.31	0.20
35	0.30	0.20	35	0.31	0.20
36	0.30	0.20	36	0.30	0.20
37	0.30	0.20	37	0.30	0.20
38	0.30	0.20	38	0.30	0.20
39	0.30	0.20	39	0.30	0.20
40	0.30	0.20	40	0.30	0.20
41	0.29	0.20	41	0.29	0.20
42	0.29	0.20	42	0.29	0.20
43	0.29	0.20	43	0.29	0.21
44	0.29	0.20	44	0.29	0.21
45	0.29	0.20	45	0.29	0.21
46	0.29	0.21	46	0.29	0.21
47	0.29	0.21	47	0.29	0.21
48	0.28	0.21	48	0.29	0.21
49	0.28	0.21	49	0.28	0.21
50	0.28	0.21	50	0.28	0.22
51	0.28	0.21	51	0.28	0.22
52	0.28	0.21	52	0.28	0.22
53	0.28	0.22	53	0.28	0.22
54	0.28	0.22	54	0.28	0.22
55	0.28	0.22	55	0.29	0.23
56	0.28	0.22	56	0.29	0.23
57	0.28	0.22	57	0.29	0.23
58	0.28	0.23	58	0.29	0.23
59	0.29	0.23	59	0.29	0.23
60	0.29	0.23	60	0.30	0.24
61	0.29	0.23	60.7	0.30	0.24
62	0.29	0.23	60.7	0.30	0.24
63	0.29	0.24	60.7	0.30	0.24
64	0.29	0.24	60.7	0.30	0.24
65	0.30	0.24	60.7	0.30	0.24

NOTE: Emission factors were calculated by MOBILE6.2 and represent a composite vehicle type during winter conditions.

VMT and Emissions Tables:

LRTP Update Projects

Roadway Projects Reviewed as Part of Transporation Plan Work

Regionally Significant Roadway Projects	Community	Status	Year in Service
Waterfront Drive south of Dexter Road	East Providence	Under Construction	2013
Sakonnet River Bridge	Tiverton/Portsmouth	TIP - Highway	2014
Reconstruction of Two Mile Corner	Newport	TIP - Highway	2015
Apponaug Bypass	Warwick	TIP - Highway	2016
Pell Bridge Ramps	Newport/Middletown	TIP - Highway	2016
Route 403 Ramps (remaining 3 ramps)	North Kingston	Future Years	2018
Main Street Conversion	Pawtucket	TIP - Study and Development	2020
Route 10 North to Route 6 West	Providence	Future Years	2020
Route 10/Route 6	Providence	Future Years	2020
Route 116/146 Reconstruction - Phase 2	Lincoln	Future Years	2020
Route 95/Route 4	Warwick	TIP - Study and Development	2025
I-195 Interchange Taunton and Warren Ave	East Providence	TIP - Study and Development	2025
Route 1/4 bypasses	North Kingston	TIP - Study and Development	2035
Route 146 Sayles Hill Road Intersection	North Smithfield	TIP - Study and Development	2035

Other Roadway Projects	Community	Status	Year in Service	Comments
Route 138	South Kingston	TIP - Highway	2016	Rehab
Hartford Ave	Johnston	TIP - Highway	2014	Rehab
East Main Road - Town Center	Portsmouth	TIP - Highway	2018	Rehab
Route 5 Improvements	Warwick	TIP - Highway	2016	Rehab
Pawtucket River Bridge	Pawtucket	Under Construction	2016	Replace
Providence Viaduct	Providence	TIP - Bridge	2016	Replace
J. T. Connell Highway	Middletown/Newport	TIP - Study and Development	Uncertain	Rehab
Burma Road	Middletown/Portsmouth	TIP - Study and Development	Uncertain	
Thurbers Avenue/Allen's Avenue	Providence	TIP - Study and Development	Uncertain	
Add Lane I-95	Multi Communities	Removed from TIP	Not moving forward	
Pontiac Ave/Sockanosett	Cranston	Removed from TIP	Not moving forward	
Widen I-195 to 3 lanes	Multi Communities	Removed from TIP	Not moving forward	

VMT and Emissions Tables:

Statewide-Ozone

2012 Existing

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 1

Vehicle Miles of Travel

Functional Class	2009 Network Model Output	2009 HPMS	Future Network Model Output	HPMS Adjusted	HPMS & Seasonal Factor Adjusted
Interstate-Rural	1145	1108	1,168,212	1,130,462	1,298,896
Other PA-Rural	305	350	314,156	360,507	381,809
Minor Art.-Rural	416	366	429,004	377,441	430,957
Major Coll.-Rural	444	407	456,337	418,309	529,497
Minor Coll.-Rural	70	99	71,532	101,166	110,777
Local-Rural	63	62	318,459	313,404	340,333
Interstate-Urban	4503	4773	4,590,450	4,865,694	5,147,052
Other F/E-Urban	3469	3389	3,347,604	3,270,403	3,504,344
Other PA-Urban	5553	5902	5,828,459	6,194,771	6,708,632
Minor Art.-Urban	3125	3224	3,117,510	3,216,273	3,498,339
Collector-Urban	1843	2128	1,867,155	2,155,891	2,360,700
Local-Urban	756	794	1,764,372	1,853,057	2,012,357
Total	21692	22602	23,273,249	24,257,378	26,323,693

Input Tranplan File: C:\Program Files\AIR2005Software\2012OUTPUTR.DBF
Input Mobile File: C:\Program Files\AIR2005Software\12RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 2A

Mobile 6.2 Format

Vehicle Type	Fraction of Fleet
LDGV	0.529731
LDGT1	0.071900
LDGT2	0.239500
LDGT3	0.063569
LDGT4	0.029271
HDGV2B	0.010011
HDGV3	0.000376
HDGV4	0.000108
HDGV5	0.000344
HDGV6	0.000753
HDGV7	0.000312
HDGV8A	0.000001
HDGV8B	0.000000
LDDV	0.000469
LDDT12	0.000000
HDDV2B	0.002889
HDDV3	0.000924
HDDV4	0.000992
HDDV5	0.000456
HDDV6	0.002147
HDDV7	0.003088
HDDV8A	0.003699
HDDV8B	0.013200
MC	0.023900
HDGB	0.000046
HDDBT	0.000300
HDDBS	0.000654
LDDT34	0.001360

Input Tranplan File: C:\Program Files\AIR2005Software\2012OUTPUTR.DBF
Input Mobile File: C:\Program Files\AIR2005Software\12RIOZ.TB1

Rhode Island

Table: 2B

Transportation Conformity Air Quality Analysis

AIRS Format

Vehicle Type	Fraction of Fleet
HDDV	0.028349
HDGV	0.011951
LDDT	0.00136
LDDV	0.000469
LDGT12	0.3114
LDGT34	0.09284
LDGV	0.529731
MC	0.0239

Input Tranplan File: C:\Program Files\AIR2005Software\2012OUTPUTR.DBF
Input Mobile File: C:\Program Files\AIR2005Software\12RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 3

Total Volatile Organice Compound Emissions (grams/day)

V-Type	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U	Total
LDGV	0	69,414	75,742	88,347	21,190	41,804	917,501	612,922	1,255,059	651,185	455,759	247,815	4,436,738
LDGT1	0	11,706	12,757	14,880	3,527	6,827	155,268	103,989	210,140	109,087	75,855	40,475	744,512
LDGT2	0	41,526	45,236	52,764	12,478	24,169	552,408	370,242	744,024	386,226	268,377	143,294	2,640,744
LDGT3	0	14,197	15,488	18,066	4,315	8,442	186,627	124,740	255,906	132,819	92,810	50,045	903,455
LDGT4	0	6,978	7,612	8,879	2,121	4,154	91,721	61,308	125,748	65,264	45,624	24,625	444,035
HDGV2B	0	2,495	2,742	3,198	835	1,875	31,821	20,795	47,486	24,545	17,972	11,104	164,867
HDGV3	0	85	94	109	29	64	1,087	710	1,623	839	615	382	5,636
HDGV4	0	43	47	55	14	29	557	368	794	411	293	169	2,778
HDGV5	0	112	123	144	36	79	1,455	958	2,104	1,089	785	466	7,351
HDGV6	0	245	268	313	80	172	3,169	2,087	4,584	2,372	1,711	1,016	16,017
HDGV7	0	111	122	142	36	78	1,444	951	2,085	1,079	778	462	7,290
HDGV8A	0	0	1	1	0	0	6	4	9	5	3	2	31
HDGV8B	0	0	0	0	0	0	0	0	0	0	0	0	0
LDDV	0	15	17	20	5	11	198	129	296	153	112	68	1,026
LDDT12	0	0	0	0	0	0	0	0	0	0	0	0	0
HDDV2B	0	132	147	171	49	119	1,628	1,037	2,670	1,375	1,057	702	9,087
HDDV3	0	44	49	57	16	40	547	348	897	462	355	236	3,052
HDDV4	0	62	69	81	23	56	767	489	1,259	648	498	331	4,284
HDDV5	0	31	34	40	12	28	383	244	628	323	248	165	2,136
HDDV6	0	180	200	233	67	162	2,219	1,414	3,641	1,876	1,440	956	12,388
HDDV7	0	321	355	415	119	287	3,944	2,513	6,470	3,333	2,560	1,700	22,016
HDDV8A	0	392	435	507	146	351	4,823	3,073	7,915	4,077	3,131	2,079	26,929
HDDV8B	0	1,676	1,859	2,168	622	1,501	20,614	13,133	33,817	17,419	13,382	8,885	115,076
MC	0	15,121	16,500	19,246	4,859	10,037	222,382	148,966	280,902	145,452	104,523	59,478	1,027,467
HDGB	0	30	33	39	10	23	380	248	575	297	219	137	1,991
HDDBT	0	24	27	31	9	22	299	190	490	252	194	129	1,666
HDDBS	0	106	118	138	39	95	1,308	833	2,145	1,105	849	564	7,301
LDDT34	0	153	168	196	52	114	1,955	1,277	2,930	1,514	1,113	672	10,144
TOTAL	0	165,204	180,245	210,240	50,691	100,536	2,204,511	1,472,969	2,994,197	1,553,207	1,090,264	595,955	10,618,019

Input Tranplan File: C:\Program Files\AIR2005Software\2012OUTPUTR.DBF

Input Mobile File: C:\Program Files\AIR2005Software\12RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 4

Total Carbon Monoxide Emissions (grams/day)

V-Type	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U	Total
LDGV	0	895,504	955,807	1,114,869	234,335	428,741	14,405,682	9,912,085	14,615,363	7,590,903	5,039,604	2,543,425	57,736,320
LDGT1	0	136,778	146,117	170,434	35,903	65,183	2,168,656	1,491,605	2,240,642	1,164,056	772,115	386,706	8,778,195
LDGT2	0	514,649	550,284	641,860	135,653	244,979	8,065,818	5,543,949	8,464,141	4,398,113	2,917,316	1,453,434	32,930,197
LDGT3	0	177,523	189,787	221,371	46,662	84,281	2,774,632	1,907,623	2,917,356	1,515,964	1,003,505	500,035	11,338,739
LDGT4	0	84,385	90,242	105,260	22,219	40,102	1,314,953	903,815	1,388,599	721,590	477,839	237,923	5,386,925
HDGV2B	0	18,357	19,886	23,195	6,446	17,190	303,342	201,504	351,710	180,478	138,694	101,708	1,362,510
HDGV3	0	757	820	956	266	709	12,505	8,307	14,499	7,440	5,718	4,193	56,169
HDGV4	0	221	239	279	78	207	3,649	2,424	4,231	2,171	1,668	1,223	16,389
HDGV5	0	794	860	1,004	279	744	13,124	8,718	15,216	7,808	6,000	4,400	58,947
HDGV6	0	1,724	1,868	2,179	605	1,615	28,492	18,926	33,035	16,952	13,027	9,553	127,976
HDGV7	0	792	858	1,000	278	741	13,083	8,691	15,169	7,784	5,982	4,387	58,765
HDGV8A	0	3	3	4	1	3	46	31	54	28	21	16	208
HDGV8B	0	0	0	0	0	0	0	0	0	0	0	0	0
LDDV	0	108	118	137	35	81	1,531	1,015	2,019	1,043	762	478	7,327
LDDT12	0	0	0	0	0	0	0	0	0	0	0	0	0
HDDV2B	0	387	423	494	142	376	5,698	3,713	7,646	3,924	3,051	2,227	28,081
HDDV3	0	125	137	160	46	122	1,844	1,201	2,474	1,270	987	720	9,086
HDDV4	0	195	213	249	71	189	2,868	1,869	3,848	1,975	1,536	1,121	14,133
HDDV5	0	95	104	122	35	93	1,402	914	1,882	966	751	548	6,911
HDDV6	0	450	492	574	165	437	6,624	4,316	8,888	4,562	3,547	2,589	32,644
HDDV7	0	808	885	1,032	296	786	11,907	7,759	15,977	8,200	6,377	4,653	58,681
HDDV8A	0	1,320	1,445	1,685	484	1,284	19,446	12,671	26,094	13,393	10,414	7,599	95,835
HDDV8B	0	6,501	7,116	8,301	2,384	6,326	95,788	62,416	128,536	65,970	51,300	37,432	472,069
MC	0	77,255	85,070	99,227	28,342	68,887	1,412,665	947,484	1,540,257	792,841	609,772	407,767	6,069,566
HDGB	0	170	185	215	60	160	2,817	1,871	3,266	1,676	1,288	944	12,651
HDDBT	0	156	171	200	57	152	2,304	1,501	3,091	1,587	1,234	900	11,354
HDDBS	0	282	309	360	103	274	4,153	2,706	5,573	2,860	2,224	1,623	20,468
LDDT34	0	258	281	327	85	193	3,653	2,422	4,816	2,487	1,818	1,141	17,480
TOTAL	0	1,919,596	2,053,720	2,395,493	515,030	963,854	30,676,680	21,059,536	31,814,382	16,516,039	11,076,551	5,716,745	124,707,627

Input Tranplan File: C:\Program Files\AIR2005Software\2012OUTPUTR.DBF

Input Mobile File: C:\Program Files\AIR2005Software\12RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 5

Total Nitrogen Oxide Emissions (grams/day)

V-Type	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U	Total
LDGV	0	59,772	64,469	75,198	17,251	33,980	865,547	588,974	1,030,671	534,138	371,031	201,445	3,842,476
LDGT1	0	9,042	9,746	11,368	2,570	4,915	131,719	89,790	155,215	80,521	55,268	29,143	579,297
LDGT2	0	44,051	47,534	55,445	12,537	23,827	634,103	431,787	759,537	394,190	269,627	141,295	2,813,933
LDGT3	0	17,462	18,857	21,996	4,983	9,468	250,344	170,311	302,042	156,777	107,175	56,145	1,115,559
LDGT4	0	11,243	12,158	14,182	3,221	6,075	159,205	108,160	195,351	101,432	69,279	36,029	716,337
HDGV2B	0	8,484	9,102	10,616	2,212	3,528	125,448	86,391	141,104	73,570	47,571	20,951	528,977
HDGV3	0	320	343	400	83	133	4,732	3,259	5,323	2,775	1,794	790	19,953
HDGV4	0	97	104	121	25	40	1,435	988	1,614	841	544	240	6,050
HDGV5	0	326	350	408	85	136	4,822	3,320	5,423	2,828	1,828	805	20,331
HDGV6	0	711	762	889	185	296	10,509	7,237	11,820	6,163	3,985	1,755	44,312
HDGV7	0	331	355	414	86	138	4,891	3,368	5,501	2,868	1,855	817	20,624
HDGV8A	0	1	1	2	0	1	19	13	21	11	7	3	79
HDGV8B	0	0	0	0	0	0	0	0	0	0	0	0	0
LDDV	0	28	30	35	8	15	525	364	476	247	167	90	1,986
LDDT12	0	0	0	0	0	0	0	0	0	0	0	0	0
HDDV2B	0	2,024	2,140	2,496	553	1,087	37,824	26,237	33,787	17,505	11,887	6,442	141,981
HDDV3	0	640	676	789	175	343	11,956	8,293	10,680	5,533	3,758	2,036	44,879
HDDV4	0	986	1,042	1,216	269	529	18,425	12,780	16,459	8,528	5,791	3,138	69,163
HDDV5	0	481	509	593	131	258	8,989	6,235	8,030	4,160	2,825	1,531	33,742
HDDV6	0	2,705	2,860	3,336	739	1,453	52,143	36,146	45,157	23,396	15,887	8,613	192,434
HDDV7	0	4,862	5,141	5,996	1,328	2,611	93,687	64,945	81,167	42,052	28,557	15,482	345,827
HDDV8A	0	6,988	7,405	8,638	1,916	3,728	141,925	98,083	117,146	60,717	41,199	22,106	509,852
HDDV8B	0	31,104	32,976	38,463	8,533	16,568	631,204	436,043	521,861	270,509	183,516	98,239	2,269,016
MC	0	10,590	11,354	13,243	2,795	4,319	172,438	119,533	178,104	92,919	60,103	25,660	691,059
HDGB	0	117	125	146	30	49	1,725	1,188	1,941	1,012	654	288	7,275
HDDBT	0	947	1,001	1,168	258	510	17,853	12,389	15,798	8,184	5,559	3,022	66,690
HDDBS	0	1,857	1,963	2,289	507	998	34,911	24,223	30,981	16,050	10,901	5,920	130,600
LDDT34	0	256	271	316	70	137	4,723	3,274	4,276	2,216	1,504	811	17,853
TOTAL	0	215,424	231,275	269,763	60,551	115,141	3,421,101	2,343,331	3,679,486	1,909,143	1,302,274	682,797	14,230,285

Input Tranplan File: C:\Program Files\AIR2005Software\2012OUTPUTR.DBF

Input Mobile File: C:\Program Files\AIR2005Software\12RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 6

Congestion Factors

County	Urban Congestion Factor %	Rural Congestion Factor %
Kent	55	45
Newport	55	45
Providence	55	45
Washington	55	45
Bristol	55	45

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 7

Seasonal Factors

County	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U
Bristol	1.095	1.046	1.168	1.067	1.095	1.095	1.126	1.009	0.998	1.095	1.095	1.095
Kent	1.095	1.046	1.168	1.067	1.095	1.095	1.126	1.009	0.998	1.095	1.095	1.095
Newport	1.187	1.095	1.095	1.592	1.095	1.095	1.209	1.19	1.151	1.053	1.095	1.095
Providence	1.095	1.046	1.168	1.067	1.095	1.095	1.031	1.009	1.047	1.095	1.095	1.095
Washington	1.187	1.095	1.095	1.592	1.095	1.095	1.209	1.19	1.527	1.053	1.095	1.095

VMT and Emissions Tables:

Statewide-Ozone
2015 Build

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 1

Vehicle Miles of Travel

Functional Class	2009 Network Model Output	2009 HPMS	Future Network Model Output	HPMS Adjusted	HPMS & Seasonal Factor Adjusted
Interstate-Rural	1145	1108	1,196,978	1,158,298	1,330,880
Other PA-Rural	305	350	325,049	373,007	395,021
Minor Art.-Rural	416	366	444,613	391,174	446,649
Major Coll.-Rural	444	407	470,244	431,057	545,763
Minor Coll.-Rural	70	99	73,872	104,477	114,402
Local-Rural	63	62	324,113	318,968	346,494
Interstate-Urban	4503	4773	4,736,694	5,020,706	5,309,472
Other F/E-Urban	3469	3389	3,387,466	3,309,346	3,547,220
Other PA-Urban	5553	5902	5,828,065	6,194,353	6,716,181
Minor Art.-Urban	3125	3224	3,221,733	3,323,797	3,615,414
Collector-Urban	1843	2128	1,881,787	2,172,785	2,379,200
Local-Urban	756	794	1,795,817	1,886,083	2,048,922
Total	21692	22602	23,686,430	24,684,051	26,795,618

Input Tranplan File: C:\Program Files\AIR2005Software\AQ2015BUILD.DBF
Input Mobile File: C:\Program Files\AIR2005Software\15RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 2A

Mobile 6.2 Format

Vehicle Type	Fraction of Fleet
LDGV	0.505744
LDGT1	0.076000
LDGT2	0.253000
LDGT3	0.067601
LDGT4	0.031140
HDGV2B	0.010033
HDGV3	0.000345
HDGV4	0.000106
HDGV5	0.000345
HDGV6	0.000717
HDGV7	0.000300
HDGV8A	0.000001
HDGV8B	0.000000
LDDV	0.000456
LDDT12	0.000000
HDDV2B	0.003067
HDDV3	0.000955
HDDV4	0.000994
HDDV5	0.000455
HDDV6	0.002183
HDDV7	0.003200
HDDV8A	0.003699
HDDV8B	0.013300
MC	0.023900
HDGB	0.000031
HDDBT	0.000300
HDDBS	0.000669
LDDT34	0.001460

Input Tranplan File: C:\Program Files\AIR2005Software\AQ2015BUILD.DBF
Input Mobile File: C:\Program Files\AIR2005Software\15RIOZ.TB1

Rhode Island

Table: 2B

Transportation Conformity Air Quality Analysis

AIRS Format

Vehicle Type	Fraction of Fleet
HDDV	0.028822
HDGV	0.011878
LDDT	0.00146
LDDV	0.000456
LDGT12	0.329
LDGT34	0.098741
LDGV	0.505744
MC	0.0239

Input Tranplan File: C:\Program Files\AIR2005Software\AQ2015BUILD.DBF
Input Mobile File: C:\Program Files\AIR2005Software\15RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 3

Total Volatile Organice Compound Emissions (grams/day)

V-Type	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U	Total
LDGV	0	60,084	65,663	76,162	18,320	35,762	792,758	519,693	1,050,404	562,857	384,529	212,015	3,778,246
LDGT1	0	13,259	14,469	16,783	3,978	7,598	175,766	115,562	229,812	123,219	83,502	45,053	829,002
LDGT2	0	47,492	51,799	60,081	14,211	27,156	631,719	415,686	821,304	440,342	298,281	161,019	2,969,090
LDGT3	0	10,881	11,883	13,783	3,290	6,357	143,582	94,280	189,136	101,382	69,050	37,689	681,312
LDGT4	0	5,400	5,897	6,840	1,633	3,157	71,201	46,750	93,866	50,314	34,285	18,719	338,066
HDGV2B	0	1,040	1,147	1,331	358	818	13,103	8,346	19,460	10,380	7,520	4,843	68,345
HDGV3	0	39	42	49	13	29	491	315	713	381	273	171	2,516
HDGV4	0	16	17	20	5	11	204	132	286	153	107	63	1,015
HDGV5	0	50	55	63	16	35	642	414	906	484	342	206	3,213
HDGV6	0	100	110	128	33	70	1,290	832	1,824	975	689	417	6,469
HDGV7	0	44	49	56	15	31	571	368	807	431	305	185	2,862
HDGV8A	0	0	0	0	0	0	2	1	3	2	1	1	11
HDGV8B	0	0	0	0	0	0	0	0	0	0	0	0	0
LDDV	0	15	17	20	5	11	196	126	283	151	108	65	998
LDDT12	0	0	0	0	0	0	0	0	0	0	0	0	0
HDDV2B	0	109	121	140	40	96	1,336	836	2,129	1,133	848	569	7,357
HDDV3	0	37	41	48	14	33	453	283	721	384	287	193	2,492
HDDV4	0	48	54	62	18	42	590	369	940	500	375	251	3,250
HDDV5	0	24	27	31	9	21	295	185	470	250	187	126	1,624
HDDV6	0	139	155	179	52	123	1,705	1,066	2,714	1,445	1,082	726	9,385
HDDV7	0	252	280	324	93	222	3,083	1,929	4,909	2,613	1,957	1,312	16,974
HDDV8A	0	318	353	410	118	280	3,899	2,439	6,208	3,304	2,475	1,659	21,464
HDDV8B	0	1,307	1,452	1,684	484	1,152	16,018	10,020	25,499	13,570	10,164	6,817	88,166
MC	0	27,710	30,253	35,090	8,692	17,191	400,128	263,491	492,146	263,485	182,438	101,905	1,822,528
HDGB	0	8	9	11	3	6	105	67	153	82	59	37	540
HDDBT	0	24	27	31	9	21	296	185	471	251	188	126	1,629
HDDBS	0	79	88	102	29	69	966	604	1,538	818	613	411	5,316
LDDT34	0	120	132	153	40	87	1,525	978	2,211	1,181	845	514	7,784
TOTAL	0	168,597	184,139	213,581	51,478	100,378	2,261,925	1,484,960	2,948,912	1,580,083	1,080,510	595,092	10,669,655

Input Tranplan File: C:\Program Files\AIR2005Software\AQ2015BUILD.DBF

Input Mobile File: C:\Program Files\AIR2005Software\15RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 4

Total Carbon Monoxide Emissions (grams/day)

V-Type	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U	Total
LDGV	0	1,169,937	1,252,085	1,452,282	307,272	556,741	18,387,897	12,398,684	18,546,697	9,947,432	6,449,003	3,303,022	73,771,051
LDGT1	0	217,115	232,477	269,648	57,051	102,726	3,384,798	2,282,044	3,448,869	1,850,209	1,197,377	609,485	13,651,800
LDGT2	0	852,416	913,834	1,059,948	225,283	402,780	13,116,613	8,834,898	13,612,750	7,304,681	4,728,155	2,389,857	53,441,214
LDGT3	0	192,327	206,031	238,974	50,681	91,022	2,980,917	2,008,941	3,061,658	1,642,611	1,063,671	540,053	12,076,885
LDGT4	0	88,117	94,434	109,533	23,269	41,743	1,361,697	917,361	1,405,266	753,983	488,371	247,669	5,531,445
HDGV2B	0	15,971	17,331	20,102	5,597	14,713	263,091	171,496	295,863	156,848	117,543	87,060	1,165,615
HDGV3	0	664	721	836	233	612	10,944	7,134	12,308	6,525	4,890	3,622	48,488
HDGV4	0	200	217	252	70	184	3,293	2,147	3,704	1,963	1,471	1,090	14,591
HDGV5	0	758	823	954	266	698	12,488	8,140	14,043	7,445	5,579	4,132	55,327
HDGV6	0	1,559	1,692	1,962	546	1,436	25,684	16,742	28,884	15,312	11,475	8,499	113,794
HDGV7	0	720	781	906	252	663	11,857	7,729	13,334	7,069	5,297	3,924	52,532
HDGV8A	0	3	3	3	1	2	42	28	48	25	19	14	187
HDGV8B	0	0	0	0	0	0	0	0	0	0	0	0	0
LDDV	0	133	146	169	43	97	1,883	1,226	2,406	1,284	913	574	8,875
LDDT12	0	0	0	0	0	0	0	0	0	0	0	0	0
HDDV2B	0	178	195	226	65	170	2,613	1,671	3,403	1,804	1,368	1,008	12,703
HDDV3	0	54	59	69	20	52	796	509	1,037	550	417	307	3,871
HDDV4	0	87	96	111	32	84	1,282	820	1,669	885	671	494	6,229
HDDV5	0	43	47	55	16	41	635	406	827	438	333	245	3,088
HDDV6	0	195	214	248	71	187	2,861	1,830	3,725	1,975	1,498	1,104	13,907
HDDV7	0	354	389	451	130	339	5,205	3,329	6,774	3,592	2,724	2,008	25,295
HDDV8A	0	508	557	646	186	486	7,455	4,768	9,705	5,146	3,902	2,876	36,234
HDDV8B	0	2,330	2,555	2,963	853	2,231	34,215	21,884	44,537	23,616	17,909	13,198	166,292
MC	0	110,809	121,888	141,377	38,935	89,359	1,925,686	1,268,855	2,088,716	1,112,754	817,444	529,142	8,244,967
HDGB	0	91	99	115	32	84	1,499	977	1,686	894	670	496	6,641
HDDBT	0	105	115	133	38	100	1,539	984	2,003	1,062	806	594	7,480
HDDBS	0	152	166	193	56	145	2,229	1,426	2,902	1,539	1,167	860	10,835
LDDT34	0	269	294	341	89	201	3,810	2,477	4,878	2,601	1,861	1,189	18,008
TOTAL	0	2,655,097	2,847,247	3,302,497	711,086	1,306,898	41,551,029	27,966,507	42,617,690	22,852,245	14,924,535	7,752,522	168,487,353

Input Tranplan File: C:\Program Files\AIR2005Software\AQ2015BUILD.DBF

Input Mobile File: C:\Program Files\AIR2005Software\15RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 5

Total Nitrogen Oxide Emissions (grams/day)

V-Type	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U	Total
LDGV	0	51,593	55,730	64,640	14,860	28,904	745,531	497,771	859,543	460,028	311,905	171,365	3,261,869
LDGT1	0	10,985	11,860	13,756	3,116	5,871	159,587	106,725	182,307	97,678	65,395	34,817	692,098
LDGT2	0	54,340	58,758	68,153	15,441	28,843	777,289	518,998	907,140	486,313	324,081	171,062	3,410,419
LDGT3	0	13,083	14,147	16,409	3,724	6,981	187,679	125,303	218,507	117,127	78,154	41,404	822,518
LDGT4	0	8,636	9,351	10,846	2,467	4,592	122,321	81,556	144,892	77,695	51,773	27,234	541,362
HDGV2B	0	3,224	3,465	4,018	839	1,319	47,547	32,113	51,863	27,925	17,608	7,833	197,754
HDGV3	0	117	125	145	30	48	1,720	1,161	1,875	1,010	637	283	7,151
HDGV4	0	32	35	40	8	13	474	320	517	278	176	78	1,972
HDGV5	0	118	126	147	31	48	1,734	1,171	1,891	1,018	642	286	7,212
HDGV6	0	241	259	300	63	98	3,548	2,396	3,870	2,084	1,314	584	14,755
HDGV7	0	112	120	139	29	46	1,647	1,113	1,797	967	610	271	6,851
HDGV8A	0	0	0	1	0	0	6	4	7	4	2	1	26
HDGV8B	0	0	0	0	0	0	0	0	0	0	0	0	0
LDDV	0	23	24	28	6	12	424	288	374	200	133	72	1,586
LDDT12	0	0	0	0	0	0	0	0	0	0	0	0	0
HDDV2B	0	838	887	1,029	228	443	15,622	10,626	13,529	7,239	4,794	2,624	57,860
HDDV3	0	239	253	293	65	126	4,450	3,027	3,854	2,062	1,366	747	16,482
HDDV4	0	409	433	502	111	216	7,622	5,185	6,601	3,532	2,339	1,280	28,231
HDDV5	0	200	212	246	54	106	3,727	2,535	3,227	1,727	1,144	626	13,803
HDDV6	0	1,020	1,080	1,253	278	539	19,450	13,226	16,469	8,812	5,836	3,197	71,161
HDDV7	0	1,856	1,966	2,280	506	981	35,389	24,064	29,965	16,033	10,618	5,818	129,475
HDDV8A	0	2,384	2,528	2,933	651	1,255	47,255	32,066	38,583	20,650	13,669	7,441	169,414
HDDV8B	0	11,033	11,709	13,581	3,017	5,798	219,124	148,615	178,771	95,689	63,328	34,379	785,042
MC	0	13,196	14,200	16,471	3,524	5,485	208,262	141,098	216,117	116,394	73,939	32,584	841,271
HDGB	0	30	33	38	8	12	448	303	489	263	166	74	1,864
HDDBT	0	592	627	727	161	313	11,140	7,581	9,549	5,109	3,384	1,858	41,042
HDDBS	0	933	988	1,145	254	494	17,527	11,926	15,048	8,051	5,333	2,927	64,627
LDDT34	0	181	192	222	49	95	3,327	2,261	2,923	1,565	1,036	564	12,415
TOTAL	0	175,410	189,107	219,344	49,521	92,637	2,642,850	1,771,432	2,909,709	1,559,454	1,039,382	549,413	11,198,259

Input Tranplan File: C:\Program Files\AIR2005Software\AQ2015BUILD.DBF

Input Mobile File: C:\Program Files\AIR2005Software\15RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 6

Congestion Factors

County	Urban Congestion Factor %	Rural Congestion Factor %
Kent	55	45
Newport	55	45
Providence	55	45
Washington	55	45
Bristol	55	45

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 7

Seasonal Factors

County	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U
Bristol	1.095	1.046	1.168	1.067	1.095	1.095	1.126	1.009	0.998	1.095	1.095	1.095
Kent	1.095	1.046	1.168	1.067	1.095	1.095	1.126	1.009	0.998	1.095	1.095	1.095
Newport	1.187	1.095	1.095	1.592	1.095	1.095	1.209	1.19	1.151	1.053	1.095	1.095
Providence	1.095	1.046	1.168	1.067	1.095	1.095	1.031	1.009	1.047	1.095	1.095	1.095
Washington	1.187	1.095	1.095	1.592	1.095	1.095	1.209	1.19	1.527	1.053	1.095	1.095

VMT and Emissions Tables:

Statewide-Ozone

2025 Build

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 1

Vehicle Miles of Travel

Functional Class	2009 Network Model Output	2009 HPMS	Future Network Model Output	HPMS Adjusted	HPMS & Seasonal Factor Adjusted
Interstate-Rural	1145	1108	1,302,675	1,260,580	1,448,398
Other PA-Rural	305	350	364,139	417,865	442,429
Minor Art.-Rural	416	366	495,616	436,047	497,928
Major Coll.-Rural	444	407	521,706	478,230	604,747
Minor Coll.-Rural	70	99	82,421	116,567	127,641
Local-Rural	63	62	343,024	337,579	367,044
Interstate-Urban	4503	4773	4,975,834	5,274,186	5,576,289
Other F/E-Urban	3469	3389	3,580,697	3,498,121	3,753,885
Other PA-Urban	5553	5902	6,127,725	6,512,846	7,074,056
Minor Art.-Urban	3125	3224	3,366,415	3,473,063	3,777,339
Collector-Urban	1843	2128	2,007,960	2,318,469	2,538,724
Local-Urban	756	794	1,900,224	1,995,738	2,170,002
Total	21692	22602	25,068,436	26,119,290	28,378,483

Input Tranplan File: C:\Program Files\AIR2005Software\AQ2025BUILDREV2.DBF
Input Mobile File: C:\Program Files\AIR2005Software\25RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 2A

Mobile 6.2 Format

Vehicle Type	Fraction of Fleet
LDGV	0.481466
LDGT1	0.080000
LDGT2	0.266200
LDGT3	0.071542
LDGT4	0.032913
HDGV2B	0.010433
HDGV3	0.000348
HDGV4	0.000105
HDGV5	0.000343
HDGV6	0.000740
HDGV7	0.000308
HDGV8A	0.000001
HDGV8B	0.000000
LDDV	0.000434
LDDT12	0.000000
HDDV2B	0.003167
HDDV3	0.000952
HDDV4	0.000995
HDDV5	0.000457
HDDV6	0.002260
HDDV7	0.003292
HDDV8A	0.003899
HDDV8B	0.013800
MC	0.023800
HDGB	0.000029
HDDBT	0.000300
HDDBS	0.000671
LDDT34	0.001545

Input Tranplan File: C:\Program Files\AIR2005Software\AQ2025BUILDREV2.DBF
Input Mobile File: C:\Program Files\AIR2005Software\25RIOZ.TB1

Rhode Island

Table: 2B

Transportation Conformity Air Quality Analysis

AIRS Format

Vehicle Type	Fraction of Fleet
HDDV	0.029793
HDGV	0.012307
LDDT	0.001545
LDDV	0.000434
LDGT12	0.3462
LDGT34	0.104455
LDGV	0.481466
MC	0.0238

Input Tranplan File: C:\Program Files\AIR2005Software\AQ2025BUILDREV2.DBF
Input Mobile File: C:\Program Files\AIR2005Software\25RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 3

Total Volatile Organice Compound Emissions (grams/day)

V-Type	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U	Total
LDGV	0	40,569	44,223	51,017	12,623	24,024	494,074	321,932	675,106	358,984	253,406	142,353	2,418,311
LDGT1	0	8,886	9,668	11,153	2,713	5,069	108,963	71,274	146,280	77,823	54,461	30,040	526,330
LDGT2	0	33,951	36,874	42,539	10,238	19,082	421,875	276,901	554,180	294,821	205,511	113,087	2,009,059
LDGT3	0	7,898	8,582	9,901	2,393	4,472	98,014	64,282	129,213	68,737	48,039	26,505	468,038
LDGT4	0	3,905	4,245	4,897	1,183	2,209	48,380	31,726	63,900	33,995	23,755	13,090	231,284
HDGV2B	0	740	815	940	260	574	8,600	5,426	13,197	6,989	5,227	3,401	46,170
HDGV3	0	33	36	41	11	22	389	250	565	300	218	133	1,998
HDGV4	0	10	11	12	3	7	118	76	169	90	65	39	598
HDGV5	0	35	38	44	12	23	423	272	604	321	232	139	2,142
HDGV6	0	75	82	95	25	50	904	582	1,293	686	496	297	4,586
HDGV7	0	33	36	42	11	22	396	255	564	300	217	130	2,004
HDGV8A	0	0	0	0	0	0	1	1	2	1	1	0	7
HDGV8B	0	0	0	0	0	0	0	0	0	0	0	0	0
LDDV	0	8	9	10	3	6	97	62	142	75	55	33	501
LDDT12	0	0	0	0	0	0	0	0	0	0	0	0	0
HDDV2B	0	111	122	141	41	92	1,275	796	2,028	1,072	820	545	7,043
HDDV3	0	38	42	48	14	31	435	271	691	366	280	186	2,403
HDDV4	0	47	52	60	17	39	538	336	855	452	346	230	2,970
HDDV5	0	23	26	30	9	19	268	167	425	225	172	114	1,478
HDDV6	0	141	156	180	52	117	1,623	1,013	2,580	1,364	1,044	694	8,963
HDDV7	0	254	281	324	94	212	2,927	1,826	4,653	2,461	1,883	1,252	16,166
HDDV8A	0	343	379	437	126	285	3,950	2,465	6,276	3,319	2,539	1,689	21,809
HDDV8B	0	1,342	1,482	1,710	495	1,116	15,453	9,641	24,560	12,987	9,933	6,607	85,326
MC	0	30,913	33,583	38,743	9,657	18,118	418,691	275,671	515,619	274,145	193,853	107,366	1,916,359
HDGB	0	4	5	5	1	3	50	32	73	39	28	17	257
HDDBT	0	24	26	30	9	20	272	170	432	229	175	116	1,503
HDDBS	0	68	75	87	25	57	786	490	1,249	660	505	336	4,339
LDDT34	0	67	73	85	23	47	797	509	1,165	618	454	277	4,114
TOTAL	0	129,518	140,920	162,570	40,037	75,717	1,629,300	1,066,425	2,145,823	1,141,058	803,713	448,676	7,783,756

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Input Mobile File: C:\Program Files\AIR2005Software\25RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 4

Total Carbon Monoxide Emissions (grams/day)

V-Type	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U	Total
LDGV	0	911,405	971,836	1,121,142	240,375	416,191	13,372,452	9,016,524	13,630,759	7,256,180	4,824,898	2,468,170	54,229,931
LDGT1	0	180,535	192,549	222,131	47,647	82,714	2,633,938	1,775,555	2,703,087	1,438,933	956,393	490,522	10,724,003
LDGT2	0	809,244	864,172	996,937	214,499	367,598	11,615,901	7,823,861	12,182,220	6,487,670	4,305,485	2,180,170	47,847,756
LDGT3	0	198,983	212,296	244,912	52,488	90,120	2,880,930	1,942,187	2,983,118	1,588,476	1,053,553	534,484	11,781,548
LDGT4	0	87,559	93,453	107,811	23,149	39,712	1,264,846	852,358	1,315,010	700,262	464,653	235,524	5,184,337
HDGV2B	0	17,965	19,401	22,382	6,271	15,637	277,753	180,935	312,378	164,569	125,947	92,506	1,235,744
HDGV3	0	766	827	954	267	667	11,840	7,713	13,316	7,015	5,369	3,943	52,679
HDGV4	0	224	242	280	78	195	3,471	2,261	3,903	2,056	1,574	1,156	15,441
HDGV5	0	856	925	1,067	299	745	13,241	8,626	14,892	7,846	6,004	4,410	58,912
HDGV6	0	1,829	1,975	2,279	638	1,592	28,276	18,419	31,801	16,754	12,822	9,417	125,801
HDGV7	0	840	907	1,046	293	731	12,986	8,459	14,605	7,694	5,888	4,325	57,774
HDGV8A	0	3	3	4	1	3	45	29	50	27	20	15	200
HDGV8B	0	0	0	0	0	0	0	0	0	0	0	0	0
LDDV	0	105	114	132	34	73	1,393	906	1,782	944	687	431	6,601
LDDT12	0	0	0	0	0	0	0	0	0	0	0	0	0
HDDV2B	0	102	112	129	37	93	1,411	901	1,836	968	749	547	6,884
HDDV3	0	33	36	42	12	30	460	294	599	315	244	179	2,245
HDDV4	0	46	50	58	17	41	630	402	819	432	334	244	3,074
HDDV5	0	23	25	29	8	21	313	200	407	215	166	121	1,528
HDDV6	0	108	118	136	39	98	1,488	950	1,935	1,020	790	577	7,258
HDDV7	0	195	213	246	71	176	2,690	1,718	3,498	1,844	1,428	1,044	13,123
HDDV8A	0	307	335	386	112	278	4,235	2,704	5,509	2,903	2,248	1,643	20,661
HDDV8B	0	1,245	1,358	1,567	454	1,126	17,175	10,968	22,340	11,773	9,116	6,662	83,785
MC	0	123,650	135,308	156,095	43,259	94,176	2,014,895	1,327,507	2,187,364	1,157,763	868,577	557,522	8,666,118
HDGB	0	97	104	120	34	84	1,494	973	1,680	885	678	498	6,648
HDDBT	0	37	41	47	14	34	515	329	670	353	274	200	2,514
HDDBS	0	70	76	88	25	63	963	615	1,252	660	511	373	4,697
LDDT34	0	246	267	308	81	177	3,277	2,126	4,201	2,225	1,632	1,046	15,586
TOTAL	0	2,336,473	2,496,744	2,880,326	630,205	1,112,374	34,166,619	22,987,522	35,439,033	18,859,782	12,650,040	6,595,730	140,154,848

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Input Mobile File: C:\Program Files\AIR2005Software\25RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 5

Total Nitrogen Oxide Emissions (grams/day)

V-Type	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U	Total
LDGV	0	24,866	26,757	30,868	7,216	13,583	334,858	223,264	391,141	207,756	144,854	80,494	1,485,658
LDGT1	0	5,977	6,424	7,411	1,694	3,057	81,473	54,504	93,276	49,608	34,003	18,119	355,546
LDGT2	0	28,764	30,921	35,672	8,128	14,537	389,199	260,353	449,258	239,022	163,156	86,183	1,705,194
LDGT3	0	7,588	8,154	9,407	2,146	3,862	103,793	69,453	118,327	62,937	43,081	22,893	451,642
LDGT4	0	5,157	5,548	6,401	1,462	2,612	69,641	46,536	80,848	43,022	29,344	15,487	306,059
HDGV2B	0	1,108	1,186	1,368	287	428	15,320	10,358	16,760	8,956	5,770	2,544	64,086
HDGV3	0	45	48	55	12	17	618	418	677	362	233	103	2,587
HDGV4	0	11	12	14	3	4	154	104	168	90	58	26	643
HDGV5	0	42	45	52	11	16	580	392	634	339	218	96	2,425
HDGV6	0	90	96	111	23	35	1,238	837	1,355	724	466	206	5,180
HDGV7	0	42	45	52	11	16	579	392	633	339	218	96	2,422
HDGV8A	0	0	0	0	0	0	2	1	2	1	1	0	8
HDGV8B	0	0	0	0	0	0	0	0	0	0	0	0	0
LDDV	0	5	6	6	1	3	91	62	80	42	29	15	340
LDDT12	0	0	0	0	0	0	0	0	0	0	0	0	0
HDDV2B	0	327	345	398	89	163	5,710	3,890	4,960	2,635	1,782	967	21,264
HDDV3	0	101	106	123	27	50	1,763	1,201	1,531	814	550	299	6,565
HDDV4	0	153	161	186	41	76	2,668	1,818	2,318	1,231	833	452	9,937
HDDV5	0	76	80	92	21	38	1,328	905	1,154	613	415	225	4,947
HDDV6	0	406	428	494	110	203	7,102	4,838	6,161	3,273	2,213	1,202	26,429
HDDV7	0	732	773	891	199	366	12,817	8,732	11,118	5,906	3,995	2,169	47,698
HDDV8A	0	957	1,010	1,166	260	478	16,966	11,551	14,546	7,728	5,226	2,833	62,721
HDDV8B	0	4,022	4,245	4,897	1,094	2,007	71,475	48,656	61,119	32,471	21,957	11,899	263,841
MC	0	14,715	15,764	18,186	3,915	5,781	217,613	147,620	226,560	121,105	78,567	34,328	884,154
HDGB	0	9	9	11	2	3	118	80	129	69	44	20	493
HDDBT	0	163	172	198	44	81	2,853	1,943	2,472	1,313	888	482	10,610
HDDBS	0	339	358	413	92	170	5,963	4,063	5,150	2,736	1,850	1,006	22,140
LDDT34	0	82	86	100	22	41	1,414	963	1,244	661	447	241	5,301
TOTAL	0	95,775	102,779	118,570	26,912	47,628	1,345,335	902,934	1,491,619	793,752	540,199	282,386	5,747,889

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Rhode Island

Transportation Conformity Air Quality Analysis

Table: 6

Congestion Factors

County	Urban Congestion Factor %	Rural Congestion Factor %
Kent	55	45
Newport	55	45
Providence	55	45
Washington	55	45
Bristol	55	45

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 7

Seasonal Factors

County	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U
Bristol	1.095	1.046	1.168	1.067	1.095	1.095	1.126	1.009	0.998	1.095	1.095	1.095
Kent	1.095	1.046	1.168	1.067	1.095	1.095	1.126	1.009	0.998	1.095	1.095	1.095
Newport	1.187	1.095	1.095	1.592	1.095	1.095	1.209	1.19	1.151	1.053	1.095	1.095
Providence	1.095	1.046	1.168	1.067	1.095	1.095	1.031	1.009	1.047	1.095	1.095	1.095
Washington	1.187	1.095	1.095	1.592	1.095	1.095	1.209	1.19	1.527	1.053	1.095	1.095

VMT and Emissions Tables:

Statewide-Ozone

2035 Build

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 1

Vehicle Miles of Travel

Functional Class	2009 Network Model Output	2009 HPMS	Future Network Model Output	HPMS Adjusted	HPMS & Seasonal Factor Adjusted
Interstate-Rural	1145	1108	1,385,583	1,340,809	1,540,804
Other PA-Rural	305	350	393,812	451,915	478,356
Minor Art.-Rural	416	366	536,028	471,601	538,653
Major Coll.-Rural	444	407	561,043	514,289	648,364
Minor Coll.-Rural	70	99	88,101	124,600	136,437
Local-Rural	63	62	359,730	354,020	385,121
Interstate-Urban	4503	4773	5,134,043	5,441,881	5,754,721
Other F/E-Urban	3469	3389	3,757,250	3,670,603	3,947,460
Other PA-Urban	5553	5902	6,409,357	6,812,178	7,397,779
Minor Art.-Urban	3125	3224	3,540,890	3,653,066	3,973,273
Collector-Urban	1843	2128	2,130,814	2,460,321	2,694,052
Local-Urban	756	794	1,992,689	2,092,851	2,276,780
Total	21692	22602	26,289,340	27,388,134	29,771,799

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Input Mobile File: C:\Program Files\AIR2005Software\35RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 2A

Mobile 6.2 Format

Vehicle Type	Fraction of Fleet
LDGV	0.481466
LDGT1	0.080000
LDGT2	0.266200
LDGT3	0.071542
LDGT4	0.032913
HDGV2B	0.010433
HDGV3	0.000348
HDGV4	0.000105
HDGV5	0.000343
HDGV6	0.000740
HDGV7	0.000308
HDGV8A	0.000001
HDGV8B	0.000000
LDDV	0.000434
LDDT12	0.000000
HDDV2B	0.003167
HDDV3	0.000952
HDDV4	0.000995
HDDV5	0.000457
HDDV6	0.002260
HDDV7	0.003292
HDDV8A	0.003899
HDDV8B	0.013800
MC	0.023800
HDGB	0.000029
HDDBT	0.000300
HDDBS	0.000671
LDDT34	0.001545

Input Tranplan File: C:\Program Files\AIR2005Software\AQ2035BUILDREV2.DBF
Input Mobile File: C:\Program Files\AIR2005Software\35RIOZ.TB1

Rhode Island

Table: 2B

Transportation Conformity Air Quality Analysis

AIRS Format

Vehicle Type	Fraction of Fleet
HDDV	0.029793
HDGV	0.012307
LDDT	0.001545
LDDV	0.000434
LDGT12	0.3462
LDGT34	0.104455
LDGV	0.481466
MC	0.0238

Input Tranplan File: C:\Program Files\AIR2005Software\AQ2035BUILDREV2.DBF
Input Mobile File: C:\Program Files\AIR2005Software\35RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 3

Total Volatile Organice Compound Emissions (grams/day)

V-Type	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U	Total
LDGV	0	43,221	47,134	53,977	13,318	24,886	501,485	332,000	696,380	372,433	265,422	147,454	2,497,710
LDGT1	0	9,446	10,280	11,773	2,855	5,238	110,337	73,333	150,522	80,541	56,903	31,042	542,269
LDGT2	0	36,370	39,511	45,247	10,850	19,852	430,991	287,735	574,429	307,354	216,225	117,646	2,086,210
LDGT3	0	8,154	8,863	10,150	2,445	4,494	96,557	64,396	129,099	69,068	48,719	26,629	468,574
LDGT4	0	4,008	4,357	4,989	1,202	2,206	47,367	31,581	63,463	33,955	23,947	13,073	230,148
HDGV2B	0	760	837	959	264	568	8,408	5,393	13,101	6,980	5,258	3,365	45,893
HDGV3	0	34	37	43	11	22	388	253	569	304	222	132	2,017
HDGV4	0	10	11	13	3	7	118	77	171	91	66	39	607
HDGV5	0	37	40	46	12	24	423	277	611	327	238	140	2,174
HDGV6	0	79	86	99	26	51	904	592	1,309	699	509	300	4,654
HDGV7	0	34	38	43	11	22	396	259	571	305	222	131	2,033
HDGV8A	0	0	0	0	0	0	1	1	2	1	1	0	7
HDGV8B	0	0	0	0	0	0	0	0	0	0	0	0	0
LDDV	0	8	9	10	3	6	95	62	141	75	56	33	498
LDDT12	0	0	0	0	0	0	0	0	0	0	0	0	0
HDDV2B	0	118	131	150	43	95	1,298	824	2,093	1,113	859	565	7,290
HDDV3	0	41	45	51	15	33	446	283	718	382	295	194	2,503
HDDV4	0	50	55	63	18	40	544	345	877	466	360	237	3,054
HDDV5	0	25	27	31	9	20	270	171	435	231	178	117	1,515
HDDV6	0	150	166	190	55	121	1,650	1,048	2,659	1,414	1,092	717	9,262
HDDV7	0	271	300	343	99	219	2,979	1,891	4,799	2,553	1,970	1,295	16,718
HDDV8A	0	368	406	465	134	297	4,038	2,563	6,507	3,461	2,671	1,755	22,665
HDDV8B	0	1,430	1,579	1,808	521	1,153	15,702	9,967	25,286	13,449	10,383	6,822	88,100
MC	0	33,431	36,326	41,600	10,322	19,001	432,034	295,070	539,236	288,359	205,715	112,593	2,013,687
HDGB	0	4	5	5	1	3	47	31	69	37	27	16	246
HDDBT	0	26	28	32	9	21	281	178	453	241	186	122	1,577
HDDBS	0	69	76	87	25	55	753	478	1,214	646	498	328	4,229
LDDT34	0	62	68	77	21	43	698	453	1,044	557	415	253	3,688
TOTAL	0	138,206	150,414	172,251	42,271	78,475	1,658,211	1,109,260	2,215,759	1,185,043	842,437	464,999	8,057,327

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Input Mobile File: C:\Program Files\AIR2005Software\35RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 4

Total Carbon Monoxide Emissions (grams/day)

V-Type	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U	Total
LDGV	0	842,811	898,536	1,028,986	219,169	371,460	11,929,799	8,246,308	12,151,377	6,505,388	4,367,366	2,202,766	48,763,965
LDGT1	0	166,435	177,355	203,104	43,169	73,483	2,353,611	1,627,976	2,394,646	1,281,840	860,232	435,746	9,617,596
LDGT2	0	632,107	674,407	772,318	164,759	277,500	8,812,513	6,087,632	9,145,150	4,897,129	3,283,146	1,645,660	36,392,320
LDGT3	0	149,157	159,028	182,116	38,735	65,393	2,097,104	1,449,906	2,151,174	1,151,801	771,870	387,797	8,604,080
LDGT4	0	71,587	76,353	87,438	18,627	31,389	1,002,420	692,730	1,034,208	553,785	371,179	186,149	4,125,866
HDGV2B	0	19,270	20,817	23,839	6,650	16,267	284,280	194,040	324,038	171,710	132,582	96,233	1,289,726
HDGV3	0	830	897	1,027	287	701	12,248	8,360	13,961	7,398	5,712	4,146	55,567
HDGV4	0	243	263	301	84	205	3,589	2,450	4,091	2,168	1,674	1,215	16,281
HDGV5	0	928	1,003	1,148	320	783	13,692	9,346	15,607	8,270	6,386	4,635	62,118
HDGV6	0	1,982	2,141	2,452	684	1,673	29,238	19,957	33,327	17,660	13,636	9,898	132,648
HDGV7	0	910	983	1,126	314	768	13,428	9,165	15,306	8,110	6,262	4,545	60,919
HDGV8A	0	3	3	4	1	3	46	32	53	28	22	16	211
HDGV8B	0	0	0	0	0	0	0	0	0	0	0	0	0
LDDV	0	100	108	124	32	67	1,264	845	1,639	874	642	398	6,094
LDDT12	0	0	0	0	0	0	0	0	0	0	0	0	0
HDDV2B	0	98	107	122	35	86	1,287	852	1,696	899	703	507	6,392
HDDV3	0	34	37	42	12	30	443	293	584	310	242	175	2,200
HDDV4	0	41	45	51	15	36	540	358	712	378	295	213	2,684
HDDV5	0	20	22	25	7	18	268	177	353	187	146	106	1,331
HDDV6	0	103	113	129	37	91	1,361	900	1,793	950	742	536	6,756
HDDV7	0	187	204	234	67	164	2,461	1,628	3,244	1,720	1,344	970	12,224
HDDV8A	0	305	333	381	110	268	4,016	2,657	5,293	2,806	2,193	1,583	19,946
HDDV8B	0	1,185	1,293	1,480	427	1,039	15,584	10,311	20,541	10,888	8,508	6,144	77,400
MC	0	133,738	146,357	167,605	46,240	98,766	2,079,125	1,485,918	2,287,441	1,217,787	921,735	584,680	9,169,392
HDGB	0	106	114	131	36	89	1,557	1,063	1,774	940	726	527	7,062
HDDBT	0	31	34	39	11	27	412	273	543	288	225	163	2,048
HDDBS	0	47	52	59	17	41	622	412	820	435	340	245	3,091
LDDT34	0	190	207	237	62	133	2,421	1,616	3,146	1,676	1,242	790	11,721
TOTAL	0	2,022,448	2,160,811	2,474,520	539,909	940,482	28,663,329	19,855,204	29,612,520	15,845,424	10,759,148	5,575,843	118,449,638

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Input Mobile File: C:\Program Files\AIR2005Software\35RIOZ.TB1

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 5

Total Nitrogen Oxide Emissions (grams/day)

V-Type	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U	Total
LDGV	0	25,266	27,203	31,152	7,263	13,439	324,356	220,624	384,582	205,436	144,741	79,634	1,463,694
LDGT1	0	6,108	6,567	7,521	1,712	3,037	79,528	54,321	92,226	49,331	34,116	18,001	352,467
LDGT2	0	29,192	31,390	35,947	8,155	14,337	377,658	258,005	440,734	235,818	162,525	84,993	1,678,754
LDGT3	0	7,373	7,923	9,073	2,061	3,652	96,696	66,118	111,065	59,405	41,068	21,648	426,081
LDGT4	0	5,018	5,399	6,183	1,405	2,474	64,964	44,337	75,970	40,652	27,994	14,663	289,059
HDGV2B	0	777	832	953	199	292	10,256	7,093	11,373	6,113	3,970	1,731	43,590
HDGV3	0	34	36	42	9	13	447	309	496	267	173	75	1,901
HDGV4	0	9	10	11	2	3	121	83	134	72	47	20	512
HDGV5	0	34	37	42	9	13	453	313	502	270	175	76	1,926
HDGV6	0	73	78	90	19	27	967	669	1,072	576	374	163	4,108
HDGV7	0	35	37	42	9	13	456	315	506	272	177	77	1,938
HDGV8A	0	0	0	0	0	0	2	1	2	1	1	0	7
HDGV8B	0	0	0	0	0	0	0	0	0	0	0	0	0
LDDV	0	5	5	6	1	2	81	58	72	39	26	14	311
LDDT12	0	0	0	0	0	0	0	0	0	0	0	0	0
HDDV2B	0	265	280	320	71	128	4,419	3,162	3,891	2,079	1,419	761	16,794
HDDV3	0	91	96	111	25	44	1,525	1,091	1,343	718	490	263	5,796
HDDV4	0	111	117	134	30	54	1,856	1,328	1,634	873	596	319	7,054
HDDV5	0	55	58	67	15	27	921	659	811	433	296	158	3,500
HDDV6	0	337	356	408	91	164	5,632	4,030	4,959	2,650	1,808	969	21,403
HDDV7	0	609	644	737	164	295	10,172	7,279	8,956	4,785	3,265	1,751	38,656
HDDV8A	0	827	873	1,000	222	401	13,796	9,872	12,147	6,490	4,428	2,375	52,429
HDDV8B	0	3,215	3,394	3,887	864	1,558	53,641	38,385	47,236	25,238	17,219	9,236	203,873
MC	0	15,909	17,051	19,527	4,185	6,063	224,578	156,861	236,954	127,385	83,374	35,997	927,883
HDGB	0	4	4	5	1	1	52	36	58	31	20	9	222
HDDBT	0	93	98	112	25	45	1,549	1,108	1,363	728	497	267	5,885
HDDBS	0	154	163	186	41	75	2,570	1,839	2,263	1,209	825	442	9,768
LDDT34	0	76	80	92	20	37	1,253	895	1,113	595	406	217	4,782
TOTAL	0	95,671	102,731	117,646	26,597	46,193	1,277,947	878,792	1,441,462	771,465	530,028	273,861	5,562,393

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Rhode Island

Transportation Conformity Air Quality Analysis

Table: 6

Congestion Factors

County	Urban Congestion Factor %	Rural Congestion Factor %
Kent	55	45
Newport	55	45
Providence	55	45
Washington	55	45
Bristol	55	45

Rhode Island

Transportation Conformity Air Quality Analysis

Table: 7

Seasonal Factors

County	Interstate-R	Other PA-R	Minor Art.-R	Major Coll.-R	Minor Coll.-R	Local-R	Interstate-U	Other F/E-U	Other PA-U	Minor Art.-U	Collector-U	Local-U
Bristol	1.095	1.046	1.168	1.067	1.095	1.095	1.126	1.009	0.998	1.095	1.095	1.095
Kent	1.095	1.046	1.168	1.067	1.095	1.095	1.126	1.009	0.998	1.095	1.095	1.095
Newport	1.187	1.095	1.095	1.592	1.095	1.095	1.209	1.19	1.151	1.053	1.095	1.095
Providence	1.095	1.046	1.168	1.067	1.095	1.095	1.031	1.009	1.047	1.095	1.095	1.095
Washington	1.187	1.095	1.095	1.592	1.095	1.095	1.209	1.19	1.527	1.053	1.095	1.095