

Development of Carbon Footprint Reduction Strategies for St. Lucie County

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St. Lucie

**Transportation
Planning
Organization**

SUBMITTED BY

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1. Introduction

The Infrastructure Investment and Jobs Act (IIJA) requires the Florida Department of Transportation (FDOT) and the Metropolitan Planning Organizations (MPOs) to develop Carbon Reduction Strategies to reduce transportation emissions from surface transportation.

Florida will receive \$320.4 million over the next five years (Source: FDOT: Carbon Reduction Strategy (fdot.gov)). The agencies are expected to follow the following guidelines in implementing the Carbon Reduction Strategies.

1. Support the reduction of transportation emissions in the state
2. Identify safe, reliable, and cost-effective options and strategies for projects
3. Consider the population density and context of the state

To support the Federal and State initiatives, St. Lucie TPO has undertaken this effort of testing various Carbon Reduction Strategies.

St. Lucie County is one of the fastest growing counties in the State of Florida, with some of the highest population growth rates to year 2045. The University of Florida's Bureau of Economic and Business Research (BEBR) estimates that by 2045, St. Lucie County's population can grow to a maximum projection over 570,000. In line with fast-growing population, the travel demand models are estimating congested conditions in 2045. The growing vehicle miles travelled (VMT) statistics are likely to contribute to the higher carbon footprint, primarily caused by the greenhouse gas (GHG) emissions, consisting of Carbon Dioxide (CO₂) and Nitrous Oxide (N₂O). It is also noted that CO₂ accounts for 97% of the GHG emissions and is an important gas to measure.

With this background, St. Lucie TPO is pursuing the system wide carbon footprint reduction strategies, for the emissions generated by passenger vehicle travel. The purpose of this study is to primarily define and demonstrate strategies that will reduce carbon footprint caused by the GHG emissions generated by automobile traffic. It should be noted that the GHG emissions are generated by a variety of sources, including automobiles, industrial pollution, and the heating and cooling systems, etc. This study primarily focuses on the transportation related GHG emissions generated by automotive traffic.

2. Performance Measures

Air quality performance measure is used to evaluate the impact of transportation on air pollution. In the context of travel demand modeling, air quality performance measures are typically used to assess the effectiveness of different transportation policies and strategies in reducing emissions and improving air quality.

Some common air quality performance measures used in travel demand modeling include:

2.1 Vehicle Miles Traveled (VMT)

Vehicle miles traveled (VMT) is a transportation performance measure that is commonly used in travel demand modeling. It refers to the total number of miles traveled by all vehicles within a specific geographic area over a given period of time.

In travel demand modeling, VMT is used as an input to estimate future transportation demand and to evaluate the impact of various transportation policies and interventions on travel behavior and system performance. VMT is often disaggregated by vehicle type, roadway type, time of day, and other factors to provide a more detailed picture of travel patterns and to inform planning and investment decisions.

VMT can be influenced by a variety of factors, including population growth, economic development, land use patterns, and transportation infrastructure investments. It is also closely linked to other transportation performance measures, such as vehicle congestion, air pollution, and greenhouse gas emissions.

In recent years, there has been growing interest in reducing VMT as a strategy to address traffic congestion, air pollution, and climate change. This has led to the development of a range of transportation policies and programs aimed at promoting more sustainable transportation modes, such as walking, cycling, and public transit, and at encouraging more efficient use of vehicles, such as through carpooling and the use of electric and hybrid vehicles.

2.2 Vehicle Hours Traveled (VHT)

Vehicle hours traveled (VHT) refers to the total amount of time that vehicles spend on the road within a given period. It is a measure of the cumulative travel time of vehicles and reflects the overall level of congestion and traffic delay within a transportation system. VHT considers both the distance traveled by vehicles and the average speed at which they are able to travel.

Reducing vehicle hours traveled is a desirable goal for several reasons. Firstly, high VHT indicates traffic congestion and inefficiencies within the transportation network. Congestion leads to delays, increased travel times, and frustration for commuters. Furthermore, reducing VHT contributes to improved air quality and reduced greenhouse gas emissions. Vehicles consume more fuel and produce higher emissions when operating in congested conditions or idling in traffic.

By reducing VHT, transportation systems can become more efficient, resulting in smoother traffic flow and improved travel times. Reducing vehicle hours traveled is crucial for improving transportation system efficiency, reducing congestion, enhancing air quality, and mitigating greenhouse gas emissions.

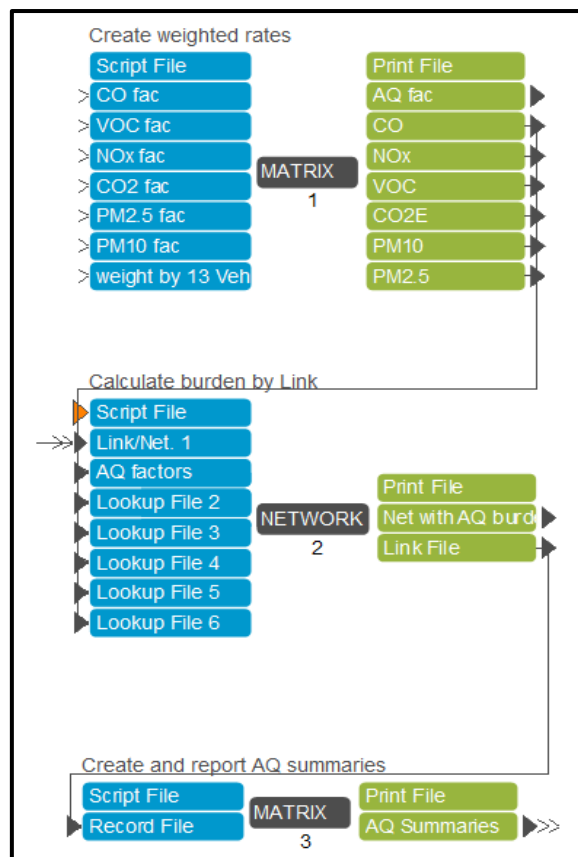
2.3 Emissions

This measures the quantity of pollutants (such as Carbon Dioxide (CO₂), Nitrous Oxide (N₂O), and particulate matter) that are emitted from vehicles. Quantifying the emissions can be used to evaluate the effectiveness of strategies that aim to reduce emissions. For certain strategies, trips can shift to other modes of transportation (such as driving, walking, or cycling). These strategies can be used to evaluate the shift in travel behavior towards more sustainable modes of transportation, which can help reduce emissions and improve air quality.

3. VMT\Air Quality Estimation Tool

Corradino developed an air quality emission tool (Figure 1) that allows for the calculation of various emissions for different transportation vehicle mixes. The tool automates the complex computations and provides a comprehensive and user-friendly way to estimate the emissions (in tons) of different modes of transportation over time. It can be used to inform policy decisions related to transportation and air quality, as well as to support research on emissions and their impact on the environment and public health. By providing accurate and up-to-date emissions estimates, this tool can help to reduce the environmental and health impacts of transportation and promote a more sustainable future.

Figure 1: Air Quality Assessment Tool



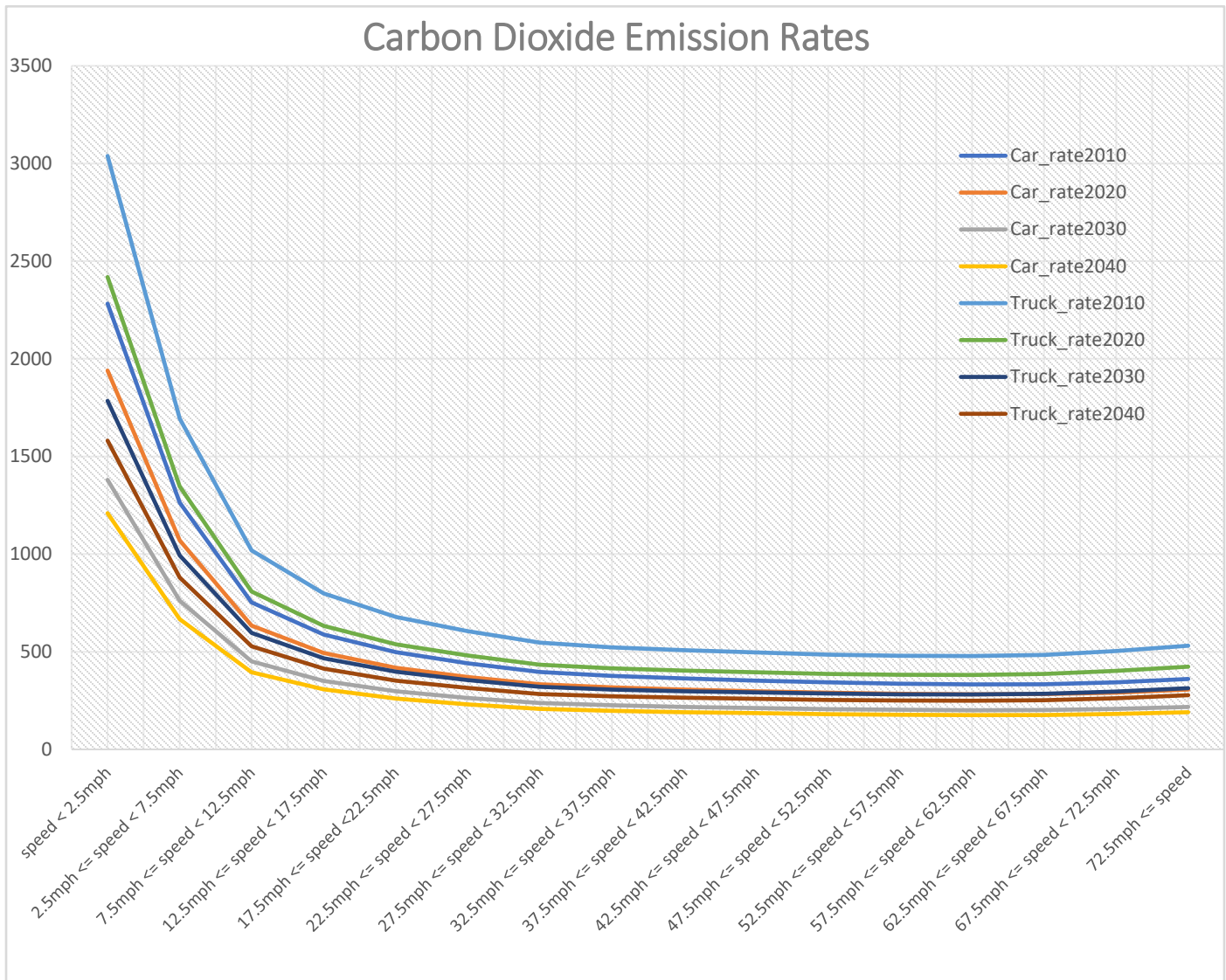
The tool utilizes rates for estimating the emissions of Carbon Monoxide (CO), Nitrous Oxide, Volatile Organic Compounds (VOC), Carbon Dioxide (CO₂), and particulate matter (less than 2.5 micrometers (PM_{2.5}), and less than 10 micrometers (PM₁₀)). The rates for each of the vehicle mixes (motorcycle, passenger car and truck) decrease every decade, starting from 2010 until 2040. The rates are developed for the use in FDOT D4 models using EPA's MOVES air quality model. It should be noted that the rates were developed based on the 2010 Census base year as starting point and is the latest information available in FDOT D4. The tool forecasts year 2045 emissions burdens by extrapolating the emissions rates of 2040. For this effort, the quantity of the pollutant is not an important performance measure. It is the difference (delta) of the quantity of the pollutant between two different scenarios that is important. The tool uses emission rates, which are typically

expressed as grams of pollutants emitted per mile traveled. These rates vary depending on the speed and type of vehicle.

For example, a motorcycle may have a higher rate of carbon monoxide emissions than a passenger car, while a passenger truck may have higher emissions of nitrogen oxide and particulate matter (Appendix A).

To calculate the emissions for a given mode of transportation, the tool would need to know the VMT traveling through a link and the corresponding emission rates for the mode and the congested speed. The tool would then multiply the distance by the rate of emissions, for a particular speed bin to calculate the total emissions for each pollutant. An example of CO₂ emission rates from the tool is shown in Figure 2.

Figure 2: Emission Rates of Carbon Dioxide for Car and Truck Modes



Fuel efficiency has been improving every passing year due to advancements in technology, changing consumer preferences, and government regulations. These improvements have resulted in reduced fuel consumption and lower emissions of greenhouse gases and other pollutants. To account for the decreasing rates over time, the tool accounts for decrease in emission rates, which involves estimating the rate for each year based on the known rates for the starting and ending years.

Overall, the tool would use basic mathematical operations, to calculate the emissions for each pollutant and mode of transportation. The accuracy of the tool would depend on the quality and reliability of the emission rates used, as well as the accuracy of the VMT traveled data.

4. GHG Emissions Reduction Strategies

There are several strategies that can be employed to reduce GHG emissions and mitigate the impacts of climate change. The study team, in coordination with the TPO, has met with the Planning Directors of the City of Port St. Lucie, City of Fort Pierce and the St. Lucie County and strategically defined the strategies to be tested for the GHG emissions. The primary strategies included Mixed-Use development, High-Density development, telecommuting, and multimodal strategies. It should be noted that higher mode split of the use of non-motorized and sustainable transportation is assumed in the Mixed-Use and High-Density development strategies and the multimodal strategy.

Each of the strategies were tested against the 2045 baseline scenario, using the Treasure Coast Regional Planning Model (TCRPM5). The following sections describe the strategies, the assumptions in implementing them using TCRPM5, and their results compared to the baseline scenario.

4.1 Mixed-Use / Multimodal Neighborhoods

Mixed-Use land development is a planning and design approach that combines different types of land uses within a single development or neighborhood. This approach contrasts with the traditional single-use development model, where residential, commercial, and industrial uses are separated into distinct areas. Mixed-Use development typically includes a mix of uses such as residential, commercial, office, and institutional uses in close proximity to one another. The goal is to create a more walkable, livable, and sustainable environment that provides a range of amenities and services within easy reach of residents.

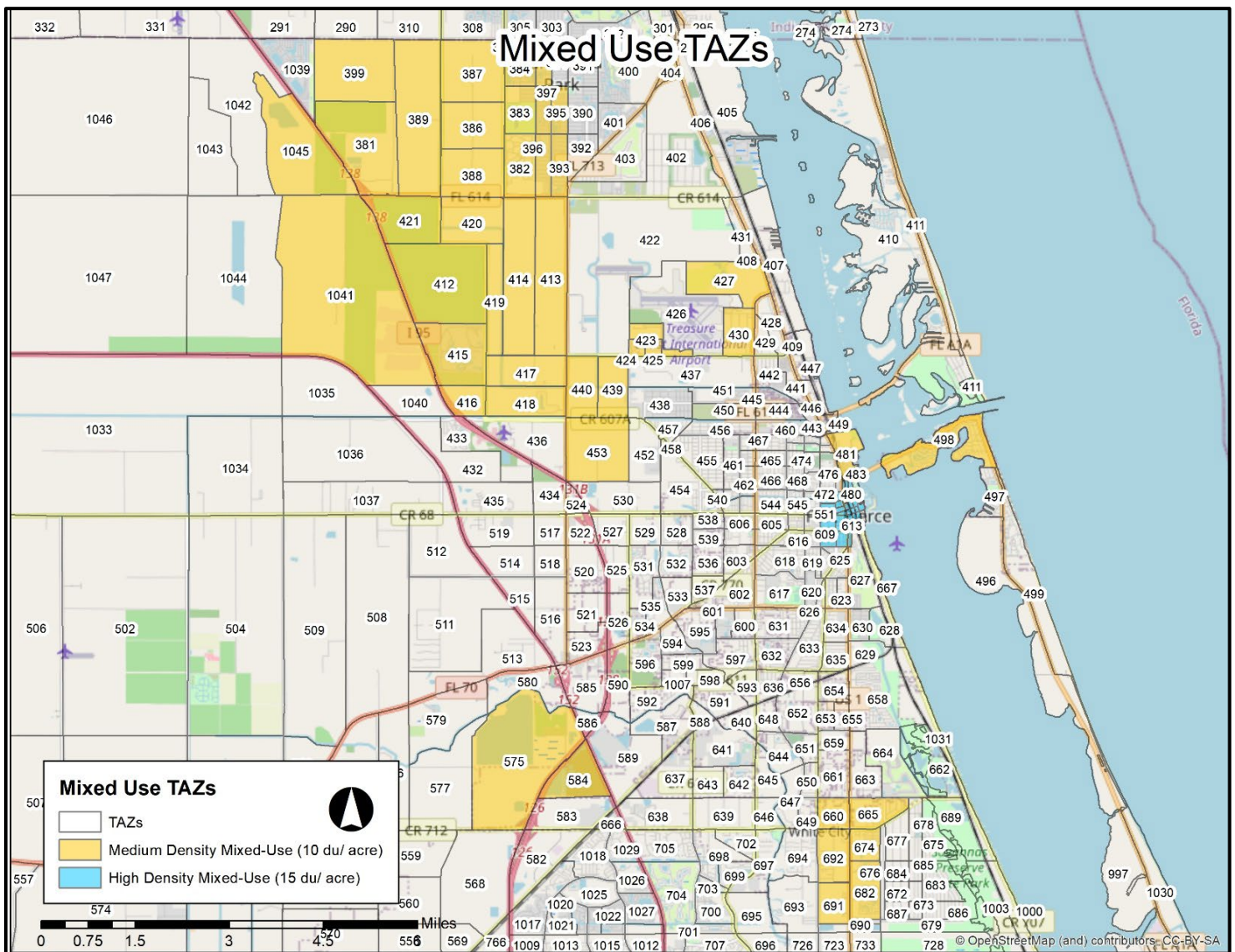
The benefits of Mixed-Use development include reduced traffic congestion, increased walkability and accessibility, and a greater sense of community. This approach can also provide opportunities for local businesses and help to support a diverse range of housing options and lifestyles.

To develop a Mixed-Use scenario, Corradino hosted a workshop with the local planning directors at the St. Lucie TPO, to obtain input on areas that they envision as Mixed-Use neighborhoods (Appendix B). Note that this is a high-level scenario used for demonstration purpose of the strategies and by no means assumes the immediate implementation. By gathering insights from

multiple organizations, Corradino aimed to create a comprehensive modeling assumption that reflects the needs and vision of the organizations. This collaborative approach helped to ensure that the resulting Mixed-Use scenario makes reasonable geographic assumptions, promoting sustainable and vibrant communities that benefit all stakeholders.

Figure 3 shows the TAZs that were demarcated as Mixed-Use neighborhoods. TAZs highlighted in orange color were selected as medium density households (10 du/acre) and TAZs highlighted in blue color as High-Density households (15 du/acre). Only 20% of the area of the TAZs was assumed for density calculations, assuming plenty of space for utilities, roads, parks, and greenspace. Total of 34,563 households and 15,312 jobs (Table 1) were added to Mixed-Use TAZs. This includes TAZs in the downtown Fort Pierce, TAZs near and west of the Treasure Coast International Airport, and the TAZs at US-1 and Midway Road intersection.

Figure 3: Mixed-Use TAZs

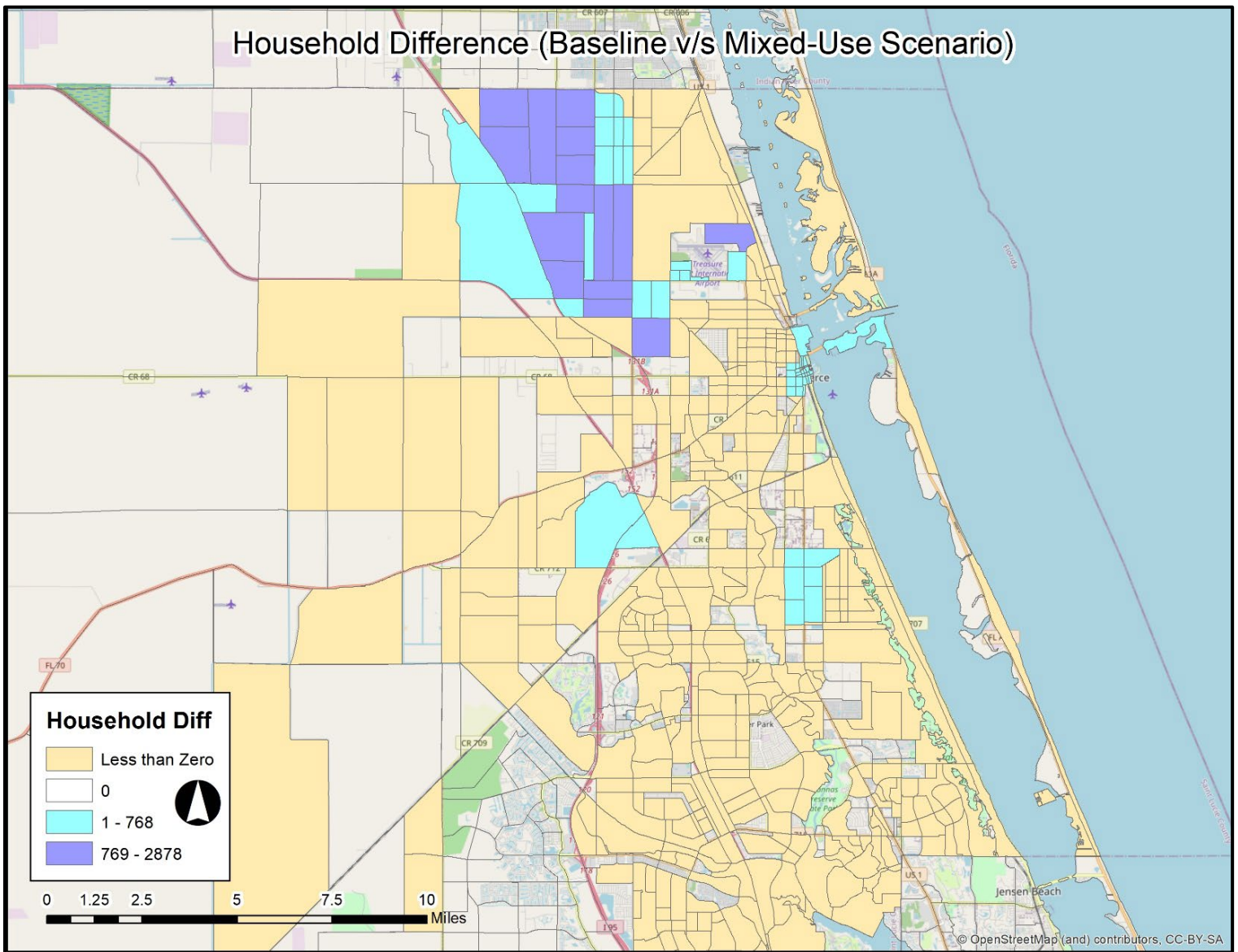


In order to honor the County control totals of St. Lucie County population, a growth reallocation procedure was implemented. This procedure involves applying a factor to adjust the growth to TAZs that are envisioned to be Mixed-Use and reallocate growth from other TAZs. The factors used for growth reallocation is based on household growth between base year and horizon year.

Table 1: Total Addition of Households and Employment for the Mixed-Use Scenario.

TOTAL_TAZ	HH_Baseline	EMP_Baseline	HH_MXD	EMP_MXD
68	13,970	19,243	48,533	34,555
Total Growth			+34,563	+15,312

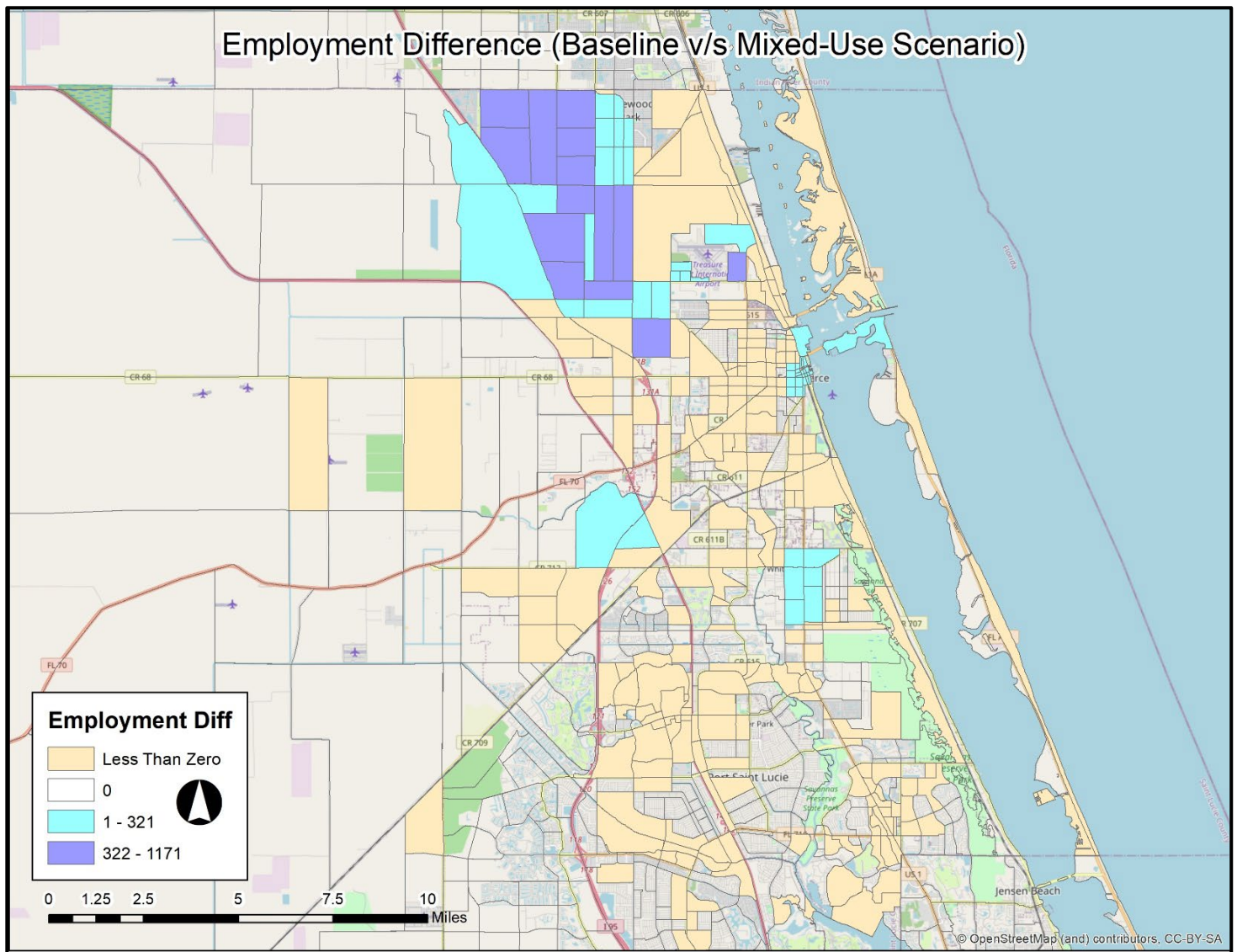
Figure 4: Household Distribution



The growth reallocation procedure is intended to provide a more accurate representation of the expected distribution of growth within the region, and to ensure that travel demand forecasts are consistent with St. Lucie County control totals. Since each of the scenario results are compared against the 2045 baseline scenario, the socioeconomic data control totals from baseline were used as the basis.

Figures 4 and 5 show household and employment difference between the baseline scenario and the Mixed-Use scenario. TAZs that are highlighted in light blue, purple color show where the household and employment growth was distributed to. TAZs highlighted in yellow color show where the additional households and employment was balanced to ensure travel demand forecasts are consistent with regional control totals.

Figure 5: Employment Distribution



After developing the baseline and Mixed-Use scenarios, key performance measures from TCRPM5 and the GHG tool were summarized. The Mixed-Use scenario included a combination of residential, commercial, and industrial land uses, and was designed to encourage walking, cycling, and transit use by providing a range of amenities and services within walking distance. The baseline scenario, on the other hand, assumed a continuation of existing land use patterns and transportation infrastructure investments.

The analysis showed that the Mixed-Use scenario led to a reduction in VMT of 0.67% (Table 2). This results in approximately 85,000 VMT reduction that roughly translates to 22.1 M reduction in vehicle miles travelled annually for 260 weekdays in a year.

Correspondingly, the reduction in VHT of 3% was observed, which translates to a total reduction of 10,000 vehicle hours. This is 2.6 M less vehicle hours travelled annually. These reductions are significant and suggest that Mixed-Use development can be an effective strategy for promoting more sustainable travel patterns.

Table 2: Comparing VMT of Mixed-Use Scenario with Baseline 2045

Statistics	Baseline Scenario	Mixed-Use Scenario	% Difference
Total Number of Directional Links	4,256	4,256	
Total Lane Miles	2,011	2,011	
Total Directional Miles	1,293	1,293	
Total Volume All Links	38,240,044	37,527,840	-1.86%
Average (Directional) Volumes of All Links	8,985	8,818	-1.86%
Total VMT All Links	12,368,345	12,285,592	-0.67%
Total VHT All Links	329,508	319,589	-3.01%
Original Speed (VMT/Free flow VHT)	48.39	48.56	
Congested Speed (VMT/Congested VHT)	37.54	38.44	
Walk Trips	171,104	221,984	29.74%
Bike Trips	43,772	42,924	-1.94%
Total Trips	2,272,728	2,270,888	0.36%

Biking and walking are highly sustainable modes of transportation that offer numerous benefits for individuals and communities. They promote a greener, healthier, and more vibrant transportation system while reducing dependence on fossil fuels and mitigating environmental impacts.

Mixed-use scenario, where residential, commercial, and recreational areas are integrated, the emphasis on walkability is even more pronounced. Analysis showed that there was a notable increase of 29.7% in walking trips, representing an additional 50,000 trips (Table 2). Additionally,

the overall increase of 0.36% in trips reflects the collective shift towards more sustainable transportation choices within the community.

Table 3 shows that the Mixed-Use scenario led to a 15-ton reduction in carbon dioxide (CO₂) emissions, as well as significant reductions in other gas categories. This was achieved by reducing the need for long-distance travel and encouraging more sustainable transportation modes, such as walking, cycling, and transit use.

Table 3: Air Quality Emissions (tons) Comparison of 2045 Baseline with the Mixed-Use Scenario

Scenario	CO	NO _x	VOC	CO ₂	PM-10	PM-2.5
Baseline Scenario	12.77	1.28	0.35	4,537	0.74	0.14
Mixed-Use Scenario	12.64	1.3	0.35	4,522	0.73	0.13

4.2 High-Density Neighborhoods

High-Density residential neighborhoods are areas characterized by a high concentration of housing units per unit of land area. These neighborhoods typically feature multi-family dwellings such as apartment buildings, condominiums, or townhouses, as well as some single-family homes.

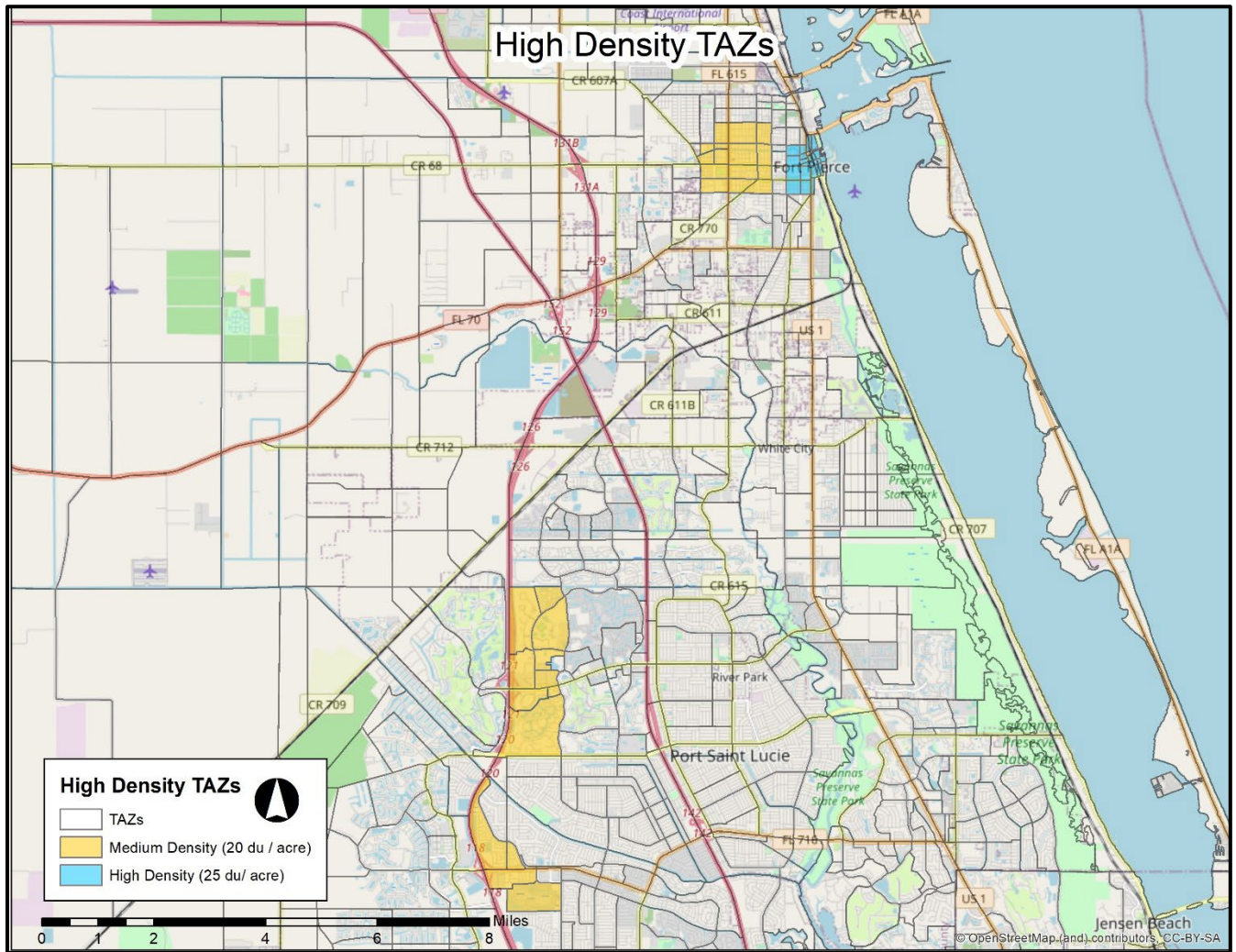
High-Density residential neighborhoods are often found in urban or suburban areas and are designed to accommodate a large number of people in a relatively small space. They typically offer a range of amenities such as parks, community centers, and public transportation, which make them attractive to residents who value the proximity to urban amenities and services.

High-Density residential neighborhoods can have several benefits, including reducing the amount of land used for housing, promoting more efficient land use, and supporting public transportation and other sustainable transportation options. They can also foster a sense of community and encourage social interaction among residents.

To develop a High-Density scenario, Corradino gathered input on areas that the TPO envisions as High-Density residential neighborhoods (Appendix B). By gathering insights from multiple organizations, Corradino created a comprehensive approach that reflected the needs and vision of the local agencies in St. Lucie TPO. This collaborative approach helped to ensure that the resulting scenario is both feasible and desirable, promoting sustainable and vibrant communities that benefit all stakeholders. Note that this scenario was developed again as a demonstration of GHG emissions reduction strategy and is not envisioned at implementation without further studies.

Figure 6 shows the TAZs that were demarcated as High-Density neighborhoods. TAZs highlighted in orange color were selected as medium density households (20 du/acre) and TAZs highlighted in blue color as High-Density households (25 du/acre).

Figure 6: High-Density TAZs



Only 20% of the area of the TAZs was assumed for density calculations. Total of 10,724 households (Table 4) were added to High-Density TAZs. This includes TAZs in Fort Pierce downtown, and east I-95 interchanges in Port St. Lucie.

Table 4: Household and Employment Comparison between the Baseline and High-Density Scenarios

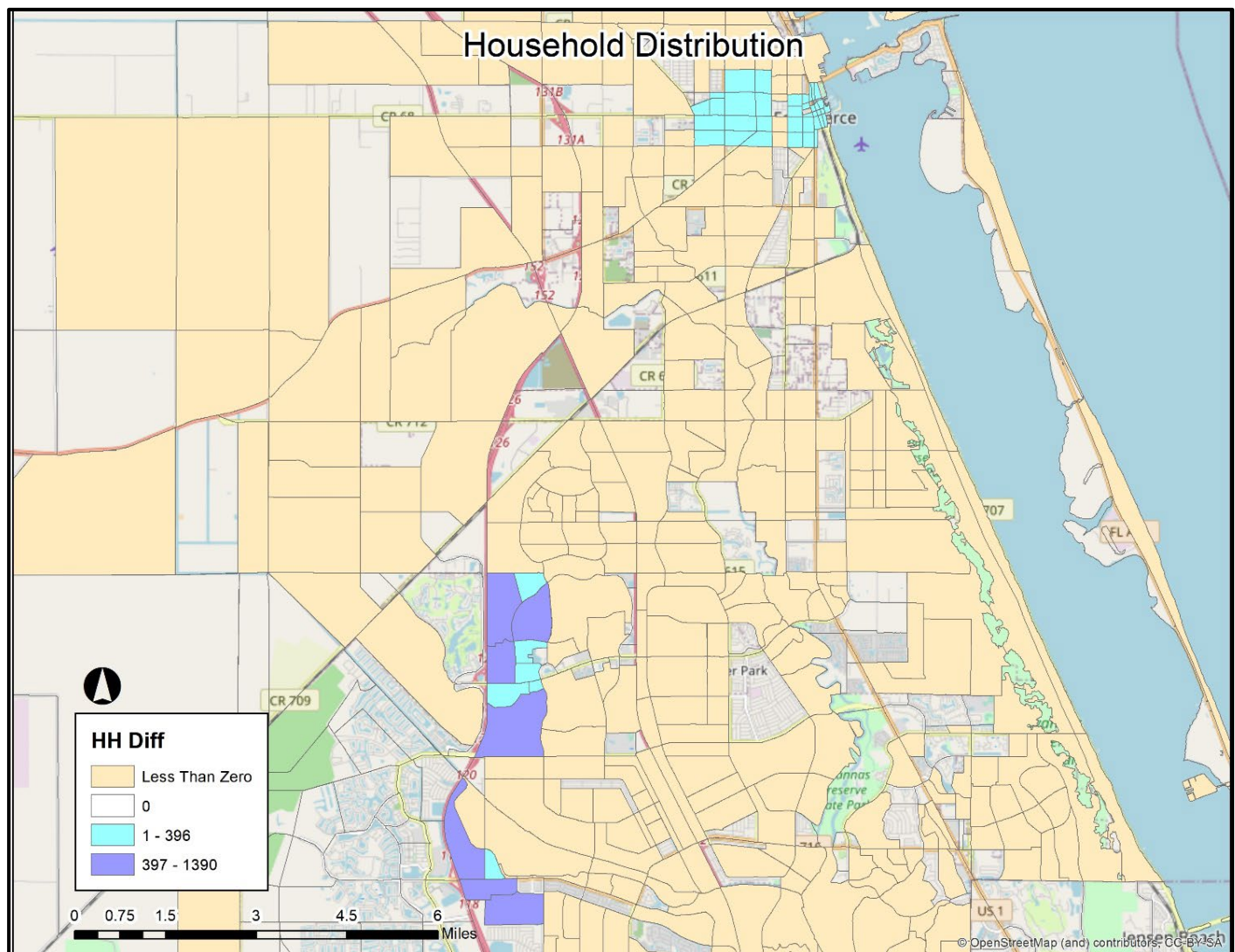
TOTAL_TAZs	HH_Baseline	EMP_Baseline	HH_HD	EMP_HD
52	6,310	19,594	17,034	19,594
Total Growth			10,724	-

In order to honor the County control totals of St. Lucie County population, a growth reallocation procedure was implemented. This procedure involves applying a factor to adjust the growth to TAZs that are envisioned to be Mixed-Use and reallocate growth from other TAZs. The factors

used for growth reallocation is based on household growth between base year and horizon year. The growth reallocation procedure is intended to provide a more accurate representation of the expected distribution of growth within the region, and to ensure that travel demand forecasts are consistent with St. Lucie County control totals. Since each of the scenario results are compared against the 2045 baseline scenario, the socioeconomic data control totals from baseline were used as the basis.

Figure 7 shows household difference between baseline scenario and the High-Density scenario. TAZs that are highlighted in light blue, purple color show where the growth was distributed to. TAZs highlighted in light orange color show where the additional households were balanced to ensure travel demand forecasts are consistent with regional control totals.

Figure 7: Household Comparison Between Revised and High-Density Scenario



The High-Density scenario results were evaluated using TCRPM5 to assess the impact of dense developments on vehicle miles traveled (VMT) and vehicle hours traveled (VHT). The High-Density scenario included a combination of residential uses and was designed to encourage

walking and cycling. The baseline scenario, on the other hand, assumed a continuation of existing land use patterns and transportation infrastructure investments.

The analysis showed that the High-Density scenario led to a reduction in VMT of 0.37% (Table 5). This results in approximately 46,000 VMT reduction that roughly translates to 11.96 M reduction in miles travelled annually for 260 weekdays in a year.

Reduction in VHT of 0.54%, which translates to a total reduction of 2,000 vehicle hours. This is 520,000 less vehicle hours travelled annually. These reductions are significant and suggest that High-Density development can be an effective strategy for promoting more sustainable travel patterns.

Table 5: Comparing VMT of High-Density Scenario with Baseline 2045

Statistics	Baseline Scenario	High-Density Scenario	% Difference
Total Number of Directional Links	4,256	4,256	
Total Lane Miles	2,011	2,011	
Total Directional Miles	1,293	1,293	
Total Volume All Links	38,240,044	38,225,340	-0.04%
Average (Directional) Volumes of All Links	8,985	8,981	-0.04%
Total VMT All Links	12,368,345	12,322,612	-0.37%
Total VHT All Links	329,508	327,726	-0.54%
Original Speed (VMT/Free flow VHT)	48.39	48.4	
Congested Speed (VMT/Congested VHT)	37.54	37.6	
Walk Trips	171,104	190,144	11.13%
Bike Trips	43,772	44,360	1.34%
Total Trips	2,272,728	2,269,408	0.30%

Walking and cycling are particularly advantageous modes of transportation for High-Density neighborhoods, offering numerous benefits for both residents and the community. In High-Density areas, where land is utilized more efficiently and distances between destinations are shorter, walking and cycling become even more viable and appealing options for daily travel.

In High-Density scenario, there was an increase of 11.13% in walking trips and 1.34% in bike trips (Table 5). This translates to an additional 20,000 walking trips and 600 more biking trips. These figures demonstrate the positive impact of the neighborhood's characteristics, infrastructure, and community support in encouraging active transportation choices.

Table 6 shows that the High-Density scenario led to an 8-ton reduction in Carbon Dioxide (CO₂) emissions, as well as slight reductions in other gas categories like carbon monoxide. This was achieved by reducing the need for long-distance travel and encouraging more sustainable transportation modes, such as walking, cycling, and transit use.

Table 6: Air Quality Emissions Comparison of High-Density Scenario with the Baseline 2045

Scenario	CO	NO _x	VOC	CO ₂	PM-10	PM-2.5
Baseline Scenario	12.77	1.28	0.35	4,537	0.74	0.14
High-Density Scenario	12.72	1.28	0.35	4,529	0.74	0.14

4.3 Telecommuting

Telecommuting is a work arrangement in which employees can perform their job duties outside of the traditional office setting, using technology to communicate and collaborate with colleagues and complete tasks remotely.

With the advancement of technology and the increasing availability of high-speed internet, remote working has become more popular in recent years. It offers many benefits to both employees and employers, such as increased flexibility, improved work-life balance, reduced commuting time and costs, and access to a larger pool of talent.

Remote working has the potential to significantly impact trip patterns, as it reduces the need for daily commuting to and from the office, which can result in a reduction in vehicle miles traveled (VMT) and greenhouse gas emissions. Employees who work remotely may have more flexible schedules and may be able to avoid rush-hour traffic, reducing congestion on roads and highways.

However, the impact of remote working on trip patterns can vary depending on the type of remote work arrangement and the characteristics of the individual. For example, employees who work from home full-time may have reduced commute trips, but they may also have more non-work trips, such as running errands during the day or traveling for leisure. Similarly, employees who work remotely part-time may still need to commute to the office for some portion of the workweek, which may not result in a significant reduction in VMT.

Overall, remote working has the potential to impact trip patterns by reducing the need for daily commuting and offering more flexibility in work schedules. This can result in reduced traffic congestion, improved air quality, and reduced greenhouse gas emissions.

To test the remote working scenario, the TCRPM5 input parameters were adjusted to reduce the home-based work trips and home-based school trips. The TCRPM model constants were adjusted so that the home-based work trips and school trips assumed increased activities from home. Table 7 presents the comparison of St. Lucie Person Trips between the Baseline and Remote Work Scenarios.

Table 7: TCRPM5 St. Lucie Person Trips Comparison of Baseline and Remote Work Scenario

Scenario	HBW	HB School	HBO	NHB	NHBW	Total
Baseline Scenario	295,280	196,552	1,203,688	383,680	183,528	2,262,728
Telecommuting Scenario	266,452	169,216	1,155,700	367,900	167,056	2,126,324
Trip Difference	28,828	27,336	47,988	15,780	16,472	136,404
% Diff	9.8%	13.9%	4.0%	4.1%	9.0%	6.0%

Table 8 presents the VMT statistics comparison between the Baseline and Remote Work Scenarios. It can be observed that this scenario produces significant reduction in VMT and VHT statistics.

Table 8: VMT Statistics Comparison of Baseline and Telecommuting Scenarios

Statistics	Baseline Scenario	Telecommuting Scenario	% Difference
Total Number of Directional Links	4,256	4,256	
Total Lane Miles	2,011	2,011	
Total Directional Miles	1,293	1,293	
Total Volume All Links	38,240,044	36,761,613	-3.87%
Average (Directional) Volumes of All Links	8,985	8,638	-3.87%
Total VMT All Links	12,368,345	11,943,924	-3.43%
Total VHT All Links	329,508	309,416	-6.10%
Original Speed (VMT/Free flow VHT)	48.39	48.57	
Congested Speed (VMT/Congested VHT)	37.54	38.6	

Table 9 presents the comparison of the Baseline and Telecommuting Scenarios. It can be noted that significant reduction of carbon emissions in the telecommuting scenario.

Table 9: Air Quality Emissions Comparison of the Baseline and Telecommuting Scenarios

Scenario	CO	NOx	VOC	CO ₂	PM-10	PM-2.5
Baseline Scenario	12.77	1.28	0.35	4,537	0.74	0.14
Telecommuting Scenario	12.28	1.26	0.33	4,372	0.69	0.13

4.4 Multimodal Scenario

As part of this scenario development, Corradino conducted discussions with the TPO and the St. Lucie County Transit division. While it was understood that robust changes to enhance transit are not yet planned, it was agreed that some testing of express buses in the area would be useful.

As part of this scenario, four express bus routes supported by park-and-ride lots were tested.

Express transit lines are public transportation routes that offer faster and more efficient service than local transit lines. These lines typically operate along major transportation corridors, such as highways or major streets, and provide limited stops and faster travel times than local transit lines.

Express transit lines often use specialized vehicles such as buses or trains, which are designed to provide a higher level of comfort and speed than regular transit vehicles. They may also offer features such as dedicated lanes, signal priority, and off-board fare collection to further improve travel times and reduce delays.

Express transit lines are often used for longer trips or for trips that require connections between different modes of transportation. They may also be used for commuting to and from work, where speed and efficiency are particularly important. Express transit lines can offer several benefits, including reduced travel times, increased reliability, and improved access to employment, education, and other important destinations. They can also support economic development by improving access to jobs and reducing the cost of transportation for residents.

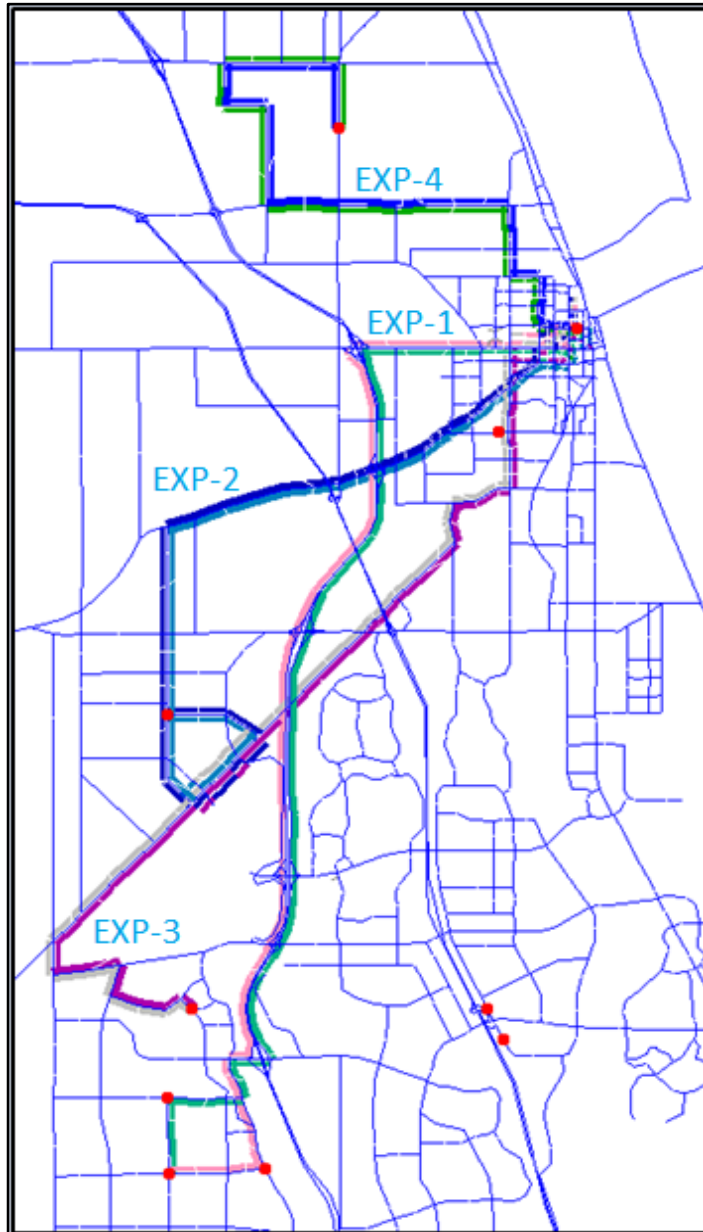


Figure 8: Transit Express Lines

Express transit lines are designed to provide faster and more efficient transportation options for commuters traveling to and from high-demand areas. In St. Lucie County, express transit lines have been developed specifically to connect the southwest region (Figure 8) of the county with the Fort Pierce downtown area, as well as to provide access to neighborhoods in the northern region where high growth is anticipated.

These transit lines offer a convenient and reliable alternative to driving, with a headway of 30 minutes and connecting regions like Tradition Parkway to the downtown. The service frequency is also higher than traditional bus routes, allowing for greater flexibility and convenience for. These transit options provide a faster, more efficient, and more sustainable means of transportation, benefitting both commuters and the broader community.

Table 10: Daily Ridership for the Express Scenario

Route	Mode	Distance (miles)	Daily Ridership
Express1_In	451	21.98	105
Express1_Out	451	21.67	106
Express2_In	451	17.12	10
Express2_out	451	17.12	49
Express3_In	451	19.86	22
Express3_Out	451	19.86	53
Express4_In	451	14.02	207
Express4_Out	451	14.02	236

Express Line 1 is a transit line in St. Lucie County that serves as a convenient and efficient transportation option for commuters traveling between high-demand areas (from Traditions Parkway to Downtown Fort Pierce). This line has an average daily ridership of 211 (Table 10). Express Line 4 is a key transit line in St. Lucie County that provides residents with access to high-growth areas in the northern region near the airport. This line has an average daily ridership of 443 (Table 10). Express Line 3 originating from Downtown to Glades-Cut off road, and Express Line 2 from the Downtown area to connect Southwest part of the county show 78 and 59 average daily ridership respectively. The multimodal scenario led to a reduction in VMT of 0.71% (Table 12). This results in approximately 88,000 VMT reduction that roughly translates to 22.9 M reduction in miles travelled annually for 260 weekdays in a year.

Reduction in VHT of 3.23% (Table 12) is observed, which translates to a total reduction of 10,656 vehicle hours. This is 2.7 M less vehicle hours travelled annually. Table 11 shows that the multimodal scenario led to 18-ton reduction in carbon-do-oxide emissions, as well as some reductions in other gas categories like carbon monoxide.

In multi-modal scenario, there was an increase of 29.6% in walking (Table 12). This translates to an additional 50,000 walking trips. It can be noted that there is slight reduction in bike trips in this scenario. This can be regarded as the noise in the data as the walk and bike modes compete in the future scenarios. These figures demonstrate the positive impact of the neighborhood's characteristics, infrastructure, and community support in encouraging active transportation choices.

Table 11: Air Quality Emissions compared with Transit-Express Scenario

Scenario	CO	NOx	VOC	CO ₂	PM-10	PM-2.5
Baseline Scenario	12.77	1.28	0.35	4,537	0.74	0.14
Multimodal Scenario	12.63	1.30	0.35	4,519	0.73	0.13

Compared to the High-Density and Mixed-Use scenarios, the transit scenario produced less impact on the VMT and greenhouse gases. However, as the region grows, in combination with the High-Density and Mixed-Use scenarios, transit options can become more effective.

Table 12: Comparing VMT of Multimodal Scenario with the Baseline 2045

Statistics	Baseline Scenario	Multimodal Scenario	% Difference
Total Number of Directional Links	4,256	4,256	
Total Lane Miles	2,011	2,011	
Total Directional Miles	1,293	1,293	
Total Volume All Links	38,240,044	37,507,504	-1.92%
Average (Directional) Volumes of All Links	8,985	8,813	-1.91%
Total VMT All Links	12,368,345	12,280,933	-0.71%
Total VHT All Links	329,508	318,852	-3.23%
Original Speed (VMT/Free flow VHT)	48.39	48.56	
Congested Speed (VMT/Congested VHT)	37.54	38.52	
Walk Trips	171,104	221,772	29.6%
Bike Trips	43,772	42,396	-3.14%
Total Trips	2,272,728	2,269,408	-0.16%

4.5 Sustainable Transportation Technologies

Sustainable transportation technologies encompass a range of innovations and practices that aim to reduce the environmental impact of transportation while maintaining efficiency and meeting mobility needs. Electric vehicles (EVs) are a significant component of sustainable transportation and have gained considerable attention in recent years.

Electric vehicles are automobiles powered by electric motors and use electricity stored in batteries as their primary energy source. They offer several environmental advantages over conventional internal combustion engine vehicles. Firstly, EVs produce zero tailpipe emissions, reducing air pollution and improving local air quality. This can have significant health benefits, particularly in densely populated areas.

Moreover, electric vehicles contribute to the reduction of greenhouse gas emissions when charged with electricity from renewable sources. They offer the potential for decarbonizing transportation and mitigating climate change impacts. By transitioning to an electric vehicle fleet, countries can reduce their dependence on fossil fuels and move towards a more sustainable and low-carbon transportation system.

In the sustainable transportation scenario, the adoption rates of electric vehicles (EVs) were considered based on age groups. The scenario assumed that individuals aged 18-34 had an EV adoption rate of 27%, those aged 35-50 had a rate of 40%, and individuals over 50 years old had a rate of 33% (Corradino’s internet research included various data sources on the ongoing EV sales data). To calculate the weighted average adoption rate, each age group’s adoption rate was multiplied by the proportion of the population it represented. If current trends continue, the weighted average EV adoption rate for St. Lucie County TAZ data age distribution came out to be 33%. The study team is aware of the much aggressive EV adoption goals of the current administration. If these aggressive goals are met, they will only improve the air quality in the region from the conservative scenario assumed herein. It should be noted that the EV penetration rates depend on the government’s policy decisions over the next few decades and make this scenario result highly uncertain.

Table 13: Air Quality Emissions of 2045 Baseline compared with Sustainable Transportation Scenario

Scenario	CO	NOx	VOC	CO ₂	PM-10	PM-2.5
Baseline Scenario	12.77	1.28	0.35	4,537	0.74	0.14
Sustainable Transportation Scenario	11.99	1.22	0.33	4,293	0.70	0.13

This weighted average EV adoption rate of 33% was then applied as a weighing factor to reduce the total emissions produced, vehicle miles traveled (VMT), by 33%. By encouraging a higher

adoption of electric vehicles, the scenario aimed to decrease the reliance on traditional gasoline-powered vehicles, resulting in reduced greenhouse gas emissions and improved air quality. Table 13 shows that there was a decrease in 44 tons of CO₂ emissions, as well as significant reductions in other gas categories like carbon monoxide.

5. Conclusions and Recommendations

St. Lucie TPO has undertaken the testing of various strategies for the carbon footprint reduction. In this effort, the 2045 Baseline Model Scenario adopted in April 2023 was used as the basis for comparison. Mixed-Use, High-Density, Telecommuting, Multimodal and the Sustainable Transportation strategies were tested as part of this effort. The TCRPM5 and the Air Quality Assessment tool were run for quantifying the benefits of each scenario.

Table 144: Comparison of GHG Reduction Scenario Performance Measures with the Baseline

Statistics	Baseline Scenario	High-Density Scenario	% Diff	Mixed- Use Scenario	% Diff	Telecommuting Scenario	% Diff	Multimodal Scenario	% Diff	Sustainable Transportation Scenario	% Diff
Total VMT All Links	12,368,345	12,322,612	-0.37%	12,285,592	-0.67%	11,943,924	-3.43%	12,280,933	-0.71%	12,368,345	0.00%
Total VHT All Links	329,508	327,726	-0.54%	319,589	-3.01%	309,416	-6.10%	318,852	-3.23%	329,508	0.00%
CO ₂ Emissions	4,537	4,529	-0.18%	4,522	-0.33%	4,372	-3.64%	4,519	-0.40%	4,293	-5.38%

Note that there is high uncertainty involving the EV market penetration rates that highly influence the results of the sustainable transportation scenario. Majority of this is dependent on the infrastructure improvements, availability of clean electric grid, availability of fast charging stations, and the Federal government policies, that are beyond the control of the local governments. Local governments can plan and support the infrastructure improvements that are necessary for implementing this scenario. St. Lucie TPO is conducting the strategies for implementing the sustainable transportation planning. Similar uncertainty exists in the Telecommuting Scenario, although some of these policies are within the local government’s authority. Local governments can collaborate with the public/private sector employers in developing remote working strategies/infrastructure necessary for implementing such scenario. In comparing different scenarios (Table 14), Sustainable Transportation Scenario provided the highest benefits, followed by the Telecommuting Scenario.

Mixed-Use and High-Density strategies provided significant benefits that can be considered as the local land use strategies for implementation in carbon footprint reduction. The express buses and non-motorized trips increase tested under multimodal scenario provide some encouragement for transit improvements in the region.

It should be noted that both the Mixed-Use and High-Density scenarios included significant increases of non-motorized trips. Implementation of walk/bike networks and the increase of multimodal connectivity can enhance the quality of these developments and reducing the carbon footprint. In addition, transportation infrastructure improvements that improve the flow of the

vehicle mix (reduce congestion) can be considered. These include signal coordination improvements and improvements of transportation flow by implementing roundabouts and other innovative designs along with the shared use paths. The Mixed-Use and High-Density developments when combined with transit/multimodal services can provide the best benefits for carbon footprint reduction and improving the community health.

Appendices

Appendix A – Emission Rates

(Source: FDOT D4 FSUTMS models)

PM 2.5 Emission Rates

PID	PDESC	VEHID	VEHDESC	SP_BIN	SP_desc	rate2010	rate2020	rate2030	rate2040
110	PM2.5	11	Motorcycle	1	speed < 2.5mph	0.058173	0.058538	0.058682	0.058693
110	PM2.5	11	Motorcycle	2	2.5mph <= speed < 7.5mph	0.039142	0.039389	0.039486	0.039493
110	PM2.5	11	Motorcycle	3	7.5mph <= speed < 12.5mph	0.029095	0.029279	0.029352	0.029357
110	PM2.5	11	Motorcycle	4	12.5mph <= speed < 17.5mph	0.024890	0.025048	0.025110	0.025115
110	PM2.5	11	Motorcycle	5	17.5mph <= speed < 22.5mph	0.023395	0.023544	0.023603	0.023607
110	PM2.5	11	Motorcycle	6	22.5mph <= speed < 27.5mph	0.021128	0.021263	0.021317	0.021320
110	PM2.5	11	Motorcycle	7	27.5mph <= speed < 32.5mph	0.020989	0.021125	0.021178	0.021182
110	PM2.5	11	Motorcycle	8	32.5mph <= speed < 37.5mph	0.023405	0.023558	0.023619	0.023623
110	PM2.5	11	Motorcycle	9	37.5mph <= speed < 42.5mph	0.024942	0.025107	0.025171	0.025176
110	PM2.5	11	Motorcycle	10	42.5mph <= speed < 47.5mph	0.026020	0.026193	0.026261	0.026266
110	PM2.5	11	Motorcycle	11	47.5mph <= speed < 52.5mph	0.026099	0.026273	0.026342	0.026347
110	PM2.5	11	Motorcycle	12	52.5mph <= speed < 57.5mph	0.025476	0.025647	0.025714	0.025719
110	PM2.5	11	Motorcycle	13	57.5mph <= speed < 62.5mph	0.025227	0.025396	0.025463	0.025468
110	PM2.5	11	Motorcycle	14	62.5mph <= speed < 67.5mph	0.025215	0.025384	0.025451	0.025456
110	PM2.5	11	Motorcycle	15	67.5mph <= speed < 72.5mph	0.025176	0.025346	0.025412	0.025417
110	PM2.5	11	Motorcycle	16	72.5mph <= speed	0.024860	0.025028	0.025094	0.025098
110	PM2.5	21	Passenger Car	1	speed < 2.5mph	0.057856	0.055359	0.050299	0.047785
110	PM2.5	21	Passenger Car	2	2.5mph <= speed < 7.5mph	0.035095	0.032245	0.029085	0.027624
110	PM2.5	21	Passenger Car	3	7.5mph <= speed < 12.5mph	0.023443	0.020509	0.018344	0.017426
110	PM2.5	21	Passenger Car	4	12.5mph <= speed < 17.5mph	0.019192	0.016386	0.014626	0.013915
110	PM2.5	21	Passenger Car	5	17.5mph <= speed < 22.5mph	0.016297	0.013774	0.012271	0.011666
110	PM2.5	21	Passenger Car	6	22.5mph <= speed < 27.5mph	0.013773	0.011776	0.010541	0.010014
110	PM2.5	21	Passenger Car	7	27.5mph <= speed < 32.5mph	0.012117	0.009975	0.008763	0.008260
110	PM2.5	21	Passenger Car	8	32.5mph <= speed < 37.5mph	0.011238	0.008698	0.007431	0.006925
110	PM2.5	21	Passenger Car	9	37.5mph <= speed < 42.5mph	0.010572	0.007724	0.006415	0.005905
110	PM2.5	21	Passenger Car	10	42.5mph <= speed < 47.5mph	0.009980	0.006912	0.005578	0.005067
110	PM2.5	21	Passenger Car	11	47.5mph <= speed < 52.5mph	0.009289	0.006166	0.004841	0.004335
110	PM2.5	21	Passenger Car	12	52.5mph <= speed < 57.5mph	0.008549	0.005540	0.004274	0.003778
110	PM2.5	21	Passenger Car	13	57.5mph <= speed < 62.5mph	0.008071	0.005099	0.003867	0.003381
110	PM2.5	21	Passenger Car	14	62.5mph <= speed < 67.5mph	0.007822	0.004830	0.003600	0.003105
110	PM2.5	21	Passenger Car	15	67.5mph <= speed < 72.5mph	0.007856	0.004769	0.003487	0.002958
110	PM2.5	21	Passenger Car	16	72.5mph <= speed	0.008658	0.005170	0.003716	0.003104
110	PM2.5	31	Passenger Truck	1	speed < 2.5mph	0.098869	0.080752	0.074225	0.072306
110	PM2.5	31	Passenger Truck	2	2.5mph <= speed < 7.5mph	0.057688	0.047133	0.042943	0.041637
110	PM2.5	31	Passenger Truck	3	7.5mph <= speed < 12.5mph	0.036828	0.030110	0.027135	0.026153
110	PM2.5	31	Passenger Truck	4	12.5mph <= speed < 17.5mph	0.029786	0.024408	0.021911	0.021065
110	PM2.5	31	Passenger Truck	5	17.5mph <= speed < 22.5mph	0.024867	0.020459	0.018297	0.017540
110	PM2.5	31	Passenger Truck	6	22.5mph <= speed < 27.5mph	0.021069	0.017546	0.015745	0.015083
110	PM2.5	31	Passenger Truck	7	27.5mph <= speed < 32.5mph	0.017771	0.014602	0.012915	0.012282
110	PM2.5	31	Passenger Truck	8	32.5mph <= speed < 37.5mph	0.016078	0.012745	0.010947	0.010279
110	PM2.5	31	Passenger Truck	9	37.5mph <= speed < 42.5mph	0.014788	0.011300	0.009418	0.008725
110	PM2.5	31	Passenger Truck	10	42.5mph <= speed < 47.5mph	0.013674	0.010107	0.008173	0.007463
110	PM2.5	31	Passenger Truck	11	47.5mph <= speed < 52.5mph	0.012521	0.008970	0.007038	0.006329
110	PM2.5	31	Passenger Truck	12	52.5mph <= speed < 57.5mph	0.011440	0.007994	0.006128	0.005441
110	PM2.5	31	Passenger Truck	13	57.5mph <= speed < 62.5mph	0.010738	0.007338	0.005507	0.004833
110	PM2.5	31	Passenger Truck	14	62.5mph <= speed < 67.5mph	0.010416	0.006952	0.005093	0.004409
110	PM2.5	31	Passenger Truck	15	67.5mph <= speed < 72.5mph	0.010651	0.006935	0.004943	0.004213
110	PM2.5	31	Passenger Truck	16	72.5mph <= speed	0.011459	0.007351	0.005130	0.004322
110	PM2.5	32	Light Commercial Truck	1	speed < 2.5mph	0.158308	0.093434	0.077178	0.074465
110	PM2.5	32	Light Commercial Truck	2	2.5mph <= speed < 7.5mph	0.089056	0.053880	0.044629	0.042923
110	PM2.5	32	Light Commercial Truck	3	7.5mph <= speed < 12.5mph	0.054050	0.033830	0.028140	0.026958
110	PM2.5	32	Light Commercial Truck	4	12.5mph <= speed < 17.5mph	0.042332	0.027056	0.022614	0.021636
110	PM2.5	32	Light Commercial Truck	5	17.5mph <= speed < 22.5mph	0.034475	0.022436	0.018823	0.017980
110	PM2.5	32	Light Commercial Truck	6	22.5mph <= speed < 27.5mph	0.028961	0.019169	0.016197	0.015476
110	PM2.5	32	Light Commercial Truck	7	27.5mph <= speed < 32.5mph	0.024602	0.016073	0.013382	0.012696
110	PM2.5	32	Light Commercial Truck	8	32.5mph <= speed < 37.5mph	0.021979	0.013899	0.011265	0.010574
110	PM2.5	32	Light Commercial Truck	9	37.5mph <= speed < 42.5mph	0.020188	0.012322	0.009687	0.008981
110	PM2.5	32	Light Commercial Truck	10	42.5mph <= speed < 47.5mph	0.018743	0.011056	0.008420	0.007701
110	PM2.5	32	Light Commercial Truck	11	47.5mph <= speed < 52.5mph	0.017316	0.009871	0.007279	0.006563
110	PM2.5	32	Light Commercial Truck	12	52.5mph <= speed < 57.5mph	0.016138	0.008922	0.006399	0.005698
110	PM2.5	32	Light Commercial Truck	13	57.5mph <= speed < 62.5mph	0.015379	0.008285	0.005796	0.005103
110	PM2.5	32	Light Commercial Truck	14	62.5mph <= speed < 67.5mph	0.014971	0.007889	0.005382	0.004678

110	PM2.5	32	Light Commercial Truck	15	67.5mph <= speed < 72.5mph	0.015052	0.007852	0.005236	0.004488
110	PM2.5	32	Light Commercial Truck	16	72.5mph <= speed	0.015783	0.008292	0.005464	0.004636
110	PM2.5	41	Intercity Bus	1	speed < 2.5mph	5.892893	2.679820	0.833438	0.312906
110	PM2.5	41	Intercity Bus	2	2.5mph <= speed < 7.5mph	3.522362	1.576108	0.557974	0.288558
110	PM2.5	41	Intercity Bus	3	7.5mph <= speed < 12.5mph	2.111854	0.922408	0.321546	0.164037
110	PM2.5	41	Intercity Bus	4	12.5mph <= speed < 17.5mph	1.754821	0.742477	0.251368	0.123769
110	PM2.5	41	Intercity Bus	5	17.5mph <= speed < 22.5mph	1.526878	0.631534	0.207325	0.097399
110	PM2.5	41	Intercity Bus	6	22.5mph <= speed < 27.5mph	1.346285	0.552320	0.176690	0.077854
110	PM2.5	41	Intercity Bus	7	27.5mph <= speed < 32.5mph	1.266625	0.514050	0.160903	0.069067
110	PM2.5	41	Intercity Bus	8	32.5mph <= speed < 37.5mph	1.045294	0.415513	0.129662	0.055108
110	PM2.5	41	Intercity Bus	9	37.5mph <= speed < 42.5mph	0.955082	0.371655	0.113200	0.045600
110	PM2.5	41	Intercity Bus	10	42.5mph <= speed < 47.5mph	0.881865	0.336343	0.100102	0.038152
110	PM2.5	41	Intercity Bus	11	47.5mph <= speed < 52.5mph	0.802030	0.300413	0.088194	0.032356
110	PM2.5	41	Intercity Bus	12	52.5mph <= speed < 57.5mph	0.735590	0.270558	0.078316	0.027551
110	PM2.5	41	Intercity Bus	13	57.5mph <= speed < 62.5mph	0.682148	0.248473	0.071303	0.024816
110	PM2.5	41	Intercity Bus	14	62.5mph <= speed < 67.5mph	0.671089	0.244071	0.069075	0.023817
110	PM2.5	41	Intercity Bus	15	67.5mph <= speed < 72.5mph	0.663546	0.241037	0.067357	0.023019
110	PM2.5	41	Intercity Bus	16	72.5mph <= speed	0.670613	0.243187	0.067028	0.022757
110	PM2.5	42	Transit Bus	1	speed < 2.5mph	5.391692	2.138297	0.571807	0.250154
110	PM2.5	42	Transit Bus	2	2.5mph <= speed < 7.5mph	2.863309	1.138342	0.344514	0.184069
110	PM2.5	42	Transit Bus	3	7.5mph <= speed < 12.5mph	1.647164	0.645662	0.194077	0.103855
110	PM2.5	42	Transit Bus	4	12.5mph <= speed < 17.5mph	1.045586	0.410674	0.124316	0.066900
110	PM2.5	42	Transit Bus	5	17.5mph <= speed < 22.5mph	0.961872	0.368476	0.107970	0.057030
110	PM2.5	42	Transit Bus	6	22.5mph <= speed < 27.5mph	0.901995	0.340723	0.097258	0.050262
110	PM2.5	42	Transit Bus	7	27.5mph <= speed < 32.5mph	0.877277	0.327473	0.091564	0.046914
110	PM2.5	42	Transit Bus	8	32.5mph <= speed < 37.5mph	0.800066	0.295072	0.081054	0.040603
110	PM2.5	42	Transit Bus	9	37.5mph <= speed < 42.5mph	0.774330	0.282318	0.075388	0.036559
110	PM2.5	42	Transit Bus	10	42.5mph <= speed < 47.5mph	0.751672	0.271406	0.070767	0.033321
110	PM2.5	42	Transit Bus	11	47.5mph <= speed < 52.5mph	0.703135	0.242859	0.061775	0.028157
110	PM2.5	42	Transit Bus	12	52.5mph <= speed < 57.5mph	0.662554	0.219167	0.054334	0.023885
110	PM2.5	42	Transit Bus	13	57.5mph <= speed < 62.5mph	0.610823	0.199555	0.049273	0.021585
110	PM2.5	42	Transit Bus	14	62.5mph <= speed < 67.5mph	0.608016	0.199036	0.048645	0.021223
110	PM2.5	42	Transit Bus	15	67.5mph <= speed < 72.5mph	0.607288	0.199203	0.048255	0.020961
110	PM2.5	42	Transit Bus	16	72.5mph <= speed	0.621574	0.204246	0.048857	0.021161
110	PM2.5	43	School Bus	1	speed < 2.5mph	5.017784	2.540005	0.631963	0.213168
110	PM2.5	43	School Bus	2	2.5mph <= speed < 7.5mph	2.520262	1.295110	0.360202	0.156624
110	PM2.5	43	School Bus	3	7.5mph <= speed < 12.5mph	1.400559	0.713095	0.195841	0.086528
110	PM2.5	43	School Bus	4	12.5mph <= speed < 17.5mph	0.878287	0.450509	0.127373	0.055990
110	PM2.5	43	School Bus	5	17.5mph <= speed < 22.5mph	0.750820	0.379241	0.105121	0.045689
110	PM2.5	43	School Bus	6	22.5mph <= speed < 27.5mph	0.661710	0.330672	0.090391	0.038608
110	PM2.5	43	School Bus	7	27.5mph <= speed < 32.5mph	0.615360	0.304985	0.082439	0.035030
110	PM2.5	43	School Bus	8	32.5mph <= speed < 37.5mph	0.542981	0.267247	0.071732	0.029881
110	PM2.5	43	School Bus	9	37.5mph <= speed < 42.5mph	0.493868	0.241503	0.064609	0.026000
110	PM2.5	43	School Bus	10	42.5mph <= speed < 47.5mph	0.454776	0.221125	0.059004	0.022956
110	PM2.5	43	School Bus	11	47.5mph <= speed < 52.5mph	0.454232	0.218350	0.058866	0.021123
110	PM2.5	43	School Bus	12	52.5mph <= speed < 57.5mph	0.453427	0.215913	0.058706	0.019598
110	PM2.5	43	School Bus	13	57.5mph <= speed < 62.5mph	0.418759	0.198897	0.054737	0.018200
110	PM2.5	43	School Bus	14	62.5mph <= speed < 67.5mph	0.403480	0.190593	0.050814	0.016788
110	PM2.5	43	School Bus	15	67.5mph <= speed < 72.5mph	0.391289	0.183876	0.047387	0.015537
110	PM2.5	43	School Bus	16	72.5mph <= speed	0.382715	0.178814	0.044437	0.014508
110	PM2.5	51	Refuse Truck	1	speed < 2.5mph	4.181279	1.121840	0.381162	0.333929
110	PM2.5	51	Refuse Truck	2	2.5mph <= speed < 7.5mph	2.444154	0.721269	0.313012	0.287291
110	PM2.5	51	Refuse Truck	3	7.5mph <= speed < 12.5mph	1.525991	0.459168	0.211196	0.195759
110	PM2.5	51	Refuse Truck	4	12.5mph <= speed < 17.5mph	1.286346	0.365592	0.152656	0.139609
110	PM2.5	51	Refuse Truck	5	17.5mph <= speed < 22.5mph	1.102483	0.300431	0.114574	0.103058
110	PM2.5	51	Refuse Truck	6	22.5mph <= speed < 27.5mph	1.007354	0.272694	0.103435	0.093042
110	PM2.5	51	Refuse Truck	7	27.5mph <= speed < 32.5mph	0.939418	0.248447	0.089551	0.079859
110	PM2.5	51	Refuse Truck	8	32.5mph <= speed < 37.5mph	0.739332	0.195195	0.070463	0.062761
110	PM2.5	51	Refuse Truck	9	37.5mph <= speed < 42.5mph	0.684122	0.176675	0.060871	0.053772
110	PM2.5	51	Refuse Truck	10	42.5mph <= speed < 47.5mph	0.641068	0.162210	0.053361	0.046738
110	PM2.5	51	Refuse Truck	11	47.5mph <= speed < 52.5mph	0.565496	0.140483	0.044374	0.038533
110	PM2.5	51	Refuse Truck	12	52.5mph <= speed < 57.5mph	0.481456	0.117347	0.035556	0.030570
110	PM2.5	51	Refuse Truck	13	57.5mph <= speed < 62.5mph	0.438237	0.105554	0.031085	0.026543
110	PM2.5	51	Refuse Truck	14	62.5mph <= speed < 67.5mph	0.437435	0.104933	0.030544	0.026027
110	PM2.5	51	Refuse Truck	15	67.5mph <= speed < 72.5mph	0.436803	0.104411	0.030071	0.025575
110	PM2.5	51	Refuse Truck	16	72.5mph <= speed	0.447109	0.106375	0.030289	0.025719
110	PM2.5	52	Single Unit Short-haul Truck	1	speed < 2.5mph	3.114151	0.676072	0.205188	0.174984
110	PM2.5	52	Single Unit Short-haul Truck	2	2.5mph <= speed < 7.5mph	1.640807	0.400040	0.163344	0.148779
110	PM2.5	52	Single Unit Short-haul Truck	3	7.5mph <= speed < 12.5mph	0.912266	0.223642	0.092986	0.084899

110	PM2.5	52	Single Unit Short-haul Truck	4	12.5mph <= speed < 17.5mph	0.672680	0.161012	0.064906	0.058919
110	PM2.5	52	Single Unit Short-haul Truck	5	17.5mph <= speed <22.5mph	0.546583	0.128184	0.050350	0.045467
110	PM2.5	52	Single Unit Short-haul Truck	6	22.5mph <= speed < 27.5mph	0.458527	0.104710	0.039157	0.034970
110	PM2.5	52	Single Unit Short-haul Truck	7	27.5mph <= speed < 32.5mph	0.417439	0.095084	0.035481	0.031646
110	PM2.5	52	Single Unit Short-haul Truck	8	32.5mph <= speed < 37.5mph	0.364615	0.082715	0.030793	0.027445
110	PM2.5	52	Single Unit Short-haul Truck	9	37.5mph <= speed < 42.5mph	0.335744	0.075513	0.027702	0.024565
110	PM2.5	52	Single Unit Short-haul Truck	10	42.5mph <= speed < 47.5mph	0.313004	0.069989	0.025422	0.022452
110	PM2.5	52	Single Unit Short-haul Truck	11	47.5mph <= speed < 52.5mph	0.292236	0.065463	0.023843	0.021012
110	PM2.5	52	Single Unit Short-haul Truck	12	52.5mph <= speed < 57.5mph	0.273941	0.061206	0.022160	0.019450
110	PM2.5	52	Single Unit Short-haul Truck	13	57.5mph <= speed < 62.5mph	0.251373	0.056342	0.020608	0.018100
110	PM2.5	52	Single Unit Short-haul Truck	14	62.5mph <= speed < 67.5mph	0.236242	0.052866	0.019299	0.016962
110	PM2.5	52	Single Unit Short-haul Truck	15	67.5mph <= speed < 72.5mph	0.223805	0.050026	0.018235	0.016042
110	PM2.5	52	Single Unit Short-haul Truck	16	72.5mph <= speed	0.214237	0.047899	0.017489	0.015423
110	PM2.5	53	Single Unit Long-haul Truck	1	speed < 2.5mph	3.478807	0.789100	0.277177	0.233505
110	PM2.5	53	Single Unit Long-haul Truck	2	2.5mph <= speed < 7.5mph	1.798835	0.471040	0.217806	0.197055
110	PM2.5	53	Single Unit Long-haul Truck	3	7.5mph <= speed < 12.5mph	0.965767	0.256210	0.121543	0.110432
110	PM2.5	53	Single Unit Long-haul Truck	4	12.5mph <= speed < 17.5mph	0.709172	0.182740	0.083863	0.075626
110	PM2.5	53	Single Unit Long-haul Truck	5	17.5mph <= speed <22.5mph	0.578687	0.145587	0.065000	0.058227
110	PM2.5	53	Single Unit Long-haul Truck	6	22.5mph <= speed < 27.5mph	0.495137	0.120304	0.051069	0.045128
110	PM2.5	53	Single Unit Long-haul Truck	7	27.5mph <= speed < 32.5mph	0.446604	0.107568	0.045067	0.039670
110	PM2.5	53	Single Unit Long-haul Truck	8	32.5mph <= speed < 37.5mph	0.394604	0.093601	0.038085	0.033313
110	PM2.5	53	Single Unit Long-haul Truck	9	37.5mph <= speed < 42.5mph	0.365866	0.084416	0.032555	0.028036
110	PM2.5	53	Single Unit Long-haul Truck	10	42.5mph <= speed < 47.5mph	0.343193	0.077283	0.028292	0.023974
110	PM2.5	53	Single Unit Long-haul Truck	11	47.5mph <= speed < 52.5mph	0.321728	0.071513	0.025473	0.021358
110	PM2.5	53	Single Unit Long-haul Truck	12	52.5mph <= speed < 57.5mph	0.302448	0.066343	0.023072	0.019146
110	PM2.5	53	Single Unit Long-haul Truck	13	57.5mph <= speed < 62.5mph	0.279397	0.061191	0.021316	0.017670
110	PM2.5	53	Single Unit Long-haul Truck	14	62.5mph <= speed < 67.5mph	0.261173	0.057063	0.019738	0.016340
110	PM2.5	53	Single Unit Long-haul Truck	15	67.5mph <= speed < 72.5mph	0.245870	0.053587	0.018373	0.015186
110	PM2.5	53	Single Unit Long-haul Truck	16	72.5mph <= speed	0.233621	0.050826	0.017252	0.014243
110	PM2.5	54	Motor Home	1	speed < 2.5mph	1.717180	0.822298	0.259948	0.149128
110	PM2.5	54	Motor Home	2	2.5mph <= speed < 7.5mph	0.939889	0.468540	0.180045	0.126679
110	PM2.5	54	Motor Home	3	7.5mph <= speed < 12.5mph	0.515078	0.257011	0.102409	0.073662
110	PM2.5	54	Motor Home	4	12.5mph <= speed < 17.5mph	0.379322	0.184463	0.071792	0.050591
110	PM2.5	54	Motor Home	5	17.5mph <= speed <22.5mph	0.307843	0.146329	0.056046	0.038878
110	PM2.5	54	Motor Home	6	22.5mph <= speed < 27.5mph	0.256783	0.120282	0.045095	0.030351
110	PM2.5	54	Motor Home	7	27.5mph <= speed < 32.5mph	0.236721	0.110774	0.041759	0.028047
110	PM2.5	54	Motor Home	8	32.5mph <= speed < 37.5mph	0.212467	0.100272	0.038397	0.026141
110	PM2.5	54	Motor Home	9	37.5mph <= speed < 42.5mph	0.200630	0.095292	0.036737	0.024825
110	PM2.5	54	Motor Home	10	42.5mph <= speed < 47.5mph	0.191180	0.091417	0.035493	0.023847
110	PM2.5	54	Motor Home	11	47.5mph <= speed < 52.5mph	0.181279	0.087518	0.034537	0.023185
110	PM2.5	54	Motor Home	12	52.5mph <= speed < 57.5mph	0.171158	0.082927	0.033040	0.022037
110	PM2.5	54	Motor Home	13	57.5mph <= speed < 62.5mph	0.158465	0.076785	0.030905	0.020664
110	PM2.5	54	Motor Home	14	62.5mph <= speed < 67.5mph	0.153304	0.073627	0.029647	0.020136
110	PM2.5	54	Motor Home	15	67.5mph <= speed < 72.5mph	0.149390	0.071122	0.028615	0.019731
110	PM2.5	54	Motor Home	16	72.5mph <= speed	0.147736	0.069705	0.028089	0.019763
110	PM2.5	61	Combination Short-haul Truck	1	speed < 2.5mph	5.035955	1.122296	0.398534	0.328106
110	PM2.5	61	Combination Short-haul Truck	2	2.5mph <= speed < 7.5mph	2.857316	0.737824	0.350957	0.314516
110	PM2.5	61	Combination Short-haul Truck	3	7.5mph <= speed < 12.5mph	1.672538	0.429275	0.203893	0.182968
110	PM2.5	61	Combination Short-haul Truck	4	12.5mph <= speed < 17.5mph	1.390839	0.333154	0.141211	0.123834
110	PM2.5	61	Combination Short-haul Truck	5	17.5mph <= speed <22.5mph	1.193625	0.273036	0.106809	0.091589
110	PM2.5	61	Combination Short-haul Truck	6	22.5mph <= speed < 27.5mph	1.093127	0.248101	0.095820	0.082124
110	PM2.5	61	Combination Short-haul Truck	7	27.5mph <= speed < 32.5mph	1.017157	0.225756	0.083040	0.070378
110	PM2.5	61	Combination Short-haul Truck	8	32.5mph <= speed < 37.5mph	0.804141	0.177478	0.065635	0.055455
110	PM2.5	61	Combination Short-haul Truck	9	37.5mph <= speed < 42.5mph	0.744219	0.160671	0.056846	0.047483
110	PM2.5	61	Combination Short-haul Truck	10	42.5mph <= speed < 47.5mph	0.697182	0.147445	0.049910	0.041190
110	PM2.5	61	Combination Short-haul Truck	11	47.5mph <= speed < 52.5mph	0.619536	0.128485	0.041942	0.034178
110	PM2.5	61	Combination Short-haul Truck	12	52.5mph <= speed < 57.5mph	0.533485	0.108404	0.034214	0.027484
110	PM2.5	61	Combination Short-haul Truck	13	57.5mph <= speed < 62.5mph	0.489722	0.098252	0.030237	0.024056
110	PM2.5	61	Combination Short-haul Truck	14	62.5mph <= speed < 67.5mph	0.495815	0.099048	0.029745	0.023567
110	PM2.5	61	Combination Short-haul Truck	15	67.5mph <= speed < 72.5mph	0.499846	0.099471	0.029252	0.023090
110	PM2.5	61	Combination Short-haul Truck	16	72.5mph <= speed	0.518035	0.102621	0.029456	0.023170
110	PM2.5	62	Combination Long-haul Truck	1	speed < 2.5mph	4.302766	1.709845	0.560949	0.368799
110	PM2.5	62	Combination Long-haul Truck	2	2.5mph <= speed < 7.5mph	2.421115	1.053416	0.452285	0.352219
110	PM2.5	62	Combination Long-haul Truck	3	7.5mph <= speed < 12.5mph	1.422608	0.616789	0.263802	0.205289
110	PM2.5	62	Combination Long-haul Truck	4	12.5mph <= speed < 17.5mph	1.176636	0.489527	0.189402	0.140264
110	PM2.5	62	Combination Long-haul Truck	5	17.5mph <= speed <22.5mph	1.015798	0.411085	0.146892	0.103565
110	PM2.5	62	Combination Long-haul Truck	6	22.5mph <= speed < 27.5mph	0.925816	0.373336	0.132715	0.093493
110	PM2.5	62	Combination Long-haul Truck	7	27.5mph <= speed < 32.5mph	0.861024	0.342454	0.116911	0.080327
110	PM2.5	62	Combination Long-haul Truck	8	32.5mph <= speed < 37.5mph	0.679252	0.269882	0.092030	0.062916

110	PM2.5	62	Combination Long-haul Truck	9	37.5mph <= speed < 42.5mph	0.624416	0.244997	0.080577	0.053749
110	PM2.5	62	Combination Long-haul Truck	10	42.5mph <= speed < 47.5mph	0.581593	0.225513	0.071570	0.046529
110	PM2.5	62	Combination Long-haul Truck	11	47.5mph <= speed < 52.5mph	0.511754	0.196360	0.060340	0.038180
110	PM2.5	62	Combination Long-haul Truck	12	52.5mph <= speed < 57.5mph	0.434710	0.165077	0.049146	0.030176
110	PM2.5	62	Combination Long-haul Truck	13	57.5mph <= speed < 62.5mph	0.393691	0.148665	0.043657	0.026476
110	PM2.5	62	Combination Long-haul Truck	14	62.5mph <= speed < 67.5mph	0.401014	0.150843	0.043568	0.026108
110	PM2.5	62	Combination Long-haul Truck	15	67.5mph <= speed < 72.5mph	0.406347	0.152351	0.043387	0.025724
110	PM2.5	62	Combination Long-haul Truck	16	72.5mph <= speed	0.422555	0.157774	0.044207	0.025908

PM 10 Emission Rates

PID	PDESC	VEHID	VEHDESC	SP_BIN	SP_desc	rate2010	rate2020	rate2030	rate2040
100	PM10	11	Motorcycle	1	speed < 2.5mph	0.097980	0.098394	0.098556	0.098568
100	PM10	11	Motorcycle	2	2.5mph <= speed < 7.5mph	0.064587	0.064866	0.064976	0.064983
100	PM10	11	Motorcycle	3	7.5mph <= speed < 12.5mph	0.047022	0.047231	0.047313	0.047319
100	PM10	11	Motorcycle	4	12.5mph <= speed < 17.5mph	0.039978	0.040157	0.040227	0.040232
100	PM10	11	Motorcycle	5	17.5mph <= speed < 22.5mph	0.036654	0.036822	0.036889	0.036893
100	PM10	11	Motorcycle	6	22.5mph <= speed < 27.5mph	0.032730	0.032882	0.032942	0.032947
100	PM10	11	Motorcycle	7	27.5mph <= speed < 32.5mph	0.031191	0.031344	0.031405	0.031409
100	PM10	11	Motorcycle	8	32.5mph <= speed < 37.5mph	0.032845	0.033018	0.033086	0.033091
100	PM10	11	Motorcycle	9	37.5mph <= speed < 42.5mph	0.033702	0.033888	0.033962	0.033967
100	PM10	11	Motorcycle	10	42.5mph <= speed < 47.5mph	0.034182	0.034378	0.034455	0.034460
100	PM10	11	Motorcycle	11	47.5mph <= speed < 52.5mph	0.033647	0.033844	0.033922	0.033927
100	PM10	11	Motorcycle	12	52.5mph <= speed < 57.5mph	0.032439	0.032632	0.032708	0.032713
100	PM10	11	Motorcycle	13	57.5mph <= speed < 62.5mph	0.031763	0.031955	0.032030	0.032035
100	PM10	11	Motorcycle	14	62.5mph <= speed < 67.5mph	0.031419	0.031610	0.031686	0.031691
100	PM10	11	Motorcycle	15	67.5mph <= speed < 72.5mph	0.031082	0.031274	0.031350	0.031355
100	PM10	11	Motorcycle	16	72.5mph <= speed	0.030504	0.030694	0.030769	0.030774
100	PM10	21	Passenger Car	1	speed < 2.5mph	0.330587	0.327762	0.322042	0.319202
100	PM10	21	Passenger Car	2	2.5mph <= speed < 7.5mph	0.191623	0.188402	0.184830	0.183180
100	PM10	21	Passenger Car	3	7.5mph <= speed < 12.5mph	0.121536	0.118220	0.115773	0.114735
100	PM10	21	Passenger Car	4	12.5mph <= speed < 17.5mph	0.097743	0.094572	0.092582	0.091779
100	PM10	21	Passenger Car	5	17.5mph <= speed < 22.5mph	0.081714	0.078863	0.077164	0.076480
100	PM10	21	Passenger Car	6	22.5mph <= speed < 27.5mph	0.069489	0.067234	0.065837	0.065241
100	PM10	21	Passenger Car	7	27.5mph <= speed < 32.5mph	0.056319	0.053899	0.052529	0.051960
100	PM10	21	Passenger Car	8	32.5mph <= speed < 37.5mph	0.046267	0.043397	0.041965	0.041394
100	PM10	21	Passenger Car	9	37.5mph <= speed < 42.5mph	0.038550	0.035333	0.033853	0.033277
100	PM10	21	Passenger Car	10	42.5mph <= speed < 47.5mph	0.032243	0.028777	0.027268	0.026691
100	PM10	21	Passenger Car	11	47.5mph <= speed < 52.5mph	0.026659	0.023130	0.021633	0.021060
100	PM10	21	Passenger Car	12	52.5mph <= speed < 57.5mph	0.022374	0.018974	0.017542	0.016983
100	PM10	21	Passenger Car	13	57.5mph <= speed < 62.5mph	0.019401	0.016042	0.014650	0.014100
100	PM10	21	Passenger Car	14	62.5mph <= speed < 67.5mph	0.017102	0.013721	0.012331	0.011771
100	PM10	21	Passenger Car	15	67.5mph <= speed < 72.5mph	0.015429	0.011942	0.010492	0.009895
100	PM10	21	Passenger Car	16	72.5mph <= speed	0.015446	0.011505	0.009861	0.009170
100	PM10	31	Passenger Truck	1	speed < 2.5mph	0.545735	0.525604	0.518346	0.516195
100	PM10	31	Passenger Truck	2	2.5mph <= speed < 7.5mph	0.308974	0.297249	0.292580	0.291113
100	PM10	31	Passenger Truck	3	7.5mph <= speed < 12.5mph	0.189887	0.182427	0.179104	0.177999
100	PM10	31	Passenger Truck	4	12.5mph <= speed < 17.5mph	0.151549	0.145575	0.142783	0.141831
100	PM10	31	Passenger Truck	5	17.5mph <= speed < 22.5mph	0.124569	0.119673	0.117254	0.116401
100	PM10	31	Passenger Truck	6	22.5mph <= speed < 27.5mph	0.106042	0.102138	0.100122	0.099377
100	PM10	31	Passenger Truck	7	27.5mph <= speed < 32.5mph	0.084161	0.080651	0.078764	0.078050
100	PM10	31	Passenger Truck	8	32.5mph <= speed < 37.5mph	0.067803	0.064107	0.062093	0.061339
100	PM10	31	Passenger Truck	9	37.5mph <= speed < 42.5mph	0.055251	0.051378	0.049269	0.048489
100	PM10	31	Passenger Truck	10	42.5mph <= speed < 47.5mph	0.045029	0.041066	0.038898	0.038098
100	PM10	31	Passenger Truck	11	47.5mph <= speed < 52.5mph	0.036093	0.032148	0.029982	0.029183
100	PM10	31	Passenger Truck	12	52.5mph <= speed < 57.5mph	0.029491	0.025664	0.023572	0.022799
100	PM10	31	Passenger Truck	13	57.5mph <= speed < 62.5mph	0.024945	0.021170	0.019117	0.018358
100	PM10	31	Passenger Truck	14	62.5mph <= speed < 67.5mph	0.021481	0.017632	0.015548	0.014777
100	PM10	31	Passenger Truck	15	67.5mph <= speed < 72.5mph	0.019298	0.015164	0.012929	0.012107
100	PM10	31	Passenger Truck	16	72.5mph <= speed	0.018957	0.014378	0.011885	0.010973
100	PM10	32	Light Commercial Truck	1	speed < 2.5mph	0.606454	0.536013	0.518282	0.515286
100	PM10	32	Light Commercial Truck	2	2.5mph <= speed < 7.5mph	0.341762	0.303522	0.293403	0.291512
100	PM10	32	Light Commercial Truck	3	7.5mph <= speed < 12.5mph	0.208379	0.186359	0.180112	0.178796
100	PM10	32	Light Commercial Truck	4	12.5mph <= speed < 17.5mph	0.164936	0.148282	0.143395	0.142303
100	PM10	32	Light Commercial Truck	5	17.5mph <= speed < 22.5mph	0.134994	0.121863	0.117882	0.116940
100	PM10	32	Light Commercial Truck	6	22.5mph <= speed < 27.5mph	0.114979	0.104303	0.101029	0.100221
100	PM10	32	Light Commercial Truck	7	27.5mph <= speed < 32.5mph	0.092185	0.082876	0.079906	0.079138
100	PM10	32	Light Commercial Truck	8	32.5mph <= speed < 37.5mph	0.074679	0.065849	0.062939	0.062164
100	PM10	32	Light Commercial Truck	9	37.5mph <= speed < 42.5mph	0.061477	0.052873	0.049959	0.049167
100	PM10	32	Light Commercial Truck	10	42.5mph <= speed < 47.5mph	0.050847	0.042432	0.039514	0.038708
100	PM10	32	Light Commercial Truck	11	47.5mph <= speed < 52.5mph	0.041619	0.033465	0.030594	0.029790
100	PM10	32	Light Commercial Truck	12	52.5mph <= speed < 57.5mph	0.034945	0.027040	0.024245	0.023459
100	PM10	32	Light Commercial Truck	13	57.5mph <= speed < 62.5mph	0.030304	0.022533	0.019776	0.018998
100	PM10	32	Light Commercial Truck	14	62.5mph <= speed < 67.5mph	0.026725	0.018964	0.016186	0.015397
100	PM10	32	Light Commercial Truck	15	67.5mph <= speed < 72.5mph	0.024295	0.016396	0.013493	0.012653
100	PM10	32	Light Commercial Truck	16	72.5mph <= speed	0.023854	0.015625	0.012482	0.011553
100	PM10	41	Intercity Bus	1	speed < 2.5mph	7.488504	3.996050	1.989118	1.423331
100	PM10	41	Intercity Bus	2	2.5mph <= speed < 7.5mph	5.232750	3.117282	2.010623	1.717793
100	PM10	41	Intercity Bus	3	7.5mph <= speed < 12.5mph	3.052359	1.759498	1.106392	0.935193
100	PM10	41	Intercity Bus	4	12.5mph <= speed < 17.5mph	2.440346	1.339978	0.806167	0.667477
100	PM10	41	Intercity Bus	5	17.5mph <= speed < 22.5mph	2.044547	1.071352	0.610258	0.490775
100	PM10	41	Intercity Bus	6	22.5mph <= speed < 27.5mph	1.737395	0.874389	0.466096	0.358668
100	PM10	41	Intercity Bus	7	27.5mph <= speed < 32.5mph	1.603333	0.785320	0.401466	0.301645
100	PM10	41	Intercity Bus	8	32.5mph <= speed < 37.5mph	1.316660	0.632118	0.321411	0.240375
100	PM10	41	Intercity Bus	9	37.5mph <= speed < 42.5mph	1.170338	0.536180	0.255251	0.181773
100	PM10	41	Intercity Bus	10	42.5mph <= speed < 47.5mph	1.053489	0.460529	0.203746	0.136409
100	PM10	41	Intercity Bus	11	47.5mph <= speed < 52.5mph	0.941567	0.396331	0.165658	0.104965
100	PM10	41	Intercity Bus	12	52.5mph <= speed < 57.5mph	0.848601	0.343130	0.134170	0.078991
100	PM10	41	Intercity Bus	13	57.5mph <= speed < 62.5mph	0.780874	0.309489	0.116912	0.066382

100	PM10	41	Intercity Bus	14	62.5mph <= speed < 67.5mph	0.762577	0.298425	0.108213	0.059019
100	PM10	41	Intercity Bus	15	67.5mph <= speed < 72.5mph	0.749024	0.289773	0.100991	0.052797
100	PM10	41	Intercity Bus	16	72.5mph <= speed	0.752744	0.288150	0.096672	0.048552
100	PM10	42	Transit Bus	1	speed < 2.5mph	6.571461	3.038898	1.338059	0.988915
100	PM10	42	Transit Bus	2	2.5mph <= speed < 7.5mph	3.828381	1.957200	1.096224	0.922309
100	PM10	42	Transit Bus	3	7.5mph <= speed < 12.5mph	2.184371	1.097870	0.608054	0.510253
100	PM10	42	Transit Bus	4	12.5mph <= speed < 17.5mph	1.388298	0.699508	0.388910	0.326671
100	PM10	42	Transit Bus	5	17.5mph <= speed < 22.5mph	1.242592	0.598644	0.316008	0.260773
100	PM10	42	Transit Bus	6	22.5mph <= speed < 27.5mph	1.139233	0.530005	0.265793	0.214818
100	PM10	42	Transit Bus	7	27.5mph <= speed < 32.5mph	1.092792	0.495927	0.239877	0.191442
100	PM10	42	Transit Bus	8	32.5mph <= speed < 37.5mph	0.983608	0.435314	0.202992	0.159102
100	PM10	42	Transit Bus	9	37.5mph <= speed < 42.5mph	0.933169	0.398869	0.174193	0.132051
100	PM10	42	Transit Bus	10	42.5mph <= speed < 47.5mph	0.891019	0.369395	0.151511	0.110861
100	PM10	42	Transit Bus	11	47.5mph <= speed < 52.5mph	0.815552	0.315536	0.118850	0.082347
100	PM10	42	Transit Bus	12	52.5mph <= speed < 57.5mph	0.752737	0.270982	0.091913	0.058842
100	PM10	42	Transit Bus	13	57.5mph <= speed < 62.5mph	0.690423	0.243545	0.080276	0.050201
100	PM10	42	Transit Bus	14	62.5mph <= speed < 67.5mph	0.682976	0.238557	0.075155	0.045367
100	PM10	42	Transit Bus	15	67.5mph <= speed < 72.5mph	0.678361	0.234888	0.070869	0.041217
100	PM10	42	Transit Bus	16	72.5mph <= speed	0.691145	0.237607	0.068751	0.038660
100	PM10	43	School Bus	1	speed < 2.5mph	6.109647	3.414726	1.340695	0.885477
100	PM10	43	School Bus	2	2.5mph <= speed < 7.5mph	3.415099	2.082477	1.066229	0.844943
100	PM10	43	School Bus	3	7.5mph <= speed < 12.5mph	1.899109	1.151342	0.589085	0.470263
100	PM10	43	School Bus	4	12.5mph <= speed < 17.5mph	1.195125	0.729795	0.378544	0.300951
100	PM10	43	School Bus	5	17.5mph <= speed < 22.5mph	1.007169	0.602923	0.304950	0.240349
100	PM10	43	School Bus	6	22.5mph <= speed < 27.5mph	0.875626	0.515451	0.254263	0.197974
100	PM10	43	School Bus	7	27.5mph <= speed < 32.5mph	0.807488	0.469754	0.227840	0.176306
100	PM10	43	School Bus	8	32.5mph <= speed < 37.5mph	0.704799	0.404754	0.192222	0.146731
100	PM10	43	School Bus	9	37.5mph <= speed < 42.5mph	0.630723	0.356083	0.163788	0.121821
100	PM10	43	School Bus	10	42.5mph <= speed < 47.5mph	0.572139	0.317848	0.141609	0.102425
100	PM10	43	School Bus	11	47.5mph <= speed < 52.5mph	0.553720	0.296945	0.123568	0.082543
100	PM10	43	School Bus	12	52.5mph <= speed < 57.5mph	0.538168	0.279570	0.108666	0.066156
100	PM10	43	School Bus	13	57.5mph <= speed < 62.5mph	0.496073	0.256659	0.099936	0.060220
100	PM10	43	School Bus	14	62.5mph <= speed < 67.5mph	0.472429	0.240493	0.088527	0.051542
100	PM10	43	School Bus	15	67.5mph <= speed < 72.5mph	0.452769	0.226689	0.078299	0.043678
100	PM10	43	School Bus	16	72.5mph <= speed	0.437812	0.215449	0.069351	0.036819
100	PM10	51	Refuse Truck	1	speed < 2.5mph	5.743102	2.473354	1.679060	1.627748
100	PM10	51	Refuse Truck	2	2.5mph <= speed < 7.5mph	3.965791	2.154504	1.722642	1.694716
100	PM10	51	Refuse Truck	3	7.5mph <= speed < 12.5mph	2.565823	1.448521	1.187179	1.170419
100	PM10	51	Refuse Truck	4	12.5mph <= speed < 17.5mph	1.968757	0.993939	0.767504	0.753335
100	PM10	51	Refuse Truck	5	17.5mph <= speed < 22.5mph	1.561284	0.705626	0.506726	0.494217
100	PM10	51	Refuse Truck	6	22.5mph <= speed < 27.5mph	1.413549	0.628913	0.447618	0.436328
100	PM10	51	Refuse Truck	7	27.5mph <= speed < 32.5mph	1.265415	0.524794	0.354087	0.343558
100	PM10	51	Refuse Truck	8	32.5mph <= speed < 37.5mph	0.997824	0.414705	0.280736	0.272367
100	PM10	51	Refuse Truck	9	37.5mph <= speed < 42.5mph	0.893360	0.348000	0.223319	0.215606
100	PM10	51	Refuse Truck	10	42.5mph <= speed < 47.5mph	0.811932	0.295992	0.178545	0.171349
100	PM10	51	Refuse Truck	11	47.5mph <= speed < 52.5mph	0.698518	0.239695	0.135823	0.129476
100	PM10	51	Refuse Truck	12	52.5mph <= speed < 57.5mph	0.580026	0.186233	0.097699	0.092281
100	PM10	51	Refuse Truck	13	57.5mph <= speed < 62.5mph	0.516240	0.155918	0.075210	0.070274
100	PM10	51	Refuse Truck	14	62.5mph <= speed < 67.5mph	0.510159	0.149882	0.069233	0.064324
100	PM10	51	Refuse Truck	15	67.5mph <= speed < 72.5mph	0.504944	0.144654	0.064032	0.059146
100	PM10	51	Refuse Truck	16	72.5mph <= speed	0.512342	0.142859	0.060316	0.055349
100	PM10	52	Single Unit Short-haul Truck	1	speed < 2.5mph	4.013051	1.321301	0.800891	0.767407
100	PM10	52	Single Unit Short-haul Truck	2	2.5mph <= speed < 7.5mph	2.565263	1.164576	0.896538	0.879886
100	PM10	52	Single Unit Short-haul Truck	3	7.5mph <= speed < 12.5mph	1.435526	0.658017	0.510002	0.500754
100	PM10	52	Single Unit Short-haul Truck	4	12.5mph <= speed < 17.5mph	1.026954	0.451949	0.343590	0.336785
100	PM10	52	Single Unit Short-haul Truck	5	17.5mph <= speed < 22.5mph	0.812510	0.344184	0.256783	0.251261
100	PM10	52	Single Unit Short-haul Truck	6	22.5mph <= speed < 27.5mph	0.654753	0.260666	0.187451	0.182750
100	PM10	52	Single Unit Short-haul Truck	7	27.5mph <= speed < 32.5mph	0.585550	0.227255	0.160839	0.156545
100	PM10	52	Single Unit Short-haul Truck	8	32.5mph <= speed < 37.5mph	0.502981	0.190268	0.132533	0.128794
100	PM10	52	Single Unit Short-haul Truck	9	37.5mph <= speed < 42.5mph	0.446162	0.158675	0.105751	0.102269
100	PM10	52	Single Unit Short-haul Truck	10	42.5mph <= speed < 47.5mph	0.402066	0.134558	0.085422	0.082141
100	PM10	52	Single Unit Short-haul Truck	11	47.5mph <= speed < 52.5mph	0.367810	0.118722	0.072947	0.069830
100	PM10	52	Single Unit Short-haul Truck	12	52.5mph <= speed < 57.5mph	0.338208	0.105023	0.062179	0.059203
100	PM10	52	Single Unit Short-haul Truck	13	57.5mph <= speed < 62.5mph	0.309860	0.096158	0.056964	0.054211
100	PM10	52	Single Unit Short-haul Truck	14	62.5mph <= speed < 67.5mph	0.288714	0.087906	0.051115	0.048552
100	PM10	52	Single Unit Short-haul Truck	15	67.5mph <= speed < 72.5mph	0.270994	0.080813	0.045996	0.043594
100	PM10	52	Single Unit Short-haul Truck	16	72.5mph <= speed	0.256733	0.074806	0.041528	0.039266
100	PM10	53	Single Unit Long-haul Truck	1	speed < 2.5mph	4.479034	1.609334	1.062539	1.015246
100	PM10	53	Single Unit Long-haul Truck	2	2.5mph <= speed < 7.5mph	2.825081	1.449656	1.186546	1.164211
100	PM10	53	Single Unit Long-haul Truck	3	7.5mph <= speed < 12.5mph	1.542461	0.808815	0.669178	0.657222
100	PM10	53	Single Unit Long-haul Truck	4	12.5mph <= speed < 17.5mph	1.094790	0.546531	0.443350	0.434473
100	PM10	53	Single Unit Long-haul Truck	5	17.5mph <= speed < 22.5mph	0.867724	0.414039	0.329509	0.322200
100	PM10	53	Single Unit Long-haul Truck	6	22.5mph <= speed < 27.5mph	0.708407	0.312885	0.239767	0.233345
100	PM10	53	Single Unit Long-haul Truck	7	27.5mph <= speed < 32.5mph	0.629356	0.270682	0.204510	0.198672
100	PM10	53	Single Unit Long-haul Truck	8	32.5mph <= speed < 37.5mph	0.545567	0.226157	0.167196	0.162030
100	PM10	53	Single Unit Long-haul Truck	9	37.5mph <= speed < 42.5mph	0.486012	0.185539	0.130122	0.125223
100	PM10	53	Single Unit Long-haul Truck	10	42.5mph <= speed < 47.5mph	0.439836	0.154491	0.101867	0.097179
100	PM10	53	Single Unit Long-haul Truck	11	47.5mph <= speed < 52.5mph	0.403901	0.134590	0.084984	0.080513
100	PM10	53	Single Unit Long-haul Truck	12	52.5mph <= speed < 57.5mph	0.372432	0.117637	0.070896	0.066627
100	PM10	53	Single Unit Long-haul Truck	13	57.5mph <= speed < 62.5mph	0.343374	0.107770	0.064676	0.060711
100	PM10	53	Single Unit Long-haul Truck	14	62.5mph <= speed < 67.5mph	0.318902	0.098400	0.058042	0.054348
100	PM10	53	Single Unit Long-haul Truck	15	67.5mph <= speed < 72.5mph	0.298081	0.090235	0.052140	0.048673
100	PM10	53	Single Unit Long-haul Truck	16	72.5mph <= speed	0.280940	0.083238	0.046896	0.043623
100	PM10	54	Motor Home	1	speed < 2.5mph	2.347944	1.373188	0.761653	0.641188
100	PM10	54	Motor Home	2	2.5mph <= speed < 7.5mph	1.629833	1.116319	0.802555	0.744543
100	PM10	54	Motor Home	3	7.5mph <= speed < 12.5mph	0.920445	0.639199	0.471046	0.439796
100	PM10	54	Motor Home	4	12.5mph <= speed < 17.5mph	0.650481	0.438053	0.315502	0.292455
100	PM10	54	Motor Home	5	17.5mph <= speed < 22.5mph	0.510352	0.334216	0.236010	0.217347
100	PM10	54	Motor Home	6	22.5mph <= speed < 27.5mph	0.408009	0.259123	0.177337	0.161308
100	PM10	54	Motor Home	7	27.5mph <= speed < 32.5mph	0.365853	0.228407	0.153302	0.138391
100	PM10	54	Motor Home	8	32.5mph <= speed < 37.5mph	0.321771	0.199327	0.131940	0.118603
100	PM10	54	Motor Home	9	37.5mph <= speed < 42.5mph	0.286761	0.171737	0.107884	0.094910
100	PM10	54	Motor Home	10	42.5mph <= speed < 47.5mph	0.259780	0.150797	0.089751	0.077057
100	PM10	54	Motor Home	11	47.5mph <= speed < 52.5mph	0.240671	0.138231	0.080372	0.067995

100	PM10	54	Motor Home	12	52.5mph <= speed < 57.5mph	0.222622	0.126229	0.071750	0.059753
100	PM10	54	Motor Home	13	57.5mph <= speed < 62.5mph	0.205579	0.116335	0.066235	0.055071
100	PM10	54	Motor Home	14	62.5mph <= speed < 67.5mph	0.194783	0.107622	0.059591	0.049222
100	PM10	54	Motor Home	15	67.5mph <= speed < 72.5mph	0.185827	0.100108	0.053677	0.043993
100	PM10	54	Motor Home	16	72.5mph <= speed	0.179592	0.094018	0.048551	0.039475
100	PM10	61	Combination Short-haul Truck	1	speed < 2.5mph	6.714656	2.435151	1.642869	1.566074
100	PM10	61	Combination Short-haul Truck	2	2.5mph <= speed < 7.5mph	4.747982	2.410240	1.982302	1.942372
100	PM10	61	Combination Short-haul Truck	3	7.5mph <= speed < 12.5mph	2.747412	1.377102	1.127983	1.105054
100	PM10	61	Combination Short-haul Truck	4	12.5mph <= speed < 17.5mph	2.059057	0.898513	0.687500	0.668507
100	PM10	61	Combination Short-haul Truck	5	17.5mph <= speed < 22.5mph	1.647861	0.640470	0.458312	0.441703
100	PM10	61	Combination Short-haul Truck	6	22.5mph <= speed < 27.5mph	1.493504	0.569229	0.402445	0.387503
100	PM10	61	Combination Short-haul Truck	7	27.5mph <= speed < 32.5mph	1.340869	0.476295	0.320216	0.306412
100	PM10	61	Combination Short-haul Truck	8	32.5mph <= speed < 37.5mph	1.060213	0.375592	0.253265	0.242166
100	PM10	61	Combination Short-haul Truck	9	37.5mph <= speed < 42.5mph	0.952627	0.315739	0.202318	0.192116
100	PM10	61	Combination Short-haul Truck	10	42.5mph <= speed < 47.5mph	0.868064	0.268612	0.162179	0.152681
100	PM10	61	Combination Short-haul Truck	11	47.5mph <= speed < 52.5mph	0.753501	0.218421	0.124062	0.115611
100	PM10	61	Combination Short-haul Truck	12	52.5mph <= speed < 57.5mph	0.633974	0.171082	0.090256	0.082932
100	PM10	61	Combination Short-haul Truck	13	57.5mph <= speed < 62.5mph	0.570638	0.144555	0.070501	0.063777
100	PM10	61	Combination Short-haul Truck	14	62.5mph <= speed < 67.5mph	0.572038	0.140246	0.064803	0.058084
100	PM10	61	Combination Short-haul Truck	15	67.5mph <= speed < 72.5mph	0.571820	0.136153	0.059725	0.053022
100	PM10	61	Combination Short-haul Truck	16	72.5mph <= speed	0.587900	0.135927	0.056304	0.049468
100	PM10	62	Combination Long-haul Truck	1	speed < 2.5mph	6.068083	3.249078	1.999840	1.790905
100	PM10	62	Combination Long-haul Truck	2	2.5mph <= speed < 7.5mph	4.431485	2.944068	2.290100	2.181235
100	PM10	62	Combination Long-haul Truck	3	7.5mph <= speed < 12.5mph	2.561653	1.685325	1.301326	1.237671
100	PM10	62	Combination Long-haul Truck	4	12.5mph <= speed < 17.5mph	1.879301	1.132191	0.805785	0.752343
100	PM10	62	Combination Long-haul Truck	5	17.5mph <= speed < 22.5mph	1.485795	0.828340	0.541061	0.493947
100	PM10	62	Combination Long-haul Truck	6	22.5mph <= speed < 27.5mph	1.339301	0.738646	0.477004	0.434354
100	PM10	62	Combination Long-haul Truck	7	27.5mph <= speed < 32.5mph	1.191426	0.627661	0.382432	0.342654
100	PM10	62	Combination Long-haul Truck	8	32.5mph <= speed < 37.5mph	0.940963	0.495914	0.302538	0.270882
100	PM10	62	Combination Long-haul Truck	9	37.5mph <= speed < 42.5mph	0.834552	0.422080	0.243318	0.214150
100	PM10	62	Combination Long-haul Truck	10	42.5mph <= speed < 47.5mph	0.751146	0.364058	0.196696	0.169472
100	PM10	62	Combination Long-haul Truck	11	47.5mph <= speed < 52.5mph	0.641718	0.298866	0.150996	0.126905
100	PM10	62	Combination Long-haul Truck	12	52.5mph <= speed < 57.5mph	0.529227	0.236127	0.110101	0.089478
100	PM10	62	Combination Long-haul Truck	13	57.5mph <= speed < 62.5mph	0.468692	0.202345	0.088196	0.069520
100	PM10	62	Combination Long-haul Truck	14	62.5mph <= speed < 67.5mph	0.471258	0.199320	0.082707	0.063728
100	PM10	62	Combination Long-haul Truck	15	67.5mph <= speed < 72.5mph	0.472317	0.196222	0.077775	0.058575
100	PM10	62	Combination Long-haul Truck	16	72.5mph <= speed	0.486105	0.198288	0.074839	0.054948

Carbon Monoxide Emission Rates

PID	PDESC	VEHID	VEHDESC	SP_BIN	SP_desc	rate2010	rate2020	rate2030	rate2040
2	CO	11	Motorcycle	1	speed < 2.5mph	69.702070	55.285463	51.178811	49.863332
2	CO	11	Motorcycle	2	2.5mph <= speed < 7.5mph	38.149676	30.259088	28.011391	27.291403
2	CO	11	Motorcycle	3	7.5mph <= speed < 12.5mph	22.352765	17.729549	16.412583	15.990710
2	CO	11	Motorcycle	4	12.5mph <= speed < 17.5mph	17.234833	13.670095	12.654692	12.329426
2	CO	11	Motorcycle	5	17.5mph <= speed < 22.5mph	14.995918	11.894281	11.010737	10.727746
2	CO	11	Motorcycle	6	22.5mph <= speed < 27.5mph	14.052466	11.145949	10.318024	10.052797
2	CO	11	Motorcycle	7	27.5mph <= speed < 32.5mph	13.600863	10.787762	9.986433	9.729761
2	CO	11	Motorcycle	8	32.5mph <= speed < 37.5mph	14.568795	11.555511	10.697154	10.422216
2	CO	11	Motorcycle	9	37.5mph <= speed < 42.5mph	15.549982	12.333743	11.417562	11.124116
2	CO	11	Motorcycle	10	42.5mph <= speed < 47.5mph	16.259046	12.896155	11.938175	11.631352
2	CO	11	Motorcycle	11	47.5mph <= speed < 52.5mph	16.700489	13.246279	12.262345	11.947164
2	CO	11	Motorcycle	12	52.5mph <= speed < 57.5mph	16.993440	13.478681	12.477483	12.156762
2	CO	11	Motorcycle	13	57.5mph <= speed < 62.5mph	17.272311	13.699865	12.682241	12.356268
2	CO	11	Motorcycle	14	62.5mph <= speed < 67.5mph	17.489394	13.872006	12.841566	12.511523
2	CO	11	Motorcycle	15	67.5mph <= speed < 72.5mph	17.212254	13.652206	12.638090	12.313270
2	CO	11	Motorcycle	16	72.5mph <= speed	16.704331	13.249343	12.265169	11.949908
2	CO	21	Passenger Car	1	speed < 2.5mph	20.926124	9.609551	4.228814	2.517169
2	CO	21	Passenger Car	2	2.5mph <= speed < 7.5mph	12.756236	6.108067	2.786188	1.713605
2	CO	21	Passenger Car	3	7.5mph <= speed < 12.5mph	8.622707	4.338157	2.051806	1.300277
2	CO	21	Passenger Car	4	12.5mph <= speed < 17.5mph	7.273902	3.783313	1.815192	1.160092
2	CO	21	Passenger Car	5	17.5mph <= speed < 22.5mph	6.398608	3.389381	1.635913	1.046660
2	CO	21	Passenger Car	6	22.5mph <= speed < 27.5mph	5.531845	2.860902	1.358178	0.855429
2	CO	21	Passenger Car	7	27.5mph <= speed < 32.5mph	5.237998	2.794816	1.367060	0.885232
2	CO	21	Passenger Car	8	32.5mph <= speed < 37.5mph	5.042371	2.739274	1.379504	0.919707
2	CO	21	Passenger Car	9	37.5mph <= speed < 42.5mph	4.861016	2.665208	1.369965	0.932245
2	CO	21	Passenger Car	10	42.5mph <= speed < 47.5mph	4.731400	2.613662	1.366668	0.945442
2	CO	21	Passenger Car	11	47.5mph <= speed < 52.5mph	4.618541	2.561768	1.356457	0.949563
2	CO	21	Passenger Car	12	52.5mph <= speed < 57.5mph	4.572976	2.529390	1.349926	0.953018
2	CO	21	Passenger Car	13	57.5mph <= speed < 62.5mph	4.592541	2.543363	1.370341	0.976323
2	CO	21	Passenger Car	14	62.5mph <= speed < 67.5mph	4.729246	2.636967	1.441046	1.039312
2	CO	21	Passenger Car	15	67.5mph <= speed < 72.5mph	5.188716	2.974658	1.660156	1.214760
2	CO	21	Passenger Car	16	72.5mph <= speed	6.537504	3.833424	2.186068	1.625440
2	CO	31	Passenger Truck	1	speed < 2.5mph	33.858902	13.251870	5.302844	2.900298
2	CO	31	Passenger Truck	2	2.5mph <= speed < 7.5mph	20.510971	8.476160	3.532456	1.982461
2	CO	31	Passenger Truck	3	7.5mph <= speed < 12.5mph	13.796784	6.064367	2.631872	1.511502
2	CO	31	Passenger Truck	4	12.5mph <= speed < 17.5mph	11.653091	5.298324	2.338335	1.350933
2	CO	31	Passenger Truck	5	17.5mph <= speed < 22.5mph	10.231809	4.777574	2.136989	1.239101

2	CO	31	Passenger Truck	6	22.5mph <= speed < 27.5mph	8.828877	4.113631	1.829906	1.052532
2	CO	31	Passenger Truck	7	27.5mph <= speed < 32.5mph	8.309217	3.974257	1.809664	1.062060
2	CO	31	Passenger Truck	8	32.5mph <= speed < 37.5mph	8.167237	3.993437	1.862680	1.122243
2	CO	31	Passenger Truck	9	37.5mph <= speed < 42.5mph	8.023407	3.973454	1.881826	1.154108
2	CO	31	Passenger Truck	10	42.5mph <= speed < 47.5mph	7.893093	3.945927	1.890680	1.175024
2	CO	31	Passenger Truck	11	47.5mph <= speed < 52.5mph	7.775946	3.919286	1.894941	1.188759
2	CO	31	Passenger Truck	12	52.5mph <= speed < 57.5mph	7.781284	3.948980	1.924963	1.218038
2	CO	31	Passenger Truck	13	57.5mph <= speed < 62.5mph	7.886538	4.031351	1.981334	1.264346
2	CO	31	Passenger Truck	14	62.5mph <= speed < 67.5mph	8.255812	4.286288	2.137276	1.381310
2	CO	31	Passenger Truck	15	67.5mph <= speed < 72.5mph	9.327337	4.994665	2.549421	1.676004
2	CO	31	Passenger Truck	16	72.5mph <= speed	11.870718	6.420698	3.329894	2.222172
2	CO	32	Light Commercial Truck	1	speed < 2.5mph	30.374144	13.275325	5.610725	3.077158
2	CO	32	Light Commercial Truck	2	2.5mph <= speed < 7.5mph	18.574854	8.602091	3.765882	2.104718
2	CO	32	Light Commercial Truck	3	7.5mph <= speed < 12.5mph	12.593050	6.212983	2.814362	1.598727
2	CO	32	Light Commercial Truck	4	12.5mph <= speed < 17.5mph	10.699026	5.448913	2.499200	1.422328
2	CO	32	Light Commercial Truck	5	17.5mph <= speed < 22.5mph	9.357777	4.885951	2.262586	1.290267
2	CO	32	Light Commercial Truck	6	22.5mph <= speed < 27.5mph	8.078652	4.222019	1.942713	1.095509
2	CO	32	Light Commercial Truck	7	27.5mph <= speed < 32.5mph	7.603712	4.079440	1.919336	1.107396
2	CO	32	Light Commercial Truck	8	32.5mph <= speed < 37.5mph	7.289454	3.975202	1.900386	1.118926
2	CO	32	Light Commercial Truck	9	37.5mph <= speed < 42.5mph	7.083458	3.913581	1.894876	1.133963
2	CO	32	Light Commercial Truck	10	42.5mph <= speed < 47.5mph	6.920160	3.864769	1.890320	1.145336
2	CO	32	Light Commercial Truck	11	47.5mph <= speed < 52.5mph	6.759421	3.815569	1.882121	1.150992
2	CO	32	Light Commercial Truck	12	52.5mph <= speed < 57.5mph	6.710699	3.830963	1.907133	1.177872
2	CO	32	Light Commercial Truck	13	57.5mph <= speed < 62.5mph	6.765169	3.903260	1.961829	1.224250
2	CO	32	Light Commercial Truck	14	62.5mph <= speed < 67.5mph	7.026488	4.127438	2.108855	1.338074
2	CO	32	Light Commercial Truck	15	67.5mph <= speed < 72.5mph	7.837931	4.759113	2.500729	1.628039
2	CO	32	Light Commercial Truck	16	72.5mph <= speed	9.711182	5.983698	3.223799	2.149903
2	CO	41	Intercity Bus	1	speed < 2.5mph	26.040945	13.261134	4.853628	2.419819
2	CO	41	Intercity Bus	2	2.5mph <= speed < 7.5mph	16.023179	8.011776	2.805628	1.355096
2	CO	41	Intercity Bus	3	7.5mph <= speed < 12.5mph	9.485321	4.692858	1.599629	0.756613
2	CO	41	Intercity Bus	4	12.5mph <= speed < 17.5mph	7.736734	3.817764	1.292252	0.607555
2	CO	41	Intercity Bus	5	17.5mph <= speed < 22.5mph	6.505864	3.215011	1.092289	0.515007
2	CO	41	Intercity Bus	6	22.5mph <= speed < 27.5mph	5.589768	2.778748	0.958576	0.457348
2	CO	41	Intercity Bus	7	27.5mph <= speed < 32.5mph	5.135179	2.537002	0.860928	0.405091
2	CO	41	Intercity Bus	8	32.5mph <= speed < 37.5mph	4.451898	2.217548	0.769003	0.368505
2	CO	41	Intercity Bus	9	37.5mph <= speed < 42.5mph	4.145935	2.071955	0.724377	0.349143
2	CO	41	Intercity Bus	10	42.5mph <= speed < 47.5mph	3.906507	1.957572	0.688914	0.333608
2	CO	41	Intercity Bus	11	47.5mph <= speed < 52.5mph	3.697222	1.853339	0.652832	0.316400
2	CO	41	Intercity Bus	12	52.5mph <= speed < 57.5mph	3.523636	1.766910	0.622940	0.302153
2	CO	41	Intercity Bus	13	57.5mph <= speed < 62.5mph	3.325500	1.667337	0.587760	0.285193
2	CO	41	Intercity Bus	14	62.5mph <= speed < 67.5mph	3.248532	1.615119	0.557518	0.266306
2	CO	41	Intercity Bus	15	67.5mph <= speed < 72.5mph	3.189420	1.572748	0.531518	0.249740
2	CO	41	Intercity Bus	16	72.5mph <= speed	3.176533	1.549632	0.508861	0.233539
2	CO	42	Transit Bus	1	speed < 2.5mph	36.251463	15.888402	4.953141	3.043878
2	CO	42	Transit Bus	2	2.5mph <= speed < 7.5mph	19.933499	8.605352	2.608271	1.594085
2	CO	42	Transit Bus	3	7.5mph <= speed < 12.5mph	11.440699	4.926328	1.493730	0.919075
2	CO	42	Transit Bus	4	12.5mph <= speed < 17.5mph	7.268055	3.138016	0.958599	0.593319
2	CO	42	Transit Bus	5	17.5mph <= speed < 22.5mph	6.498072	2.808493	0.872819	0.552294
2	CO	42	Transit Bus	6	22.5mph <= speed < 27.5mph	5.958882	2.584367	0.818303	0.527348
2	CO	42	Transit Bus	7	27.5mph <= speed < 32.5mph	5.736343	2.472756	0.777944	0.503208
2	CO	42	Transit Bus	8	32.5mph <= speed < 37.5mph	5.191881	2.243396	0.709509	0.459560
2	CO	42	Transit Bus	9	37.5mph <= speed < 42.5mph	4.908391	2.123955	0.675971	0.440039
2	CO	42	Transit Bus	10	42.5mph <= speed < 47.5mph	4.685640	2.029501	0.648758	0.423845
2	CO	42	Transit Bus	11	47.5mph <= speed < 52.5mph	4.967148	2.145778	0.673578	0.433210
2	CO	42	Transit Bus	12	52.5mph <= speed < 57.5mph	5.196507	2.240398	0.693590	0.440614
2	CO	42	Transit Bus	13	57.5mph <= speed < 62.5mph	4.950595	2.126110	0.649402	0.409344
2	CO	42	Transit Bus	14	62.5mph <= speed < 67.5mph	4.988195	2.115053	0.627724	0.391959
2	CO	42	Transit Bus	15	67.5mph <= speed < 72.5mph	5.040101	2.112453	0.610273	0.377601
2	CO	42	Transit Bus	16	72.5mph <= speed	5.173532	2.139626	0.599035	0.366671
2	CO	43	School Bus	1	speed < 2.5mph	35.724010	14.867713	5.002389	2.642065
2	CO	43	School Bus	2	2.5mph <= speed < 7.5mph	19.643978	7.779254	2.491250	1.296081
2	CO	43	School Bus	3	7.5mph <= speed < 12.5mph	11.824668	4.520503	1.398893	0.722454
2	CO	43	School Bus	4	12.5mph <= speed < 17.5mph	7.552875	2.883362	0.888801	0.460400
2	CO	43	School Bus	5	17.5mph <= speed < 22.5mph	7.804234	2.737804	0.788939	0.407674
2	CO	43	School Bus	6	22.5mph <= speed < 27.5mph	7.712877	2.588067	0.719502	0.372206
2	CO	43	School Bus	7	27.5mph <= speed < 32.5mph	8.038314	2.535088	0.673818	0.348385
2	CO	43	School Bus	8	32.5mph <= speed < 37.5mph	7.152925	2.267278	0.618520	0.322113
2	CO	43	School Bus	9	37.5mph <= speed < 42.5mph	6.868892	2.134392	0.585805	0.306855
2	CO	43	School Bus	10	42.5mph <= speed < 47.5mph	6.616186	2.025869	0.559418	0.294478

2	CO	43	School Bus	11	47.5mph <= speed < 52.5mph	6.580532	2.074930	0.591894	0.315740
2	CO	43	School Bus	12	52.5mph <= speed < 57.5mph	6.536997	2.113025	0.618102	0.332945
2	CO	43	School Bus	13	57.5mph <= speed < 62.5mph	6.067840	1.966728	0.575776	0.310606
2	CO	43	School Bus	14	62.5mph <= speed < 67.5mph	6.796541	2.041170	0.548179	0.295645
2	CO	43	School Bus	15	67.5mph <= speed < 72.5mph	7.499833	2.120464	0.525256	0.283181
2	CO	43	School Bus	16	72.5mph <= speed	8.263775	2.216013	0.506899	0.273412
2	CO	51	Refuse Truck	1	speed < 2.5mph	23.642688	6.442388	2.430681	2.231885
2	CO	51	Refuse Truck	2	2.5mph <= speed < 7.5mph	15.281885	3.956338	1.388516	1.271001
2	CO	51	Refuse Truck	3	7.5mph <= speed < 12.5mph	10.656724	2.601508	0.836866	0.763094
2	CO	51	Refuse Truck	4	12.5mph <= speed < 17.5mph	9.483680	2.191487	0.649485	0.590286
2	CO	51	Refuse Truck	5	17.5mph <= speed < 22.5mph	8.250630	1.895780	0.561019	0.509810
2	CO	51	Refuse Truck	6	22.5mph <= speed < 27.5mph	7.764450	1.753224	0.502661	0.456213
2	CO	51	Refuse Truck	7	27.5mph <= speed < 32.5mph	7.370338	1.632028	0.453989	0.411601
2	CO	51	Refuse Truck	8	32.5mph <= speed < 37.5mph	6.100086	1.392764	0.411386	0.374038
2	CO	51	Refuse Truck	9	37.5mph <= speed < 42.5mph	5.781755	1.309540	0.383125	0.348299
2	CO	51	Refuse Truck	10	42.5mph <= speed < 47.5mph	5.532984	1.244569	0.361089	0.328231
2	CO	51	Refuse Truck	11	47.5mph <= speed < 52.5mph	5.124516	1.159032	0.342189	0.311403
2	CO	51	Refuse Truck	12	52.5mph <= speed < 57.5mph	4.700490	1.073482	0.325691	0.296871
2	CO	51	Refuse Truck	13	57.5mph <= speed < 62.5mph	4.576907	1.031510	0.309099	0.281743
2	CO	51	Refuse Truck	14	62.5mph <= speed < 67.5mph	4.614763	1.008847	0.287706	0.261789
2	CO	51	Refuse Truck	15	67.5mph <= speed < 72.5mph	4.645409	0.989073	0.269272	0.244594
2	CO	51	Refuse Truck	16	72.5mph <= speed	4.747644	0.982618	0.252920	0.229229
2	CO	52	Single Unit Short-haul Truck	1	speed < 2.5mph	46.512555	15.024697	7.411082	6.487451
2	CO	52	Single Unit Short-haul Truck	2	2.5mph <= speed < 7.5mph	25.764602	8.191017	3.993291	3.501874
2	CO	52	Single Unit Short-haul Truck	3	7.5mph <= speed < 12.5mph	16.856282	5.146876	2.432982	2.132861
2	CO	52	Single Unit Short-haul Truck	4	12.5mph <= speed < 17.5mph	14.753467	4.534892	2.136300	1.863278
2	CO	52	Single Unit Short-haul Truck	5	17.5mph <= speed < 22.5mph	13.777353	4.227735	1.989649	1.734482
2	CO	52	Single Unit Short-haul Truck	6	22.5mph <= speed < 27.5mph	12.387397	3.857850	1.838808	1.601777
2	CO	52	Single Unit Short-haul Truck	7	27.5mph <= speed < 32.5mph	12.445295	3.787912	1.791405	1.567761
2	CO	52	Single Unit Short-haul Truck	8	32.5mph <= speed < 37.5mph	10.357180	3.226363	1.551727	1.357127
2	CO	52	Single Unit Short-haul Truck	9	37.5mph <= speed < 42.5mph	9.664119	3.010262	1.451800	1.271440
2	CO	52	Single Unit Short-haul Truck	10	42.5mph <= speed < 47.5mph	9.083084	2.829198	1.367636	1.199060
2	CO	52	Single Unit Short-haul Truck	11	47.5mph <= speed < 52.5mph	8.471019	2.638589	1.278720	1.122263
2	CO	52	Single Unit Short-haul Truck	12	52.5mph <= speed < 57.5mph	7.928198	2.468135	1.197392	1.051698
2	CO	52	Single Unit Short-haul Truck	13	57.5mph <= speed < 62.5mph	7.135505	2.220603	1.077160	0.946631
2	CO	52	Single Unit Short-haul Truck	14	62.5mph <= speed < 67.5mph	7.215503	2.157413	1.014219	0.891400
2	CO	52	Single Unit Short-haul Truck	15	67.5mph <= speed < 72.5mph	7.348408	2.116970	0.964899	0.848168
2	CO	52	Single Unit Short-haul Truck	16	72.5mph <= speed	7.680465	2.119525	0.929611	0.817271
2	CO	53	Single Unit Long-haul Truck	1	speed < 2.5mph	42.674759	9.450880	2.875354	2.480502
2	CO	53	Single Unit Long-haul Truck	2	2.5mph <= speed < 7.5mph	22.908853	5.024718	1.491680	1.282217
2	CO	53	Single Unit Long-haul Truck	3	7.5mph <= speed < 12.5mph	13.578388	2.914312	0.807513	0.688258
2	CO	53	Single Unit Long-haul Truck	4	12.5mph <= speed < 17.5mph	11.171618	2.371011	0.624255	0.528762
2	CO	53	Single Unit Long-haul Truck	5	17.5mph <= speed < 22.5mph	10.412908	2.172960	0.535854	0.450177
2	CO	53	Single Unit Long-haul Truck	6	22.5mph <= speed < 27.5mph	9.788338	2.028078	0.483289	0.403804
2	CO	53	Single Unit Long-haul Truck	7	27.5mph <= speed < 32.5mph	9.696700	1.972331	0.440280	0.364776
2	CO	53	Single Unit Long-haul Truck	8	32.5mph <= speed < 37.5mph	8.299459	1.704451	0.401155	0.334537
2	CO	53	Single Unit Long-haul Truck	9	37.5mph <= speed < 42.5mph	7.765752	1.597360	0.380964	0.318495
2	CO	53	Single Unit Long-haul Truck	10	42.5mph <= speed < 47.5mph	7.319445	1.508551	0.364326	0.305276
2	CO	53	Single Unit Long-haul Truck	11	47.5mph <= speed < 52.5mph	6.854767	1.415368	0.345180	0.289719
2	CO	53	Single Unit Long-haul Truck	12	52.5mph <= speed < 57.5mph	6.439635	1.333840	0.329181	0.276854
2	CO	53	Single Unit Long-haul Truck	13	57.5mph <= speed < 62.5mph	5.911385	1.228193	0.306017	0.258055
2	CO	53	Single Unit Long-haul Truck	14	62.5mph <= speed < 67.5mph	5.826978	1.202419	0.286635	0.241665
2	CO	53	Single Unit Long-haul Truck	15	67.5mph <= speed < 72.5mph	5.787706	1.185955	0.270097	0.227605
2	CO	53	Single Unit Long-haul Truck	16	72.5mph <= speed	5.914371	1.200422	0.256470	0.215888
2	CO	54	Motor Home	1	speed < 2.5mph	96.870591	47.672678	16.621043	11.507770
2	CO	54	Motor Home	2	2.5mph <= speed < 7.5mph	54.015497	26.095464	8.889824	6.151995
2	CO	54	Motor Home	3	7.5mph <= speed < 12.5mph	35.682727	16.656074	5.397447	3.748207
2	CO	54	Motor Home	4	12.5mph <= speed < 17.5mph	32.503982	15.113866	4.803448	3.327691
2	CO	54	Motor Home	5	17.5mph <= speed < 22.5mph	31.447763	14.443187	4.517062	3.134651
2	CO	54	Motor Home	6	22.5mph <= speed < 27.5mph	29.616588	13.711165	4.322216	2.991718
2	CO	54	Motor Home	7	27.5mph <= speed < 32.5mph	30.936532	13.701464	4.172193	2.910671
2	CO	54	Motor Home	8	32.5mph <= speed < 37.5mph	25.495685	11.526793	3.638920	2.537536
2	CO	54	Motor Home	9	37.5mph <= speed < 42.5mph	24.143080	10.830464	3.395950	2.370619
2	CO	54	Motor Home	10	42.5mph <= speed < 47.5mph	22.948958	10.236942	3.190932	2.229219
2	CO	54	Motor Home	11	47.5mph <= speed < 52.5mph	21.445852	9.524523	2.960479	2.073112
2	CO	54	Motor Home	12	52.5mph <= speed < 57.5mph	20.083066	8.893490	2.752643	1.931113
2	CO	54	Motor Home	13	57.5mph <= speed < 62.5mph	18.565272	8.148525	2.467571	1.731925
2	CO	54	Motor Home	14	62.5mph <= speed < 67.5mph	21.711849	9.002748	2.363252	1.658722
2	CO	54	Motor Home	15	67.5mph <= speed < 72.5mph	24.772665	9.856604	2.287432	1.605584

2	CO	54	Motor Home	16	72.5mph <= speed	28.477822	10.940506	2.248110	1.578928
2	CO	61	Combination Short-haul Truck	1	speed < 2.5mph	24.647498	6.333265	2.824414	2.495809
2	CO	61	Combination Short-haul Truck	2	2.5mph <= speed < 7.5mph	14.867624	3.702413	1.575570	1.384069
2	CO	61	Combination Short-haul Truck	3	7.5mph <= speed < 12.5mph	8.776191	2.140379	0.881760	0.771140
2	CO	61	Combination Short-haul Truck	4	12.5mph <= speed < 17.5mph	6.844406	1.651152	0.669618	0.584323
2	CO	61	Combination Short-haul Truck	5	17.5mph <= speed < 22.5mph	5.655728	1.383717	0.575712	0.504080
2	CO	61	Combination Short-haul Truck	6	22.5mph <= speed < 27.5mph	5.106155	1.243484	0.514091	0.449740
2	CO	61	Combination Short-haul Truck	7	27.5mph <= speed < 32.5mph	4.680264	1.131569	0.463198	0.404792
2	CO	61	Combination Short-haul Truck	8	32.5mph <= speed < 37.5mph	4.089154	1.005104	0.421687	0.369677
2	CO	61	Combination Short-haul Truck	9	37.5mph <= speed < 42.5mph	3.839089	0.940594	0.392700	0.344087
2	CO	61	Combination Short-haul Truck	10	42.5mph <= speed < 47.5mph	3.644632	0.890477	0.370206	0.324231
2	CO	61	Combination Short-haul Truck	11	47.5mph <= speed < 52.5mph	3.432677	0.841846	0.351888	0.308431
2	CO	61	Combination Short-haul Truck	12	52.5mph <= speed < 57.5mph	3.232888	0.797393	0.336055	0.294903
2	CO	61	Combination Short-haul Truck	13	57.5mph <= speed < 62.5mph	3.131476	0.766527	0.319360	0.279940
2	CO	61	Combination Short-haul Truck	14	62.5mph <= speed < 67.5mph	3.090432	0.740209	0.297707	0.259773
2	CO	61	Combination Short-haul Truck	15	67.5mph <= speed < 72.5mph	3.053588	0.717335	0.279071	0.242426
2	CO	61	Combination Short-haul Truck	16	72.5mph <= speed	3.050416	0.701082	0.262284	0.226651
2	CO	62	Combination Long-haul Truck	1	speed < 2.5mph	20.013428	8.572440	3.304142	2.503759
2	CO	62	Combination Long-haul Truck	2	2.5mph <= speed < 7.5mph	11.840676	4.979485	1.850140	1.389897
2	CO	62	Combination Long-haul Truck	3	7.5mph <= speed < 12.5mph	6.964751	2.889733	1.041332	0.775104
2	CO	62	Combination Long-haul Truck	4	12.5mph <= speed < 17.5mph	5.407379	2.230504	0.793509	0.588621
2	CO	62	Combination Long-haul Truck	5	17.5mph <= speed < 22.5mph	4.486797	1.870161	0.679886	0.506830
2	CO	62	Combination Long-haul Truck	6	22.5mph <= speed < 27.5mph	4.030557	1.676624	0.606858	0.451853
2	CO	62	Combination Long-haul Truck	7	27.5mph <= speed < 32.5mph	3.692260	1.527112	0.546187	0.405570
2	CO	62	Combination Long-haul Truck	8	32.5mph <= speed < 37.5mph	3.260289	1.360479	0.495729	0.369727
2	CO	62	Combination Long-haul Truck	9	37.5mph <= speed < 42.5mph	3.062637	1.274534	0.461613	0.343689
2	CO	62	Combination Long-haul Truck	10	42.5mph <= speed < 47.5mph	2.909702	1.208029	0.435216	0.323543
2	CO	62	Combination Long-haul Truck	11	47.5mph <= speed < 52.5mph	2.754437	1.145145	0.413523	0.307456
2	CO	62	Combination Long-haul Truck	12	52.5mph <= speed < 57.5mph	2.608881	1.087417	0.394801	0.293920
2	CO	62	Combination Long-haul Truck	13	57.5mph <= speed < 62.5mph	2.503032	1.038663	0.374803	0.279295
2	CO	62	Combination Long-haul Truck	14	62.5mph <= speed < 67.5mph	2.442027	0.999881	0.350372	0.259128
2	CO	62	Combination Long-haul Truck	15	67.5mph <= speed < 72.5mph	2.388747	0.966288	0.329355	0.241793
2	CO	62	Combination Long-haul Truck	16	72.5mph <= speed	2.357972	0.940997	0.310797	0.226336

NOx Emission Rates

PID	PDESC	VEHID	VEHDESC	SP_BIN	SP_desc	rate2010	rate2020	rate2030	rate2040
3	Nox	11	Motorcycle	1	speed < 2.5mph	1.049152	0.988460	0.969545	0.964653
3	Nox	11	Motorcycle	2	2.5mph <= speed < 7.5mph	0.683369	0.643836	0.631516	0.628330
3	Nox	11	Motorcycle	3	7.5mph <= speed < 12.5mph	0.497524	0.468743	0.459773	0.457453
3	Nox	11	Motorcycle	4	12.5mph <= speed < 17.5mph	0.433157	0.408099	0.400290	0.398270
3	Nox	11	Motorcycle	5	17.5mph <= speed < 22.5mph	0.418752	0.394528	0.386978	0.385026
3	Nox	11	Motorcycle	6	22.5mph <= speed < 27.5mph	0.439515	0.414089	0.406165	0.404116
3	Nox	11	Motorcycle	7	27.5mph <= speed < 32.5mph	0.458598	0.432068	0.423800	0.421662
3	Nox	11	Motorcycle	8	32.5mph <= speed < 37.5mph	0.538706	0.507542	0.497830	0.495318
3	Nox	11	Motorcycle	9	37.5mph <= speed < 42.5mph	0.612182	0.576767	0.565730	0.562875
3	Nox	11	Motorcycle	10	42.5mph <= speed < 47.5mph	0.666936	0.628354	0.616330	0.613220
3	Nox	11	Motorcycle	11	47.5mph <= speed < 52.5mph	0.701270	0.660702	0.648059	0.644789
3	Nox	11	Motorcycle	12	52.5mph <= speed < 57.5mph	0.720723	0.679030	0.666036	0.662675
3	Nox	11	Motorcycle	13	57.5mph <= speed < 62.5mph	0.736140	0.693554	0.680283	0.676850
3	Nox	11	Motorcycle	14	62.5mph <= speed < 67.5mph	0.745901	0.702751	0.689303	0.685825
3	Nox	11	Motorcycle	15	67.5mph <= speed < 72.5mph	0.722668	0.680863	0.667834	0.664464
3	Nox	11	Motorcycle	16	72.5mph <= speed	0.692445	0.652388	0.639903	0.636675
3	Nox	21	Passenger Car	1	speed < 2.5mph	2.201089	0.358224	0.045770	0.008767
3	Nox	21	Passenger Car	2	2.5mph <= speed < 7.5mph	1.389110	0.250181	0.041165	0.012690
3	Nox	21	Passenger Car	3	7.5mph <= speed < 12.5mph	0.967873	0.192372	0.037627	0.013913
3	Nox	21	Passenger Car	4	12.5mph <= speed < 17.5mph	0.805342	0.167297	0.034301	0.012938
3	Nox	21	Passenger Car	5	17.5mph <= speed < 22.5mph	0.723663	0.154587	0.033120	0.013024
3	Nox	21	Passenger Car	6	22.5mph <= speed < 27.5mph	0.683994	0.148347	0.032100	0.012527
3	Nox	21	Passenger Car	7	27.5mph <= speed < 32.5mph	0.630178	0.141097	0.033513	0.014811
3	Nox	21	Passenger Car	8	32.5mph <= speed < 37.5mph	0.620632	0.143332	0.037181	0.018111
3	Nox	21	Passenger Car	9	37.5mph <= speed < 42.5mph	0.618226	0.145933	0.039986	0.020496

3	Nox	21	Passenger Car	10	42.5mph <= speed < 47.5mph	0.618324	0.148423	0.042357	0.022488
3	Nox	21	Passenger Car	11	47.5mph <= speed < 52.5mph	0.620549	0.151011	0.044501	0.024260
3	Nox	21	Passenger Car	12	52.5mph <= speed < 57.5mph	0.625237	0.153912	0.046612	0.025979
3	Nox	21	Passenger Car	13	57.5mph <= speed < 62.5mph	0.632191	0.157567	0.049142	0.028029
3	Nox	21	Passenger Car	14	62.5mph <= speed < 67.5mph	0.652734	0.166900	0.055284	0.033006
3	Nox	21	Passenger Car	15	67.5mph <= speed < 72.5mph	0.699911	0.186976	0.068317	0.043631
3	Nox	21	Passenger Car	16	72.5mph <= speed	0.763555	0.215648	0.087216	0.059040
3	Nox	31	Passenger Truck	1	speed < 2.5mph	3.349898	0.853322	0.177334	0.074098
3	Nox	31	Passenger Truck	2	2.5mph <= speed < 7.5mph	2.156294	0.567293	0.125084	0.050596
3	Nox	31	Passenger Truck	3	7.5mph <= speed < 12.5mph	1.538734	0.417467	0.096761	0.037812
3	Nox	31	Passenger Truck	4	12.5mph <= speed < 17.5mph	1.302716	0.356889	0.083552	0.031684
3	Nox	31	Passenger Truck	5	17.5mph <= speed < 22.5mph	1.186266	0.328854	0.078760	0.029872
3	Nox	31	Passenger Truck	6	22.5mph <= speed < 27.5mph	1.134141	0.316742	0.076934	0.029105
3	Nox	31	Passenger Truck	7	27.5mph <= speed < 32.5mph	1.060853	0.301501	0.076436	0.030141
3	Nox	31	Passenger Truck	8	32.5mph <= speed < 37.5mph	1.074199	0.312759	0.084144	0.034965
3	Nox	31	Passenger Truck	9	37.5mph <= speed < 42.5mph	1.094748	0.323794	0.090440	0.038711
3	Nox	31	Passenger Truck	10	42.5mph <= speed < 47.5mph	1.112480	0.332762	0.095407	0.041651
3	Nox	31	Passenger Truck	11	47.5mph <= speed < 52.5mph	1.127257	0.339686	0.099091	0.043810
3	Nox	31	Passenger Truck	12	52.5mph <= speed < 57.5mph	1.146531	0.348918	0.103969	0.046734
3	Nox	31	Passenger Truck	13	57.5mph <= speed < 62.5mph	1.174239	0.361578	0.110258	0.050426
3	Nox	31	Passenger Truck	14	62.5mph <= speed < 67.5mph	1.226222	0.388127	0.123881	0.058530
3	Nox	31	Passenger Truck	15	67.5mph <= speed < 72.5mph	1.325508	0.442736	0.152577	0.075788
3	Nox	31	Passenger Truck	16	72.5mph <= speed	1.450188	0.509447	0.186914	0.096422
3	Nox	32	Light Commercial Truck	1	speed < 2.5mph	4.778044	1.327877	0.311727	0.144027
3	Nox	32	Light Commercial Truck	2	2.5mph <= speed < 7.5mph	2.794251	0.800524	0.197174	0.088486
3	Nox	32	Light Commercial Truck	3	7.5mph <= speed < 12.5mph	1.779094	0.528808	0.137192	0.059427
3	Nox	32	Light Commercial Truck	4	12.5mph <= speed < 17.5mph	1.405587	0.425981	0.112847	0.047541
3	Nox	32	Light Commercial Truck	5	17.5mph <= speed < 22.5mph	1.219551	0.375157	0.101490	0.042307
3	Nox	32	Light Commercial Truck	6	22.5mph <= speed < 27.5mph	1.132544	0.351447	0.096144	0.039564
3	Nox	32	Light Commercial Truck	7	27.5mph <= speed < 32.5mph	1.047833	0.331538	0.094014	0.039785
3	Nox	32	Light Commercial Truck	8	32.5mph <= speed < 37.5mph	1.041578	0.336124	0.099090	0.043128
3	Nox	32	Light Commercial Truck	9	37.5mph <= speed < 42.5mph	1.048120	0.343258	0.104078	0.046155
3	Nox	32	Light Commercial Truck	10	42.5mph <= speed < 47.5mph	1.054680	0.348920	0.107837	0.048399
3	Nox	32	Light Commercial Truck	11	47.5mph <= speed < 52.5mph	1.060880	0.353469	0.110834	0.050212
3	Nox	32	Light Commercial Truck	12	52.5mph <= speed < 57.5mph	1.070342	0.360120	0.115132	0.052914
3	Nox	32	Light Commercial Truck	13	57.5mph <= speed < 62.5mph	1.088811	0.370565	0.121055	0.056536
3	Nox	32	Light Commercial Truck	14	62.5mph <= speed < 67.5mph	1.128966	0.393770	0.134005	0.064559
3	Nox	32	Light Commercial Truck	15	67.5mph <= speed < 72.5mph	1.209199	0.442702	0.161851	0.082080
3	Nox	32	Light Commercial Truck	16	72.5mph <= speed	1.315105	0.505694	0.196966	0.104170
3	Nox	41	Intercity Bus	1	speed < 2.5mph	75.178277	33.854220	11.864002	5.851108
3	Nox	41	Intercity Bus	2	2.5mph <= speed < 7.5mph	39.564834	17.877886	6.340959	3.168392
3	Nox	41	Intercity Bus	3	7.5mph <= speed < 12.5mph	24.959762	11.234075	3.981383	2.004354
3	Nox	41	Intercity Bus	4	12.5mph <= speed < 17.5mph	21.240531	9.437491	3.291554	1.657904
3	Nox	41	Intercity Bus	5	17.5mph <= speed < 22.5mph	19.080513	8.345956	2.838757	1.419022
3	Nox	41	Intercity Bus	6	22.5mph <= speed < 27.5mph	17.592337	7.629243	2.554698	1.269887
3	Nox	41	Intercity Bus	7	27.5mph <= speed < 32.5mph	17.193737	7.401599	2.436279	1.200348
3	Nox	41	Intercity Bus	8	32.5mph <= speed < 37.5mph	14.601709	6.304432	2.075489	1.020509

3	Nox	41	Intercity Bus	9	37.5mph <= speed < 42.5mph	14.293164	6.146512	1.994354	0.971897
3	Nox	41	Intercity Bus	10	42.5mph <= speed < 47.5mph	14.062109	6.029179	1.933352	0.935113
3	Nox	41	Intercity Bus	11	47.5mph <= speed < 52.5mph	13.892232	5.954075	1.893166	0.909998
3	Nox	41	Intercity Bus	12	52.5mph <= speed < 57.5mph	13.740753	5.887688	1.858910	0.888809
3	Nox	41	Intercity Bus	13	57.5mph <= speed < 62.5mph	14.171550	6.030734	1.871504	0.892276
3	Nox	41	Intercity Bus	14	62.5mph <= speed < 67.5mph	14.925032	6.325652	1.945560	0.923418
3	Nox	41	Intercity Bus	15	67.5mph <= speed < 72.5mph	15.602659	6.593016	2.014451	0.952484
3	Nox	41	Intercity Bus	16	72.5mph <= speed	16.431953	6.929885	2.108839	0.992693
3	Nox	42	Transit Bus	1	speed < 2.5mph	93.802488	34.325371	10.971956	7.185615
3	Nox	42	Transit Bus	2	2.5mph <= speed < 7.5mph	45.339905	16.817647	5.524516	3.633972
3	Nox	42	Transit Bus	3	7.5mph <= speed < 12.5mph	25.192969	9.342061	3.066609	2.023576
3	Nox	42	Transit Bus	4	12.5mph <= speed < 17.5mph	16.280708	6.042580	1.989045	1.311773
3	Nox	42	Transit Bus	5	17.5mph <= speed < 22.5mph	14.394608	5.346974	1.755218	1.158464
3	Nox	42	Transit Bus	6	22.5mph <= speed < 27.5mph	13.242119	4.915677	1.607908	1.062390
3	Nox	42	Transit Bus	7	27.5mph <= speed < 32.5mph	12.685356	4.721096	1.539626	1.013274
3	Nox	42	Transit Bus	8	32.5mph <= speed < 37.5mph	11.593473	4.307349	1.397767	0.919300
3	Nox	42	Transit Bus	9	37.5mph <= speed < 42.5mph	11.198393	4.154747	1.338256	0.877292
3	Nox	42	Transit Bus	10	42.5mph <= speed < 47.5mph	10.884754	4.033651	1.291213	0.844151
3	Nox	42	Transit Bus	11	47.5mph <= speed < 52.5mph	11.633087	4.296887	1.374985	0.904973
3	Nox	42	Transit Bus	12	52.5mph <= speed < 57.5mph	12.241610	4.510820	1.443050	0.954431
3	Nox	42	Transit Bus	13	57.5mph <= speed < 62.5mph	12.076639	4.441048	1.413078	0.934176
3	Nox	42	Transit Bus	14	62.5mph <= speed < 67.5mph	12.968764	4.764972	1.494510	0.976606
3	Nox	42	Transit Bus	15	67.5mph <= speed < 72.5mph	13.819150	5.074136	1.573096	1.017966
3	Nox	42	Transit Bus	16	72.5mph <= speed	14.925063	5.482767	1.682479	1.076562
3	Nox	43	School Bus	1	speed < 2.5mph	58.027046	29.124567	10.237039	5.902906
3	Nox	43	School Bus	2	2.5mph <= speed < 7.5mph	26.279761	13.146960	4.599434	2.628515
3	Nox	43	School Bus	3	7.5mph <= speed < 12.5mph	15.216614	7.601739	2.683304	1.551596
3	Nox	43	School Bus	4	12.5mph <= speed < 17.5mph	9.404118	4.680783	1.634492	0.934494
3	Nox	43	School Bus	5	17.5mph <= speed < 22.5mph	8.629590	4.254059	1.477997	0.848658
3	Nox	43	School Bus	6	22.5mph <= speed < 27.5mph	8.078737	3.960268	1.373678	0.792236
3	Nox	43	School Bus	7	27.5mph <= speed < 32.5mph	7.876186	3.847737	1.335406	0.771001
3	Nox	43	School Bus	8	32.5mph <= speed < 37.5mph	7.095985	3.462722	1.203114	0.696859
3	Nox	43	School Bus	9	37.5mph <= speed < 42.5mph	6.717275	3.267182	1.129976	0.654213
3	Nox	43	School Bus	10	42.5mph <= speed < 47.5mph	6.411207	3.110317	1.072142	0.620531
3	Nox	43	School Bus	11	47.5mph <= speed < 52.5mph	6.489997	3.153865	1.119243	0.649240
3	Nox	43	School Bus	12	52.5mph <= speed < 57.5mph	6.549219	3.187005	1.156989	0.672255
3	Nox	43	School Bus	13	57.5mph <= speed < 62.5mph	6.152728	2.995474	1.093231	0.634134
3	Nox	43	School Bus	14	62.5mph <= speed < 67.5mph	7.116719	3.415121	1.170582	0.670432
3	Nox	43	School Bus	15	67.5mph <= speed < 72.5mph	8.050791	3.823250	1.248147	0.707402
3	Nox	43	School Bus	16	72.5mph <= speed	9.024905	4.253541	1.338208	0.754182
3	Nox	51	Refuse Truck	1	speed < 2.5mph	53.504686	15.644810	6.548308	5.910401
3	Nox	51	Refuse Truck	2	2.5mph <= speed < 7.5mph	30.313251	8.913968	3.774357	3.410612
3	Nox	51	Refuse Truck	3	7.5mph <= speed < 12.5mph	19.294337	5.684785	2.427313	2.195943
3	Nox	51	Refuse Truck	4	12.5mph <= speed < 17.5mph	16.647444	4.821877	2.029321	1.836039
3	Nox	51	Refuse Truck	5	17.5mph <= speed < 22.5mph	14.630114	4.176096	1.733168	1.567233
3	Nox	51	Refuse Truck	6	22.5mph <= speed < 27.5mph	13.393142	3.785067	1.554366	1.404561
3	Nox	51	Refuse Truck	7	27.5mph <= speed < 32.5mph	13.060444	3.645249	1.475641	1.333026
3	Nox	51	Refuse Truck	8	32.5mph <= speed < 37.5mph	11.241263	3.133296	1.262540	1.140360
3	Nox	51	Refuse Truck	9	37.5mph <= speed < 42.5mph	10.888942	3.008924	1.197839	1.081372
3	Nox	51	Refuse Truck	10	42.5mph <= speed < 47.5mph	10.609232	2.911063	1.147222	1.035219
3	Nox	51	Refuse Truck	11	47.5mph <= speed < 52.5mph	10.197069	2.779332	1.083454	0.977286
3	Nox	51	Refuse Truck	12	52.5mph <= speed < 57.5mph	9.857501	2.669454	1.030179	0.929291
3	Nox	51	Refuse Truck	13	57.5mph <= speed < 62.5mph	10.143918	2.731181	1.051196	0.950166
3	Nox	51	Refuse Truck	14	62.5mph <= speed < 67.5mph	10.675196	2.853020	1.090789	0.986537
3	Nox	51	Refuse Truck	15	67.5mph <= speed < 72.5mph	11.121957	2.955183	1.123871	1.016938
3	Nox	51	Refuse Truck	16	72.5mph <= speed	11.693216	3.095273	1.175635	1.064768

3	Nox	52	Single Unit Short-haul Truck	1	speed < 2.5mph	40.392959	11.064367	4.674809	4.081407
3	Nox	52	Single Unit Short-haul Truck	2	2.5mph <= speed < 7.5mph	19.270512	5.329533	2.273174	1.984937
3	Nox	52	Single Unit Short-haul Truck	3	7.5mph <= speed < 12.5mph	11.269711	3.142398	1.354293	1.184156
3	Nox	52	Single Unit Short-haul Truck	4	12.5mph <= speed < 17.5mph	8.877774	2.475711	1.070229	0.936740
3	Nox	52	Single Unit Short-haul Truck	5	17.5mph <= speed < 22.5mph	7.499729	2.083595	0.899027	0.787253
3	Nox	52	Single Unit Short-haul Truck	6	22.5mph <= speed < 27.5mph	6.548336	1.810640	0.778349	0.681536
3	Nox	52	Single Unit Short-haul Truck	7	27.5mph <= speed < 32.5mph	6.243665	1.735522	0.750095	0.657114
3	Nox	52	Single Unit Short-haul Truck	8	32.5mph <= speed < 37.5mph	5.427303	1.530640	0.669897	0.586759
3	Nox	52	Single Unit Short-haul Truck	9	37.5mph <= speed < 42.5mph	5.093940	1.450526	0.640080	0.560600
3	Nox	52	Single Unit Short-haul Truck	10	42.5mph <= speed < 47.5mph	4.818772	1.384933	0.615892	0.539380
3	Nox	52	Single Unit Short-haul Truck	11	47.5mph <= speed < 52.5mph	4.537199	1.322204	0.594630	0.520724
3	Nox	52	Single Unit Short-haul Truck	12	52.5mph <= speed < 57.5mph	4.305972	1.270467	0.576916	0.505149
3	Nox	52	Single Unit Short-haul Truck	13	57.5mph <= speed < 62.5mph	3.972508	1.183063	0.541267	0.473944
3	Nox	52	Single Unit Short-haul Truck	14	62.5mph <= speed < 67.5mph	4.079089	1.189065	0.534282	0.467645
3	Nox	52	Single Unit Short-haul Truck	15	67.5mph <= speed < 72.5mph	4.199284	1.200102	0.529990	0.463722
3	Nox	52	Single Unit Short-haul Truck	16	72.5mph <= speed	4.432584	1.238835	0.536384	0.469212
3	Nox	53	Single Unit Long-haul Truck	1	speed < 2.5mph	44.662082	12.558511	5.871444	5.195374
3	Nox	53	Single Unit Long-haul Truck	2	2.5mph <= speed < 7.5mph	21.001006	5.898996	2.754548	2.436876
3	Nox	53	Single Unit Long-haul Truck	3	7.5mph <= speed < 12.5mph	11.687931	3.300595	1.553695	1.376753
3	Nox	53	Single Unit Long-haul Truck	4	12.5mph <= speed < 17.5mph	9.024553	2.543548	1.194757	1.058840
3	Nox	53	Single Unit Long-haul Truck	5	17.5mph <= speed < 22.5mph	7.572941	2.111405	0.979152	0.866867
3	Nox	53	Single Unit Long-haul Truck	6	22.5mph <= speed < 27.5mph	6.721673	1.861041	0.856602	0.758116
3	Nox	53	Single Unit Long-haul Truck	7	27.5mph <= speed < 32.5mph	6.253577	1.719339	0.784072	0.692745
3	Nox	53	Single Unit Long-haul Truck	8	32.5mph <= speed < 37.5mph	5.527761	1.521522	0.694109	0.612390
3	Nox	53	Single Unit Long-haul Truck	9	37.5mph <= speed < 42.5mph	5.151757	1.413584	0.642353	0.565808
3	Nox	53	Single Unit Long-haul Truck	10	42.5mph <= speed < 47.5mph	4.841187	1.325261	0.600444	0.528112
3	Nox	53	Single Unit Long-haul Truck	11	47.5mph <= speed < 52.5mph	4.524013	1.238144	0.560770	0.492412
3	Nox	53	Single Unit Long-haul Truck	12	52.5mph <= speed < 57.5mph	4.262930	1.166462	0.528151	0.463057
3	Nox	53	Single Unit Long-haul Truck	13	57.5mph <= speed < 62.5mph	3.973526	1.085889	0.490823	0.429848
3	Nox	53	Single Unit Long-haul Truck	14	62.5mph <= speed < 67.5mph	3.996651	1.082752	0.483767	0.423539
3	Nox	53	Single Unit Long-haul Truck	15	67.5mph <= speed < 72.5mph	4.036220	1.084914	0.479585	0.419797
3	Nox	53	Single Unit Long-haul Truck	16	72.5mph <= speed	4.203399	1.119082	0.488196	0.427294
3	Nox	54	Motor Home	1	speed < 2.5mph	29.483784	14.239117	5.950268	4.079428
3	Nox	54	Motor Home	2	2.5mph <= speed < 7.5mph	14.605226	7.073358	2.959764	2.022104
3	Nox	54	Motor Home	3	7.5mph <= speed < 12.5mph	8.514657	4.106644	1.730583	1.192705
3	Nox	54	Motor Home	4	12.5mph <= speed < 17.5mph	7.046283	3.351860	1.403882	0.972042
3	Nox	54	Motor Home	5	17.5mph <= speed < 22.5mph	6.160597	2.898666	1.207279	0.839623
3	Nox	54	Motor Home	6	22.5mph <= speed < 27.5mph	5.507230	2.563948	1.057742	0.735882
3	Nox	54	Motor Home	7	27.5mph <= speed < 32.5mph	5.349399	2.488951	1.029700	0.716983

3	Nox	54	Motor Home	8	32.5mph <= speed < 37.5mph	4.815834	2.249649	0.945631	0.660875
3	Nox	54	Motor Home	9	37.5mph <= speed < 42.5mph	4.700902	2.195608	0.929231	0.649675
3	Nox	54	Motor Home	10	42.5mph <= speed < 47.5mph	4.599705	2.148653	0.915013	0.640012
3	Nox	54	Motor Home	11	47.5mph <= speed < 52.5mph	4.460733	2.089112	0.899041	0.629740
3	Nox	54	Motor Home	12	52.5mph <= speed < 57.5mph	4.342625	2.037671	0.884517	0.620212
3	Nox	54	Motor Home	13	57.5mph <= speed < 62.5mph	4.145046	1.944459	0.845894	0.592817
3	Nox	54	Motor Home	14	62.5mph <= speed < 67.5mph	4.430234	2.040333	0.860761	0.600804
3	Nox	54	Motor Home	15	67.5mph <= speed < 72.5mph	4.708598	2.135667	0.877080	0.610015
3	Nox	54	Motor Home	16	72.5mph <= speed	5.072738	2.268186	0.907723	0.629630
3	Nox	61	Combination Short-haul Truck	1	speed < 2.5mph	67.558602	17.342212	7.627988	6.706438
3	Nox	61	Combination Short-haul Truck	2	2.5mph <= speed < 7.5mph	35.713230	9.251196	4.119971	3.630880
3	Nox	61	Combination Short-haul Truck	3	7.5mph <= speed < 12.5mph	21.219251	5.503050	2.457942	2.168548
3	Nox	61	Combination Short-haul Truck	4	12.5mph <= speed < 17.5mph	18.120355	4.627613	2.029782	1.789367
3	Nox	61	Combination Short-haul Truck	5	17.5mph <= speed < 22.5mph	15.988972	4.025470	1.731274	1.523889
3	Nox	61	Combination Short-haul Truck	6	22.5mph <= speed < 27.5mph	14.737515	3.673563	1.554515	1.366162
3	Nox	61	Combination Short-haul Truck	7	27.5mph <= speed < 32.5mph	14.392414	3.548838	1.478742	1.297869
3	Nox	61	Combination Short-haul Truck	8	32.5mph <= speed < 37.5mph	12.549909	3.082715	1.273013	1.114990
3	Nox	61	Combination Short-haul Truck	9	37.5mph <= speed < 42.5mph	12.249381	2.982268	1.213734	1.061015
3	Nox	61	Combination Short-haul Truck	10	42.5mph <= speed < 47.5mph	12.019007	2.904970	1.167961	1.019333
3	Nox	61	Combination Short-haul Truck	11	47.5mph <= speed < 52.5mph	11.671297	2.801856	1.113074	0.969907
3	Nox	61	Combination Short-haul Truck	12	52.5mph <= speed < 57.5mph	11.359723	2.710393	1.065610	0.927543
3	Nox	61	Combination Short-haul Truck	13	57.5mph <= speed < 62.5mph	11.636767	2.763643	1.082391	0.942965
3	Nox	61	Combination Short-haul Truck	14	62.5mph <= speed < 67.5mph	12.466012	2.934441	1.131972	0.984275
3	Nox	61	Combination Short-haul Truck	15	67.5mph <= speed < 72.5mph	13.178452	3.081183	1.174579	1.019771
3	Nox	61	Combination Short-haul Truck	16	72.5mph <= speed	13.997728	3.258722	1.234381	1.071056
3	Nox	62	Combination Long-haul Truck	1	speed < 2.5mph	55.999320	24.077922	9.482878	6.952810
3	Nox	62	Combination Long-haul Truck	2	2.5mph <= speed < 7.5mph	29.746425	12.861032	5.123989	3.770337
3	Nox	62	Combination Long-haul Truck	3	7.5mph <= speed < 12.5mph	17.893960	7.735918	3.078423	2.261326
3	Nox	62	Combination Long-haul Truck	4	12.5mph <= speed < 17.5mph	15.072450	6.467326	2.550696	1.874754
3	Nox	62	Combination Long-haul Truck	5	17.5mph <= speed < 22.5mph	13.187906	5.610340	2.179201	1.595020
3	Nox	62	Combination Long-haul Truck	6	22.5mph <= speed < 27.5mph	11.987388	5.079143	1.959709	1.431976
3	Nox	62	Combination Long-haul Truck	7	27.5mph <= speed < 32.5mph	11.658384	4.904466	1.866707	1.359666
3	Nox	62	Combination Long-haul Truck	8	32.5mph <= speed < 37.5mph	10.204736	4.274766	1.606331	1.163760
3	Nox	62	Combination Long-haul Truck	9	37.5mph <= speed < 42.5mph	9.953376	4.139948	1.530081	1.102192
3	Nox	62	Combination Long-haul Truck	10	42.5mph <= speed < 47.5mph	9.763220	4.037289	1.471606	1.054929
3	Nox	62	Combination Long-haul Truck	11	47.5mph <= speed < 52.5mph	9.513593	3.907470	1.398874	0.995930
3	Nox	62	Combination Long-haul Truck	12	52.5mph <= speed < 57.5mph	9.249873	3.777933	1.333733	0.945715
3	Nox	62	Combination Long-haul Truck	13	57.5mph <= speed < 62.5mph	9.146832	3.743386	1.341987	0.964769
3	Nox	62	Combination Long-haul Truck	14	62.5mph <= speed < 67.5mph	9.712106	3.954075	1.400617	1.002721

3	Nox	62	Combination Long-haul Truck	15	67.5mph <= speed < 72.5mph	10.198364	4.135304	1.451049	1.035382
3	Nox	62	Combination Long-haul Truck	16	72.5mph <= speed	10.755936	4.350736	1.519143	1.082334

Carbon Di-Oxide Emission Rates

PID	PDESC	VEHID	VEHDESC	SP_BIN	SP_desc	rate2010	rate2020	rate2030	rate2040
98	CO2 Equivalent	11	Motorcycle	1	speed < 2.5mph	1307.370866	1310.752358	1311.801835	1311.801835
98	CO2 Equivalent	11	Motorcycle	2	2.5mph <= speed < 7.5mph	768.918321	770.950399	771.580203	771.580619
98	CO2 Equivalent	11	Motorcycle	3	7.5mph <= speed < 12.5mph	499.809850	501.167678	501.585664	501.585798
98	CO2 Equivalent	11	Motorcycle	4	12.5mph <= speed < 17.5mph	415.944143	417.090665	417.442911	417.443358
98	CO2 Equivalent	11	Motorcycle	5	17.5mph <= speed < 22.5mph	371.093679	372.141862	372.462052	372.462553
98	CO2 Equivalent	11	Motorcycle	6	22.5mph <= speed < 27.5mph	345.396457	346.413679	346.720813	346.720985
98	CO2 Equivalent	11	Motorcycle	7	27.5mph <= speed < 32.5mph	329.846173	330.868754	331.171686	331.171825
98	CO2 Equivalent	11	Motorcycle	8	32.5mph <= speed < 37.5mph	339.650766	340.846817	341.184597	341.184597
98	CO2 Equivalent	11	Motorcycle	9	37.5mph <= speed < 42.5mph	350.705954	352.062824	352.433912	352.433970
98	CO2 Equivalent	11	Motorcycle	10	42.5mph <= speed < 47.5mph	359.032485	360.514086	360.910992	360.911508
98	CO2 Equivalent	11	Motorcycle	11	47.5mph <= speed < 52.5mph	367.545343	369.136343	369.555428	369.555428
98	CO2 Equivalent	11	Motorcycle	12	52.5mph <= speed < 57.5mph	378.362102	380.071648	380.513790	380.513790
98	CO2 Equivalent	11	Motorcycle	13	57.5mph <= speed < 62.5mph	390.270534	392.099597	392.565317	392.565307
98	CO2 Equivalent	11	Motorcycle	14	62.5mph <= speed < 67.5mph	402.060702	404.009349	404.498370	404.498542
98	CO2 Equivalent	11	Motorcycle	15	67.5mph <= speed < 72.5mph	410.684583	412.732331	413.237889	413.237889
98	CO2 Equivalent	11	Motorcycle	16	72.5mph <= speed	409.947336	412.030358	412.538732	412.538732
98	CO2 Equivalent	21	Passenger Car	1	speed < 2.5mph	2282.246876	1939.546063	1380.044804	1209.308964
98	CO2 Equivalent	21	Passenger Car	2	2.5mph <= speed < 7.5mph	1263.656375	1070.260980	761.061936	666.850814
98	CO2 Equivalent	21	Passenger Car	3	7.5mph <= speed < 12.5mph	752.477449	634.160409	450.545085	394.723540
98	CO2 Equivalent	21	Passenger Car	4	12.5mph <= speed < 17.5mph	587.546027	493.776522	350.608889	307.141475
98	CO2 Equivalent	21	Passenger Car	5	17.5mph <= speed < 22.5mph	497.325531	418.088280	296.834709	260.019453
98	CO2 Equivalent	21	Passenger Car	6	22.5mph <= speed < 27.5mph	440.064316	370.025364	262.692477	230.102013
98	CO2 Equivalent	21	Passenger Car	7	27.5mph <= speed < 32.5mph	396.731658	333.752755	236.940823	207.538606
98	CO2 Equivalent	21	Passenger Car	8	32.5mph <= speed < 37.5mph	376.476835	317.329697	225.326009	197.358778
98	CO2 Equivalent	21	Passenger Car	9	37.5mph <= speed < 42.5mph	362.911170	306.444582	217.637881	190.619684
98	CO2 Equivalent	21	Passenger Car	10	42.5mph <= speed < 47.5mph	352.304028	297.896071	211.596518	185.324287
98	CO2 Equivalent	21	Passenger Car	11	47.5mph <= speed < 52.5mph	342.952961	290.217385	206.157092	180.556538
98	CO2 Equivalent	21	Passenger Car	12	52.5mph <= speed < 57.5mph	336.741007	285.166910	202.582050	177.422461
98	CO2 Equivalent	21	Passenger Car	13	57.5mph <= speed < 62.5mph	332.745577	281.972498	200.324223	175.442209
98	CO2 Equivalent	21	Passenger Car	14	62.5mph <= speed < 67.5mph	333.816997	283.088972	201.128483	176.142897
98	CO2 Equivalent	21	Passenger Car	15	67.5mph <= speed < 72.5mph	343.009699	291.081660	206.810871	181.114741
98	CO2 Equivalent	21	Passenger Car	16	72.5mph <= speed	359.995952	305.726655	217.216857	190.222302
98	CO2 Equivalent	31	Passenger Truck	1	speed < 2.5mph	3038.324208	2418.435349	1784.534828	1580.827048
98	CO2 Equivalent	31	Passenger Truck	2	2.5mph <= speed < 7.5mph	1693.650239	1346.439396	993.352073	879.985206
98	CO2 Equivalent	31	Passenger Truck	3	7.5mph <= speed < 12.5mph	1018.475065	808.279358	596.174502	528.157213
98	CO2 Equivalent	31	Passenger Truck	4	12.5mph <= speed < 17.5mph	798.110416	632.901877	466.765255	413.517543
98	CO2 Equivalent	31	Passenger Truck	5	17.5mph <= speed < 22.5mph	678.768531	538.475681	397.162462	351.856706
98	CO2 Equivalent	31	Passenger Truck	6	22.5mph <= speed < 27.5mph	605.813623	480.800775	354.669354	314.215511
98	CO2 Equivalent	31	Passenger Truck	7	27.5mph <= speed < 32.5mph	546.180905	433.594414	319.868946	283.379221
98	CO2 Equivalent	31	Passenger Truck	8	32.5mph <= speed < 37.5mph	522.581176	415.294287	306.430596	271.459548
98	CO2 Equivalent	31	Passenger Truck	9	37.5mph <= speed < 42.5mph	507.899051	404.016556	298.165772	264.125785
98	CO2 Equivalent	31	Passenger Truck	10	42.5mph <= speed < 47.5mph	496.279783	395.060795	291.599500	258.300274
98	CO2 Equivalent	31	Passenger Truck	11	47.5mph <= speed < 52.5mph	485.653411	386.766482	285.504897	252.896381
98	CO2 Equivalent	31	Passenger Truck	12	52.5mph <= speed < 57.5mph	479.323637	381.893827	281.929885	249.723821
98	CO2 Equivalent	31	Passenger Truck	13	57.5mph <= speed < 62.5mph	478.037619	381.034064	281.313355	249.170940
98	CO2 Equivalent	31	Passenger Truck	14	62.5mph <= speed < 67.5mph	483.980964	385.954334	284.954082	252.384181
98	CO2 Equivalent	31	Passenger Truck	15	67.5mph <= speed < 72.5mph	503.150149	401.403109	296.337030	262.446970
98	CO2 Equivalent	31	Passenger Truck	16	72.5mph <= speed	531.101214	423.925522	312.921852	277.106305
98	CO2 Equivalent	32	Light Commercial Truck	1	speed < 2.5mph	3079.028997	2482.339680	1870.748319	1675.707184
98	CO2 Equivalent	32	Light Commercial Truck	2	2.5mph <= speed < 7.5mph	1719.164196	1384.266982	1043.095596	934.429637
98	CO2 Equivalent	32	Light Commercial Truck	3	7.5mph <= speed < 12.5mph	1033.209508	830.453050	625.675180	560.566766
98	CO2 Equivalent	32	Light Commercial Truck	4	12.5mph <= speed < 17.5mph	809.052258	649.707707	489.458263	438.552784
98	CO2 Equivalent	32	Light Commercial Truck	5	17.5mph <= speed < 22.5mph	686.931177	551.725933	415.674443	372.456124
98	CO2 Equivalent	32	Light Commercial Truck	6	22.5mph <= speed < 27.5mph	613.152737	492.541878	371.121615	332.550647
98	CO2 Equivalent	32	Light Commercial Truck	7	27.5mph <= speed < 32.5mph	552.490945	443.875949	334.462595	299.696225
98	CO2 Equivalent	32	Light Commercial Truck	8	32.5mph <= speed < 37.5mph	526.702350	423.427625	319.084784	285.899782
98	CO2 Equivalent	32	Light Commercial Truck	9	37.5mph <= speed < 42.5mph	510.931131	411.000559	309.748071	277.518183
98	CO2 Equivalent	32	Light Commercial Truck	10	42.5mph <= speed < 47.5mph	498.236914	400.960585	302.201829	270.745803
98	CO2 Equivalent	32	Light Commercial Truck	11	47.5mph <= speed < 52.5mph	486.805363	391.852491	295.350702	264.601833
98	CO2 Equivalent	32	Light Commercial Truck	12	52.5mph <= speed < 57.5mph	479.467072	386.044071	290.981614	260.680392
98	CO2 Equivalent	32	Light Commercial Truck	13	57.5mph <= speed < 62.5mph	477.482578	384.549396	289.860817	259.667497
98	CO2 Equivalent	32	Light Commercial Truck	14	62.5mph <= speed < 67.5mph	483.057125	389.172309	293.342948	262.771951
98	CO2 Equivalent	32	Light Commercial Truck	15	67.5mph <= speed < 72.5mph	501.128946	403.878854	304.401883	272.653740
98	CO2 Equivalent	32	Light Commercial Truck	16	72.5mph <= speed	528.192764	425.910655	320.960029	287.444190
98	CO2 Equivalent	41	Intercity Bus	1	speed < 2.5mph	8794.584560	8677.853408	8404.032309	8257.589610
98	CO2 Equivalent	41	Intercity Bus	2	2.5mph <= speed < 7.5mph	4871.377056	4815.621896	4675.283129	4599.644584
98	CO2 Equivalent	41	Intercity Bus	3	7.5mph <= speed < 12.5mph	3181.089984	3140.751683	3047.911284	2998.204937
98	CO2 Equivalent	41	Intercity Bus	4	12.5mph <= speed < 17.5mph	2726.991057	2689.675252	2608.737442	2565.619722
98	CO2 Equivalent	41	Intercity Bus	5	17.5mph <= speed < 22.5mph	2436.268686	2400.053678	2325.770936	2286.406583
98	CO2 Equivalent	41	Intercity Bus	6	22.5mph <= speed < 27.5mph	2227.565953	2193.687155	2125.568609	2089.536712
98	CO2 Equivalent	41	Intercity Bus	7	27.5mph <= speed < 32.5mph	2176.073271	2138.070968	2067.083019	2029.848075
98	CO2 Equivalent	41	Intercity Bus	8	32.5mph <= speed < 37.5mph	1827.994023	1798.873938	1741.978577	1711.970282
98	CO2 Equivalent	41	Intercity Bus	9	37.5mph <= speed < 42.5mph	1766.802702	1736.963824	1680.483016	1650.803032
98	CO2 Equivalent	41	Intercity Bus	10	42.5mph <= speed < 47.5mph	1719.508383	1689.118513	1632.971604	1603.549890
98	CO2 Equivalent	41	Intercity Bus	11	47.5mph <= speed < 52.5mph	1679.304274	1648.612897	1592.920815	1563.800463

98	CO2 Equivalent	41	Intercity Bus	12	52.5mph <= speed < 57.5mph	1644.788598	1613.874791	1558.603534	1529.753433
98	CO2 Equivalent	41	Intercity Bus	13	57.5mph <= speed < 62.5mph	1661.485314	1632.023513	1578.254605	1550.103645
98	CO2 Equivalent	41	Intercity Bus	14	62.5mph <= speed < 67.5mph	1741.877081	1710.873120	1654.639297	1625.214379
98	CO2 Equivalent	41	Intercity Bus	15	67.5mph <= speed < 72.5mph	1816.101005	1783.536375	1724.870044	1694.193068
98	CO2 Equivalent	41	Intercity Bus	16	72.5mph <= speed	1918.343754	1883.427615	1821.141513	1788.606632
98	CO2 Equivalent	42	Transit Bus	1	speed < 2.5mph	8705.551619	8435.437257	8087.132505	7960.704688
98	CO2 Equivalent	42	Transit Bus	2	2.5mph <= speed < 7.5mph	4488.856855	4360.436383	4189.071905	4126.460560
98	CO2 Equivalent	42	Transit Bus	3	7.5mph <= speed < 12.5mph	2657.940872	2578.087508	2474.178741	2436.356802
98	CO2 Equivalent	42	Transit Bus	4	12.5mph <= speed < 17.5mph	1683.866418	1635.643702	1571.517914	1548.088606
98	CO2 Equivalent	42	Transit Bus	5	17.5mph <= speed < 22.5mph	1590.584186	1544.101028	1483.274716	1461.097807
98	CO2 Equivalent	42	Transit Bus	6	22.5mph <= speed < 27.5mph	1534.198770	1489.453135	1431.207135	1409.979561
98	CO2 Equivalent	42	Transit Bus	7	27.5mph <= speed < 32.5mph	1522.243109	1476.807501	1418.479020	1397.264653
98	CO2 Equivalent	42	Transit Bus	8	32.5mph <= speed < 37.5mph	1386.767029	1344.330164	1290.532127	1271.005090
98	CO2 Equivalent	42	Transit Bus	9	37.5mph <= speed < 42.5mph	1345.185444	1302.625754	1249.542028	1230.328171
98	CO2 Equivalent	42	Transit Bus	10	42.5mph <= speed < 47.5mph	1312.367693	1269.752824	1217.264651	1198.306824
98	CO2 Equivalent	42	Transit Bus	11	47.5mph <= speed < 52.5mph	1418.873697	1372.338811	1315.497673	1294.993715
98	CO2 Equivalent	42	Transit Bus	12	52.5mph <= speed < 57.5mph	1505.679316	1455.944033	1395.553294	1373.787942
98	CO2 Equivalent	42	Transit Bus	13	57.5mph <= speed < 62.5mph	1498.877488	1449.663768	1389.970138	1368.459339
98	CO2 Equivalent	42	Transit Bus	14	62.5mph <= speed < 67.5mph	1597.445971	1543.405135	1478.771651	1455.539037
98	CO2 Equivalent	42	Transit Bus	15	67.5mph <= speed < 72.5mph	1690.526987	1631.914444	1562.590320	1537.722673
98	CO2 Equivalent	42	Transit Bus	16	72.5mph <= speed	1798.953771	1735.429335	1660.909877	1634.218336
98	CO2 Equivalent	43	School Bus	1	speed < 2.5mph	8139.416157	8105.651417	7811.587185	7650.000068
98	CO2 Equivalent	43	School Bus	2	2.5mph <= speed < 7.5mph	3823.228364	3790.024268	3647.855009	3570.959692
98	CO2 Equivalent	43	School Bus	3	7.5mph <= speed < 12.5mph	2219.606915	2201.712266	2119.705016	2075.275535
98	CO2 Equivalent	43	School Bus	4	12.5mph <= speed < 17.5mph	1377.294437	1361.224666	1308.629503	1280.488467
98	CO2 Equivalent	43	School Bus	5	17.5mph <= speed < 22.5mph	1273.464690	1254.888232	1206.155158	1180.350073
98	CO2 Equivalent	43	School Bus	6	22.5mph <= speed < 27.5mph	1197.859106	1179.169041	1133.696187	1109.711237
98	CO2 Equivalent	43	School Bus	7	27.5mph <= speed < 32.5mph	1173.620792	1153.263495	1108.433125	1084.936408
98	CO2 Equivalent	43	School Bus	8	32.5mph <= speed < 37.5mph	1055.606681	1038.731685	999.183715	978.365428
98	CO2 Equivalent	43	School Bus	9	37.5mph <= speed < 42.5mph	997.775131	981.782008	944.141845	924.339996
98	CO2 Equivalent	43	School Bus	10	42.5mph <= speed < 47.5mph	950.733723	935.498990	899.441382	880.480194
98	CO2 Equivalent	43	School Bus	11	47.5mph <= speed < 52.5mph	975.974142	955.262440	917.092472	897.363055
98	CO2 Equivalent	43	School Bus	12	52.5mph <= speed < 57.5mph	995.780914	970.603492	930.736954	910.396476
98	CO2 Equivalent	43	School Bus	13	57.5mph <= speed < 62.5mph	937.724777	912.917689	874.987527	855.705247
98	CO2 Equivalent	43	School Bus	14	62.5mph <= speed < 67.5mph	1031.367893	1006.143951	962.510960	940.186344
98	CO2 Equivalent	43	School Bus	15	67.5mph <= speed < 72.5mph	1123.303039	1097.656960	1048.537386	1023.283400
98	CO2 Equivalent	43	School Bus	16	72.5mph <= speed	1222.524439	1199.811338	1148.777285	1122.233469
98	CO2 Equivalent	51	Refuse Truck	1	speed < 2.5mph	7973.946005	7781.439982	7578.197868	7542.225299
98	CO2 Equivalent	51	Refuse Truck	2	2.5mph <= speed < 7.5mph	4734.417786	4620.460216	4503.239912	4482.630409
98	CO2 Equivalent	51	Refuse Truck	3	7.5mph <= speed < 12.5mph	3159.147111	3074.161869	2994.271199	2980.547833
98	CO2 Equivalent	51	Refuse Truck	4	12.5mph <= speed < 17.5mph	2836.166218	2743.229881	2665.412921	2652.486289
98	CO2 Equivalent	51	Refuse Truck	5	17.5mph <= speed < 22.5mph	2488.323732	2404.928114	2335.059780	2323.430519
98	CO2 Equivalent	51	Refuse Truck	6	22.5mph <= speed < 27.5mph	2310.178723	2233.561091	2169.664051	2159.042972
98	CO2 Equivalent	51	Refuse Truck	7	27.5mph <= speed < 32.5mph	2259.740319	2184.929354	2122.303302	2111.868966
98	CO2 Equivalent	51	Refuse Truck	8	32.5mph <= speed < 37.5mph	1900.441367	1839.800638	1787.558538	1778.771967
98	CO2 Equivalent	51	Refuse Truck	9	37.5mph <= speed < 42.5mph	1847.560814	1786.639540	1734.884058	1726.211918
98	CO2 Equivalent	51	Refuse Truck	10	42.5mph <= speed < 47.5mph	1805.783700	1744.623067	1693.254760	1684.674907
98	CO2 Equivalent	51	Refuse Truck	11	47.5mph <= speed < 52.5mph	1721.105089	1659.812863	1609.149067	1600.727556
98	CO2 Equivalent	51	Refuse Truck	12	52.5mph <= speed < 57.5mph	1637.463102	1577.697654	1528.470108	1520.293271
98	CO2 Equivalent	51	Refuse Truck	13	57.5mph <= speed < 62.5mph	1660.246272	1608.181956	1562.363357	1554.588307
98	CO2 Equivalent	51	Refuse Truck	14	62.5mph <= speed < 67.5mph	1748.011915	1691.648430	1642.391176	1634.044675
98	CO2 Equivalent	51	Refuse Truck	15	67.5mph <= speed < 72.5mph	1821.826745	1761.812500	1709.643286	1700.811866
98	CO2 Equivalent	51	Refuse Truck	16	72.5mph <= speed	1925.221244	1865.182250	1811.679149	1802.551094
98	CO2 Equivalent	52	Single Unit Short-haul Truck	1	speed < 2.5mph	8319.040052	7973.397952	7712.411613	7675.287033
98	CO2 Equivalent	52	Single Unit Short-haul Truck	2	2.5mph <= speed < 7.5mph	4117.345684	3947.986172	3819.685273	3801.454930
98	CO2 Equivalent	52	Single Unit Short-haul Truck	3	7.5mph <= speed < 12.5mph	2435.705021	2333.415886	2256.670353	2245.796533
98	CO2 Equivalent	52	Single Unit Short-haul Truck	4	12.5mph <= speed < 17.5mph	1940.324044	1858.057351	1796.626190	1787.939657
98	CO2 Equivalent	52	Single Unit Short-haul Truck	5	17.5mph <= speed < 22.5mph	1657.110727	1588.046933	1536.171262	1528.834032
98	CO2 Equivalent	52	Single Unit Short-haul Truck	6	22.5mph <= speed < 27.5mph	1451.546801	1391.079685	1345.669062	1339.245902
98	CO2 Equivalent	52	Single Unit Short-haul Truck	7	27.5mph <= speed < 32.5mph	1386.705667	1330.999162	1288.572740	1282.557896
98	CO2 Equivalent	52	Single Unit Short-haul Truck	8	32.5mph <= speed < 37.5mph	1199.895532	1152.133576	1115.612023	1110.436647
98	CO2 Equivalent	52	Single Unit Short-haul Truck	9	37.5mph <= speed < 42.5mph	1126.084586	1080.761866	1046.301221	1041.428950
98	CO2 Equivalent	52	Single Unit Short-haul Truck	10	42.5mph <= speed < 47.5mph	1065.409306	1022.223418	989.512619	984.898671
98	CO2 Equivalent	52	Single Unit Short-haul Truck	11	47.5mph <= speed < 52.5mph	1003.252251	963.093476	932.546630	928.242581
98	CO2 Equivalent	52	Single Unit Short-haul Truck	12	52.5mph <= speed < 57.5mph	951.190973	913.550865	884.807604	880.760829
98	CO2 Equivalent	52	Single Unit Short-haul Truck	13	57.5mph <= speed < 62.5mph	877.200814	843.285620	817.140846	813.457144
98	CO2 Equivalent	52	Single Unit Short-haul Truck	14	62.5mph <= speed < 67.5mph	887.723136	851.657579	824.424471	820.595301
98	CO2 Equivalent	52	Single Unit Short-haul Truck	15	67.5mph <= speed < 72.5mph	902.296608	863.971607	835.549773	831.560650
98	CO2 Equivalent	52	Single Unit Short-haul Truck	16	72.5mph <= speed	939.073258	898.516577	868.629423	864.430303
98	CO2 Equivalent	53	Single Unit Long-haul Truck	1	speed < 2.5mph	8527.331248	8469.444496	8258.349328	8224.680126
98	CO2 Equivalent	53	Single Unit Long-haul Truck	2	2.5mph <= speed < 7.5mph	4154.680990	4109.564571	4004.034206	3987.538496
98	CO2 Equivalent	53	Single Unit Long-haul Truck	3	7.5mph <= speed < 12.5mph	2344.567324	2319.480313	2259.992589	2250.683207
98	CO2 Equivalent	53	Single Unit Long-haul Truck	4	12.5mph <= speed < 17.5mph	1832.792785	1804.747617	1756.048909	1748.574142
98	CO2 Equivalent	53	Single Unit Long-haul Truck	5	17.5mph <= speed < 22.5mph	1558.560554	1525.252712	1482.232501	1475.803002
98	CO2 Equivalent	53	Single Unit Long-haul Truck	6	22.5mph <= speed < 27.5mph	1393.224729	1361.239750	1322.864157	1317.175625
98	CO2 Equivalent	53	Single Unit Long-haul Truck	7	27.5mph <= speed < 32.5mph	1303.151829	1263.395187	1225.602698	1220.167911
98	CO2 Equivalent	53	Single Unit Long-haul Truck	8	32.5mph <= speed < 37.5mph	1146.914077	1107.295551	1073.241049	1068.421928
98	CO2 Equivalent	53	Single Unit Long-haul Truck	9	37.5mph <= speed < 42.5mph	1070.637398	1027.839822	995.235155	990.721317
98	CO2 Equivalent	53	Single Unit Long-haul Truck	10	42.5mph <= speed < 47.5mph	1007.557918	961.911681	930.451685	926.186707
98	CO2 Equivalent	53	Single Unit Long-haul Truck	11	47.5mph <= speed < 52.5mph	941.809595	891.756671	861.159507	857.126696
98	CO2 Equivalent	53	Single Unit Long-haul Truck	12	52.5mph <= speed < 57.5mph	886.489372	833.001524	803.171215	799.336480
98	CO2 Equivalent	53	Single Unit Long-haul Truck	13	57.5mph <= speed < 62.5mph	824.480603	771.649941	743.339539	739.742333
98	CO2 Equivalent	53	Single Unit Long-haul Truck	14	62.5mph <= speed < 67.5mph	820.633025	770.993322	743.079679	739.480590
98	CO2 Equivalent	53	Single Unit Long-haul Truck	15	67.5mph <= speed < 72.5mph	821.060988	774.341399	746.696669	743.080429
98	CO2 Equivalent	53	Single Unit Long-haul Truck	16	72.5mph <= speed	845.437306	801.667287	773.707209	769.976108
98	CO2 Equivalent	54	Motor Home	1	speed < 2.5mph	7625.234897	7683.444618	7500.662805	7403.714627

98	CO2 Equivalent	54	Motor Home	2	2.5mph <= speed < 7.5mph	3844.850774	3837.699003	3719.378122	3663.299614
98	CO2 Equivalent	54	Motor Home	3	7.5mph <= speed < 12.5mph	2209.168179	2208.948759	2147.572258	2117.963386
98	CO2 Equivalent	54	Motor Home	4	12.5mph <= speed < 17.5mph	1791.503183	1786.213541	1735.000458	1711.006526
98	CO2 Equivalent	54	Motor Home	5	17.5mph <= speed < 22.5mph	1555.334382	1547.598945	1504.092398	1484.255142
98	CO2 Equivalent	54	Motor Home	6	22.5mph <= speed < 27.5mph	1383.375547	1372.831009	1332.311719	1314.320026
98	CO2 Equivalent	54	Motor Home	7	27.5mph <= speed < 32.5mph	1326.422610	1312.145184	1271.715476	1254.335793
98	CO2 Equivalent	54	Motor Home	8	32.5mph <= speed < 37.5mph	1167.755323	1153.561467	1118.300565	1103.486563
98	CO2 Equivalent	54	Motor Home	9	37.5mph <= speed < 42.5mph	1117.064641	1098.577985	1062.138072	1047.413501
98	CO2 Equivalent	54	Motor Home	10	42.5mph <= speed < 47.5mph	1074.620375	1052.673982	1015.443507	1000.878437
98	CO2 Equivalent	54	Motor Home	11	47.5mph <= speed < 52.5mph	1024.732779	1000.118847	963.513309	949.713568
98	CO2 Equivalent	54	Motor Home	12	52.5mph <= speed < 57.5mph	981.793604	955.126180	919.133634	905.989836
98	CO2 Equivalent	54	Motor Home	13	57.5mph <= speed < 62.5mph	925.852658	898.953514	863.865288	851.179757
98	CO2 Equivalent	54	Motor Home	14	62.5mph <= speed < 67.5mph	978.577876	955.851097	920.695738	907.204363
98	CO2 Equivalent	54	Motor Home	15	67.5mph <= speed < 72.5mph	1031.493974	1012.679943	977.406228	963.136039
98	CO2 Equivalent	54	Motor Home	16	72.5mph <= speed	1103.412086	1090.514755	1056.408705	1041.682717
98	CO2 Equivalent	61	Combination Short-haul Truck	1	speed < 2.5mph	9366.859908	9013.597666	8745.856704	8706.151405
98	CO2 Equivalent	61	Combination Short-haul Truck	2	2.5mph <= speed < 7.5mph	5196.608282	5015.089068	4873.081157	4851.926151
98	CO2 Equivalent	61	Combination Short-haul Truck	3	7.5mph <= speed < 12.5mph	3204.030406	3087.765989	2998.812458	2985.595316
98	CO2 Equivalent	61	Combination Short-haul Truck	4	12.5mph <= speed < 17.5mph	2820.855498	2707.635687	2625.145755	2612.965682
98	CO2 Equivalent	61	Combination Short-haul Truck	5	17.5mph <= speed < 22.5mph	2476.949860	2370.506588	2295.202020	2284.130197
98	CO2 Equivalent	61	Combination Short-haul Truck	6	22.5mph <= speed < 27.5mph	2307.325876	2202.750398	2130.393174	2119.787982
98	CO2 Equivalent	61	Combination Short-haul Truck	7	27.5mph <= speed < 32.5mph	2253.668400	2150.425842	2079.415676	2069.014536
98	CO2 Equivalent	61	Combination Short-haul Truck	8	32.5mph <= speed < 37.5mph	1917.651976	1818.638404	1753.332725	1743.832066
98	CO2 Equivalent	61	Combination Short-haul Truck	9	37.5mph <= speed < 42.5mph	1871.189666	1769.128771	1703.122590	1693.551160
98	CO2 Equivalent	61	Combination Short-haul Truck	10	42.5mph <= speed < 47.5mph	1835.297890	1730.860687	1664.304102	1654.674840
98	CO2 Equivalent	61	Combination Short-haul Truck	11	47.5mph <= speed < 52.5mph	1762.096026	1656.907449	1590.901764	1581.378301
98	CO2 Equivalent	61	Combination Short-haul Truck	12	52.5mph <= speed < 57.5mph	1684.815396	1581.720543	1517.528694	1508.279593
98	CO2 Equivalent	61	Combination Short-haul Truck	13	57.5mph <= speed < 62.5mph	1702.714917	1606.862368	1545.642777	1536.782685
98	CO2 Equivalent	61	Combination Short-haul Truck	14	62.5mph <= speed < 67.5mph	1824.953752	1711.157623	1640.810342	1630.685198
98	CO2 Equivalent	61	Combination Short-haul Truck	15	67.5mph <= speed < 72.5mph	1929.714260	1800.536860	1722.361881	1711.152344
98	CO2 Equivalent	61	Combination Short-haul Truck	16	72.5mph <= speed	2064.593669	1922.310483	1836.950578	1824.730890
98	CO2 Equivalent	62	Combination Long-haul Truck	1	speed < 2.5mph	9422.163327	9168.927955	8885.062073	8810.553000
98	CO2 Equivalent	62	Combination Long-haul Truck	2	2.5mph <= speed < 7.5mph	5236.933593	5107.928318	4959.373083	4920.186950
98	CO2 Equivalent	62	Combination Long-haul Truck	3	7.5mph <= speed < 12.5mph	3296.384259	3194.390996	3083.987500	3055.242809
98	CO2 Equivalent	62	Combination Long-haul Truck	4	12.5mph <= speed < 17.5mph	2920.097514	2822.875957	2719.515073	2692.717749
98	CO2 Equivalent	62	Combination Long-haul Truck	5	17.5mph <= speed < 22.5mph	2575.902148	2476.848449	2374.908413	2348.668057
98	CO2 Equivalent	62	Combination Long-haul Truck	6	22.5mph <= speed < 27.5mph	2391.169405	2304.385936	2213.934459	2190.592201
98	CO2 Equivalent	62	Combination Long-haul Truck	7	27.5mph <= speed < 32.5mph	2345.349843	2255.860653	2163.589575	2139.836815
98	CO2 Equivalent	62	Combination Long-haul Truck	8	32.5mph <= speed < 37.5mph	2001.096395	1912.554390	1823.939176	1801.276056
98	CO2 Equivalent	62	Combination Long-haul Truck	9	37.5mph <= speed < 42.5mph	1962.444193	1865.478525	1770.348516	1746.133253
98	CO2 Equivalent	62	Combination Long-haul Truck	10	42.5mph <= speed < 47.5mph	1933.351523	1829.813934	1729.593102	1704.162853
98	CO2 Equivalent	62	Combination Long-haul Truck	11	47.5mph <= speed < 52.5mph	1867.887931	1753.637977	1645.278414	1617.916620
98	CO2 Equivalent	62	Combination Long-haul Truck	12	52.5mph <= speed < 57.5mph	1789.558664	1671.381903	1560.499369	1532.573490
98	CO2 Equivalent	62	Combination Long-haul Truck	13	57.5mph <= speed < 62.5mph	1761.470639	1673.706249	1587.730304	1565.854500
98	CO2 Equivalent	62	Combination Long-haul Truck	14	62.5mph <= speed < 67.5mph	1888.573184	1779.978721	1676.048092	1649.749503
98	CO2 Equivalent	62	Combination Long-haul Truck	15	67.5mph <= speed < 72.5mph	1997.556995	1871.106659	1751.782354	1721.692170
98	CO2 Equivalent	62	Combination Long-haul Truck	16	72.5mph <= speed	2135.161873	1991.363751	1856.818909	1822.961381

Volatile Organic Compound Emission Rates

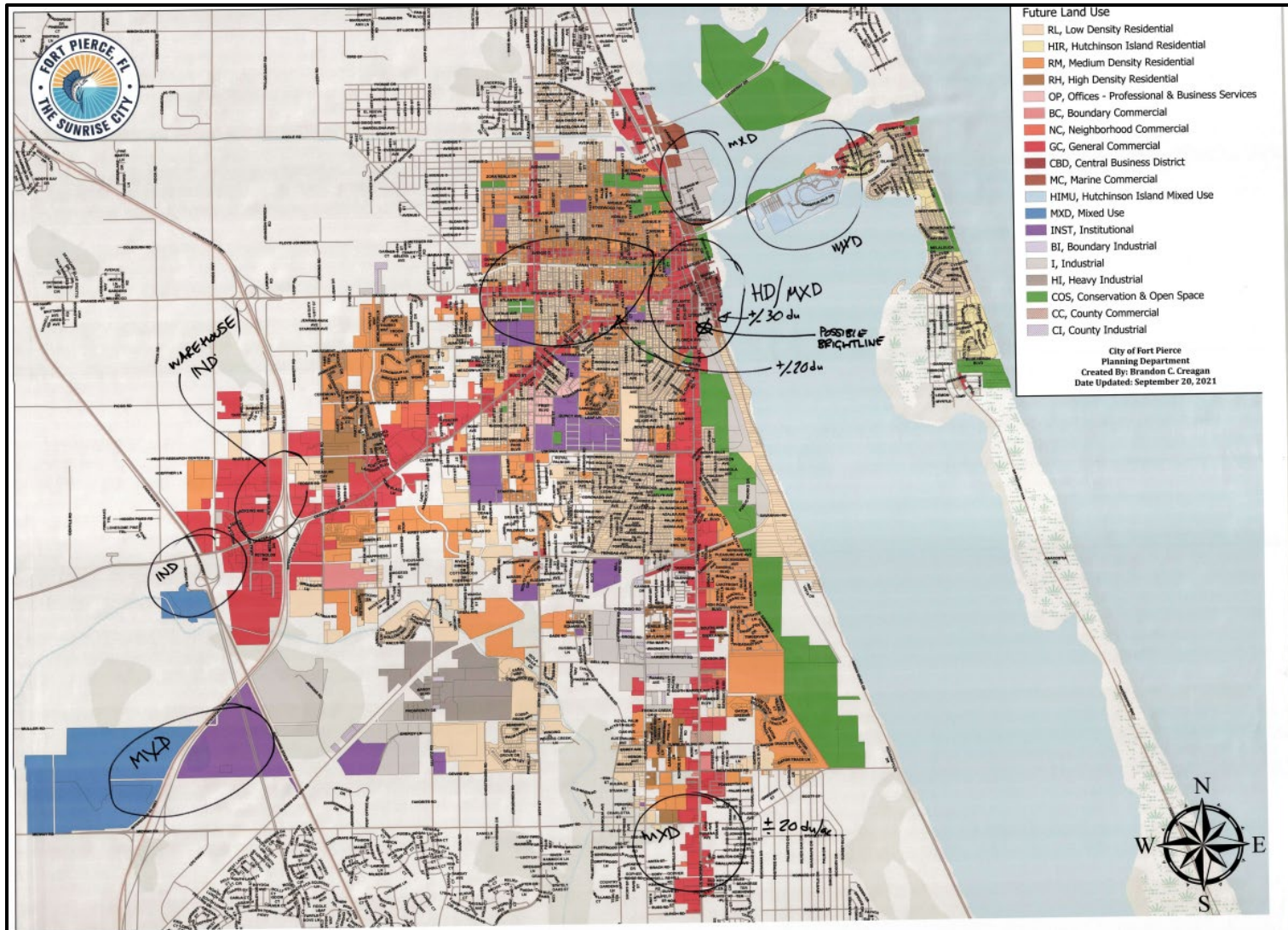
PID	PDESC	VEHID	VEHDESC	SP_BIN	SP_desc	rate2010	rate2020	rate2030	rate2040
87	VOC	11	Motorcycle	1	speed < 2.5mph	7.996059	6.054581	5.486058	5.324459
87	VOC	11	Motorcycle	2	2.5mph <= speed < 7.5mph	4.276253	3.253179	2.953592	2.868419
87	VOC	11	Motorcycle	3	7.5mph <= speed < 12.5mph	2.418844	1.854298	1.688986	1.641971
87	VOC	11	Motorcycle	4	12.5mph <= speed < 17.5mph	1.827879	1.409613	1.287133	1.252292
87	VOC	11	Motorcycle	5	17.5mph <= speed < 22.5mph	1.526726	1.182552	1.081769	1.053093
87	VOC	11	Motorcycle	6	22.5mph <= speed < 27.5mph	1.338761	1.041346	0.954254	0.929467
87	VOC	11	Motorcycle	7	27.5mph <= speed < 32.5mph	1.220317	0.952528	0.874107	0.851782
87	VOC	11	Motorcycle	8	32.5mph <= speed < 37.5mph	1.167155	0.916407	0.842964	0.822045
87	VOC	11	Motorcycle	9	37.5mph <= speed < 42.5mph	1.133220	0.894420	0.824465	0.804529
87	VOC	11	Motorcycle	10	42.5mph <= speed < 47.5mph	1.103804	0.875079	0.808067	0.788960
87	VOC	11	Motorcycle	11	47.5mph <= speed < 52.5mph	1.082529	0.861641	0.796916	0.778453
87	VOC	11	Motorcycle	12	52.5mph <= speed < 57.5mph	1.069767	0.854849	0.791864	0.773890
87	VOC	11	Motorcycle	13	57.5mph <= speed < 62.5mph	1.064054	0.853379	0.791628	0.773999
87	VOC	11	Motorcycle	14	62.5mph <= speed < 67.5mph	1.060142	0.853184	0.792513	0.775185
87	VOC	11	Motorcycle	15	67.5mph <= speed < 72.5mph	1.052706	0.849749	0.790239	0.773237
87	VOC	11	Motorcycle	16	72.5mph <= speed	1.030147	0.833334	0.775618	0.759125
87	VOC	21	Passenger Car	1	speed < 2.5mph	1.505506	0.226832	0.066555	0.051815
87	VOC	21	Passenger Car	2	2.5mph <= speed < 7.5mph	0.828168	0.129857	0.039993	0.030414
87	VOC	21	Passenger Car	3	7.5mph <= speed < 12.5mph	0.487064	0.080736	0.026436	0.019550
87	VOC	21	Passenger Car	4	12.5mph <= speed < 17.5mph	0.373466	0.063952	0.021664	0.015826
87	VOC	21	Passenger Car	5	17.5mph <= speed < 22.5mph	0.310230	0.054521	0.018993	0.013767
87	VOC	21	Passenger Car	6	22.5mph <= speed < 27.5mph	0.269695	0.047936	0.016939	0.012258
87	VOC	21	Passenger Car	7	27.5mph <= speed < 32.5mph	0.240320	0.044063	0.016043	0.011487
87	VOC	21	Passenger Car	8	32.5mph <= speed < 37.5mph	0.222348	0.042143	0.015807	0.011237
87	VOC	21	Passenger Car	9	37.5mph <= speed < 42.5mph	0.209040	0.040645	0.015582	0.011033
87	VOC	21	Passenger Car	10	42.5mph <= speed < 47.5mph	0.198918	0.039561	0.015449	0.010897
87	VOC	21	Passenger Car	11	47.5mph <= speed < 52.5mph	0.190827	0.038721	0.015357	0.010790
87	VOC	21	Passenger Car	12	52.5mph <= speed < 57.5mph	0.184994	0.038103	0.015291	0.010717
87	VOC	21	Passenger Car	13	57.5mph <= speed < 62.5mph	0.181017	0.037911	0.015398	0.010755
87	VOC	21	Passenger Car	14	62.5mph <= speed < 67.5mph	0.181038	0.039189	0.016244	0.011238
87	VOC	21	Passenger Car	15	67.5mph <= speed < 72.5mph	0.188672	0.043315	0.018514	0.012570
87	VOC	21	Passenger Car	16	72.5mph <= speed	0.205190	0.050078	0.022075	0.014674
87	VOC	31	Passenger Truck	1	speed < 2.5mph	2.881200	0.538536	0.108147	0.070946
87	VOC	31	Passenger Truck	2	2.5mph <= speed < 7.5mph	1.599799	0.307886	0.065176	0.041717
87	VOC	31	Passenger Truck	3	7.5mph <= speed < 12.5mph	0.955843	0.191574	0.043271	0.026891
87	VOC	31	Passenger Truck	4	12.5mph <= speed < 17.5mph	0.743843	0.152722	0.035551	0.021792

87	VOC	31	Passenger Truck	5	17.5mph <= speed <22.5mph	0.622453	0.130554	0.031470	0.019113
87	VOC	31	Passenger Truck	6	22.5mph <= speed < 27.5mph	0.545604	0.115939	0.028600	0.017306
87	VOC	31	Passenger Truck	7	27.5mph <= speed < 32.5mph	0.486078	0.105323	0.026922	0.016152
87	VOC	31	Passenger Truck	8	32.5mph <= speed < 37.5mph	0.452157	0.100661	0.027009	0.016061
87	VOC	31	Passenger Truck	9	37.5mph <= speed < 42.5mph	0.427476	0.097212	0.027034	0.015994
87	VOC	31	Passenger Truck	10	42.5mph <= speed < 47.5mph	0.408233	0.094517	0.027062	0.015945
87	VOC	31	Passenger Truck	11	47.5mph <= speed < 52.5mph	0.392216	0.092132	0.026979	0.015845
87	VOC	31	Passenger Truck	12	52.5mph <= speed < 57.5mph	0.381748	0.090961	0.027170	0.015890
87	VOC	31	Passenger Truck	13	57.5mph <= speed < 62.5mph	0.376578	0.091116	0.027765	0.016155
87	VOC	31	Passenger Truck	14	62.5mph <= speed < 67.5mph	0.380264	0.094633	0.029823	0.017134
87	VOC	31	Passenger Truck	15	67.5mph <= speed < 72.5mph	0.402550	0.105250	0.034926	0.019583
87	VOC	31	Passenger Truck	16	72.5mph <= speed	0.441699	0.120342	0.041476	0.022744
87	VOC	32	Light Commercial Truck	1	speed < 2.5mph	2.665122	0.555121	0.125761	0.078765
87	VOC	32	Light Commercial Truck	2	2.5mph <= speed < 7.5mph	1.478849	0.317266	0.075041	0.046122
87	VOC	32	Light Commercial Truck	3	7.5mph <= speed < 12.5mph	0.881047	0.196942	0.049116	0.029491
87	VOC	32	Light Commercial Truck	4	12.5mph <= speed < 17.5mph	0.686252	0.157305	0.040119	0.023785
87	VOC	32	Light Commercial Truck	5	17.5mph <= speed <22.5mph	0.571039	0.133277	0.035039	0.020703
87	VOC	32	Light Commercial Truck	6	22.5mph <= speed < 27.5mph	0.497360	0.117090	0.031435	0.018599
87	VOC	32	Light Commercial Truck	7	27.5mph <= speed < 32.5mph	0.442021	0.106114	0.029567	0.017437
87	VOC	32	Light Commercial Truck	8	32.5mph <= speed < 37.5mph	0.406265	0.099238	0.028792	0.017024
87	VOC	32	Light Commercial Truck	9	37.5mph <= speed < 42.5mph	0.380332	0.094280	0.028311	0.016792
87	VOC	32	Light Commercial Truck	10	42.5mph <= speed < 47.5mph	0.359985	0.090346	0.027901	0.016592
87	VOC	32	Light Commercial Truck	11	47.5mph <= speed < 52.5mph	0.343099	0.087091	0.027538	0.016402
87	VOC	32	Light Commercial Truck	12	52.5mph <= speed < 57.5mph	0.331388	0.085220	0.027533	0.016388
87	VOC	32	Light Commercial Truck	13	57.5mph <= speed < 62.5mph	0.324696	0.084704	0.027953	0.016605
87	VOC	32	Light Commercial Truck	14	62.5mph <= speed < 67.5mph	0.325204	0.087168	0.029739	0.017521
87	VOC	32	Light Commercial Truck	15	67.5mph <= speed < 72.5mph	0.340091	0.096049	0.034493	0.019918
87	VOC	32	Light Commercial Truck	16	72.5mph <= speed	0.368893	0.109408	0.041040	0.023254
87	VOC	41	Intercity Bus	1	speed < 2.5mph	9.255808	4.705177	1.667951	0.724183
87	VOC	41	Intercity Bus	2	2.5mph <= speed < 7.5mph	5.215485	2.662767	0.952217	0.414193
87	VOC	41	Intercity Bus	3	7.5mph <= speed < 12.5mph	2.791740	1.426845	0.515818	0.232796
87	VOC	41	Intercity Bus	4	12.5mph <= speed < 17.5mph	2.068761	1.060775	0.388855	0.181080
87	VOC	41	Intercity Bus	5	17.5mph <= speed <22.5mph	1.636304	0.840597	0.311435	0.149079
87	VOC	41	Intercity Bus	6	22.5mph <= speed < 27.5mph	1.345323	0.691823	0.258547	0.126934
87	VOC	41	Intercity Bus	7	27.5mph <= speed < 32.5mph	1.183720	0.609577	0.229979	0.115775
87	VOC	41	Intercity Bus	8	32.5mph <= speed < 37.5mph	1.075597	0.552504	0.206379	0.101906
87	VOC	41	Intercity Bus	9	37.5mph <= speed < 42.5mph	0.993000	0.508846	0.189746	0.094656
87	VOC	41	Intercity Bus	10	42.5mph <= speed < 47.5mph	0.929115	0.475021	0.176819	0.089016
87	VOC	41	Intercity Bus	11	47.5mph <= speed < 52.5mph	0.876827	0.446906	0.165768	0.084141
87	VOC	41	Intercity Bus	12	52.5mph <= speed < 57.5mph	0.833707	0.423723	0.156646	0.080098
87	VOC	41	Intercity Bus	13	57.5mph <= speed < 62.5mph	0.787003	0.400205	0.148995	0.077759
87	VOC	41	Intercity Bus	14	62.5mph <= speed < 67.5mph	0.747237	0.381359	0.144250	0.077569
87	VOC	41	Intercity Bus	15	67.5mph <= speed < 72.5mph	0.713435	0.365421	0.140348	0.077554
87	VOC	41	Intercity Bus	16	72.5mph <= speed	0.688526	0.354117	0.138314	0.078628
87	VOC	42	Transit Bus	1	speed < 2.5mph	9.526064	4.449297	1.515997	0.917873
87	VOC	42	Transit Bus	2	2.5mph <= speed < 7.5mph	4.787736	2.241241	0.777052	0.480515
87	VOC	42	Transit Bus	3	7.5mph <= speed < 12.5mph	2.545901	1.206968	0.431385	0.272515
87	VOC	42	Transit Bus	4	12.5mph <= speed < 17.5mph	1.639562	0.771771	0.273934	0.173465
87	VOC	42	Transit Bus	5	17.5mph <= speed <22.5mph	1.315517	0.628192	0.232777	0.152686
87	VOC	42	Transit Bus	6	22.5mph <= speed < 27.5mph	1.111428	0.536911	0.206044	0.138976
87	VOC	42	Transit Bus	7	27.5mph <= speed < 32.5mph	0.991597	0.483551	0.191049	0.131842
87	VOC	42	Transit Bus	8	32.5mph <= speed < 37.5mph	0.897058	0.435886	0.170900	0.117500
87	VOC	42	Transit Bus	9	37.5mph <= speed < 42.5mph	0.826896	0.401289	0.157957	0.109385
87	VOC	42	Transit Bus	10	42.5mph <= speed < 47.5mph	0.773105	0.374621	0.147880	0.103031
87	VOC	42	Transit Bus	11	47.5mph <= speed < 52.5mph	0.850824	0.402731	0.153237	0.105772
87	VOC	42	Transit Bus	12	52.5mph <= speed < 57.5mph	0.914490	0.425750	0.157610	0.108000
87	VOC	42	Transit Bus	13	57.5mph <= speed < 62.5mph	0.881975	0.408601	0.150864	0.103877
87	VOC	42	Transit Bus	14	62.5mph <= speed < 67.5mph	0.847543	0.394551	0.149370	0.105222
87	VOC	42	Transit Bus	15	67.5mph <= speed < 72.5mph	0.818507	0.382925	0.148484	0.106770
87	VOC	42	Transit Bus	16	72.5mph <= speed	0.802786	0.377212	0.149638	0.109707
87	VOC	43	School Bus	1	speed < 2.5mph	13.219040	6.179372	1.917872	0.778035
87	VOC	43	School Bus	2	2.5mph <= speed < 7.5mph	6.803016	3.130509	0.948014	0.375228
87	VOC	43	School Bus	3	7.5mph <= speed < 12.5mph	3.718845	1.707496	0.520057	0.208978
87	VOC	43	School Bus	4	12.5mph <= speed < 17.5mph	2.378841	1.079742	0.325407	0.129644
87	VOC	43	School Bus	5	17.5mph <= speed <22.5mph	2.013592	0.895196	0.270696	0.110759
87	VOC	43	School Bus	6	22.5mph <= speed < 27.5mph	1.764983	0.773866	0.234732	0.098137
87	VOC	43	School Bus	7	27.5mph <= speed < 32.5mph	1.611251	0.697469	0.212693	0.091035
87	VOC	43	School Bus	8	32.5mph <= speed < 37.5mph	1.411385	0.620714	0.190324	0.081710
87	VOC	43	School Bus	9	37.5mph <= speed < 42.5mph	1.274727	0.564793	0.173653	0.075197
87	VOC	43	School Bus	10	42.5mph <= speed < 47.5mph	1.166836	0.520882	0.160569	0.070051
87	VOC	43	School Bus	11	47.5mph <= speed < 52.5mph	1.132737	0.517590	0.160911	0.070849
87	VOC	43	School Bus	12	52.5mph <= speed < 57.5mph	1.104302	0.514687	0.161132	0.071467
87	VOC	43	School Bus	13	57.5mph <= speed < 62.5mph	1.017775	0.477888	0.149921	0.066721
87	VOC	43	School Bus	14	62.5mph <= speed < 67.5mph	0.973575	0.450749	0.143548	0.066636
87	VOC	43	School Bus	15	67.5mph <= speed < 72.5mph	0.937836	0.427844	0.138368	0.066895
87	VOC	43	School Bus	16	72.5mph <= speed	0.911199	0.408973	0.134655	0.068000
87	VOC	51	Refuse Truck	1	speed < 2.5mph	7.125119	2.004028	0.751341	0.675645
87	VOC	51	Refuse Truck	2	2.5mph <= speed < 7.5mph	4.075108	1.156804	0.440106	0.396397
87	VOC	51	Refuse Truck	3	7.5mph <= speed < 12.5mph	2.422293	0.693623	0.269412	0.243796
87	VOC	51	Refuse Truck	4	12.5mph <= speed < 17.5mph	1.789099	0.513836	0.204535	0.186699
87	VOC	51	Refuse Truck	5	17.5mph <= speed <22.5mph	1.390771	0.402168	0.164068	0.150563
87	VOC	51	Refuse Truck	6	22.5mph <= speed < 27.5mph	1.199119	0.348718	0.144773	0.133363
87	VOC	51	Refuse Truck	7	27.5mph <= speed < 32.5mph	1.057905	0.309817	0.131571	0.121825
87	VOC	51	Refuse Truck	8	32.5mph <= speed < 37.5mph	0.925089	0.270654	0.114117	0.105412
87	VOC	51	Refuse Truck	9	37.5mph <= speed < 42.5mph	0.853722	0.249747	0.106085	0.098268
87	VOC	51	Refuse Truck	10	42.5mph <= speed < 47.5mph	0.798684	0.233586	0.099847	0.092716
87	VOC	51	Refuse Truck	11	47.5mph <= speed < 52.5mph	0.748318	0.218331	0.093257	0.086675
87	VOC	51	Refuse Truck	12	52.5mph <= speed < 57.5mph	0.704136	0.204963	0.087401	0.081279
87	VOC	51	Refuse Truck	13	57.5mph <= speed < 62.5mph	0.669319	0.196020	0.085093	0.079437
87	VOC	51	Refuse Truck	14	62.5mph <= speed < 67.5mph	0.643993	0.190450	0.084669	0.079400
87	VOC	51	Refuse Truck	15	67.5mph <= speed < 72.5mph	0.621807	0.185536	0.084245	0.079311
87	VOC	51	Refuse Truck	16	72.5mph <= speed	0.610742	0.183940	0.085385	0.080716
87	VOC	52	Single Unit Short-haul Truck	1	speed < 2.5mph	10.419764	3.219114	1.718516	1.583142
87	VOC	52	Single Unit Short-haul Truck	2	2.5mph <= speed < 7.5mph	5.608510	1.715523	0.903685	0.830059
87	VOC	52	Single Unit Short-haul Truck	3	7.5mph <= speed < 12.5mph	3.133836	0.975894	0.525765	0.484500

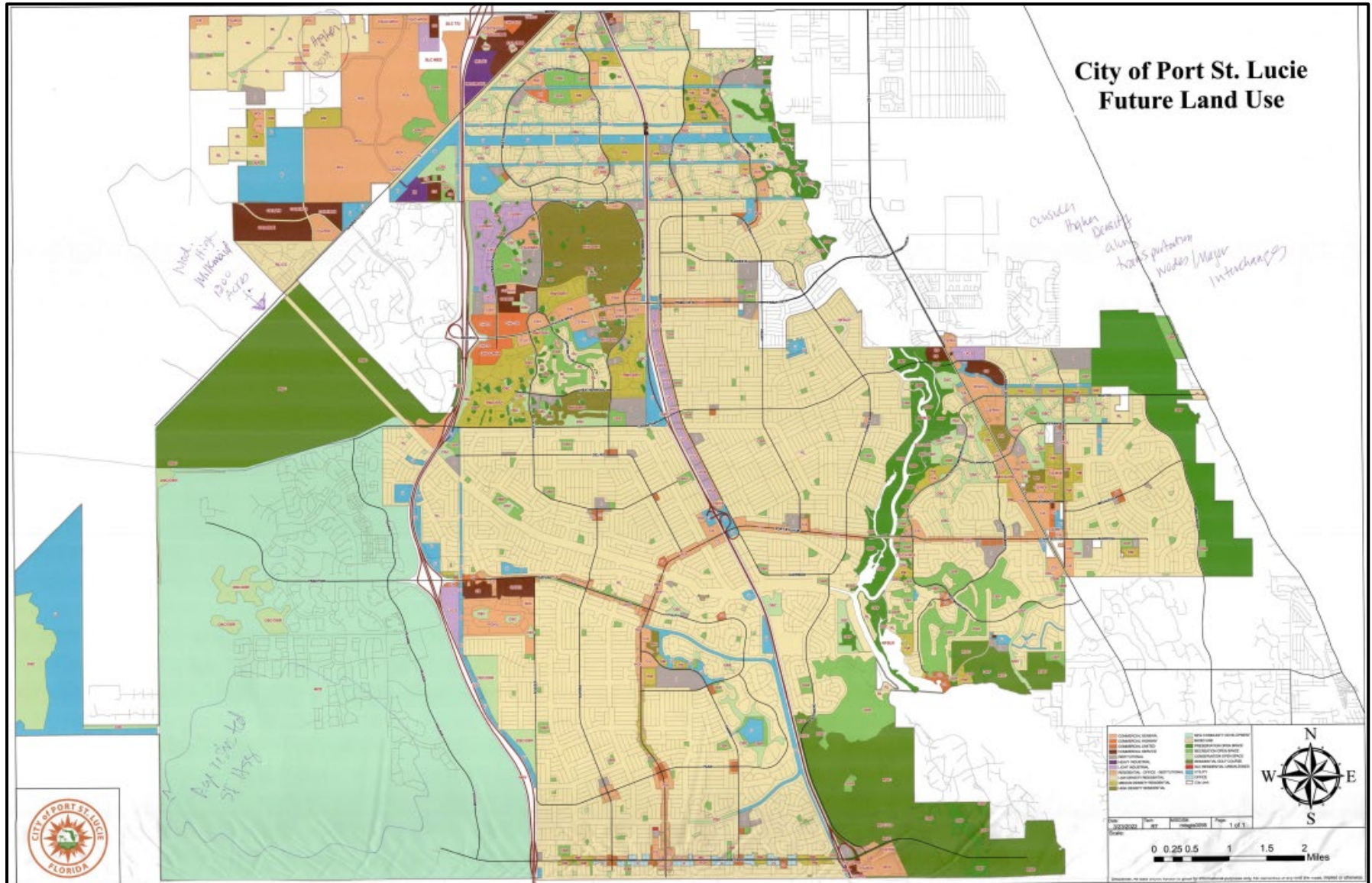
87	VOC	52	Single Unit Short-haul Truck	4	12.5mph <= speed < 17.5mph	2.342963	0.740355	0.407227	0.376761
87	VOC	52	Single Unit Short-haul Truck	5	17.5mph <= speed <22.5mph	1.912279	0.609783	0.340725	0.316443
87	VOC	52	Single Unit Short-haul Truck	6	22.5mph <= speed < 27.5mph	1.584172	0.508295	0.287513	0.267978
87	VOC	52	Single Unit Short-haul Truck	7	27.5mph <= speed < 32.5mph	1.419241	0.463393	0.267912	0.250888
87	VOC	52	Single Unit Short-haul Truck	8	32.5mph <= speed < 37.5mph	1.223344	0.398567	0.230016	0.215703
87	VOC	52	Single Unit Short-haul Truck	9	37.5mph <= speed < 42.5mph	1.100677	0.360671	0.210338	0.198023
87	VOC	52	Single Unit Short-haul Truck	10	42.5mph <= speed < 47.5mph	1.004490	0.331000	0.194930	0.184161
87	VOC	52	Single Unit Short-haul Truck	11	47.5mph <= speed < 52.5mph	0.917486	0.304234	0.181105	0.171718
87	VOC	52	Single Unit Short-haul Truck	12	52.5mph <= speed < 57.5mph	0.844931	0.281767	0.169395	0.161154
87	VOC	52	Single Unit Short-haul Truck	13	57.5mph <= speed < 62.5mph	0.771419	0.257408	0.155214	0.147917
87	VOC	52	Single Unit Short-haul Truck	14	62.5mph <= speed < 67.5mph	0.731406	0.246863	0.150834	0.144054
87	VOC	52	Single Unit Short-haul Truck	15	67.5mph <= speed < 72.5mph	0.698839	0.238606	0.147672	0.141313
87	VOC	52	Single Unit Short-haul Truck	16	72.5mph <= speed	0.676476	0.234362	0.147357	0.141340
87	VOC	53	Single Unit Long-haul Truck	1	speed < 2.5mph	11.397450	2.506228	0.832592	0.699756
87	VOC	53	Single Unit Long-haul Truck	2	2.5mph <= speed < 7.5mph	6.090380	1.331645	0.436305	0.365149
87	VOC	53	Single Unit Long-haul Truck	3	7.5mph <= speed < 12.5mph	3.262961	0.711317	0.231426	0.193756
87	VOC	53	Single Unit Long-haul Truck	4	12.5mph <= speed < 17.5mph	2.423912	0.525848	0.169249	0.141638
87	VOC	53	Single Unit Long-haul Truck	5	17.5mph <= speed <22.5mph	1.978064	0.426741	0.135726	0.113533
87	VOC	53	Single Unit Long-haul Truck	6	22.5mph <= speed < 27.5mph	1.661243	0.357577	0.113317	0.094931
87	VOC	53	Single Unit Long-haul Truck	7	27.5mph <= speed < 32.5mph	1.470976	0.316074	0.099675	0.083593
87	VOC	53	Single Unit Long-haul Truck	8	32.5mph <= speed < 37.5mph	1.286982	0.279543	0.089819	0.075524
87	VOC	53	Single Unit Long-haul Truck	9	37.5mph <= speed < 42.5mph	1.161280	0.253074	0.081614	0.068728
87	VOC	53	Single Unit Long-haul Truck	10	42.5mph <= speed < 47.5mph	1.062848	0.232251	0.075101	0.063315
87	VOC	53	Single Unit Long-haul Truck	11	47.5mph <= speed < 52.5mph	0.973485	0.213215	0.069067	0.058266
87	VOC	53	Single Unit Long-haul Truck	12	52.5mph <= speed < 57.5mph	0.898917	0.197383	0.064095	0.054110
87	VOC	53	Single Unit Long-haul Truck	13	57.5mph <= speed < 62.5mph	0.826263	0.181843	0.059203	0.050009
87	VOC	53	Single Unit Long-haul Truck	14	62.5mph <= speed < 67.5mph	0.775886	0.171117	0.056015	0.047453
87	VOC	53	Single Unit Long-haul Truck	15	67.5mph <= speed < 72.5mph	0.733640	0.162113	0.053347	0.045322
87	VOC	53	Single Unit Long-haul Truck	16	72.5mph <= speed	0.701758	0.155457	0.051520	0.043944
87	VOC	54	Motor Home	1	speed < 2.5mph	15.294994	8.119209	4.549673	3.831424
87	VOC	54	Motor Home	2	2.5mph <= speed < 7.5mph	8.181363	4.297287	2.363847	1.971295
87	VOC	54	Motor Home	3	7.5mph <= speed < 12.5mph	4.634286	2.430708	1.352361	1.136653
87	VOC	54	Motor Home	4	12.5mph <= speed < 17.5mph	3.622884	1.901092	1.072131	0.909375
87	VOC	54	Motor Home	5	17.5mph <= speed <22.5mph	3.071415	1.607428	0.918807	0.787088
87	VOC	54	Motor Home	6	22.5mph <= speed < 27.5mph	2.623687	1.370662	0.792726	0.685120
87	VOC	54	Motor Home	7	27.5mph <= speed < 32.5mph	2.397891	1.263887	0.741894	0.647563
87	VOC	54	Motor Home	8	32.5mph <= speed < 37.5mph	2.004457	1.081033	0.644148	0.565583
87	VOC	54	Motor Home	9	37.5mph <= speed < 42.5mph	1.800425	0.986479	0.598177	0.530017
87	VOC	54	Motor Home	10	42.5mph <= speed < 47.5mph	1.639923	0.912034	0.562038	0.501930
87	VOC	54	Motor Home	11	47.5mph <= speed < 52.5mph	1.481570	0.838486	0.526686	0.474382
87	VOC	54	Motor Home	12	52.5mph <= speed < 57.5mph	1.346751	0.775623	0.496274	0.450526
87	VOC	54	Motor Home	13	57.5mph <= speed < 62.5mph	1.223489	0.712735	0.460606	0.419979
87	VOC	54	Motor Home	14	62.5mph <= speed < 67.5mph	1.244353	0.721803	0.469815	0.430862
87	VOC	54	Motor Home	15	67.5mph <= speed < 72.5mph	1.272379	0.734572	0.480824	0.443088
87	VOC	54	Motor Home	16	72.5mph <= speed	1.323827	0.760582	0.501184	0.464292
87	VOC	61	Combination Short-haul Truck	1	speed < 2.5mph	7.904700	2.011549	0.881076	0.757930
87	VOC	61	Combination Short-haul Truck	2	2.5mph <= speed < 7.5mph	4.376698	1.124981	0.500221	0.430781
87	VOC	61	Combination Short-haul Truck	3	7.5mph <= speed < 12.5mph	2.348006	0.610678	0.277004	0.240027
87	VOC	61	Combination Short-haul Truck	4	12.5mph <= speed < 17.5mph	1.638201	0.434177	0.203178	0.177998
87	VOC	61	Combination Short-haul Truck	5	17.5mph <= speed <22.5mph	1.274143	0.341132	0.162266	0.143037
87	VOC	61	Combination Short-haul Truck	6	22.5mph <= speed < 27.5mph	1.084671	0.294098	0.142470	0.126197
87	VOC	61	Combination Short-haul Truck	7	27.5mph <= speed < 32.5mph	0.955334	0.261710	0.128771	0.114745
87	VOC	61	Combination Short-haul Truck	8	32.5mph <= speed < 37.5mph	0.866121	0.233631	0.112419	0.099740
87	VOC	61	Combination Short-haul Truck	9	37.5mph <= speed < 42.5mph	0.805394	0.216932	0.104289	0.092763
87	VOC	61	Combination Short-haul Truck	10	42.5mph <= speed < 47.5mph	0.758683	0.204059	0.098006	0.087368
87	VOC	61	Combination Short-haul Truck	11	47.5mph <= speed < 52.5mph	0.721752	0.192853	0.091828	0.081888
87	VOC	61	Combination Short-haul Truck	12	52.5mph <= speed < 57.5mph	0.690202	0.183067	0.086309	0.076958
87	VOC	61	Combination Short-haul Truck	13	57.5mph <= speed < 62.5mph	0.657966	0.175626	0.083700	0.074958
87	VOC	61	Combination Short-haul Truck	14	62.5mph <= speed < 67.5mph	0.629335	0.170847	0.083361	0.075146
87	VOC	61	Combination Short-haul Truck	15	67.5mph <= speed < 72.5mph	0.605063	0.166794	0.083071	0.075307
87	VOC	61	Combination Short-haul Truck	16	72.5mph <= speed	0.593048	0.165952	0.084306	0.076852
87	VOC	62	Combination Long-haul Truck	1	speed < 2.5mph	6.563488	2.819107	1.078228	0.772735
87	VOC	62	Combination Long-haul Truck	2	2.5mph <= speed < 7.5mph	3.650074	1.579505	0.612208	0.439477
87	VOC	62	Combination Long-haul Truck	3	7.5mph <= speed < 12.5mph	1.951262	0.851800	0.337795	0.246026
87	VOC	62	Combination Long-haul Truck	4	12.5mph <= speed < 17.5mph	1.352036	0.598012	0.246202	0.184058
87	VOC	62	Combination Long-haul Truck	5	17.5mph <= speed <22.5mph	1.040936	0.463880	0.195024	0.147938
87	VOC	62	Combination Long-haul Truck	6	22.5mph <= speed < 27.5mph	0.884239	0.397535	0.170726	0.131017
87	VOC	62	Combination Long-haul Truck	7	27.5mph <= speed < 32.5mph	0.776531	0.351135	0.153533	0.119439
87	VOC	62	Combination Long-haul Truck	8	32.5mph <= speed < 37.5mph	0.705078	0.315157	0.134482	0.103605
87	VOC	62	Combination Long-haul Truck	9	37.5mph <= speed < 42.5mph	0.653062	0.291318	0.124421	0.096439
87	VOC	62	Combination Long-haul Truck	10	42.5mph <= speed < 47.5mph	0.613178	0.273012	0.116679	0.090926
87	VOC	62	Combination Long-haul Truck	11	47.5mph <= speed < 52.5mph	0.581368	0.257373	0.109002	0.084975
87	VOC	62	Combination Long-haul Truck	12	52.5mph <= speed < 57.5mph	0.554434	0.243876	0.102177	0.079604
87	VOC	62	Combination Long-haul Truck	13	57.5mph <= speed < 62.5mph	0.527363	0.232589	0.098766	0.077790
87	VOC	62	Combination Long-haul Truck	14	62.5mph <= speed < 67.5mph	0.505994	0.225040	0.097595	0.077838
87	VOC	62	Combination Long-haul Truck	15	67.5mph <= speed < 72.5mph	0.487893	0.218636	0.096597	0.077882

Appendix B – Maps from the TPO Workshop

Fort Pierce



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