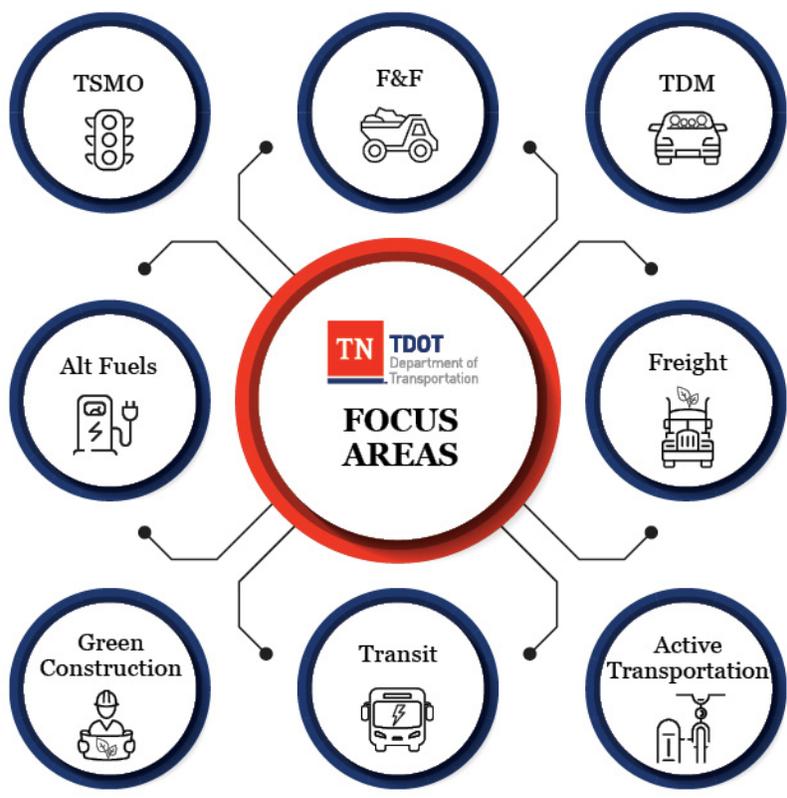
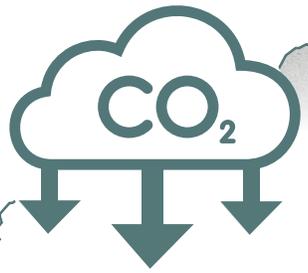


TDOT Carbon Reduction Strategy





February 20, 2024

In Reply Refer To:
HEPN-30

Mr. Butch Eley
Commissioner
Tennessee Department of Transportation
505 Deaderick Street
Nashville, TN 37243

Subject: Certification of Tennessee Carbon Reduction Strategy

Dear Commissioner Eley:

The Federal Highway Administration (FHWA) has completed our review of the Tennessee Carbon Reduction Strategy required under 23 USC 175. Based on the review, FHWA certifies that the Tennessee Carbon Reduction Strategy meets the statutory requirements.¹

Certification of this strategy does not indicate FHWA approval or authorization of any specific project. Please continue to coordinate with your FHWA division office on the implementation of programs and projects identified within your Carbon Reduction Strategy.

As a reminder, updates to Carbon Reduction Strategies are required no less frequently than every four years.² The FHWA will follow up with States on specific opportunities for improvement in future year strategies and will continue to provide technical assistance and guidance as States continue implementation.

Sincerely,

Emily Biondi
Associate Administrator
Office of Planning, Environment and Realty

cc: Tennessee Division Office

¹ 23 USC 175(d)(1) and 175(d)(2)

² 23 USC 175(d)(3)



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION**

BUREAU OF ENVIRONMENT & PLANNING
SUITE 700, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-1402
(615) 741-5376

BUTCH ELEY
DEPUTY GOVERNOR &
COMMISSIONER OF TRANSPORTATION

BILL LEE
GOVERNOR

November 9, 2023

Mr. Gilberto Deleon
Federal Highway Administration-TN Division
404 BNA Drive, Suite 508
Nashville, TN 37217

RE: Tennessee's Carbon Reduction Strategy

Dear Mr. Gilberto DeLeon,

On behalf of the State of Tennessee, attached is a copy of TDOT's Carbon Reduction Strategy which has been developed in consultation and coordination with the State's Metropolitan Planning Organizations (MPOs) as well as other stakeholders including Tennessee's Rural Planning Organizations (RPOs).

Tennessee has completed two years of implementation of the State's federal Carbon Reduction Program (CRP) as part of the Infrastructure Investment and Jobs Act (IIJA). Tennessee's goal is to increase initiatives in a variety of statewide investments that help quantify and reduce transportation emissions in Tennessee. TDOT is well positioned to continue the administration and implementation of CRP funding to reduce carbon emissions from the transportation sector with continued dedication to the strategies, collaboration and coordination with MPOs and RPOs, ongoing project evaluation, and a commitment to improving internal processes.

We look forward to your review and certification of our Carbon Reduction Strategy. Please do not hesitate to contact me or Degee Roberts in TDOT's Air Quality Planning Office at Degee.Roberts@tn.gov should you have any questions or need anything on our draft Carbon Reduction Strategy.

Sincerely,

Deputy Commissioner and Chief of Environment & Planning

Table of Contents

- EXECUTIVE SUMMARY..... 1**
- Introduction..... 3**
- Tennessee Context..... 5**
 - Existing Conditions
- Focus Areas and 4Ps 9**
- Engagement..... 19**
 - Project Advisory Committee (PAC)
 - Internal Interviews
 - MPO/RPO
 - Survey
- Framework for Optimizing CRP Investments 20**
 - Survey
 - Focus Areas
 - Project Identification
 - Eligibility
 - Prioritization
- Alignment with Federal Requirements 22**
 - Planning
 - Federal Requirements
- CRP Apportionment 23**
- Summary 24**

- Appendix A: Project Advisory Committee Members..... 25**
- Appendix B: Survey Results 26**
- Appendix C: Eligible Project and Program Types or Examples..... 29**
- Appendix D: Programmed Projects 34**

List of Figures

Figure 1: 2019 US Greenhouse Gas Emissions.....	5
Figure 2: 2019 AADT	6
Figure 3: 2019 VMT by County.....	6
Figure 4: 2019 CO2 Equivalent Emissions by County.....	6
Figure 5: 2019 Top CO2e Generating Counties	7
Figure 6: 2019 VMT and CO2e Emissions Distribution by Road Type.....	7
Figure 7: 2019 VMT and CO2e by Vehicle Group	7
Figure 8: Tennessee MPOs/RPOs/CRP Population Funding Categories	23
Figure 9: Statewide CRS Strategy Preference	26
Figure 10: TSMO Sub-Strategy Preference	26
Figure 11: Freight and Goods Movement Sub-Strategy Preference	27
Figure 12: Green Construction Sub-Strategy Preference.....	27
Figure 13: Full Project Strategy Preference	27
Figure 14: Ranking Added Benefits.....	28
Figure 15: Key Demographic and Geographic Takeaways	28

List of Tables

Table 1: 2019 TN Emission Summary by Road Type.....	8
Table 2: TDOT Alignment with Federal Requirements	22
Table 3: Tennessee CRP Apportionment FY 22-26	23

List of Acronyms

4Ps	Projects, Programs, Policies, and Processes
AADT	Annual Average Daily Traffic
BIL	Bipartisan Infrastructure Law
BRT	Bus Rapid Transit
CAV	Connected and Automated Vehicle
CH4	Methane
CMAQ	Congestion Mitigation and Air Quality
CO2	Carbon Dioxide
CO2e	CO2 Equivalent
CRP	Carbon Reduction Program
CRS	Carbon Reduction Strategy
EC	Elemental Carbon
EPA	Environmental Protection Agency
EV	Electric Vehicle
FHWA	Federal Highway Administration
GHG	Greenhouse Gas
GNRC	Greater Nashville Regional Council
HOV	High-Occupancy Vehicle
IJA	Infrastructure Investment and Jobs Act
ITS	Intelligent Transportation Systems
LEED	Leadership in Energy and Environmental Design
LRTP	Long Range Transportation Plan
MOVES	Motor Vehicle Emission Simulator
MPO	Metropolitan Planning Organization
N2O	Nitrous Oxide
NEI	National Emission Inventory
PAC	Project Advisory Committee
ROW	Right of Way
RPO	Rural Planning Organization
SOV	Single-Occupant Vehicle
SUV	Sport Utility Vehicle
TDEC	Tennessee Department of Environment and Conservation
TDM	Transportation Demand Management
TDOT	Tennessee Department of Transportation
TEC	Total Energy Consumption
TEVI	Tennessee Electric Vehicle Infrastructure
TIP	Transportation Improvement Program
TMC	Traffic Management Center
TMP	Transportation Management Plans
TSMO	Traffic System Management and Operations
VMT	Vehicle Miles Traveled

EXECUTIVE SUMMARY

The Tennessee Department of Transportation (TDOT) has developed this Carbon Reduction Strategy (CRS) to establish baselines and expectations for the Carbon Reduction Program (CRP). The CRP was established by the Infrastructure Investment and Jobs Act (IIJA) to provide funding for states to reduce transportation emissions. Each state is required to develop a CRS, in consultation with the Metropolitan Planning Organizations (MPOs), to inform how CRP funds will be spent in the state to achieve the goals of the program. Tennessee is receiving \$139 Million for the fiscal years 2022-2026, in accordance with these federal requirements and guidelines:



SUPPORT EFFORTS TO REDUCE TRANSPORTATION EMISSIONS



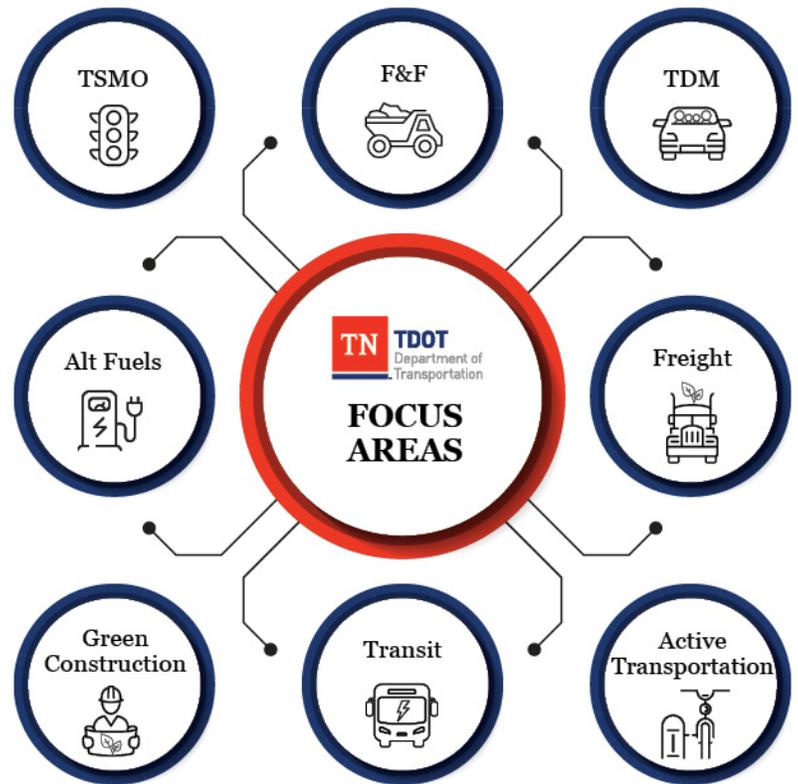
IDENTIFY PROJECTS AND STRATEGIES TO REDUCE TRANSPORTATION EMISSIONS WHICH MAY INCLUDE:

- Alternatives to single-occupant vehicle trips
- Vehicles or modes of travel that result in lower transportation emissions (CO₂) per passenger mile traveled
- Construction practices that result in lower emissions



BE APPROPRIATE TO THE POPULATION DENSITY AND CONTEXT OF THE STATE

TDOT, in consultation with MPOs, has consolidated the scope of the CRS to eight (8) Focus Areas most appropriate to meet the needs of the state of Tennessee. Applicable Projects, Programs, Processes, and Policies (4Ps) will be identified within each Focus Area to reduce transportation emissions.



To create a transparent process to prioritize investments, a multi-criteria evaluation framework has been developed, which considers:

- **Climate Benefits:** Short- and long-term carbon reductions
- **Co-Benefits:** Ancillary community benefits beyond carbon reductions
- **Feasibility:** How quickly and efficiently project can be implemented

This framework provides an evaluation method and serves as guidance for TDOT and MPOs to prioritize eligible investments within each Focus Area. Because the framework uses multiple criteria for decision making, the framework will allow TDOT and MPOs to customize evaluations to suit their needs.

Reducing transportation emissions is a federal priority. TDOT sees this CRS as a guide for all state agencies, municipalities, and our citizens to work towards achieving that goal.

Introduction



The 2021 Infrastructure Investment and Jobs Act (IIJA), also known as Bipartisan Infrastructure Law (BIL)¹, established the Carbon Reduction Program (CRP) to provide funds to reduce transportation emissions. The Tennessee Department of Transportation (TDOT) has developed this Carbon Reduction Strategy (CRS) to guide the prioritization and use of those funds for the state and potential actions resulting in carbon reduction.

The BIL provided \$6.4 Billion dollars in formula funding for fiscal years 2022-2026, to reduce carbon emissions in the transportation sector. Tennessee's portion is approximately \$139 Million to reduce carbon emissions. Per the CRP, 65 percent of Tennessee's CRP apportionment is to be obligated in urbanized areas in accordance with their relative share of the state's population. The remaining 35 percent of the funds can be obligated in any area of the state at TDOT's discretion.

Each CRS shall:

- A. Support efforts to reduce transportation emissions;
- B. Identify projects and strategies to reduce transportation emissions, which may include projects and strategies for safe, reliable, and cost-effective options—
 - i. To reduce traffic congestion by facilitating the use of alternatives to single-occupant vehicle trips, including public transportation facilities, pedestrian facilities, bicycle facilities, and shared or pooled vehicle trips within the State or an area served by the applicable MPO, if any;
 - ii. To facilitate the use of vehicles or modes of travel that result in lower transportation emissions per person-mile traveled as compared to existing vehicles and modes; and
 - iii. To facilitate approaches to the construction of transportation assets that result in lower transportation emissions as compared to existing approaches;

¹23 U.S.C. 175(d)(2)

C. Support the reduction of transportation emissions of the State;

D. At the discretion of the State, quantify the total carbon emissions from the production, transport, and use of materials used in the construction of transportation facilities within the State; and

E. Be appropriate to the population density and context of the State, including any metropolitan planning organization designated within the State.

In accordance with the U.S. National Blueprint for Transportation Decarbonization, to meet a goal of a net-zero greenhouse gas (GHG) emissions economy-wide by 2050, it is critical to implement a holistic strategy that provides sustainable transportation options for people and goods while achieving a future mobility system that is clean, safe, secure, accessible, affordable, and equitable. TDOT supports this goal and realizes it will take a multi-faceted approach. Tennessee's CRS will be balanced between the eight Focus Areas that include Projects, Programs, Policies, and Processes (4Ps).

The CRP strategies must support efforts to:

- Reduce traffic congestion by facilitating the use of alternatives to single-occupant vehicle (SOV) trips, including public transportation facilities, pedestrian

facilities, bicycle facilities, and shared or pooled vehicle trips within the State or an area served by the relevant MPO;

- Facilitate use of vehicles or modes of travel that result in lower transportation emissions per person-mile traveled as compared to existing vehicles and modes; and
- Facilitate approaches to the construction of transportation assets that result in lower transportation emissions as compared to existing approaches.

TDOT identified eight (8) Focus Areas of the CRS that meet the above requirements: Active Transportation, Alternative Fuels, Fleets and Facilities, Freight, Green Construction, Traffic System Management and Operations (TSMO), Transit, and Transportation Demand Management (TDM). Each Focus Area includes strategies from the 4Ps, as appropriate, to allow TDOT and MPOs to identify investments that are safe, reliable, and cost-effective at reducing transportation emissions.

The TDOT CRS is designed to evolve over time based on feedback from stakeholders and tracked outcomes. The strategy, per federal requirements, will be updated and refined at least every four years based on this feedback.

In the next four years, TDOT's goal is to increase investment in a wide variety of initiatives statewide that quantify and reduce carbon emissions and enhance the transportation system within the state of Tennessee.

Tennessee Context

Transportation emissions accounted for 33 percent of all GHG emissions in the United States in 2019, according to Environmental Protection Agency's (EPA) Inventory. Carbon Dioxide (CO₂) is the primary GHG pollutant from the transportation sector, resulting primarily from the combustion of petroleum-based products (e.g., diesel and gasoline fuels) within internal combustion engines. As reported by EPA, the main sources of transportation-related GHG emissions include on-road vehicles - passenger cars, pickup trucks, minivans, buses, medium-and heavy-duty trucks, and light-duty trucks, as well as SUVs and construction vehicles. These sources account for over half of the emissions from the transportation sector. Tracked since 1990, these emissions have increased by 45 percent over the last three decades. When considering the lifecycle of the transportation sector, emissions can

come from additional sources such as: the production and distribution of fuels; the production of, and fuel consumption of, construction and maintenance equipment; and the production of construction materials such as concrete. TDOT's CRS will provide various approaches to reduce transportation carbon emissions.

Existing Conditions Emissions Inventory

Like the The U.S. National Blueprint for Transportation Decarbonization, this strategy uses the 2019 baseline data since impacts due to COVID-19 complicate the use of later data.² The Tennessee Department of Environment and Conservation (TDEC) assembles statewide data in support of the tri-annual National Emission Inventory (NEI). This information is then incorporated into a database that underlies the United States EPA's updated emission model, which TDOT applied for 2019 GHG on-road mobile sources emission inventory estimates. The emission calculation results are based on the Motor Vehicle Emission Simulator (MOVES). The latest version, MOVES3.1, was applied to generate annual GHG estimates and total energy consumption (TEC) for each of Tennessee's 95 counties. The emissions calculations were made according to EPA's guidance and contained all carbon emissions components: Atmospheric CO₂ (CO₂), Methane (CH₄), Elemental Carbon (EC), the equivalent of black carbon, Nitrous Oxide (N₂O) and CO₂ Equivalent (CO₂e). Because CO₂ is the most prevalent GHG, CO₂e is a measure of how much other gases contribute to climate change, relative to carbon dioxide.

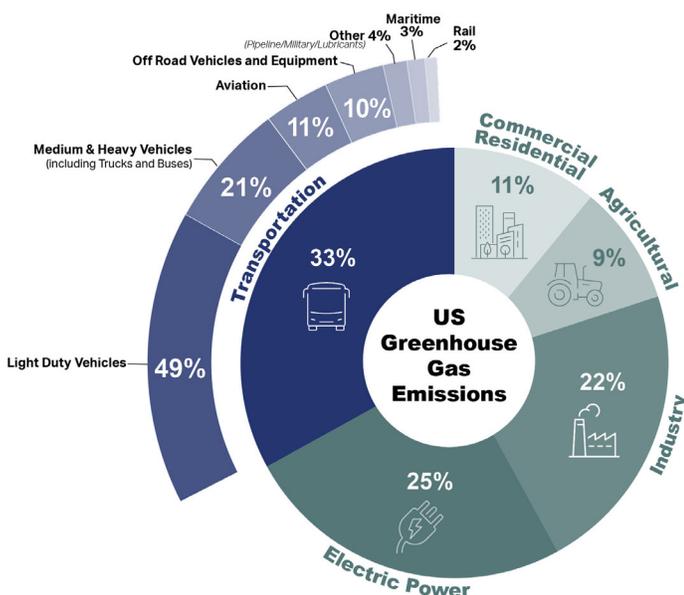


Figure 1: 2019 US Greenhouse Gas Emissions

² <https://www.energy.gov/sites/default/files/2023-01/the-us-national-blueprint-for-transportation-decarbonization.pdf>

The maps below (Figures 2-4) depict the annual average daily traffic (AADT), vehicle miles traveled (VMT), and CO2 equivalent emissions for Tennessee and each county. The figures demonstrate that vehicle travel and traffic on roadways, as well as higher emissions, occur in more densely populated urban areas.

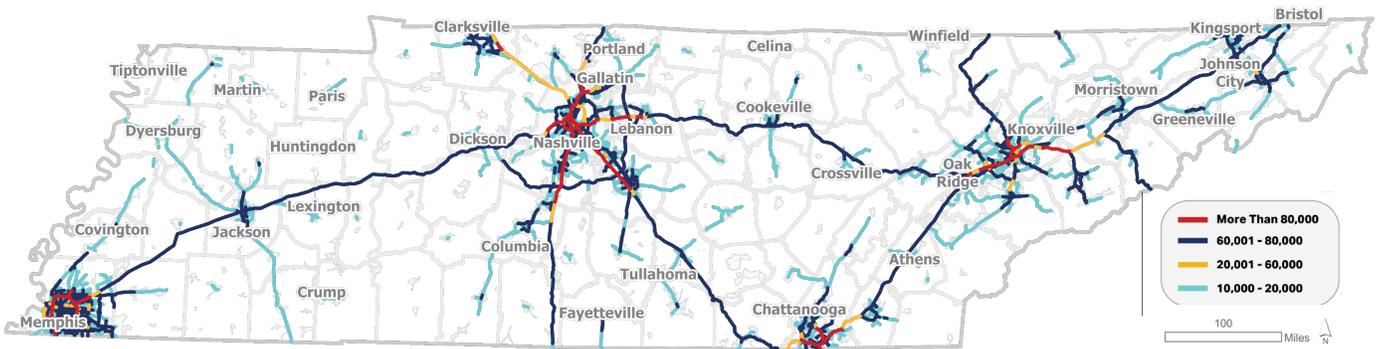


Figure 2: 2019 AADT

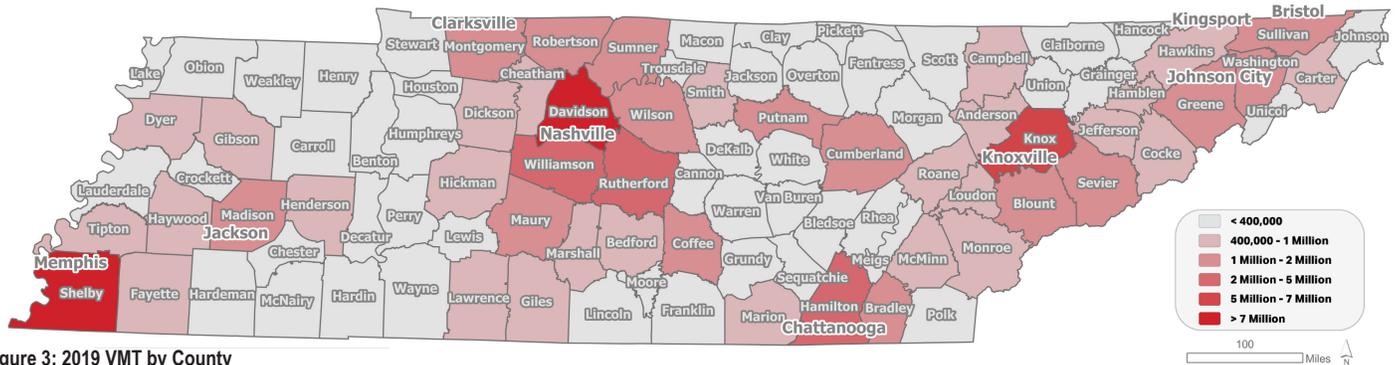


Figure 3: 2019 VMT by County

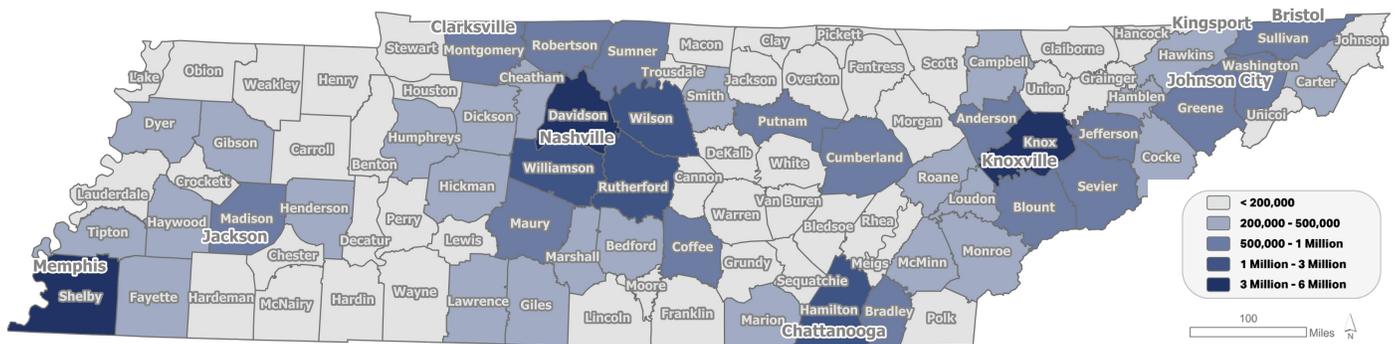


Figure 4: 2019 CO2 Equivalent Emissions by County

**Top CO2e Generating Counties
(State of Tennessee)**

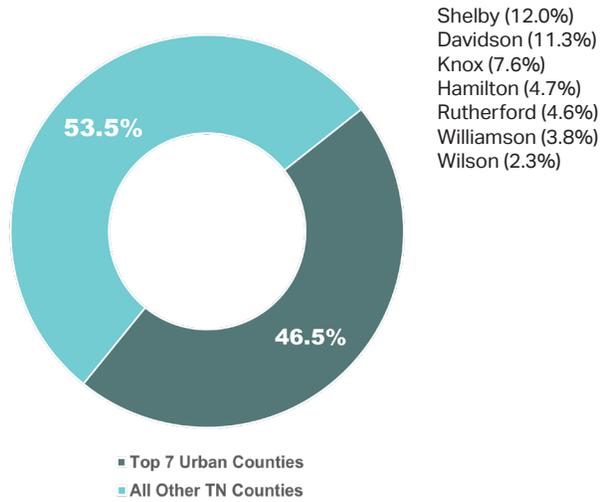
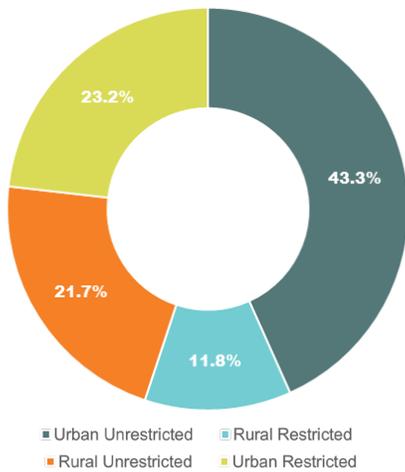


Figure 5: 2019 Top CO2e Generating Counties

**VMT by Road Type
(State of Tennessee)**



**CO2e by Road Type
(State of Tennessee)**

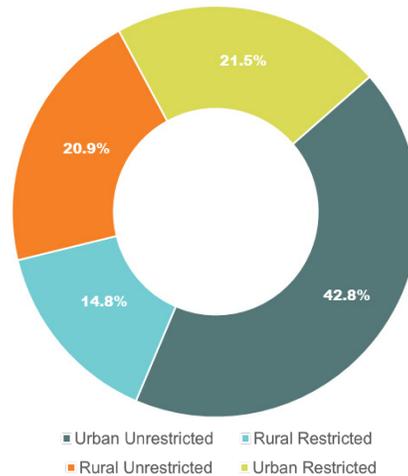
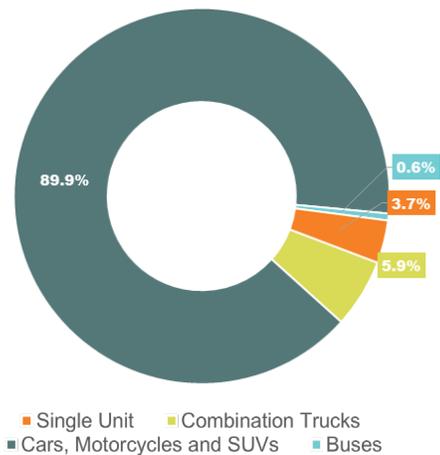


Figure 6: 2019 VMT and CO2e Emissions Distribution by Road Type

**VMT by Vehicle Group
(State of Tennessee)**



**CO2e Emissions by Vehicle Group
(State of Tennessee)**

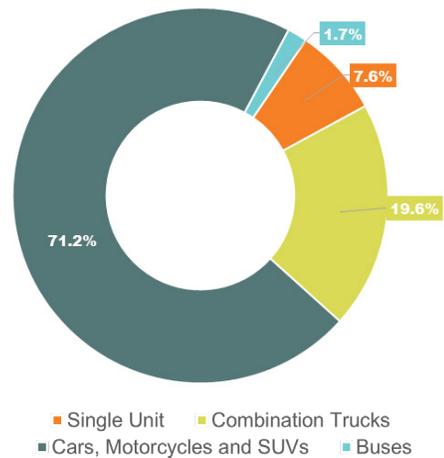


Figure 7: 2019 VMT and CO2e by Vehicle Group

Over 46 percent of emissions come from Tennessee's seven most-populated counties. The detailed breakdown of this distribution is shown in Figure 5. Figures 6 provides 2019 statewide VMT and CO2 equivalent distribution by road type. The emission generation is mostly consistent with the VMT on each road type. There is, however, a higher proportion of emissions on Rural Restricted roads (14.8 percent) as compared to the VMT (11.8 percent) due to higher travel speed and limited traffic congestion.

The 2019 VMT and CO2 equivalent distributions by vehicle group are presented in Figure 7, which clearly demonstrates that passenger cars, SUVs, and motorcycles generated almost 90 percent of the state's VMT. At the same time, this vehicle group is responsible for 71.2 percent of mobile emissions. While bus and truck VMT is much lower, the proportion of emissions generated by these vehicle groups is significantly higher. Such vehicle type emission distribution is consistent with the heavy-duty emission rates, which are much higher than light-duty vehicles emission rates.

Table 1 shows 2019 annual emissions summary for the five pollutants and total energy consumption by road type in Tennessee. EPA's MOVES defines five different Road Types:

- Off-Network – all locations where the predominant activity is vehicle starts, parking and idling (parking lots, truck stops, rest areas, freight or bus terminals)
- Rural Restricted – rural highways that can only be accessed by an on-ramp
- Rural Unrestricted – all other rural roads (arterials, connectors, and local streets)
- Urban Restricted – urban highways that can only be accessed by an on-ramp

- Urban Unrestricted – all other urban roads (arterials, connectors, and local streets)

Emissions Review

The 2019 GHG emissions estimate effort generated a detailed baseline inventory for TDOT's statewide CRS. This analysis lends itself to high-level strategies to support emissions reduction in Tennessee. Investment in CRP projects within the most populated areas may result in effective strategies to reduce statewide emissions. This aligns with the apportionment of CRP funds by population categories. For less populated areas of the state, the enforcement of speed limits and limited speeds on rural interstates could be effective carbon reduction strategies as well.

At the same time, TDOT may achieve significant carbon emission reduction by supporting traffic congestion reduction, traffic flow operation improvements, signal coordination, and other arterial speed improvement projects in urban areas. As it relates to emissions by vehicle group, the support of truck route congestion reduction, limiting idling time, and other freight and transit traffic flow optimization strategies may result in cost effective carbon emissions reduction. Investment in alternative fuel heavy duty vehicles, such as electric or hydrogen truck and bus fleets, may be a successful strategy to reduce emissions from freight and transit vehicles. And with cars, motorcycles, and SUVs as the dominant vehicle group contributing to VMT and emissions, improvements to the transportation system and information on travel choices to encourage less reliance on personal vehicles and the use of shared rides, transit, and active transportation modes will be effective emissions reductions strategies in Tennessee.

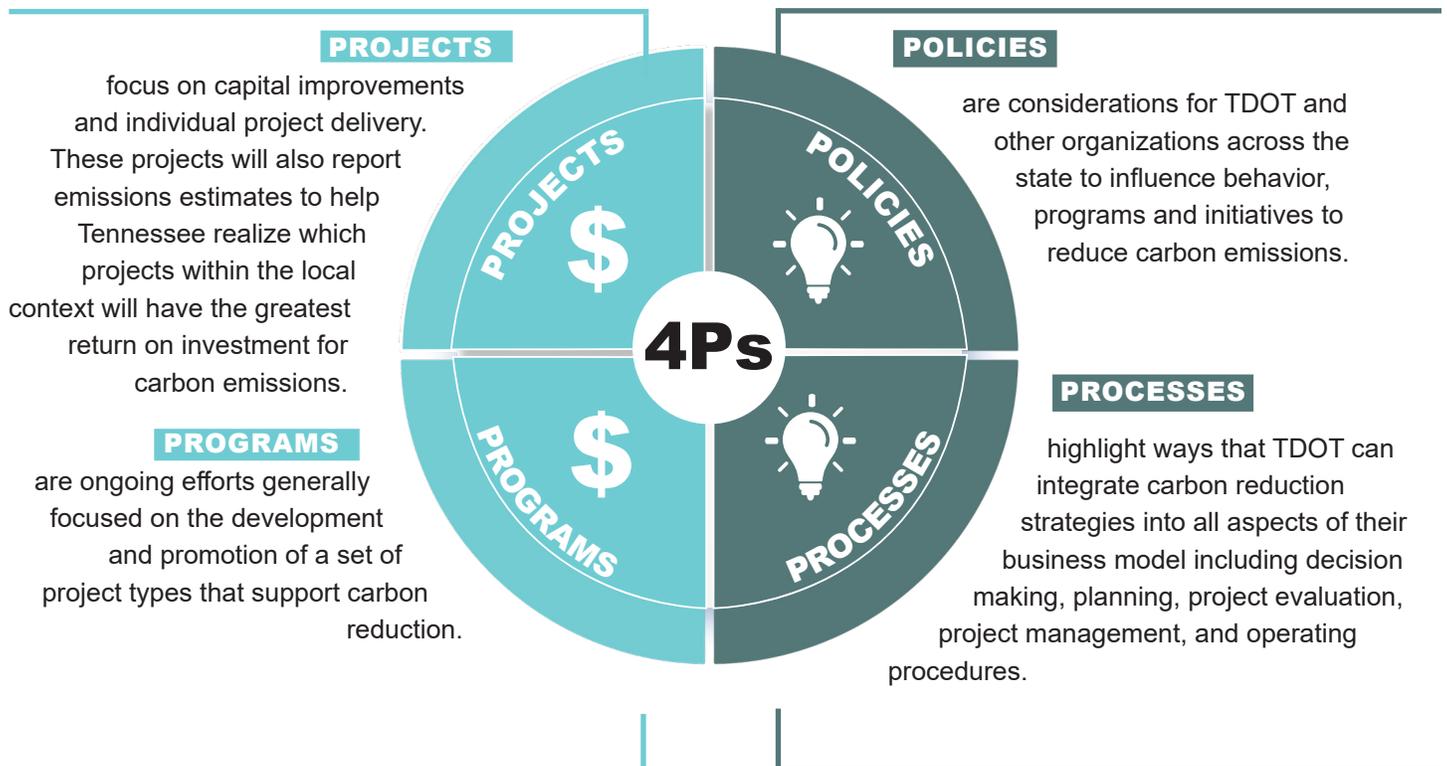
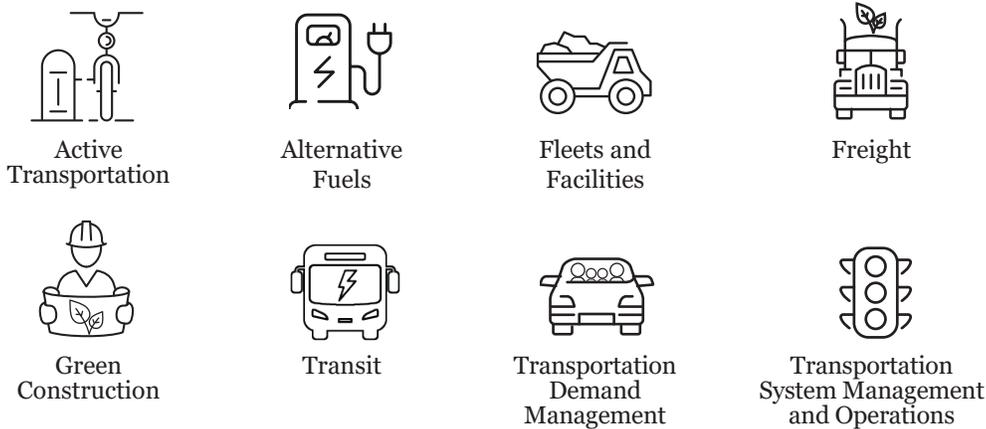
Table 1: 2019 TN Emission Summary by Road Type

Road Type	Annual VMT x1,000	TN Annual Emissions by Road Type (total metric tons)						TEC MMBTU
		HC	CH4	N20	AtmoCO2	C02Eqiv	ECARB25	
		1	5	6	90	98	112	91
Off-Network	0	7,371	1,100	486	2,731,980	2,903,928	122	35,897,523
Rural Restricted	9,819,397	948	215	14	6,066,960	6,076,385	158	78,996,963
Rural Unrestricted	17,966,892	1,801	441	36	8,534,724	8,556,219	157	111,742,501
Urban Restricted	19,213,163	1,582	375	32	8,782,845	8,801,601	148	115,014,037
Urban Unrestricted	35,892,548	4,644	1,140	126	17,464,255	17,530,012	251	229,364,744
TOTAL	82,892,000	16,347	3,271	694	43,580,765	43,868,145	835	571,015,767

Focus Areas and 4Ps

The CRP is broad in terms of its project eligibilities and goals to reduce transportation-related emissions. TDOT, with support from the MPOs, developed Focus Areas within TDOT’s sphere of influence to support carbon reduction. These eight Focus Areas encompass not only the eligible project and program types that will help Tennessee spend the CRP funds, but also identify policies and processes that TDOT and municipalities across the state can consider for implementation to further Tennessee’s success in carbon reduction through the transportation system.

The eight Focus Areas are organized by the 4Ps - applicable Projects, Programs, Policies, and Processes, that TDOT, MPOs, Rural Planning Organizations (RPOs), and other municipalities can utilize to reduce their overall carbon emissions.





Active Transportation

Active transportation refers to supporting walking, bicycling, micromobility, and other active modes as alternatives to the use of single-occupant vehicles for commuting. Where walking and bicycling conditions are favorable, typically 10-20 percent of local trips are by these modes. TDOT's Multimodal Access Grant and the Pedestrian Road Safety Initiatives are two programs that support projects to enhance walking and biking in communities around the state.

Projects

E-Bike Subsidies

- Financial incentives to offset the cost of purchasing an e-bike for personal use, making it more affordable and accessible to individuals and promoting a cleaner and more efficient transportation.

Bikeshare

- Online or on-the-spot systems that allow individuals to rent bicycles for short-term use, providing a flexible and sustainable option for mobility, travel decisions that excludes single-occupancy trips.

Walking and Biking Facilities

- The construction of dedicated paths for walking and biking that will reduce vehicle trips.

Electrified Micromobility

- A range of small-scale, lightweight, electric-powered devices operating at speeds of approximately 15 mph offering efficient and environmentally friendly transportation options for short-distance travel. This could include education for e-mobility users on safety, proper charging, maintenance and storage.

Programs (none)

Policies

Enhanced Laws Protecting Bike Users and Pedestrians

- Tennessee recognizes that the built environment can be hostile to active transportation users (as noted in the TDOT Highway Safety Plan) and that enhanced laws protecting bike users and pedestrians would be beneficial to making active transportation options safer and more appealing to a larger audience.

Processes

Alternative Mode Incorporation

- Where feasible, incorporate features that support alternative transportation modes into the design process and develop standards to ensure these features are prioritized in transportation projects. Examples include crosswalks, multi-use paths, and/or bike lanes.





Alternative Fuels

Alternative fuels refers to the use and adoption of vehicles that deviate from traditional fossil fuels, utilizing renewable or clean energy options (such as electricity, hydrogen, biofuels, and other sustainable alternatives) and associated infrastructure changes like charging stations. The Tennessee Electric Vehicle Deployment (TEVI) Plan was written to guide implementation of electric vehicle (EV) infrastructure. In addition to the TEVI plan, the Drive Electric Tennessee road mapping effort was created, which is a multi-stakeholder vision and goal to total 200,000 registered EVs in Tennessee by 2028.

Projects

EV Charging Stations:

- Deploying new charging infrastructure where you can charge an all-EV or plug-in hybrid.

Alternative Fueling Stations:

- Explore biodiesel, natural gas, hydrogen, E85 ethanol flex-fuel or liquefied petroleum gas fueling stations.

Diesel Engine Retrofits:

- Upgrading or modifying an existing diesel engine with newer technologies or components to improve performance, increase efficiency, and/or reduce emissions.

Programs

TEVI Program:

- The TEVI program directs the investment and development of charging infrastructure through Tennessee to support the widespread adoption of EVs.

Mobility Hub Charging:

- Providing EV charging infrastructure and services at centralized locations, such as select park and rides, to facilitate the efficient and convenient charging of multiple vehicles.

Policies

Land Use/Developer Policies:

- Local governments can encourage EV charging infrastructure in new developments or based on land use through policy development.

EV Fleet Transition Policies:

- Organizations should inventory their existing fleets and plan for alternative fuel vehicles and infrastructure as needed.

Processes

Fleet Transition Plan:

- TDOT and other organizations can consider outlining a comprehensive strategy and timeline to shift their vehicle fleet from traditional combustion engines to electric or other alternative fuel vehicles, including considerations such as vehicle selection, charging infrastructure, financial analysis, and implementation steps.



Fleets and Facilities

Fleets and facilities encompass the vehicles and equipment owned, operated, used, or maintained by the state or municipalities. The state has over 7,000 vehicles and equipment in its fleet today along with facilities for vehicle and equipment storage and office space for employees to support operations.

Projects

Highway Right of Way (ROW) Energy Facilities:

- The installation of renewable energy infrastructure, such as wind turbines and solar panels, along or within existing highway corridors to generate clean and sustainable energy and supply it to utility companies.

Fleet Transition:

- The process of replacing fleet vehicles, typically in commercial or government sectors, to alternative fuel vehicles and equipment with more sustainable and low-emission alternatives such as electric or hybrid vehicles.

Landscaping:

- Designing and modifying aspects of landscaping within the ROW — such as when it occurs, the types of vegetation used, and/or equipment used—to enhance the aesthetics, functionality, and environmental sustainability of an area.

Programs (none)

Policies

Rideshare:

- Create a policy for the use of agency-owned vehicles that would require staff traveling to on-site locations to ride together or limit the number of work vehicles on each project.

TDOT Fleet Transition Plan:

- A comprehensive strategy aimed at gradually replacing TDOT's vehicle fleet with more sustainable and fuel-efficient alternatives, contributing to reduced emissions and long-term environmental sustainability.

Idle Reduction Program:

- Encourage schools, businesses, and other organizations to adopt policies and initiatives to minimize the unnecessary idling of vehicles, promoting fuel efficiency, reducing emissions, and improving air quality by encouraging drivers to turn off their engines when parked or waiting.

Processes (none)



Freight

Freight and goods movement generates emissions through the state's transportation system. Nearly 7 percent of Tennessee's AADT originates from single-unit or combination truck traffic.³ The TDOT Freight and Logistics Division focuses on freight movement by rail, water, and highway. Through strategic freight research projects and other initiatives, TDOT influences freight emission reductions.

Projects

Electrified Truck Stops:

- Providing commercial trucks with parking facilities equipped with electric charging or hydrogen refueling infrastructure, heating, air conditioning, or other appliances to eliminate engine idling and promote sustainable transportation.

Rail Signalization:

- Including a rail system of visual, audible, and physical signals used in conjunction with local jurisdictions to ensure safe and efficient train operations and rail crossing safety.

Programs

Idle Reduction Programs:

- Initiatives and strategies aimed at minimizing or eliminating the unnecessary idling of vehicles or equipment installation that powers systems without engine idling, therefore reducing fuel consumption and emissions while maintaining operational efficiency.

Commercial Zero Emission Vehicles Corridors

- Identify priority locations and deploy a network of EV charging and hydrogen fueling stations for medium and heavy-duty trucks. Strategically build out infrastructure that supports a reliable zero emissions freight network.

Weigh-In-Motion:

- Considering technology which allows for the measurement of the weight of vehicles as they travel at highway speed, enabling efficient and accurate weight enforcement without the need for vehicles to stop at a weighing station.

Policies

Freight Planning:

- Improved coordination of freight transportation and land use planning which has the potential to reduce truck VMT by co-siting interdependent facilities (e.g., an auto parts supplier and automotive factory) and encouraging growth in freight land uses near existing or planned freight rail corridors.

Processes

Oversize/Overweight Permitting:

- The process which considers route planning and designation based on emissions sensitive planning (time of day, fuel consumption, etc.) and grants special authorization and permission for vehicles or loads that exceed the standard limits.

Processes cont'd

Carbon Reduction Integration into Research Projects:

- TDOT can include studies regarding the reduction of freight emissions into their strategic freight research projects, further incorporating sustainable practices, technologies, and methodologies aimed at minimizing carbon.

Freight Planning with an Emphasis on Emission Reduction:

- When feasible, conduct strategic analysis, optimization, and implementation of transportation strategies that prioritize environmentally-friendly practices, alternative fuels, efficient routing, and modal shift to minimize emissions in the movement of goods.

³ https://www.tn.gov/content/dam/tn/tdot/freight-and-logistics/TDOT_2023_StatewideMultimodalFreightPlan_FullReport_Final,%202023%2005%2030.pdf



Green Construction

Green design, construction, and maintenance includes the use of construction materials with low levels of embodied carbon and less carbon-intensive alternatives. TDOT's construction standards are one way to impact carbon emission reductions in the construction process as well as the types of materials and equipment used around the state. TDOT is piloting electric field equipment in one region to assess the emissions impact.

Projects

Street Lighting:

- Illumination projects that replace traditional street lighting and traffic control devices with energy-efficient alternatives.

Construction Equipment:

- Machinery, tools, and vehicles specifically designed and utilized for various construction activities that are either electric or zero-emission.

Green Construction Materials:

- Sustainable building materials and products that are: composed of renewable resources, responsibly sourced, energy-efficient, non-toxic, and have a reduced environmental impact throughout their lifecycle, promoting sustainable construction practices and reducing carbon emissions.

Programs (none)

Policies

Construction Staging/Idling Specs:

- Specific guidelines and requirements that encourage emissions sensitive planning for construction staging, aiming to limit engine idling duration and practices during construction staging activities, reduce unnecessary emissions, and promote sustainability on construction sites.

Construction Vehicle Specs:

- The technical specifications and requirements set for construction vehicles, including dimensions, weight capacities, engine power, alternative fuels, safety features, and other performance parameters,

to encourage construction vehicles and equipment based on emissions sensitivity.

Develop Onsite Reuse Policies:

- The creation of guidelines and strategies aligned with U.S. DOT's Sustainability Plan, TDOT, and other organizations designed to promote the identification, salvaging, and repurposing of materials and resources on construction sites, minimizing waste generation and supporting sustainable construction practices. Organizations can also develop internal policies for reuse, recycling, and composting within project delivery.

Processes

Inclusion of Sustainability/Emissions in TMP process:

- As TDOT develops Transportation Management Plans (TMP) for work zone impacts, it could consider incorporating strategies related to carbon emissions reduction and sustainability into the plan as it relates to construction staging and the traveling public to promote more sustainable and environmentally friendly transportation practices.

Estimating Carbon Emissions:

- TDOT could measure project specific carbon emission reductions to establish a baseline and track methods and practices that would have a larger impact over time.



Transit

Transit refers to travel by fixed route bus, microtransit, bus rapid transit (BRT), streetcar, light rail, heavy rail, and commuter rail. The state offers 28 transit systems serving all 95 counties: four (4) large urban systems, eight (8) small urban systems, 10 rural systems, one regional commuter transit system, and local transit in five towns. Further expansion of transit service could reduce VMT and the reliance on private transportation in some of Tennessee's most vulnerable communities.

Projects

Electrify Transit Fleet:

- Transitioning from fossil fuel powered fleet vehicles to zero-emission vehicles, like battery powered or hydrogen fueled, in order to reduce carbon emissions and promote cleaner and greener mobility solutions.

Regional Commuter Buses (EV, hydrogen, other):

- Electric vehicles, hydrogen-based vehicles, and buses using other technologies that travel longer distances for commuters with at least one round trip per day. These buses often cross jurisdictional boundaries and connect to local municipality transit, providing environmentally friendly transportation options for daily commuting and promoting sustainable mobility in a region.

High-Capacity Public Transportation:

- BRT is a high-capacity public transportation system that operates on designated lanes and combines dedicated bus lanes, off-board fare collection, and other features to provide fast, efficient, and reliable service (similar to light rail), offering a cost-effective

solution for urban mobility. High-capacity public transportation may also include rapid transit in the form of light or heavy rail.

Priority Lanes/Stop Improvements:

- Dedicated lanes and infrastructure enhancements which prioritize the movement of public transportation vehicles, allowing for faster and more efficient transit operations, reducing congestion, and improving overall transportation reliability. Transit priority lanes are specially striped and designed only for transit. Stop improvements utilize far-side-in-lane stops after intersections.

Mobility Hubs:

- Centralized locations, often along existing transit, that support various modes of transportation, including transit, cycling infrastructure, rideshare, vanpool parking, pedestrian facilities, and EV charging, while promoting connectivity and accessibility within a community.

Programs (none)

Policies

Idle Reduction Policies:

- Regulations, incentives, and practices aimed at minimizing unnecessary idling of vehicles, particularly in transit and transportation as a whole, to reduce fuel consumption, air pollution, and GHG emissions, while promoting fuel efficiency and environmental sustainability.

Sustainability Commitments:

- Pledges made to actively encourage transit agencies to prioritize and implement environmentally responsible practices and implement goals regarding carbon emission reductions.

Zero Emission Fleet Transition:

- The process of converting an existing fleet of vehicles from fossil fuel-based engines to alternative energy sources with the aim of eliminating tailpipe emissions and promoting a cleaner, greener transportation system. Agencies are encouraged to apply for low/no emissions grants and bus/bus facilities grants for zero emission vehicles and equipment.

Processes (none)



Transportation Demand Management

TDM is a collection of strategies, such as carpool, walk/bike, transit, and teleworking, that reduce SOV travel by influencing traveler behavior and increasing the utilization of transportation options available to commuters. TDM projects that have been executed in Tennessee include the Smart Trips program housed in the Knoxville Regional Transportation Planning Organization and the Memphis Area Rideshare Program operated by the Shelby County Health Department.

Projects

Incentives to Encourage Mode Shift

- Providing financial incentives to companies or individuals to use less SOV modes and more alternative forms of transportation (i.e., public transportation or carpooling).

Park and Ride Lots:

- Designated parking areas located near transportation hubs, where commuters can park their vehicles and transfer to public transportation, carpool, or vanpool for the remainder of their journey, reducing traffic congestion and promoting sustainable travel options.

Subsidies for Transit/Vanpool

- Using subsidies to reduce ridership cost to companies, agencies, or individuals to ride transit or vanpool.

Education and Marketing

- Developing of new resources to encourage travel decisions that exclude single-occupancy trips.

Turnkey Vanpool Operation

- Forming vanpools with 5 - 15 commuters (depending on size of vehicle) splitting monthly costs of vehicle, insurance, fuel, and maintenance.

Programs

Rideshare Program

- Consider additional programming around the state like Nashville Connector and Smart Trips in Knoxville to help organizations and individuals learn about and try new travel options.

Remote Work Program

- Assisting businesses and municipalities with implementation of hybrid work programs, eliminating unnecessary commute trips when possible.

Policies

Flexible Work Programs

- Tennessee adopted Alternative Workplace Solutions allowing remote and mobile work. In addition to hybrid work, organizations can also enact compressed work schedules to eliminate commute trips and flexible schedules to move commute trips outside of peak travel times.

Parking Management

- Parking management policies such as preferential parking, unbundled parking from leases, and dynamic pricing can disincentivize the use of SOVs.

Processes

TDM for Large Transportation Projects

- When transportation projects are planned and underway, consider including TDM strategies for people traveling through the construction zone—including outreach and education, travel incentives, and increased transit service – to help to alleviate congestion and improve air quality.



Transportation System Management and Operations

TSMO is an integrated approach to increase the efficiency, safety, and reliability of transportation systems by making changes to the way the system is operated in response to changing traffic or roadway conditions. Tennessee examples include: TDOT SmartWay⁴, which uses real-time camera footage to monitor highways from traffic management centers (TMCs), sensors to analyze traffic flow, and large electronic message boards to provide urgent traffic notices and safety messages to drivers.

Projects

Traffic Flow Monitoring:

- Observation and analysis of the movement and congestion of vehicles on roadways to gather data and optimize transportation infrastructure, improve efficiency, and enhance safety.

On Demand Cars/Rideshare:

- Transportation service where users can request a vehicle for immediate or scheduled pick-up through a mobile app (such as Lyft or Uber), providing convenient and flexible mobility options including carpool, scooter, and others.

Traffic Flow/Traffic Signal Optimization:

- The implementation of data-driven strategies to adjust traffic signal timings, prioritize certain traffic movements (such as the implementation of roundabouts), and improve the overall efficiency and capacity of road networks to minimize congestion and maximize the smooth movement of vehicles.

Dynamic Speed Limits:

- Variable speed restrictions that are adjusted in real-time based on current traffic, weather conditions, or

other factors, with the goal of improving safety and traffic flow by adapting speed limits to match the prevailing conditions on the road.

Traveler Information:

- Dissemination of accurate and up-to-date information regarding routes, transportation options, schedules, traffic conditions, and other relevant data to assist travelers in making informed decisions and facilitating efficient and seamless journeys.

Ramp Metering:

- A traffic management technique that regulates the flow and frequency of vehicles entering highways by using traffic signals at on-ramps to improve traffic flow, reduce congestion, and enhance safety.

Choice Lanes:

- Designated lanes on roadways that offer users the option to choose between different modes of transportation, such as buses, high-occupancy vehicles (HOVs), or managed lanes in urban environments, providing flexibility and encouraging more efficient and sustainable travel choices.

Programs

Incident Management:

- With the Interstate Incident Management Program, the coordinated and systematic approach of responding to and resolving unexpected events or disruptions, such as accidents, emergencies, or road incidents, with the aim of reducing congestion, minimizing impacts, restoring normal operations, and ensuring public safety.

Service Patrol Expansion (HELP Trucks):

- The expansion and deployment of highway emergency response vehicles or service patrol trucks that assist motorists who are stranded or in distress,

provide roadside assistance, and contribute to the overall safety and efficiency of roadways by quickly clearing minor incidents or obstructions.

Intelligent Transportation Systems (ITS) Expansion to Rural Communities:

- Improve transportation efficiency, safety, and connectivity by extending and implementing the Tennessee Statewide ITS Architecture and the TDOT SmartWay program into rural areas; including advanced traffic management systems, real-time traveler information, and communication networks.

⁴<https://smartway.tn.gov/>



Cont'd Transportation System Management and Operations (TSMO)

Policies

Connected and Automated Vehicle (CAV) Policies:

- Development of guidelines and initiatives aimed at fostering the integration and adoption of connected and automated vehicles, including provisions for testing, safety standards, infrastructure support, and legal frameworks to facilitate the advancement and deployment of CAV technology.

Pricing Policies for Green Travel:

- Strategies implemented by governments or transportation authorities to incentivize different travel times and environmentally friendly modes of transportation, such as public transit or cycling, through pricing mechanisms such as dynamic parking, choice lane use, discounted fares, or congestion charges.

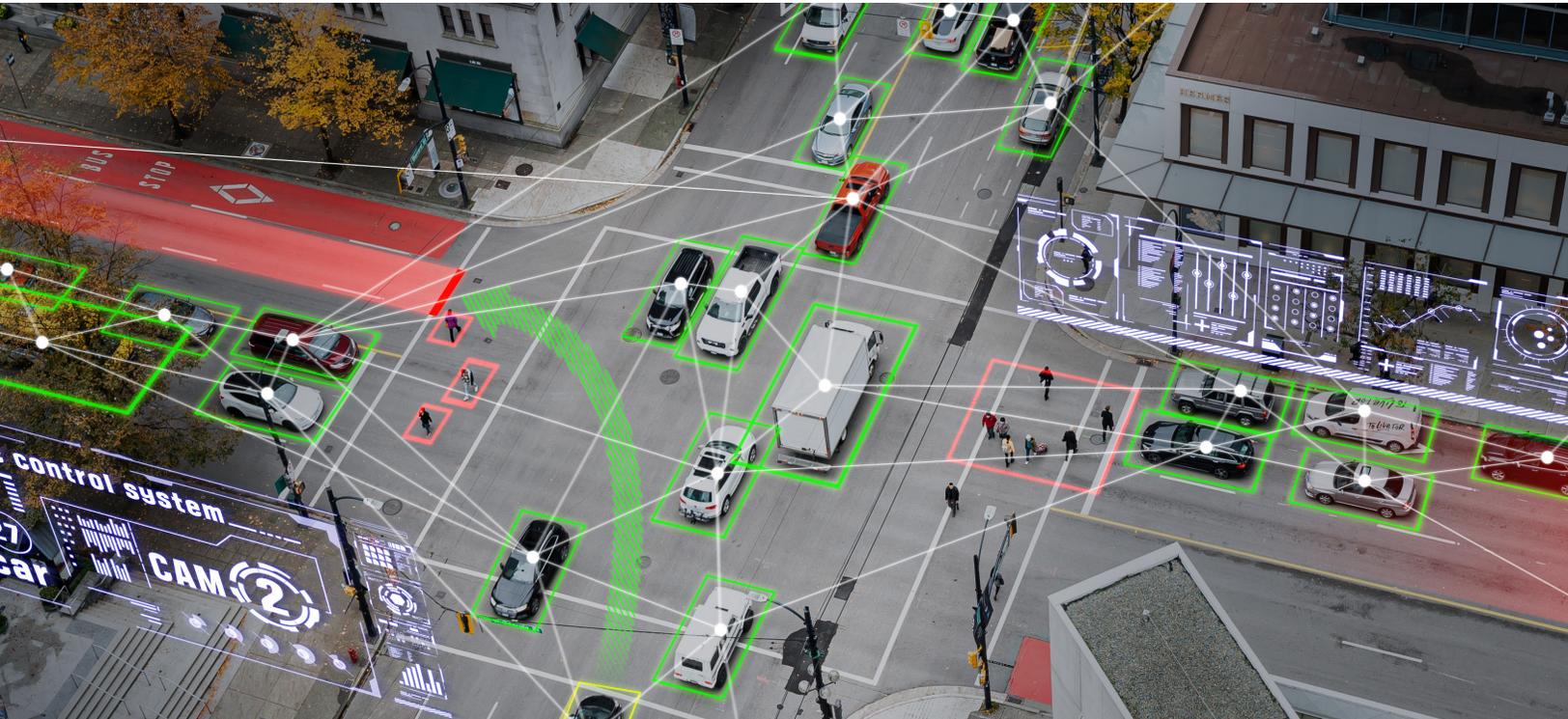
Processes

Data Management and Integration:

- The systematic organization, storage, processing, and integration of various data sources and formats to ensure the availability, accuracy, and interoperability of data for effective analysis, decision-making, and implementation of smart transportation initiatives. TDOT can continue to explore ways to collect data and integrate data to influence trip behavior and congestion.

Provide Assistance to Universities for Research:

- When feasible, TDOT can coordinate with local universities to offer support, resources, and research endeavors focused on advancing transportation technologies, mobility solutions, and sustainable transportation practices.



Engagement

The engagement strategy was rooted in gaining an understanding of the current transportation related efforts and the desired carbon reduction response. Several methods were utilized to obtain this information including forming a Project Advisory Committee (PAC), conducting internal interviews, coordinating with MPOs and RPOs, and deploying a stakeholder survey.

Project Advisory Committee (PAC)

TDOT initiated a PAC to provide technical expertise, guide the CRS development, and provide input on project materials. The PAC was comprised of internal TDOT Division Leads (or designee), MPOs, and Federal Highway Administration (FHWA). Meetings were held as needed between November 14, 2022 and June 12, 2023. The PAC was requested to provide input on development of the CRS, including the survey methodology, input on the eight (8) identified Focus Areas, and the process for evaluating each of the 4Ps. Tennessee's CRS incorporates comments from the PAC and MPOs. See Appendix A for list of PAC members.

Internal Interviews

Early engagement with TDOT department heads was one way to gain insights at the state level. The TDOT department heads participated in a survey and then follow-up interviews to guide and gain insights to inform the desktop review for the existing conditions. Internal divisions saw the need for developing standardized methods of quantifying GHG emissions (both for stricter standards on green construction materials for projects and for the total roadway network), tracking divisional input and oversight from the beginning purpose and need stages of the project, and improving consistent communication and resource-sharing between the MPOs and RPOs to better streamline emission reduction projects.

MPO/RPO

The CRP requires that each state receiving CRP funding develop their CRS in consultation with any MPOs designated within the state. TDOT has developed this

CRS in consultation with the state's MPOs and RPOs, in alignment with federal requirements and guidelines and in line with Tennessee's 25-Year Long Range Transportation Plan (LRTP). The LRTP puts a strong emphasis on further enhancing partnerships with other state agencies to explore opportunities for leveraging resources and programs that support economic development and smart growth practices in Tennessee.

Engagement with the MPOs and RPOs took many forms. An initial approach included attending the MPO monthly meetings and launching a survey. However, response rates were low. The strategy was modified to a statewide MetroQuest survey targeting MPOs, RPOs, and elected officials to confirm there were no gaps in the existing conditions desktop review and inform the strategy development. Then, the results of the survey were presented to all MPOs and RPOs across the state with additional opportunities to provide input and feedback. Also, the status of the CRS effort was shared at Tennessee's RPO 2023 Annual Conference and Tennessee's MPO 2023 Annual Conference including a presentation and discussion.

Survey

The TDOT CRS Survey was designed to guide TDOT in how best to invest Tennessee's federal CRP funds, both statewide and locally. All of Tennessee's MPO planning areas are regionally unique and therefore, have differing contributors to transportation emissions and needs to address those emissions. To solicit feedback and identify those projects which would be most desirable on a local level, a survey was transmitted to MPO and RPO coordinators with the request to share with their executive boards, committee members, mayors, and other stakeholders who would be interested. The survey was hosted on the MetroQuest platform for three weeks as a tool to educate stakeholders about carbon reduction and gather informed opinions about carbon reduction projects that would be most desired on a local level. The survey was transmitted to MPOs and RPOs on April 18, 2023. 120 responses were received.

Framework for Optimizing CRP Investments

Federal regulation requires 65 percent of Tennessee's CRP apportionment to be obligated in areas in proportion to their relative shares of the state's population, while the remaining 35 percent of the apportionment is available to be obligated in any area of the state. In urbanized areas of the state, these funds will be distributed to their respective MPOs, who shall consider potential carbon reduction benefits to their respective areas.

The following framework is intended to guide TDOT and the MPOs in optimizing the CRP funding. TDOT intends to fund projects from each Focus Area, track project implementation, and quantify carbon emission reductions. Projects funded through the CRP formula funds will inform TDOT's CRS moving forward.

The optimization framework includes a series of evaluation steps to determine CRP investments.

Survey

TDOT will use the results of the CRS survey to inform project identification efforts.

The MPO and RPO respondents reviewed Focus Areas, project types and project benefits. The aggregate preferred Focus Areas in ranked order were:

- TSMO
- Freight
- Green Construction
- Transit

Preferences did vary by the size of respondents' respective communities, with the smallest communities preferring Green Construction strategies, mid-sized communities preferring Freight and TSMO strategies, and the largest communities preferring Transit strategies. Appendix B outlines additional findings from CRS survey.

Focus Areas

TDOT will distribute funds across each Focus Area.

Eligible projects to meet the overall goal of reducing transportation emissions will be in one of the eight identified Focus Areas. TDOT intends to evaluate the programmatic Focus Areas to help quantify carbon emissions reductions, assess the impacts of different projects implemented and serve as a baseline to inform TDOT's future CRS.

Project Identification

TDOT will take a hands-on approach in identifying and prioritizing projects for the CRP funding.

Projects located within MPO boundaries will need to be programmed into the MPO's Transportation Improvement Program (TIP). TDOT will work internally to identify and program projects outside MPO boundaries. There may or may not be an external call for projects to satisfy needs in certain Focus Areas. The TDOT Air Quality staff met with the MPOs in order to identify projects and ensure eligibility and timelines are met. Initial projects identified in the TIP can be found in Appendix D.

Eligibility

TDOT will coordinate with FHWA to help local project sponsors identify what projects can and cannot be funded by the CRP.

The CRS project list contains general types of projects that are eligible. Each eligible project will refer to the publicly available emissions estimate tool where project sponsors can report their project's carbon reduction estimates to TDOT. The list is not exhaustive and does not guarantee funding approval, but it is meant to serve as a useful guide for identifying potential projects that produce a direct emissions benefit and should generate an efficient approval process. The eligible project list is available in Appendix C.

Prioritization

Following the development of potential project lists, TDOT will employ a prioritization process to evaluate projects for funding.

Using a project prioritization tool, TDOT will apply multiple criteria to evaluate and fund a diverse set of projects aligned with the objectives of the CRS to jumpstart the collection of emissions reduction data related to transportation projects and inform the future CRS.

Prioritization Tool

The tool provides a qualitative, transparent decision-making framework from which TDOT can efficiently and consistently evaluate and determine project priorities based on readily available project information. This tool can also serve as a resource for the MPOs and RPOs to assess their potential projects.

The tool allows users to evaluate CRS-related projects through a qualitative assessment in which users answer questions about a potential project's impacts or feasibility. Currently, the tool is not intended to project quantified project impacts such as GHG or VMT reduction estimates. The tool includes:

Assessment and Weighted Questions

Users will assess the project through user-defined questions or default list of options including:

- Does the Project reduce carbon emissions or improve air quality?

- Does the Project decrease SOV trips?
- Does the Project increase safety?

Users can apply optional weighting to individual questions to reflect a relatively higher importance compared to other questions (i.e. equity impacts are more important consideration than how a project increases safety).

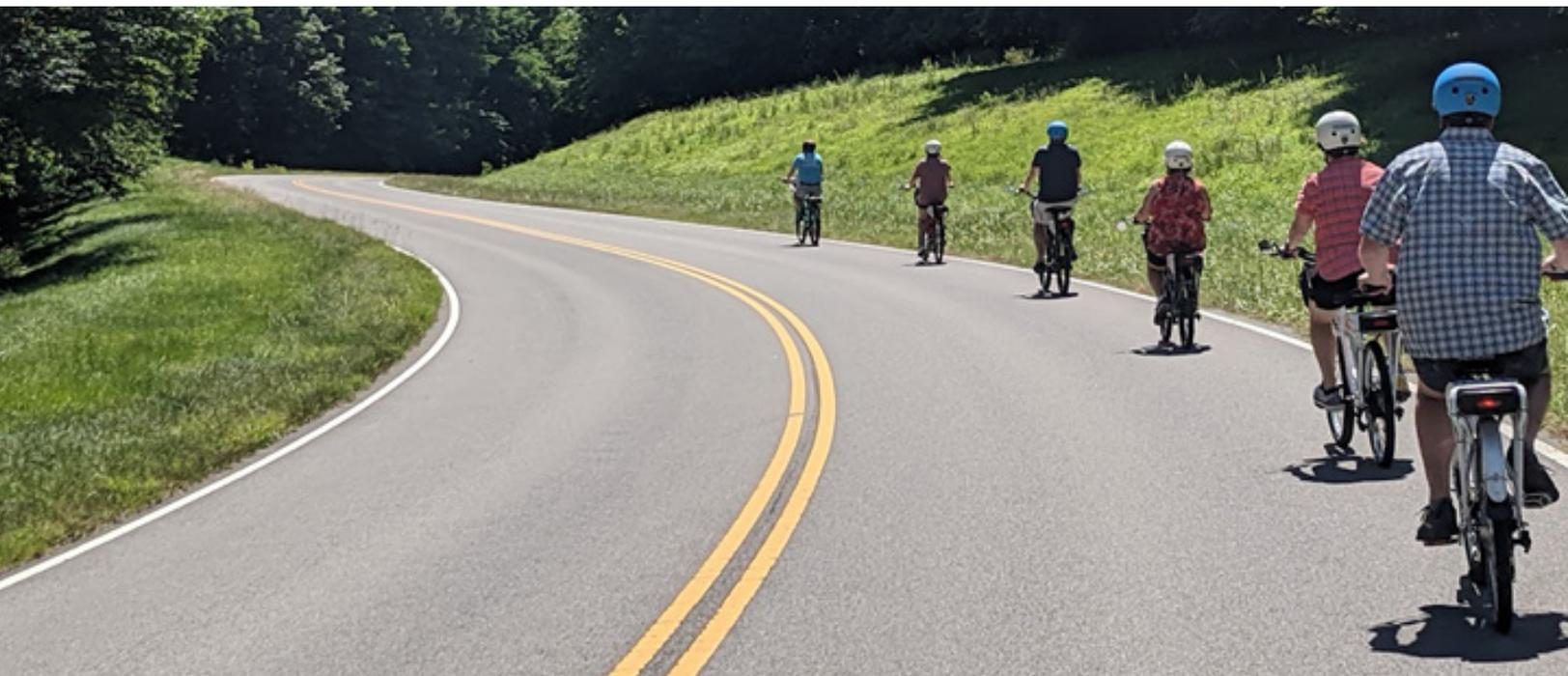
Evaluation and Scoring

The users' evaluation will be translated into a quantitative score for each project. A project's score can demonstrate its effectiveness, benefits, or feasibility, depending on the selected questions. These projects will be summarized in each of the Focus Areas.

Program Dashboard

TDOT has developed a CRP dashboard to convey to the public how funds are allocated to different projects across the state. The dashboard is a digital tool that displays key project information such as: funding amount, location, population category, Focus Area, and project description. The public can use filters to see how money is spent on projects in their area and the types of projects being funded in Tennessee. Annually, TDOT will update emissions estimates for each project to illustrate the impact of the CRP funding.

The program dashboard will be available on the [TDOT website](https://www.tn.gov/tdot)⁵ so that the public can track how and where the CRP funds are being spent. The program dashboard will be updated with project data as it becomes available including the list of projects in Appendix D.



⁵ <https://www.tn.gov/tdot/long-range-planning-home/air-quality-planning/carbon-reduction-program.html>

Alignment with Federal Requirements

Planning

The CRS aligns with the goals and recommendations of TDOT's LRTP which encourages strong partnerships with local and regional agencies and exploring emerging technologies to enhance resiliency in all modes of transportation. Individual recommendations within the LRTP which would align with the CRS's goal of reducing carbon emissions include: TSMO improvements to reduce

congestion;⁶ establishing a program for congestion reduction investments (including TDM strategies);⁷ and continuing its current practices in sustainability as a means of maximizing return on investment.⁸ Additionally, the LRTP recommends that TDOT identify existing programs, such as the CRP, that can be used to promote greater public health considerations in transportation.⁸

Federal Requirements

Table 2: TDOT Alignment with Federal Requirements

Requirement	Reference	Details	Within the CRS
Develop a strategy in consultation with any MPO designated within the State	§ 11403; 23 U.S.C. 175(d)	MPOs were invited to the Project Advisory Committee (PAC) meetings and asked to share carbon reduction goals and project type preferences for their regions. Additionally, TDOT provided MPOs and RPOs with a survey to provide input on the eight Focus Areas. Lastly, TDOT presented the findings of the survey throughout the state to MPOs and RPOs.	Page 19
Develop a CRS not later than 2 years after enactment	§ 11403; 23 U.S.C. 175(d)(1)	TDOT's CRS will be finalized by November 2023.	Coverpage
Update the strategy at least every four years	§ 11403; 23 U.S.C. 175(d)(3)	The TDOT CRS will be updated at least every four years based on results from project tracking and input from stakeholders.	Page 4
Support efforts—and identify projects and strategies—to support the reduction of transportation emissions	§ 11403; 23 U.S.C. 175(d)(2)	The TDOT CRS identifies strategies based on Focus Areas to support the reduction of transportation emissions. Additionally, TDOT has provided a list of eligible and programmed projects for ease of reference.	Page 9-18 and Appendix C/D
At the State's discretion, quantify the total carbon emissions from production, transport, and use of materials used in the construction of transportation facilities in the State	§ 11403; 23 U.S.C. 175(d)(2)	TDOT will not be quantifying carbon emissions prior to project implementation. The prioritization tool would be used to qualitatively assess projects eligible for CRS funding. Where possible, TDOT will retroactively quantify carbon emission reductions as a result of CRS-implemented projects.	Page 14 and Appendix C
Be appropriate to the population density and context of the State, including any MPO designated within the State	§ 11403; 23 U.S.C. 175(d)(2)	65 percent of Tennessee's CRP apportionment is to be obligated to urbanized areas in accordance with their relative share of the state's population. The remaining 35 percent of the funds may be distributed throughout the state at TDOT's discretion. Additionally, the TDOT CRS is in alignment with the LRTP for Tennessee.	Pages 5 and 22

⁶ https://www.tn.gov/content/dam/tn/tdot/documents/Safety_022316.pdf

⁷ https://www.tn.gov/content/dam/tn/tdot/documents/Mobility_022316.pdf

⁸ https://www.tn.gov/content/dam/tn/tdot/documents/Accessibility_022316.pdf

CRP Apportionment

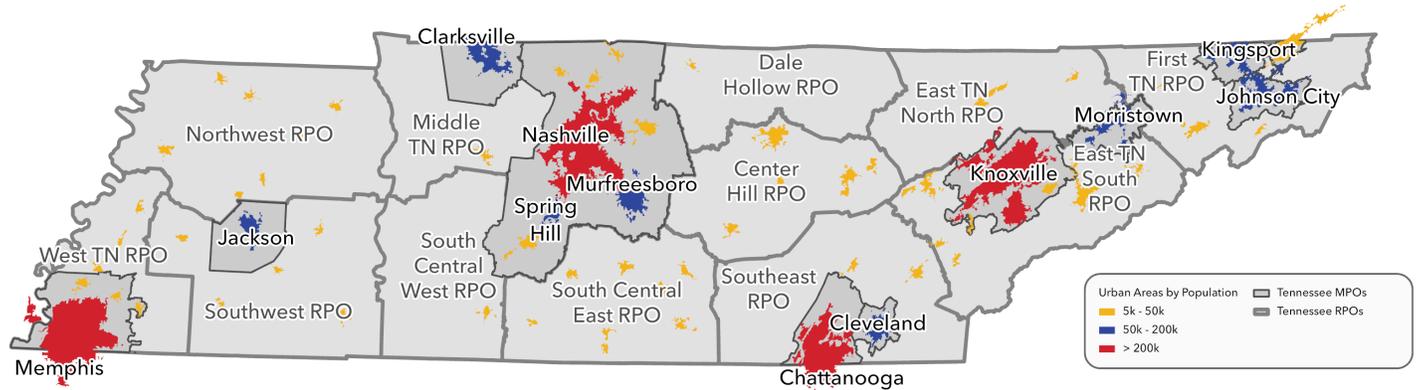


Figure 8: Tennessee MPOs/RPOs/CRP Population Funding Categories

Source: 2020 Census

Figure 8 displays the geographic boundaries for population funding areas of Tennessee. For each fiscal year, 65 percent of funds apportioned to the state shall be obligated, in proportion to their relative shares of the population. The remaining 35 percent of funds may be obligated in any area of the state. Table 3 shows the CRP suballocations apportionment for Tennessee for FY 22-26.

Table 3: Tennessee CRP Apportionment FY 22-26

Total CRP Apportionment (estimated)	Suballocations Apportionment (FY 22-26)					Total Apportionment
	>200K	50K to 200K	5K to <50K	<5K	Any Area	
Chattanooga	\$4,315,591					
Knoxville	\$7,964,055					
Memphis	\$12,707,819					
Nashville_Davidson	\$13,821,197					
Bristol		\$515,023				
Clarksville		\$1,971,556				
Cleveland		\$951,887				
Jackson		\$1,024,629				
Johnson City		\$1,716,485				
Kingsport		\$1,460,082				
Morristown		\$841,540				
Murfreesboro		\$1,899,131				
Total	\$38,808,662	\$10,380,333	\$9,392,080	\$31,880,908	\$48,710,296	\$139,172,279

Summary

The CRS is an important document aimed at addressing the need for reducing transportation carbon emissions in our state. Tennessee's goal is to increase initiatives in a variety of statewide investments that help quantify and reduce carbon emissions. Moving forward, TDOT will focus on the following efforts to advance the strategies outlined within this document:

- Integrate the CRP strategies into the overall planning process, ensuring that carbon reduction is a fundamental consideration in all future projects.
- Continue coordination and engagement with MPOs and recognize the importance of collaboration and shared responsibility to achieve carbon reduction targets.
- Evaluate the effectiveness of the strategies to determine the combination of projects that have the greatest ability to reduce carbon emissions.
- Explore internal processes for potential improvements to adapt and refine the strategy.

With continued dedication to the strategies, collaboration with MPOs, ongoing project evaluation, and a commitment to improving internal processes, Tennessee is well-positioned to reduce carbon emissions from the transportation sector.



Appendix A

Project Advisory Committee Members

- Adam Jaeckel, TDOT Freight and Logistics Division, Transportation Program Monitor
- Adam Price, TDOT Structures, Division Manager
- Andrea Noel, TDOT Air Quality Office, Program Supervisor
- Anna Emerson, GNRC Transportation Improvement Program Coordinator
- Brandon Chance, TDOT Environmental Division, Technical Studies Manager
- Brian Egan, TDOT Construction Division, Director
- Chris Harris, TDOT Asset Management Division Manager
- Dan Pallme, TDOT Assistant Chief of Environment and Planning/Freight and Logistics Division Director
- Daniel McDonnell, TDOT Multimodal Planning Division, Transportation Manager
- David Lee, TDOT Long Range Planning, Assistant Division Director
- Degee Roberts, Air Quality Office, Program Administrator
- Greg Thomas, Cleveland MPO Transportation Director
- Heather Purdy Hall, TDOT Materials and Tests Division Director
- Jon Storey, TSMO Special Projects Manager
- Justin Underwood, TDOT Central Services Division Director
- Lee Smith, TDOT Traffic Operations Division Interim Director
- Lia Prince, TDOT Long Range Planning Division, Planning Manager
- Matt Meservy, TDOT Long Range Planning Division Director
- Melanie Murphy, FHWA TN Division, Transportation Planning Specialist
- Melissa Taylor, Chattanooga TPO Long Range Transportation Planning and Programming Director
- Michelle Nickerson, TDOT Traffic Design Division, Operations and Safety Section Manager
- Mike Conger, Knoxville Regional TPO Senior Transportation Engineer
- Sean Pfalzer, GNRC Transportation Planning Manager
- Sean Santalla, FHWA TN Division, Program Development Team Leader
- Stacy Morrison, TDOT Long Range Planning Division, Planning Manager
- Susannah Kniazewycz, TDOT Environmental Division Director
- Ted Kniazewycz, TDOT Structures Division Director
- Veda Nguyen, TDOT Multimodal Planning Division, Civil Engineering Manager
- Zachary Coleman, FHWA TN Division, Transportation Planning Specialist

Appendix B

CRS Survey Results

TDOT administered the CRS Survey to MPO and RPO members/stakeholders to identify preferred Focus Areas, project types, and additional project benefits. TDOT used the results of the survey to inform project prioritization efforts.

Survey respondents were asked to rate a series of strategies from 1 to 5, with 1 meaning they preferred that strategy least, and 5 meaning they preferred the strategy most. When responses were aggregated across the state, the most preferred strategy was TSMO. This was followed closely by Freight, Green Construction, and Transit. As seen in Figure 9, all eight strategies received a score between 3 and 4. The next section will highlight the three highest ranking Focus Areas or strategies.



Figure 9: Statewide CRS Strategy Preference

Transportation System Management and Operations Sub-Strategies

Respondents were asked to rate all TSMO sub-strategies on a similar scale of 1 to 5, with 1 meaning they preferred that sub-strategy least, and 5 meaning they preferred the sub-strategy most. Aggregated statewide, the most preferred sub-strategy was traffic flow. This was followed closely by strategies to monitor traffic flow and provision of traveler information (Figure 10).

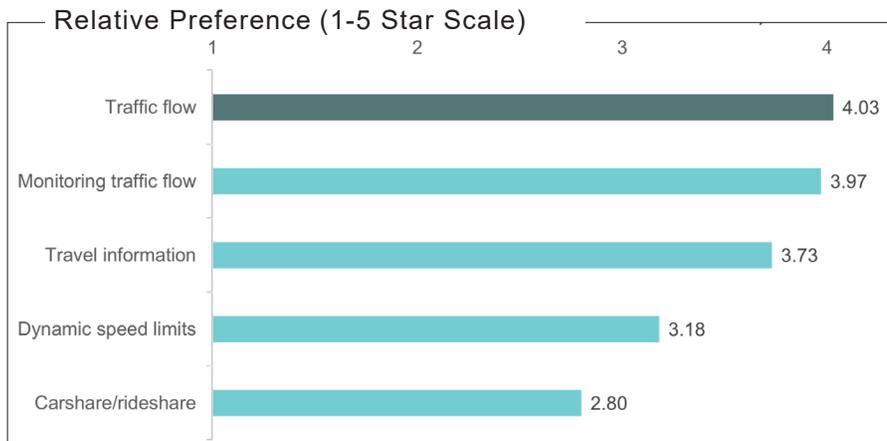


Figure 10: TSMO Sub-Strategy Preference

Freight Sub-Strategies

Respondents were asked to rate all Freight and goods movement sub-strategies on a similar scale of 1 to 5, with 1 meaning they preferred that sub-strategy least, and 5 meaning they preferred the sub-strategy most. Aggregated statewide, electrified truck stops were identified as the most preferred sub-strategy (Figure 11).

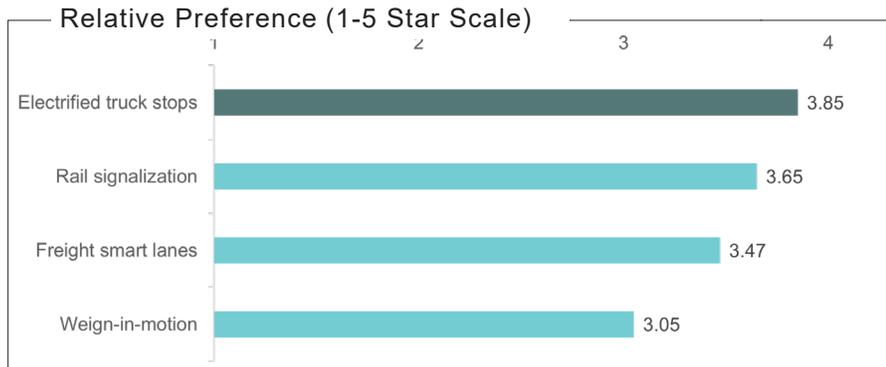


Figure 11: Freight and Goods Movement Sub-Strategy Preference

Green Construction Sub-Strategies

Respondents were asked to rate all Green Construction and maintenance sub-strategies on a similar scale of 1 to 5, with 1 meaning they preferred that sub-strategy least, and 5 meaning they preferred the sub-strategy most. Aggregated statewide, improved street lighting was identified as the most preferred Green Construction and maintenance sub-strategy (Figure 12).

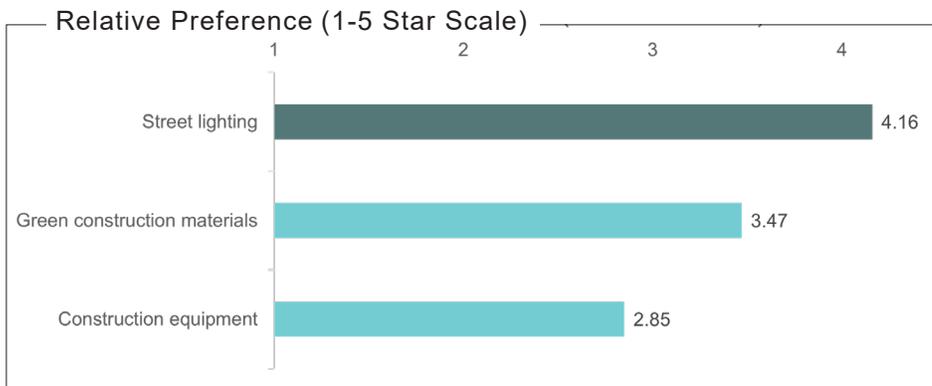


Figure 12: Green Construction Sub-Strategy Preference

Full Sub-Strategy Comparison

Respondents were also asked to rate their relative preference among all project strategies on a similar scale of 1 to 5, with 1 meaning they preferred that project least, and 5 meaning they preferred that project most. Aggregated statewide, improved street lighting was the most preferred, followed closely by walking and biking facilities (Figure 13).



Figure 13: Full Project Strategy Preference

Additional Carbon Reduction Benefits

Respondents were asked to rank a series of added benefits of carbon reduction strategies from most to least important. Aggregated statewide, roadway safety was identified as the most important added benefit of carbon reduction strategies. Figure 14 illustrates the average ranking for added benefit.

Ranking of Added Benefits of Carbon Reduction Strategies	
1.	Roadway Safety
2.	Congestion Management
3.	Air Quality
4.	System Resiliency
5.	Cost Effectiveness

Figure 14: Ranking Added Benefits

Respondent Demographics and Corresponding Preferences

Respondents were also asked for demographic and geographic information. The greatest number of surveys were collected from communities with between 5,000 and 50,000 residents. Preferences varied by the size of respondents' respective communities, with the smallest communities preferring Green Construction strategies, mid-sized communities preferring Freight and TSMO strategies, and the largest communities preferring Transit strategies. Preferences also varied based on geography; East Tennessee communities preferred Green Construction and TSMO strategies, Middle Tennessee preferred TSMO and TDM strategies, and West Tennessee preferred transit and alternative fuel strategies. One other notable finding was that walking and biking facilities were among the top five preferred sub-strategies regardless of community size or state division (Figure 15).

Key Survey Takeaways	
Community	Preferred Strategies
Smallest communities	Green Construction
Mid-sized communities	Freight and TSMO
Largest communities	Transit
Geography	Preferred Strategies
East Tennessee	Green Construction and TSMO
Middle Tennessee	TDM and TSMO
West Tennessee	Transit and Alternative Fuels
General	Preferred Strategies
Walking and biking facilities were among the top strategies regardless of community size or geography	

Figure 15: Key Demographic and Geographic Takeaways

Appendix C

Eligible Project and Program Types or Examples

This is a sample list of projects that could be eligible for CRP funds as long as they demonstrate a direct emissions benefit. The degree of difficulty rating was determined by data availability, ease of use for the technical tools, difficulty of technical analysis, and complexity of the project.

Potential Project		Focus Area	Emissions Estimate Tool	Degree of Difficulty
1	Complete Streets projects	Active Transportation	1. Estimate VMT reduction. 2. Apply emission rate to calculate benefits	Moderate
2	Greenway construction	Active Transportation	1. Estimate VMT reduction. 2. Apply emission rate to calculate benefits	Moderate
3	Sidewalk installation to separate pedestrians from motorists	Active Transportation	FHWA CMAQ toolkit (Bicycle and Pedestrian Improvements)	Moderate
4	Micromobility (Scooters, bikes)	Active Transportation	FHWA CMAQ toolkit (Bicycle and Pedestrian Improvements)	Moderate
5	Bike share program development	Active Transportation	FHWA CMAQ toolkit (Bicycle and Pedestrian Improvements)	Moderate
6	Mid-block crossing installation	Active Transportation	MOVES	Difficult
7	Non-motorized mid-block signals	Active Transportation	MOVES	Difficult
8	Bike/pedestrian safety awareness campaigns	Active Transportation	FHWA CMAQ toolkit (Bicycle and Pedestrian Improvements)	Difficult
9	Non-motorized wayfinding	Active Transportation	FHWA CMAQ toolkit (Bicycle and Pedestrian Improvements)	Difficult
10	Rails-to-trails development	Active Transportation	1. Estimate VMT reduction. 2. Apply emission rate to calculate benefits	Moderate
11	Install buffers between transportation modes within ROW	Active Transportation	FHWA CMAQ toolkit (Bicycle and Pedestrian Improvements)	Difficult
12	Bike lane ROW reconfiguration	Active Transportation	FHWA CMAQ toolkit (Bicycle and Pedestrian Improvements)	Easy
13	Install median refuge islands for non-motorized users	Active Transportation	FHWA CMAQ toolkit (Bicycle and Pedestrian Improvements)	Moderate
14	Sidewalk/greenway sweepers/maintenance equipment acquisition	Active Transportation	Apply on-road emission rates and use post-processing tool to calculate benefits	Easy

Potential Project		Focus Area	Emissions Estimate Tool	Degree of Difficulty
15	Installation of EV charging network	Alternative Fuels	FHWA CMAQ toolkit (Alternative Fuel Vehicles and Infrastructure)	Easy
16	Installation of temporary movable on-street parking charging units	Alternative Fuels	FHWA CMAQ toolkit (Electric Vehicles and EV Charging Infrastructure)	Easy
17	Diesel engine retrofits	Alternative Fuels	FHWA CMAQ toolkit (Diesel Truck and Engine Retrofit and Replacement)	Easy
18	Alternative fueling stations	Alternative Fuels	FHWA CMAQ toolkit (Alternative Fuel Vehicles and Infrastructure)	Moderate
19	Scenic electric byways program	Alternative Fuels	FHWA CMAQ toolkit (Alternative Fuel Vehicles and Infrastructure)	Moderate
20	Alternative fuel fleet vehicle replacement programs (EV, CNG, hydro, propane, BioDiesel)	Fleets and Facilities	FHWA CMAQ toolkit (Alternative Fuel Vehicles and Infrastructure)	Easy
21	Electric staff/job vehicles	Fleets and Facilities	FHWA CMAQ toolkit (Electric Vehicles and EV Charging Infrastructure)	Easy
22	Electric charging integrated into public parking facilities	Fleets and Facilities	FHWA CMAQ toolkit (Electric Vehicles and EV Charging Infrastructure)	Moderate
23	Bike parking at public facilities	Fleets and Facilities	FHWA CMAQ toolkit (Bicycle and Pedestrian Improvements)	Moderate
24	Bike lockers at public facilities	Fleets and Facilities	FHWA CMAQ toolkit (Bicycle and Pedestrian Improvements)	Moderate
25	Showers/lockers for active transport to public facilities	Fleets and Facilities	FHWA CMAQ toolkit (Bicycle and Pedestrian Improvements)	Moderate
26	Highway ROW energy facilities	Fleets and Facilities	FHWA CMAQ toolkit (Alternative Fuel Vehicles and Infrastructure)	Difficult
27	Carbon-reducing landscaping	Fleets and Facilities	ecoSmart Landscapes (USDA, UC Davis), U.S. Forest Carbon Calculation Tool (CCT) - Carbon Calculation Tool 4.0, CCTv40.exe	Moderate
28	Development and implementation of freight routing algorithms for municipal traffic	Freight	1. Estimate change in VMT. 2. Apply emission rates estimated by MOVES	Moderate
29	Dynamic intermodal connection systems - reduce idling; prioritize efficiency	Freight	FHWA CMAQ toolkit, Idling Reduction Savings Calculator (ANL)	Easy
30	Last-mile delivery networks	Freight	1. Estimate speed change. 2. Apply emission rates by speed bin estimated by MOVES	Moderate
31	Inductive loop freight measurement systems	Freight	1. Estimate speed change. 2. Apply emission rates by speed bin estimated by MOVES	Difficult
32	Weigh-in-motion freight systems	Freight	1. Estimate speed change. 2. Apply emission rates by speed bin estimated by MOVES	Easy
33	Truck stop parking and electrification or alt fuel (hydrogen, other)	Freight	FHWA CMAQ toolkit (Diesel Idle Reduction Strategies or Alternative Fuel Vehicles and Infrastructure)	Moderate

Potential Project		Focus Area	Emissions Estimate Tool	Degree of Difficulty
34	Dedicated freight smart lanes	Freight	1. Estimate speed change. 2. Apply emission rates by speed bin estimated by MOVES	Easy
35	Replace street lighting and traffic control devices with energy-efficient alternatives	Green Construction	Number of traffic signals upgraded and type of fixture	Easy
36	Construction utilizing recycled materials (Sustainable pavements technologies, Repurposed concrete)	Green Construction	Construction Carbon Calculator	Easy/Moderate
37	ROW planting for biologic carbon sequestration practices	Green Construction	ecoSmart Landscapes (USDA, UC Davis)	Easy
38	Lower-emissions construction equipment	Green Construction	FHWA CMAQ toolkit (Non-Road Construction and Intermodal Equipment)	Easy
39	Materials specification guide (lower emissions materials list)	Green Construction	Construction Carbon Calculator, EPD list	Difficult
40	Dust mitigation	Green Construction	FHWA CMAQ toolkit (Dust Mitigation)	Easy
41	Investment in public transportation systems to reduce reliance on private vehicles	TDM	FHWA CMAQ toolkit (Transit Bus Upgrades and System Improvements, Bicycle and Pedestrian Improvements, Transit Bus Service and Fleet Expansion)	Easy
42	Transit/vanpool/carpool subsidy programs	TDM	FHWA CMAQ toolkit (Carpooling and Vanpooling)	Easy
43	Bike/walk subsidy programs	TDM	FHWA CMAQ toolkit (Bicycle and Pedestrian Improvements)	Moderate
44	Regional rideshare website/network	TDM	FHWA CMAQ toolkit (Carpooling and Vanpooling)	Easy
45	Parking reconfiguration - reconfigure/reduce/expand	TDM	1. Estimate VMT increase/reduction. 2. Apply emission rates estimated by MOVES	Moderate
46	Vanpool program	TDM	FHWA CMAQ toolkit (Carpooling and Vanpooling)	Easy
47	Education and outreach of transportation options	TDM	FHWA CMAQ toolkit (Carpooling and Vanpooling)	Easy
48	Incentives to encourage mode shift away from drive alone	TDM	FHWA CMAQ toolkit (Carpooling and Vanpooling)	Easy
50	Remote work consultations and services	TDM	1. Estimate VMT reduction. 2. Apply emission rates estimated by MOVES	Moderate
51	Choice Lane discount programs	TDM	FHWA CMAQ toolkit (Managed Lanes)	Moderate
52	Park and ride lots	TDM	1. Estimate VMT reduction. 2. Apply emission rate to calculate benefits (MOVES)	Easy
53	Mass transit (rail, BRT, regional commuter bus, etc.)	Transit	FHWA CMAQ toolkit (Transit Bus Upgrades and System Improvements)	Easy

Potential Project		Focus Area	Emissions Estimate Tool	Degree of Difficulty
54	Electric transit vehicle acquisition	Transit	FHWA CMAQ toolkit (Electric Vehicles and EV Charging Infrastructure)	Easy
55	Transit stop and station enhancements	Transit	1. Estimate speed change. 2. Apply emission rates by speed bin estimated by MOVES	Difficult
56	Electric paratransit vehicle acquisition	Transit	FHWA CMAQ toolkit (Electric Vehicles and EV Charging Infrastructure)	Easy
57	Priority transit lanes	Transit	1. Estimate speed change. 2. Apply emission rates by speed bin estimated by MOVES	Moderate
58	Transit charging stations	Transit	FHWA CMAQ toolkit (Alternative Fuel Vehicles and Infrastructure)	Easy
59	Multimodal transit connection improvements	Transit	FHWA CMAQ toolkit (Transit Bus Upgrades and System Improvements, Bicycle and Pedestrian Improvements, Transit Bus Service and Fleet Expansion)	Easy
60	Transit marketing and amenity improvements	Transit	1. Estimate speed change. 2. Apply emission rates by speed bin estimated by MOVES	Difficult
61	Light rail network and station development	Transit	1. Estimate speed and VMT change. 2. Apply emission rates by speed bin estimated by MOVES	Moderate
62	Public service announcements and campaigns - transit	Transit	1. Estimate VMT change. 2. Apply emission rates by speed bin estimated by MOVES	Difficult
63	Implementation of energy-efficient traffic signals	TSMO	Energy reduction and GHG Equivalencies Calculator (EPA)	Moderate
64	Carshare parking, lanes, and program development	TSMO	FHWA CMAQ toolkit (Carpooling and Vanpooling)	Moderate
65	Implementation and operation of smart traffic systems	TSMO	FHWA CMAQ toolkit (Travel Advisories)	Difficult
66	Connected Vehicles	TSMO	FHWA CMAQ toolkit (Travel Advisories)	Difficult
67	Dynamic speed limit systems	TSMO	FHWA CMAQ toolkit (Travel Advisories)	Difficult
68	Dynamic parking pricing/reservation systems (trucks or passenger cars)	TSMO	Reduction of VMT; Reduction of truck idling	Difficult
69	Transit priority signal systems	TSMO	1. Estimate speed change. 2. Apply emission rates by speed bin estimated by MOVES	Difficult
70	Non-motorized priority signal systems	TSMO	1. Estimate speed change. 2. Apply emission rates by speed bin estimated by MOVES	Difficult
71	New Choice Lanes	TSMO	FHWA CMAQ toolkit (Managed Lanes)	Easy
72	Dynamic warning systems/digital signs	TSMO	FHWA CMAQ toolkit (Travel Advisories)	Moderate

Potential Project		Focus Area	Emissions Estimate Tool	Degree of Difficulty
73	Dynamic emergency vehicle routing systems	TSMO	FHWA CMAQ toolkit (Travel Advisories) or 1. Estimate VMT reduction. 2. Apply emission rate to calculate benefits (MOVES)	Moderate
74	Dynamic traffic incident management systems	TSMO	FHWA CMAQ toolkit (Travel Advisories) or 1. Estimate VMT reduction. 2. Apply emission rate to calculate benefits (MOVES)	Moderate
75	Conversion of slip lanes to turning lanes	TSMO	FHWA CMAQ toolkit (Congestion Reduction and Traffic Flow Improvements) or 1. Capacity analysis to estimate speed change. 2. Apply emission rates by speed bin estimated by MOVES	Easy
76	Intersection safety improvements	TSMO	FHWA CMAQ toolkit (Congestion Reduction and Traffic Flow Improvements) or 1. Capacity analysis to estimate speed change. 2. Apply emission rates by speed bin estimated by MOVES	Easy
77	Chicanes and speed tables	TSMO	1. Capacity analysis to estimate speed change (delay reduction). 2. Apply emission rates by speed bin estimated by MOVES	Easy
78	Lane reconfiguration/removal/addition	TSMO	FHWA CMAQ toolkit (Congestion Reduction and Traffic Flow Improvements) or 1. Capacity analysis to estimate speed change. 2. Apply emission rates by speed bin estimated by MOVES	Easy
79	Access management - driveway removal/access road improvements	TSMO	1. Capacity analysis to estimate speed change (delay reduction). 2. Apply emission rates by speed bin estimated by MOVES	Moderate
80	Service patrol expansion	TSMO	1. Estimate delay reduction. 2. Apply emission rate to calculate benefits (MOVES)	Moderate
81	Integrated Corridor Management, including active freeway management and active arterial management (single corridor)	TSMO	FHWA CMAQ toolkit (multiple calculators) or apply emission rates estimated by MOVES	Moderate
82	Congestion pricing system	TSMO	1. Capacity analysis to estimate speed change. 2. Traffic simulation to estimate VMT change. 3. Apply emission rates by speed bin estimated by MOVES	Difficult
83	Traffic circle installation	TSMO	FHWA CMAQ toolkit (Congestion Reduction and Traffic Flow Improvements)	Easy
84	On demand cars/rideshare service	TSMO	1. Estimate VMT reduction. 2. Apply emission rate to calculate benefits (MOVES)	Moderate
85	Real-time traveler information system	TSMO	FHWA CMAQ toolkit (Travel Advisories)	Easy
86	Ramp metering	TSMO	1. Estimate delay reduction. 2. Apply emission rate to calculate benefits (MOVES)	Moderate

Appendix D

Programmed Projects

Project #	Pin #	Project Name	Project Phase	Focus Area	CRP Funding Amount	Funding Year	MPO/RPO	County	City	Population Category	
1	CHC HCAQIMROVE	Hamilton County Traffic Signals project	Purchase	TSMO	1,658,554	2023	Chattanooga	Hamilton	Chattanooga	>200K	
2	CHC HCAQIMROVE	Hamilton County Electrification project	Purchase	Fleets and Facilities	829,277	2024	Chattanooga	Hamilton	Chattanooga	>200K	
3	CHC HCAQIMROVE	Hamilton County Electrification project	Purchase	Fleets and Facilities	829,277	2025	Chattanooga	Hamilton	Chattanooga	>200K	
4	CHC HCAQIMROVE	Hamilton County Electrification project	Purchase	Fleets and Facilities	829,277	2026	Chattanooga	Hamilton	Chattanooga	>200K	
5	2017-47-029	125507	Smyrna ITS Phases 3, 4, and 5	Construction	TSMO	1,416,792	2023	Nashville-Davidson	Rutherford County	Smyrna	>200K
6	23-2014-042	120004	Traffic Control Equipment Upgrade-purchase	Construction	TSMO	812,000	2025	Knoxville	Knox	Knoxville	>200K
7	23-2017-011	128777.01	East Knox Greenway - Phase 1 ROW - greenway	ROW	Active Transportation	400,000	2023	Knoxville	Knox	Knoxville	>200K
8	23-2017-006	130845	Maryville to Townsend Greenway - Phase 1 ROW greenway	ROW	Active Transportation	1,264,000	2023	Knoxville	Blount	Maryville	>200K
9	23-2023-305		South Knoxville Bridge Greenway	Construction	Active Transportation	890,400	2024	Knoxville	Knox	Knoxville	>200K
10	23-2023-305		Fort Sanders Neighborhood to Tyson Park Connection	Construction	Active Transportation	1,900,000	2026	Knoxville	Knox	Knoxville	>200K
11	CMAQ-2023-01		Fast Charging Network and Fleet Conversion to Electric Vehicles	Purchase/Construction	Fleets and Facilities	2,400,000	2023	Memphis	Shelby	Memphis	>200K
12	CMAQ-2023-01		Georgia Ave At Riverside Dr Intersection Improvements	Construction	TSMO	777,062	2023	Memphis	Shelby	Memphis	>200K
13	STP-M-2009-004		Wolf River Greenway - Phase 15	ROW	Active Transportation	522,266	2023	Memphis	Shelby	Memphis	>200K

Project #		Pin #	Project Name	Project Phase	Focus Area	CRP Funding Amount	Funding Year	MPO/RPO	County	City	Population Category
14	STP-M-2009-004		Chiswood Street Pedestrian Safety	ROW	Active Transportation	41,384	2023	Memphis	Shelby	Memphis	>200K
15	CLK 50	127899	Wilma Rudolph Blvd	Construction	TSMO	560,000	2023	Clarksville	Montgomery	Clarksville	50K to 200K
16	2018-01	125182.01	Sidewalks on 25th St	Construction	Active Transportation	559,788	2024	Cleveland	Bradley	Cleveland	50K to 200K
17	JCM 2023-18		ITS Fiber Optic Expansion		TSMO	40,000	2024	Johnson City	Washington	Johnson City	50K to 200K
18	JCM 2023-18		ITS Fiber Optic Expansion		TSMO	40,000	2024	Johnson City	Washington	Johnson City	50K to 200K
19	JCM 2023-18		ITS Fiber Optic Expansion		TSMO	680,000	2024	Johnson City	Washington	Johnson City	50K to 200K
20	KPT-2015-002	123325	Main Street Kingsport Rebuild		Active Transportation	858,648	2024	Kingsport	Sullivan	Kingsport	50K to 200K
21	LAM 1003	127267	E Morris Blvd	PE-N/PE-D/ROW/ CONST	TSMO	326,653	2023	Morristown	Hamblen	Morristown	50K to 200K
22	LAM 1010	127680	Central Church Rd improvements	PE-N/PE-D/ROW/ CONST	TSMO	175,039	2026	Morristown	Hamblen	Morristown	50K to 200K
23	LAM 3022		Old Andrew Johnson Hwy	PE-N/PE-D/ROW/ CONST	TSMO	168,242	2024	Morristown	Jefferson	Jefferson City	50K to 200K
24	LAM 3022		Old Andrew Johnson Hwy	PE-N/PE-D/ROW/ CONST	TSMO	171,607	2025	Morristown	Jefferson	Jefferson City	50K to 200K
25	2017-47-019	125505	Rutherford Boulevard Adaptive Signal Control Technology	Construction	TSMO	737,166	2023	Murfreesboro	Rutherford	Murfreesboro	50K to 200K
26	23-2017-053	127949	Oak Ridge Turnpike from Illinois Ave	Implementation	TSMO	2,573,400	2023	East TN North	Anderson	Oak Ridge	5K to <50K