

State of Tennessee's Beneficiary Mitigation Plan

Volkswagen Settlement Environmental Mitigation Trust

***Prepared by the Tennessee Department of
Environment and Conservation***

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The following represents the State of Tennessee's Beneficiary Mitigation Plan under the Volkswagen Environmental Mitigation Trust. Learn more about the Volkswagen Environmental Mitigation Trust at <https://www.tn.gov/environment/VWSettlement>.

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ACRONYMS AND ABBREVIATIONS

BEV	Battery Electric Vehicle
BMP	Beneficiary Mitigation Plan
CARB	California Air Resources Board
CNG	Compressed natural gas
DBI	Disproportionate Burden Index
DCFC	Electric vehicle direct current fast charging
DERA	Diesel Emission Reduction Act
DEQ	Diesel Emissions Quantifier
DHS	United States Department of Homeland Security
DOE	United States Department of Energy
DOI	United States Department of Interior
DOJ	United States Department of Justice
EMAs	Eligible Mitigation Actions
EMT	Environmental Mitigation Trust
EPA	United States Environmental Protection Agency
EPB	Electric Power Board of Chattanooga
EV	Electric vehicle
EVSE	Electric vehicle supply equipment
FCEV	Fuel Cell Electric Vehicle
FHWA	Federal Highway Administration
GVWR	Gross Vehicle Weight Rating
HEV	Hybrid Electric Vehicle
L1	Level 1 electric vehicle charging
L2	Level 2 electric vehicle charging
MPa	Megapascals
MTA	Metropolitan Transit Authority
NAAQS	National Ambient Air Quality Standards
NEI	National Emissions Inventory
NO _x	Nitrogen oxides
OEM	Original Equipment Manufacturer
ORNL	Oak Ridge National Laboratory
PEV	Plug-in Electric Vehicle
PHEV	Plug-in Hybrid Electric Vehicle
PM _{2.5}	Particulate matter less than 2.5 micrometers in diameter
RE-X	Range-Extended Electric Vehicle
RFI	Request for Information
The State	State of Tennessee
State Trust Agreement	Environmental Mitigation Trust for State Beneficiaries
TAC	Technical Advisory Committee
TDEC	Tennessee Department of Environment and Conservation
TDEC Email List	VW Environmental Mitigation Trust email list
TDEC Webpage	TDEC's public-facing VW Settlement webpage
TDOT	Tennessee Department of Transportation

TED	Trust Effective Date
TVA	Tennessee Valley Authority
USDA	United States Department of Agriculture
VW	Volkswagen Group and associated companies
VW Settlement	Volkswagen Clean Air Act Civil Settlement
ZEV	Zero Emission Vehicle

I. INTRODUCTION

A. Overview of the Volkswagen Settlement

In 2015, Volkswagen (VW) publicly admitted that it had secretly and deliberately installed a defeat device—software designed to cheat emissions tests and deceive federal and state regulators—in approximately 590,000 model year 2009 to 2016 motor vehicles containing 2.0 and 3.0 liter diesel engines. The United States Department of Justice (DOJ) filed a complaint against VW, alleging that the company had violated the Clean Air Act. In October 2016 and May 2017, the U.S. District Court, Northern District of California (“Court”), approved two partial settlements related to the affected 2.0 and 3.0 liter vehicles, respectively, totaling \$14.9 billion (“the VW Settlement”).

The VW Settlement will be implemented through the First Partial Consent Decree and Second Partial Consent Decree.¹ Under these consent decrees, VW has agreed to: (1) dedicate \$10 Billion to the recall of at least 85% of the affected 2.0 and 3.0 liter vehicles; (2) invest \$2 Billion in zero-emission vehicle infrastructure and promotion (“Zero Emission Vehicle Investment Plan”); and (3) establish a \$2.9 Billion Environmental Mitigation Trust (EMT) to mitigate the environmental effects of the excess nitrogen oxide (NO_x) emissions from the affected vehicles.

B. Overview of the Environmental Mitigation Trust

In March 2017, the Court appointed Wilmington Trust, N.A. as Trustee of the EMT, and in October 2017, the Court approved two Trust Agreements for Beneficiaries: one for the 50 states, the District of Columbia, and the Commonwealth of Puerto Rico (“State Trust Agreement”)², and one for the separate allocation for federally recognized Indian tribes in the U.S. The State of Tennessee (“the State”) officially became a Beneficiary of the EMT on January 29, 2018,³ allowing the State to fund Eligible Mitigation Actions (EMAs), as defined in the First Partial Consent Decree and State Trust Agreement,⁴ that comply with the State’s Beneficiary Mitigation Plan (BMP). The State’s initial allocation⁵ under the State Trust is \$45,759,914.40. To date, Volkswagen has funded two-thirds of the State EMT. The Trust will be fully funded in November 2018.

The State will strive to have no less than 80% of its initial allocation obligated well in advance of the 10th anniversary of the Trust Effective Date (TED) of October 2, 2017. On that date, a Beneficiary may request a supplemental allocation by filing with the Court and submitting to the Trustee a report that demonstrates it has obligated at least 80% of funds allocated to it.⁶ This

¹ First Partial Consent Decree, <https://www.epa.gov/sites/production/files/2016-06/documents/vwpartialsettlement-cd.pdf>; Second Partial Consent Decree, <https://www.epa.gov/sites/production/files/2016-12/documents/30literpartialconsentdecree.pdf>.

² State Trust Agreement, https://www.tn.gov/content/dam/tn/environment/energy/documents/vw-resources/Dkt_51-1_State_Beneficiary_Trust_Agreement.pdf.

³ Wilmington Trust filed the Notice of Beneficiary Designation with the court on January 29, 2018. [https://www.vwenvironmentalmitigationtrust.com/pdfs/Dkt%204700%20Notice%20of%20Beneficial%20Designation%20\(State%20Trust\).pdf](https://www.vwenvironmentalmitigationtrust.com/pdfs/Dkt%204700%20Notice%20of%20Beneficial%20Designation%20(State%20Trust).pdf).

⁴ State Trust Agreement, App’x D-2, https://www.tn.gov/content/dam/tn/environment/energy/documents/vw-resources/Dkt_51-1_State_Beneficiary_Trust_Agreement.pdf. (For ease of reference, Appendix D-2 of the State Trust Agreement is attached to this document as Appendix 1.)

⁵ Should VW fail to achieve the National Recall Rate Target, it must pay monetary penalties, which will be invested in the EMT. (First Partial Consent Decree, App’x A ¶ 6.3; Second Partial Consent Decree, App’x A ¶ 10.3.) These EMT payments shall be allocated among Beneficiaries as noted in the State Trust Agreement. (State Trust Agreement, ¶ 5.0.3 and 5.0.4.)

⁶ *Id.*, ¶ 5.4.2.

supplemental allocation will be determined by dividing the “Remainder Balance” between those determined to be “Supplemental Funding Eligible Beneficiaries.”⁷ Not later than the 15th anniversary of the TED, unused Beneficiary funds shall be returned to the Trust. The final disposition of Trust assets will be distributed in accordance with the State Trust Agreement.⁸

This document (i.e., *State of Tennessee’s Beneficiary Mitigation Plan*) focuses on the State Trust Agreement, which sets forth the roles and responsibilities of the Court-approved Trustee, as well as the EMAs and Mitigation Action Expenditures that Beneficiaries may fund with their EMT allocations. Pursuant to ¶ 4.1 of the State Trust Agreement, each Beneficiary shall submit to the Trustee and make publicly available a BMP. The BMP must be submitted by a Beneficiary to the Trustee no later than 30 days prior to submitting its first funding request.

C. Elements of a Beneficiary Mitigation Plan

The BMP must explain the process by which the Beneficiary shall seek and consider public input on its BMP and summarize how the Beneficiary plans to use its allocation, specifically addressing the following:

- (1) the process by which the Beneficiary will seek and consider public input regarding its BMP;
- (2) the Beneficiary’s overall goal for the use of the funds;
- (3) the EMA categories the Beneficiary anticipates will be appropriate to achieve the stated goals;
- (4) a preliminary assessment of the percentages of funds anticipated to be used for each EMA category;
- (5) a general description of the expected ranges of emission benefits the Beneficiary estimates would be realized by implementation of the EMAs identified in the BMP;
- (6) a description of how the Beneficiary will consider the potential beneficial impact of the selected EMAs on air quality in areas that bear a disproportionate share of the air pollution burden within the Beneficiary’s jurisdiction.⁹

The BMP is “intended to provide the public with insight into a Beneficiary’s high-level vision for use of the mitigation funds and information about the specific uses for which funding is expected to be requested.”¹⁰ The State Trust Agreement notes that the BMP “need only provide the level of detail reasonably ascertainable at the time of submission.”¹¹ The State Trust Agreement further provides that the BMP is not binding on any Beneficiary, and it does not create rights in any person to claim an entitlement of any kind. As such, Beneficiaries have the flexibility to adjust their goals and specific spending plans at their discretion. If Beneficiaries elect to make adjustments, they must provide the Trustee with updates to their BMP.¹²

⁷ *Id.*, ¶¶ 5.4.1, 5.4.3-4.

⁸ *Id.*, ¶ 5.4.5.

⁹ *Id.*, ¶ 4.1.

¹⁰ *Id.*

¹¹ *Id.*

¹² *Id.*

The *State of Tennessee's Beneficiary Mitigation Plan* meets the requirements of the First and Second Partial Consent Decrees and the State Trust Agreement. Sections II through VI below address the aforementioned elements of a BMP.

II. THE STATE'S APPROACH TO DEVELOPMENT OF A BENEFICIARY MITIGATION PLAN

Following Governor Haslam's designation of the Tennessee Department of Environment and Conservation (TDEC) as the Lead Agency¹³ for administering the State's VW EMT allocation, TDEC formed a multidisciplinary Technical Advisory Committee (TAC) to develop a BMP. The TAC is comprised of representatives from the following TDEC divisions: Air Pollution Control; Office of Energy Programs; Office of Policy and Sustainable Practices; and Office of General Counsel. These representatives possess broad subject matter expertise on topics including, but not limited to: air pollution and vehicle emissions; transportation fuels, transit, electric vehicles (EVs), and EV charging infrastructure; environmental law; environmental policy; and grant program development and administration.

From the third quarter of 2017 through April 2018, TDEC's TAC met on a bi-weekly basis to contemplate issues germane to the development of the State's BMP and consequent programs through which the State's EMT allocation will be disbursed. Specifically, topics and issues addressed by the TAC have included or will include:

- Mandatory BMP elements noted in Section I.C. of this document;
- Definitions of additional terms not defined within Appendix D-2 of the State Trust Agreement, for purposes of the State's BMP; and
- Program design considerations.

TDEC's TAC has engaged in regular interactions with the Governor's Office and relevant peer State agencies to apprise them of developments relating to the EMT, TDEC's process for developing the State's BMP, and the types of EMAs that can be funded by the State's EMT allocation. TDEC has also provided ample opportunities for interested stakeholders and the public to provide input regarding TDEC's administration of the State's EMT allocation. A more detailed description of these efforts is provided in Section III.

In December 2017, the National Association of State Energy Officials and the National Association of Clean Air Agencies launched a VW Settlement Working Group to enable state-to-state communication related to the EMT. TDEC has engaged in this Working Group and will continue to do so in order to remain informed as to the activities and plans of other state Beneficiaries, as well as to confer with other Beneficiaries regarding the development of related programs.

III. SOLICITATION AND CONSIDERATION OF PUBLIC INPUT

In November 2017, the State filed with the U.S. District Court and submitted to the Trustee its *Certification for Beneficiary Status Under Environmental Mitigation Trust Agreement* ("Certification Form").¹⁴ The Certification Form detailed the process by which public input would be solicited and

¹³ *Id.*, ¶ 4.2.1.

¹⁴ Certification Form, [https://www.tn.gov/content/dam/tn/environment/energy/documents/vw-resources/Tennessee%20Appendix%20D-3%20form%20\(executed%20and%20filed\).pdf](https://www.tn.gov/content/dam/tn/environment/energy/documents/vw-resources/Tennessee%20Appendix%20D-3%20form%20(executed%20and%20filed).pdf).

considered for the BMP, as required by the State Trust Agreement.¹⁵ The following subsections include this information and also detail TDEC's public involvement and participation strategies and efforts, from both general and VW Settlement-specific standpoints.

A. TDEC's Overall Approach to Public Involvement and Participation

TDEC aims to provide opportunities for the meaningful involvement in and access to its programs and services for all people regardless of race, color, national origin, or income. TDEC accomplishes equitable and meaningful involvement of all Tennesseans through several strategies:

- Engaging the public to raise awareness of TDEC projects or services and to provide stakeholders with a meaningful opportunity to provide input during the decision-making process;
- Hosting public meetings/hearings in centralized locations and at times accessible to the community, such as evenings or on weekends;
- Collaborating with the TDEC Office of Communications to share relevant information with local media resources and minority newspapers;
- Utilizing the community contacts maintained by the Regional Directors of TDEC's Office of External Affairs and various other TDEC Divisions;
- Accommodating vulnerable or minority communities by utilizing language assistance services for Limited English Proficiency individuals and groups when necessary; and
- Hosting "Enhancing Engagement in Your Community" conversations across the state, which serve as opportunities for TDEC to learn how to improve its outreach within underserved and/or underrepresented communities and to enhance opportunities for communities to provide input on TDEC programming.

These strategies have been an essential part of the development of the State's BMP. TDEC will continue to employ these strategies as it releases information on future funding opportunity announcements and project solicitations related to the VW Settlement EMT.

B. TDEC Webpage and Email List

In the fall of 2016, TDEC created a public-facing webpage ("TDEC Webpage"), which is accessible at <https://www.tn.gov/environment/program-areas/energy/state-energy-office--seo/tennessee-and-the-volkswagen-diesel-settlement/faqs.html>. The TDEC Webpage was created and is maintained for the following purposes:

- (1) to inform Tennesseans about the VW Settlement;
- (2) to share information regarding the State's approach to stakeholder outreach and use of mitigation funds available to the State under the EMT (for example, the TDEC Webpage includes Frequently Asked Questions¹⁶ and provides links to numerous resources such as the Environmental Protection Agency's (EPA's) and DOJ's related webpages¹⁷ and to the Trustee Public Website);

¹⁵ State Trust Agreement, ¶¶ 4.1-4.2, App'x D-3.

¹⁶ <https://www.tn.gov/environment/program-areas/energy/state-energy-office--seo/tennessee-and-the-volkswagen-diesel-settlement/faqs.html>.

¹⁷ <https://www.tn.gov/environment/program-areas/energy/state-energy-office--seo/tennessee-and-the-volkswagen-diesel-settlement/resources.html>.

- (3) to provide notice to the general public regarding public information sessions and/or webinars related to the VW Settlement, EMT, and/or BMP, as appropriate; and
- (4) to provide a standardized and centralized method for soliciting and receiving comments and input from the general public regarding the development of a BMP.

TDEC will continue to add and/or update information and resources to the TDEC Webpage as such information becomes available. Additionally, TDEC has also established and will continue to maintain a VW EMT email list ("TDEC Email List").¹⁸ TDEC has and will continue to utilize the TDEC Email List when sending out updates regarding TDEC's EMT efforts, including, but not limited to, the scheduling of public information sessions, the release of proposed and final BMPs, and the release of project solicitations. The public may request to be added to this email list through a link on the TDEC Webpage¹⁹, via email, or in-person.

C. Public Comments Received through January 2018

TDEC developed a web-based form to allow interested stakeholders to submit comments regarding the State's utilization of its EMT allocation.²⁰ Specifically, TDEC sought input on the EMA categories that the State should consider as well as the percentage of funds to dedicate to each category. TDEC accepted public comments via the Public Comment Form, as well as directly through email or phone from October 2016 through January 2018. (For more details regarding the Public Comment Form, please see Appendix 2.) All public comments were to have been received by 11:59 pm Central on January 16, 2018 to be considered for the proposed BMP. TDEC reviewed and considered all comments received by this date.²¹

By January 16, 2018, TDEC had received comments from 145 total respondents, representing 121 unique entities. These entities provided advocacy, business, government, higher education, individual, and other perspectives on how the State should administer its EMT allocation. All commenters were added to the TDEC Email List so that they would be kept apprised of any future and related announcements.

D. Request for Information Regarding Eligible Mitigation Action Category Costs

On December 12, 2017, TDEC released a Request for Information (RFI) to seek cost information on EMAs, in order to inform TDEC's BMP planning process. Responses were due to TDEC by January 23, 2018. All RFI respondents were added to the TDEC Email List so that they would be kept apprised of any future and related VW Settlement announcements. TDEC received cost information from 34 distinct entities.

¹⁸ <https://signup.e2ma.net/signup/1843437/1737620/>.

¹⁹ *Ibid.*

²⁰ <https://www.tn.gov/environment/program-areas/energy/state-energy-office--seo-/tennessee-and-the-volkswagen-diesel-settlement/presentations-and-upcoming-events.html>.

²¹ Certification Form, 7.(ii), [https://www.tn.gov/content/dam/tn/environment/energy/documents/vw-resources/Tennessee%20Appendix%20D-3%20form%20\(executed%20and%20filed\).pdf](https://www.tn.gov/content/dam/tn/environment/energy/documents/vw-resources/Tennessee%20Appendix%20D-3%20form%20(executed%20and%20filed).pdf).

E. Presentations and Public Information Sessions to Date

TDEC has participated as a speaker at various state and local conferences, forums, webinars, and other meetings to inform the general public about the VW Settlement, the EMT, and the development of the State's BMP. (A comprehensive listing of this public engagement activity to date is included in Appendix 2.)

In the winter of 2017, TDEC organized a series of five VW Settlement public information sessions, which were held in Nashville, Knoxville, Memphis, Chattanooga, and online via webinar.²² A recording and copy of the webinar presentation slides were subsequently added to the TDEC Webpage for public reference.²³ These meetings provided an overview of the VW Settlement, the EMT, TDEC's process for developing a proposed BMP, and the types of EMAs that can be funded by the State's EMT allocation. All of these public information sessions were free and open to the public.

The public information sessions provided TDEC with an opportunity to solicit public comments and input regarding the development of a BMP. With regard to questions that were received during the public information sessions, TDEC responded to all session questions either in person or by follow-up email. These questions and answers were subsequently added to the TDEC Webpage.²⁴

F. Public Comments Received During Proposed BMP Comment Period

In conjunction with the release of the proposed BMP to the public on July 17, 2018, TDEC uploaded a recorded presentation to the TDEC Webpage that addressed the various sections of the State's proposed BMP. The public was encouraged to submit comments via a public comment form accessible online or via email. Following the close of a thirty (30 day) public comment period on August 17, 2018, all comments and input received were reviewed and considered by TDEC personnel.

TDEC received comments from 44 respondents, each representing a unique entity. As with the first public comment period addressed in Section III. C., these entities provided advocacy, business, government, individual, and other perspectives. All commenters were added to the TDEC Email List so that they will be kept apprised of any future and related announcements.

As a result of the feedback received, the final BMP incorporates the following revisions:

(1) Due to expected NOx emissions reductions from Alternate Fueled and All-Electric projects being higher than expected NOx emissions reductions from new diesel projects, the State will prioritize funding for Alternate Fueled and All-Electric vehicle Repower and/or replacement projects under the Class 4-7 Local Freight Trucks and Class 8 Local Freight Trucks and Port Drayage Trucks EMA categories as well as under the Class 4-8 School Bus EMA sub-category.

²² <https://www.tn.gov/environment/program-areas/energy/state-energy-office--seo/tennessee-and-the-volkswagen-diesel-settlement/presentations-and-upcoming-events.html>.

²³ *Ibid.*

²⁴ <https://www.tn.gov/content/dam/tn/environment/energy/documents/vw-resources/All%20VW%20Public%20Info%20Session%20QA.pdf>.

(2) Due to confirmed commercial viability, Repowers of eligible Class 4-8 Transit and Shuttle Buses with any new All-Electric engine shall be considered eligible. All other Repowers under this EMA sub-category will not be considered eligible.

These revisions and any related recalculations are addressed in Section V.

IV. OVERALL GOAL FOR USE OF THE STATE'S ALLOCATION

The purpose of the EMT is to execute environmental mitigation projects that reduce emissions of NOx.²⁵ In accordance with the EMT goal, the State's overall goal in administering its EMT allocation is to reduce NOx emissions by targeting the largest contributors of mobile NOx emissions in Tennessee: the on-road, diesel heavy duty sector (33% of mobile NOx emissions) and the on-road, non-diesel light duty sector (40% of mobile NOx emissions).²⁶ As NOx emissions contribute to the formation of ozone and particulate matter, reductions in NOx emissions will assist in the State's efforts to maintain compliance with the National Ambient Air Quality Standard (NAAQS)²⁷ for Ozone and Particulate Matter less than 2.5 micrometers in diameter (PM_{2.5}).

In furtherance of this goal, the TDEC TAC has considered and will continue to consider the following guiding principles when making decisions regarding the State's EMT allocation:

- The State will fulfill its obligations under the Clean Air Act and the Tennessee Air Quality Act by working to ensure attainment and maintenance with the NAAQS.
- The State will attempt to generate health benefits through improved air quality for all Tennesseans, ensuring that such benefits also inure to vulnerable populations (e.g., low income, minority, elderly, and youth) and geographic areas that experience disproportionate levels of air pollutants.
- The State will endeavor to support local government and business economies, including those in Distressed Counties,²⁸ by offsetting the cost of new and cleaner vehicle and transportation technologies.
- The State will be good stewards of public resources by leveraging non-EMT funding sources.
- The State will select categories that maximize the diversity and potential quantity of eligible applicants.
- The State will solicit projects that are both commercially viable and are of interest to eligible applicants.
- The State will attempt to strengthen emergency preparedness and the resiliency of the transportation sector through diversity of fuel and project types by spurring public and private investment in zero emission and alternative fuel vehicles.

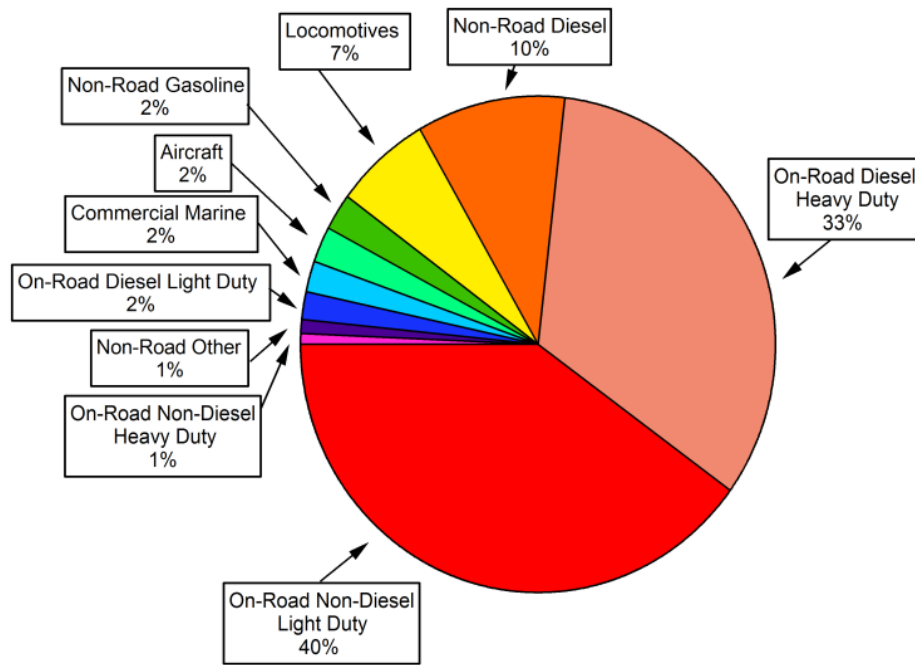
²⁵ State Trust Agreement at p. 1 ("Purpose and Recitals"), https://www.tn.gov/content/dam/tn/environment/energy/documents/vw-resources/Dkt_51-1_State_Beneficiary_Trust_Agreement.pdf.

²⁶ See Figures 1 and 2, National Emissions Inventory (2014). The National Emissions Inventory is released every three years based on data provided by State, local, and tribal air agencies for sources in their jurisdictions and supplemented by data developed by the U.S. EPA. The second version of the 2014 National Emissions Inventory, which was published on February 6, 2018, contains the most recent data available at the time this document was released to the public.

²⁷ For a comprehensive listing of the NAAQS for Ozone and PM_{2.5}, please see <https://www.epa.gov/criteria-air-pollutants/naaqs-table>.

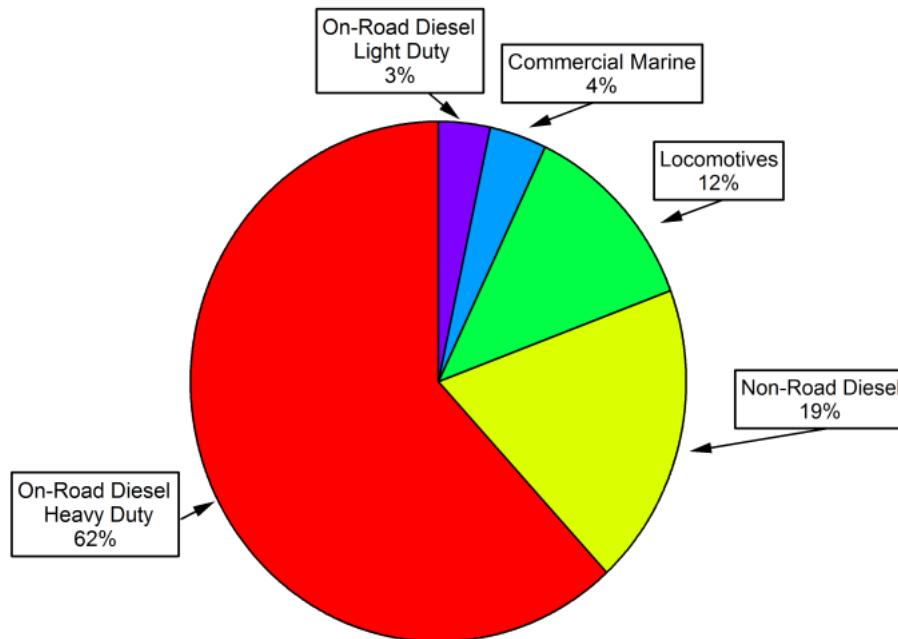
²⁸ Distressed Counties are defined as those counties that rank amongst the 10% most economically distressed counties in the nation based on a three-year average unemployment rate, per capita market income, and poverty rate. As of July 2018, Tennessee has 15 Distressed Counties. <https://www.tn.gov/transparenttn/jobs-economic-development/openecd/tneecd-performance-metrics/openecd-long-term-objectives-quick-stats/distressed-counties.html>.

Figure 1: Mobile NO_x Emissions in Tennessee (2014)



Source: 2014 NEI v2

Figure 2: Mobile Diesel NO_x Emissions in Tennessee (2014)



Source: 2014 NEI v2

V. IMPLEMENTATION

Appendix D-2 of the State Trust Agreement lists 10 specific EMA categories and various EMA administrative expenditures that are eligible for EMT funding.²⁹ (All terms that are both bolded and italicized in this section are defined in Appendix D-2 of the State Trust Agreement.) Eligible projects under these EMA categories include replacing or ***Repowering*** older diesel engines with new diesel, ***Alternate Fueled*** (e.g., compressed natural gas (CNG), propane, diesel-electric hybrid), or ***All-Electric*** engines (including installation of associated charging infrastructure); replacing older diesel vehicles, vessels, and equipment with new diesel, ***Alternate Fueled***, or ***All-Electric*** vehicles, vessels, and equipment (including installation of associated charging infrastructure); and installing charging infrastructure for light duty ***All-Electric*** vehicles. In addition, a Beneficiary may use EMT funds for non-federal voluntary match for projects eligible under the Diesel Emission Reduction Act (“DERA”) program of the Energy Policy Act of 2005.

Nine of the 10 EMA categories have separate sub-categories for Non-Government Owned and ***Government*** Owned projects. For Non-Government Owned, the percentage of the cost of an EMA that can be funded by the EMT is dictated by the sub-category of the EMA (i.e., replacement with a new diesel vehicle versus replacement with a new ***All-Electric*** vehicle). For ***Government*** Owned, up to 100% of the cost of an EMA can be funded with EMT funds, regardless of the sub-category. All eligible engines, vehicles, vessels, and equipment must be ***Scrapped***.

The EMA categories are as follows:

- (1) Large Trucks: ***Class 8 Local Freight Trucks and Port Drayage Trucks;***
- (2) Buses: ***Class 4-8 School Bus, Shuttle Bus, or Transit Bus;***
- (3) ***Freight Switchers;***
- (4) Ferries and ***Tugs;***
- (5) Ocean Going Vessel Shorepower;
- (6) Medium Trucks: ***Class 4-7 Local Freight Trucks;***
- (7) ***Airport Ground Support Equipment;***
- (8) ***Forklifts*** and ***Port Cargo Handling Equipment;***
- (9) Light Duty ***Zero Emission Vehicle*** Supply Equipment; and
- (10) Diesel Emission Reduction Act (DERA) Option.

This section of the *State of Tennessee’s Beneficiary Mitigation Plan* addresses eligible applicants, the EMA categories that the State anticipates will be appropriate to achieve the overall goal described in Section IV, the preliminary assessment of the percentages of funds anticipated to be used for each type of EMA (i.e., allocation amounts), and a general description of the expected ranges of emission benefits to be realized by implementation of the EMAs identified. In addition, this section addresses TDEC’s projected timeline for the implementation of the BMP and eligible administrative expenditures.

A. Eligible Applicants

Eligible applicants under each EMA shall include both ***Government*** and Non-Government. ***Government*** entities must be located (e.g., a municipal or county government) and/or have a

²⁹ For ease of reference, Appendix D-2 of the State Trust Agreement is attached to this document as Appendix 1.

physical presence in Tennessee (e.g., certain Federal Agencies). Non-Government entities must have a physical presence and operate within Tennessee. For information regarding the State's treatment of Federal Agencies, which are not included in the definition of **Government** set forth in Appendix D-2 of the State Trust Agreement, please see Appendix 3.

B. Eligible Mitigation Categories, Allocation of Funds, and Expected Ranges of Emissions Benefits

The State has selected the following EMA categories and allocation amounts:

- ***Class 8 Local Freight Trucks and Port Drayage Trucks: 10%***
- ***Class 4-7 Local Freight Trucks: 15%***
- ***Class 4-8 School Bus, Shuttle Bus, or Transit Bus: 60%***
- ***Light Duty Zero Emission Vehicle Supply Equipment: 15%***

These categories allow the State to target the two sectors that make up approximately 75% of Tennessee's mobile NOx emissions: the on-road, diesel heavy duty sector (33% of mobile NOx emissions and 62% of mobile diesel NOx emissions) and the on-road, non-diesel light duty sector (40% of mobile NOx emissions). The categories and allocation amounts were determined by the TDEC TAC after consideration of public input and numerous variables, including, but not limited to:

- The current emissions inventory for Tennessee, as detailed by EPA's National Emissions Inventory (NEI)³⁰;
- Expected ranges of emissions benefits from potential projects under all EMA categories except for Ocean Going Vessel Shorepower (determined to not be viable in Tennessee), calculated using the EPA's Diesel Emissions Quantifier (DEQ)³¹ or EPA emission rates;
- Vehicle, vessel, and equipment inventories in Tennessee, sourced from the Tennessee Department of Transportation's (TDOT) vehicle inventory data (compiled by the University of Tennessee, Knoxville for NEI reporting), as well as from inventory data provided by stakeholders;
- Cost to **Repower** or replace eligible engines, vehicles, vessels, or equipment, sourced from responses to TDEC's RFI on cost information;
- Cost effectiveness of EMAs in terms of dollar spent per ton of NOx reduced;
- Potential impact to vulnerable populations or populations affected by a disproportionate share of the air pollution burden;
- Lessons learned from emissions reduction and sustainable transportation programs;
- Potential to impact local government and business economies;
- Public input received during the public comment periods;
- Market demand for particular EMA categories, fuel types, and technologies, as expressed by potential applicants through public input (i.e., public interest in or support for);
- Viability of specific technologies, based on cost or commercial availability;
- Availability of other funding sources (e.g., Federal Highway Administration's [FHWA's] Congestion Mitigation Air Quality Improvement Program – administered by TDOT, Tennessee Valley Authority's [TVA's] Electric Forklift Program, Federal Aviation Administration's Voluntary Airport Low Emissions Program);

³⁰ "2014 National Emissions Inventory (NEI) Data." Environmental Protection Agency, 2 Mar. 2018, www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data.

³¹ "Diesel Emissions Quantifier (DEQ)." Environmental Protection Agency, <https://www.epa.gov/cleandiesel/diesel-emissions-quantifier-deq>.

- Opportunities to strengthen emergency preparedness and resiliency of the transportation sector through diversity of fuel and project types;
- Ability to maximize the State's allocation through required cost share; and
- Ancillary benefits (e.g., quietness of engines, health benefits to children's lungs from a school bus project).

Expected ranges of emissions benefits were calculated for EMA categories #1-4, 6-8, and 10 using EPA's DEQ, which provides a standard platform for computing the expected range in emissions reductions across a variety of on-road and nonroad vehicles and engines. Emissions benefits were not calculated for EMA category #5 (Ocean Going Vessel Shorepower), as this category was determined to not be viable in Tennessee. For EMA category #9 (Light Duty Zero Emission Vehicle Supply Equipment), emissions for a Tier 2 light duty passenger vehicle were utilized,³² as this type of vehicle was assumed to be the vehicle that would be purchased, had a zero emission vehicle not been purchased. EPA emission rates for a Tier 2 vehicle were then multiplied across an assumed utilization of the charging infrastructure, which was estimated based on data contained in a 2015 report by Idaho National Laboratory.³³

In order to provide a side-by-side comparison of project types by annual emission reduction benefit, expected ranges of emissions benefits for all EMA categories were captured in tons/year. During the project solicitation and review phases, the State expects to also consider and evaluate lifetime emissions benefits (i.e., total emissions reductions to be achieved when taking into consideration the remaining useful life of the vehicle to be **Repowered** or replaced) once additional and specific project details are known (e.g., actual model years and engine types proposed to be **Repowered** or replaced).

The subsections below provide additional details for each selected EMA category.

i. **Class 4-8 Local Freight Trucks and Port Drayage Trucks**

The State is allocating 25% of its EMT allocation to the Local Freight Truck sector, with 10% dedicated to **Class 8 Local Freight Trucks and Port Drayage Trucks** and 15% dedicated to **Class 4-7 Local Freight Trucks**. The State is dedicating a slightly larger allocation to **Class 4-7 Local Freight Trucks** due to the larger eligible inventory of vehicles within the state in this category (approximately 71,356 eligible **Class 4-7 Local Freight Trucks** as compared to approximately 26,002 eligible **Class 8 Local Freight Trucks and Port Drayage Trucks**),³⁴ as well as a slightly higher amount of public interest expressed in this category than was expressed for **Class 8 Local Freight Trucks and Port**

³² *Light-Duty Vehicles, Light-Duty Trucks, and Medium-Duty Passenger Vehicles: Tier 2 Exhaust Emission Standards and Implementation Schedule*. EPA-420-B-17-028. September 2017, <https://nepis.epa.gov/Exe/ZyNET.exe/P100SMQA.TXT?ZyActionD=ZyDocument&Client=EPA&Index=2011+Thru+2015&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C11thru15%5CTxt%5C00000027%5CP100SMQA.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL>.

³³ *Plug-in Electric Vehicle and Infrastructure Analysis* (INL/EXT-15-35708. September, 2015. Pages 11-16 and 11-17), <https://avt.inl.gov/sites/default/files/pdf/arra/ARRAPEVnInfrastructureFinalReportHqlySept2015.pdf>.

³⁴ Sourced from the Tennessee Department of Transportation's 2014 vehicle inventory data (compiled by the University of Tennessee, Knoxville for NEI reporting).

Drayage Trucks (Class 4-7 Local Freight Trucks received the third-highest amount of public support during TDEC's first public comment period, whereas **Class 8 Local Freight Trucks and Port Drayage Trucks** received the fourth-highest amount of public support).

According to 2014 NEI data, on-road, diesel heavy duty vehicles, which include **Class 8 Local Freight Trucks, Class 4-8 School Buses, Shuttle Buses, and Transit Buses**, and **Class 4-7 Local Freight Trucks**, account for 62% of mobile diesel NOx emissions in Tennessee. Thus, on-road heavy duty vehicles are the largest contributor of NOx emissions from mobile diesel sources in Tennessee. Local Freight Trucks and Port **Drayage Trucks** are used by a diverse array of sectors and entity types, including commercial, industrial, government, ports, and small business. Funding **Class 8 Local Freight Trucks and Port Drayage Trucks** and **Class 4-7 Local Freight Trucks** will allow the State to address a more diverse applicant pool potentially not served by the other selected categories.

Under these two selected EMA categories, eligible **Class 8 Local Freight Trucks and Port Drayage Trucks** and **Class 4-7 Local Freight Trucks** may be **Repowered** with any new diesel, **Alternate Fueled**, or **All-Electric** engine, or may be replaced with any new diesel, **Alternate Fueled**, or **All-Electric** vehicle. Due to expected NOx emissions reductions from **Alternate Fueled** and **All-Electric** projects being higher than expected NOx emissions reductions from new diesel projects, the State will prioritize funding for **Alternate Fueled** and **All-Electric** vehicle **Repowers** and/or replacements under this EMA category. The cost to **Repower** an engine shall include the cost to purchase and install such engine.

For both of these EMA categories, the State will fund:

- Up to 25% of the cost of a **Repower** or replacement for Non-Government Owned projects;
- Up to 50% of the cost of a **Repower** or replacement for **Government** Owned projects;
- Up to 75% of the cost of a **Repower** or replacement for **Government** Owned projects in current or former nonattainment areas for Ozone and/or PM_{2.5} NAAQS;³⁵ and
- Up to 75% of the cost of a **Repower** or replacement for **Government** Owned projects in Distressed Counties.

For **All-Electric Repower** or replacement projects, the State will fund up to 25% of the acquisition and installation costs for associated charging infrastructure (**All-Electric** infrastructure costs) for Non-Government Owned projects and up to 50% of the **All-Electric** infrastructure costs for **Government** Owned projects.³⁶

³⁵ Tennessee Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants, https://www3.epa.gov/airquality/greenbook/anayo_tn.html.

³⁶ The only allowable infrastructure costs under the State Trust Agreement are the costs of infrastructure associated with eligible **All-Electric** engines, vehicles, or equipment and the cost of acquisition, installation, operation and maintenance of new **Light Duty ZEV Supply Equipment** (Level 1, Level 2, and fast charging electric vehicle infrastructure, and hydrogen dispensing equipment). The State's EMT allocation cannot be used to fund costs associated with refueling infrastructure for diesel, natural gas, or propane-powered vehicles.

Table 1: Class 8 Local Freight Trucks and Port Drayage Trucks Summary

Eligible Applicants	Non-Government and Government	
Anticipated % of Funds	10% (\$4,575,991.44)	
Available Funds	Initial Eligible Project Funds: \$4,118,392.30 Initial Eligible Administrative Expenditures Reserve ³⁷ : \$457,599.14	
	Class 8 Local Freight Trucks and Port Drayage Trucks	All-Electric Infrastructure Costs
Funding Cap	- Up to 25% of the cost of a Repower or replacement for Non-Government Owned - Up to 50% of the cost of a Repower or replacement for Government Owned - Up to 75% of the cost of a Repower or replacement for Government Owned projects in current or former nonattainment areas for Ozone and/or PM_{2.5} NAAQS - Up to 75% of the cost of a Repower or replacement for Government Owned projects in Distressed Counties	- Up to 25% of the acquisition and installation costs for associated All-Electric infrastructure for Non-Government Owned - Up to 50% of the acquisition and installation costs for associated All-Electric infrastructure for Government Owned
Expected Emissions Benefits	Dependent on fuel and project type, the State expects to be able to fund between 17-140 Class 8 Local Freight and Port Drayage Truck projects. ³⁸ Doing so is expected to yield NOx emissions reductions between 2.0-63.4 NOx tons/year . ³⁹	
Program/Project Considerations	- Eligible Local Freight Trucks must operate in Tennessee counties for 70% or more of the time. - Eligible Port Drayage Trucks must service Ports. - Bi-fuel engines and vehicles will be considered on a case-by-case basis for Emergency Response Vehicles only. - See Appendix 4 for the State's definitions of the terms "Local," "Port," "Bi-fuel," and "Emergency Response Vehicle." - Due to expected NOx emissions reductions from Alternate Fueled and All-Electric projects being higher than expected NOx emissions reductions from new diesel projects, the State will prioritize funding for Alternate Fueled and All-Electric vehicle Repowers and/or replacements under this EMA category.	

³⁷ Tables 1-4 include the Initial Eligible Administrative Expenditures Reserve of 10% for each EMA category. Subsection D. explains these expenditures in greater detail.

³⁸ This range was calculated using **Repower** and replacement cost information submitted in response to TDEC's RFI and/or obtained by TDEC personnel through subsequent outreach. It reflects the highest and lowest number of Class 8 Local Freight Truck and Port Drayage Truck projects that the State may fund under its Initial Eligible Project Funds budget of \$4,118,392.30 (see Table 1). The low end of this estimate reflects the hypothetical funding of the maximum number of the most costly replacement at the 75% funding cap. The high end of this estimate reflects the hypothetical funding of the maximum number of the least costly **Repower** at the 25% funding cap. The total number of projects that could be funded for each sub-category of this EMA (e.g., **Repower** with a new **All-Electric** engine, replace with a new **All-Electric** vehicle, etc.) was then multiplied by the corresponding expected emissions reduction estimates to arrive at the range of expected emissions reductions for this EMA.

³⁹ All emission reduction estimates have been rounded to the nearest tenth.

Table 2: Class 4-7 Local Freight Trucks Summary

Eligible Applicants	Non-Government and Government	
Anticipated % of Funds	15% (\$6,863,987.16)	
Available Funds	Initial Eligible Project Funds: \$6,177,588.45 Initial Eligible Administrative Expenditures Reserve: \$686,398.71	
	Class 4-7 Local Freight Trucks	All-Electric Infrastructure Costs
Funding Cap	• Up to 25% of the cost of a Repower or replacement for Non-Government Owned • Up to 50% of the cost of a Repower or replacement for Government Owned • Up to 75% of the cost of a Repower or replacement for Government Owned projects in current or former nonattainment areas for Ozone and/or PM_{2.5} NAAQS • Up to 75% of the cost of a Repower or replacement for Government Owned projects in Distressed Counties	• Up to 25% of the acquisition and installation costs for associated All-Electric infrastructure for Non-Government Owned • Up to 50% of the acquisition and installation costs for associated All-Electric infrastructure for Government Owned
Expected Emissions Benefits	Dependent on fuel and project type, the State expects to be able to fund between 44-1,617 Class 4-7 Local Freight Truck projects. ⁴⁰ Doing so is expected to yield NOx emissions reductions between 2.0-721.2 NOx tons/year .	
Program/Project Considerations	• Eligible Local Freight Trucks must operate in Tennessee counties for 70% or more of the time. • Bi-fuel engines and vehicles will be considered on a case-by-case basis for Emergency Response Vehicles only. • See Appendix 4 for the State's definitions of the terms "Local," "Port," "Bi-fuel," and "Emergency Response Vehicle." • Due to expected NOx emissions reductions from Alternate Fueled and All-Electric projects being higher than expected NOx emissions reductions from new diesel projects, the State will prioritize funding for Alternate Fueled and All-Electric vehicle Repowers and/or replacements under this EMA category.	

⁴⁰ This range was calculated using **Repower** and replacement cost information submitted in response to TDEC's RFI and/or obtained by TDEC personnel through subsequent outreach. It reflects the highest and lowest number of Class 4-7 Local Freight Truck projects that the State may fund under its Initial Eligible Project Funds budget of \$6,177,588.45 (see Table 2). The low end of this estimate reflects the hypothetical funding of the maximum number of the most costly replacement at the 75% funding cap. The high end of this estimate reflects the hypothetical funding of the maximum number of the least costly **Repower** at the 25% funding cap. The total number of projects that could be funded for each sub-category of this EMA (e.g., **Repower** with a new **All-Electric** engine, replace with a new **All-Electric** vehicle, etc.) was then multiplied by the corresponding expected emissions reduction estimates to arrive at the range of expected emissions reductions for this EMA.

ii. **Class 4-8 School Bus, Shuttle Bus, and Transit Bus**

The State will allocate 60% of its EMT allocation to the **Class 4-8 School Bus, Shuttle Bus, and Transit Bus** category, which received the highest amount of public support of all EMA categories during the State's first public comment period.

This category directly serves and impacts the public, as it supports the movement of people. This category also allows the State to fund projects that reduce tailpipe emissions among vulnerable populations, including low-income populations that may depend on public transit as a primary source of transportation, school age children with developing lungs, and the elderly or disabled who may use public transportation as an alternative to personal vehicle use. It bears repeating that, as noted in Subsection V.B.i., on-road, diesel heavy duty vehicles, which include **Class 8 Local Freight Trucks, Class 4-8 School Buses, Shuttle Buses, and Transit Buses**, and **Class 4-7 Local Freight Trucks**, account for 62% of mobile diesel NOx emissions in Tennessee.

a. **Class 4-8 Transit and Shuttle Buses**

Of the \$27,455,948.64 to be dedicated to the **Class 4-8 School Bus, Shuttle Bus, and Transit Bus** category, the State will allocate \$16,000,000 to eligible **Class 4-8 Transit and Shuttle Bus** projects. The rationale for this allocation within this sub-category of vehicles is as follows:

- (1) A **Transit or Shuttle Bus** replacement project yields a much higher annual NOx reduction than a **School Bus** replacement project. This is due to the demanding duty cycles and higher annual mileage of **Transit and Shuttle Buses**;
- (2) **School Buses** are substantially cheaper to replace than **Transit and Shuttle Buses**. As a result, the allocation for the sub-category of **School Buses** (addressed below) can provide funding assistance for an equal or higher number of **School Bus** projects;
- (3) Overall, **Transit and Shuttle Buses** are more cost-effective than **School Buses** at reducing NOx emissions on an annual basis.

Eligible **Transit and Shuttle Buses** may be replaced with any **Alternate Fueled** or **All-Electric** vehicle. The replacement of **Transit and Shuttle Buses** with new diesel vehicles will not be considered eligible under this EMA sub-category, as the majority of interest expressed by potential applicants during the State's comment periods was focused on Alternate Fueled or All-Electric **Repower** or replacement projects. For purposes of the State's BMP, **Repowers** of **Class 4-8 Transit and Shuttle Buses** with any new **All-Electric** engine shall be considered eligible. All other **Repowers** under this EMA sub-category will not be considered eligible, as these types of vehicle modifications were found to not be commercially viable.

For eligible **Shuttle and Transit Buses**, the State will fund:

- Up to 25% of the cost of a **Repower** or replacement for Non-Government Owned projects;
- Up to 50% of the cost of a **Repower** or replacement for **Government** Owned projects;
- Up to 75% of the cost of a **Repower** or replacement for **Government** Owned projects in current or former nonattainment areas for Ozone and/or PM_{2.5} NAAQS; and
- Up to 75% of the cost of a **Repower** or replacement for **Government** Owned projects in Distressed Counties.

For **All-Electric** replacement projects, the State will fund up to 25% of the acquisition and installation costs for associated charging infrastructure (**All-Electric** infrastructure costs) for Non-Government Owned projects and up to 50% of the **All-Electric** infrastructure costs for **Government** Owned projects.

b. Class 4-8 School Buses

The State will allocate the remaining \$8,710,353.78 within the Bus category to **Class 4-8 School Bus** projects.

Eligible **School Buses** may be replaced with any new diesel, **Alternate Fueled**, or **All-Electric** vehicle. Due to expected NOx emissions reductions from **Alternate Fueled** and **All-Electric** projects being higher than expected NOx emissions reductions from new diesel projects, the State will prioritize funding for **Alternate Fueled** and **All-Electric** vehicle replacements under this EMA sub-category. For purposes of the State's BMP, **Repowers** for **Class 4-8 School Buses** shall not be considered eligible, as these types of vehicle modifications were found to not be commercially viable. Furthermore, useful life restrictions on **School Buses**, as outlined in Tenn. Code Ann. § 49-6-2109 (b), further limit the viability of **School Bus Repowers** in Tennessee.⁴¹

For eligible **School Buses**, the State will fund:

- Up to 25% of the cost of a replacement for Non-Government Owned projects;
- Up to 50% of the cost of a replacement for **Government** Owned projects;
- Up to 75% of the cost of a replacement for **Government** Owned projects in current or former nonattainment areas for Ozone and/or PM_{2.5} NAAQS; and
- Up to 75% of the cost of a replacement for **Government** Owned projects in Distressed Counties.

For **All-Electric** replacement projects, the State will fund up to 25% of the acquisition and installation costs for associated charging infrastructure (**All-Electric** infrastructure costs) for Non-Government Owned projects and up to 50% of the **All-Electric** infrastructure costs for **Government** Owned projects.

Considering that **School Bus** idling wastes fuel and financial resources while producing exhaust emissions that are harmful to human health and the environment, the State will prioritize eligible **School Bus** projects in school districts where an idle reduction policy for or including **School Buses** has been adopted as of the date a proposal is submitted.

In selecting eligible **School Buses** to replace, the State will prioritize certain model years, due to the pre-existing useful life restrictions on **School Buses** in Tennessee and the natural turnover in vehicle stock that results.⁴² Model years to be prioritized for replacement shall be announced during the project solicitation phase for the **Class 4-8 School Bus, Shuttle Bus, and Transit Bus** program.

⁴¹ Tenn. Code Ann. § 49-6-2109 (b) (1) states that conventional and Class D school buses "may be used until the buses reach the eighteenth year from the in-service date of the buses." Tenn. Code Ann. § 49-6-2109 (b) (2) states that "the Commissioner of Safety, through the inspection process, may approve additional years of service beyond the eighteenth year from the in-service date for conventional and Class D buses on a year-to-year basis," only if the school bus being operated has less than two hundred thousand (200,000) miles of recorded travel.

⁴² Tenn. Code Ann. § 49-6-2109 (b).

Table 3: Class 4-8 School Bus, Shuttle Bus, and Transit Bus Summary

Eligible Applicants	Non-Government and Government		
Anticipated % of Funds	60% (\$27,455,948.64)		
Available Funds	Initial Eligible Project Funds: \$24,710,353.78 (\$16,000,000 for Transit and Shuttle Buses and \$8,710,353.78 for School Buses) Initial Eligible Administrative Expenditures Reserve: \$2,745,594.86		
	Transit and Shuttle Buses	School Buses	All-Electric Infrastructure Costs
Funding Cap	- Up to 25% of the cost of a Repower or replacement for Non-Government Owned - Up to 50% of the cost of a Repower or replacement for Government Owned - Up to 75% of the cost of a Repower or replacement for Government Owned projects in current or former nonattainment areas for Ozone and/or PM_{2.5} NAAQS - Up to 75% of the cost of a Repower or replacement for Government Owned projects in Distressed Counties	- Up to 25% of the cost of a replacement for Non-Government Owned - Up to 50% of the cost of a replacement for Government Owned - Up to 75% of the cost of a replacement for Government Owned projects in current or former nonattainment areas for Ozone and/or PM_{2.5} NAAQS - Up to 75% of the cost of a replacement for Government Owned projects in Distressed Counties	- Up to 25% of the acquisition and installation costs for associated All-Electric infrastructure for Non-Government Owned - Up to 50% of the acquisition and installation costs for associated All-Electric infrastructure for Government Owned
Expected Emissions Benefits	Dependent on fuel and project type, the State expects to be able to fund between 27 and 673 Transit or Shuttle Bus projects. ⁴³	Dependent on fuel and project type, the State expects to be able to fund between 30 and 384 School Bus projects. ⁴⁴ Doing so is	

⁴³ This range was calculated using replacement cost information submitted in response to TDEC's RFI and/or obtained by TDEC personnel through subsequent outreach. It reflects the highest and lowest number of Class 4-8 Transit and Shuttle Bus projects that the State may fund under its Initial Eligible Project Funds budget of \$16,000,000 (see Table 3). The low end of this estimate reflects the hypothetical funding of the maximum number of the most costly replacement at the 75% funding cap. The high end of this estimate reflects the hypothetical funding of the maximum number of the least costly **Repower** at the 25% funding cap. The total number of projects that could be funded for each sub-category of this EMA (e.g., replace with a new **All-Electric** vehicle, replace with an **Alternate Fueled** vehicle, etc.) was then multiplied by the corresponding expected emissions reduction estimates to arrive at the range of expected emissions reductions for this EMA.

⁴⁴ This range was calculated using replacement cost information submitted in response to TDEC's RFI and/or obtained by TDEC personnel through subsequent outreach. It reflects the highest and lowest number of Class 4-8 School Bus projects that the State may fund under its Initial Eligible Project Funds budget of \$8,710,353.78 (see Table 3). The low end of this estimate reflects the hypothetical funding of the maximum number of the most costly replacement at the 75% funding cap. The high end of this estimate reflects the hypothetical funding of the maximum number of the least costly replacement at the 25%

	Doing so is expected to yield NOx emissions reductions between 6.2 – 187 NOx tons/year.	expected to yield NOx emissions reductions between 1.4-44.5 NOx tons/year. (This estimate does not include the additional NOx emissions reductions that will likely occur from the voluntary adoption and implementation of additional idling reduction policies by Tennessee school districts).	
Program / Project Considerations	• Repowers of eligible Transit and Shuttle Buses with any new All-Electric engine shall be considered eligible. All other Repowers under this EMA sub-category will not be considered eligible, • Replacement of eligible Shuttle and Transit Buses with a new diesel vehicle shall not be considered eligible. • Bi-fuel vehicles will be considered on a case-by-case basis for Government Owned Shuttle Buses only. Bi-fuel Transit Buses were found to not be commercially viable. • See Appendix 4 for the State's definition of the term "Bi-fuel."	• Repowers of existing engines shall not be considered eligible under this EMA sub-category. • The State will prioritize eligible School Bus projects in school districts where an idle reduction policy for or including School Buses has been adopted as of the date a proposal is submitted. • Due to expected NOx emissions reductions from Alternate Fueled and All-Electric projects being higher than expected NOx emissions reductions from new diesel projects, the State will prioritize funding for Alternate Fueled and All-Electric vehicle replacements under this EMA sub-category.	

funding cap. The total number of projects that could be funded for each sub-category of this EMA (e.g., replace with a new **All-Electric** vehicle, replace with an **Alternate Fueled** vehicle, etc.) was then multiplied by the corresponding expected emissions reduction estimates to arrive at the range of expected emissions reductions for this EMA.

iii. **Light Duty Zero Emission Vehicle (ZEV) Supply Equipment**

The State will allocate 15% of its EMT allocation to the **Light Duty ZEV Supply Equipment** EMA category. As noted in Appendix D-2 to the State Trust Agreement,⁴⁵ this is the maximum allowable percentage of EMT funds that Beneficiaries can dedicate to this category.

According to 2014 NEI data, on-road, non-diesel light duty vehicles account for the largest contribution (40%) of NOx emissions from mobile sources in Tennessee. By increasing access and availability to **Light Duty ZEV Supply Equipment** across Tennessee, the State can encourage and incentivize the adoption and usage of cleaner, electric-powered light duty vehicles.

Light Duty ZEV Supply Equipment received the second highest amount of public support of all EMA categories during the State's first public comment period. In line with the level of public support and interest expressed, the automotive industry has announced that more than 100 battery electric vehicle (BEV) models will be introduced worldwide over the next five years.⁴⁶ As battery costs decrease and economies of scale grow, EVs are expected to reach price parity with their gasoline counterparts by 2022 or sooner.⁴⁷ With announcements of forthcoming EV releases by most of the major automotive manufacturers, it is clear that the light-duty automotive sector is moving in the direction of electrification. (Appendix 5 details the current plans as of April 2018 of all major auto manufacturers for EV production within the next decade).

With regard to State-specific economic development considerations, light-duty EV manufacturing and production in Tennessee continues to grow. Assuming that ZEV infrastructure growth accelerates EV sales, investment in this category could directly support automotive manufacturing facilities within the State.

Notably, as of September 10, 2018, five Southeastern states have published draft BMPs (Kentucky and South Carolina) and final BMPs (Arkansas, North Carolina, and Virginia) that indicate support for funding the **Light Duty ZEV Supply Equipment** category at 15% of their respective EMT allocations. Thus, there is an opportunity for the State to pursue **Light Duty ZEV Supply Equipment** investments in shared corridors, such as along major highways and interstates, which could extend the regional range and viability of ZEV travel. Appendix 6 details ongoing ZEV initiatives, the results of which will impact the Light Duty ZEV sector and inform the State's program design and implementation under the **Light Duty ZEV Supply Equipment** EMA category.

Within the **Light Duty ZEV Supply Equipment** EMA category, the State will fund a portion of the cost to purchase and install publicly accessible light duty electric vehicle supply equipment (EVSE)⁴⁸ at both **Government** Owned properties and Non-Government Owned properties. The State will also fund a portion of the cost to purchase and install eligible light duty EVSE at both workplaces and multi-unit dwellings. Based on anticipated use cases, the State will fund only Level 2 (L2) or

⁴⁵ See Appendix 1.

⁴⁶ Roper, Preston. *6 Trends Driving Vehicle Electrification in 2018*. Greentech Media, 19 Feb. 2018, www.greentechmedia.com/articles/read/how-vehicle-electrification-will-evolve-in-2018#gs.XyuD=vo.

⁴⁷ *Ibid.*

⁴⁸ The State has decided not to fund the **Light Duty ZEV Supply Equipment** EMA sub-category of light duty hydrogen fuel cell vehicle supply equipment due to an insufficient level of public interest during the public comment periods.

Direct Current Fast Charging (DCFC) equipment for publicly accessible EVSE. For workplace and multi-unit dwelling infrastructure, the State will only fund Level 1 (L1) or L2 charging equipment.

Table 4: Light Duty ZEV Supply Equipment Summary

Eligible Applicants	Non-Government and Government
Anticipated % of Funds	15% (\$6,863,987.16)
Available Funds	Initial Eligible Project Funds: \$6,177,588.45 Initial Eligible Administrative Expenditures Reserve: \$686,398.71
Funding Caps	To be determined. Funding caps for specific project types will be announced during the project solicitation phase. These funding caps shall not exceed those set forth in the State Trust Agreement for this EMA category. See Appendix 1.
Expected Emissions Benefits	The State expects to be able to fund between 88 and 1,372 pieces of Light Duty ZEV Supply Equipment . ⁴⁹ Doing so is expected to yield NOx emissions reductions (dependent on station utilization) of 16.7-1,162.8 NOx tons/year .
Program / Project Considerations	• The State Trust Agreement allows Beneficiaries to fund the costs necessary for, and directly connected to, the acquisition, installation, operation and maintenance of new Light Duty ZEV Supply Equipment. However, with regard to "Operation and Maintenance Costs," the State has determined that it will consider funding recurring Operation and Maintenance Costs only for State-owned Light Duty ZEV Supply Equipment that will be available to the public. • See Appendix 4 for the State's definitions of the terms "Operation and Maintenance Costs," "Power Supply Equipment," and "State-owned."

C. Projected Timeline for Implementation

Following the finalization of the BMP, TDEC will release funding opportunity announcements and/or project solicitations for corresponding programs. TDEC will also host workshops throughout the State and/or via webinar in order to provide the public with information regarding the proposal process, program and project eligibility, timelines for implementation, and reporting requirements. All program-related documents and announcements will be posted to the TDEC Webpage and shared with the TDEC Email List. Additionally, announcements regarding workshops or other public events will be shared via media and/or press releases.

TDEC plans to release separate project solicitations for each of the EMA categories. TDEC anticipates that it will employ the following order, with the first project solicitation to be released in the third quarter of calendar year 2018:

⁴⁹ This range was calculated using EVSE cost information submitted in response to TDEC's RFI and/or obtained by TDEC personnel through subsequent outreach. It reflects the highest and lowest number of **Light Duty ZEV Supply Equipment** projects or pieces of equipment that the State may fund under its Initial Eligible Project Funds budget of \$6,177,588.45 (see Table 4) at the maximum funding cap percentages detailed in Appendix D-2 to the State Trust Agreement. The total number of **Light Duty ZEV Supply Equipment** projects or pieces of equipment that could be funded for each sub-category of this EMA (e.g., **Light Duty ZEV Supply Equipment** at a multi-unit dwelling, **Light Duty ZEV Supply Equipment** at a workplace, etc.) was then multiplied by the corresponding expected emissions reduction estimates to arrive at the range of expected emissions reductions for this EMA.

- (1) ***Class 4-8 School Buses;***
- (2) ***Class 4-8 Shuttle and Transit Buses;***
- (3) ***Class 4-7 Local Freight Trucks, Class 8 Local Freight and Port Drayage Trucks;*** and
- (4) ***Light Duty ZEV Supply Equipment.***

Additional project solicitations for these EMA categories will be released until eligible project funds are exhausted.⁵⁰ TDEC will strive to obligate Initial Eligible Project Funds by the end of calendar year 2023.

D. Administrative Expenditures

Appendix D-2 of the State Trust Agreement provides that Beneficiaries may use EMT funds for “actual administrative expenditures” associated with the implementation of an EMA.⁵¹ However, such expenditures cannot exceed 15% of the total cost of such EMA.

As the Lead Agency for purposes of administering the State’s EMT allocation, TDEC is responsible for the management and oversight of any related programs and projects. These administrative efforts will include, but will not be limited to, the following:

- (1) development and updating of program collateral for each EMA category (e.g., project solicitations, applications, program manuals, reporting templates);
- (2) receipt and review of project proposals;
- (3) contract development and management;
- (4) monitoring of EMT fund recipients’ projects; and
- (5) compliance with the numerous reporting, audit, financial, and transparency requirements set forth in the State Trust Agreement, as well as with applicable State rules and regulations.

Certain efforts, such as those addressed in (5) above, will be necessary for the duration of the Trust, which will exist for a minimum of 10 years following the TED. As the level of funding TDEC receives annually from the State and federal government is not guaranteed, it is critical that the State identify a dedicated source of funding to support the administration of its EMT allocation. Thus, the State reserves the right to use up to the maximum for allowable administrative expenditures for each category, should the administration of related programs and projects warrant. TDEC personnel will endeavor to minimize administrative expenditures throughout the duration of the Trust so that a greater number of projects may be funded.

The inclusion of the Initial Eligible Administrative Expenditures Reserve of 10% for each category in Tables 1-4 above serves two purposes. First, doing so allowed the State to calculate the amount of Initial Eligible Project Funds and the Expected Emissions Benefits for each category. Second, it provides transparency regarding the State’s intent to utilize EMT funds to support the administration of its EMT allocation. TDEC will evaluate cumulative administrative expenditures on a semi-annual basis to determine whether any of the funds reserved for administrative expenditures can be reallocated to Eligible Project Funds. In the event Eligible Project Funds for any EMA category can be increased, the State will provide the Trustee with an updated BMP as required by the State Trust Agreement and noted in Section I.C. of this document. Summarized details

⁵⁰ TDEC does not anticipate releasing project solicitations for the ***Light Duty ZEV Supply Equipment*** category until the Tennessee Valley Authority (TVA)/Navigant-led EV Consortium has concluded its work and Electrify America provides greater details regarding its planned investments under Cycle 2 of the National ZEV Investment Plan.

⁵¹ State Trust Agreement, App’x D-2.

regarding the expenditure of EMT funds by the State (e.g., cumulative totals for Eligible Project Funds and administrative expenditures for each EMA category, identification of recipients of trust funds and their project scopes) will be maintained on the TDEC Webpage along with updated versions of the BMP.

VI. CONSIDERATION OF DISPROPORTIONATE BURDEN

The State Trust Agreement requires Beneficiaries to include within the BMP a “description of how the Beneficiary will consider the potential beneficial impact of the selected Eligible Mitigation Actions on air quality in areas that bear a disproportionate share of the air pollution burden within its jurisdiction.”⁵² To address these requirements, the State has developed a “Disproportionate Burden Index” (DBI), which combines environmental, economic, and demographic datasets in a geospatial format to determine geographic units in Tennessee that have the highest air quality burden. Given that disproportionate burden is relative to the location of a project, TDEC will utilize the DBI and its geospatial display during the proposal review phase to assist with project prioritization and selection, focusing on the location and/or service area of the proposed project. In order to afford potential applicants the ability to determine the DBI for a prospective project proposal, TDEC will upload a DBI map of Tennessee to the TDEC Webpage and include specific instructions as to its use.

The DBI considers four datasets that relate to environmental, economic and demographic conditions at the county level. Each county level data point is evaluated to determine whether it exceeds a defined threshold specific to each dataset; in all datasets, the threshold is established as the arithmetic mean of all 95 county data points within Tennessee. If a county has a higher than average data point for a given dataset, the county is assigned a score of “1”; otherwise, the county receives a score of “0” for that dataset. The maximum DBI score a county can be assigned is a “4.” Datasets utilized for the DBI will be updated by TDEC on an annual basis. With each update to a DBI dataset, a corresponding and revised DBI map for Tennessee counties will be posted to the TDEC Webpage. Table 5 below includes information on the year, source, and Tennessee specific averages for the four DBI datasets.

Table 5: Disproportionate Burden Index Dataset Description

Description of Dataset	Year	Source	Threshold
Percent of Population Below Federal Poverty Level	2016	U.S. Census Bureau	Counties above statewide average of 19%
On-road NOx Emissions	2014	National Emissions Inventory	Counties with on-road NOx emissions above average of 1383 tons per year
Vulnerable Age Segments of Population (Below 14 and Above 65)	2016	U.S. Census Bureau	Counties with population above state average of 35.78%
Percentage of Population that is Minority	2016	U.S. Census Bureau	Counties with population above state average of 13.35%

⁵² *Id.*, ¶ 4.1.

The State selected the above datasets to assess disproportionate burden based on a variety of factors:

- (1) Datasets identifying the relative percentage of minority and low-income communities identify the presence of groups that are more likely to be exposed to higher levels of airborne particulate matter in the United States.⁵³ Poverty and income status is also directly linked to an individual's ability to self-mitigate the impacts of pollution;
- (2) The on-road NOx emission dataset promotes consistency between the DBI and the EMA categories included in the State's proposed BMP, which address on-road NOx emissions; and
- (3) Age data is used to identify vulnerable populations as well. The American Lung Association identifies detrimental air pollution impacts on lung development in teenagers 18 years or younger and research routinely identifies adverse health impacts from air pollution to elderly Americans aged 65 and older.⁵⁴ (Appendix 7 includes additional information regarding the DBI.)

Because of the nature of the datasets that comprise the DBI, its utilization by the State in the proposal review phase will maximize the potential for the State's EMT allocation to impact the areas of Tennessee with high emissions, as well as the areas that are home to vulnerable populations.

VII. CONCLUSION

The *State of Tennessee's Beneficiary Mitigation Plan* has been developed in accordance with the terms of the State Trust Agreement. This BMP is not a solicitation for projects. As such, this BMP includes limited detail on the application or project selection processes. Such information will be provided on the TDEC Webpage during project solicitations.

As part of periodic evaluations, the State may revise the final BMP as necessary to reflect major changes in project demand, the State's priorities, and/or any increases to the State's EMT allocation in future years. Interested persons and entities are advised to sign up for the VW Email List at <https://signup.e2ma.net/signup/1843437/1737620/> in order to receive related email updates on topics including, but not limited to, revisions to the BMP, funding cycles, and project solicitation.

⁵³ Bell, M. L. and K. Ebisu. (2012). Environmental Inequality in Exposures to Airborne Particulate Matter Components in the United States. *Environmental Health Perspectives*. Volume 12, Number 12; and Morello-Frosch, R. and B. M. Jesdale. (2006). Separate and Unequal: Residential Segregation and Estimated Cancer Risks Associated with Ambient Air Toxics in U.S. Metropolitan Areas. *Environmental Health Perspectives*. Volume 114, Number 3.

⁵⁴ Laurent O, Hu J, Li L, et al. (2016). A statewide nested case-control study of preterm birth and air pollution by source and composition: California, 2001-2008. *Environ Health Perspective*. Volume 124, Number 9. Simoni, M., et al. (2015). Adverse effects of outdoor pollution in the elderly. *Journal of Thoracic Disease*. 7(1):34-45.

APPENDIX 1 – STATE TRUST AGREEMENT, APPENDIX D-2

APPENDIX D-2

ELIGIBLE MITIGATION ACTIONS AND MITIGATION ACTION EXPENDITURES

1. Class 8 Local Freight Trucks and Port Drayage Trucks (Eligible Large Trucks)

- a. Eligible Large Trucks include 1992-2009 engine model year Class 8 Local Freight or Drayage. For Beneficiaries that have State regulations that already require upgrades to 1992-2009 engine model year trucks at the time of the proposed Eligible Mitigation Action, Eligible Large Trucks shall also include 2010-2012 engine model year Class 8 Local Freight or Drayage.
- b. Eligible Large Trucks must be Scrapped.
- c. Eligible Large Trucks may be Repowered with any new diesel or Alternate Fueled engine or All-Electric engine, or may be replaced with any new diesel or Alternate Fueled or All-Electric vehicle, with the engine model year in which the Eligible Large Trucks Mitigation Action occurs or one engine model year prior.
- d. For Non-Government Owned Eligible Class 8 Local Freight Trucks, Beneficiaries may only draw funds from the Trust in the amount of:
 1. Up to 40% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.
 2. Up to 25% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.
 3. Up to 75% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new All-Electric engine.
 4. Up to 75% of the cost of a new All-Electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.
- e. For Non-Government Owned Eligible Drayage Trucks, Beneficiaries may only draw funds from the Trust in the amount of:
 1. Up to 40% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.
 2. Up to 50% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.
 3. Up to 75% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging

infrastructure associated with the new All-Electric engine.

4. Up to 75% of the cost of a new All-electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.
- f. For Government Owned Eligible Class 8 Large Trucks, Beneficiaries may draw funds from the Trust in the amount of:
1. Up to 100% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.
 2. Up to 100% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.
 3. Up to 100% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new All-Electric engine.
 4. Up to 100% of the cost of a new All-Electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.

2. Class 4-8 School Bus, Shuttle Bus, or Transit Bus (Eligible Buses)

- a. Eligible Buses include 2009 engine model year or older class 4-8 school buses, shuttle buses, or transit buses. For Beneficiaries that have State regulations that already require upgrades to 1992-2009 engine model year buses at the time of the proposed Eligible Mitigation Action, Eligible Buses shall also include 2010-2012 engine model year class 4-8 school buses, shuttle buses, or transit buses.
- b. Eligible Buses must be Scrapped.
- c. Eligible Buses may be Repowered with any new diesel or Alternate Fueled or All-Electric engine, or may be replaced with any new diesel or Alternate Fueled or All-Electric vehicle, with the engine model year in which the Eligible Bus Mitigation Action occurs or one engine model year prior.
- d. For Non-Government Owned Buses, Beneficiaries may draw funds from the Trust in the amount of:
 1. Up to 40% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.
 2. Up to 25% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.
 3. Up to 75% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new All-Electric engine.

4. Up to 75% of the cost of a new All-Electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.
- e. For Government Owned Eligible Buses, and Privately Owned School Buses Under Contract with a Public School District, Beneficiaries may draw funds from the Trust in the amount of:
1. Up to 100% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.
 2. Up to 100% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.
 3. Up to 100% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new All-Electric engine.
 4. Up to 100% of the cost of a new All-Electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.

3. Freight Switchers

- a. Eligible Freight Switchers include pre-Tier 4 switcher locomotives that operate 1000 or more hours per year.
- b. Eligible Freight Switchers must be Scrapped.
- c. Eligible Freight Switchers may be Repowered with any new diesel or Alternate Fueled or All-Electric engine(s) (including Generator Sets), or may be replaced with any new diesel or Alternate Fueled or All-Electric (including Generator Sets) Freight Switcher, that is certified to meet the applicable EPA emissions standards (or other more stringent equivalent State standard) as published in the CFR for the engine model year in which the Eligible Freight Switcher Mitigation Action occurs.
- d. For Non-Government Owned Freight Switchers, Beneficiaries may draw funds from the Trust in the amount of:
 1. Up to 40% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine(s) or Generator Sets, including the costs of installation of such engine(s).
 2. Up to 25% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) Freight Switcher.
 3. Up to 75% of the cost of a Repower with a new All-Electric engine(s), including the costs of installation of such engine(s), and charging infrastructure associated with the new All-Electric engine(s).
 4. Up to 75% of the cost of a new All-Electric Freight Switcher, including

charging infrastructure associated with the new All-Electric Freight Switcher.

- e. For Government Owned Eligible Freight Switchers, Beneficiaries may draw funds from the Trust in the amount of:
 - 1. Up to 100% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine(s) or Generator Sets, including the costs of installation of such engine(s).
 - 2. Up to 100% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) Freight Switcher.
 - 3. Up to 100% of the cost of a Repower with a new All-Electric engine(s), including the costs of installation of such engine(s), and charging infrastructure associated with the new All-Electric engine(s).
 - 4. Up to 100% of the cost of a new All-Electric Freight Switcher, including charging infrastructure associated with the new All-Electric Freight Switcher.

4. Ferries/Tugs

- a. Eligible Ferries and/or Tugs include unregulated, Tier 1, or Tier 2 marine engines.
- b. Eligible Ferry and/or Tug engines that are replaced must be Scrapped.
- c. Eligible Ferries and/or Tugs may be Repowered with any new Tier 3 or Tier 4 diesel or Alternate Fueled engines, or with All-Electric engines, or may be upgraded with an EPA Certified Remanufacture System or an EPA Verified Engine Upgrade.
- d. For Non-Government Owned Eligible Ferries and/or Tugs, Beneficiaries may only draw funds from the Trust in the amount of:
 - 1. Up to 40% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine(s), including the costs of installation of such engine(s).
 - 2. Up to 75% of the cost of a Repower with a new All-Electric engine(s), including the costs of installation of such engine(s), and charging infrastructure associated with the new All-Electric engine(s).
- e. For Government Owned Eligible Ferries and/or Tugs, Beneficiaries may draw funds from the Trust in the amount of:
 - 1. Up to 100% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine(s), including the costs of installation of such engine(s).

2. Up to 100% of the cost of a Repower with a new All-Electric engine(s), including the costs of installation of such engine(s), and charging infrastructure associated with the new All-Electric engine(s).

5. Ocean Going Vessels (OGV) Shorepower

- a. Eligible Marine Shorepower includes systems that enable a compatible vessel's main and auxiliary engines to remain off while the vessel is at berth. Components of such systems eligible for reimbursement are limited to cables, cable management systems, shore power coupler systems, distribution control systems, and power distribution. Marine shore power systems must comply with international shore power design standards (ISO/IEC/IEEE 80005-1-2012 High Voltage Shore Connection Systems or the IEC/PAS 80005-3:2014 Low Voltage Shore Connection Systems) and should be supplied with power sourced from the local utility grid. Eligible Marine Shorepower includes equipment for vessels that operate within the Great Lakes.
- b. For Non-Government Owned Marine Shorepower, Beneficiaries may only draw funds from the Trust in the amount of up to 25% for the costs associated with the shore-side system, including cables, cable management systems, shore power coupler systems, distribution control systems, installation, and power distribution components.
- c. For Government Owned Marine Shorepower, Beneficiaries may draw funds from the Trust in the amount of up to 100% for the costs associated with the shore-side system, including cables, cable management systems, shore power coupler systems, distribution control systems, installation, and power distribution components.

6. Class 4-7 Local Freight Trucks (Medium Trucks)

- a. Eligible Medium Trucks include 1992-2009 engine model year class 4-7 Local Freight trucks, and for Beneficiaries that have State regulations that already require upgrades to 1992-2009 engine model year trucks at the time of the proposed Eligible Mitigation Action, Eligible Trucks shall also include 2010-2012 engine model year class 4-7 Local Freight trucks.
- b. Eligible Medium Trucks must be Scrapped.
- c. Eligible Medium Trucks may be Repowered with any new diesel or Alternate Fueled or All-Electric engine, or may be replaced with any new diesel or Alternate Fueled or All-Electric vehicle, with the engine model year in which the Eligible Medium Trucks Mitigation Action occurs or one engine model year prior.
- d. For Non-Government Owned Eligible Medium Trucks, Beneficiaries may draw funds from the Trust in the amount of:
 1. Up to 40% of the cost of a Repower with a new diesel or Alternate

- Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.
- 2. Up to 25% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.
- 3. Up to 75% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new All-Electric engine.
- 4. Up to 75% of the cost of a new All-Electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.
- e. For Government Owned Eligible Medium Trucks, Beneficiaries may draw funds from the Trust in the amount of:
 - 1. Up to 100% of the cost of a Repower with a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) engine, including the costs of installation of such engine.
 - 2. Up to 100% of the cost of a new diesel or Alternate Fueled (e.g., CNG, propane, Hybrid) vehicle.
 - 3. Up to 100% of the cost of a Repower with a new All-Electric engine, including the costs of installation of such engine, and charging infrastructure associated with the new All-Electric engine.
 - 4. Up to 100% of the cost of a new All-Electric vehicle, including charging infrastructure associated with the new All-Electric vehicle.

7. Airport Ground Support Equipment

- a. Eligible Airport Ground Support Equipment includes:
 - 1. Tier 0, Tier 1, or Tier 2 diesel powered airport ground support equipment; and
 - 2. Uncertified, or certified to 3 g/bhp-hr or higher emissions, spark ignition engine powered airport ground support equipment.
- b. Eligible Airport Ground Support Equipment must be Scrapped.
- c. Eligible Airport Ground Support Equipment may be Repowered with an All-Electric engine, or may be replaced with the same Airport Ground Support Equipment in an All-Electric form.
- d. For Non-Government Owned Eligible Airport Ground Support Equipment, Beneficiaries may only draw funds from the Trust in the amount of:
 - 1. Up to 75% of the cost of a Repower with a new All-Electric engine, including costs of installation of such engine, and charging infrastructure associated with such new All-Electric engine.

2. Up to 75% of the cost of a new All-Electric Airport Ground Support Equipment, including charging infrastructure associated with such new All-Electric Airport Ground Support Equipment.
- e. For Government Owned Eligible Airport Ground Support Equipment, Beneficiaries may draw funds from the Trust in the amount of:
1. Up to 100% of the cost of a Repower with a new All-Electric engine, including costs of installation of such engine, and charging infrastructure associated with such new All-Electric engine.
 2. Up to 100% of the cost of a new All-Electric Airport Ground Support Equipment, including charging infrastructure associated with such new All-Electric Airport Ground Support Equipment.

8. Forklifts and Port Cargo Handling Equipment

- a. Eligible Forklifts includes forklifts with greater than 8000 pounds lift capacity.
- b. Eligible Forklifts and Port Cargo Handling Equipment must be Scrapped.
- c. Eligible Forklifts and Port Cargo Handling Equipment may be Repowered with an All-Electric engine, or may be replaced with the same equipment in an All-Electric form.
- d. For Non-Government Owned Eligible Forklifts and Port Cargo Handling Equipment, Beneficiaries may draw funds from the Trust in the amount of:
 1. Up to 75% of the cost of a Repower with a new All-Electric engine, including costs of installation of such engine, and charging infrastructure associated with such new All-Electric engine.
 2. Up to 75% of the cost of a new All-Electric Forklift or Port Cargo Handling Equipment, including charging infrastructure associated with such new All-Electric Forklift or Port Cargo Handling Equipment.
- e. For Government Owned Eligible Forklifts and Port Cargo Handling Equipment, Beneficiaries may draw funds from the Trust in the amount of:
 1. Up to 100% of the cost of a Repower with a new All-Electric engine, including costs of installation of such engine, and charging infrastructure associated with such new All-Electric engine.
 2. Up to 100% of the cost of a new All-Electric Forklift or Port Cargo Handling Equipment, including charging infrastructure associated with such new All-Electric Forklift or Port Cargo Handling Equipment.

9. Light Duty Zero Emission Vehicle Supply Equipment. Each Beneficiary may use up to fifteen percent (15%) of its allocation of Trust Funds on the costs necessary for, and directly

connected to, the acquisition, installation, operation and maintenance of new light duty zero emission vehicle supply equipment for projects as specified below. Provided, however, that Trust Funds shall not be made available or used to purchase or rent real- estate, other capital costs (e.g., construction of buildings, parking facilities, etc.) or general maintenance (i.e., maintenance other than of the Supply Equipment).

- a. Light duty electric vehicle supply equipment includes Level 1, Level 2 or fast charging equipment (or analogous successor technologies) that is located in a public place, workplace, or multi-unit dwelling and is not consumer light duty electric vehicle supply equipment (i.e., not located at a private residential dwelling that is not a multi-unit dwelling).
- b. Light duty hydrogen fuel cell vehicle supply equipment includes hydrogen dispensing equipment capable of dispensing hydrogen at a pressure of 70 megapascals (MPa) (or analogous successor technologies) that is located in a public place.
- c. Subject to the 15% limitation above, each Beneficiary may draw funds from the Trust in the amount of:
 1. Up to 100% of the cost to purchase, install and maintain eligible light duty electric vehicle supply equipment that will be available to the public at a Government Owned Property.
 2. Up to 80% of the cost to purchase, install and maintain eligible light duty electric vehicle supply equipment that will be available to the public at a Non-Government Owned Property.
 3. Up to 60% of the cost to purchase, install and maintain eligible light duty electric vehicle supply equipment that is available at a workplace but not to the general public.
 4. Up to 60% of the cost to purchase, install and maintain eligible light duty electric vehicle supply equipment that is available at a multi-unit dwelling but not to the general public.
 5. Up to 33% of the cost to purchase, install and maintain eligible light duty hydrogen fuel cell vehicle supply equipment capable of dispensing at least 250 kg/day that will be available to the public.
 6. Up to 25% of the cost to purchase, install and maintain eligible light duty hydrogen fuel cell vehicle supply equipment capable of dispensing at least 100 kg/day that will be available to the public.

10. Diesel Emission Reduction Act (DERA) Option. Beneficiaries may use Trust Funds for their non-federal voluntary match, pursuant to Title VII, Subtitle G, Section 793 of the DERA Program in the Energy Policy Act of 2005 (codified at 42 U.S.C. § 16133), or Section 792 (codified at 42

U.S.C. § 16132) in the case of Tribes, thereby allowing Beneficiaries to use such Trust Funds for actions not specifically enumerated in this Appendix D-2, but otherwise eligible under DERA pursuant to all DERA guidance documents available through the EPA. Trust Funds shall not be used to meet the non- federal mandatory cost share requirements, as defined in applicable DERA program guidance, of any DERA grant.

Eligible Mitigation Action Administrative Expenditures

For any Eligible Mitigation Action, Beneficiaries may use Trust Funds for actual administrative expenditures (described below) associated with implementing such Eligible Mitigation Action, but not to exceed 15% of the total cost of such Eligible Mitigation Action. The 15% cap includes the aggregated amount of eligible administrative expenditures incurred by the Beneficiary and any third-party contractor(s).

1. Personnel including costs of employee salaries and wages, but not consultants.
2. Fringe Benefits including costs of employee fringe benefits such as health insurance, FICA, retirement, life insurance, and payroll taxes.
3. Travel including costs of Mitigation Action-related travel by program staff, but does not include consultant travel.
4. Supplies including tangible property purchased in support of the Mitigation Action that will be expensed on the Statement of Activities, such as educational publications, office supplies, etc. Identify general categories of supplies and their Mitigation Action costs.
5. Contractual including all contracted services and goods except for those charged under other categories such as supplies, construction, etc. Contracts for evaluation and consulting services and contracts with sub-recipient organizations are included.
6. Construction including costs associated with ordinary or normal rearrangement and alteration of facilities.
7. Other costs including insurance, professional services, occupancy and equipment leases, printing and publication, training, indirect costs, and accounting.

Definitions/Glossary of Terms

“Airport Ground Support Equipment” shall mean vehicles and equipment used at an airport to service aircraft between flights.

“All-Electric” shall mean powered exclusively by electricity provided by a battery, fuel cell, or the grid.

“Alternate Fueled” shall mean an engine, or a vehicle or piece of equipment that is powered by an engine, which uses a fuel different from or in addition to gasoline fuel or diesel fuel (e.g., CNG, propane, diesel-electric Hybrid).

“Certified Remanufacture System or Verified Engine Upgrade” shall mean engine upgrades certified or verified by EPA or CARB to achieve a reduction in emissions.

“Class 4-7 Local Freight Trucks (Medium Trucks)” shall mean trucks, including commercial trucks, used to deliver cargo and freight (e.g., courier services, delivery trucks, box trucks moving freight, waste haulers, dump trucks, concrete mixers) with a Gross Vehicle Weight Rating (GVWR) between 14,001 and 33,000 lbs.

“Class 4-8 School Bus, Shuttle Bus, or Transit Bus (Buses)” shall mean vehicles with a Gross Vehicle Weight Rating (GVWR) greater than 14,001 lbs. used for transporting people. See definition for School Bus below.

“Class 8 Local Freight, and Port Drayage Trucks (Eligible Large Trucks)” shall mean trucks with a Gross Vehicle Weight Rating (GVWR) greater than 33,000 lbs. used for port drayage and/or freight/cargo delivery (including waste haulers, dump trucks, concrete mixers).

“CNG” shall mean Compressed Natural Gas.

“Drayage Trucks” shall mean trucks hauling cargo to and from ports and intermodal rail yards.

“Forklift” shall mean nonroad equipment used to lift and move materials short distances; generally includes tines to lift objects. Eligible types of forklifts include reach stackers, side loaders, and top loaders.

“Freight Switcher” shall mean a locomotive that moves rail cars around a rail yard as compared to a line-haul engine that moves freight long distances.

“Generator Set” shall mean a switcher locomotive equipped with multiple engines that can turn off one or more engines to reduce emissions and save fuel depending on the load it is moving.

“Government” shall mean a State or local government agency (including a school district, municipality, city, county, special district, transit district, joint powers authority, or port authority, owning fleets purchased with government funds), and a tribal government or native village. The term “State” means the several States, the District of Columbia, and the Commonwealth of Puerto Rico.

“Gross Vehicle Weight Rating (GVWR)” shall mean the maximum weight of the vehicle, as specified by the manufacturer. GVWR includes total vehicle weight plus fluids, passengers, and cargo.

Class 1: < 6000 lb.
Class 2: 6001-10,000 lb.
Class 3: 10,001-14,000 lb.
Class 4: 14,001-16,000 lb.
Class 5: 16,001-19,500 lb.
Class 6: 19,501-26,000 lb.
Class 7: 26,001-33,000 lb.
Class 8: > 33,001 lb.

“Hybrid” shall mean a vehicle that combines an internal combustion engine with a battery and electric motor.

“Infrastructure” shall mean the equipment used to enable the use of electric powered vehicles (e.g., electric vehicle charging station).

“Intermodal Rail Yard” shall mean a rail facility in which cargo is transferred from drayage truck to train or vice-versa.

“Port Cargo Handling Equipment” shall mean rubber-tired gantry cranes, straddle carriers, shuttle carriers, and terminal tractors, including yard hostlers and yard tractors that operate within ports.

“Plug-in Hybrid Electric Vehicle (PHEV)” shall mean a vehicle that is similar to a Hybrid but is equipped with a larger, more advanced battery that allows the vehicle to be plugged in and recharged in addition to refueling with gasoline. This larger battery allows the car to be driven on a combination of electric and gasoline fuels.

“Repower” shall mean to replace an existing engine with a newer, cleaner engine or power source that is certified by EPA and, if applicable, CARB, to meet a more stringent set of engine emission standards. Repower includes, but is not limited to, diesel engine replacement with an engine certified for use with diesel or a clean alternate fuel, diesel engine replacement with an electric power source (e.g., grid, battery), diesel engine replacement with a fuel cell, diesel engine replacement with an electric generator(s) (genset), diesel engine upgrades in Ferries/Tugs with an EPA Certified Remanufacture System, and/or diesel engine upgrades in Ferries/Tugs with an EPA Verified Engine Upgrade. All-Electric and fuel cell Repowers do not require EPA or CARB certification.

“School Bus” shall mean a Class 4-8 bus sold or introduced into interstate commerce for purposes that include carrying students to and from school or related events. May be Type A-D.

“Scrapped” shall mean to render inoperable and available for recycle, and, at a minimum, to specifically cut a 3-inch hole in the engine block for all engines. If any Eligible Vehicle will be replaced as part of an Eligible project, Scrapped shall also include the disabling of the chassis by cutting the vehicle’s frame rails completely in half.

“Tier 0, 1, 2, 3, 4” shall refer to corresponding EPA engine emission classifications for nonroad, locomotive, and marine engines.

“Tugs” shall mean dedicated vessels that push or pull other vessels in ports, harbors, and inland waterways (e.g., tugboats and towboats).

“Zero Emission Vehicle (ZEV)” shall mean a vehicle that produces no emissions from the on-board source of power (e.g., All-Electric or hydrogen fuel cell vehicles).

APPENDIX 2 – PUBLIC OUTREACH AND COMMENT PERIOD – ACTIVITIES

A. Public Comment Form Revisions

In response to stakeholder feedback, TDEC twice revised the public comment form. On December 1, 2017, the form was revised to include more detail on the various options that would be available to the State within each EMA category. Though accessible on the TDEC Webpage, these detailed EMA descriptions were brought directly into the public comment form in order to allow for easier reference. On December 22, 2017, the form was revised again to provide respondents with the option to utilize checkboxes to specify interest in the various fuel types (e.g., New Diesel, Alternate Fueled, or All-Electric) that are applicable within each EMA category. As was the case with the previous iterations of the form, respondents were able to provide additional comments via the comment box or by uploading a document with their submission.

B. Public Information Sessions

In the winter of 2017, TDEC hosted several VW Settlement Public Information Sessions at locations across the state and via webinar. The sessions provided an overview of the VW Settlement, the EMT, TDEC's process for developing a proposed BMP for the State, and the types of EMAs that can be funded by the State's EMT allocation. All sessions were free and open to the public. TDEC responded to all session questions in a Q&A document, which was subsequently added to the TDEC Webpage.⁵⁵ A comprehensive listing of these public information sessions follows:

- Nashville: October 31, 2017;
- Knoxville: November 7, 2017;
- Memphis: November 17, 2017;
- Chattanooga: December 15, 2017; and
- Webinar: December 19, 2017 (A recording and copy of the webinar presentation slides were posted to the TDEC Webpage for public reference).⁵⁶

C. Volkswagen Diesel Settlement Presentations

TDEC has participated and will continue to participate as a speaker at various state and local conferences, forums, webinars, and other meetings to inform attendees about the VW Settlement, the EMT, and the development of the State's BMP. A comprehensive listing of this public outreach and engagement activity to date follows:

- Tennessee Clean Fuels Stakeholder Webinar: March 3, 2017
- Tennessee Statewide Interagency Consultation Group Call: April 5, 2017
 - This group is comprised of representatives from state and local air agencies, departments of transportation, and metropolitan planning organizations.
- Environmental Show of the South, Chattanooga: May 17-19, 2017
- State of Tennessee Employees Continuing Legal Education Cooperative: July 28, 2017
- TennSMART Consortium Meeting, Knoxville: September 21, 2017

⁵⁵ VW Settlement Public Information Sessions Q&A, <https://www.tn.gov/environment/program-areas/energy/state-energy-office--seo/tennessee-and-the-volkswagen-diesel-settlement/presentations-and-upcoming-events.html>.

⁵⁶ "Public Participation and Presentations," Tennessee and the Volkswagen Diesel Settlement, TDEC Office of Energy Programs, <https://www.tn.gov/environment/program-areas/energy/state-energy-office--seo/tennessee-and-the-volkswagen-diesel-settlement/presentations-and-upcoming-events.html>.

- Southeast Diesel Collaborative 12th Annual Conference, Atlanta: November 29-30, 2017
- Tennessee Statewide Interagency Consultation Group Call: December 6, 2017
- Memphis Area Maritime Security Committee Meeting, Memphis: December 14, 2017
- Tennessee Renewable Energy & Economic Development Council Annual Conference, Cookeville: December 14-15, 2017
- Clarksville Urbanized Area Metropolitan Planning Organization Meeting, Clarksville: January 18, 2018
- 2018 County Government Day (hosted by the Tennessee County Services Association), Nashville: March 12, 2018
- Tennessee Statewide Interagency Consultation Group Call: April 11, 2018
- Southeast Diesel Collaborative Monthly Call: April 18, 2018
- TDEC Air Pollution Control Statewide Meeting, Paris Landing: May 2, 2018
- Environmental Show of the South, Chattanooga: May 16, 2018
- National Association of Clean Air Agencies Annual Meeting, Chattanooga: May 22, 2018
- Tennessee Association of Pupil Transportation Annual Meeting, Pigeon Forge: June 6, 2018
- Alternative Fuel Vehicle School Bus Workshop, Lebanon: July 25, 2018
- Tennessee Statewide Interagency Consultation Group Call: August 1, 2018
- Sustainable Fleet Technology Conference and Expo, Durham: August 23, 2018
- Tennessee Sustainable Transportation Forum and Expo, Knoxville: September 17, 2018

Note: Following the date of release of the final BMP, please refer to the TDEC Webpage for a comprehensive and updated listing of public outreach and engagement.

APPENDIX 3 – NOTICE OF AVAILABILITY OF MITIGATION ACTION FUNDS TO CERTAIN FEDERAL AGENCIES

On February 28, 2018, as required by ¶ 4.2.8. of the State Trust Agreement, the State provided “notice” to certain Federal Agencies of the availability of EMT funds. Said paragraph states as follows:

Notice of Availability of Mitigation Action Funds: Each Certification Form (Appendix D-3) must certify that, not later than 30 Days after being deemed a Beneficiary pursuant to subparagraph 4.0.2.1 hereof, the Certifying Entity will provide a copy of this Agreement with Attachments to the U.S. Department of the Interior [DOI], the U.S. Department of Agriculture [USDA], and any other Federal Agency that has custody, control, or management of land within or contiguous to the territorial boundaries of the Certifying Entity and has by then notified the Certifying Entity of its interest hereunder, explaining that the Certifying Entity may request Eligible Mitigation Action funds for use on lands within that Federal Agency’s custody, control, or management (including but not limited to Clean Air Act Class I and II areas), and setting forth the procedures by which the Certifying Entity will review, consider, and make a written determination upon each such request.

The required notice was sent to DOI, USDA, as well as Federal Agencies that had by that date notified the State of their interest (i.e., the U.S. Department of Energy (DOE), TVA, FHWA, and the Department of Homeland Security (DHS)). It informed these Federal Agencies that (1) they may respond to future project solicitation(s) and request EMT funds for use on lands within their custody, control, or management that are within or contiguous to the State and (2) they must follow the to-be-developed guidance that will be set forth in said solicitations, as there will not be a separate process under which the State will review, consider, and make a written determination upon requests for funding (i.e., proposals) submitted by Federal Agencies.

The required notice further informed these Federal Agencies that the State will classify DOI, USDA, and other eligible Federal Agencies as **Government** entities with regard to proposal(s) for projects limited to or located in federal Clean Air Act Class I and II areas⁵⁷ and as Non-Government entities with regard to all other proposals. Federal Clean Air Act Class I and II areas will be determined at the time of the submission of project proposals. The required notice also addressed the significance of the distinction between **Government** and Non-Government, which is that the State may elect to fund up to 100% of the cost of eligible **Government** projects but is limited to the ceilings or maximum percentages set forth in Appendix D-2 to the State Trust Agreement for Non-Government projects.

Under this approach, the State-determined funding ceilings or maximum percentages for **Government** entities will apply to any successful proposals submitted by these Federal Agencies for projects that are limited to or located in federal Clean Air Act Class I or Class II in Tennessee. (See Figures 3 and 4 on the following page.) This will allow the State to obligate a higher level of funding to projects that seek to prevent significant deterioration to existing clean air resources and areas of special national or regional natural, recreational, scenic, or historic value, as established by the Clean Air Act.

⁵⁷ See 42 U.S.C. §7472 and §7407 for definitions of Clean Air Act Class I and Class II areas.

Figure 3: Class I Areas in Tennessee (May 2018)

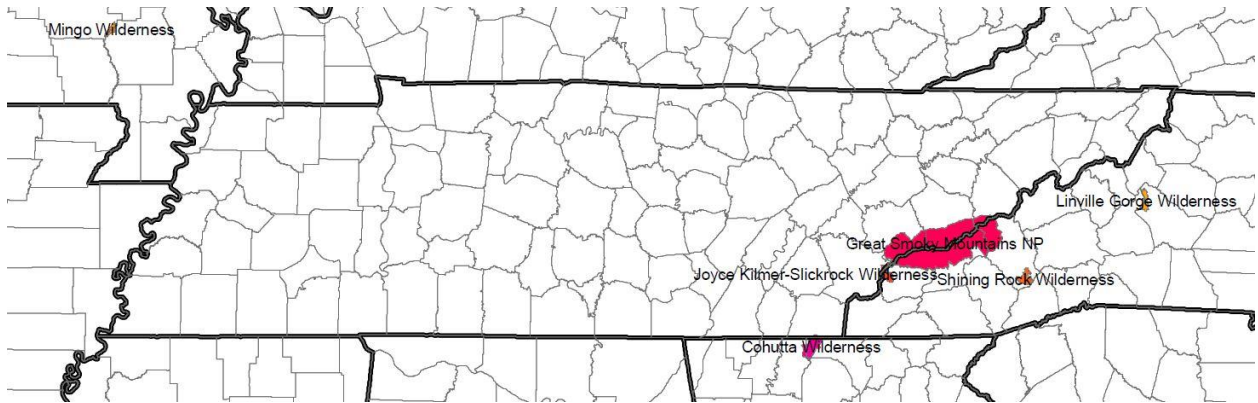
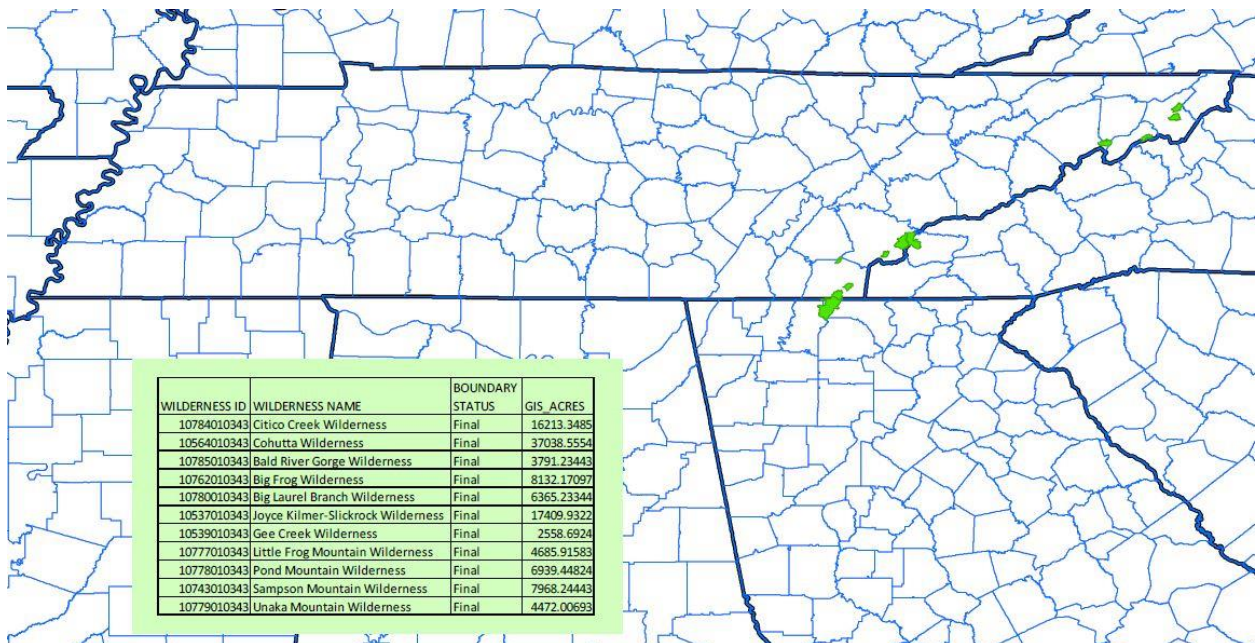


Figure 4: Class II Areas in Tennessee (May 2018)



APPENDIX 4 – ADDITIONAL DEFINED TERMS

Appendix D-2 to the State Trust Agreement includes definitions related to the various EMA categories and is attached to this proposed BMP as Appendix 1. The State has identified several additional terms that must be defined for purposes of administering its EMT allocation. These terms and their definitions are included below.

“Bi-fuel” shall mean an engine or motor vehicle that is capable of operating on gasoline or diesel fuel in addition to another type of fuel, such as natural gas or propane. Both fuels are stored on board and the driver can switch between the fuels. The vehicle is equipped with fuel tanks, fuel injection systems, and fuel lines for both fuels.

“Emergency Response Vehicle” shall mean any vehicle that is designated and authorized to respond to an emergency situation that threatens or negatively impacts public health, safety, and welfare. These vehicles are usually operated by designated government agencies or first responders (including fire, police, and emergency medical personnel), but may also be operated by charities, non-governmental organizations, and some commercial companies. Examples of emergency response vehicles include police cars, firetrucks, ambulances, and other similar on-road vehicles necessary for transporting first responders, other emergency services personnel, patients, and equipment in times of emergency.

“Local” shall refer to vehicles that operate in Tennessee counties for 70% or more of the time.

“Operation and Maintenance Costs” shall mean the costs necessary for, and directly connected to, the operation and maintenance of new light duty electric vehicle supply equipment, which may include, but are not limited to, electricity consumption and/or demand charges, grid access charges, network fees, repairs, and the purchase and installation of Power Supply Equipment for the specific purpose of generating electricity for, storing electricity for, and/or delivering electricity to the light duty electric vehicle supply equipment.

“Port” shall refer to facilities along navigable water for the loading and unloading of cargo from ships; places from which aircraft operate that have paved runways and passenger and cargo terminals which include baggage-movement and passenger-transit operations; or nodes in the larger goods movement supply chain, to include cruise terminals, bulk terminals, container terminals, and intermodal container transfer facilities.

“Power Supply Equipment” shall mean equipment or infrastructure used for generation, storage, and/or delivery of electricity for the operation of light duty electric vehicle supply equipment, which may include, but is not limited to, devices for traditional connection to the electric grid, stationary storage batteries, non-grid tied solar photovoltaic panels, and other equipment or infrastructure associated with the powering of light duty electric vehicle supply equipment (or analogous successor technologies).

“State-owned” shall mean any vehicle or equipment owned by a State agency or a State public higher education institution.

APPENDIX 5 – ORIGINAL EQUIPMENT MANUFACTURER (OEM) U.S. MARKET VEHICLE ELECTRIFICATION INVESTMENTS AS OF SEPTEMBER 2018

This Appendix provides a comprehensive list of planned investments (as of September 2018) by major auto manufacturers, detailing the EV models to be made available in the U.S. within the next decade.

Table 6: Planned Investments by Major Auto Manufacturers

OEM	PEVs	PEV Announcements
BMW	i3	BMW announced it will have 25 PEVs on the market by 2025. ⁵⁸
	i8	
	330e	BMW also announced plans to build a production version of its iVision Dynamics BEV concept, now called the BMW i4. ⁵⁹ When unveiling the concept, BMW claimed the i4 would have a 600 km range. BMW also announced that it would release a concept for another BEV called the iX3 sometime in 2018. ⁶⁰
	740e	
	X5 xDrive40e	
		Finally, BMW announced plans to release a prototype of its iNext battery-electric SUV in 2018, production to begin in 2021. ⁶¹ Reportedly, iNext will have a 435 mile range.
Daimler AG	Mercedes-Benz B250e	By 2022, Daimler AG announced plans to bring more than 10 BEVs to market. ⁶² Daimler AG will also electrify the entire Mercedes-Benz portfolio, meaning they will have 50 plug-in electric vehicles (PEVs) for sale by 2022. Mercedes-Benz will also build an EQ brand, which combines electric mobility with intelligent services, energy storage, sustainable battery recycling, etc. The first EQ brand model, the EQC, will be produced in Bremen in 2019.
	Mercedes-Benz C350e	
	Mercedes-Benz GLE550e	
	Mercedes-Benz S550e	
	Smart ForTwo Electric Drive	

⁵⁸ "BMW Will Have 25 Electric Cars, Plug-in Hybrid Models by 2025," Green Car Reports, January 23, 2018, https://www.greencarreports.com/news/1114946_bmw-will-have-25-electric-cars-plug-in-hybrid-models-by-2025.

⁵⁹ "BMW Confirms New Electric i4 Sedan Coming to Production Based on iVision Dynamics Concept," Electrek, March 6, 2018, <https://electrek.co/2018/03/06/bmw-i4-electric-sedan-ivision-dynamics-concept/>.

⁶⁰ "BMW to unveil a series of new all-electric vehicles this year: iX3, iNEXT, and more," Electrek, March 21, 2018, <https://electrek.co/2018/03/21/bmw-series-new-all-electric-vehicle-production-ix3-inext/>.

⁶¹ "Concept Previewing BMW iNext SUV Coming Later this Year," BMWBlog, January 16, 2018, <http://www.bmwblog.com/2018/01/16/concept-previewing-bmw-inext-suv-coming-later-this-year/>.

⁶² "Plans for More than Ten Different All-Electric Vehicles by 2022: All Systems are Go," Daimler Media, accessed April 9, 2018, <http://media.daimler.com/marsMediaSite/en/instance/ko/Plans-for-more-than-ten-different-all-electric-vehicles-by-2022-All-systems-are-go.xhtml?oid=29779739>.

Fiat Chrysler	Chrysler Pacifica Hybrid Fiat 500e	Mercedes-Benz released also plans for an all-electric “Concept EQ” crossover SUV, which purports to have a 500 km battery range.⁶³ Fiat Chrysler (FCA) announced a new product lineup update that featured electrification of many models, particularly within its Jeep and Maserati brands. The company’s new product plans include several new hybrid-electric vehicles (HEVs), PHEVs, and BEVs in production by 2022, although many of these vehicles will be sold primarily in Asia.⁶⁴
Ford	Fusion Energi C-MAX Energi* Focus Electric	Ford announced plans to make an \$11 billion investment in vehicle electrification production and research.⁶⁵ Ford announced that it would have 40 PEVs on the market by 2022 (16 will be fully electric, and the rest will be plug-in hybrids). Ford also unveiled plans for its “2020 refresh lineup,” including plans to introduce their first ground-up BEV.⁶⁶ This vehicle will be a 300-mile, Mustang-inspired, small battery-electric SUV (codenamed Mach 1).⁶⁷
Geely Holding Group	Volvo XC90 Twin Engine PHEV	Starting in 2019, every new Volvo model will run at least in part on electric power. ⁶⁸ Between 2019 and 2021, Volvo will produce 5 BEVs along with other PHEVs and HEVs.
General Motors	Cadillac CT6 PHEV Cadillac ELR* Chevy Bolt BEV Chevy Volt PHEV/RE-X Chevy Spark BEV*	General Motors (GM) announced plans to produce 2 new PEVs by Q1 of 2019 and 20 new PEVs by 2022. ⁶⁹ GM also confirmed that these new PEVs will include 5 crossovers, 2 minivans, 7 SUVs, and more. ⁷⁰ At that time, GM claimed that

⁶³ “Mercedes-Benz Electric Car ‘Concept EQ’: Mobility Revisited,” Daimler, accessed April 9, 2018, <https://www.daimler.com/innovation/case/electric/concept-eq-2.html>.

⁶⁴ “FCA announces a bunch of new all-electric vehicles: 4 Jeep SUVs, 4 Maserati models, and 2 Fiat cars,” Electrek, June 1, 2018, <https://electrek.co/2018/06/01/fca-new-all-electric-vehicles-jeep-maserati-models/>.

⁶⁵ “Ford Plans \$11 Billion Investment, 40 Electrified Vehicles by 2022,” Reuters, January 14, 2018, <https://www.reuters.com/article/us-autoshow-detroit-ford-motor/ford-plans-11-billion-investment-40-electrified-vehicles-by-2022-idUSKBN1F30YZ>.

⁶⁶ “Ford Teases Upcoming Electric Vehicles, Says it will Focus on Charging Experience,” Electrek, March 15, 2018, <https://electrek.co/2018/03/15/ford-upcoming-electric-vehicles-charging-experience/>.

⁶⁷ “Ford is saying goodbye to cars and hello to batteries,” Engadget, July 9, 2018, <https://www.engadget.com/2018/07/09/ford-future-ev-interview/>.

⁶⁸ “Volvo’s Electric Car Plan Isn’t as Bold or Crazy as it Seems,” Wired, July 6, 2017, <https://www.wired.com/story/volvos-electric-car-plan/>.

⁶⁹ “GM Announces Serious Electric Car Plan: 2 New EVs Within 18 Months, 20 Within 5 Years,” Electrek, October 2, 2017, <https://electrek.co/2017/10/02/gm-electric-car-commitment-new-models/>.

⁷⁰ “GM Elaborates on Electric Vehicle Plans: 5 Crossovers, 2 Minivans, 7 SUVs, and More,” Electrek, November 15, 2017, <https://electrek.co/2017/11/15/gm-electric-vehicles-crossover-minivan-corvette/>.

they currently pay \$145/kWh for battery cell costs (not to be misconstrued with battery pack costs) and will continue to bring the battery cell cost down to less than \$100/kWh soon.⁷¹

GM also announced plans to ramp up Chevy Bolt BEV production in response to high consumer demand.⁷² GM stated that they are looking for partners in the energy industry to help the OEM build out a U.S. network of charging stations.

Finally, GM and Honda announced a joint partnership to build next-generation batteries for EVs.⁷³ This partnership will focus on the development of advanced chemistry battery components, including the cell and module, to accelerate both companies' plans for future BEV production. Their aim for this next-generation battery is to deliver higher energy density, smaller packaging, and faster charging capabilities for both companies' future products, mainly for the North American market.

Honda Motor Company	Clarity (PHEV and BEV) Fit EV*
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	Honda announced plans to launch two all-electric vehicles in 2018 (one in China, one in Europe). ⁷⁴ Honda is aiming for two-thirds of its vehicle lineup to be comprised of PEVs by 2030.
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	Honda also announced that it will be building 15-minute charging system for its upcoming PEV models. ⁷⁵
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	Finally, Honda announced a joint partnership with GM to build next-generation batteries for EVs. ⁷⁶ (See "General Motors" above for more information.)
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Hyundai Motor	Kia Soul EV
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	Hyundai Motor Group announced plans to bring
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⁷¹ *Ibid.*

⁷² "GM Increasing Chevy Bolt Production in a Step Toward All-Electric Future," CNBC, March 7, 2018, <https://www.cnbc.com/2018/03/07/mary-barra-gm-ceraweeek-chevy-bolt.html>.

⁷³ "GM and Honda are partnering to build next-gen batteries for electric vehicles," Electrek, June 7, 2018, <https://electrek.co/2018/06/07/gm-honda-partner-next-gen-batteries-electric-vehicles/>.

⁷⁴ "Honda is Firing Back at Tesla and Other Automakers by Rolling Out 2 Electric Cars by 2018," Business Insider, August 30, 2017, <http://www.businessinsider.com/honda-to-launch-2-electric-cars-by-2018-2017-8>.

⁷⁵ "Honda is Working on 15-Minute Charging for its Upcoming Electric Cars," Electrek, November 27, 2017, <https://electrek.co/2017/11/27/honda-electric-car-15-minute-charging/>.

⁷⁶ "GM and Honda are partnering to build next-gen batteries for electric vehicles," Electrek, June 7, 2018, <https://electrek.co/2018/06/07/gm-honda-partner-next-gen-batteries-electric-vehicles/>.

Group	IONIQ Electric Sonata PHEV	to market up to 38 “green” cars by 2025, including 7 new models between by 2022. ⁷⁷ Many will be PEVs. Others may be fuel cell electric vehicles (FCEVs). No further clarification has been announced.
		Hyundai also released plans to sell a Kona Electric SUV in the United States by 2019. ⁷⁸ The vehicle is projected to travel between 186-292 miles per charge, depending on the trim level.
Renault-Nissan-Mitsubishi Alliance	Mitsubishi i-MiEV Mitsubishi Outlander PHEV Nissan LEAF	The Renault-Nissan-Mitsubishi Alliance released a six-year plan laying out its upcoming business goals. ⁷⁹ The group said it will launch 12 separate BEVs globally by 2022. In particular, Nissan will release four BEVs over the next five years; Infiniti will release two BEVs over the next five years. ⁸⁰ Nissan also announced that luxury Infiniti brand will only introduce fully or partially electric vehicles starting in 2021, with the exception of its large SUVs segment. ⁸¹
		Nissan recently announced a new goal to sell one million electrified vehicles (HEVs, PHEVs, and BEVs) a year by 2022 as part of its new M.O.V.E to 2022 midterm plan. ⁸² Additionally, Nissan launched the second generation all-electric LEAF production in its Smyrna, TN plant. ⁸³ This includes an additional \$110 M investment in the plant to prepare for new vehicle production. The Smyrna plant employs 8,400 people and makes 640,000 vehicles a year. Nissan and partners have now sold more than 540,000 PEVs worldwide. ⁸⁴

⁷⁷ “Hyundai Bolsters Electric Car Lineup to Narrow Gap with Rivals,” Bloomberg, December 12, 2017,

<https://www.bloomberg.com/news/articles/2017-12-12/hyundai-bolsters-electric-car-lineup-to-narrow-gap-with-rivals>.

⁷⁸ “Hyundai Kona Electric Debuts Before Geneva Show; 292-Mile Range From Top Model,” Green Car Reports, February 28, 2018, https://www.greencarreports.com/news/1115215_hyundai-kona-electric-crossover-teased-before-geneva-auto-show-reveal.

⁷⁹ “Nissan, Mitsubishi, Renault to Launch 12 New Electric Cars by 2022,” Green Car Reports, September 15, 2017, https://www.greencarreports.com/news/1112706_nissan-mitsubishi-renault-to-launch-12-new-electric-cars-by-2022.

⁸⁰ “Six EVs Headed to Nissan, Infiniti,” Automotive News, February 4, 2018, <http://www.autonews.com/article/20180204/OEM05/180209930/six-evs-headed-to-nissan-infiniti>.

⁸¹ “Nissan CEO: Infiniti Luxury Brand to Switch to Electric Cars, Hybrids,” USA Today, January 16, 2018, <https://www.usatoday.com/story/money/cars/2018/01/16/nissan-ceo-infiniti-luxury-brand-switch-electric-cars-hybrids/1038293001/>.

⁸² “Nissan announces new goal to sell 1 million ‘electrified vehicles’ a year by 2022,” Electrek, March 23, 2018, <https://electrek.co/2018/03/23/nissan-electrified-vehicles-goal/>.

⁸³ “Nissan Launches New LEAF Production in Smyrna,” The Tennessean, December 4, 2017, <https://www.tennessean.com/story/money/2017/12/04/nissan-launches-new-leaf-production-smyrna/919094001/>.

⁸⁴ “Nissan and Partners Have Now Sold 540,000 Plug-in Electric Vehicles,” Green Car Reports, January 31, 2018, https://www.greencarreports.com/news/1115086_nissan-and-partners-have-now-sold-540000-plug-in-electric-vehicles.

		The Renault-Nissan-Mitsubishi alliance also announced that it has signed an MOU with Didi (an Uber-like, Chinese company) to build an EV car-sharing program in China. ⁸⁵
Subaru	N/A	Subaru announced plans to produce a Crosstrek PHEV by 2019, ⁸⁶ the company's first modern PEV.
Tata Motors	I-Pace Land Rover PHEV Range Rover PHEV	Jaguar officially unveiled the I-Pace, an all-electric luxury crossover with a range of 240 miles. ⁸⁷ Tata Motors announced that it is working on almost a dozen EV and HEV solutions in the commercial vehicle space. The company is simultaneously developing a dedicated electric platform for passenger vehicles that it will use in future EV models. ⁸⁸
Tesla, Inc.	Roadster* Model S Model X Model 3	As of February 2018, Tesla has sold more than 300,000 light-duty PEVs worldwide. ⁸⁹ The OEM recently announced its new all-electric Class 8 Semi ⁹⁰ , which it purports to have a range of 300-500 miles and an expected base price of \$150,000-\$180,000. ⁹¹ Tesla also announced it will produce a Model Y ⁹² , an all-electric crossover to be built on the same third generation vehicle platform as the Model 3. It will not be released until 2019 or 2020. Tesla has announced tentative plans to build an all-electric pick-up truck sometime after Model Y release. ⁹³
		Finally, Tesla has also announced a ramp up of

⁸⁵ "Renault-Nissan-Mitsubishi Explore a New Electric Vehicle Car-Sharing Program with Didi," Electrek, February 7, 2018, <https://electrek.co/2018/02/07/renault-nissan-mitsubishi-electric-vehicle-car-sharing-program-didi/>.

⁸⁶ "Subaru Announces its First Plug-In Hybrid Vehicle, the 2019 Crosstrek Hybrid," Subaru U.S. Media Center, May 11, 2018, <http://media.subaru.com/pressrelease/1277/1/subaru-announces-its-first-plug-hybrid-vehicle-2019>.

⁸⁷ "Jaguar Reveals its 'Tesla Fighter': I-Pace Electric Crossover Sales to Begin this Year in U.S.," Los Angeles Times, March 1, 2018, <http://www.latimes.com/business/autos/la-fi-hy-jaguar-ipace-ev-20180301-story.html>.

⁸⁸ "Tata Motors working on a dozen electric, hybrid vehicles," The Economic Times, June 6, 2018, <https://economictimes.indiatimes.com/industry/auto/auto-news/tata-motors-working-on-a-dozen-electric-hybrid-vehicles/articleshow/64472653.cms>.

⁸⁹ "Nissan, Tesla Surpasses 300,000 Electric Cars; One Started Later, One Did it With a Single Model," Green Car Reports, February 20, 2018, https://www.greencarreports.com/news/1115343_nissan-tesla-surpass-300000-electric-cars-one-started-later-one-did-it-with-a-single-model.

⁹⁰ "Tesla Semi," Electrek, updated April 6, 2018, <https://electrek.co/guides/tesla-semi/>.

⁹¹ "Tesla Semi," Tesla, accessed April 9, 2018, <https://www.tesla.com/semi>.

⁹² "Tesla Model Y," Electrek, updated March 9, 2018, <https://electrek.co/guides/tesla-model-y/>.

⁹³ "Elon Musk Confirms Tesla Pickup Truck Coming After Model Y," Electrek, December 26, 2017, <https://electrek.co/2017/12/26/elon-musk-tesla-pickup-truck-coming-after-model-y/>.

		production and hiring in its Nevada-based Gigafactory 1 ⁹⁴ , which will produce battery cells for Tesla's vehicles, trucks, and energy storage mechanisms. ⁹⁵ Gigafactory 2 is a photovoltaic cell factory in New York, leased by Tesla subsidiary SolarCity. New Gigafactory locations may be named within the year.
Toyota	Prius Prime (second generation of Prius Plug-in) Rav 4*	Toyota announced plans to produce 10 new BEVs worldwide by "the early 2020s." Toyota also announced plans to have electric options for all its vehicle models by 2025 (including HEV, PHEV, BEV, and FCEV). ⁹⁶ By around 2030, Toyota aims to have global sales of more than 5.5 million electrified cars annually, including more than 1 million ZEVs (BEVs and FCEVs).
Volkswagen Group	e-Golf Audi A3 e-Tron Porsche Cayenne E-Hybrid Porsche Panamera E-Hybrid	VW announced plans to build a new, all-electric crossover vehicle, the I.D. Crozz ⁹⁷ , in the United States, most likely at its Chattanooga plant. A longer range e-Golf may also be produced in the U.S., too. Other upcoming VW BEVs include the I.D., the I.D. Buzz, and the U.D. Vizzion. ⁹⁸ VW also announced plans to invest \$3.3 billion nationwide over the coming years to increase their production capacity in the U.S. and release at least two new vehicles a year, some of which may also be electric. ⁹⁹ Finally, VW announced plans to build electric versions of all its 300 vehicle models by 2030. ¹⁰⁰

* Retired model not currently in production in the United States.

⁹⁴ "Elon Musk Ramps Hiring Effort for Tesla's Gigafactory Battery Factory," Teslarati, January 3, 2018, <https://www.teslarati.com/elon-musk-tweets-tesla-gigafactory-hiring-jobs/>.

⁹⁵ "Tesla Gigafactory," Tesla, accessed April 9, 2018, <https://www.tesla.com/gigafactory>.

⁹⁶ "Toyota Announces Major Expansion of its Electric Car Plans: 10 New BEVs, all Models to have Electric Motors," Electrek, December 18, 2017, <https://electrek.co/2017/12/18/toyota-electric-car-plans/>.

⁹⁷ "VW Debuts All-Electric SUV Concept in the U.S., Says it Will be its First Next-Gen EV in the Market," Electrek, November 29, 2017, <https://electrek.co/2017/11/29/vw-debuts-all-electric-suv-concept-in-the-us-first-next-gen-ev/>.

⁹⁸ "VW Unveils New ID Electric Sedan: 111 kWh Battery Pack, Self-Driving, and More," Electrek, March 5, 2018, <https://electrek.co/2018/03/05/vw-id-vizzion-electric-sedan-self-driving/>.

⁹⁹ "VW Announces New All-Electric Car Platform to be Produced in the U.S. by 2020," Electrek, January 15, 2018, <https://electrek.co/2018/01/15/vw-all-electric-car-platform-produced-us-2020/>.

¹⁰⁰ "VW to Build Electric Versions of All 300 Models by 2030," Bloomberg, September 11, 2017, <https://www.bloomberg.com/news/articles/2017-09-11/vw-ceo-vows-to-offer-electric-version-of-all-300-models-by-2030>.

APPENDIX 6 – CURRENT LIGHT DUTY ZERO EMISSION VEHICLE INITIATIVES

A. Electrify America’s National ZEV Investment Plan

Under Appendix C to the Volkswagen Diesel Settlement’s First Partial Consent Decree, VW must invest \$2 billion over 10 years in projects that support the increased use of ZEVs, which are defined as BEVs, PHEVs, and FCEVs. This will be a VW-administered program. VW has created a separate entity within VW Group of America, known as Electrify America, LLC¹⁰¹, to oversee the ZEV investment. The funding will be distributed over four, 30 month cycles: \$300 million per cycle in the National ZEV Investment Plan with EPA oversight (totaling \$1.2 billion) and \$200 million per cycle in the California ZEV Investment Plan with California Air Resources Board (CARB) oversight (totaling \$800 million).

Eligible National ZEV Investment expenses include:

- Design/planning, construction/installation, and operation and maintenance of ZEV infrastructure;
- Brand-neutral education or public outreach that builds or increases awareness; and
- Programs or actions to increase public exposure or access to ZEVs without requiring the consumer to purchase or lease a ZEV at full market value, such as car sharing services or ride hailing services.

On April 9, 2017, Electrify America published the National ZEV Investment Plan: Cycle 1¹⁰². The plan, which was approved by the U.S. EPA, presents the first of four required 30-month, \$300 million investments to support increased use of ZEV technology in the United States. TDEC submitted a response to the first cycle solicitation on January 13, 2017 to provide VW with basic knowledge regarding ZEV stakeholders, the current EV landscape, and the priorities, recommendations, and goals for ZEV infrastructure and awareness investments in Tennessee.

As a part of its Cycle 1 National ZEV Investment Plan, Electrify America released a map (Figure 5) indicating the anticipated placement of long-distance highway charging locations around the U.S. Each site within this highway charging network will be located along high-traffic corridors connecting eleven metropolitan areas (i.e., the locations identified by Electrify America for community charging investments during Cycle 1) and will include between four and ten 150 kW and 350 kW individual DCFC units at each location. These stations are expected to be operational or under construction by June 2019. Electrify America has indicated that several interstates in Tennessee may be included in this long-distance highway charging network, and it will announce specific charging station locations as they are constructed. As of September 10, 2018, Electrify America has released highway charging station location information for Manchester, Nashville, Ooltewah, Clarksville, and Memphis, Tennessee. Additional information on these stations and a more detailed map, which will be updated to reflect station locations as they are announced, may be accessed here: <https://www.electrifyamerica.com/locations>.

¹⁰¹ Electrify America, <http://www.electrifyamerica.com/>.

¹⁰² “National ZEV Investment Plan: Cycle 1,” Volkswagen Group of America, 9 April 2017, http://www.epa.gov/sites/production/files/2017-04/documents/nationalzevinvestmentplan.pdf?utm_source=v2_VW%27s+Electrify+America+Releases+ZEV+Investment+Plan&utm_campaign=Newsletter+-+September+17%2C+2014&utm_medium=email.

Figure 5: Electrify America’s National ZEV Investment Plan: Cycle 1¹⁰³



From January 15 through March 1, 2018, Electrify America requested comments, proposals, and recommendations on its Cycle 2 investment under the National ZEV Investment Plan.¹⁰⁴ TDEC submitted a response to the solicitation in order to update VW on Tennessee’s EV landscape and related planning. This response also provided information on charging station utilization rates within Tennessee and identified State and local policies that could help accelerate EV adoption in Tennessee.

The State will continue to coordinate and engage with Electrify America in an effort to spur investment by Electrify America in Tennessee. It must be noted that Electrify America intends to own and operate its ZEV infrastructure investments, while some investments will be owned, operated, and maintained by third parties under contract with Electrify America for services rendered.¹⁰⁵ Pending approval of its National ZEV Investment Plans by U.S. EPA, Electrify America has full discretion as to where it will invest these funds.

B. Electric Vehicle Landscape and Related Initiatives in Tennessee

Despite minimal incentives, Tennessee has an EV-friendly culture and forward-looking vision when it comes to accelerated EV adoption. Although Tennessee is not yet to the point where it can claim a mature and dependable charging ecosystem, the following efforts and partnerships highlight that Tennessee has been an important test bed for advancing the deployment of EVs in the U.S. and

¹⁰³ <https://www.electrifyamerica.com/our-plan>.

¹⁰⁴ “Submit a Comment, Proposal, or Recommendation,” Electrify America, <https://www.electrifyamerica.com/submissions>.

¹⁰⁵ Section 8.2.California ZEV Investment Plan Cycle 1 Supplement. https://www.arb.ca.gov/msprog/vw_info/vsi/vw-zevinvest/documents/california_zev_investment_plan_supplement_062917.pdf.

that it possesses a unique set of key actors across sectors that are working together to implement and collaborate on the next wave of charging infrastructure improvements. These initiatives also highlight additional areas that will continue to inform the State regarding its implementation of related **Light Duty ZEV Supply Equipment** investments.

i. Federal Highway Administration Alternative Fuel Corridors

On March 8, 2018, the FHWA designated portions of I-24, I-75, and I-65 in Tennessee as either “signage-ready” or “signage-pending” Alternative Fuel Corridors for publicly accessible EV DCFC and CNG refueling.¹⁰⁶ These Tennessee highways join I-40, which was designated in 2017 by FHWA as an Alternative Fuel Corridor for electric, CNG, propane autogas and hydrogen refueling (“signage-ready” or “signage-pending,” depending on the fuel). FHWA has designated these corridors to improve the mobility of alternative fuel vehicles across the country. In order to designate the corridors, FHWA solicited nominations from state and local officials for major highways with regularly spaced alternative fuel stations running through their jurisdictions. TDEC’s Office of Energy Programs worked with TDOT, Tennessee Clean Fuels, TVA, Oak Ridge National Lab (ORNL), and ChargePoint to draft this successful nomination.

ii. Tennessee Electric Vehicle Consortium

In December 2017, TVA unveiled a work plan for a “Tennessee Electric Vehicle Shared Visioning and Roadmap Development” project, under which Navigant Consulting is conducting a multi-stakeholder engagement process and will produce a market assessment and related roadmap for EV adoption and deployment in the Tennessee Valley. These deliverables, which are expected to be complete by October 2018, will likely inform the program design and implementation timeline for the **Light Duty ZEV Supply Equipment** category. The TDEC Office of Energy Programs is engaged as a core team member, along with TVA, TDOT, ORNL, the Electric Power Board of Chattanooga (EPB), Metropolitan Nashville Government, Nashville Metropolitan Transit Authority (MTA), City of Knoxville, Nissan, LocalMotors, and Gridsmart.

iii. Research and Development Efforts in Tennessee

Tennessee-based ORNL is the largest DOE science and energy laboratory in the United States. ORNL conducts basic and applied research to deliver transformative solutions to compelling problems in energy and security. The National Transportation Research Center (NTRC) at ORNL is the most comprehensive transportation technology facility in the DOE laboratory system and leverages ORNL’s world-leading science capabilities to address national transportation challenges. The facility supports research focused on vehicle electrification, engines and emission controls, new materials for future systems, and data science and automated vehicle technologies — transforming new scientific discoveries into early stage technologies for commercialization by America’s transportation industries. The ORNL NTRC has unique capabilities in the areas of fuels and engines, inverter design, wireless EV charging systems, and core competency in power systems and electrical engineering. Additionally, ORNL has recently-acquired experience with the policies and procedures necessary for deployment of these systems. These experiences include up-to-date knowledge of EV

¹⁰⁶ “Alternative Fuel Corridors: Advancing America’s 21st Century Transportation Network,” FHWA, 4 April 2018, https://www.fhwa.dot.gov/environment/alternative_fuel_corridors/.

charging equipment, expertise on data collection and data analysis, as well as on charging station use patterns.

Given the potential for the abovementioned research to affect near-term improvements and advancements with regard to vehicle technologies and EV charging equipment, the State will stay apprised of ORNL's research throughout the duration of the Trust in order make informed decisions on related investments.

Similarly, the State will track the activity and results of specific research projects in Tennessee that may impact the commercial viability of high-speed EV charging technologies. On April 30, 2018, DOE awarded \$4.8 million in cost-shared research projects focused on batteries and vehicle electrification technologies to three Tennessee organizations: the University of Tennessee at Knoxville; Coulometrics, LLC, and ORNL.¹⁰⁷ Over the next 2-3 years, these research projects will focus on (1) advanced anodes, electrolytes, and battery cell designs that can be charged rapidly – in less than 10 minutes – while still maintaining performance over a 10 year life span, and (2) the development and verification of electric drive systems and infrastructure for electric vehicle extreme fast charging, which will increase charging power levels from current home charging at 7 kW to power levels up to 400 kW. These projects will also focus on reducing typical charging times from 8 hours down to 15 minutes or less. As these research projects move forward, the State will seek to stay informed of their findings so as to be cognizant of the potential for development, commercialization and deployment of improved EV charging technology options that could be funded under the EMT.

¹⁰⁷ <https://www.energy.gov/articles/departments-energy-announces-19-million-advanced-battery-and-electrification-research-enable>.

APPENDIX 7 – IDENTIFICATION OF AREAS THAT BEAR A DISPROPORTIONATE SHARE OF AIR POLLUTION

Figure 6: Disproportionate Burden Index by County for Tennessee (September 2018)

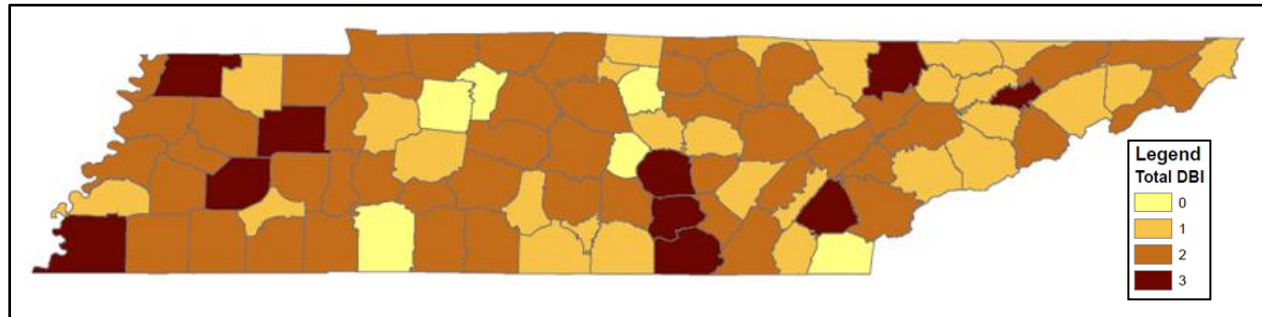


Table 7: Disproportionate Burden Index by County for Tennessee (September 2018)¹⁰⁸

County	Percent Below Federal Poverty Level (2016) Dollars	DBI Score	On-road NOx Emissions (2014) Tons	DBI Score	Vulnerable Age Segment % (2016) Below 14 and Above 65	DBI Score	Minority % of Population (2016)	DBI Score	Total DBI
Anderson	17.2	0	1681.8	1	36.4	1	10.2	0	2
Bedford	16.3	0	681.5	0	36.7	1	21.8	1	2
Benton	22.6	1	558.6	0	38.3	1	6.8	0	2
Bledsoe	23.7	1	171.3	0	33.2	0	10.1	0	1
Blount	13.6	0	1681.7	1	35.5	0	8.4	0	1
Bradley	18.4	0	2015.2	1	34.4	0	13.1	0	1
Campbell	22.4	1	1667.0	1	36.4	1	3.3	0	3
Cannon	16.2	0	195.6	0	35.4	0	5.4	0	0
Carroll	19.8	1	459.0	0	37.5	1	15.0	1	3
Carter	23.9	1	761.7	0	35.8	1	4.7	0	2
Cheatham	12.9	0	1106.2	0	32.8	0	6.4	0	0
Chester	17.9	0	214.8	0	34.7	0	13.7	1	1
Claiborne	22.3	1	485.2	0	33.8	0	4.5	0	1
Clay	24.8	1	112.4	0	40.6	1	5.1	0	2
Cocke	26.1	1	1096.1	0	36.5	1	6.4	0	2
Coffee	15.9	0	2066.6	1	36.6	1	10.7	0	2
Crockett	18.3	0	248.6	0	38.1	1	24.9	1	2
Cumberland	16.0	0	1839.8	1	43.9	1	5.2	0	2
Davidson	17.7	0	14538.8	1	29.5	0	43.4	1	2
Decatur	20.9	1	445.4	0	40.1	1	8.1	0	2

¹⁰⁸ The figures within this table have been rounded to the nearest tenth. Refer to Table 5: Disproportionate Burden Index Dataset Description for further detail on each dataset consulted.

County	Percent Below Federal Poverty Level (2016) Dollars	DBI Score	On-road NOx Emissions (2014) Tons	DBI Score	Vulnerable Age Segment % (2016) Below 14 and Above 65	DBI Score	Minority % of Population (2016)	DBI Score	Total DBI
DeKalb	22.2	1	258.8	0	35.5	0	10.5	0	1
Dickson	15.9	0	1326.7	0	34.8	0	9.9	0	0
Dyer	18.6	0	684.9	0	35.8	1	19.6	1	2
Fayette	15.0	0	1157.0	0	35.9	1	31.9	1	2
Fentress	23.3	1	299.5	0	37.3	1	3.1	0	2
Franklin	16.2	0	566.2	0	35.8	1	10.9	0	1
Gibson	18.7	0	592.1	0	37.9	1	22.9	1	2
Giles	16.7	0	893.0	0	36.0	1	15.2	1	2
Grainger	20.2	1	376.2	0	35.4	0	4.9	0	1
Greene	18.6	0	1919.6	1	35.7	0	6.5	0	1
Grundy	28.0	1	535.2	0	38.5	1	19.7	1	3
Hamblen	21.2	1	1239.2	0	37.0	1	17.8	1	3
Hamilton	14.8	0	6273.8	1	33.8	0	28.5	1	2
Hancock	27.3	1	86.2	0	35.5	0	2.8	0	1
Hardeman	23.7	1	374.1	0	32.6	0	45.2	1	2
Hardin	22.2	1	411.6	0	38.2	1	7.8	0	2
Hawkins	19.2	1	730.9	0	36.1	1	4.5	0	2
Haywood	21.0	1	1234.6	0	35.7	0	55.3	1	2
Henderson	20.7	1	1383.3	0	36.1	1	12.2	0	2
Henry	19.4	1	508.1	0	38.8	1	12.3	0	2
Hickman	22.9	1	858.8	0	32.9	0	9.1	0	1
Houston	20.9	1	95.2	0	38.1	1	7.7	0	2
Humphreys	18.5	0	792.4	0	37.0	1	6.8	0	1
Jackson	25.0	1	147.2	0	35.9	1	4.1	0	2
Jefferson	15.2	0	2192.1	1	35.5	0	7.4	0	1
Johnson	26.9	1	205.0	0	35.1	0	7.7	0	1
Knox	16.2	0	10100.8	1	32.3	0	17.1	1	2
Lake	29.2	1	51.3	0	27.8	0	32.5	1	2
Lauderdale	24.7	1	306.5	0	33.2	0	39.5	1	2
Lawrence	19.5	1	649.9	0	38.3	1	5.8	0	2
Lewis	20.4	1	136.4	0	37.4	1	6.6	0	2
Lincoln	18.5	0	557.5	0	37.0	1	12.5	0	1
Loudon	13.5	0	1765.0	1	41.0	1	11.2	0	2
McMinn	19.5	1	1826.6	1	36.5	1	10.2	0	3
McNairy	23.1	1	468.2	0	38.2	1	9.9	0	2
Macon	18.6	0	298.8	0	36.1	1	5.7	0	1
Madison	19.4	1	2584.3	1	34.1	0	43.3	1	3
Marion	19.2	1	1863.7	1	35.8	1	7.8	0	3

County	Percent Below Federal Poverty Level (2016) Dollars	DBI Score	On-road NOx Emissions (2014) Tons	DBI Score	Vulnerable Age Segment % (2016) Below 14 and Above 65	DBI Score	Minority % of Population (2016)	DBI Score	Total DBI
Marshall	15.1	0	709.1	0	34.8	0	14.2	1	1
Maury	14.7	0	1718.5	1	34.6	0	20.1	1	2
Meigs	18.8	0	184.8	0	36.5	1	5.3	0	1
Monroe	19.2	1	910.5	0	37.0	1	8.5	0	2
Montgomery	15.2	0	2607.7	1	31.9	0	34.9	1	2
Moore	10.4	0	106.4	0	37.0	1	6.4	0	1
Morgan	23.6	1	238.4	0	31.7	0	6.5	0	1
Obion	21.1	1	462.0	0	36.9	1	16.2	1	3
Overton	20.0	1	344.0	0	37.6	1	3.5	0	2
Perry	28.6	1	129.5	0	38.6	1	6.9	0	2
Pickett	16.5	0	80.4	0	40.9	1	3.1	0	1
Polk	17.8	0	308.6	0	35.7	0	4.5	0	0
Putnam	24.0	1	2371.9	1	33.6	0	10.9	0	2
Rhea	22.9	1	481.9	0	36.6	1	8.8	0	2
Roane	16.2	0	1535.9	1	37.1	1	6.7	0	2
Robertson	10.5	0	2254.5	1	34.1	0	15.7	1	2
Rutherford	12.6	0	5337.7	1	30.5	0	26.6	1	2
Scott	27.7	1	301.7	0	35.6	0	2.4	0	1
Sequatchie	16.1	0	226.0	0	37.9	1	14.4	1	2
Sevier	15.3	0	1845.2	1	35.2	0	9.0	0	1
Shelby	21.4	1	14005.3	1	32.8	0	63.2	1	3
Smith	16.2	0	905.5	0	34.8	0	6.7	0	0
Stewart	19.2	1	221.1	0	36.5	1	8.0	0	2
Sullivan	16.8	0	2701.7	1	36.7	1	6.2	0	2
Sumner	9.7	0	2184.0	1	34.6	0	14.3	1	2
Tipton	13.8	0	642.7	0	33.8	0	23.9	1	1
Trousdale	13.3	0	129.3	0	35.0	0	14.4	1	1
Unicoi	21.0	1	549.4	0	37.1	1	6.0	0	2
Union	23.5	1	205.2	0	34.8	0	3.3	0	1
Van Buren	19.1	1	100.2	0	36.2	1	4.3	0	2
Warren	20.7	1	522.8	0	36.6	1	13.7	1	3
Washington	17.1	0	1981.5	1	33.2	0	10.5	0	1
Wayne	18.9	0	205.2	0	32.6	0	9.5	0	0
Weakley	19.1	1	426.6	0	32.9	0	12.8	0	1
White	18.1	0	410.5	0	38.0	1	6.1	0	1
Williamson	5.2	0	3449.9	1	34.5	0	14.3	1	2
Wilson	9.1	0	2848.4	1	34.5	0	13.7	1	2