

Transit Related Comments



December 29, 2017

NC VW Settlement RFI
Division of Air Quality-Mobile Sources
217 West Jones Street
1641 Mail Service Center
Raleigh, NC 27699-1641

Submitted via USPS and email to: dag.NC_VWGrants@ncdenr.gov

This submittal is in response to the North Carolina Department of Environmental Quality Request for Information *Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas*.

On behalf of Mayor Nancy Vaughan, GTA Board Chair Richard Bryson, and City Manager Jim Westmoreland, I am pleased to submit this letter in support of replacing our aging diesel bus fleet with zero-emission, battery electric buses under the state's mitigation plan for the Volkswagen 2.0 and 3.0 liter vehicle partial consent decrees.

The City of Greensboro and the Greensboro Transit Authority (GTA) are committed to transitioning to an all-electric bus fleet to advance emission goals. All-electric buses will make a significant contribution to the City of Greensboro's goal to reduce emissions and increase the environmental sustainability of its transit operations. In addition to the environmental benefit of zero emission buses, the new vehicles are more fuel-efficient and have lower operation and maintenance costs than diesel buses. As a result, the City will increase the number of buses in revenue service, providing more trips per year, and possibly adding new service. The increase in frequency and the possibility of new service will increase daily passenger capacity and increase transit demand thus reducing the reliance on passenger vehicles and further advancing our emission goals in Greensboro.

GTA's fixed route fleet of 55 buses currently contains 16 diesel buses that have exceeded FTA's useful life standards (12 years and/or 500,000 miles). Another 10 diesel buses will exceed their useful lives in 2018. GTA has worked closely with the Metropolitan Planning Organization (MPO), the North Carolina Department of transportation (NCDOT), and the City of Greensboro to secure Federal, State and local funding to replace our aging diesel powered transit fleet with zero-emission all-electric buses. However, these sources will not be sufficient to replace buses in a timely manner. The City has reserved federal grant funding and local matching funds for the purchase of four (4) zero-emission, all-electric buses in 2018. The City has also secured funding, in the amount of \$450,000, under Duke Energy's Electric Bus Charging Infrastructure

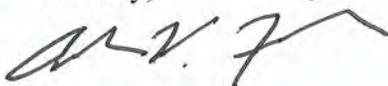
Support Project to apply towards the purchase of an overhead fast charge station. The delivery of four (4) electric buses and the associated charging infrastructure in August 2018 will make Greensboro the first municipal transit agency in North Carolina to operate zero-emission, all electric buses.

The electric buses on order will achieve 22+ MPGe performance, 500%+ better than diesel and CNG buses; eliminating toxic diesel particulate matter and reducing carbon emissions by 70% or more compared to CNG or diesel buses. In addition, the cost of maintenance differential is substantial in comparison to fossil fueled buses. Using the useful life standards (12 years and/or 500,000 miles), it is estimated that an all-electric bus will save a transit agency up to \$350,000 per bus on average over the life cycle of the transit bus as compared to a fossil fuel transit bus.

The City of Greensboro fully supports the effort to deploy 100% electric buses in North Carolina and urges you to give strong consideration for Public Transit initiatives to increase sustainable mobility options for the State. The City of Greensboro respectfully requests use of the mitigation funds allotted the Trust for the acquisition of up to ten (10) all-electric buses to replace an aging fleet of diesel buses and further advance emission goals in Greensboro. The estimated cost per electric bus is \$800,000 including charging infrastructure. The total cost of the Greensboro project is \$8 Million with local as well as State and Federal matching funds being available to support the transition to 100% electric buses. See the attached project summary for additional information on Greensboro's request.

The City of Greensboro looks forward to its partnership with the Department of Environmental Quality to advance cleaner sustainable mobility options in Greensboro and across the great State of North Carolina.

Sincerely,



Adam Fischer, PE, Director of Transportation

cc: Mayor Nancy Vaughan
Greensboro City Council
Richard Bryson, GTA Board Chair
Greensboro Transit Authority Board
Jim Westmoreland, PE, City Manager
David Parrish, Assistant City Manager
Bruce Adams, Public Transportation Manage

Project Application Information

Organization - City of Greensboro/Greensboro Transit Authority

Contact - Adam Fischer, PE, Director of Transportation

Type - Local Government

Address - 300 W. Washington Street, PO Box 3136, Greensboro, NC 27402-3136

Email - Adam.fischer@greensboro-nc.gov

Phone - (336) 373-2861

Project Category

Class 8 Transit Buses with model year 2009 or older engines and a GVWR greater than 14,001 lbs. and used for transporting people.

PROJECT SUMMARY

The Greensboro Transit Authority (GTA) provides public transportation services for the City of Greensboro, serving 287,027 citizens over 131.8 square miles. GTA provides 4.1 million passenger trips each year through 16 fixed bus routes covering 231 miles and paratransit service throughout the entire City. The fixed route fleet drives 2,170,000 revenue miles each year and the paratransit system covers 1,400,000 revenue miles each year serving citizens who cannot utilize the fixed route system. The GTA fleet is comprised of 55 fixed route buses (44 diesel and 11-hybrid electric-diesel) and 49 paratransit vehicles (42 diesel and 7 hybrid electric-diesel). Currently sixteen (16) diesel fixed route buses have exceeded FTA's useful life standards (12 years and/or 500,000 miles) and another ten (10) diesel fixed route buses will exceed their useful lives at the end of 2018. Over the next 2 years GTA has need to replace a total of 26 fixed route diesel buses as these diesel buses which have exceeded their useful life are experiencing costly repairs.

Mitigation Action Requested:

The City of Greensboro/GTA request the use of VW Mitigation Trust Funds allotted to the State of North Carolina to purchase 100% electric zero emission buses to replace aging diesel buses.

Number of Vehicles:

Ten (10) 100% battery electric buses

Ten (10) Plug-in depot chargers

Technology:

100% battery electric bus with 440kWh of on-board storage. The bus body is comprised of advanced carbon composites that are extremely light, durable and corrosion resistant. The battery-electric bus recharging system will consist of a 62.5 kWh Plug-in Depot Chargers for each bus. The Depot Chargers will recharge the 440 kWh buses to 100% State of Charge in four (4) to six (6) hours providing 250 miles of range. The Depot chargers will have standard SAE J1772 CCS components, which will allow other light duty vehicles or public vehicles charging when the transit buses are not utilizing the chargers.

Project Cost:

Battery electric bus - \$750,000; x 10 = \$7,500,000

Depot chargers - \$50,000; x 10 = \$500,000

Total Cost = \$8,000,000

Cost Share:

In 2016, a local bond referendum passed in Greensboro to support bus replacements, which authorizes the city to use \$4.5 Million in local funds towards bus replacements. The City plans to use these local funds to match available Federal Funds and other grants to replace our aging diesel bus fleet with 100% electric buses. Last year Duke Energy awarded the City a \$450,000 grant to support electric bus charging infrastructure. The City of Greensboro recently utilized \$4.1 in Federal and local matching funds along with the \$450,000 Duke Energy grant to purchase four (4) electric battery powered buses and associated charging infrastructure. The buses and charging infrastructure will be delivered in August 2018.

Project Benefits:

Economic – Electric battery powered lightweight carbon fiber buses provide significant efficiencies and offer a lower total cost of ownership as compared to conventional transit buses. Electric buses operate with fewer moving parts – reducing maintenance costs associated with oils, filters, fluids, particulate filters, and brakes. Electric energy is also less expensive than traditional diesel or other petroleum fuels, which further reduces operating cost. Over the 12 year/500,000 mile life of a transit vehicle, it is conservatively estimated that a \$350,000 savings in total ownership (electric vs. diesel) for each bus. These savings will be utilized to further enhance transit services in Greensboro and will have inherent economic benefits associated with a vibrant modern public transportation system (access to jobs, access to education, etc.).

Environmental – A typical diesel bus emits approximately 200,000 lbs. of greenhouse gases (GHG) each year. A switch to zero-emission buses with no tailpipe exhaust will greatly reduce GHG and NOx emissions. Based upon a conservative 12-year lifespan of zero-emission, battery-electric buses – the project's ten (10) buses well-to-wheel Greenhouse Gas (GHG) emissions reduction is estimated at up to 13,345 metric tons CO₂e and 5.04 metric tons of NO_x.

Total Cost Effectiveness of GHG Emission Reductions using the Carl Moyer Program Guidelines for the cost calculations.

<https://www.arb.ca.gov/msprog/moyer/guidelines/current.htm>.

- $(\text{Capital Recovery Factor} \times \text{Project Cost}) / \text{Annual GHG Emission reductions}$
- $(.095 \times \$8,000,000) / 1,120 \text{ metric tons of CO}_2\text{e} = \$678 / \text{metric tons of CO}_2\text{e}$
- $(.095 \times \$8,000,000) / .42 \text{ metric tons of NO}_x = \$1,809,523 / \text{metric tons of NO}_x$

Conclusion:

Greensboro is in critical need to replace several aging diesel buses and has already taken the first step towards replacement with the recent order of four (4) 100% electric battery buses and associated charging infrastructure (supported by a Duke Energy grant). We are committed to continue the critical replacement of our aging diesel fleet with electric buses in order to create a cleaner, modern, sustainable transit system for our citizens. This project to support the purchase of ten (10) electric buses in Greensboro will greatly aide these efforts.



STATE OF NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY 217 WEST
JONES STREET, RALEIGH, NC 27603 P. O. BOX 1641, RALEIGH, NC 27699-1641
December 29, 2017

NC VW Settlement RFI
Division of Air Quality - Mobile Sources
217 West Jones Street
1641 Mail Service Center
Raleigh, NC 27699-1641

To whom it may concern:

This submittal is in response to the North Carolina Department of Environmental Quality Request for Information Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas released November 21, 2017.

The City of Asheville has identified a need for both a replacement of vehicles, transit buses and sanitation trucks to be specific, as well as a need for infrastructure investment in electric charging stations and compressed natural gas as a funding priority. The City of Asheville is committed to improving the air quality in our community. This is demonstrated by our commitment to reducing our municipal carbon emissions by 4% annually and through our recent efforts to become more resilient. The City is currently updating our comprehensive plan that includes promotion of low emission vehicles both within City operations as well as the private sector.

Thank you for the opportunity to shape the distribution of these funds. Please do not hesitate to contact me if you have any questions or require additional information.

Respectfully,

Amber Weaver
Sustainability Officer
City of Asheville

Section 1 - Project Applicant Information

- **Organization:** City of Asheville, N.C.
- **Contact:** Amber Weaver, Office of Sustainability
- **Type:** Asheville City Government (local government)
- **Address:** P.O. Box 7148, Asheville, NC 28802
- **Phone:** (828) 271-6141
- **Email:** aweaver@ashevillenc.gov

Section 2 – VW Program and Solicitation Design Questions

1. **Prioritization:** In order to have the most significant impact on air quality across North Carolina potential projects should be based on the following:
 - **Environmental Impact:** The funds should target vehicles that have the greatest emissions or reduce the number of vehicles on the road. Considerations should be prioritized by average yearly miles driven, average yearly fuel consumption and reduction of vehicles on the road.
 - **Market Transformation:** Projects that will support a change in market behavior by removing identified barriers or accelerate the adoption of all cost-effective low emission vehicles as a matter of standard practice. These projects will stimulate economic activity or opportunities in the green economy. This should include public sector projects that have the ability to influence private sector activity.
 - **Economic Stability:** Projects that will decrease costs for the citizens of North Carolina should be prioritized. This should include projects for governmental agencies which will result in a decrease of cost that is supported by taxpayer dollars. These dollars will be able to be diverted to providing economic stability through affordable housing, increased infrastructure, public education, etc.
 - **Sustainable Policies:** Organizations that have dedicated policies to sustainability and resiliency should be given priority. This ensures that these funds will support systemic change to reduce the impact on our environment as well as respond the changes in our atmosphere as a direct result of vehicle emissions and climate change.
 - **Preparedness:** Organizations that the demonstrated the need and ability to replace vehicles quickly should be expedited. This will magnify the impact of this funding by taking high emission vehicles off the road more quickly.
2. **Demand:** We anticipate that there will be a high demand for replacement vehicles within government agencies as more and more jurisdictions embrace more efficient fleet policies.
3. **Trust Funding for Light Duty Zero Emission Vehicle Support Equipment:** We suggest that this be redefined as “zero emission vehicles and/or charging infrastructure”.

This will provide the market the most flexibility while ensuring that emission-free vehicles are the result.

4. **Demand for Diesel Engines Outside the VW Scope:** Not sure.
5. **Allocated Funds by Project Type:** Allocation should be distributed based on the need that is demonstrated through the RFI process.
6. **Percentage Reserved for government projects:** Yes, a percentage of the funding should be reserved for governmental projects. Projects that aim to maximize the environmental impact as well as the societal cost should fast-tracked. Investments in government projects reduce the cost to taxpayers in the long term and should be prioritized.
7. **Geographic Distribution:** Not necessarily. Priority should be given to projects and communities that are demonstrating commitment to clean air and expedited based on the list included in #1.
8. **Matching Funds:** Yes, local matches ensure that governments are committed and have vetted the viability of a project. Without local matches, scarce financial resources can be squandered because there is no public cost.
9. **Minimum Project Size:** Perhaps a minimum number of miles driven or gallons of fuel to be transitioned from. We should judge the reduced impact of emissions not the size of the vehicle.
10. **Key Factors:** Yes, they should consider the cost per metric ton of carbon that is offset be each vehicle.
11. **Other Feedback:** Funding should not be allocated to any project that aims to pilot or test vehicles because there are communities that have already demonstrated commitments to transition to zero-emission vehicles and it would be better to fund jurisdictions that are moving in a direction that will move the market rather than offering scarce funds for trials that tend to lack political commitment. This is the standard for [FTA's Low or No Emission Vehicle Program](#).
12. **Tools to Quantify Emission Reducts:** EPA Greenhouse Gas Equivalency Calculator: [link](#).
13. **Methods to Reduce Barriers to Participation in Solicitation:** Please prioritize projects that can use funding in the first years in order to provide maximum benefits to communities quickly. If funds are not available until later years, the age of vehicles should be adjusted as pre-2009 vehicles will be largely out of service.
14. **Valuable Stakeholder Information:** Specific guidelines and standards for how to calculate cost effectiveness and measure anticipated environmental impact.

Section 3 – Project Information

Project Summary

- **Project Category:**

- Class 4 - Asheville maintains 7 pre-2009 diesel transit vehicles and 5 2010 diesel hybrid transit vehicles.
- Class 8 - Asheville has 4 pre-2009 diesel sanitation trucks scheduled for replacement.
- **Geographic Area:** Asheville's transit system operates citywide and also provides service to nearby Black Mountain, with over 2,000,000 unlinked passenger trips in 2017. The sanitation division operates citywide.
- **Fleet type:**
 - Transit vehicles are mix of 30- and 35-foot diesel or diesel hybrid buses
 - Sanitation vehicles are a mix of diesel and CNG.
- **Mitigation action:** Asheville would use funding to purchase zero-emission battery-electric transit buses and purchase diesel sanitation trucks that will be fueled with biodiesel.
- **Number of engines/vehicles/vessels/equipment targeted for emission reductions:** The number would depend on when and how much funding would be available. Asheville's preference would be for the bulk of funding to be available as soon as possible in order to be able to contribute to the replacement of pre-2009 vehicles that currently need to be replaced.
- **Emission reduction/offset technology to be used:** Zero-emission, battery-electric vehicles, electric charging infrastructure, biodiesel vehicles and expanded CNG charging are proposed.
- **Estimated cost of project:**
 - Transit: Assuming that the grant would provide 80% of each project, funding needed per bus would total approximately \$665,000 (\$830,000 for the total project), which includes the cost of a 35-foot zero-emission battery electric bus and long-range (overnight) charging station.
 - Sanitation Trucks: Assuming the grant would provide 80% of each project, funding needed per truck would total approximately \$190,000 (\$237,515 for the total per vehicle). This includes the cost of one class 8 sanitation truck.
- **Expected Benefits:**
 - Transitioning to battery electric buses will provide:
 - Greater municipal financial sustainability: By transitioning to battery-electric buses the City will reduce its liability and risk associated with uncertainties relating to the price and supply of liquid fossil fuels. The price of diesel fuel is uncertain and has fluctuated between \$2-4 in the last ten years resulting in local transit fuel costs that vary significantly. Electricity in our region also has a better of history of continued uninterrupted service.
 - Reduced energy consumption: According to our analysis, based on average fuel economy data from our fleet, Altoona-verified standards of Proterra vehicles, and Energy Information Administration (EIA) energy conversion equivalents, battery-electric buses use approximately 6,000 BTU per mile versus diesel buses that consume over 32,000 BTU per

mile when comparing fuel types against each other. In other words, when comparing fuel consumption against a BTU standard, battery-electric buses use 80% less energy.

- Reduced harmful local emissions: Although it is difficult to measure precise quantities for emissions due to many factors that influence a vehicle's operation and emissions patterns, battery-electric vehicles produce zero local emissions while the combustion engine emits many different harmful gases. According to our analysis, a conservative estimate shows each diesel bus produces at least 1,000 pounds of harmful emissions per year. This grant opportunity would therefore contribute to a reduction of at least 6,000 pounds of harmful local emissions every year.
- Reduced carbon emissions: A significant goal of the City of Asheville is to reduce carbon emissions by 4% per year (see attached Resolution 11-77). Each diesel bus that is converted to battery-electric reduces yearly carbon emission by approximately 54 tons. This grant opportunity to convert six buses equates to the reduction of 324 tons of carbon per year, which meets 25% of the City's yearly carbon emissions reduction goal.
- Increased quality of light: battery-electric buses are not as noisy, contributing to fewer noise complaints and a better quality of life for anyone living near a bus stop.
- Replacing sanitation trucks from trucks that were retrofitted to accept biodiesel will enhance our ability to higher concentrations of biodiesel.
- Upgrading and expanding the CNG station will benefit both the government and the community. This filling station is public and used by both the municipality as well as private industry. Expanding the capacity will allow both the private sector and local government to expand investments in CNG which will be decrease our environmental impact increase our communities resilience through increasing the fuel diversity of our fleet.

Project Detail

- Vehicles and Equipment Targeted for Emission Reductions
 - Number:
 - Seven pre-2009 diesel transit buses
 - Four pre-2009 diesel sanitation trucks
 - Class or equipment type:
 - Heavy duty buses with 12 yr/500,000 mile useful life
 - Heavy duty trucks that consume approximately 11,255 gallons annually
 - Fuel type, amount of fuel used, annual miles travelled or annual usage rate, annual idling hours:

- Transit: Diesel fuel B20 mix; approximately 10,000 gallons per transit vehicle per year; approximately 45,000 miles driven per year; idling hours uncertain though probably very high.
- Sanitation Trucks: Consume approximately 11,255 gallons annually, idling hours uncertain though probably very high
- Implementation
 - Technology type, make, and model: Proterra 35-foot Catalyst E2, zero-emission battery-electric long-range buses
 - Equipment type:
 - Transit: charging infrastructure to be installed this year and will be expanded with each purchase of additional ZEVs.
 - CNG: Upgrade and expand CNG capacity by replacing the current compressors with a new Galileo Micro Box 3000 MX2, 215-4-1800, with drying tower.
- Benefits to areas that have been disproportionately impacted by emissions of nitrogen oxides (NOx) or other pollutants.
 - Whether a project applicant is low income, minority, or disadvantaged or operates vehicles in these communities: Any project that supports cleaner transit vehicles should be ranked highly because low income populations are dependent on transit, regardless of where they live. That is, dependent transit riders find their way to the transit system where it's an option because the yearly transportation cost is lower than owning and operating a car.

Capital and Project Costs

- Cost per vehicle:
 - Transit: Zero-emission 35-foot transit vehicles cost approximately \$830,000 including chargers installed. One approach to the program could be to only fund the conversion of transit vehicles to zero-emission electric buses. The yearly \$9M would provide an 80% match for approximately 14 buses each year, 140 buses in total.
 - Sanitation: Assuming the grant would provide 80% of each project, funding needed per truck would total approximately \$190,000 (\$237,515 for the total per vehicle). This includes the cost of one class 8 sanitation truck.
 - Upgrade and Expand CNG Fueling Station: The cost to replace the current compressors with a new Galileo Micro Box 3000 with drying tower will cost \$600,000.
- Identify projected cost share: The City of Asheville proposes to match projects with 20% matching funds from local city funds.



December 22, 2017

Brian C. Phillips
Mobile Sources Compliance Branch Supervisor
North Carolina Department of Environmental Quality
1601 Mail Service Center
Raleigh, N.C. 27699-1601

Delivered via email and USPS to: [daq.NC VWGrants@ncdenr.gov](mailto:daq.NC_VWGrants@ncdenr.gov)

Dear Mr. Phillips:

Enclosed please find the City of High Point's submittal to the *Department of Environmental Quality Request for Information - Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas* dated November 21, 2017. We appreciate the efforts of NC DEQ in soliciting and considering public input regarding this important settlement. As detailed in our submittal, we have a project that is ready to implement that will help reduce emissions, if we are fortunate enough to be awarded VW settlement funding.

Thank you again for your transparency in administering this important program and we look forward to the evolution of the settlement grant program in the state. Please do not hesitate to contact Angela Wynes, our Transit Manager, if you have questions or require additional information.

Sincerely,

Greg Demko, City Manager



Department of Transportation

City of High Point North Carolina



Public Transportation Division

Request for Information Submittal

Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas

Introduction

This submittal is in response to the North Carolina Department of Environmental Quality Request for Information *Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas* released November 21, 2017.

Section 1 - Project Application Information

Company – City of High Point
Contact – Angela Wynes, Transit Manager
Type – North Carolina Local Government
Address – PO Box 230, High Point, NC 27261
Phone – (336) 883-3424
Email – angela.wynes@highpointnc.gov

Section 2 - VW Program and Solicitation Design Questions

1. Prioritization - in an effort to maintain the highest level of compliance with the settlement, potential projects should be prioritized based for transit vehicles fueled by clean diesel, diesel hybrid, electric and CNG as follows:

i. Environmental impact - focusing the settlement funds on applications targeting the greatest emitters, providing the greatest environmental benefit. Under the terms of the settlement, there are eleven categories eligible for funding. Four of these represent medium and heavy-duty on-road vehicles, which are also the greatest contributors of NOx emissions of the categories listed. The City of High Point has a need to replace 1 bus between FY18-23 which will have exceeded its useful life of 12 years. A significant reduction in NOx would occur by simply replacing the vehicle with a much cleaner, more fuel efficient diesel engine.

ii. Minimizing tax burden - minimizing taxpayer subsidies by allocating settlement funds to public entities should be considered. This minimizes the impact on local government budgets. Reduction in federal funding for significant projects which are eligible for settlement grants should be considered when priorities are quantified.

iii. Project readiness - inflationary pressure will minimize the impact of projects awarded if grantees are not in a position to implement projects in a timely manner. The option of a near term purchase versus a purchase in future years could result in

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significant savings. Prioritization of this type would serve to maximize the purchasing power of the settlement.

iv. Project cost - projects that maximize the investment of settlement funding, taking into account the environmental impact, should be given priority. For example, if an entity can purchase two Class 4 - 8 vehicles that are powered by clean diesel for the cost of a single electric vehicle, the two-vehicle purchase would be more impactful thereby justifying a higher priority.

2. Demand - as demonstrated in Table 1, congressional support for bus capital under USC 49 has decreased over 100% from 2012 to 2016. This change was primarily due to the elimination of federal congressional earmarks in 2009. The impact of this reduction in funding has been significantly impactful to the transit industry. The decrease in federal funding has been compounded by inflationary pressures, rising commodity costs, changes to compliance regulations, and increasing onboard technology investments. While significant demand for discretionary funding is expected, high demand among transit providers should be expected due to aging fleets and decreased federal support.



3. Trust Funding for Light Duty Zero Emission Vehicle Supply Equipment - Infrastructure costs, whether they are allocated to a natural gas fueling station, or to charging stations for electric vehicles can be significant. This would reduce trust funds available for vehicle replacement. Directing the funds to vehicle replacement will directly lead to increased reduction in emissions.

4. Anticipated Demand Outside the VW Settlement - significant demand for capital vehicle replacement exists, and it is not anticipated that VW settlement funding will eliminate demand but should relieve some demand.

5. Funding Percentage Allocation - funding should be allocated based on the priorities outlined in number 1 of this section. The number one priority should be diesel emission reduction. Projects that demonstrate the greatest diesel emission reduction in the most economical manner should receive priority.

6. Percentage to Government Projects - projects that reduce the burden on North Carolina taxpayers should receive the highest priority. Should surplus settlement funding be available,

private projects could be considered. The responsibility of public agencies to allocate settlement funds in compliance with grant requirements will lead to less administrative burden for DEQ and significantly higher compliance. North Carolina governments are held to a standard and have internal controls and available staff that will produce the highest level of oversight and compliance with settlement requirements. Settlement funding awarded to public agencies will reduce taxpayer funded investments at the federal, state, and local levels and provide a far greater return on investment for taxpayers than settlement funding awarded to private providers, while meeting the ultimate goal of emission reduction.

7. Geographical Distribution - geographical equity between urban and rural areas should be considered. It is also imperative to distribute the funds in an equitable manner between the large urban areas including Charlotte, the Triad and Triangle, and the urban centers in the eastern and western portions of the state. Prioritizing funding to ozone non-attainment areas would be short sighted. Areas meeting EPA clean air requirements can only continue to maintain such status by continued investment in emission reduction efforts.

8. Matching Funds - there is no debate that requiring matching funds will broaden the reach of settlement funds and an argument could be made for matching fund requirements, but the process could prove burdensome. Also, projects often are delayed due to lack of matching funds. The City of High Point favors no matching fund requirements for government agencies.

9. Minimum Project Size - taking into account the administrative burden on the trustee, restricting a project to a minimum cost could lead to a quality project being excluded.

10. Other Key Factors - to maximize the impact of settlement funding in reducing emissions, cost effectiveness evaluation should include the amount of hours and/or miles the proposed vehicles are operated. Support for government projects that benefit North Carolina businesses would be beneficial to private manufacturers operating in the State.

11. Additional Feedback - as highlighted in previous responses, an agency's ability to manage grant funding in a responsible and compliant manner should be considered.

12. Quantifying Results - absent significant investment in air quality monitoring equipment, quantifying success could be challenging. Significant data exists to demonstrate the benefits of replacing an eligible diesel engine with a newer model, regardless of fuel type. Verifiable data also exists to demonstrate additional emission reduction from alternative fuels and electric propulsion vehicles.

13. Future Solicitations - a certain level of administrative resources and experience in diesel fleet management is vital to a successful grant program from settlement funds. Expanding the scope of involvement in the program is admirable but could lead to failure of grantees to implement successful projects which could dilute the impact of settlement funding.

14. Stakeholder Communication - as a potential stakeholder, the City of High Point would benefit from consistent feedback highlighting successful settlement awards and methods for improving applications. A clear understanding of how settlement funds are proposed to be distributed including: annual awards; award types; public private split (if applicable); geographic distribution; and detailed annual reporting would allow stakeholders to develop strategies for future submittals. Additional resources could include webinars and listening sessions as well as regional question and answer sessions. If implemented, these steps should lead to increased interest in the program, better applications for settlement funding, simplified project evaluation, reduced administrative burden, and a high level of transparency.

Section 3 - Project Information

The City of High Point is interested in this funding. Project specifics include:

- **Project Category** - Class 4 - 8 transit buses model 2009 year or earlier
- **Project Summary**
 - **Geographic area** - Corporate limits of the city of High Point
 - **Fleet type** - transit buses
 - **Mitigation action** - replace older diesel bus with clean diesel bus.
 - **Number of vehicles targeted** - 1
 - **Technology** -Clean diesel
 - **Estimated cost** - \$500,000
 - **Project benefits** - reduced exhaust emissions
- **Project Detail**
 - **Vehicles targeted for replacement**
 - **Number of vehicles** - 1
 - **Class** - 8
 - **Engine specifics** – Mercedes Benz MBE 906 model year 2004
 - **Fuel specifics** – Diesel, average annual fuel use – 1,800 gallons, average annual miles travel – 30,000
 - **Proposed replacement vehicles**
 - **Vehicle** – Current model year New Flyer 35’ Heavy Duty low floor transit bus
 - **Engine Specifics** – Cummins Diesel ISL9
 - **Engine Model Year** – estimated 2019
 - **LD ZEV Equipment** – not applicable
 - **Capital and Project Costs**
 - **Cost per unit** - \$500,000
 - **Cost sharing** – opportunities may include cost sharing by NCDOT and local funding partners

- **Project Benefits**

- **Annual lifetime and lifetime project emissions reductions**

Calculation method: Environmental Protection Agency's (EPA) Diesel Emissions Quantifier Tool

Type Onroad	Engine Model Year 2005	Fuel Type ULSD
Target Transit Bus	Upgrade Year 2019	Annual Fuel Gallons 1,800
Class or Equipment Transit Buses	Remaining Life 1	Annual Miles Traveled 30,000
Quantity 1		Annual Idling Hours 300
Edit Group Copy This Group Delete		

Upgrades to DCCB SLF

Action	Upgrade	New Model Year	Annual Gallons Reduced	Cost per Unit		Percent Reduction				
				Upgrade	Labor	NO _x	PM2.5	HC	CO	CO ₂
Edit Delete	Vehicle Replacement - Diesel	2019	0	\$500,000	\$0	89.9	97.8	91.9	91.8	-



TOWN OF CHAPEL HILL
Office of the Manager

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December 31, 2017

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Re: Request for Information Submittal Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas

Chapel Hill Transit is submitting a response to North Carolina Department of Environmental Quality's request for submittals regarding the recent Volkswagen Consent Decree Environmental Mitigation Trust. We appreciate the efforts of NC DEQ in soliciting and considering public input regarding this important settlement.

The Town of Chapel Hill is pleased to assist NC DEQ in your efforts to meet the settlement requirements of reducing diesel emissions in the state of North Carolina.

Please do not hesitate to contact me or our staff if you have questions or require additional information. We appreciate your consideration of this submittal.

Sincerely,

Brian Litchfield
Director, Chapel Hill Transit

Enclosed: VW RFI Submittal – delivered via electronic mail

Request for Information Submittal
Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas

Section 1 - Proposal Information

Project Applicant Information

- *Organization* – Town of Chapel Hill - Chapel Hill Transit
- *Contact* - Brian Litchfield, Director
- *Type* - Town of Chapel Hill (local government)
- *Address* - 405 Martin Luther King Jr. Blvd, Chapel Hill, NC 27514
- *Phone* - (919) 969-4000
- *Email* - blitchfield@townofchapelhill.org

Summary: This submittal is in response to the North Carolina Department of Environmental Quality Request for Information *Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas* released November 21, 2017. Chapel Hill Transit's (CHT) fleet of 98 fixed-route vehicles includes 40 heavy-duty transit buses that are beyond their useful life as defined by Federal Transit Administration (FTA) guidelines – 20 of which are more than 15 years old.

Description of services and area served: Chapel Hill Transit, the second largest transit system in North Carolina, is the public transportation provider for Chapel Hill, Carrboro and the University of North Carolina at Chapel Hill, serving over 60 square miles. Chapel Hill Transit provides fixed-route bus services (30 weekday & weekend routes) and EZ Rider (ADA) services. Chapel Hill Transit has a fleet of 117 vehicles (98 fixed-route and 19 demand response) – providing over 7 million annual rides and covering over 2.5 million miles.

Request for Information Submittal
Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas

Section 2: VW Program and Solicitation Design Questions

1. **Prioritization** - in an effort to maintain the highest level of compliance with the settlement, we believe potential projects should be prioritized based on the following:
 - a. **Environmental Impact** – projects that provide the maximum reduction in emissions should be given this highest priority, while also taking into account maximum return on investment.
 - b. **Project Cost/Return on Investment** – when developing the quantifiable criteria by which all projects will be judged, the scale should be weighed to maximize the greatest return on investment.
 - c. **Tax Burden Reduction** - minimizing taxpayer subsidies by allocating settlement funds to public entities before private companies should be considered. Distribution of VW settlement revenue between private and public providers should be weighted in favor of public agencies and the impact funding could have on the budgets of local governments.
 - d. **Project Readiness** – Prioritization should be given to projects that are ready to be implemented to reduce overruns and inflationary increases, which would minimize the effectiveness of the purchasing power of the settlement moneys. Projects should be evaluated based on the extent to which the project is ready to implement within a reasonable period of time.
 - e. **Demonstration of Need** - Applicants must demonstrate how the proposed project will address an unmet need for capital investment and mitigation of emissions.
 - f. **Demonstration of Benefits** – Applicants should be able to demonstrate the benefits of the project’s ability to reduce emissions, while placing emphasis on creating economic improvement and support for partnerships between public agencies, non-profit organizations and the private sector.
 - g. **Demonstration of Capability** - Applicants must demonstrate that they have the technical, legal and financial capacity to undertake the project. Applicants should also demonstrate how the proposed project is consistent with local and regional long-range planning documents and local government priorities and local financial commitment to the project.

2. **Public Demand** – The elimination of Congressional earmarks in 2009 has had a significant impact on the public transit; a reduction in over 100% for available federal funds for bus capital purchases between the years of 2012 and 2016. This has resulted in many transit agencies running older buses long past their defined useful

life. This extension has led to a backlog in the need of transit agencies to replace aging heavy duty and light duty diesel vehicles. Replacement of these older vehicles would result in a high return on investment as newer buses – especially zero emission buses – would result in a massive mitigation of high emission vehicles.

3. **Government Need** – As mentioned above, projects that reduce the burden on North Carolina taxpayers should receive the highest priority. Government agencies are uniquely suited to steward these funds as we already possess the necessary staff and continuing controls in place to ensure proper use of funds in accordance with both federal and state regulations. Likewise, the ability of government agencies to meet these regulatory demands in house would reduce the oversight burden on DEQ.
4. **Geographical Distribution** – we believe DEQ should consider a plan that foster's geographical equity between urban and rural areas. It is imperative to distribute the funds in an equitable manner between the large urban areas across the state and among rural entities.
5. **Matching Funds** – Matching funds will not only increase the reach and purchasing power of the settlement funds, and allow for a wider array and larger quantity of projects, but will also ensure a local commitment in the continued mitigation of emissions. A requirement of 10% matching funds would not be unreasonable and would serve to ensure a continued local commitment to investing in the infrastructure needed for continuing new technologies.
1. **Minimum Project Size** – There are two equally valid arguments to be made here: minimum project size would reduce the number of projects that DEQ has to exercise oversight on, but at the same time might eliminate smaller, quality projects – especially in rural areas – thus affecting the equitable distribution discussed above. If DEQ sets a minimum project size, it might be prudent to consider two separate categories for award and set different criteria for each: i.e. small scale project and large scale projects.
2. **Feedback** – Consistent feedback, not only on the development of the criteria, but also on the selection and rejection process would be beneficial to all agencies and could be easily accomplished through webinars, conference calls or even regional meetings for question and answer sessions. Specifically, highlighting successful awards and why they were chosen would help agencies tailor their projects to meet DEQ settlement goals and reduce the time DEQ spends reviewing any potential future applications.

Request for Information Submittal
Volkswagen Consent Decree Environmental Mitigation Trust Project
Ideas

Section 3: Project Summary

The Town of Chapel Hill is interested in applying for settlement funding. An example of our proposed project type is as follows:

PROJECT SUMMARY

Project Type: Class 4-8 Transit Buses Heavy duty with 2009 or older engine

Project Summary: The Town of Chapel Hill seeks funding to replace ten 35' Nova HD Diesel buses with all-electric models and overnight chargers.

Geographic Region: Chapel Hill Transit, the second largest transit system in North Carolina, is the public transportation provider for Chapel Hill, Carrboro and the University of North Carolina at Chapel Hill, serving over 60 square miles. Chapel Hill Transit provides fixed-route bus services (30 weekday & weekend routes) and EZ Rider (ADA) services.

Fleet Type: Chapel Hill Transit has a fleet of 117 vehicles (98 fixed-route and 19 demand response) – providing over 7 million annual rides and covering over 2.5 million miles.

Mitigation Action: Replace ten diesel buses with all electric models. Vehicles proposed to be replaced include: (10) 2001 Nova Diesel 35'. Vehicles to be replaced with Gillig 40' Electric HD Bus and ten overnight charging stations

Estimated Cost: \$12,000,000.00

DEMONSTRATION OF NEEDS

The primary mission of Chapel Hill Transit (CHT) is to provide safe, convenient, affordable, reliable, and responsive public transportation services to residents and visitors of the Chapel Hill, Carrboro, and University of North Carolina communities; to be accessible, efficiently operated and supportive of a healthy environment and a sustainable local economy; and to connect and coordinate with other transportation means in the Research Triangle area providing an alternative for local and regional travel.

CHT currently consists of over 20 weekday routes, of each around one third run during evenings and Saturdays. Three late night, "Safe Ride routes" operate on Thursday, Friday, and Saturday when the university is in session. Chapel Hill transit currently owns 98 buses and 11 lift-equipped vans. CHT is a very successful system carrying more riders than any other transit agency in North Carolina, excluding the

Charlotte Area Transit System. Much of the CHT's growth has occurred over the past decade, after deciding to operate as a fare-free system in 2002.

Success, however, has come with struggles. Consistent with experience nationally, traditional funding sources for transit agencies are stagnating while the cost to operate service increases. At the same time, the demand and need for transit is growing as transit services are increasingly viewed as important tools to stimulate economic development, protect the environment, offer viable travel options, and, specific to the situation in Chapel Hill, are an integral part of the parking plan for the UNC-Chapel Hill campus and reduce the number of emission spewing vehicles on the roads.

The reduction in funding has resulted in Chapel Hill Transit running vehicles well past their federally defined useful life, including running some diesel buses that are as old as 22 years. These vehicles are not low emission and their advanced age only results in even higher emission payloads.

The Town of Chapel Hill has made it a part of its mission to focus on environmentally friendly alternatives and solutions to today's issues. This includes recent efforts to replace the oldest of our buses with "clean-diesel" and electric transit buses using local funds. Unfortunately, all other current funding sources are exhausted forcing the Town to continue running some buses that are as old as 15-17 years.

DEMONSTRATION OF BENEFITS

As discussed, CHT ridership has grown significantly over the past 10 years. Between 2002 and 2009, ridership more than doubled, growing from 3.5 million riders to 7.9 million riders over the eight-year period (see Figure 2). From 2002 to 2012, investment in service hours increased by 30% (from 121,000 annual revenue vehicle hours to 158,323) and investment in service operations more than doubled (from \$6.9 million to \$14.6 million).

Based on CHT's recent spring 2016 customer survey, Fifty-one percent (51%) of riders surveyed had an income under \$30,000. Median income in Chapel Hill is \$35,106. The most common occupations of transit riders were: student (55%), professional (22%), skilled technician (5%), and various service industry occupations (4%). Only 3% of riders identified as unemployed.

The most common relationships with UNC were: undergraduate student (34%), graduate student (26%), employee at UNC hospital (13%), and staff/contractor at UNC (12%). On express routes 37% of riders identified as employees at UNC hospital, and on local routes 39% identified as undergraduate students at UNC. Sixty-eight percent (68%) of riders used public transit at least 5 days a week; 21% used it 3 to 4

days a week. The most frequently mentioned destinations of riders surveyed were: work (47%), or college (46%).

CHT has clearly become a lifeline for its service area, and is used primarily as a means of transportation for students to its partner institution: The University of North Carolina at Chapel Hill as well as a means for transit to our customers' employment, especially amongst those below median income. Approximately 90% of customers surveyed rated the overall quality of services provided by Chapel Hill Transit as excellent or good. This has remained largely unchanged since the 2012 customer survey. By providing a high level of satisfactory service to a diverse population, we are reducing the number of vehicles on the road for our most common trips: to work or school. This further mitigates pollution in the area as a result of combustion engines.

By replacing our oldest diesel buses (2001 NOVA 35' HD Buses) with all electric Gillig 40' buses, we can further reduce the emission payloads of our transit fleet as shown below:

EPA Emission Quantifier	
If Used for Replacement Vehicles:	CHAPEL Hill Transit
Fleet Information	2001 Nova Heavy Diesel
Number of Buses	10
Total Bus VMT/yr	197,930
Miles/Gallon	3.70
Gallons of Fuel/yr	53,495
Traveled Idle hours/year (4 veh)	5,200
EPA Quantifier Emission Results (Short tons-907.185kg)	
Nox Emission for entire fleet/year	47.525
CO Emission for entire fleet/ year	21.294
HC Emission for entire fleet/year	4.226
PM2.5 Emission for entire fleet/ year	2.441
CO2 Emission for entire fleet/ year	6018.00
Total Particulate Matter	6093.49
EPA Quantifier Emission Results (Short ton *907.185 kg) Kg equivalent/yr	
Nox Emission for entire fleet/year	43113.97
CO Emission for entire fleet/ year	19317.60
HC Emission for entire fleet/year	3833.76
PM2.5 Emission for entire fleet/ year	2214.44
CO2 Emission for entire fleet/ year	5459439.33
Total Particulate Matter	5527919.10

LOCAL SUPPORT

The Research Triangle Region of North Carolina generally refers to the cities of Raleigh, Durham, and Chapel Hill, as well as Wake, Durham, and Orange counties. Chatham County is also sometimes considered part of the Triangle Region, but this analysis concentrates on Wake, Durham, and Orange counties.

The region is well-known nationally for its concentration of universities and colleges, medical centers, and the Research Triangle Park (RTP), one of the largest research and development centers in the U.S. In part due to the success of RTP, the Triangle Region has emerged on the national stage as one of the nation's most desirable places to live. This has fueled tremendous growth, such that the region's population has doubled in the past 12 years, growing from roughly 700,000 in 1990 to 1.4 million in 2012. Development of the Triangle Region is somewhat unique as a metropolitan area because there is no clear urban center.

While the City of Raleigh is by far the largest urbanized area in the region, its population is just over 420,000 residents out of a regional population of 1.4 million, accounting for less than one-third of all residents. In addition, the diversity of employment centers, including Raleigh (North Carolina State capital and home to North Carolina State University), Durham (RTP, Duke University, and North Carolina Central University) and Chapel Hill (UNC and UNC Hospitals) meaning the region is truly polycentric. The region is expected to continue to expand, with both population and employment forecasted to increase significantly over the next several decades.

The regional transit plan is an ambitious program of transit investments. The Bus and Rail Investment Plan for Orange County, as adopted in December 2012, lays out a plan for expanding and improving local and regional bus service as well as developing new regional transit infrastructure. New projects include new local bus service within the county, expanded rural service in the northern and western part of the county, and new regional services operating between Durham and Orange counties. Specifically, in the first five years, the plan calls for an investment of 34,650 bus service hours. Unfortunately, funding is only available for expansion of service and not capital replacement.

In 2006, the Town of Chapel Hill became the first U.S. municipality to commit to a 60 percent reduction in carbon dioxide emissions by 2050 through the [Carbon Reduction Program](#). The Council authorized the pledge to reduce carbon dioxide emissions from Town municipal operations on a per capita basis, beginning with an initial goal of 5 percent reduction by 2010.

As of 2015, emissions per capita for Town operations are 6.7% below 2005 levels. The Town population has increased by 20% over the same 10-year period. These results indicate that the Town has lowered emissions from operations relative to an increase

in population size and corresponding service demand. Comparatively, absolute emissions from Town operations are 11.5% higher than in 2005; however, this number is down 7.5% since an emissions peak in 2010.

The project is consistent with the transit priorities identified in the 2035 Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) long range transit plan. The project was not included in the Metropolitan TIP and the State TIP due to lack of funding. The DCHC MPO will amend the Metropolitan TIP to add funding as soon as the grant award is announced. The State will approve a corresponding STIP amendment.

The implications of the regional transit strategy for CHT are unfolding. A broad commitment to strengthening and improving transit services will significantly benefit the region overall. The regional strategy will support many goals articulated in each of CHT's partners' plans: development of regional transit services will make it easier and more efficient for people to travel into Chapel Hill and Carrboro. By increasing travel options, new services will help sustain proposed growth at UNC as well as reduce local and regional traffic and congestion, thereby significantly contributing to the overall quality of life and a reduction in emissions.

LOCAL FINANCIAL COMMITMENT

The Town of Chapel Hill (Town) has undertaken a Strategic and Financial Plan for Chapel Hill Transit, creating a strategic plan to guide future system growth, development and investment. This study has resulted in a "Preferred Capital Funding Plan." This Preferred Capital Funding Plan provides a roadmap for the future financial sustainability of the CHT's services.

Based on the current Preferred Plan, CHT will purchase the most economic vehicles possible, including 40-foot clean diesel very low emissions buses and all-electric 40-foot buses. An early goal of vehicle acquisition will be to replace the oldest vehicles currently in the CHT fleet.

Local match will be provided by the Town of Chapel Hill through its Capital Reserve Fund

TECHNICAL, LEGAL AND FINANCIAL CPACITY

Chapel Hill Transit is eligible and authorized under state and local law to request, receive and dispense federal and state grant funds and to execute and administer grant funded projects. Chapel Hill Transit is able to implement the program of projects in accordance with the applicable laws and regulations, using sound procurement practices. Chapel Hill Transit has the ability to manage grant funds, maintain and operate grant funded facilities and equipment and conduct an annual

independent organization wide audit in accordance with the provisions of OMB Circular A-133.

CHT does not have any outstanding legal, technical or financial issues.



Office of the County Manager

P.O. Box 550 • Raleigh, North Carolina 27602

TEL 919 856 6160
FAX 919 856 6168

December 29, 2017

NC VW Settlement RFI
Division of Air Quality – Mobile Sources
217 West Jones Street
1641 Mail Service Center
Raleigh, NC 27699-1641

**Re: County of Wake Request for Information (RFI) Response
North Carolina's Volkswagen Mitigation Trust Fund Plan**

Dear NC Department of Environmental Quality (DEQ):

In 2016 Wake County voters approved a local option sales tax to support a major transit expansion in an area that is adding about 67 people per day. Over the next 10-years the community investment will triple the existing level of bus service by expanding 17 miles of frequent bus service to 83 miles. The plan will bring a transit stop within walking distance of more than 54 percent of homes and 80 percent of jobs in Wake County, and enhance access to transit to many areas in the County through the expansion and improvement of fixed route services, expansion and improvement to non-fixed route paratransit services in rural areas, and the introduction of a 50% match program for towns to establish local transit services. The transit plan also includes 37 miles of investment in commuter rail and 20 miles of infrastructure for bus rapid transit.

As part of implementing the transit vision, Wake County fully supports the move to alternative fuel vehicles for transit purposes. In April of this year, the Board of Commissioners requested the Wake County Transit Planning Advisory Committee, comprised of members from all of Wake County's municipalities, plus GoTriangle, the Capital Area Metropolitan Planning Organization (CAMPO), Wake County, North Carolina State University (NCSU), and Research Triangle Park (RTP), develop a strategy to address environmental goals related to bus fleet technology. The County specifically requested consideration of alternative sources for propulsion (electric, compressed natural gas, other) and consideration of how different options relate to the "look and feel" of transit services.

The County is supportive of the inclusion of Class 4-8 public transit vehicles as an eligible project type in North Carolina's distribution of the Volkswagen (VW) Mitigation Trust Fund monies. Moreover, Wake County supports creating a direct allocation of a portion of the settlement funds for transit vehicles. The County encourages a minimum funding amount of \$30 million directly allocated for distribution through an application process. This program could be modeled after other states, where specific transit vehicle allocations have been created from the VW settlement funds, which are then applied for by transit agencies, and administered by state Departments of Transportation. The application program could be developed by NCDOT Public Transportation or mirror requirements of the FTA Low or No Emission (Low-No) Vehicle program. However, allocation of funds from the settlement, for all purposes, not just for transit vehicles, should be allocated through a competitive process, based on strength of application and ability to match funds, including leveraging settlement funds with local and or federal participation.

To implement new service, the Wake Transit plan calls for a structured expansion of new vehicles and replacement of existing older vehicles. In the next two years, funding is allocated for the replacement at least thirty (30), 12-year old diesel vehicles. A competitive process that would allow grant funding to pay for the differential between the cost of an electric or compressed natural gas (CNG) bus, as compared to the cost of a diesel bus, would be transformative for the region in shaping the provision of bus service. We estimate that based on current costs the difference between a diesel and electric bus is approximately \$300,000, including the charging infrastructure. If all 30 buses planned for replacement as part of the Wake Transit Plan were replaced as electric vehicles, an additional \$9.0 million would be needed. With a direct allocation of funding from the VW Settlement, the County through its participation in the Wake Transit governance structure, would encourage transit providers to leverage Wake Transit Funds and submit applications for clean technology replacement vehicles and related infrastructure.

The work of implementation of transit in Wake County is just underway. Many of our transit partners will also be submitting responses to this RFI and are also looking to move to alternative fuel vehicles for transit purposes. If additional information is needed regarding the Wake Transit Plan, or details to further answer the Department's RFI, please feel free to contact the County.

Sincerely,



David Ellis, Interim County Manager
Wake County, NC

cc: Board of County Commissioners
Nicole Kreiser
Chris Dillon



Cape Fear Public Transportation Authority

P.O. Box 12630 • Wilmington, NC 28405 • (910) 343-0106 • (910) 343-8317 fax • wavetransit.com

December 22, 2017

Brian C. Phillips
Mobile Sources Compliance Branch Supervisor
North Carolina Department of Environmental Quality
1601 Mail Service Center
Raleigh, N.C. 27699-1601

Delivered via email and USPS to: daq.NC_VWGrants@ncdenr.gov

Dear Mr. Phillips:

Enclosed please find the Cape Fear Public Transportation Authority's submittal to the *Department of Environmental Quality Request for Information - Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas* dated November 21, 2017. We appreciate the efforts of NC DEQ in soliciting and considering public input regarding this important settlement. Wave Transit is in excellent position to assist DEQ in your efforts to meet the settlement requirements of reducing diesel emissions in Southeastern North Carolina. As detailed in our submittal, we are also primed to implement emission reducing strategies that will minimize taxpayer burden both regionally and statewide, if we are fortunate enough to be awarded VW settlement funding.

The Authority also would like extend an offer to DEQ to host any informational sessions regarding the settlement in the Wilmington region. Wave Transit has meeting availability for up to 85 at our operations center. The facility offers ample parking and a functioning state of the art compressed natural gas fueling station, which may be of interest to potential grantees.

Thank you again for your transparency in administering this important program and we look forward to the evolution of the settlement grant program in the state. Please do not hesitate to contact me or our staff if you have questions or require additional information.

Cordially,

William Bryden
Chairman

Attachment - VW Settlement RFI Submittal

Cc: Cape Fear Public Transportation Authority Members
Albert Eby, Executive Director, Cape Fear Public Transportation Authority
Tony McEwen, Asst. to the City Manager for Legislative and Intergovernmental Affairs, City of Wilmington
Mike Kozlosky, Executive Director, Wilmington Urban Area Metropolitan Planning Organization



CAPE FEAR PUBLIC TRANSPORTATION AUTHORITY

Request for Information Submittal

Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas

Introduction

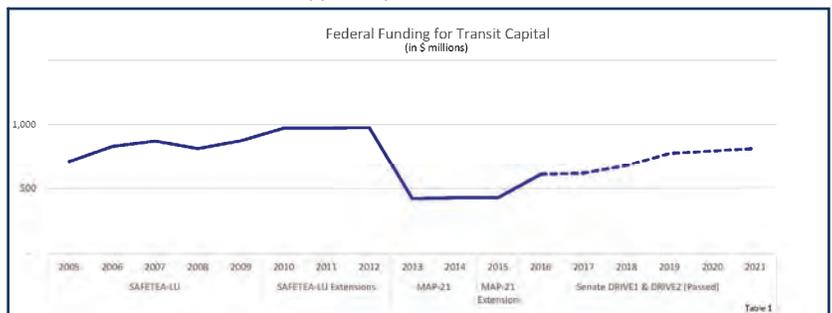
This submittal is in response to the North Carolina Department of Environmental Quality Request for Information *Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas* released November 21, 2017. The information and recommendations submitted herein are exclusively those of the Cape Fear Public Transportation Authority, a North Carolina local government established under the provisions of North Carolina General Statute 160A Article 25.

Section 1 - Project Applicant Information

- **Organization** - Cape Fear Public Transportation Authority (Wave Transit)
- **Contact** - Albert Eby, Executive Director
- **Type** - North Carolina Public Transportation Authority (local government)
- **Address** - P.O. Box 12630, Wilmington, NC 28405
- **Phone** - (910) 202-2035
- **Email** - aeby@wavetransit.com

Section 2 - VW Program and Solicitation Design Questions

1. **Prioritization** - in an effort to maintain the highest level of compliance with the settlement, potential projects should be prioritized based on the following:
 - i. **Environmental impact** - projects that maximize the reduction in emissions should be given the highest priority. While diesel for diesel powerplant replacements meet the settlement requirements, replacing a diesel vehicle with an electric or CNG engine would be more environmentally impactful.
 - ii. **Minimizing tax burden** - minimizing taxpayer subsidies by allocating settlement funds to public entities before private companies should be considered. Distribution of VW settlement revenue between private and public providers should be weighted in favor of public agencies and the impact funding could have on the budgets of local governments. Reduction in federal funding for significant projects which are eligible for settlement grants should be considered when priorities are quantified.
 - iii. **Project readiness** - inflationary pressure will minimize the impact of projects awarded if grantees are not in a position to implement projects in a timely manner. The option of a near term purchase versus a purchase in future years could result in significant savings. Prioritization of this type would serve to maximize the purchasing power of the settlement.
 - iv. **Project cost** - projects that maximize the investment of settlement funding, taking into account the environmental impact, should be given priority. For example, if an entity can purchase two Class 4 - 8 vehicles that are powered by natural gas for the cost of a single electric vehicle, the two vehicle purchase would be more impactful thereby justifying a higher priority.
 - v. **Commitment to sustainability** - settlement funds should be prioritized to assist agencies that have demonstrated a commitment to sustainability. Many will view the opportunity for unencumbered revenue as a way to experiment with alternate fuels without making the difficult decision to invest in alternative fuels utilizing available resources. This "soft" commitment typically leads to failure based on lack of experience, knowledge, and unwillingness to invest in alternative fuels following expiration of the one-time funding.
2. **Demand** - as demonstrated in Table 1, congressional support for bus capital under USC 49 has decreased over 100% from 2012 to 2016. This change was primarily due to the elimination of federal



congressional earmarks in 2009. The impact of this reduction in funding has been significantly impactful to the transit industry. The decrease in federal funding has been compounded by inflationary pressures, rising commodity costs, changes to compliance regulations, and increasing onboard technology investments. While significant demand for discretionary funding is expected, high demand among transit providers should be expected due to aging fleets and decreased federal support.

- 3. Trust Funding for Light Duty Zero Emission Vehicle Supply Equipment** - our initial comment to this request would be to challenge the term “zero emission.” A more accurate moniker would be “zero on board emission” vehicles. For demonstration purposes, compare a compressed natural gas vehicle to an all electric bus. Assuming the utility is producing electricity from natural gas, which many in the state are, both a natural gas powered vehicle and an electric vehicle would produce propulsion from the same natural resource, thereby emitting similar amounts of tailpipe exhaust.

Infrastructure costs, whether they are allocated to a natural gas fueling station, or to charging stations for electric vehicles can be significant. This would reduce trust funds available for vehicle replacement. Wave Transit supports a grant program with VW trust funds that demonstrates a prior commitment to alternative fuels. This would limit funding for infrastructure investments and direct settlement funds to vehicle replacement which will directly lead to increased reduction in emissions. Without including cumbersome requirements in the grant application, it is conceivable that government agencies could invest significant trust funds to vehicle supply equipment that would be underutilized without additional investment outside of trust funding. This would be the most inefficient investment of trust funds.

- 4. Anticipated Demand Outside the VW Settlement** - significant demand for capital vehicle replacement exists, and it is not anticipated that VW settlement funding will eliminate demand but should relieve some exigency.
- 5. Funding Percentage Allocation** - in the opinion of the Cape Fear Public Transportation Authority, funding should be allocated based on the priorities outlined in number 1 of this section. DEQ is tasked with implementing the provisions of the settlement and the number one priority should be diesel emission reduction. Projects that demonstrate the greatest diesel emission reduction in the most economical manner should receive priority without regard to competing project types.

Weighted distribution to areas with a higher percentage of affected vehicles sold should receive strong consideration. DEQ data highlights the areas where affected Volkswagen’s were sold throughout the state. The areas where these vehicles were sold should be afforded greater consideration for settlement distribution.

- 6. Percentage to Government Projects** - projects that reduce the burden on North Carolina taxpayers should receive the highest priority. Should surplus settlement funding be available, private projects could be considered. The responsibility of public agencies to allocate settlement funds in compliance with grant requirements will lead to less administrative burden for DEQ and significantly higher compliance. North Carolina governments are held to a standard and have internal controls and available staff that will produce the highest level of conformity with the settlement requirements. Compliance by private entities over the life cycle of a vehicle funded by the trust could be burdensome. Settlement funding awarded to public agencies will reduce taxpayer funded investments at the federal, state, and local levels and provide a far greater return on investment for taxpayers than settlement funding awarded to private providers, while meeting the ultimate goal of emission reduction.
- 7. Geographical Distribution** - geographical equity between urban and rural areas should be considered. It is also imperative to distribute the funds in an equitable manner between the large urban areas including Charlotte, the Triad and Triangle, and the urban centers in the eastern and western portions of the state. Prioritizing funding to ozone non-attainment areas would be short sighted. Areas meeting EPA clean air requirements can only continue to maintain such status by continued investment in emission reduction efforts.
- 8. Matching Funds** - there is no debate that requiring matching funds will broaden the reach of settlement funds and an argument could be made for matching fund requirements, but the process could prove burdensome. For example, could local, state and/or federal funding be considered matching funds? What about subsidized program revenues? Would a matching fund requirement eliminate a quality project? Would the matching fund requirement be more burdensome to a small entity or a rural agency thereby impacting geographical equity? It could be argued that matching funds demonstrate a commitment to the project which would support the argument. The Authority favors no matching fund requirements by government agencies for the benefit it would provide to taxpayers as mentioned earlier. If utilized, matching funds for government

sponsored projects should not exceed 10% of the project cost. Wave Transit supports matching fund requirements for private entities in accordance with the *Eligible Mitigation Action 1 - 10: DERA Options* for non-government owned assets only after the needs of governments are addressed.

9. **Minimum Project Size** - taking into account the administrative burden on the trustee, restricting a project to a minimum cost could lead to a quality project being excluded. This is especially true in a rural area. That said, projects under \$500,000 could be difficult to justify.
10. **Other Key Factors** - to maximize the impact of settlement funding in reducing emissions, cost effectiveness evaluation should include the amount of hours and/or miles the proposed vehicles are operated. Support for government projects that benefit North Carolina businesses would be beneficial to private manufacturers operating in the State. Priority should be afforded to projects that include manufacturing activities and job support to North Carolina businesses.
Alternative fuel projects which reduce emissions at levels higher than diesel engines should also be given priority. While current diesel technology meets the requirements of the settlement and would reduce emissions significantly, proven affordable and available technology exists to exceed the minimum requirements. NC DEQ should provide the greatest support for projects that exceed minimal expectations.
11. **Additional Feedback** - as highlighted in previous responses, an agency's ability to manage grant funding in a responsible and compliant manner should be considered. This will not only serve to ensure compliance but will reduce the administrative burden on DEQ and prevent situations where non compliance could prove counterproductive.
12. **Quantifying Results** - absent significant investment in air quality monitoring equipment, quantifying success could be challenging. Significant data exists to demonstrate the benefits of replacing an eligible diesel engine with a newer model, regardless of fuel type. Verifiable data also exists to demonstrate additional emission reduction from alternative fuels and electric propulsion vehicles.
13. **Future Solicitations** - a certain level of administrative resources and experience in diesel fleet management is vital to a successful grant program from settlement funds. Expanding the scope of involvement in the program is admirable but could lead to failure of grantees to implement successful projects which could dilute the impact of settlement funding.
14. **Stakeholder Communication** - as a potential stakeholder, Wave Transit would benefit from consistent feedback highlighting successful settlement awards and methods for improving applications. A clear understanding of how settlement funds are proposed to be distributed including: annual awards; award types; public private split (if applicable); geographic distribution; and detailed annual reporting would allow stakeholders to develop strategies for future submittals. Additional resources could include webinars and listening sessions as well as regional question and answer sessions. If implemented, these steps should lead to increased interest in the program, better applications for settlement funding, simplified project evaluation, reduced administrative burden, and a high level of transparency.

Section 3 - Project Information

The Cape Fear Public Transportation has significant interest in applying for settlement funding. Project specifics include:

- **Project Category** - Class 4 - 8 transit buses model 2009 year or earlier
- **Project Summary**
 - **Geographic area** - Wilmington urbanized area as defined by the U. S. Census Bureau which includes all of New Hanover County, Southern Pender County, and Northern Brunswick County
 - **Fleet type** - transit buses
 - **Mitigation action** - replace diesel buses with CNG powered buses; 8 model year 2003; 2 model year 2005
 - **Number of vehicles targeted** - 10
 - **Technology** - Cummins Westport ISL G Near Zero Compressed Natural Gas
 - **Estimated cost** - \$5,000,000
 - **Project benefits** - reduce exhaust emissions by almost 90%; reduce additional emissions as detailed in project benefits section; maximize investment in CNG fueling facility
- **Project Detail**
 - **Vehicles targeted for replacement**

- **Number of vehicles** - 10
- **Class** - 8
- **Engine specifics** - Detroit Diesel Series 50 diesel engine model year 2004 and 2005 (pre 2004 and 2010 EPA emission standards)
- **Fuel specifics** - diesel, average annual fuel use (per vehicle) - average annual miles traveled (per vehicle) - 44,782
- **Proposed replacement vehicles**
 - **Vehicle** - Current model year Gillig 35' HHD low floor transit bus
 - **Engine specifics** - Cummins Westport ISL G Near Zero compressed natural gas engine
 - **Engine model year** - current model year at time of delivery
- **LD ZEV Equipment** - not applicable
- **Capital and Project Costs**
 - **Cost per unit** - \$500,000 under contract with Gillig, Inc through April 2019; operating costs are significantly lower than current fleet due to high maintenance costs for maintaining 2003 model buses. Fuel infrastructure maintenance cost built in to fuel cost and not included as part of project cost.
 - **Cost Sharing** - opportunities may include cost sharing by NCDOT and local funding partners
- **Project Benefits**
 - Annual lifetime and lifetime project emissions reductions (Table 2)
Calculation method: Environmental Protection Agency's (EPA) Diesel Emissions Quantifier Tool
Data based on average annual fleet miles traveled by 2003 and 2005 diesel bus fleet

Type Onroad	Engine Model Year 2003	Fuel Type ULSD
Target Transit Bus	Upgrade Year 2019	Annual Fuel Gallons 9,326
Class or Equipment Transit Buses	Remaining Life 1	Annual Miles Traveled 44,782
Quantity 10		Annual Idling Hours 340
Edit Group Copy This Group Delete		

Upgrades to Gillig Diesel

Action	Upgrade	New Model Year	Annual Gallons Reduced	Cost per Unit		Percent Reduction				
				Upgrade	Labor	NO _x	PM2.5	HC	CO	CO ₂
Edit Delete	Vehicle Replacement - CNG	2019	0	\$500,000	\$0	89.9	97.8	91.9	91.8	-

Table 2

- **Capital cost effectiveness** - petroleum, GHG, and air pollutant cost savings \$12,366 per unit
Calculation method: Argonne National Laboratory Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool
- **Total cost effectiveness** - total petroleum GHG, and air pollutant cost savings \$123,363
Calculation method: Argonne National Laboratory Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool
- **Annual operating savings with externality cost savings** - \$375,733
Calculation method: Argonne National Laboratory Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool
- **Simple payback with externality costs (years)** - 7.2

Section 1 - Project Applicant Information:

- Company/Agency/Organization Name
Greater Hickory MPO – Coordinator
Western Piedmont Regional Transit Authority - Clerk
- Contact Person Name
John Marshall
- Government/Non-Government
Government
- Mailing Address
1880 2nd Avenue, NW, Hickory, NC 28601
- Phone Number
828-485-4234
- Email Address
John.marshall@wpcog.org

Section 2 – VW Program and Solicitation Design Questions

Respondents should consider providing information in response to the following questions:

1. How should DEQ prioritize projects?
We would like to let the MPO's and RPO's (COG's) prioritize the projects for their respective areas.
2. What is the anticipated demand for each eligible project type?
We can see a demand for public transportation vehicles.
3. The percentage of trust funds, if any, that DEQ should devote to Light Duty Zero Emission Vehicle Supply Equipment?
We would like to investigate the Light Duty Zero Emission Vehicles for our area.
4. What is the anticipated demand for specific types of diesel emission reduction projects not eligible under the VW settlement but otherwise eligible under DERA or other state programs?
Depends on the cost and available funding.
5. Should a certain percentage of available VW funds be allocated to each eligible project type and if so how should the percentage be determined?
The MPO's and RPO's could develop the percentages depending on the need of each area.
6. Should a certain percentage of available Mitigation Trust funds be reserved for government projects?
That would be a good idea to investigate further.
7. Should funds be geographically distributed, and if so how?
They should be distributed by population to the MPO's and RPO's across the state.
8. Should governmental entities be required to provide matching funds and if so, how much?
Requiring a 20% match would be reasonable since most local governments are required to pay 20% for other government programs.
9. Should DEQ establish a minimum project size and if so, what size?
Minimum project size should be \$50,000
10. In addition to evaluating a proposed project's total cost effectiveness (\$/ton), what other key factors should DEQ consider when evaluating projects?
That the projects can be sustained in the future.
11. What other feedback do you have on project evaluation and/or scoring criteria?
Number of population affected and specific populations (low income, elderly).
12. What publicly available tool(s) should be used to quantify anticipated emission reductions/offsets for eligible mitigation projects? What, if any, additional resources should be provided and made available?
We have ozone-reducing resources.

13. What methods could DEQ employ to reduce barriers and increase participation in future solicitations for projects?

Public workshops to better explain the process.

14. What information/resources would be most valuable for stakeholders interested in submitting projects and what is the best way to communicate those?

Probably more time to research the topics and respond.



City of Raleigh *North Carolina*

December 29, 2017

NC VW Settlement RFI
Division of Air Quality – Mobile Sources
217 West Jones Street
1641 Mail Service Center
Raleigh, NC 27699-1641

Re: City of Raleigh Request for Information (RFI) Response
North Carolina's Volkswagen Mitigation Trust Fund Plan

Dear NC Department of Environmental Quality (NCDEQ):

The City of Raleigh is experiencing rapid growth and development. To proactively prepare to handle population increase and increased demand for mobility options, GoRaleigh, in coordination with other local stakeholders and partners, is working on expanding the network of transit services by participating in implementation of the Wake Transit Plan. The Plan is funded by a local sales tax that was approved by Wake County voters in 2016. Over the next 10-years the community investment will triple the existing level of bus service by expanding 17 miles of frequent bus service to 83 miles. The plan will bring a transit stop within walking distance of more than 54 percent of homes and 80 percent of jobs in Wake County, and enhance access to transit to many areas in the County through the expansion and improvement of fixed route services, expansion and improvement to non-fixed route paratransit services in rural areas, and the introduction of a 50% match program for towns to establish local transit services. The transit plan also includes 37 miles of investment in commuter rail and 20 miles of infrastructure for bus rapid transit.

As part of implementing the transit vision, the City of Raleigh is actively exploring options of introducing alternative fuel vehicles to GoRaleigh's fleet. The City of Raleigh's Council and the Raleigh Transit Authority (RTA) adopted a goal of developing a fleet consisting of 75% CNG and 25% other alternative technology vehicles (electric). Advancements in alternative fuel vehicle technology and implementation of CNG and electric vehicles in the transit industry can contribute to drastic reductions in emissions and provide significant environmental benefits.

The City of Raleigh is supportive of the inclusion of Class 4-8 public transit vehicles as an eligible project type in North Carolina's distribution of the Volkswagen (VW) Mitigation Trust Fund

monies. The City encourages prioritization of public projects to lessen taxpayer burden. Allocation of funds from the settlement, for all purposes, not just for transit vehicles, should be allocated through a competitive process, based on strength of application and ability to match funds, including leveraging settlement funds with local and / or federal participation.

The Wake County Plan has allocated funding toward bus replacement. As part of the plan, in the next two years, GoRaleigh, GoTriangle and GoCary plan to replace at least thirty (30) diesel vehicles that are at or beyond their useful life. The Plan allocated approximately \$17 million to purchase new diesel buses. We estimate that based on current costs the difference between a diesel and electric bus is approximately \$300,000, including the charging infrastructure. If all 30 buses planned for replacement by participating transit providers were replaced as electric vehicles, an additional \$9.0 million would be needed. A competitive process that would allow VW Settlement funding to pay for the differential between the cost of an electric or compressed natural gas (CNG) bus, as compared to the cost of a diesel bus, would be transformative for the region in shaping the provision of bus service and meeting the City's goals of transitioning to alternative fuel vehicles.

The City of Raleigh appreciates the efforts of NCDEQ in soliciting and considering public input regarding this important settlement. If additional information is needed regarding the Wake Transit Plan, or details to further answer the Department's RFI, please feel free to contact me at 919-996-4040.

Thank You,



David Eatman
Transit Administrator
City of Raleigh

CC: Tansy Hayward, Assistant City Manager, City of Raleigh
Mila Vega, Senior Planner, City of Raleigh
Jason Horne, Chairman, Raleigh Transit Authority



December 18, 2017

NC VW Settlement RFI
Division of Air Quality – Mobile Sources
217 West Jones Street
1641 Mail Service Center
Raleigh, NC 27699-1641

Re: Proterra's RFI Responses re North Carolina's Volkswagen (VW) Mitigation Trust Plan

Dear NC Department of Environmental Quality (DEQ):

Proterra, the leading U.S. manufacturer of electric, zero-emission transit buses, appreciates the opportunity to respond to North Carolina's Request for Information (RFI) in order to help the DEQ determine the best use of the \$92 million that the State expects to receive from the VW Mitigation Trust.

As background, Proterra designs and manufactures the world's most fuel-efficient battery electric bus and features on-route, fast-charge technology that offers functionally unlimited range, as well as an extended range version that enables transit agencies to travel up to 350 miles on a single charge. Proterra's CATALYST™ bus achieves 22+ MPGe performance, 500%+ better than diesel and CNG buses, eliminating toxic diesel particulate matter and reducing carbon emissions by 70% or more compared to CNG or diesel buses. In addition, the cost of maintenance differential is substantial in comparison to fossil fueled buses. Using the APTA average of 36,000 miles per year and the FTA required 12-year life, a Proterra bus will save a transit agency over \$200,000.00 per bus on average compared to a fossil fuel transit bus. This is a big reason why the Raleigh-Durham Airport recently purchased four electric transit buses from Proterra.¹ Additionally, the Federal Transit Administration awarded the City of Asheville a grant of \$633,000 to purchase new electric buses.² And just a few weeks ago Greensboro Transit announced that it also was ordering four electric buses from Proterra.³

Our mission is simple: to deliver clean, quiet transportation to all communities by replacing heavy-duty, fossil-fueled transit buses with zero-emission public transit buses. The harmful effects of vehicle exhaust from medium and heavy-duty trucks are on the rise and have been for years. The EPA reports that medium and heavy-duty vehicles account for 20% of GHG emissions and oil use in the United States' transportation sector, but represent only 5% of the vehicles on the road. Similarly, GHG emissions from heavy duty vehicles across the globe are growing rapidly and are expected to surpass emissions from passenger vehicles by 2030. There is thus a strong need not only to mitigate past criteria pollutant emissions, but to continue to reduce toxic air pollutants in the medium and heavy-duty sector.

The Volkswagen settlement provides a much-needed opportunity to address this growing environmental concern and further demonstrate that commercially available zero-emission technologies have the lowest cost of ownership, improved maintenance and performance, and better serve a diverse range of communities' public transit needs, including the reduction of NOx and the elimination of GHG and criteria emissions. Replacing diesel buses with electric buses is simply one of the best investments the state can make to help electrify public transit.

¹ <https://www.rdu.com/press-release/rdpurchasing-four-zero-emissions-electric-buses/>

² <https://www.transit.dot.gov/funding/grants/fiscal-year-2017-low-or-no-emission-low-no-bus-program-projects>

³ <http://www.metro-magazine.com/sustainability/news/726314/greensboro-transit-orders-proterra-electric-buses>



Consistent with these goals, Proterra strongly urges the DEQ to consider allocating a minimum of 25% of its mitigation funding for zero-emission, battery electric transit buses. Additionally, we suggest that the state pay 110% of only the incremental costs of the buses and required charging infrastructure, much like the state of Colorado has proposed in its draft mitigation plan. This approach will help spur the adoption of a greater number of electric buses among transit agencies, airports and universities.

The electrification of heavy duty vehicles offers a pathway towards achieving the numerous benefits associated with zero emission transit. Indeed, Park City, Utah's recent deployment of Proterra's buses is the poster child for why North Carolina should emphasize the electrification of transit buses with its VW mitigation funding. In June 2017, Park City Transit deployed six battery electric buses. Since that time, the electric fleet has traveled more than 160,000 miles using 269,400 of kWh electricity, resulting in an average fuel efficiency of 1.7 kWh/mile, or just over 22 MPGe (compared to 4 MPG for Park City's diesel buses). The electric buses have displaced the use of ~ 32,000 gallons of diesel fuel in their first four months alone, while eliminating more than 801,000 lbs. of GHG emissions. Additionally, the electric buses have saved Park City Transit money through the savings in fuel and maintenance. In fact, the cost per mile of operation has dropped from a high of \$0.63 a mile using diesel to a low of \$0.30 using electricity. Not surprisingly, Park City has seen an increase in ridership on those routes utilizing zero emission buses, causing other state entities to determine how they too can add and/or increase the number of zero emission buses on the road.

We propose that North Carolina adopt two specific funding programs that have significantly accelerated the adoption of heavy duty EVs and, as a direct result, helped reduce NOx and GHG emissions.

First, we urge the DEQ to adopt the competitive funding programs in place in California and at the federal level. The CA Zero-Emission Truck and Bus Program is a competitive funding program that allows all manufacturers of zero-emission technology to partner with transit agencies and compete for project funding. It is very much modeled after the highly competitive Federal Transit Administration's Low or No Emission Program, which has helped fund the purchase of zero-emission transit buses across the US and in the state of North Carolina. The CA program is important in that it allows newcomers to receive funding for not only buses, but also chargers. Proterra estimates that a 30-bus EV bus deployment, including 30 plug-in chargers, would cost ~ \$24.1 million (and significantly less if the state would only cover the incremental cost of a new electric bus and associated charging infrastructure). Further, the cost effectiveness of a 30-bus EV bus deployment tilts heavily in favor of more funding for EV transit buses. The total cost effectiveness of GHG emission reductions for a 30-bus deployment is ~ \$686.30/metric tons of CO₂e. And the total cost effectiveness of Criteria Pollutants for 10 buses is ~\$1,817,063.49/metric tons of weighted criteria pollutants (NOx is included in the criteria pollutants and comprises most of those pollutants). See Exhibit A for a 30-bus project proposal.

Second, we request the DEQ to adopt the successful voucher/incentive programs that are helping to accelerate the adoption of heavy-duty EV buses. California's Hybrid & Zero-Emission Truck and Bus Voucher Incentive Program (HVIP) is a pool of money that is used by transit agencies on a first come, first served basis to bridge the gap between purchasing a fossil fuel vehicle and a zero-emission vehicle. For example, the transit bus OEM can receive a voucher for up to \$160,000 per EV vehicle, which amount is then deducted from the cost of the bus. New York City (New York Truck Voucher Incentive Program) and Chicago (Drive Clean Truck Voucher Program) have implemented similar programs. These



programs have proven valuable in allowing agencies (and commercial properties) to grow their fleets of zero-emission buses.

The VW Settlement is a transformational opportunity to invest in and promote the use of zero emission vehicles and infrastructure while achieving measurable reductions of NOx emissions. To achieve that primary goal, Proterra encourages the DEQ to promote the adoption of zero-emission technology, and not “near-zero” technology. Nationally, 7,461,458 tons of NOx, or 55% of the 13,489,110 tons of NOx emitted derive from mobile sources; 35% attributable to on-road sources.⁴ In the state of North Carolina, 193,682 tons of NOx, or 65% of the 300,184 tons of NOx emitted are from mobile sources.⁵ On this basis alone, we urge DEQ to use a minimum of 25% of its funds to advance the electrification of transit buses in those areas disproportionately impacted by the VW diesel vehicle emissions. By doing so, North Carolina will help achieve its program goals, including the reduction of NOx, greenhouse gases and other pollutants.

Thank you for the opportunity to respond to the RFI. Please feel free to contact me directly at 864-214-2668 or emccarthy@proterra.com.

Sincerely,

Eric J. McCarthy

SVP, Government Relations, Public Policy and Legal Affairs
Proterra Inc.

⁴ <https://www3.epa.gov/cgi-bin/broker?polchoice=NOX& debug=0& service=data& program=dataprog.national 1.sas>

⁵ <https://www3.epa.gov/cgi-bin/broker? service=data& debug=0& program=dataprog.state 1.sas&pol=NOX&stfips=37>

The Public Transit Electrification Project: Sustainable Mobility for North Carolina

Project Application Information

Proterra Inc.

Eric J. McCarthy

Private Corporation (Non-Government)

1 Whitlee Court, Greenville, SC 29607

864-214-2668

emccarthy@proterra.com

PROJECT SUMMARY

Zero-emission public transit buses are ripe for immediate scaling and investment from the Environmental Mitigation Trust to help carry out the goals of North Carolina's mitigation plan to achieve significant and sustained reductions in diesel emissions and expedite deployment and widespread adoption of zero-emission vehicles. *The Public Transit Electrification Project* will initially deploy 30 zero-emission, battery-electric transit buses and 30 multi-use depot charging stations at one or more North Carolina municipalities to provide electric mobility for all North Carolina residents and serve as a strong spark to accelerate the deployment of ZEVs, reduce diesel emissions and eliminate toxic air pollutants. The size of the project, however, can easily scale to accommodate other interested transit agencies.

Proterra, the leading U.S. provider of zero-emission, all-electric transit solutions, designs and manufactures the world's most fuel-efficient battery electric bus and features on-route, fast-charge technology that offers functionally unlimited range, as well as an extended range version that enables transit agencies to travel 350 miles on a single charge. Proterra's CATALYST™ bus achieves 22+ MPGe performance, 500%+ better than diesel and CNG buses, eliminating toxic diesel particulate matter and reducing carbon emissions by 70% or more compared to CNG or diesel buses. To date, Proterra's buses have logged 3+ million miles of service in cities across the United States. With over 38 transit customers and over 400 buses on order, Proterra has become the zero-emission technology provider of choice for transit agencies nationwide.

Proterra will manufacture and deploy the commercial zero-emission buses and depot charging stations and will work closely with the participating North Carolina municipality or municipalities to successfully implement *the Project*. *The Public Transit Electrification Project* will demonstrate the economic and environmental benefits of accelerating the transition to commercially available ZEV technology, increase ZEV access and education, and eliminate toxic diesel exposures – achieving the goals of North Carolina's mitigation plan to improve and protect ambient air quality.

The Public Transit Electrification Project: Sustainable Mobility for North Carolina

The goals of this Project are to:

- Reduce NOx emissions to improve air quality and provide health benefits.
- Launch a zero-emission public transit bus pilot project to demonstrate concepts of sustainable mobility in one or more municipalities.
- Increase zero-emission vehicle awareness and access.
- Accelerate scaled zero-emission vehicle deployment.
- Demonstrate the economic and environmental benefits of accelerating the transition to commercially available zero-emission technology to a large cluster of transit routes.
- Provide zero-emission buses to benefit those areas and vulnerable communities that bear a disproportionate share of the State's air pollution burden, eliminating toxic emissions and providing zero-emission miles.
- Lead the transformation and technology transfer for a wide range of commercial fleets.
- Help drive down per-vehicle zero-emission bus costs with the Project's scale.

The objectives of this Project are to:

- Deploy 30 zero-emission, battery-electric transit buses and 30 multi-use depot charging stations to show that commercially available battery electric transit buses better serve communities' transit needs, substantially reduce greenhouse gas emissions, and provide substantial localized air quality benefits for disadvantaged communities.
- Reduce greenhouse gas emissions by up to ~ 3,336 metric tons CO₂e/year.
- Eliminate ~ 2.9 tons/year of weighted criteria pollutants and PM emissions.
- Provide scalable lessons learned to drive additional deployments of zero-emission heavy-duty technologies throughout North Carolina.
- Deploy Proterra buses that charge using the J 1772 CCS standard.

PROJECT DETAIL

The *Public Transit Electrification Project* will deploy 30 zero-emission, battery-electric transit buses and 30 multi-use depot charging stations at the participating North Carolina municipality or municipalities. To this end, Proterra is in discussions with some of the largest transit agencies in North Carolina. These agencies are located in areas that receive a disproportionate quantity of air pollution from diesel fleets and from highway diesel NOx.

The VW settlement provides a much-needed opportunity to further demonstrate that commercially available zero-emission technologies have the lowest cost of ownership, improved maintenance and performance, and better serve a diverse range of communities' public transit needs, including the reduction of diesel emissions and the elimination of criteria emissions.

The Public Transit Electrification Project: Sustainable Mobility for North Carolina

Proterra – Technology Manufacturer and Project Coordinator

Proterra’s zero-emission, battery-electric technology is being deployed in revenue service throughout the nation. Transit agency early adopters, such as Foothill Transit and San Joaquin RTD in California, have demonstrated the technology readiness of Proterra’s battery all-electric solutions on urban as well as mixed suburban routes – and now major metropolitan agencies such as SEPTA (Philadelphia) and King County Metro (Seattle) are placing larger orders - 25 and 73 buses respectively. Nevertheless, there is a need for more deployments to demonstrate the economic, performance and lasting environmental benefits of deploying commercially available, cost-saving, zero-emission battery electric buses. The *Public Transit Electrification Project* will accelerate the deployment and adoption of commercially viable, immediately scalable zero-emission public transit buses in similar fleets throughout North Carolina and beyond.



For the proposed project, Proterra will offer its extensive experience and expertise in manufacturing, deploying, operating, and maintaining commercial zero-emission buses and infrastructure – working closely with one or more participating transit agencies. To date, Proterra’s buses have logged 3+ million miles of service in cities across the United States. Proterra has zero-emission buses operating in revenue-generating service in the following cities: San Joaquin RTD in Stockton, CA, Foothill Transit in Pomona, CA, VIA Metropolitan in San Antonio, TX, University of Montana in Missoula, MT, WRTA in Worcester, MA, TARC in Louisville, KY, LexTran in Lexington, KY, Nashville MTA in Nashville, TN, PVTA in Springfield, MA, Star Metro in Tallahassee, FL, King County Metro, WA, RTC in Reno, NV, Jones Lang LaSalle in Chicago, IL, CATBus in Seneca, SC, Park City Transit, Park City, UT, Sportran in Shreveport, LA, DDOT in Washington, DC and soon at MTA in New York, NY and SEPTA in Philadelphia, PA. Raleigh-Durham Airport recently purchased four electric transit buses from Proterra.¹ Additionally, the Federal Transit Administration awarded the City of Asheville a grant of \$633,000 to purchase new electric buses.² And just a few weeks ago Greensboro Transit announced that it also was ordering four electric buses from Proterra.³

The battery-electric buses and charging infrastructure for this project will be manufactured at Proterra’s manufacturing facility in Greenville, SC. The close proximity to the transit agency partner

¹ <https://www.rdu.com/press-release/rdu-purchasing-four-zero-emissions-electric-buses/>

² <https://www.transit.dot.gov/funding/grants/fiscal-year-2017-low-or-no-emission-low-no-bus-program-projects>

³ <http://www.metro-magazine.com/sustainability/news/726314/greensboro-transit-orders-proterra-electric-buses>

The Public Transit Electrification Project: Sustainable Mobility for North Carolina

will ensure collaboration and ease of maintenance for any needed repairs to the vehicles and charging infrastructure during the 12-year vehicle lifespan.

Eligible Technologies to be Implemented

- **Battery-Electric Bus:** Proterra will replace Class 8, diesel heavy-duty transit buses at one or more transit agencies with 30 Proterra E2 battery-electric buses. Proterra is proposing its 40-foot Catalyst E2 battery-electric bus. The proposed Catalyst E2 bus has a total of 440kWh of on-board energy storage; more than 25% more capacity than other 40' battery electric buses on the market. Importantly, the Catalyst was designed from the start exclusively as an electric vehicle. It delivers remarkable route flexibility and has a stellar track record in operational performance. The bus body is made with advanced carbon composites that are extremely light, durable, and resistant to corrosion. The bus body is then paired with an advanced, scalable energy storage system and the most efficient drivetrain on the market. With its durability and corrosion resistance, this platform is designed to safely and to quietly withstand nearly two decades of service. The curb weight of the vehicle is 29,849 lbs. and the Gross Vehicle Weight is 39,050 lbs. The maximum speed is 65 mph (6000 RPM).
- **Plug-In Charging System:** Proterra is proposing 30 62.5 kWh depot chargers that can be combined to charge a Catalyst E2 440kWh bus from 0% to 100% State of Charge (SOC) in ~ four (4) hours.

Management/Implementation Capacities

Proterra will work directly and collaboratively with a municipality to ensure the successful planning, manufacturing, deployment, operation, and maintenance of the zero-emission public transit buses and charging infrastructure throughout the Project. Proterra will provide significant executive staff resources and a dedicated maintenance employee to ensure a successful deployment of zero-emission vehicles and charging infrastructure and proper training for all existing service and maintenance employees.

The Proterra team members have extensive backgrounds in project management, manufacturing, vehicle deployment, vehicle maintenance and operations, vehicle and infrastructure training, and permitting and other on-site operational needs. The Proterra team will ensure this project is on time and within budget.

Project Objectives and Work Plan

The Project will demonstrate that zero-emission technologies can achieve significant and sustained reductions in diesel emissions in areas that receive a disproportionate quantity of air pollution from diesel fleets - perfectly capturing one of the primary goals of North Carolina's mitigation plan. The Project will also help accelerate the deployment and increase the awareness of electric vehicles, as well as provide the opportunity for all state residents to ride in an electric vehicle. It will serve as a major component of a citywide ecosystem that increases awareness of the many options for zero-emission mobility. In turn, this Project will significantly accelerate the adoption of zero-emission vehicles that will reduce greenhouse gas emissions, eliminate criteria pollutants, and provide the opportunity for all residents to go electric today and realize the many associated health benefits.

The Public Transit Electrification Project: Sustainable Mobility for North Carolina

The Project tasks are divided into four major phases that are necessary to prepare for and conduct the proposed *Public Transit Electrification Project*: 1 – Project Kick-Off, 2 – Production and Delivery, 3 – Entry into Service, and 4 – Reporting and Feedback. Each phase is described below and in further detail, including identifying the entity is performing each task.

Phase 1 – Project Kick-Off [9 months]

Phase 1 lays the foundation for the success of the *Public Transit Electrification Project*, which includes finalizing all necessary documents and agreements and attending the kick-off meeting and pre-production meetings with end-users.

Phase 2 – Production and Delivery [up to 12 months]

In Phase 2 the zero-emission buses are manufactured and delivered and the charging infrastructure are ordered, delivered, and installed. This includes the site design, permitting, production and installation of each charging station, as well as the status report of the vehicle production and delivery.

Phase 3 – Entry into Service [3 months]

In Phase 3, Proterra will initiate the customer launch process that ensures that the buses are effectively and efficiently received, inspected, accepted and deployed with confidence. About 6 weeks before the delivery of the first bus, Proterra initiates the launch process, which includes providing an overview of the vehicle, the end-user training, and coordination to ensure the end-user to ready for delivery and deployment of the vehicles into service.

Phase 4 – Reporting and Feedback [ongoing]

Throughout the Project, Proterra will provide quarterly status reports to the state and the transit agency. Each vehicle is equipped with an on-board data logger that provides data on bus performance and Proterra will ensure that all necessary data is compiled and reported to both entities.

Project Vehicles, Equipment and Service

Proterra will work directly with a transit agency to ensure a successful execution and completion of the project – including vehicle operation, charging, vehicle maintenance and repair, and data collection. Proterra has worked with multiple transit agencies across the United States. This vast experience will ensure successful implementation.

Proterra will install on-board data loggers in each vehicle to provide performance data on a quarterly basis. Data will include, but not be limited to: fuel/electricity consumption, fueling/charging times, state of charge, battery and odometer readings, relevant telematics, GPS data, hours of operation, temperatures, etc.

Proterra has developed extensive driver and maintenance technician training to ensure successful execution and completion of the proposed pilot project – including, but not limited to, training for vehicle operation, charging, vehicle maintenance and repair, and data collection. The training for both drivers and maintenance technicians includes classroom instruction and hands-on/in-the-seat training. The training will be performed at each end-user location with the appropriate materials

The Public Transit Electrification Project: Sustainable Mobility for North Carolina

available to the participants. The training includes tests that are administered after each classroom session and a certificate of completion after the participants have successfully finished the course. All drivers, maintenance technicians, and transit managers for this proposed project will receive classroom instruction and hands-on training. In addition, Proterra has created a series of “YouTube” style videos that provide an easy reference tool and more background on procedures – such as docking the bus successfully, towing the bus safely, using the diagnostic tool, and high-voltage safety.

The Proterra battery-electric bus and charging infrastructure that will be used in the *Public Transit Electrification Project* is the Catalyst E2 extended-range, battery electric vehicle for use on all routes. The Catalyst E2 vehicle, which offers energy capacity of 440 kWh and a nominal range of ~ 250 miles per charge, uses a 62.5 kWh Plug-in Depot Charger that is commercially available with dual charging connectors. Proterra is the only EV bus manufacturer to invest in the standard SAE J1772 CCS for depot charging. This unique offering allows transit agencies to charge their fleet of light duty electric vehicles or offer public charging when the transit buses are not utilizing the chargers.

Using a sophisticated computer model, Proterra can analyze each transit route to ensure that the infrastructure and vehicles are designed and engineered to match the specific minimum charging needs of the 30-bus fleet. The inputs to the route simulation tool include: route distance, speed, stops, layovers, duration, and grade, as well as passenger loading, ambient temperature/HVAC loads, and other accessory devices that use power for the safe and efficient operation of the vehicles. This simulation provides information on charging station needs and location planning, route performance, gradeability and feasibility, fuel savings/cost of operation evaluation, route schedule, and harmful emission reduction calculations.

Proterra has extensive experience installing depot chargers, securing necessary permits with local entities, and addressing electrical needs and grid impacts throughout the country. Proterra will work directly with the end-user in the *Public Transit Electrification Project* and associated utility to ensure that the patiating municipality obtains all permits and approvals necessary for the infrastructure, as well as address any grid impacts or electrical needs at the charging location.

Potential Emission Reduction Benefits/Expected Proposed Project Benefits

At Proterra, we're continually refining designs and looking for innovative ways to reduce impact on the environment. Proterra buses produce zero tailpipe emissions and decrease dependency on fossil fuels. Emissions are reduced by an astounding ~ 200,000 lbs. of CO₂ annually each time a dirty diesel vehicle is replaced by a zero-emission bus. Particulate matter from traditional transit buses contains numerous harmful gases and upwards of 40 cancer-causing substances.

A typical diesel bus emits ~ 200,000 lbs. of greenhouse gases annually, while a CNG bus emits ~ 175,000 lbs./year and a diesel hybrid emits ~140,000 lbs./year. A switch to zero-emission buses, which emit no tailpipe pollution, presents a critical opportunity to cut pollution, reduce oil dependence and make Earth a better place.

The Public Transit Electrification Project: Sustainable Mobility for North Carolina

Annual Tailpipe Emissions

Emission (lbs/bus/yr)	Proterra	CNG	Hybrid	Diesel
CO	0	1,822	20.59	41.18
CH4	0	792	4.11	4.03
CO ₂	0	169,488	140,976	198,000
GHG (CO₂e)	0	190,080	141,083	198,105
NO _x	0	46.73	92.66	92.66
VOC	0	3.82	3.82	3.82
PM (2.5+10)	0	3.52	3.52	3.52
BC	0	0.15	0.15	0.15

<https://greet.es.anl.gov/>

Assumes 36k miles driven per bus per year.

The well-to-wheel GHG emissions avoided for 30 zero-emission transit buses is approximately 3,336 metric tons CO₂e/year. Based on a conservative 12-year lifespan of the zero-emission, battery-electric buses – the project’s lifetime well-to-wheel GHG emissions avoided is up to 40,035 metric tons CO₂e (for a 30-bus deployment).

All the vehicles in the proposed project are zero-emission battery-electric vehicles that do not have any tailpipe emissions; therefore, there are no additional NO_x, ROG or PM₁₀ emissions associated with the project. The total tailpipe emission reduction for 30 zero-emission transit buses is 1.26 tons NO_x/year, 0.0519 tons of ROG/year and .0479 of PM₁₀/year. Combined tailpipe weight emission reductions for criteria pollutants is 1.36 tons/year and 16.33 tons over the lifetime of the project. That reduction more than doubles when well-to-wheel criteria pollutants are considered, reducing ~ 3.0 tons/ year and 34.76 tons over the lifetime of the project.

The estimated cost-effectiveness of the total project dollars per ton of combined criteria pollutant and weighted PM emissions reduced, and dollars per ton of GHG emissions reduced during a 12-year operation for all 30 vehicles are the following:

- Total Cost Effectiveness of GHG Emission Reductions
 - (Capital Recovery Factor x Project Cost)/Annual GHG Emission reductions

The Public Transit Electrification Project: Sustainable Mobility for North Carolina

- $(.095 \times \$24,100,000.00)/3,336$ metric tons of CO₂e = \$686.30/metric tons of CO₂e
- Total Cost Effectiveness of Criteria Pollutants⁴
 - $(\text{Capital Recovery Factor} \times \text{Project Cost})/\text{Annual criteria pollutant emissions reductions}$
 - $(.095 \times \$24,100,000.00)/1.26$ metric tons weighted criteria pollutants = \$1,817,063.49/metric tons of weighted criteria pollutants

Proterra used the Carl Moyer Program Guidelines for the cost calculations.

<https://www.arb.ca.gov/msprog/moyer/guidelines/current.htm>.

Economic and Environmental Benefits

The *Public Transit Electrification Project* is both located within and provides direct economic and environmental benefits to one or more municipalities. The proposed project addresses common economic needs of communities, including increasing job readiness and career opportunities, improving transit service, and creating further quality jobs. Proterra will provide on-the-job training and certifications for driver and maintenance technicians to operate, maintain and repair zero-emission heavy-duty vehicles. This will increase job readiness and career opportunities in the growing electric vehicle market and further career opportunities. In addition, Proterra's state-of-the-art zero-emission public transit vehicles will eliminate toxic diesel and other criteria pollutant exposures to passengers – improving transit service within communities. The *Project* will increase quality jobs – including a dedicated Proterra employee to oversee the project, construction jobs to deploy the electric charging stations and other indirect jobs from vehicle component suppliers.

By combining performance, efficiency and design, Proterra's zero-emission, battery-electric transit buses offer the lowest total cost of ownership as compared to conventional diesel transit buses. Proterra's zero-emission transit buses operate with fewer moving parts – reducing maintenance costs associated with oils, filters, fluids, particulate filters, and brakes. In addition, electricity is much less expensive and less volatile than traditional diesel or other petroleum fuel – helping to reduce costs and provide more certainty for operating costs. Proterra's buses have significantly higher fuel efficiency, an average of 1.7 kWh/mile or 23.4 mpg equivalency, which also helps provide significant economic benefits for the participating municipality.

These operational advantages yield at least \$135,000 savings in maintenance costs and \$290,000 in fuel savings as compared to diesel fuel. Therefore, the economic benefits are over \$400,000/bus in savings during the 12-year Federal Transit Agency (FTA) mandated lifetime of the vehicle for the transit agency or agencies participating in the *Public Transit Electrification Project*.

⁴ NO_x is included in the criteria pollutants and comprises the majority of those pollutants.

The Public Transit Electrification Project: Sustainable Mobility for North Carolina

Lastly, we estimate that, over 12 years of operation, the 30 Proterra buses will reduce ~ 3 million gallons of diesel fuel. On a per bus basis this equates to 100,000 gallons of diesel saved each year in typical transit operation (e.g., ~36,000 miles per year).

Estimated Project Cost

The estimated total project cost for 30 zero-emission, battery-electric transit buses and 30 multi-use depot charging stations is **\$24,100,000**.⁵ Funding is needed now to further demonstrate that commercially available zero-emission technologies have the lowest cost of ownership, improved maintenance and performance, and better serve a diverse range of communities' public transit needs, including the reduction of GHG and the elimination of criteria emissions.

<u>Item</u>	<u>Cost</u>	<u>Quantity</u>	<u>Subtotal</u>	<u>Taxes</u> <u>0%</u>	<u>Total</u>
Proterra Bus	\$749,000.00	30	\$22,470,000.00	0.00	\$22,470,000.00
Depot Charger	\$50,000.00	30	\$1,500,000.00	0.00	\$1,500,000.00
Regional Service Representative and fringe benefits	\$130,000.00	1	\$130,000.00		\$130,000.00

The recipient of the VW funds would largely be the municipalities. Therefore, Proterra anticipates that 100% of the cost of the vehicles and chargers would be covered by the state, subject to whatever local match funds the municipalities could contribute.

Increase ZEV Awareness and Education

To increase the exposure of the vehicles in the *Public Transit Electrification Project*, Proterra will develop project-specific webpages that will provide information on emission savings, vehicles deployed and funding sources to showcase the environmental and air quality benefits of the *Project* as a model deployment for other regions throughout North Carolina and across the nation. Additionally, Proterra will work with the transit agency or agencies to customize bus wraps to include messages that highlight the zero-emission technology and acknowledging the funding sources for the successful deployment.

In addition, Proterra will work directly with any participating municipality and its transit agency to implement an outreach strategy to the community to help raise awareness and education about the health, air quality and other benefits of zero-emission technology. In conjunction with the end-users, Proterra will launch a direct mail and email marketing campaign to generate awareness about the

⁵ This cost may vary slightly depending on the applicable tax rate, if any, and how the buses are configured and optioned by the participating transit agency. Finally, installation costs for the depot chargers are not included as they vary widely.

The Public Transit Electrification Project: Sustainable Mobility for North Carolina

zero-emission transit bus technology in their communities. In addition, Proterra will provide a demonstration bus to circulate prior to the project deployment to help raise awareness and provide education about the vehicle technology. At the launch of service, Proterra will work with the local transit partner to execute a local public relations strategy – including press releases, media outreach and a launch event. Proterra will also offer an option to publicly display emissions savings and environmental benefits information on the transit agency’s website.

Other

In addition to the above, Proterra strongly recommends that North Carolina direct 26% of the VW settlement funds to incentivize the deployment of zero emission, battery electric transit buses and medium duty vehicles to help reduce NOx and GHG emissions and vehicle miles traveled, as well as provide other health and associated benefits throughout North Carolina. We also recommend that North Carolina dedicate the remaining 15% towards EV charging infrastructure.

Beyond this specific project, we propose that North Carolina adopt two specific funding programs that have significantly accelerated the adoption of heavy duty EVs and, as a direct result, helped reduce NOx and GHG emissions. First, we urge North Carolina to adopt the competitive funding programs in place in CA and at the federal level. The CA Zero-Emission Truck and Bus Program is a competitive funding program that allows all manufacturers of zero-emission technology to partner with transit agencies and compete for project funding. It is very much modeled after the highly competitive Federal Transit Administration’s Low or No Emission Program, which has helped fund the purchase of zero-emission transit buses across the US. The CA program is important in that it allows newcomers to receive funding for not only buses, but also chargers. Second, California’s Hybrid & Zero-Emission Truck and Bus Voucher Incentive Program (HVIP) is a pool of money that is used by transit agencies on a first come, first served basis to bridge the gap between purchasing a fossil fuel vehicle and a zero-emission vehicle. For example, the transit bus OEM can receive a voucher for up to \$160,000 per EV vehicle, which amount is then deducted from the cost of the bus. New York City (New York Truck Voucher Incentive Program) and Chicago (Drive Clean Truck Voucher Program) have implemented similar programs. These programs have proven valuable in allowing agencies (and commercial properties) to grow their fleets of zero-emission buses.

Conclusion

The *Public Transit Electrification Project* will deploy 30 zero-emission, battery-electric transit buses and 30 multi-use depot charging stations at one or more municipalities to provide electric mobility and serve as a successful pilot project to accelerate the deployment of electric vehicles, reduce NOx emissions, improve air quality and provide health benefits. Proterra is excited to increase zero-emission vehicle awareness and eliminate toxic diesel exposures to both transit riders and non-transit riders throughout North Carolina and beyond.



December 27, 2017

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Delivered via email and USPS to: daq.NC_VWGrants@ncdenr.gov

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Dear Mr. Phillips:

Marikay Abuzuaiter
Greensboro TAC

Enclosed please find the Piedmont Authority for Regional Transportation's (PART) submittal to the *Department of Environmental Quality Request for Information - Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas* dated November 21, 2017. We appreciate the efforts of NC DEQ in soliciting and considering public input regarding this important settlement.

Neal Grimes
High Point TAC

PART Express Transit is in an excellent position to assist DEQ in your efforts to meet the settlement requirements of reducing diesel emissions in the Piedmont Triad region of North Carolina. We have been implementing and encouraging internal combustion engine emission reducing strategies that minimize taxpayer burden both regionally and statewide for over 15 years. If we are fortunate enough to be awarded VW settlement funding, we can be even better at fulfilling our agency mission.

Larry Williams
Winston-Salem TAC

The PART Agency would also like to offer DEQ the use of our facility to host any informational sessions held in the Piedmont Triad regarding the settlement. PART has meeting space availability for up to 70 people at our administrative office located at the center point between the Triad's three largest cities.

Sharon Hightower
Greensboro

Thank you again for your transparency in administering this important program. Please do not hesitate to contact me if you have questions or require additional information.

Jim Butler
Burlington

Sincerely,

Jason Ewing
High Point

Bob Byrd
Alamance County

Scott W Rhine
Executive Director
Piedmont Authority for Regional Transportation

Don Truell
Davidson County

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Airport Commission of FC

Attachment - VW Settlement RFI Submittal

Vacant
Piedmont Triad Airport

NCDOT Bnd of Transportation
Michael S. Fox Div. 7
Andrew Perkins, Mass Transit
R. Michael Wells, Sr. Div. 9

VW Settlement RFI Submittal

Piedmont Authority for Regional Transportation

Introduction

This submittal is in response to the North Carolina Department of Environmental Quality Request for Information (RFI) *Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas* released November 21, 2017. The information and recommendations submitted herein are those of the Piedmont Authority for Regional Transportation, a North Carolina regional transportation authority established under the provisions of North Carolina General Statute 160A Article 27.

Section 1 - Project Applicant Information

- **Organization** - Piedmont Authority for Regional Transportation (PART)
- **Contact** - Scott W. Rhine, Executive Director
- **Type** - Regional Government - North Carolina Regional Transportation Authority
- **Address** - 107 Arrow Road, Greensboro, NC 27409
- **Phone** - 336.291.4316
- **Email** - scottr@partnc.org

Section 2 - VW Program and Solicitation Design Questions

1. **Prioritization** - in an effort to maintain the highest level of compliance with the settlement, potential projects should be prioritized based on the following:
 - I. **Commitment to sustainability** - settlement funds should be prioritized to assist agencies that have demonstrated a commitment to the complete spectrum of sustainability. In the transportation sector there is a tendency to focus on one thing—moving vehicles. The greater questions of why move vehicles and where do we move them and what is the best vehicle for each job doesn't often get answered—especially not with any consideration of sustainability. Even within sustainability circles, hyper-focus is a problem. There are advocates who have tunnel vision regarding alternative fuels, and those who can see only van pooling or cycling infrastructure as the answer. A transportation agency which works side by side with land-use professionals, engineers, transportation demand modelers and a wide range of elected officials as well as their own customers; and leads regional sustainability initiatives is an agency committed to sustainability.
 - II. **Project readiness** - inflationary pressure will maximize the impact of projects awarded if grantees are in a position to implement projects in a timely manner. The option of a near term purchase versus a purchase in future years could result in significant savings. Prioritization of this type would serve to maximize the purchasing power of the settlement. An agency with an active vehicle manufacturing contract for clean diesel transit buses is an agency ready to purchase at a moment's notice.
 - III. **Project cost** - projects that maximize the investment of settlement funding, taking into account the environmental impact, should be given priority. For example, if an entity can purchase two Class 4 - 8 vehicles that are powered by diesel for the cost of a single electric vehicle, the two vehicle purchase would be more impactful thereby justifying a higher priority. In the same vein, if the purchase of a diesel

transit bus costs on average \$200,000 less than a comparable CNG transit bus, the less expensive new diesel bus should take precedent.

IV. **Minimizing tax burden** - minimizing taxpayer subsidies by allocating settlement funds to public entities before private companies should be considered. Distribution of VW settlement revenue between private and public providers should be weighted in favor of public agencies and the impact funding could have on the budgets of local governments. The reduction in federal funding for public transportation projects which are eligible for settlement grants should be considered when priorities are quantified.

V. **Environmental impact** - projects that maximize the reduction in emissions should be given the highest priority. A reduction of vehicle mile traveled (VMT) by single occupancy vehicle operations is an environmental benefit and should be considered a positive impact. The PART agency recorded a reduction of over 21 million VMT for the public services offered under PART Express transit and our Regional Vanpool program.

2. **Demand** - as demonstrated in Table 1, congressional support for transit vehicle capital under USC 49 has decreased over 100% from 2012 to 2016. This change was primarily due to the elimination of federal congressional earmarks in 2009. The impact of this reduction in funding has been significantly impactful to the transit industry. The decrease in federal funding has been compounded by inflationary pressures, rising commodity costs, changes to compliance regulations, and increasing onboard technology investments.

High demand among transit providers should be expected due to aging, less fuel efficient fleets and decreased federal support.

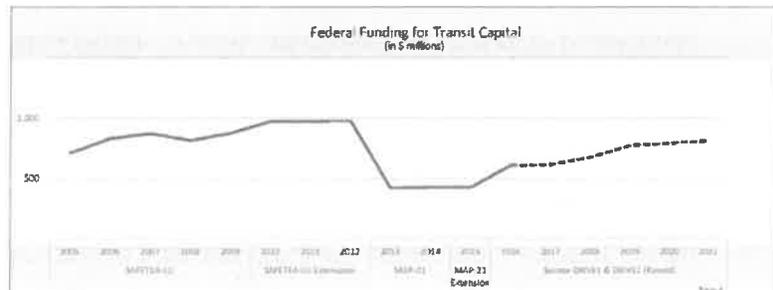


Figure 1: Reduction in Federal Funding for Transit

3. **Trust Funding for Light Duty Zero Emission Vehicle Supply Equipment** - our initial comment to this request would be to challenge the term "zero emission." A more accurate moniker would be "zero on-board emission" vehicles.

Infrastructure costs, whether they are allocated to a fueling station of any kind—PEV charging stations, CNG fueling stations or any such facility—can be significant. Funding fueling station, and maintenance facility infrastructure would reduce trust funds available for vehicle replacement.

PART supports a grant program with VW trust funds that limits funding for vehicle fueling infrastructure investments and directs settlement funds to vehicle replacement (regardless of the type of fuel used "on-board"). This will directly lead to increased reduction in emissions as soon as the new vehicles hit the road and the old ones are sold for scrap. Without including cumbersome requirements in the grant application, it is conceivable that government agencies could invest significant trust funds to vehicle supply equipment that would be underutilized without additional investment outside of

trust funding. This would be the most inefficient investment of trust funds.

4. **Anticipated Demand Outside the VW Settlement** - significant demand for diesel engine replacement capital exists, and it is not anticipated that VW settlement funding will eliminate demand but should relieve some exigency. For example, the demand for replacement industrial diesel generators used for meeting the needs of businesses and government during power outages is fairly strong since these generators tend to cause a large amount of pollution when they are running. However, they aren't often running and any focus on such replacements would afford minimal impact.
5. **Funding Percentage Allocation** - in the opinion of the Piedmont Authority for Regional Transportation, funding should be allocated based on the priorities outlined in number 1 of this section. The number one priority should be diesel emission reduction within government fleets which provide the most trips for the people of North Carolina. In NC, the public fleets which supply the most trips for the most people are the public transit fleets. Because well provided public transit is the best way to attract people from driving a single occupant vehicle, and because public transit vehicles run continually throughout the day and evening; it is the highest priority for all 2009 and older diesel transit vehicles in North Carolina to be replaced. Transit agencies continually demonstrate emission reduction successes with every person who hops on the bus and gives up commuting in their car for a day, a week, a year. This is a sustainable and proven manner by which to reduce greenhouse gas and particulate matter emissions and should receive priority without regard to competing project types.
6. **Percentage to Government Projects** - projects that reduce the burden on North Carolina taxpayers should receive the highest priority. Should surplus settlement funding be available, private projects may be considered. The responsibility of public agencies to allocate settlement funds in compliance with grant requirements should lead to less administrative burden for DEQ and significantly higher compliance. North Carolina governments are held to a standard and have internal controls and available staff that will produce the highest level of conformity with the settlement requirements. Compliance by private entities over the life cycle of a vehicle funded by the trust could be burdensome. Settlement funding awarded to public agencies will reduce taxpayer funded investments at the federal, state, and local levels and provide a far greater return on investment for taxpayers than settlement funding awarded to private providers, while meeting the ultimate goal of emission reduction.
7. **Geographical Distribution** - geographical equity between urban and rural areas should be considered. It is also imperative to distribute the funds in an equitable manner between the large urban areas including Charlotte, the Triad and Triangle, and the urban centers in the eastern and western portions of the state. Prioritizing funding to ozone non-attainment and maintenance areas should be a priority. Areas meeting EPA clean air requirements can only continue to maintain such status by continued investment in emission reduction efforts.
8. **Matching Funds** - there is no debate that requiring matching funds will broaden the reach of settlement funds, and an argument could be made for matching fund requirements, but the process could prove burdensome.

For example, could local, state and/or federal funding be considered matching funds? What about subsidized program revenues? Would a matching fund requirement eliminate a quality project? Would the matching fund requirement be more

burdensome to a small entity or a rural agency thereby impacting geographical equity?

PART favors no matching fund requirements by government agencies for the benefit it would provide to taxpayers as mentioned earlier.

If utilized, a matching funds requirement for government sponsored projects should not exceed 10% of the project cost. PART supports matching fund requirements for private entities in accordance with the *Eligible Mitigation Action 1 - 10: DERA Options* for nongovernment owned assets only after the needs of governments are addressed.

9. **Minimum Project Size** - taking into account the administrative burden on the trustee, restricting a project to a minimum cost could lead to a quality project being excluded. This is especially true in a rural area. It may be more appropriate to set the minimum project size by another measure than by cost. In the case of transit vehicle replacement, perhaps the project minimum should be based on fleet size—that a minimum of 50% of an agency's fleet must be replaced by the proposed project. This way a rural transit system which may have only four light transit vehicles could replace its two oldest vehicles if the other two vehicles are of post 2009 manufacture.
10. **Other Key Factors** - to maximize the impact of settlement funding in reducing emissions, DEQ's evaluation of proposed project should include the estimated number of single occupant vehicles taken off the road and the estimated VMT that represents; the amount of days, hours and miles the proposal vehicles are operated throughout each month or annually; and the actions of the agency to provide seamless connectivity across political boundaries. All of these points factor into the ease in which the public take advantage of vehicle emission reducing travel modes.
11. **Additional Feedback** - an agency's ability to manage grant funding in a responsible and compliant manner should be considered. This will not only serve to ensure compliance but will reduce the administrative burden on DEQ and prevent situations where noncompliance could prove counterproductive.
12. **Quantifying Anticipated Results** - the Argonne GREET, NCDQA Mobile 6 or CARB models are all sufficient to estimate anticipated emissions reductions when replacing a 2009 or older transit bus with a newer transit bus. (Of course NCDQA Mobile 6 doesn't estimate PM2.5 reductions). Significant data exists to demonstrate the benefits of replacing an eligible diesel engine with a newer model, regardless of fuel type. It is likely that all agencies requesting settlement funds will need assistance from DEQ staff to calculate anticipated emission reductions; and with DEQ staff help, it will be easier to have the factors which are put into model calculations standardized so that evaluation teams will be able to compare "apples to apples". For instance, one agency may estimate that for every person riding their bus, one single occupant vehicle is taken off the road and thus inflate, even if unaware, their anticipated emissions reductions. And another agency may under estimate by saying that for every two persons on their buses, one single occupant vehicle is taken off roadways. It would be best if DEQ standardize these factors and help individual agency staff calculate emissions reductions.
13. **Future Solicitations Barrier Reduction** - PART does not know of any barriers to participation which DEQ could address. The barriers I know of are set by the settlement and cannot be changed. There may be government agencies across the state which do not understand how the settlement might benefit them or how they may be eligible to apply for funds; however, this is a matter of education/getting the word out and not a matter

of a true barrier.

14. **Stakeholder Communication** - as a potential stakeholder, PART would benefit from consistent feedback highlighting successful settlement awards and methods for improving applications. A clear understanding of how settlement funds are proposed to be distributed including: annual awards; award types; public private split (if applicable); geographic distribution; and detailed annual reporting would allow stakeholders to develop strategies for future submittals. Additional resources could include webinars and listening sessions as well as regional question and answer sessions. If implemented, these steps should lead to increased interest in the program, better applications for settlement funding, simplified project evaluation, reduced administrative burden, and a high level of transparency.

Section 3 - Project Information

The Piedmont Authority for Regional Transportation has significant interest in applying for settlement funds. Project specifics include:

1. **Project Category** - Class 4 - 8 transit buses model 2009 year and earlier
2. **Project Summary**
 - I. **Geographic area** - The Piedmont Authority for Regional Transportation covers: Alamance, Davidson, Davie, Forsyth, Guilford, Randolph, Rockingham, Stokes, Surry and Yadkin Counties. This represents two RPOs and four MPOs. This also includes four Census Bureau Urbanized Areas.

PART Express commuter bus routes currently connects 15 cities and towns; five urban transit systems and two Amtrak stations. One route extends out of the PART area to Chapel Hill and connects with GoTriangle.
 - II. **Fleet type** - 35' and 40' transit buses and light transit vehicles
 - III. **Mitigation action** - replace model year 2009 and 2008 diesel buses with new clean diesel transit buses. Due to the long distance nature of PART transit routes, many of these buses have surpassed or are on the cusp of surpassing the 500,000 mile (for heavy duty buses) and 250,000 mile (for medium duty buses) and 150,000 mile (for Sprinters) limit set by the Federal Transit Administration for the useful life of a 40' transit bus:
 - 8—40' transit buses 2009 (heavy duty)
 - 5—40' transit buses 2008 (heavy duty)
 - 2—34' transit buses 2008 (medium duty)
 - 2—Sprinters 2008
 - IV. **Number of vehicles targeted** - 17
 - V. **Technology** - Cummings ISL9 for EPA 2013 diesel engine for the 15 replacement 40' transit buses.
 - VI. **Estimated cost** -

- \$7,500,000 (\$500,000 each for the 40' heavy duty and 34' medium duty transit buses)
- \$170,000 (\$85,000 each for the Sprinter Shuttle Vehicles)

VII. **Project benefits** - reduce exhaust emissions by operating buses with cleaner diesel power plants adhering to EPA 2013 diesel engine emission standards. The chart below is from running the Environmental Protection Agency's (EPA) Diesel Emissions Quantifier Tool with data on PART's equipment targeted for replacement and the replacement vehicles PART proposes to use.

Annual Results (short tons)	NO_x	PM2.5	HC	CO	CO₂	Fuel
Amount Reduced After Upgrades	2.793	0.012	0.069	0.283	551.6	49,035
Percent Reduced After Upgrades	79.7%	48.8%	58.3%	58.3%	31.1%	31.1%

Lifetime Results (short tons)	NO_x	PM2.5	HC	CO	CO₂	Fuel
Amount Reduced After Upgrades	25.140	0.107	0.623	2.544	4,964.8	441,315
Percent Reduced After Upgrades	79.7%	48.8%	58.3%	58.3%	31.1%	31.1%

3. Project Detail

I. Equipment targeted for replacement

- **Number of vehicles** - 17
- **Class** - 8 transit vehicles
- **Engine specifics** - Cummins ISL; 280 horsepower, EPA 2007 engine emission standards
- **Fuel specifics** - Diesel, 10,500 gallons average annual fuel usage (*per vehicle*) - 47,000 average annual miles traveled (*per vehicle*)

II. Proposed replacement vehicles

- **Vehicle** - current model year New Flyer Excelsior
- **Engine specifics** - Cummings ISL9, current model year, EPA 2013. 280 - 330 hp / 209 - 246 kW, 900 - 1100 lb-ft / 1220 - 1491 N•m.
- **Engine model year** - current model year
- **Fuel type and annual idling hours reduced** - Diesel

III. LD ZEV Equipment - not applicable

IV. Although the Piedmont Triad region is currently in attainment, several counties in the region have only recently shed the non-attainment designation. This indicates that the region is still a sensitive area and needs to have air quality watched closely.

4. Capital and Project Costs

- I. **Cost per unit** - \$500,000 for heavy duty transit buses under contract with New Flyer, Inc. through October 2019. Operating costs are significantly lower than current fleet due to high maintenance costs for maintaining the current fleet of high mileage buses.
- II. **Cost Sharing** - opportunities may include cost sharing by NCDOT and local funding partners.

5. Expected Project Benefits

- I. Annual reduction in NO_x emissions: 2.793 short tons
Amount reduction in NO_x emissions over the lifetime project: 25.140 short tons
- II. Capital cost effectiveness: \$298,328
Total cost effectiveness: \$298,328
- III. Used the Environmental Protection Agency's (EPA) Diesel Emissions Quantifier Tool for the emissions reduction and cost effectiveness calculations used in this document
 - Shortcomings of this on-line tool
 1. Makes no distinction between city transit bus uses and commuter transit bus uses
 2. Does not consider the mileage of vehicles—commuter transit buses accumulate mileage at a higher rate than city transit buses.
 3. Sets the useful life of a transit vehicle at almost double Federal Transit Administration standards



Request for Information Submittal Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas

This submittal is in response to the North Carolina Department of Environmental Quality Request for Information *Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas* released November 21, 2017.

The Public Transportation Division, in partnership with local governments, has identified **replacement of buses** in urbanized areas as a funding priority. A majority of the fleet has exceeded the useful life standards set by the Federal Transit Administration. Many of our fleets were purchased with federal earmarks or discretionary grants; both of which are no longer available under the FAST Act. The safety and maintenance costs of operating these vehicles increase drastically with each mile of operation. Nine hundred and ten vehicles (910) are scheduled for replacement between fiscal years 18-23. This need is one NCDOT shares with our local government partners. Our needs are 3.5 times greater than the funding. Therefore, the request for this funding is:

Fuel Type	#	Price
Diesel	30	\$ 15,000,000
Hybrid Diesel	17	\$ 11,900,000
Electric	20	\$ 16,000,000
CNG	13	\$ 7,020,000
	80	\$ 49,920,000

Section 1 - Project Application Information

Company – NCDOT Public Transportation Division, partnering with local governments
 Contact – Debbie Collins
 Government – NCDOT
 Address – 1550 Mail Service Center, Raleigh, NC 27699-1550
 Phone – 919 707 4684
 Email – dgcollins1@ncdot.gov

Section 2 - VW Program and Solicitation Design Questions

1. Prioritization - in an effort to maintain the highest level of compliance with the settlement, potential projects should be prioritized based for transit vehicles fueled by clean diesel, diesel hybrid, electric and CNG as follows:

i. Environmental impact - focusing the settlement funds on applications targeting the greatest emitters, providing the greatest environmental benefit. Under the terms of the settlement, there are eleven categories eligible for funding. Four of these represent medium and heavy-duty on-road vehicles, which are also the greatest contributors of NOx emissions of the categories listed. In our urbanized areas, NC has a need to replace 910 buses between FY18-23 which exceed their useful life of 15 years. Some are older than 20 years. The reduction in NOx would occur with vehicle replacements of any type - clean diesel, diesel hybrid, electric and CNG.

ii. Minimizing tax burden - minimizing taxpayer subsidies by allocating settlement funds to public entities should be considered. This minimizes the impact on local



government budgets. Reduction in federal funding for significant projects which are eligible for settlement grants should be considered when priorities are quantified.

iii. Project readiness - inflationary pressure will minimize the impact of projects awarded if grantees are not in a position to implement projects in a timely manner. The option of a near term purchase versus a purchase in future years could result in significant savings. Prioritization of this type would serve to maximize the purchasing power of the settlement.

2. Demand - as demonstrated in Table 1, congressional support for bus capital under USC 49 has decreased over 100% from 2012 to 2016. This change was primarily due to the elimination of federal congressional earmarks in 2009. The impact of this reduction in funding has been significantly impactful to the transit industry. The decrease in federal funding has been compounded by inflationary pressures, rising commodity costs, changes to compliance regulations, and increasing onboard technology investments. While significant demand for discretionary funding is expected, high demand among transit providers should be expected due to aging fleets and decreased federal support.



3. Trust Funding Devoted to Light Duty Zero Emission Vehicle Supply Equipment -

A September 2017 Alternative fuels memo was prepared by Whitman Requardt for Montgomery County MD yielded the information in this answer – the full draft memo is available upon request.

The California Air Resources Board (CARB) certifies exhaust emission levels by engine family in terms of grams of pollutants per brake-horsepower per hour (g/bhp-hr). These reports allow the comparison of emissions between different fuels. Forty-foot transit buses (conventional diesel, CNG and diesel hybrid) use the Cummings ISB 6.7 engine.

Table 2 presents the horsepower and pollutant certification levels in g/bhp-hr using the Federal Test Procedure (FTP) for the 2017 model year. The certification results show that the engines meet the standards and the CNG engines are lower in NOx and higher in CO with very low particulate matter for both fuel types.

Table 2: CARB Emission Certifications by Engine

Bus Type	Engine	Horsepower	Certification in g/bhp-hr		
			NOx	CO	PM
40' Diesel and Diesel Hybrid	ISB 6.7	280	.19	.7	.000



40' CNG	ISB 6.7 G	280	.08	3.0	.000
Source: CARB Executive Orders and ABTRC					

The Altoona Bus Test Results Center conducts the Federal Transit Administration's (FTA) bus testing program which was established to provide information for transit agencies in procuring buses. Agencies conducting any federally assisted procurement of more than 10 transit buses must review the applicable bus testing reports prior to purchasing buses. The Altoona reports document a variety of tests including structural durability, fuel economy, air quality, performance and handling, and noise. Test reports for more than 400 buses can be found at <http://altoonabustest.psu.edu/buses>.

Altoona tests are conducted when a manufacturer introduces a new model or when there is a significant change in the vehicle's configuration including different engines. Test results listed in Table 3 are from 2012 through 2014. Since EPA heavy-duty on-road emissions standards have not changed since 2010, these results are representative of emissions that would come from buses manufactured in 2017. The emissions estimates shown in Table 3 have used the applicable Altoona Bus Test Results Center (ABTRC) test report Orange County Bus Cycle, an average 40,000 annual miles per bus, and the monetized value per ton for select pollutants from the USDOT Tiger 2016 Resource Guide. For CO₂, the 2020 cost per metric ton (\$47) has been used in the analysis.

Table 3: Emissions Value Estimates by Fuel Type

Pollutant		CO ₂	NO _x	PM	Total Hydrocarbons	Total Annual Value
Monetized Value per Ton		\$47	\$7,266	\$332,405	\$1,844	
Diesel	Grams per mile - Test# R1211	1950	0.92	0.016	0.04	\$4,201.13
	Annual Value	\$3,668.64	\$294.74	\$234.50	\$3.25	
Diesel Hybrid	Grams per mile - Test# R1206-P	1953	1.06	0.005	0.01	\$4,087.97
	Annual Value	\$3,674.28	\$339.59	\$73.28	\$0.81	
CNG	Grams per mile - Test# R1306	1725	0.4	n/a	0.21	\$3,390.56
	Annual Value	\$3,245.33	\$128.15	\$0.00	\$17.07	

Electric buses are now coming into widespread utilization. They have zero emissions emanating from the bus. However, they use electricity that is generated at power plants using different fuels. Electric bus emissions estimates (Tables 4, 5 and 6) have been calculated using Altoona Bus Testing Results Center report number LTI-BT-R1406 to estimate energy consumption in Kwh/mile U. S. Energy Information Administration – Maryland Electricity Profile 2015 to estimate pollution per Kwh, an average 40,000 annual miles per bus, and the monetized value per ton for select pollutants from the USDOT Tiger 2016 Resource Guide (Appendix – Figure 6). It is also possible to reduce electric related emissions by purchasing electricity through Maryland Public Service Commission's Green Power initiative where electric re-sellers are selling energy with 50% renewable generation. Maryland's electric emissions are also expected to be reduced as some of the state's coal fired power stations are scheduled for closure. Consequently, the future tons of electric bus emissions has been reduced by 50%.



Table 4: Maryland Electric Emissions in Lbs. / Kwh

Pollution Estimates	Tons	Conversion to Lbs.	Lbs.	Net Generation Kwh	Lbs. / Kwh
Sulfur dioxide (short tons)	34,366	2000	68,732,000	36,365,544,000	0.00189
Nitrogen oxide (short tons)	16,106	2000	32,212,000	36,365,544,000	0.00089
Carbon dioxide (thousand metric tons)	18,314	2,204,600	40,375,044,400	36,365,544,000	1.11026

Table 5: Proterra 40' Electric Bus Annual Electric Consumption Estimate

Vehicle	Annual Miles	Kwh per Mile	Annual Kwh
Proterra 40' ART Duty Cycle LTI-BT-R1406 – page 134	40,000	2.1	84,000

Table 6: Electric Bus Emissions Estimate

Pollutant	Lbs. per Kwh	Lbs. per year	Renewable Electric Factor	Tons per year	Value per ton	Annual Value
Sulfur dioxide	0.00189	158.76	.5	0.0397	\$42,947	\$1,704.59
Nitrogen oxide	0.00089	74.41	.5	0.0186	\$7,266	\$ 135.16
Carbon dioxide	1.11026	93,261.46	.5	21.1516	\$47	\$ 994.12
Electric Bus Annual Emissions Estimate						\$2,833.88

4. Anticipated Demand Outside the VW Settlement - significant demand for capital vehicle replacement exists, and it is not anticipated that VW settlement funding will eliminate demand but should relieve some demand.

5. Funding Percentage Allocation - funding should be allocated based on the priorities outlined in number 1 of this section. The number one priority should be diesel emission reduction. Projects that demonstrate the greatest diesel emission reduction in the most economical manner should receive priority.

6. Percentage to Government Projects - projects that reduce the burden on North Carolina taxpayers should receive the highest priority. Should surplus settlement funding be available, private projects could be considered. The responsibility of public agencies to allocate settlement funds in compliance with grant requirements will lead to less administrative burden for DEQ and significantly higher compliance. North Carolina's transit system have a high level of oversight and expectations for compliance.

7. Geographical Distribution - geographical equity between urban and rural areas should be considered. It is also imperative to distribute the funds in an equitable manner between the large urban areas including Charlotte, the Triad and Triangle, and the urban centers in the eastern and western portions of the state. Prioritizing funding to ozone non-attainment areas would be



short sighted. Areas meeting EPA clean air requirements can only continue to maintain such status by continued investment in emission reduction efforts.

8. Matching Funds - there is no debate that requiring matching funds will broaden the reach of settlement funds and an argument could be made for matching fund requirements, but the process could prove burdensome. Also, projects often are delayed due to lack of matching funds. NCDOT favors no matching fund requirements for government agencies.

9. Minimum Project Size - taking into account the administrative burden on the trustee, restricting a project to a minimum cost could lead to a quality project being excluded. NCDOT trusts DEQ's experience with different project sizes to answer this question.

10. Other Key Factors - to maximize the impact of settlement funding in reducing emissions, cost effectiveness evaluation should include the amount of hours and/or miles the proposed vehicles are operated. Support for government projects that benefit North Carolina businesses would be beneficial to private manufacturers operating in the State.

11. Additional Feedback - as highlighted in previous responses, an agency's ability to manage grant funding in a responsible and compliant manner should be considered.

12. Quantifying Results - absent significant investment in air quality monitoring equipment, quantifying success could be challenging. Significant data exists on bus emissions as shown in the answer to question #3.

13. Future Solicitations - use the partners created in this process to share the news of these opportunities.

14. Stakeholder Communication - NCDOT PTD will assist DEQ in sharing and communication about the opportunities.

Section 3 - Project Information

The NCDOT PTD local partners are interested in this funding.

Project Category - Class 4 - 8 transit buses model 2009 year or earlier

Project Summary

The Public Transportation Division, in partnership with local governments, has identified **replacement of buses** in urbanized areas as a funding priority. A majority of the fleet has exceeded the useful life standards set by the Federal Transit Administration. Many of our fleets were purchased with federal earmarks or discretionary grants; both of which are no longer available under the FAST Act. The safety and maintenance costs of operating these vehicles increase drastically with each mile of operation. Nine hundred and ten vehicles (910) are scheduled for replacement between fiscal years 18-23. This need is one NCDOT shares with our local government partners. Our needs are 3.5 times greater than the funding. Therefore, the request for this funding is:

Fuel Type	#	Price
Diesel	30	\$ 15,000,000
Hybrid Diesel	17	\$ 11,900,000
Electric	20	\$ 16,000,000
CNG	13	\$ 7,020,000
	80	\$ 49,920,000



Geographic area - Urban areas of NC

Fleet type - transit buses

Mitigation action - replace older diesel buses with CNG, electric, hybrid diesel or clean diesel buses.

Number of vehicles targeted - 80

Technology - Cummins Westport ISL G Near Zero Compressed Natural Gas, electric, diesel and hybrid diesel

Estimated cost - \$49.9

Project benefits - please see section 3



December 31, 2017

NC VW Settlement RFI
Division of Air Quality – Mobile Sources
217 West Jones St
1641 Mail Service Center
Raleigh, NC 27699-1641
Washington, DC 20590

RE: Response to NC VW RFI

The Charlotte Area Transit System (CATS) appreciates the opportunity to provide comments to the Division of Air Quality regarding the VW Settlement. This settlement provides a unique and timely opportunity for North Carolina to continue its commitment to emissions reductions and renew its commitment to public transportation investment as a means to that end. North Carolina is a rapidly growing state with every increasing demand on our transportation infrastructure and systems. As a result, regions of our state have struggled with poor air quality and with the ability to keep up with the increasing demand on our transportation infrastructure. CATS supports the utilization of these funds to maximize the investment in replacement and expansion transit vehicles to provide an alternative to the single occupant vehicle and as a cost effective and efficient use of these funds to reduce mobile emissions.

VW Program and Solicitation Design Questions

1. How should DEQ Prioritize Projects?

Projects should be prioritized based upon emission reductions, project readiness and financial match. It is imperative that the emissions reduction calculations include consideration of the utilization of the vehicles as well. Implementing a project that will receive minimal usage will not provide as great a benefit as one that is utilized daily and serves numerous users. Funding for Bus replacements is in high demand statewide and can be implemented quickly and can easily demonstrate the number of daily and annual users and vehicle utilization. Additionally, the encouragement of matching funds from various sources will expand the reach and effect of the program.

2. What is the anticipated demand for each eligible project type?

CATS believes that the replacement of transit vehicles would be one of the greatest demands within the 9 eligible project types listed in section 3.



3. Percentage of Trust funds that should be devoted to Light Duty Zero Emission Vehicle Supply Equipment?
Significant investment in electric charging stations and parking was made under various grants of ARRA funds. Unless this section could be utilized to provide funding to help offset the cost of construction/implementation of a CNG fueling facility, CATS believes that the investment in this category should be a lower priority.
4. Anticipated Demand Outside the VW Settlement?
CATS believes that significant demand for capital vehicle replacement exists, and it is not anticipated that VW settlement funding will eliminate demand but should help address some demand.
5. Funding Percentage Allocation?
Funding should be allocated based on the priorities outlined in number 1 of this section. The number one priority should be diesel emission reduction. Projects that demonstrate the greatest diesel emission reduction in the most economical manner when considering utilization should receive priority.
6. Should a percentage of available funds be reserved for government projects?
Yes, projects that reduce the burden on NC taxpayers should receive that highest priority. Furthermore, government agencies are best set up to utilize these funds while maintaining openness and accountability to the public for their use.
7. Should funds be geographically distributed?
A higher emphasis should be placed on benefit and demand for the use of these funds.
8. Should government entities be required to provide matching funds?
A match should be encouraged from all applicants to maximize the effect of the program and to ensure project sponsor commitment to the project. The amount of the match should be a factor in the rating/award of the project. The source of the match should be flexible and allow any combination of funds available to the local sponsor to maximize potential investment.
9. Should there be a minimum project size?
Yes, in order to minimize the amount of funds going toward oversight/overhead a minimum project cost should be established. This would encourage smaller projects/applicants to partner with each other to help improve program efficiency and project efficiency.
10. In addition to cost effectiveness, what other key factors should be considered?
To maximize the impact of settlement funding in reducing emissions the cost effectiveness evaluation should include the utilization (amount of hours and/or miles) the proposed project is operated.
11. What other feedback do you have on project evaluation or scoring criteria?
As stated in #1 above, the amount of project match being provided should be a consideration.
12. What available tools should be used to quantify emission reductions?

There are several tools that are publicly available from the CMAQ process that could be utilized for this purpose. CATS agrees that it is important to have a set of tools available to effectively and fairly evaluate each project.

13. What methods could DEQ utilize to reduce barriers and increase participation in future solicitations for projects?

Partnering with NCDOT, the NC Association of MPOs and the NC Public Transportation Association could help in this area.

14. What information/resources would be most valuable to stakeholders interested in submitting projects and what is the best way to communicate?

Utilization of your website is important; but, continued use of the partners mentioned in 13 and the inclusion of all RFI responders on an email list would also be beneficial.

CATS will await the call for projects to submit the project details requested in section 3. We appreciate the opportunity to comment on this important effort and look forward to the future call for projects.

Sincerely,

E. D. McDonald, II, P.E.
Transit Planning Manager
Charlotte Area Transit System



December 19, 2017

Mr. Michael Abraczinskas, Director
North Carolina Department of Environmental Quality
217 West Jones Street
Raleigh, NC 27603

Dear Sir:

East Carolina University, a public university located in Greenville, North Carolina, operates a university-owned transit fleet serving the transportation needs of our students, staff, faculty and visitors on and around our campus. ECU Transit operates on and off campus providing nearly three million passenger trips annually to reduce private conveyance, the need for parking, congestion and to improve air quality around our campus and in our community.

The availability of diesel mitigation funds would significantly impact our ability to replace aging heavy-duty transit buses with new clean compressed natural gas transit buses. ECU Transit, in partnership with Greenville Utilities, began purchasing clean CNG powered heavy-duty transit buses in 2016. The natural gas engine from Cummins, produced in North Carolina, significantly reduces emissions compared to the standard diesel transit bus for a nominal upcharge of \$40,000 per transit bus. To date, we have purchased four new transit buses powered by clean CNG with two additional units to be built and delivered in April 2018. Natural gas provides a clean alternative fuel option to diesel at an affordable price point as compared to other options such as battery electric technology which has reduced operating range and costly infrastructure requirements.

As the program is currently defined, government agencies would be able to receive 100% funding for capital replacement of diesel vehicles older than 2007. We would respectfully request this provision stay as is and include natural gas engines which classify as “near-zero” meeting the 0.02 g/bhp-hr NO_x emissions standards for medium-duty truck, urban bus, school bus, and refuse applications. Allowing capital funding for natural gas powered vehicles would allow for significant reduction in NO_x emissions at a price point which would stretch funding farther and replace more vehicles currently operating pre-emissions diesel engine technology. If matching funds are required for government agencies we would respectfully request the percentage not exceed 20% for transit fleets operating in an urban environment since our NO_x emissions reduction can be significant by replacing our old diesel buses which we operate approximately 300 days per years.

Thank you for your consideration and the opportunity to provide feedback on this opportunity to significantly reduce NO_x emissions and improve air quality in the State of North Carolina.

Sincerely,

Wood G. Davidson
Director

December 29, 2017

Brian C. Phillips
Mobile Sources Compliance Branch Supervisor
North Carolina Department of Environmental Quality
1601 Mail Service Center
Raleigh, N.C. 27699-1601

Dear Mr. Phillips:

Enclosed please find GoTriangle's submittal to the *Department of Environmental Quality Request for Information - Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas* dated November 21, 2017. We appreciate the efforts of NC DEQ in soliciting and considering public input regarding this important settlement. GoTriangle is currently working with Clean Technology on a fleet assessment for our over 60 full size transit buses that operate throughout the Triangle Region. We are confident that we will be able to assist DEQ in efforts to meet the settlement requirements of reducing diesel emissions throughout the counties of Wake, Durham and Orange in North Carolina. As detailed in our submittal, we are also ready to implement emission reducing strategies that will minimize taxpayer burden both regionally and statewide.

Thank you again for your transparency in administering this important program and we look forward to the evolution of the settlement grant program in the state. Please do not hesitate to contact me or our staff if you have questions or require additional information.

Sincerely,



Jeff Mann
General Manager

RESEARCH TRIANGLE REGIONAL PUBLIC TRANSPORTATION AUTHORITY, d/b/a GoTriangle

Introduction

This submittal is in response to the North Carolina Department of Environmental Quality Request for Information *Volkswagen Consent Decree Environmental Mitigation Trust Project Ideas*. The information and recommendation submitted herein are exclusively those of the Research Triangle Regional Public Transportation Authority, a North Carolina local government established under the provisions of North Carolina General Statute 160A, section 26.

Section 1 - Project Applicant Information

- **Organization** - Research Triangle Regional Public Transportation Authority (GoTriangle)
- **Contact** - Jeff Mann, General Manager
- **Type** - North Carolina Public Transportation Authority (local government)
- **Address** - P.O. Box 13787, RTP, NC 27709
- **Phone** - (919) 485-7424
- **Email** - jmann@gotriangle.org

Section 2 - VW Program and Solicitation Design Questions

1. **Prioritization** - in an effort to maintain the highest level of compliance with the settlement, potential projects should be prioritized based on the following:
 - i. Environmental impact** - Projects that maximize reduction in emissions should be given the highest priority. Diesel for diesel power plant replacements meet the settlement requirements, however replacing a diesel vehicle with an electric or CNG engine will have a greater impact on the environment.
 - ii. Minimizing tax burden** - Minimizing taxpayer subsidies by allocating settlement funds to public agencies should be considered. Distribution of VW settlement revenue between private and public providers should be weighted in favor of public agencies and the impact funding could have on the budgets of local governments. Reduction in federal funding for significant projects which are eligible for settlement grants should be considered when priorities are quantified.
 - iii. Project readiness** - Inflationary pressure will minimize the impact of projects awarded if grantees are not in a position to quickly implement projects. The option of a near term purchase versus a purchase in future years could result in significant savings. Prioritization of this type would serve to maximize the purchasing power of the settlement.
 - iv. Project cost** - Projects that maximize the investment of settlement funding, taking into account the environmental impact, should be given priority. This should include projects that include significant matching funds. For conversion to battery electric buses, GoTriangle will only request settlement funds to offset the increased initial cost of each bus and charging components, not the full cost of the vehicle.
 - v. Commitment to sustainability** - Settlement funds should be prioritized to assist agencies that have demonstrated a commitment to sustainability. Established transportation demand management programs should also be considered as commitment.
2. **Demand** - Support for bus capital funding has decreased since 2012 primarily due to reduced federal funding. The impact of this reduction in funding has been significantly impacted the transit industry. The decrease in federal funding has been compounded by rising commodity costs, changes to compliance regulations and increasing onboard technology investments. While significant demand for discretionary funding is expected, high demand among transit providers should be expected due to aging fleets and decreased federal support.
3. **Trust Funding for Light Duty Zero Emission Vehicle Supply Equipment** - GoTriangle proposes to deploy zero tailpipe emission battery electric buses, both for replacement and expansion purposes.

4. Anticipated Demand Outside the VW Settlement - Significant demand for capital vehicle replacement already exists, and it is not anticipated that VW settlement funding will eliminate this demand but should provide assistance in meeting vehicle replacement and expansion needs.

5. Funding Percentage Allocation - Funding should be allocated based on the priorities outlined in number 1 of this section. DEQ is tasked with implementing the provisions of the settlement and a key priority should be diesel emission reduction. Projects that demonstrate the greatest diesel emission reduction in the most economical manner should receive priority.

6. Percentage to Government Projects - Projects that reduce the burden on North Carolina taxpayers should receive high priority.

7. Matching Funds - Matching funds should be considered to broaden the reach of settlement funding. As noted previously, GoTriangle proposes to only seek settlement funds for the delta between a diesel and an alternative fuel vehicle (and related components). For example, the estimate initial capital cost of a state of the art battery electric bus is approximately \$980K. A new full size Gillig diesel bus is approximately \$500K. In this case matching funds total over 50% per vehicle.

8. Other Key Factors - To maximize the impact of settlement funding in reducing emissions, the evaluation of cost effectiveness should include an assessment of the hours and/or miles the proposed vehicles will be operated. Projects that include vehicles that will operate on a limited or somewhat limited basis will not provide the same level of benefit and highly utilized vehicles such as transit buses, which in many cases operate well in excess of 40,000 miles per year.

9. Additional Feedback - An agency's ability to manage grant funding in a responsible and compliant manner should be considered. This will not only serve to ensure compliance but will reduce the administrative burden on DEQ.

10. Quantifying Results - Significant data exists to demonstrate the benefits of replacing an eligible diesel engine with a newer model, regardless of fuel type. Verifiable data also exists to demonstrate additional emission reduction from alternative fuels and electric propulsion vehicles. The attached FTA No Emission/Lo Emission grant application that was submitted earlier this year includes an estimate of emission reduction that would be realized through the deployment of just seven battery electric buses. The grant application is attached for your review.

11. Stakeholder Communication - As a potential stakeholder, GoTriangle would benefit from consistent feedback highlighting successful settlement awards and methods for improving applications. A clear understanding of how settlement funds are proposed to be distributed including: annual awards; award types; public private split (if applicable); geographic distribution; and detailed annual reporting would allow stakeholders to develop strategies for future submittals. Additional resources could include webinars and listening sessions as well as regional questions and answer sessions. If implemented, these steps should lead to increased interest in the program, better applications for settlement funding, simplified project evaluations, reduced administrative burden, and a high level of transparency.

Section 3 - Project Information

GoTriangle is currently working on a fleet assessment with NC Clean Technology to determine the proper alternative fuel vehicles that should be included in future replacement and expansion procurements. The fleet assessment will be complete during the 1st quarter of calendar year 2018. We fully anticipate developing a strategy that will include a mix of technologies that will include alternative fuel vehicles with the use of a number of battery electric buses. Our initial estimate of funding to be requested through the settlement is for the increased initial capital cost to purchase eight electric buses and related components, or approximately \$3.8 Million. These vehicles will operate on GoTriangle routes in Wake, Durham and Orange counties. The environmental benefits that will be realized through deployment of battery electric buses (BEB's) is estimated below on a per vehicle basis.

Reduction in Harmful Emissions:

Buses running on diesel and gasoline all produce harmful emissions; including varying ranges of nitrogen oxide (NOx), methane (CH₄), carbon monoxide (CO), hydrocarbon (HC), particulate matter (PM) and black carbon (BC). In comparison, battery electric buses emit no tailpipe emissions, and will reduce harmful emission and local air pollution by eliminating dangerous compounds and particulates. Using the USDOE's GREET Model Fleet Footprint Calculator, the reduction in harmful emissions is estimated and shown below. However, it should not be assumed that operating BEBs is completely free of emissions as the source of emissions is dependent on the type of power generation used to charge electric vehicles. Replacing one diesel bus with one Proterra Catalyst battery electric bus will reduce annual tailpipe emissions by:

- 59 pounds of NOx
- 158 pounds of CH₄
- 59 pounds of CO
- 11 pounds of HC
- 1 pound of PM
- 891 pounds of BC

Reduction in Direct Carbon Emissions:

A diesel bus running 36,000 miles per year (national average) produces an estimated 201,000 pounds of CO₂ annually, equivalent to 5.6 pounds per mile. The annual reduction in direct carbon emissions per vehicle for GoTriangle is estimated below:

- 239,120 pounds of CO₂ for GoTriangle with an annual average mileage of 42,700

Finally, as noted previously, GoTriangle, along with partner transit agencies submitted a regional application for "No Lo" emission federal grant. Although we were unsuccessful in the award of this grant, we are committed to continue efforts to deploy more efficient and cleaner vehicles. As with the "NoLo" grant application, we anticipated requesting settlement funding for only the increased initial capital cost of vehicle procurement. A copy of the grant application is included.

Section 5339 (c) Bus and Bus Facilities Grant Low or No Emission Grant

Applicant Name: Research Triangle Regional Public Transportation Authority, d/b/a GoTriangle

FTA Recipient number ID Number: 5527

Attachments to follow:

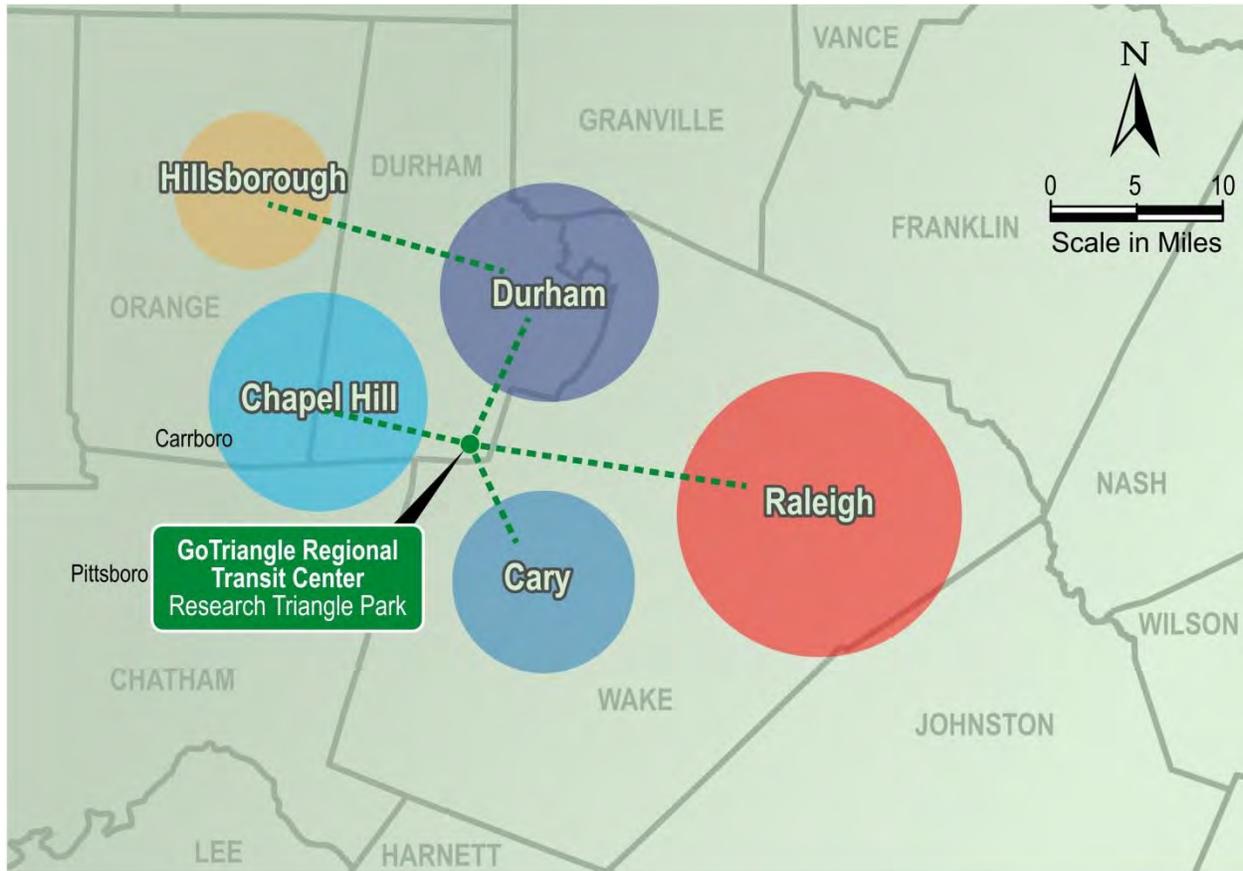
GoTransit Regional Map

Capital Costs and Contributions

- Complete
- Scaled

Proterra Qualifications

GoTransit Regional Map



Service Areas

- | | |
|---|---|
|  Raleigh - GoRaleigh |  GoTriangle Regional Service |
|  Cary - GoCary |  Chapel Hill - Chapel Hill Transit |
| |  Durham - GoDurham |

Regional GoTransit Electric Bus Implementation Project (Complete)

Proterra Vehicle + Plug In Charger Cost	Per vehicle	# of vehicles requested	Total
Proterra long range electric vehicle - Catalyst E2	\$ 798,000		
Average cost of configurable options e.g. camera systems	\$ 75,000		
Extended warranty for battery - 12 years	\$ 55,000		
Plug-In charger 50kW	\$ 40,000		
Installation cost for Plug-In charger	\$ 15,000		
Total Project Cost	\$ 983,000	7	\$ 6,881,000
Private Partner In-Kind match			
Proterra In-Kind match	\$ 25,000	7	\$ 175,000
Local financial commitment			
GoTriangle			\$ 1,000,000
GoRaleigh			\$ 1,000,000
Chapel Hill			\$ 916,000
GoCary			\$ 500,000
Total local financial commitment		7	\$ 3,416,000
Federal funds requested			
Federal share requested		7	\$ 3,290,000
Total			\$ 3,290,000
Distribution of Costs			
	Private partner share	3%	
	Local share	50%	
	Federal share	48%	

Regional GoTransit Electric Bus Implementation Project (Scaled)

Proterra Vehicle + Plug In Charger Cost	Per vehicle	# of vehicles requested	Total
Proterra long range electric vehicle - Catalyst E2	\$ 798,000		
Average cost of configurable options e.g. camera systems	\$ 75,000		
Extended warranty for battery - 12 years	\$ 55,000		
Plug-In charger 50kW	\$ 40,000		
Installation cost for Plug-In charger	\$ 15,000		
Total Project Cost	\$ 983,000	4	\$ 3,932,000
Private Partner In-Kind match			
Proterra In-Kind match	\$ 25,000	4	\$ 100,000
Local financial commitment			
GoTriangle			\$ 500,000
GoRaleigh			\$ 500,000
Chapel Hill			\$ 458,000
GoCary			\$ 500,000
Total local financial commitment		4	\$ 1,958,000
Federal funds requested			
Federal share requested		4	\$ 1,874,000
Total			\$ 1,874,000
Distribution of Costs			
	Private partner share	3%	
	Local share	50%	
	Federal share	48%	



PROTERRA

FTA FY17 5339(c) Low-No Program Proterra Qualifications

Proterra Background

Proterra is a leader in the design and manufacture of zero-emission vehicles that enable bus fleet operators to eliminate their dependency on fossil fuels and to significantly reduce operating costs while delivering clean, quiet transportation to the community. Proterra has sold more than 400 vehicles to 38 different municipal, university, and commercial transit agencies in 20 states across the USA. Proterra's configurable EV platform, battery, and charging options make its buses well suited for a wide range of transit routes. With unmatched durability and energy efficiency based on Altoona and testing, Proterra products are proudly designed, engineered and manufactured in America, with offices in Silicon Valley, South Carolina, and Los Angeles. For more information, visit: <http://www.proterra>.

Proterra's Low-No History

On February 5, 2015, the Federal Transit Administration (FTA) announced projects selected for Fiscal Year 2013 and Fiscal Year 2014 funding under the Low and No Emission Vehicle Deployment Program (Low-No Program). Transit agencies that partnered with Proterra won six (6) of ten (10) projects funded by the FTA and six (6) of seven (7) battery-electric bus projects. The winning agencies partnering with Proterra included Dallas Area Rapid Transit (DART), Duluth Transit Authority (DTA), Transit Authority of Lexington (Lextran), San Joaquin Regional Transit District (RTD), Transit Authority of River City (TARC) and Worcester Regional Transit Authority (WRTA).



On April 19, 2016, the FTA announced projects selected for Fiscal Year 2015 funding under the Low-No Program and agencies partnering with Proterra were again very successful, with thirty-three (33) of the forty-eight (48) battery-electric buses funded going to agencies partnered with Proterra (69%). These agencies include Foothill Transit, Southeastern Pennsylvania Transportation Authority (SEPTA), and King County Metro.



Proterra Proprietary and Confidential



PROTERRA

On July 26, 2016, the FTA announced that eight (8) agencies partnering with Proterra won Fiscal Year 2016 Low or No Program funding. The 2016 Low-No grant awardees are acquiring thirty-five (35) Proterra Catalyst zero-emission battery-electric buses. From Delaware to Washington to Louisiana, electric bus adoption is growing amongst a diverse group of transit agencies from coast-to-coast. Innovative transit agencies that embraced the economic and environmental benefits of Proterra's zero-emission battery-electric buses in the 2016 Low-No Program include:

- Delaware Transit Corporation (Wilmington, DE), six (6) 35' Catalyst E2 buses
- Everett Transit (Everett, WA), four (4) 40' Catalyst E2 buses
- Lextran (Lexington, KY), one (1) 40' Catalyst FC+ bus
- Park City Transit (Park City, UT), six (6) 40' Catalyst FC+ buses
- Pierce Transit (Pierce County, WA), two (2) 40' Catalyst E2 buses
- Port Arthur Transit (Port Arthur, TX), six (6) 35' Catalyst FC+ buses
- SporTran (Shreveport, LA), five (5) 40' Catalyst E2 buses



Transit agencies partnering with Proterra have won seventeen (17) of the thirty (30) Low-No Program awards for zero-emission battery-electric buses where the agency partnered with an OEM. That represents fifty-seven percent (57%) of the awards for battery-electric buses where the agency partnered with an OEM. In contrast, agencies partnering with other battery-electric bus OEMs have won thirteen (13) times combined (43%).

Proterra Proprietary and Confidential

Page 2



Innovative Financing Solutions

Beginning in Fiscal Year 2016, the FTA Low-No Program began accepting applications for bus purchase or lease as well as the purchase of a bus with a leased fuel source. Park City Transit took advantage of this change by proposing a grant application for the purchase of six (6) 40' Catalyst FC+ buses with leased batteries along with two (2) Proterra overhead fast-charging stations. Proterra and Park City Transit executed a bus purchase contract and Battery Services Agreement (BSA) earlier this year and are currently in the process of taking delivery of their 40' Proterra Catalyst FC+ vehicles.

Manufacturing at Scale

In 2017, Proterra is planning to build and deliver zero-emission battery-electric buses to thirteen (13) different transit providers. Proterra's new west-coast manufacturing facility based in Los Angeles will deliver zero-emission Catalyst buses to five (5) of the thirteen (13) customers as that facility ramps up operation. Proterra has the current capacity in its South Carolina and Los Angeles facilities to manufacture as many as twenty (20) battery-electric buses per month on a single shift. Proterra is actively managing our growth to maintain the balance between having a healthy backlog and maintaining the ability to deliver new battery-electric buses in a twelve (12) to fifteen (15) month timeframe from date of award / contracting. Proterra anticipates all buses funded from the Fiscal Year 2017 Low-No Program will be delivered in 2018 or 2019 based on customer preference.

Successful Revenue Operation

Proterra battery-electric vehicles, a combination of both the first-generation 35' BE35 EcoRide buses and second-generation 40' Catalyst FC buses, have amassed more than three million (3M) miles in revenue service at fourteen (14) different transit providers from thirteen (13) different states. These buses provide clean transportation to citizens across this nation and are relied on by transit providers and their riders daily. To date, ten (10) of Proterra's customers have placed repeat orders, providing further evidence of our customer's satisfaction with their Proterra electric buses.

Setting Customers Up for Success

No Proterra customer has experienced a failed deployment of their Proterra battery-electric buses. Proterra uses a sophisticated computer model to simulate the performance of our vehicles on a prospective customer's route(s). The simulator has been built and tested based on real-world field data and proven to provide accurate results. The Proterra route simulation tool considers all key aspects of a given route, including: route distance, speed, stops, layovers, duration, grade, passenger loading, ambient temperature and associated HVAC loads required for comfortable operation, and other hotel loads required for safe and efficient operation.

The simulation results are useful for: 1 – selecting the appropriate vehicle and energy storage levels for each route; 2 – scheduling; and 3 – developing the appropriate charging strategies. Using this approach, Proterra and the customer can match the appropriate vehicle and

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Page 3

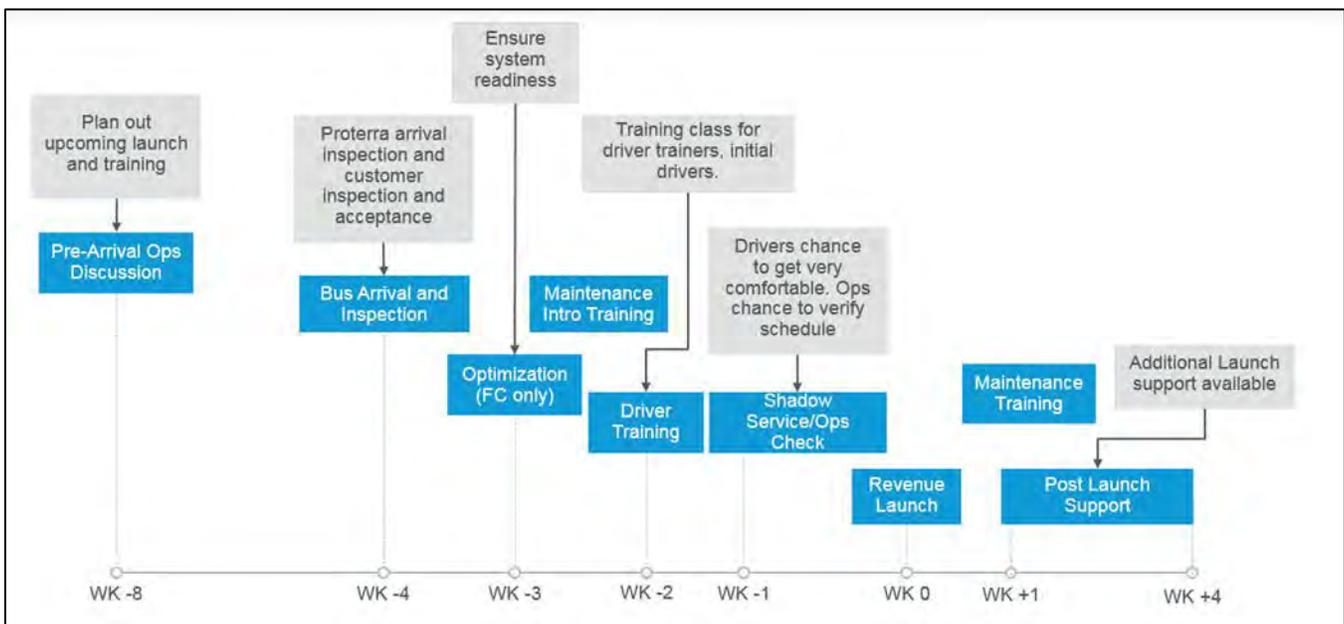


charging strategy for any given route.

Customer Launch Process

Proterra understands that the deployment of new technology can be challenging at times. To reduce anxieties about the roll-out of Proterra battery-electric buses, we have developed a Customer Launch Process (CLP) to ensure that all parties involved are knowledgeable about the vehicle and the supporting charging infrastructure. The CLP is designed to ensure that our transit partners are provided with complete OEM support to implement new technology successfully.

The CLP begins approximately two (2) months prior to buses beginning revenue service, with a planning meeting between Proterra and all customer stakeholders, including those who may not have been actively involved during the procurement process. During this planning session, the parties discuss and agree upon a schedule for activities that will take place between when the buses are delivered and when they enter revenue service, including how driver and maintenance training will be conducted.



The next phase occurs when buses are delivered and the receiving inspection and acceptance process begins. The receiving inspection and acceptance process will conform to the requirements of the contract and will also be reviewed during the planning session so that all parties are clear on the process. Overlapping this phase will be the beginning of the workforce development training for the maintenance technicians and drivers.

One week prior to the revenue service start date, Proterra recommends running the buses in

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“shadow” service to allow the drivers to become comfortable with the vehicle on the route(s). Once the vehicles are in revenue service, Proterra’s post-launch support continues, with the regional Proterra Field Service Representative (FSR) being located on-site for a six (6) week period to provide on-the-job training, provide warranty support, and troubleshoot any issues or concerns that arise.

Buy America Compliance

Well in advance of the new Buy America requirements in the FAST Act, Proterra’s buses already contain greater than 70% domestic content. And since our vehicles are proudly built in South Carolina and Los Angeles, partnering with Proterra provides transit agencies with the confidence of knowing that the FY 2020 Buy America requirements have already been demonstrated.

Altoona Testing

The 40’ Proterra Catalyst completed its testing at the Pennsylvania Transportation Institute, Bus Testing and Research Center (Altoona) in April 2015. As noted in the Altoona Test Report, the Proterra Catalyst received a best-in-class average energy efficiency of 1.70 kWh/mi which is the equivalent of 22.14 MPGe (Miles per Diesel Gallon equivalent). In addition to energy efficiency, the Proterra Catalyst broke electric bus records at Altoona for gradeability, weight (lightest), and acceleration. The Altoona Test Report is available at: <http://altoonabustest.psu.edu/buses/454>. All issues noted in the Altoona report have been corrected and Proterra is happy to provide additional information regarding those items if requested.

Proterra will complete the required partial Altoona testing (Fuel Economy & Performance) for its 40’ Catalyst E2 extended range battery-electric bus in June 2017. In August, Proterra will bring our 35’ Catalyst bus to a partial Altoona test incorporating performance tests including range, gradeability, acceleration, and fuel economy.

Warranty

Proterra’s electric buses come standard with the following warranties:

- Complete Bus (Bumper to Bumper): 1 year / 50,000 miles
- Main Composite Monocoque Structure (Body / Class 1 & 2): 12 years / 500,000 miles
- Structural Systems: 3 years / 150,000 miles
- Major Components: 2 years / 100,000 miles
 - Brake System
 - Transmission
 - Axles
 - Destination Signs
 - Door Systems
 - Defroster

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- Air Compressor
- Air Dryer
- ADA Ramp
- Passenger Seating
- Passenger Windows
- A/C Unit & Compressor
- Traction Motor & Inverter
- Transmission
- Power Steering Unit
- Energy Storage Systems: 6 years / 300,000 miles
- Charging Systems: 2 years

Extended warranties are also available for purchase and are included in the accompanying Proterra Budget Worksheet.

Workforce Development / Training

Proterra offers a variety of training designed to efficiently train operators and technicians on the use and maintenance of our products. When purchasing a vehicle, Proterra offers the following training which is considered our baseline training package which is included in the vehicle price:

- Operator Training
 - 40 hours of operator training
 - Utilizes a “train-the-trainer” approach to enable customers to provide as much training as required for their operators
 - 50/50 split between classroom and seat-time for the operators
- Bus Maintenance Training
 - 36 hours of vehicle maintenance training.
 - Classroom and hands-on training
- Bus Introduction Training
 - 16 hours of general bus introduction training
 - Meant for supervisors, managers, procurement
- Charger Maintenance Training
 - 24 hours of charger maintenance training
 - Classroom and hands-on training

Beyond the baseline training and workforce development included in the bus price, Proterra also offers “Service Plus” and “Service Premium” training and workforce development packages that include additional training hours, and in the case of the “Service Premium” package, a dedicated Field Service Representative for additional on-the-job training during the first year of revenue service.

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FTA FY17 5339(c) Low-No Program Proterra Catalyst Product Information

About Proterra's Zero Emission Buses

Proterra's electric buses are unique when compared to other zero-emission battery-electric transit buses. The Proterra Catalyst family of battery-electric buses were specifically designed from the ground up to be heavy-duty electric vehicles, thus resulting in the market's best performing and most efficient buses available. Other OEMs are forced to work within the constraints of an existing metal framed body, often using high voltage battery packs that are not uniform in form factor and placed at suboptimal locations both inside and outside of the passenger cabin.

Having the foresight to design the vehicle purely as an electric vehicle, Proterra began with a light-weight, durable composite monocoque body structure manufactured from high strength fiberglass, carbon fiber, and resin with a balsa wood core. The benefits of using the composite body include: a lighter total vehicle weight (reducing the impact to local roads / infrastructure), improved vehicle efficiency / fuel economy, improved thermal and noise reducing properties, exceptional torsional stiffness (resulting in an excellent ride and handling), increased durability (LA Metro has reported that their composite bus bodies are expected to last up to 20 years), corrosion resistance, and best-in-class safety (better impact resistance). For reference, most 40' electric buses that have traditional metal framed bodies weigh an average of 5,000lbs more than Proterra's Catalyst electric buses.

Additionally, the Catalyst battery-electric buses have a recessed cavity under the bus body, between the axles for the high-voltage battery packs. Much like purpose-built light-duty electric vehicles, placing the high voltage battery packs under the body increase vehicle safety (located outside of the passenger cabin and below the side impact zone), improve the ride and handling (centering mass between the axles and low to the ground), and optimize the use of space around the vehicle (allowing for a rear window and a clean, simple powertrain design).



Underbody View of 40-foot Catalyst E2

The Proterra Catalyst comes standard with all wheel air-disc brakes, a ZF independent front suspension, all-electric components and accessories, a state-of-the-art vehicle multiplex system, a proven all-electric Eberspächer HVAC, state-of-the-art high voltage battery pack components manufactured by Proterra in the United States (which meet Buy America

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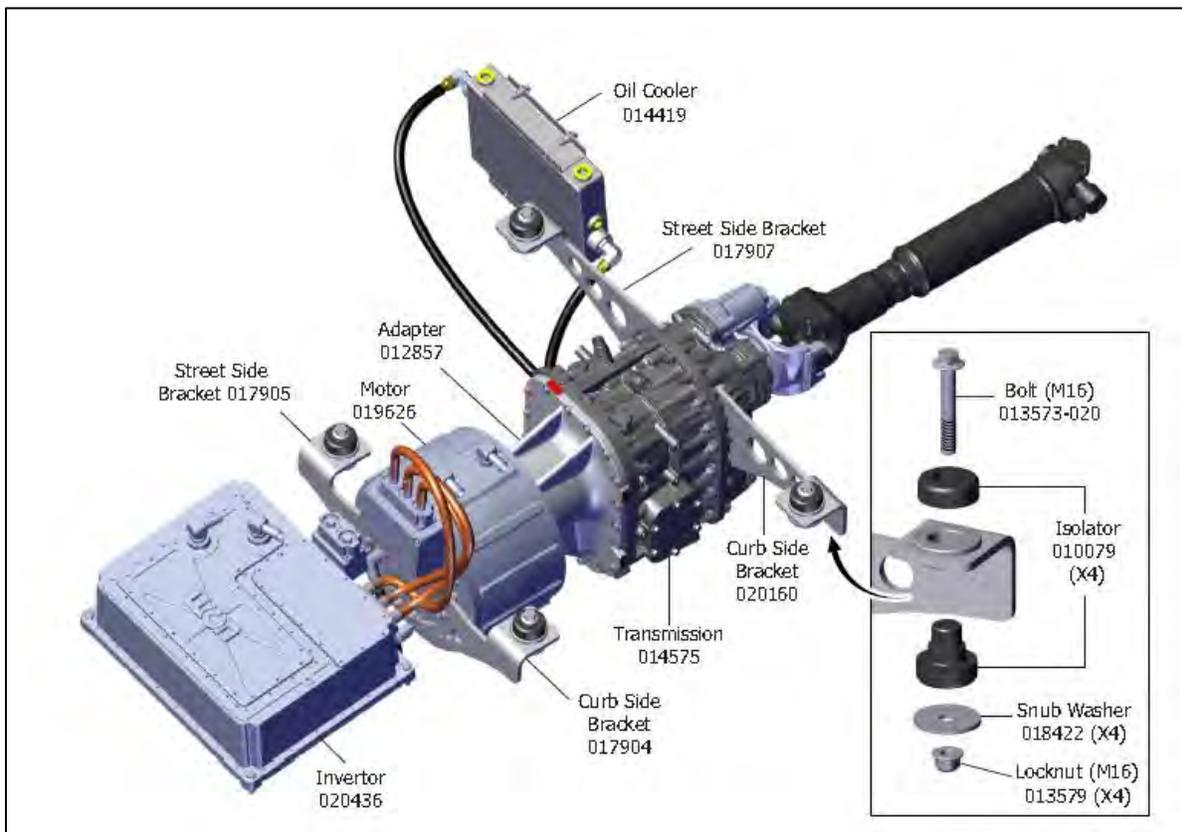
PROTERRA

requirements for components), and an ergonomically designed driver's station.

Proven Electric Propulsion System

The “clean sheet” design of the Catalyst vehicles also allowed Proterra to build from the company's proven electric powertrain technology. The Proterra Catalyst propulsion system consists of three major components: the traction motor; the power inverter; and the 2-speed gear box / transmission.

Proterra uses a permanent magnet synchronous motor with a two-speed automated manual transmission. The traction motor is capable of 220kW peak power and is controlled via an inverter which receives direct current power from the high voltage battery system. Both the traction motor and inverter are liquid cooled.



Catalyst Propulsion System

Proterra's unique two-speed transmission contains a planetary gear set with a pneumatically driven shift mechanism. The transmission is oil-cooled and contains an additional oil cooler to ensure transmission temperatures remain at ideal temperatures under the most difficult driving cycles. The output of the transmission supplies power to the ZF drop center rear axle.

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With the two-speed transmission, the Proterra Catalyst can utilize a smaller, lighter traction motor to meet the performance requirements of a heavy-duty transit bus. This transmission also allows the traction motor to operate in its most efficient operating range.

The combination of the traction motor, the power inverter, and the transmission are the primary reason why the 40' Catalyst was able to break the Altoona records for acceleration and gradeability.

Operating Ranges

As the below chart indicates, the nominal operating range of the Proterra Catalyst vehicles provide customers with electric bus options for most of their fixed transit routes. As with any customer, Proterra recommends completing a detailed route simulation analysis to specifically predict performance on a given route.

Proterra Vehicles	Energy Storage (kWh)	Operating Range (Nominal miles)	Operating Range (hours)
40' Catalyst FC+	105	Up to 62 miles	24 (All-Day)
40' Catalyst XR+	330	Up to 193 miles	Up to 24*
40' Catalyst E2	440	Up to 251 miles	Up to 24*
35' Catalyst FC+	105	Up to 62 miles	24 (All-Day)
35' Catalyst XR+	330	Up to 193 miles	Up to 24*
35' Catalyst E2	440	Up to 251 miles	Up to 24*

* *The extended-range vehicles (XR+ & E2) are also compatible with Proterra's overhead charging system and with regular on-route opportunity charging and ideal conditions, the Catalyst XR vehicles could remain in service up to 24 hours. Under normal circumstances, with no opportunity charging (overhead or otherwise), the extended-range Catalyst XR+ / E2 vehicles can operate up to 12 / 16 hours, respectively.*

Recharging / Refueling Requirements

Proterra offers two primary means of charging the Catalyst battery-electric buses, plug-in depot-based charging and overhead fast-charging. Both the Catalyst fast-charge vehicles and the Catalyst extended-range vehicles are designed to charge from either charging option, although operational demands typically make one or the other better suited for specific deployments. In any and all cases, the Proterra team works with its customers on developing operational plans that optimize the types, quantities, and locations of the charging equipment. Proterra vehicles have now accomplished over 300,000 successful charge events; with that number growing daily.

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Plug-In / Depot Charging

All Proterra vehicles can charge the high voltage batteries using any SAE J1772 CCS commercially available plug-in charger. The SAE J1772 CCS standard is the North American plug-in charging standard that many automotive OEMs have adopted, including GM, Ford, Chrysler, BMW, Porsche, Audi, and Volkswagen. Leveraging the automotive standard allows Proterra's customers to piggyback on the strong demand in the automotive sector for SAE J1772 CCS chargers, resulting in lower prices that are driven by open competition and market forces.

For the 2017 Low-No Program, Proterra is offering SAE J1772 CCS chargers at power levels of 50kW, 62.5kW, and 125kW.



50kW Plug-In
Charger



62.5kW Plug-In
Charger



125kW Plug-In
Charger



Overhead Fast-Charging

Proterra's customers have successfully deployed fifteen (15) Overhead Fast-Charging Stations that currently support their battery-electric fleets. Based on our involvement with those installations, Proterra has developed a detailed Charge Station Information Package (CSIP) Rev. 3.1 that contains the electrical requirements, physical dimensions, and considerations for install locations, etc. to assist customers when planning for and installing overhead fast-charge stations. Additionally, Proterra also offers a full service "turnkey" design and installation package that includes the site layout/design, permitting, construction, and commissioning (in addition to the equipment delivery).

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Headquarters

1815 Rollins Road, Burlingame, CA 94010

East Coast Manufacturing

1 Whitelee Court, Greenville, SC 29607

West Coast Manufacturing

383 Cheryl Lane, City of Industry, CA 91789

www.proterra.com



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Demonstration of Benefits

Proterra’s Catalyst electric buses are purpose-built to maximize the benefits they offer their operators. Operating the industry’s most efficient vehicle means less energy is required per mile than any other electric bus and far less energy than diesel, compressed natural gas, or diesel-hybrid vehicles. And like all zero-emission vehicles, operators that deploy the Proterra Catalyst electric buses directly reduce the harmful emissions in their local communities.

Reducing Energy Consumption

The Proterra Catalyst battery-electric bus is the most energy-efficient heavy duty transit vehicle ever tested at Altoona, registering an overall average efficiency of 1.70kWh/mile or 22.14MPGe. In comparison, the latest 40’ low-floor diesel buses tested at Altoona registered less than 5MPG fuel economy. By deploying a Proterra Catalyst electric bus, transit agencies are reducing their overall energy consumption by reducing the amount of energy required to move their buses.

In addition to the efficiency of the electric bus, the generation and transmission of electricity is much more efficient than extracting, refining, and distributing either diesel or compressed natural gas.

Reducing Harmful Emissions

The Proterra Catalyst vehicle produces zero harmful emissions. In contrast, diesel, compressed natural gas (CNG), and diesel-hybrid transit vehicles all product harmful emissions; including varying ranges of Nitrogen Oxide (NO_x), Methane (CH₄), Carbon Dioxide (CO₂), Hydrocarbon (HC), Particulate Matter (PM10 & PM2.5), and Black Carbon (BC). The below chart provides additional information regarding tailpipe emissions compared to diesel, CNG, and diesel-hybrid buses.

ANNUAL TAILPIPE EMISSIONS				
	Proterra Catalyst®	CNG	HYBRID	DIESEL
GHG Greenhouse Gases (lbs)	0	312,840	221,760	300,960
CO ₂ Carbon Dioxide (lbs)	0	208,560	158,400	243,980
CH ₄ Methane (lbs)	0	85,455	103	158
CO Carbon Monoxide (lbs)	0	793	38	59
NO _x Nitrogen Oxide (lbs)	0	237	46	59
HC Hydrocarbon (lbs)	0	0	7	11
PM Particulate Matter (lbs)	0	0	1	1
BC Black Carbon (lbs)	0	178	579	891

*PM includes PM2.5 and PM10.
Source: GREET Model Fleet Footprint Calculator and EPA Motor Vehicle Emission Simulator



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Reduce Direct Carbon Emissions

Proterra Catalyst transit buses produce zero tailpipe emissions. In comparison, a single diesel bus running 36,000 miles per year (national average) produces an astonishing 201,000 pounds of CO₂ every year. Thus, over the 12-year life of a typical transit vehicle, replacing a single diesel transit bus with a Proterra Catalyst zero-emission transit bus will save over 2.4 million pounds of direct carbon emissions.

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FY 2017 Low-No Program Deployment Timeline

TASK / STEP	START	END
FTA announces selections for FY 2017 Low-No Competitive Grant Program ¹	9/29/2017	9/29/2017
Project Kick-Off Meeting with the Proterra team. Introduction to the assigned Proterra Customer Program Manager (CPM)	Oct-17	Oct-17
Phase 1 - Contracting & Configuration	Oct-17	Apr-18
1.1 Bus Configuration Discussions	Oct-17	Dec-17
1.2 Charger Configuration Discussions (Site Selection, Concept Definition)	Oct-17	Dec-17
1.3 Contract Discussions	Oct-17	Jan-18
1.4 Board Approval	Feb-18	Mar-18
1.5 Contract Execution	Apr-18	Apr-18
Phase 2 - Production		
2.1 Charger Project Design, Permitting, and Construction	Apr-18	Oct-18
2.2 Pre-Production Meeting	Apr-18	Apr-18
2.3 Engineering Design Review & Approval	May-18	May-18
2.5 Plug-In Charger Commissioning & Acceptance (if applicable)	Oct-18	Nov-18
2.6 Overhead Fast Charge Station Commissioning & Acceptance (if applicable)	Oct-18	Nov-18
2.7 1st Bus Production ²	Nov-18	Dec-18
2.8 Bus Delivery and Acceptance ³	Dec-18	Dec-18
Phase 3 – Customer Service		
3.1 Pre-Arrival Operations Discussions Meeting	Oct-18	Oct-18
3.2 Vehicle & Charging System Optimization	Jan-19	Jan-19
3.3 Operator and Maintenance Training	Jan-19	Feb-19
3.4 Revenue Service Launch	Feb-19	Feb-19

¹ The FTA issues pre-award authority for selected projects through a notification in the Federal Register.

² Production start date is subject to change based on the contracting & configuration progress and customer backlog. FY 2017 Low-No customers will be given priority based on how quickly they move through the configuration and contracting process.

³ Delivery and acceptance of the 1st bus in the order.

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Attachments to follow:

Letters of Support and Commitment

- Wake County
- Durham County
- Orange County
- City of Raleigh
- Town of Cary
- Towns of Chapel Hill and Carrboro
- University of North Carolina at Chapel Hill
- Proterra
- Duke Energy
- North Carolina Department of Transportation – Public Transportation Division
- Triangle J Council of Governments
- NC Capital Area Metropolitan Planning Organization
- Durham-Chapel Hill-Carrboro Metropolitan Planning Organization
- Southern Environmental Law Center
- Regional Transportation Alliance
- Research Triangle Cleantech Cluster
- NC Clean Energy Technology Center
- WakeUp Wake County



Office of the County Manager
P.O. Box 550 • Raleigh, North Carolina 27602

TEL 919 856 6160
FAX 919 856 6168

June 16, 2017

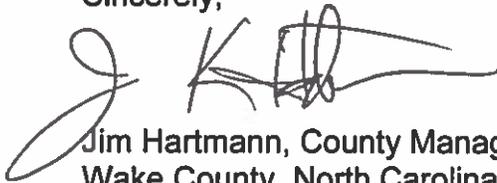
Jeff Mann, General Manager
GoTriangle
4600 Emperor Boulevard, Suite 100
Durham, NC 27703

Dear Mr. Mann,

It is my pleasure to write this letter in support of GoTriangle's application under FTA's Low or No Emission Bus Program for the acquisition of Battery Electric Buses. Wake County fully supports the move to alternative fuel vehicles for transit purposes. In April of this year, the Board of Commissioners requested the Wake County Transit Planning Advisory Committee, comprised of members from all of Wake County's municipalities, plus GoTriangle, the Capital Area Metropolitan Planning Organization (CAMPO), Wake County, North Carolina State University (NCSU), and Research Triangle Park (RTP), develop a strategy to address environmental goals related to bus fleet technology. The County specifically requested consideration of alternative sources for propulsion (electric, compressed natural gas, other) and consideration of how different options relate to the "look and feel" of transit services.

We support the regional approach and inter agency cooperation of this application; the County is happy to support implementation of Battery Electric Bus technology in the Wake Transit Plan and the Triangle region.

Sincerely,



Jim Hartmann, County Manager
Wake County, North Carolina



COUNTY OF DURHAM

WENDELL M. DAVIS
COUNTY MANAGER

June 14, 2017

Mr. Jeff Mann
General Manager
GoTriangle
4600 Emperor Boulevard, Suite #100
Durham, NC 27703

Dear Mr. Mann:

I am pleased to write this letter in support of GoTriangle's application under FTA's Low or No Emission Bus Program for the acquisition of Battery Electric Buses. Durham County fully supports the move to alternative fuel vehicles for transit purposes. Battery Electric Buses provide reductions in fuel consumption, harmful emissions and contribute to the livability and sustainability of our region. We support the regional approach and inter-agency cooperation of this application which will allow five transit agencies – GoTriangle, GoRaleigh, GoDurham, GoCary and Chapel Hill Transit – to partner together to implement electric vehicles by a systematic and successful regional deployment.

Thank you for leading the Regional GoTransit Electric Bus Implementation Project and we look forward to working together to successfully implement this technology in the Triangle region.

Sincerely,

Wendell M. Davis
County Manager



ORANGE COUNTY
NORTH CAROLINA
COUNTY MANAGER'S OFFICE

200 South Cameron Street
Post Office Box 8181
Hillsborough, North Carolina 27278

Bonnie B. Hammersley, County Manager
Travis Myren, Deputy County Manager

Phone (919) 245-2300
Fax (919) 644-3004

June 15, 2017

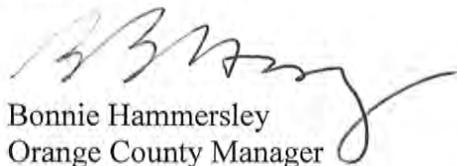
Jeff Mann, General Manager
GoTriangle
4600 Emperor Boulevard, Suite 100
Durham, NC 27703

Dear Mr. Mann,

I am pleased to write this letter in support of GoTriangle's application under FTA's Low or No Emission Bus Program for the acquisition of Battery Electric Buses. Orange County fully supports the move to alternative fuel vehicles for transit purposes. Battery Electric Buses provide reductions in fuel consumption, harmful emissions and contribute to the livability and sustainability of our region. We support the regional approach and inter-agency cooperation of this application which will allow five transit agencies – GoTriangle, GoRaleigh, GoDurham, GoCary and Chapel Hill Transit – to partner together to implement electric vehicles by a systematic and successful regional deployment.

Thank you for leading the Regional GoTransit Electric Bus Implementation Project and we look forward to working together to successfully implement this technology in the Triangle region.

Sincerely,



Bonnie Hammersley
Orange County Manager

June 16, 2017

Secretary Chao
Federal Transit Administration
U.S. Department of Transportation
1200 New Jersey Ave, SE
Washington, DC 20590

Re: GoTriangle regional application for FY2017 Low or No Emission Vehicle Program – 5339
(c)

Dear Secretary Chao,

The Chapel Hill Transit funding Partners (Town of Chapel Hill, Town of Carrboro and University of North Carolina at Chapel Hill) are pleased to write this letter in support of a regional grant application coordinated by GoTriangle under FTA's Low/No Emission Bus Program for the acquisition of Battery Electric Buses.

Chapel Hill Transit and its funding Partners have long-supported investment in alternatively powered vehicles and environmentally sustainable practices. Transit plays a key role in the Partners' efforts to reduce greenhouse gas emissions by removing around 30,000 personal automobile trips from the transportation network. Additionally, Chapel Hill Transit was one of first systems in the state of North Carolina to invest in hybrid buses and the first to implement hybrid articulated buses and the mini-hybrid system in diesel powered buses – along with solar powered bus stops, NextBus signs and sustainable maintenance practices.

Chapel Hill Transit's current fleet of 99 heavy duty transit buses is 30% alternatively powered (hybrids) and we are committed to maintaining and increasing that percentage. We have already started to invest local funds to lease an electric bus and charging infrastructure (FY18 budget) and believe by partnering further with GoTriangle, GoRaleigh, GoDurham and GoCary on this regional application, if funded, we would greatly accelerate the process for conversion to electric powered buses in our service area and the region.

We understand that Battery Electric Buses provide reductions in fuel consumption, harmful emissions and potential operating cost reductions – all of which are stated goals for our Transit system and consistent with our overall sustainability goals. Additionally, the North Carolina Triangle region offers a strong network of transit services and the region's transit providers work together to maximize service efficiency and reliability. Funding through this program will benefit several system in the Triangle Region and will allow the region to reduce

greenhouse gases that are harmful to environment and the health of the communities we serve.

Thank you for your consideration of this application!

Sincerely,

Florentine Miller



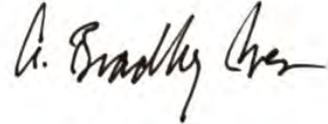
Deputy Town Manager
Town of Chapel Hill

David Andrews



Town Manager
Town of Carrboro

A. Bradley Ives



Associate Vice Chancellor for
Campus Enterprises
& Chief Sustainability Officer
University of North Carolina at
Chapel Hill



June 17, 2017

Jeff Mann
General Manager
The Research Triangle Regional Public Transportation Authority
4600 Emperor Blvd. Suite 100
Durham, NC 27703

Subject: Letter of Commitment for GoTriangle Transit's FY 2017 Low-No Program Application

Dear Mr. Mann:

Proterra Inc (Proterra) is pleased to provide this letter of commitment to The Research Triangle Regional Public Transportation Authority (GoTriangle) in support of their plan to be the lead agency in a regional collaboration to deploy zero-emission transit buses and associated charging infrastructure in response to FTA's FY2017 Low or No Emission Grant Program (Low-No Program). Proterra is excited to be part of the team assembled by GoTriangle to support the deployment of these zero-emission buses.

In an unprecedented alliance with regional partner agencies GoRaleigh, GoCary and Chapel Hill Transit, GoTriangle's application will replace seven (7) of the region's emission-producing transit vehicles with zero-emission battery-electric buses. This partnership will drive positive change throughout one of the nation's fastest growing regions by accelerating the adoption of clean, quiet zero-emission vehicles.

As the market leader of battery-electric buses in North America, Proterra brings considerable experience and reliability to the project as the bus OEM partner selected by GoTriangle. Proterra has worked in unison with transit agencies across North America to develop their battery-electric transit fleet and would gladly welcome each of the Research Triangle's four transit agencies to the list of progressive communities that are using Proterra's zero-emission vehicles to provide critical transportation services to its citizens.

Proterra looks forward to working with GoTriangle and its regional partners on this project.

Sincerely,

Ryan Popple
President and CEO
Proterra Inc



TRIANGLE J COUNCIL OF GOVERNMENTS

World Class Region

June 22, 2017

Jeff Mann, General Manager
GoTriangle
4600 Emperor Boulevard, Suite 100
Durham, NC 27703

Dear Mr. Mann,

It is my pleasure to write this letter in support of GoTriangle's application under FTA's Low or No Emission Bus Program for the acquisition of Battery Electric Buses. The Triangle J Council of Governments fully supports the move to alternative fuel vehicles for transit purposes. Battery Electric Buses provide reductions in fuel consumption, harmful emissions and potential operating cost reductions for public agency transit providers. We support the regional approach and inter-agency cooperation of this application which will allow up to five partner transit agencies – GoTriangle, GoRaleigh, GoDurham, GoCary and Chapel Hill Transit – to partner together to implement electric vehicles by a systematic and successful regional deployment.

The Triangle J Council of Governments is dedicated to promoting collaboration among local governments, stakeholders, and partners, tackling challenges that cross jurisdictional lines. As part of this effort, we administer the Triangle Clean Cities Coalition, aimed at improving air quality and reducing dependence on petroleum. This inter-agency project to implement Battery Electric Buses would be a major step toward achieving our goals and continuing to improve the quality of life for citizens across our region.

Thank you for leading the Regional GoTransit Electric Bus Implementation Project and we look forward to working together to successfully implement this technology in the Triangle region.

Sincerely,



Lee Worsley
Executive Director



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

June 15, 2017

Jeff Mann
General Manager
GoTriangle
4600 Emperor Boulevard, Suite 100
Durham, NC 27703

Dear Mr. Mann,

It is my pleasure to write this letter in support of GoTriangle's application under FTA's Low or No Emission Bus Program for the acquisition of Battery Electric Buses. NCDOT's Public Transportation Division fully supports the move to alternative fuel vehicles for transit purposes. Battery Electric Buses provide reductions in fuel consumption, harmful emissions and potential operating cost reductions for public agency transit providers. We support the regional approach and inter-agency cooperation of this application which will allow five partner transit agencies – GoTriangle, GoRaleigh, GoDurham, GoCary and Chapel Hill Transit – to partner together to implement electric vehicles by a systematic and successful regional deployment.

Thank you for leading the Regional GoTransit Electric Bus Implementation Project and we look forward to working together to successfully implement this technology in the Triangle region.

Sincerely,

A handwritten signature in black ink that reads "Debbie Collins".

Debbie Collins
Public Transportation Director



TOWN MANAGER'S OFFICE

June 19, 2017

Mr. Jeff Mann
General Manager
GoTriangle
4600 Emperor Boulevard, Suite 100
Durham, NC 27703

RE: Town of Cary Support for the Regional GoTransit Electric Bus Implementation Project

Dear Mr. Mann:

It is my pleasure to write this letter in support of GoTriangle's application under FTA's Low/No Emission Bus Program for the acquisition of Battery Electric Buses. The Town of Cary fully supports the move to alternative fuel vehicles for transit purposes.

Battery Electric Bus acquisition and operation very much aligns with the Town's Strategic Energy Action Plan as well as our Comprehensive Community Plan long-term goals. We support the regional approach and act as a proud partner-transit operating entity through the entire process. Battery Electric Buses provide reductions in fuel consumption, harmful emissions and potential operating cost reductions for public agency transit providers. Through this partnership, we look forward to implementing these new vehicles in a systematic manner that will serve our local community, as well as the region together.

Thank you for leading the Regional GoTransit Electric Bus Implementation Project. We look forward to working together to successfully implement this technology throughout the Triangle.

Sincerely,

Sean R. Stegall
Town Manager

TOWN of CARY



City of Raleigh
North Carolina

Jeff Mann, General Manager
GoTriangle
4600 Emperor Blvd, Suite 100
Durham, NC 27703

June 20, 2017

RE: Letter of Support – Low No Electric Bus Application

Dear Mr. Mann,

It is my pleasure to write this letter in support of GoTriangle's application under FTA's Low or No Emission Bus Program for the acquisition of Battery Electric Buses. GoRaleigh fully supports the move to alternative fuel vehicles for transit purposes and is committed to upgrading our fleet with Battery Electric Buses. We will update our fleet management plan to reflect this intention at the earliest opportunity. The Raleigh Transit Authority also supports and is committed to this application.

GoRaleigh will commit a local match towards two Proterra E2 vehicles plus two plug-in chargers in the amount of \$1,000,000 subject to Board approval. These funds will be provided from the Wake County Transit Tax revenues in Fiscal Year 2019 and will be available in the event of a successful award, subject to governing Board approval.

We support the regional approach and inter-agency cooperation of this application which will allow five partner transit agencies – GoTriangle, GoRaleigh, GoDurham, GoCary and Chapel Hill Transit – to work together to implement electric vehicles by a systematic and successful regional deployment. Thank you for leading the Regional GoTransit Electric Bus Implementation Project and we look forward to working together to successfully implement this technology in the Triangle region.

Sincerely,

David Eatman
GoRaleigh Transit Director

	Proterra Vehicle + Plug In Charger Cost	Per vehicle	# of vehicles requested	Total	GoTriangle	Local	GoDurham CMAQ	GoRaleigh	Chapel Hill	GoCary
	Proterra long range electric vehicle - Catalyst E2	\$ 798,000								
	Average cost of configurable options e.g. camera systems	\$ 75,000								
	Extended warranty for battery - 12 years	\$ 55,000								
	Plug-in charger 50kW	\$ 40,000								
	Installation cost for Plug-in charger	\$ 15,000								
	Total Project Cost	\$ 983,000	9	\$ 8,877,000						
	Private Partner In-Kind match									
	Proterra In-Kind match	\$ 25,000	9	\$ 225,000						
	Local financial commitment									
	Total local financial commitment		9	\$ 3,831,000	\$ 1,000,000	\$ 415,000	\$ 585,000	\$ 1,000,000	\$ 916,000	\$ 500,000
	Federal funds requested									
	Federal share requested		9	\$ 4,206,000						
	Durham CMAQ funds	\$ 585,000		\$ 585,000						
	Total	\$ 585,000		\$ 4,791,000						
	Total percentages									
	Private partner share									3%
	Local share									43%
	Federal share									54%
	Total non-federal matching funds			\$ 4,056,000						

June 23, 2017

College of Engineering
N.C. Clean Energy Technology Center
Campus Box 7409
Raleigh, NC 27695-7401
919.515.2788 (P)
resapienza@ncsu.edu
www.nccleantech.ncsu.edu

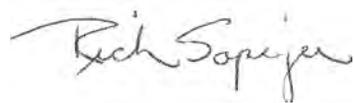
Mr. Jeff Mann
General Manager
GoTriangle
4600 Emperor Boulevard, Suite 100
Durham, NC 27703

Dear Mr. Mann,

I am writing this letter in support of the GoTriangle application for the FTA 2017 Low or No Emission Bus Program. With the current and projected rate of growth in the Triangle, the area's public transit system will become more and more important to maintaining a high and sustainable quality of life for Triangle residents and visitors. The fact that several organizations have partnered in this effort shows vision and commitment. This type of public private collaboration and coordination is essential in developing a effective and efficient transportation system.

The Clean Transportation Program at the North Carolina Clean Energy Technology Center works in collaboration with industry, government and academia to expand alternative fuels, advanced transportation technologies, and alternative fuels infrastructure throughout North Carolina, the Southeast and North America. We are pleased and proud to fully support projects of the type that GoTriangle has proposed. Please to not hesistate to seek our assistance. We are here as resource.

Sincerely,



Rick Sapienza
Clean Transportation Program Director
NC State University
NC Clean Energy Technology Center



Clark Sutton Gillespy
SVP & Chief Economic
Development Officer

Duke Energy
40 W. Broad Street
Greenville, SC 29601

o: 864-370-5220
Clark.Gillespy@duke-energy.com

June 22, 2017

Tara Clark
Federal Transit Administration
Office of Program Management
1200 New Jersey Avenue, S.E.
Washington, DC 20590

Subject: Raleigh Area Transit Agencies' Low or No Emission Vehicle Grant Program 5339(c) Application.

Dear Ms. Clark:

On behalf of Duke Energy, I am writing to express support of the Raleigh Area Transit Agencies' 5339(c) Grant Application to deploy electric buses and charging infrastructure in Wake County, North Carolina. We believe the Low or No Emission Vehicle Program (Low-No) funding is important for Raleigh Area Transit Agencies' fleets to deploy electric buses in order to eliminate pollution at the point of contact and provide the agencies with strong ongoing fuel and maintenance savings.

We are in support of this application, and are currently assessing the ability to provide funding for charging station purchase and installation as part of our existing NSR Settlement electric bus charging station grant program. The level of funding we can provide will not be determined until later in 2017. We can furthermore commit to providing technical advice to ensure appropriate electric service delivery and rate selection to minimize the cost of implementing an electric bus deployment. Our OPT-TOU rate will allow the Raleigh Area Transit Agencies to take advantage of very low-cost off-peak energy for bus charging that could potentially save each agency approximately \$21,000 per year or \$250,000 over the life of each bus from fuel costs alone.

I ask that you please give this application serious consideration.

Sincerely,

A handwritten signature in blue ink that reads "Clark S. Gillespy". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Clark Gillespy



RESEARCH TRIANGLE
CLEANTECH CLUSTER

June 15, 2017

Mr. Jeff Mann
General Manager
GoTriangle
4600 Emperor Boulevard, Suite 100
Durham, NC 27703

Subject: Research Triangle Cleantech Cluster Support for the Regional GoTransit Electric Bus Implementation Project

Dear Mr. Mann,

We're very excited to learn that GoTriangle is applying for support through the Federal Transit Administration's Low-No Program during Fiscal Year 2017. The goals of this grant program echo that of the Research Triangle Cleantech Cluster by enabling the deployment of clean technologies, and more specifically smart transportation in our region. The deployment of these electric buses will continue to highlight the strength of our region as a global leader in innovation and deployment of smart technologies.

The mission of the Research Triangle Cleantech Cluster is to elevate the strength of the cleantech industry within the Research Triangle region and promote business development opportunities within this space. Part of that mission includes the promotion of public-private partnerships to help our municipalities continue to innovate and lead within the smart cities conversation.

We look forward to the opportunity to engage with this project and provide any additional assistance in branding and promoting these new assets should they be awarded.

Sincerely,

Susan Sanford
Executive Director
Research Triangle Cleantech Cluster

SOUTHERN ENVIRONMENTAL LAW CENTER

Telephone 919-967-1450

601 WEST ROSEMARY STREET, SUITE 220
CHAPEL HILL, NC 27516-2356

Facsimile 919-929-9421

June 19, 2017

Tara Clark
Program Manager
FTA Office of Program Management
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Re: GoTriangle Application for Low or No Emission Vehicle Program – 5339(c)

Dear Ms. Clark:

Please accept this letter in support of GoTriangle's application for funding under FTA's Low or No Emission Vehicle Program for the acquisition of nine battery-electric buses and supporting infrastructure. The Southern Environmental Law Center ("SELC") works with a wide variety of citizens' groups that take an interest in North Carolina transportation issues, including increased investment in mass-transit and new low-emission technologies. We believe the application, which has been submitted on behalf of a partnership of four Triangle-area transit agencies, will generate many benefits for the rapidly growing Triangle region by investing in a critical first step towards the conversion to lower emission public transit vehicles throughout the region.

SELC is committed to promoting clean, efficient, and sustainable modes of travel and creating more livable communities throughout North Carolina. SELC worked to support the passage of transit sales tax referenda in Durham, Orange, and Wake Counties to help fund expansions of the public transit system across the region. GoTriangle's application, with its inter-agency and region-wide approach, represents a continuation of this shared dedication throughout the Triangle metro area to improving public transportation. By beginning the transition towards lower-emission public transit options, this project will help to accommodate rapid urbanization and growth while reducing harmful emissions, providing affordable access to jobs and needed services, and facilitating economic development.

We are excited to offer our strong support for this application and to endorse this essential public transportation investment that will protect the health of our environment and the economic vitality of our network of communities. We look forward to watching this become a reality.

Sincerely,



Kym Hunter
Staff Attorney



NC Capital Area Metropolitan Planning Organization

June 19, 2017

Mr. Jeff Mann
General Manager
GoTriangle
4600 Emperor Boulevard, Suite 100
Durham, NC 27703

Subject: Capital Area MPO support for Regional GoTransit Electric Bus Implementation Project

Dear Mr. Mann,

It is my pleasure to write this letter in support of GoTriangle's application under the Federal Transit Administration (FTA) Low or No Emission Bus Program for the acquisition of battery electric buses. The Capital Area Metropolitan Planning Organization (CAMPO) is highly supportive of the move to alternative fuel vehicles for transit purposes. Battery electric buses provide reductions in fuel consumption and harmful emissions and potential operating cost reductions for providers of public transportation. These impacts associated with battery electric buses are consistent with performance goals and associated measures drafted by CAMPO that seek to protect our environmental resources and minimize climate change, and to more specifically reduce mobile source emissions and energy consumption.

CAMPO is also highly supportive of the regional approach and inter-agency cooperation exhibited with this application, which will allow five partner transit agencies (GoTriangle, GoRaleigh, GoCary, GoDurham, and Chapel Hill Transit) to implement the utilization of electric buses through a systematic regional deployment. Thank you for your leadership on this project. CAMPO looks forward to working with its transit partners to successfully implement this technology throughout the Triangle region.

Sincerely,

A handwritten signature in black ink, appearing to read "Alex Rickard", is written over a light blue circular stamp.

Alex Rickard
Deputy Director
Capital Area Metropolitan Planning Organization



P.O. Box 6484 Raleigh, NC 27628

Speaking UP for a better tomorrow
www.wakeupwakecounty.org

June 16, 2017

Tara Clark Program Manager
FTA Office of Program Management
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590

Dear Ms. Clark:

This letter serves a recommendation for the application of GoTriangle's application for funding under FTA's Low or No Emission Vehicle Program 5339(c) for the acquisition of nine battery-electric buses and supporting infrastructure.

Wake County is the fastest growing county (above 1 million) in the US, and the entire Triangle metro region is among the fastest growing in the US. Our region has been an air emissions non-attainment zone and is projected to be again, based upon additional vehicles on the road. Wake County alone is growing by 67 people per day, and residents here drive more miles per day than the national average.

We are at a pivotal moment in our transit expansion, as Wake County voters just approved a sales tax referendum in November 2017 to expand and improve public transit. Residents understand a strong transit future includes cleaner bus technology that will improve air emissions. Asthma is the number one reason children are admitted to emergency rooms in North Carolina.

Our citizen non-profit and many other civic organizations have urged local transit authorities to switch from diesel buses to greener technologies. A grant from the FTA for pilot projects will boost their ability to make this technological shift, and we strongly recommend their application.

Thank you for your consideration.

Sincerely,

A handwritten signature in blue ink that reads "Karen Rindge". The signature is fluid and cursive, with a long horizontal stroke at the end.

Karen Rindge
Executive Director

June 14, 2017

Federal Transit Administration
U.S. Department of Transportation
1200 New Jersey Ave, SE
Washington, DC 20590

Re: GoTransit regional application for FY2017 Low or No Emission Vehicle Program - 5339(c)

Dear Secretary Chao,

The Regional Transportation Alliance, the voice of the regional business community on transportation in the greater Research Triangle region of North Carolina, is a strong advocate for alternative fuel technologies to make public transit more attractive, sustainable, and effective.

The RTA business coalition strongly supports this regional GoTransit application for a Low or No Emission Vehicle Program grant to accelerate the implementation of battery-electric buses throughout the Raleigh-Durham-Cary-Chapel Hill metro area.

Our region thrives on innovation and collaboration. We were ranked by Forbes as the most educated large metro area in the U.S., and we are the home of three Tier 1 research universities.

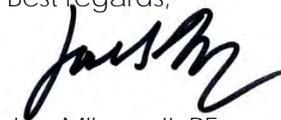
GoTriangle, our regional transit agency and the applicant for this Low-No grant, successfully **initiated America's** first multi-agency, real-time transit information system covering an entire region. In addition, GoTriangle, NCDOT, and RTA created the largest Bus on Shoulder System in the southern United States, covering multiple freeways across three counties.

Wake, Durham, and Orange counties have demonstrated a strong commitment to enhanced transit by voter approval of more than \$100 million annually in dedicated, locally-controlled sales taxes for new public transportation options. FTA grant support would jump-start a shared effort to create a lower-emission regional transit system for our market while we construct five bus rapid transit corridors and complementary rail investments across our region during the next ten years.

The RTA endorses this application to advance a cleaner, more sustainable transit future for our growing region that will accelerate economic growth, expand travel options, enhance job access and opportunity, and preserve our natural resources.

If you have any questions or need additional information, please contact me at 919.664.7065 or joe@letsgetmoving.org.

Best regards,



Joe Milazzo II, PE
Executive Director
Regional Transportation Alliance

Phillips, Brian

From: Ken George <Ken.George@townofcary.org>
Sent: Monday, December 11, 2017 4:02 PM
To: daq.NC_VWGrants
Cc: Virginia Johnson
Subject: [External] Comments on VW funds

CAUTION: External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to report.spam@nc.gov.

I'd like to see the money spent on a CNG bus program or electric bus program so that more than just a few Electric Vehicle owners could benefit. These buses are currently diesel, so replacing them will help reduce pollution much more than adding a few charging stations.

Cary will be adding quite a few buses under the new transit plan. You can help by allocating money for a clean bus program.

Ken

Ken George
Cary Town Council
919-535-7606
Ken.George@townofcary.org

"Working together to change lives through exceptional service."

Please note that e-mail sent to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties including the media.

Phillips, Brian

From: ltobin@nc.rr.com
Sent: Sunday, December 31, 2017 2:43 PM
To: daq.NC_VWGrants
Subject: [External] Response to NC VW RFI

CAUTION: External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to report.spam@nc.gov.

Dear NC DAQ,

Thank you for the opportunity to provide public feedback on the VW settlement funds.

As a year round bicycle commuter, I have logged over 50,000 miles on NC roads over the past 25 years. My current daily commute involves 24 miles of cycling, and a 12 mile ride on our regional Go Triangle bus service from Chapel Hill to our Regional Transit Center. I am in my mid 50s now and have become more sensitive to vehicle exhaust fumes due to my several hours of weekly traffic exposure. This is most severe when I'm cycling up a hill, and a large vehicle (commercial truck or bus) guns its engine to pass by. I am breathing heavily as a large cloud of exhaust settles on the roadway all the way up the hill. I usually try to hold my breath while climbing and hope any prevailing wind clears the air before I need to inhale.

Some vehicles produce more fumes, due to their age or lack of maintenance. On three occasions this year I have contacted Chapel Hill Transit and Go Triangle to please remove specific buses from their fleet for emissions checks and and repairs. Public school buses that pass me have also released excessive emissions, which is troubling because most are hauling children with more sensitive lungs than mine.

I suggest that North Carolina's \$92 million allocation from the Volkswagen Settlement be invested in option 2, school/shuttle/transit buses. Many of our state's public school and transit systems are underfunded, and the money could be used to repair older busses, or replace them with emission- free buses. This option will offer a greater return on investment from an emissions perspective. We will reduce emissions of our existing and future bus fleets, while encouraging the removal of more internal combustion vehicles from our roadways as more NC commuters choose mass transit.

Sincerely,
Lee Tobin
Chapel Hill