U.S. Department
of Transportation
Federal Aviation Administration

Zero Emissions Airport Vehicle and Infrastructure Pilot Program

Technical Guidance

Version 1

Office of Airports
Airport Planning and Programming
Airports Planning and Environmental Division

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ATTACHMENTS

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1.0 Legislative Authority

The FAA Modernization and Reform Act of 2012 created a new section in Title 49, United States Code, 49 USC §47136a, *Zero-Emission Airport Vehicles and Infrastructure*. The section establishes a pilot program that allows the FAA to award Airport Improvement Program (AIP) grants for the acquisition and operation of zero emissions vehicles (ZEVs) at an airport including the construction or modification of infrastructure to facilitate the delivery of fuel and services necessary for the use of such vehicles.

2.0 References

As required in 49 USC §47136a(a), the FAA will utilize the definition of ZEV as found in Title 40 of the Code of Federal Regulations 88.102-94 (40 CFR 88.102-94) in implementing the ZEV Pilot Program. Title 40 CFR 88.104-94 defines clean-fuel vehicle tailpipe emission standards for light-duty vehicles and light-duty trucks. Title 40 CFR 88.105-94 defines clean-fuel fleet emission standards for heavy-duty engines.

The referenced CFRs are found at the following website: http://ecfr.gpoaccess.gov.

3.0 Definitions

The following...	Means...
Zero Emissions Vehicle (ZEV)	Per 40 CFR 88.102-94, any light-duty vehicle, light-duty truck, or any heavy-duty vehicle conforming to the applicable Zero Emission Vehicle standard vehicle that produces zero exhaust emissions of any criteria pollutant (or precursor pollutant) under any and all possible operational modes and conditions. In most cases, this involves a vehicle that has an all-electric or hydrogen-powered drive train.
Light-duty vehicle	Per 40 CFR 86.082-2, a passenger car or passenger car derivative capable of seating 12 passengers or less.
Light-duty truck	Per 40 CFR 86.082-2, any motor vehicle rated at 8,500 pounds gross vehicle weight rating (GVWR) or less which has a vehicle curb weight of 6,000 pounds or less and which has a basic vehicle frontal area of 45 square feet or less, which is: (1) Designed primarily for purposes of transportation of property or is a derivation of such a vehicle, or (2) Designed primarily for transportation of persons and has a capacity of more than 12 persons, or (3) Available with special features enabling off-street or off-highway operation and use.

The following...	Means...
Heavy-duty vehicle	Per 40 CFR 86.082-2, any motor vehicle rated at more than 8,500 pounds GVWR or that has a vehicle curb weight of more than 6,000 pounds or that has a basic vehicle frontal area in excess of 45 square feet.
Heavy-duty engine	Per 40 CFR 86.082-2, any engine which the engine manufacturer could reasonably expect to be used for motive power in a heavy-duty vehicle.
Van	Per 40 CFR 86.082-2, a light-duty truck having an integral enclosure, fully enclosing the driver compartment and load carrying device, and having no body sections protruding more than 30 inches ahead of the leading edge of the windshield.
On-road	A motor vehicle capable of being safely and practically driven on public roads or highways.
New Vehicle	Vehicles purchased from an Original Equipment Manufacturer (OEM) or an associated dealer that are pre-market (i.e., "neofits") with essentially zero miles.

4.0 Vehicle Requirements

4.1 Eligible Vehicles

For purposes of the ZEV Pilot Program, only on-road light-duty vehicles, on-road light-duty trucks or vans, or any on-road heavy-duty vehicles meeting the definitions in Paragraph 3 are eligible for AIP funding.

4.2 Airport-Dedicated Vehicles

ZEV Pilot Program funding is limited to vehicles that are owned by the airport sponsor and used exclusively on-airport for airport purposes. Therefore, all vehicles purchased through the ZEV Pilot Program must be "airport-dedicated," meaning that they must be an integral part of the aeronautical, transportation, security, or maintenance services at the airport, or other essential airport need, used on a regular basis in normal operation of the airport, and stored and maintained within the airport boundary. Airport-dedicated vehicles include many on-road vehicles, such as airport parking lot shuttles and buses, airport security vehicles, and airport maintenance vehicles. Use of on-road vehicles outside the airport boundary is permitted only if such use is minor, intermittent, and related to its primary mission to deliver airport services at the airport. Examples of acceptable and unacceptable off-airport use are found in Table 1.

Table 1. Off Airport Vehicle Use

For the following off-airport use...	The use would be considered...
Driving the vehicle off-airport for required servicing.	Acceptable
To specifically support aeronautical services such as airport maintenance or airport security that requires driving the outside perimeter of the airport.	Acceptable
Driving between two airports owned by the Sponsor to transport employees or supplies between the two airports.	Acceptable
Driving to airport-related meetings (i.e., City Council meetings)	Acceptable
Driving the vehicle to attend an airport-related conference.	Unacceptable
Driving the vehicle for personal reasons	Unacceptable
As a loaner vehicle for airport tenant or users	Unacceptable

4.3 Vehicle Use

Sponsors must operate vehicles acquired under the ZEV Pilot Program at the same level of use that was estimated in the airport sponsor's application.

4.4 New Vehicles

Airport sponsors must purchase new vehicles under the ZEV Pilot Program.

The ZEV Program is limited to costs for vehicle acquisition and related improvements and accessories to the vehicle that are normally eligible under the Airport improvement Program (AIP) for operation on the airport. For example, the airport sponsor can include in the grant application costs to add a radio for communications with the Airport Traffic Control Tower (ATCT) when the vehicle is planned for use in the Aircraft Operations Area (AOA). Likewise, costs for specialized lighting on the vehicle may also be eligible if justified. However, costs to retrofit the vehicle for a specific airport purpose are not eligible. This would include modifications to the vehicle to include specialized equipment, storage boxes, etc. The airport sponsor must exclude these costs from the ZEV Pilot Program application.

4.5 Other Costs Associated with Vehicles

Program eligibility for all vehicles is limited to capital improvement costs and does not extend to operational or maintenance costs, including fuel, replacement parts or extended warranties.

4.6 Ownership Requirements

The requirements for ownership of ZEV vehicles and equipment are listed in **Table 2**.

Table 2. ZEV Ownership Requirements.

Sponsors owning ZEV must...
(1) Own all new vehicles and equipment purchased through the ZEV Pilot Program.
(2) Not use ZEV Pilot Program funding for tenant-owned vehicles or equipment (e.g., airline vehicles, contractor or concessionaire-owned vehicles, etc..).
(3) Not lease or loan ZEV vehicles and equipment purchased under the ZEV Pilot Program to airport tenants.
(4) Not sell or transfer title to program vehicles during the useful life of the vehicle without prior notification and written approval by the FAA.

4.7 Useful Life for Typical Airport Vehicles

Table 3 provides average useful life data for the three major vehicles categories eligible under the ZEV Pilot Program. The airport sponsor must use these useful life assumptions to calculate project emission reduction. Because airport-dedicated vehicles operate primarily on airport property, their useful lives can differ from the typical life spans of the same vehicles when used off-airport. The following useful life estimates for common airport vehicle types are based on FAA project experience through implementation of the Voluntary Airport Low Emissions (VALE) Program.

Table 3. Useful Life

For the following category and vehicle type...	The expected useful life in years is...
Light Duty Vehicles: Cars/vans	5
Light Duty Trucks: Pickup trucks	5
Light Duty Trucks: Flatbed/large trucks	5
Heavy Duty Vehicles: 19-35 foot buses	10
Heavy Duty Vehicles: 40+ foot buses	10

4.8 Buy American

All vehicles purchased under the ZEV Pilot Program must meet Buy American requirements. Each application must include information on how the proposed ZEV complies with Buy American requirements. Buy American requirements for AIP are posted at http://www.faa.gov/airports/aip/buy_american/.

4.9 Commercial Availability

Relatively few manufacturers currently produce ZEVs. The California Air Resources Board has compiled a list of vehicles that currently meet the ZEV standards. This list is found at www.driveclean.ca.gov. This list does not address Buy American requirements.

4.10 Excluded Vehicles

Vehicles that are excluded from the ZEV Pilot Program are listed in Table 4.

Table 4. Ineligible Vehicles

The following vehicles are ineligible for the ZEV Pilot Program...	
(1)	Non-road vehicles. Non-road vehicles types include, but are not limited to, aircraft tugs, baggage tugs, airport rescue and firefighting vehicles, off-road recreational vehicles (i.e., dirt bikes, all-terrain vehicles, snowmobiles, golf carts), tracked vehicles, and certain types of construction equipment. Non-road vehicles are not eligible under the ZEV Pilot Program since they do not fall within the definition of a light duty-vehicle, light-duty truck, or heavy-duty truck.
(2)	Partial ZEV's or vehicles utilizing "hybrid" technologies are not considered a ZEV and are not eligible under the ZEV Pilot Program.
(3)	Vehicles that are not owned and operated by the airport sponsor.
(4)	ARFF support vehicles, such as Fire Marshall Vehicles or Mobile Incident Command Vehicles, unless specifically required by 14 CFR Part 139 or 49 CFR Part 1542.
(5)	Commercial courtesy vehicles, general use automobiles, commercial buses, taxicabs, limousines, rental cars, super shuttles, and other vehicles that operate to and from the airport as part of a regional transportation circuit or inter-airport service.

5.0 Refueling and Recharging Stations

As specified in 49 USC §47136(a), the construction or modification of infrastructure to facilitate the delivery of fuel for project ZEVs is eligible. The FAA defines eligible infrastructure as including refueling stations, rechargers, on-site fuel storage tanks and other equipment needed for station operation. The sponsor must limit the capacity of refueling and recharging stations to the number of project vehicles and their fueling requirements. For instance, the number of project rechargers should not exceed one port per ZEV project vehicle with reasonable allowances for the efficient management of peak operations.

Eligible costs do not include major upgrades to airport fuel storage systems, electrical substations, and trunk lines. In addition, installation costs for refueling and recharging stations and related equipment are limited to the lowest-cost alternative for installation as demonstrated by the airport sponsor through a comparative value-engineering analysis.

5.1 Public Access to Refueling and Recharging Stations.

Another consideration in capacity sizing is public access, which the sponsor may grant for hydrogen refueling stations and electric recharging stations under certain conditions. The requirements for public access are listed in Table 5.

6.0 Eligible Airports

Any public-use airport eligible to receive AIP grants in the National Plan of Integrated Airport Systems (NPIAS), subject to additional criterion in Section 7.0.

Table 5. Requirements for Public Access to Refueling Stations and Charging Facilities

The requirements are...
90 percent of the funded refueling or recharging station capacity is dedicated for on-airport vehicle use. Therefore, only 10 percent of the funded refueling or recharging station capacity can be available for public use.
The sponsor must guarantee security and public safety.
The sponsor must charge a reasonable fee for the use of the facility. Fees are considered airport revenue.
Sponsor vehicles must have priority use of the facility, especially in the event of fuel shortages or emergencies.
The sponsor must clearly document the number of project ZEVs and public ZEVs that will access the facility.
Sponsors must provide letters of commitment to FAA from non-airport ZEV owners at the time of grant application to support their proposed facility use plans. The sponsor must not unreasonably deny access or unjustly discriminate against users requesting access to these federally funded airport facilities.

7.0 Selection Criteria

The FAA has established specific project selection criteria to give priority for funding applications received under the ZEV Pilot Program to comply with the requirements of 49 USC §47136a(b)(1)(2) and 49 USC §47136a(c).

While 49 USC §47136a(b)(1) specifies that only airports located in non-attainment areas as defined in Section 171 of the Clean Air Act (CAA) can participate in the ZEV Pilot Program, 49 USC §47136a(b)(2) allows the FAA to expand eligibility to airports located in attainment areas if there is a shortage of applicants from non-attainment areas. Since 49 USC §47136a(b)(2) does not give specificity to the definition of "shortage of applicants," the FAA has developed the selection criteria below to give priority to funding projects at airports located in non-attainment areas as required by 49 USC §47136a(b)(1) and projects with the greatest air quality benefits as measured by emissions reduced per dollar of funds expended under the program (referred to as the project's cost effectiveness) as required by 49 USC §47136a(c) before funding projects at airports in attainment areas.

For applications received under the ZEV Pilot Program, the FAA will consider projects based on the three categories listed in Table 6.

When making funding decisions in each Fiscal Year, the FAA will give priority to projects in Category I before giving consideration to projects in Category II and Category III. The FAA will only move to a lower rated category once all applications in a particular category are considered for funding.

Table 6. Priority Funding Categories and Selection Criterion.

Category	The requirements of the category are...
Category I	**Airport is in a nonattainment area.** ZEVs purchased at public-use airports located in an EPA-designated air quality non-attainment area for any of the six National Ambient Air Quality Standards (NAAQS) criteria pollutants. When receiving more than one application from airports in this category, the FAA will give priority to the applications with the greatest air quality benefits as measured by emissions reduced per dollar of funds expended under the program (referred to as the project's cost effectiveness) . Projects with the best cost effectiveness will have the highest priority for funding.
Category II	**Airport is in a maintenance area.** ZEVs purchased at a public-use airport located in an air quality maintenance area for any of the NAAQS criteria pollutants. When receiving more than one application from airports in this category, the FAA will give priority to the applications with the greatest air quality benefits as measured by emissions reduced per dollar of funds expended under the program (referred to as the project's cost effectiveness) Projects with the best cost effectiveness will have the highest priority for funding.
Category III	**Airport is in an attainment area.** ZEVs purchased at a public-use airport located in an air quality attainment area. When receiving more than one application from airports in this category, the FAA will give priority to the applications with the greatest air quality benefits as measured by emissions reduced per dollar of funds expended under the program (referred to as the project's cost effectiveness). Projects with the best cost effectiveness will have the highest priority for funding.

7.1 Emissions Reduction Estimates and Cost Effectiveness

As discussed in Paragraph 7, Selection Criteria, the FAA will give funding priority to applications that demonstrate the greatest air quality benefits measured by the amount of emissions reduced per dollar of funds expended (referred to as the project's cost effectiveness) through the ZEV Pilot Program. The Airport Sponsor must use the methodology discussed in this section to estimate the reduction in emissions as a result of project implementation and for calculating the project's cost effectiveness.

The emissions reduction assessment process involves a step-by-step progression that accounts for the assumed baseline condition, which is a conventionally-fueled vehicle comparable to the proposed ZEV. In all cases, the proposed ZEV is assumed to have zero criteria pollutants; therefore, the emissions reductions are simply the total emissions calculated for the representative conventionally fueled vehicle over the useful life of the project.

The FAA has developed a methodology to quickly estimate air quality emissions reductions in this program. This is intended to limit the amount of technical assistance needed to complete the ZEV Pilot Program application and reduce overall program costs.

In implementing the ZEV Pilot Program, the FAA will use an estimate of tons of Ozone (O_3) reduced over the useful life of the project as the basis for consistently measuring cost effectiveness. While ZEVs reduce other criteria pollutants, vehicles are one of the primary drivers of Ozone nonattainment in the United States. To calculate Ozone reduced, the airport sponsor will sum the total tons of Nitrogen Oxides (NOx) and Volatile Organic Compounds (VOC) reduced for the useful life of the project. Refer to the calculation methodology included on the application in Attachment A.

8.0 Federal Share

The Federal Share of any ZEV Pilot Program project is 50 percent of the total project cost. The Federal Share of 50 percent extends to and includes up to 10 percent for reasonable project formulation costs and technical assistance costs that the sponsor includes in the project application.

The Airport Sponsor must include the completed application included in Attachment A with a completed SF 424, *Application for Federal Assistance,* to receive consideration for funding under the ZEV Pilot Program.

9.0 Technical Assistance

9.1 Limits on Formulation and Technical Assistance Costs

Per 49 USC §47136a(e)(1), the cost of technical assistance and formulation costs in an application are limited to a maximum of 10 percent of the total ZEV vehicle purchase price. Technical assistance includes any professional services for preparation of the ZEV Pilot Program application and other project formulation costs sought by the sponsor.

9.2 Use of University Transportation Centers

Airport sponsors can obtain technical assistance from University Transportation Centers receiving grants under Title 49 USC §5506, *University Transportation Research*. Per 49 USC §47136a(e)(2), the University Transportation Center must be located in the region where the airport is located. For purposes of this pilot program, the FAA defines this as the University Transportation Center located closest to the airport.

Sponsors must ensure that the University Transportation Center was selected using competitive, qualifications-based selection process if the airport sponsor seeks reimbursement for the costs incurred by the University Transportation Center.

Policies and procedures for procurement of professional services are established in Federal Regulation Title 49 CFR Part 18, *Uniform Administrative Requirements for Grants and Cooperative Agreements*. FAA Advisory Circular 150/5100-14, *Architectural, Engineering, and Planning Consultant Services for Airport Grant Projects,* serves as the official FAA guidance for sponsors to assure conformance with Title 49 CFR Part 18.

ATTACHMENT A

APPLICATION AND EMISSIONS REDUCTION WORKSHEETS

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Application
Zero Emissions Vehicle Pilot Program

Airport Name:		3-Letter Airport ID:	
Airport Sponsor Name and Contact Person:		Proposal Date:	
Mailing Address:		Phone:	
Email Address:		Fax:	
Describe the intended use of this vehicle.			

What is the air quality status of the region? (Place an "X" for all designations that apply)		
Ozone (O_3) 8-hour standard		Nonattainment
		Maintenance
		Attainment
Particulate Matter - PM_{10}		Nonattainment
		Maintenance
		Attainment
Particulate Matter - $PM_{2.5}$		Nonattainment
		Maintenance
		Attainment
Carbon Monoxide (CO)		Nonattainment
		Maintenance
		Attainment
Nitrogen Dioxide (NO_2)		Nonattainment
		Maintenance
		Attainment
Sulfur Dioxide (SO_2)		Nonattainment
		Maintenance
		Attainment

Proposed Zero Emissions Vehicle Identification	
Vehicle Model Year	
Vehicle Manufacturer	
Vehicle Model	

Vehicle Cost Calculation A	
Number of Vehicles	
Per Vehicle Cost ($)	
AIP Funding Share per Vehicle (50%)	
Matching Funds Required (50%)	
Total Cost ($)	

Refueling/Recharging Station Cost Calculation B					
Description	**Unit Cost ($)**	**No. of Units**	**AIP Funding (50%)**	**Required Matching Funds (50%)**	**Total Cost ($)**
Equipment Costs					
Equipment Installation and Infrastructure					
Total					

Total Cost Calculation C			
Category	**AIP Funding (50%)**	**Required Matching Funds (50%)**	**Total Cost ($)**
Vehicles (A)			
Refueling and Recharging Stations (B)			
Technical Assistance, Design Fees, and Project Formulation [1]			
Totals (C)			

[1] Not to exceed 10% of total vehicle costs

Project Cost Effectiveness Calculation			
Pollutant	**Total Project Cost (C)**	**Projected Emission Reductions over Useful Life of Project (D)**	**Cost Effectiveness over Useful Life of Project ($/ton) [1]**
Ozone (NOx + VOC)			

[1] Total Project Cost Divided by Total Tons of Ozone

CALCUATION OF EMISSION REDUCTION

Step 1: Determine representative conventionally-fueled vehicle comparable to the proposed zero emissions vehicle included in this application.

For purposes of the emission reduction analysis, you must make an assumption of the conventionally-fueled vehicle that you would have purchased and put in use. List the specifics of this vehicle in the table below.

Representative Conventionally-Fueled Vehicle Specifics		
Vehicle Manufacturer		
Vehicle Make and Model		
Gross Vehicle Weight Rating (GVWR)		
If a heavy-duty vehicle, indicate the type of engine	Compression Ignition (i.e., diesel)	Spark Ignition (i.e., gasoline)

Step 2: Calculate Emissions Reductions

2a: Select emissions factor table for conventionally-fueled vehicle.

Select and the table from Page7 that best represents the representative conventionally-fueled vehicle listed above. Place a mark next to the table you selected below.

	Table 1
	Table 2
	Table 3

2b. Document assumptions for emissions calculations

Annual Miles	
Source for this data	

2c. Select Useful Life (Select from Table 4)

List useful life assumption _____ years

2d. Calculate Annual Tons of NOx and VOC Reduced

When Using Table 1		
Step 1	**Calculate Annual Grams of NOx Reduction** (Annual Vehicle Miles x 0.11)	
Step 2	**Convert to Annual Pounds of NOx Reduction** (Result of Step 1 x 0.0022)	
Step 3	**Calculate Pounds of NOx Reduction over Vehicle Useful Life** (Result of Step 2 x Useful Life)	
Step 4	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 3 divided by 2,000)	
Step 5	**Calculate Annual Grams of VOC Reduction** (Annual Vehicle Miles x (0.067)	
Step 6	**Convert to Annual Pounds of VOC Reduction** (Result of Step 5 x 0.0022)	
Step 7	**Calculate Pounds of VOC Reduction over Vehicle Useful Life** (Result of Step 6 x Useful Life)	
Step 8	**Convert to Tons of VOC Reduction over Vehicle Useful Life** (Result of Step 7 divided by 2,000)	
Step 9	**Total NOx and VOC Reduction** (Sum Step 4 and Step 8) **D**	

When Using Table 2		
Step 1	**Calculate Annual Grams of NOx Reduction** (Annual Vehicle Miles x 0.135)	
Step 2	**Convert to Annual Pounds of NOx Reduction** (Result of Step 1 x 0.0022)	
Step 3	**Calculate Pounds of NOx Reduction over Vehicle Useful Life** (Result of Step 2 x Useful Life)	
Step 4	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 3 divided by 2,000)	
Step 5	**Calculate Annual Grams of VOC Reduction** (Annual Vehicle Miles x (0.123)	
Step 6	**Convert to Annual Pounds of VOC Reduction** (Result of Step 5 x 0.0022)	
Step 7	**Calculate Pounds of VOC Reduction over Vehicle Useful Life** (Result of Step 6 x Useful Life)	
Step 8	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 7 divided by 2,000)	
Step 9	**Total NOx and VOC Reduction** (Sum Step 4 and Step 8) **D**	

When Using Table 3 (Compression Ignition Vehicles)		
Step 1	**Calculate Annual Grams of NOx Reduction** (Annual Vehicle Miles x 0.226)	
Step 2	**Convert to Annual Pounds of NOx Reduction** (Result of Step 1 x 0.0022)	
Step 3	**Calculate Pounds of NOx Reduction over Vehicle Useful Life** (Result of Step 2 x Useful Life)	
Step 4	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 3 divided by 2,000)	
Step 5	**Calculate Annual Grams of VOC Reduction** (Annual Vehicle Miles x (0.17)	
Step 6	**Convert to Annual Pounds of VOC Reduction** (Result of Step 5 x 0.0022)	
Step 7	**Calculate Pounds of VOC Reduction over Vehicle Useful Life** (Result of Step 6 x Useful Life)	
Step 8	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 7 divided by 2,000)	
Step 9	**Total NOx and VOC Reduction** (Sum Step 4 and Step 8) **D**	

When Using Table 3 (Spark Ignition Vehicles)		
Step 1	**Calculate Annual Grams of NOx Reduction** (Annual Vehicle Miles x 0.226)	
Step 2	**Convert to Annual Pounds of NOx Reduction** (Result of Step 1 x 0.0022)	
Step 3	**Calculate Pounds of NOx Reduction over Vehicle Useful Life** (Result of Step 2 x Useful Life)	
Step 4	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 3 divided by 2,000)	
Step 5	**Calculate Annual Grams of VOC Reduction** (Annual Vehicle Miles x (0.165)	
Step 6	**Convert to Annual Pounds of VOC Reduction** (Result of Step 5 x 0.0022)	
Step 7	**Calculate Pounds of VOC Reduction over Vehicle Useful Life** (Result of Step 6 x Useful Life)	
Step 8	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 7 divided by 2,000)	
Step 9	**Total NOx and VOC Reduction** (Sum Step 4 and Step 8) **D**	

Table 1 - Emissions Factors: Light-Duty Vehicles (Passenger Cars and Trucks ≤ 6,000 lbs. GVWR)		
Fiscal Year of AIP Funding Request	**NOx (grams/mile)**	**VOC (grams/mile)**
2013	0.11	0.067
2014	0.11	0.067
GVWR – Gross Vehicle Weight Rating		

Table 2 – Emissions Factors: Light-Duty Trucks (≥ 6,001 - ≤8,500 lbs. GVWR)		
Fiscal Year of AIP Funding Request	**NOx (grams/mile)**	**VOC (grams/mile)**
2013	0.135	0.123
2014	0.135	0.123
GVWR – Gross Vehicle Weight Rating		

Table 3 – Heavy-Duty Vehicles (>8,500 lbs GVWR)			
Fiscal Year of AIP Funding Request	**Diesel (CI) & Gasoline (SI) Engines**	**NOx (grams/mile)**	**VOC (grams/mile)**
2013	CI	0.226	0.17
	SI		0.165
2014	CI	0.226	0.17
	SI		0.165
CI: Compression Ignition SI: Spark Ignition GVWR – Gross Vehicle Weight Rating			

Table 4 Useful Life in Years	
Light Duty Vehicles: Cars/vans	5
Light Duty Trucks: Pickup trucks	5
Light Duty Trucks: Flatbed/large trucks	10
Heavy Duty Vehicles: 19-35 foot buses	10
Heavy Duty Vehicles: 40+ foot buses	10

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ATTACHMENT B

EXAMPLE OF COMPLETED APPLICATION AND EMISSIONS REDUCTION WORKSHEETS

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Application
Zero Emissions Vehicle Pilot Program

Airport Name:	Self-Explanatory	3-Letter Airport ID:	Self-Explanatory
Airport Sponsor Name and Contact Person:	Self-Explanatory	Proposal Date:	Self-Explanatory
Mailing Address:	Self-Explanatory	Phone:	Self-Explanatory
Email Address:	Self-Explanatory	Fax:	Self-Explanatory
Describe the intended use of this vehicle. Self-Explanatory.			

What is the air quality status of the region? (Place an "X" for all designations that apply)		
Ozone (O_3) 8-hour standard	X	Nonattainment
		Maintenance
		Attainment
Particulate Matter - PM_{10}		Nonattainment
		Maintenance
	X	Attainment
Particulate Matter - $PM_{2.5}$		Nonattainment
		Maintenance
	X	Attainment
Carbon Monoxide (CO)		Nonattainment
		Maintenance
	X	Attainment
Nitrogen Dioxide (NO_2)		Nonattainment
		Maintenance
	X	Attainment
Sulfur Dioxide (SO_2)		Nonattainment
		Maintenance
		Attainment

Proposed Zero Emissions Vehicle Identification	
Vehicle Model Year	2013
Vehicle Manufacturer	Ford
Vehicle Model	Transit Connect Electric

Vehicle Cost Calculation	A
Number of Vehicles	1
Per Vehicle Cost ($)	$65,000
AIP Funding Share per Vehicle (50%)	$37,500
Matching Funds Required (50%)	$37,500
Total Cost ($)	$65,000

Refueling/Recharging Station Cost Calculation					B
Description	**Unit Cost ($)**	**No. of Units**	**AIP Funding (50%)**	**Required Matching Funds (50%)**	**Total Cost ($)**
Equipment Costs	$50,000	1	$25,000	$25,000	$50,000
Equipment Installation and Infrastructure			$2,500	$2,500	$5,000
Total			$27,500	$27,500	$55,000

Total Cost Calculation			C
Category	**AIP Funding (50%)**	**Required Matching Funds (50%)**	**Total Cost ($)**
Vehicles (A)	$37,500	$37,500	$65,000
Refueling and Recharging Stations (B)	$27,500	$27,500	$50,000
Technical Assistance and Project Formulation [1]	$3,750	$3,750	$6,500
Totals (C)	$60,750	$60,750	$121,500

[1] Not to exceed 10% of total vehicle costs

Project Cost Effectiveness Calculation			
Pollutant	**Total Project Cost (C)**	**Projected Emission Reductions over Useful Life of Project (D)**	**Cost Effectiveness over Useful Life of Project ($/ton) [1]**
Ozone (NOx + VOC)	$121,500	.0146	$8,321,917

[1] Total Project Cost Divided by Total Tons of Ozone

CALCUATION OF EMISSION REDUCTION

Step 1: Determine representative conventionally-fueled vehicle comparable to the proposed zero emissions vehicle included in this application.

For purposes of the emission reduction analysis, you must make an assumption of the conventionally-fueled vehicle that you would have purchased and put in use. List the specifics of this vehicle in the table below.

Representative Conventionally-Fueled Vehicle Specifics		
Vehicle Manufacturer	**Ford**	
Vehicle Make and Model	**Transit Connect**	
Gross Vehicle Weight Rating (GVWR)	**5,005**	
If a heavy-duty vehicle, indicate the type of engine	Compression Ignition (i.e., diesel)	Spark Ignition (i.e., gasoline)

Step 2: Calculate Emissions Reductions

2a: Select emissions factor table for conventionally-fueled vehicle.

Select and the table from Page7 that best represents the representative conventionally-fueled vehicle listed above. Place a mark next to the table you selected below.

X	Table 1
	Table 2
	Table 3

2b. Document assumptions for emissions calculations

Annual Miles	**15,000**
Source for this data	**Airport records showing historical use of vehicle being replaced.**

2c. Select Useful Life

Useful Life		
X	Light Duty Vehicles: Cars/vans	5
	Light Duty Trucks: Pickup trucks	5
	Light Duty Trucks: Flatbed/large trucks	5
	Heavy Duty Vehicles: 19-35 foot buses	10
	Heavy Duty Vehicles: 40+ foot buses	10

2d. Calculate Annual Tons of NOx and VOC Reduced

When Using Table 1		
Step 1	**Calculate Annual Grams of NOx Reduction** (Annual Vehicle Miles x 0.11)	**1,650**
Step 2	**Convert to Annual Pounds of NOx Reduction** (Result of Step 1 x 0.0022)	**3.63**
Step 3	**Calculate Pounds of NOx Reduction over Vehicle Useful Life** (Result of Step 2 x Useful Life)	**18.15**
Step 4	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 3 divided by 2,000)	**.0091**
Step 5	**Calculate Annual Grams of VOC Reduction** (Annual Vehicle Miles x (0.067)	**1,005**
Step 6	**Convert to Annual Pounds of VOC Reduction** (Result of Step 5 x 0.0022)	**2.211**
Step 7	**Calculate Pounds of VOC Reduction over Vehicle Useful Life** (Result of Step 6 x Useful Life)	**11.05**
Step 8	**Convert to Tons of VOC Reduction over Vehicle Useful Life** (Result of Step 7 divided by 2,000)	**.0055**
Step 9	**Total NOx and VOC Reduction** (Sum Step 4 and Step 8)	**.0146**

D

When Using Table 2		
Step 1	**Calculate Annual Grams of NOx Reduction** (Annual Vehicle Miles x 0.135)	
Step 2	**Convert to Annual Pounds of NOx Reduction** (Result of Step 1 x 0.0022)	
Step 3	**Calculate Pounds of NOx Reduction over Vehicle Useful Life** (Result of Step 2 x Useful Life)	
Step 4	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 3 divided by 2,000)	
Step 5	**Calculate Annual Grams of VOC Reduction** (Annual Vehicle Miles x (0.123)	
Step 6	**Convert to Annual Pounds of VOC Reduction** (Result of Step 5 x 0.0022)	
Step 7	**Calculate Pounds of VOC Reduction over Vehicle Useful Life** (Result of Step 6 x Useful Life)	
Step 8	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 7 divided by 2,000)	
Step 9	**Total NOx and VOC Reduction** (Sum Step 4 and Step 8) **D**	

When Using Table 3 (Compression Ignition Vehicles)		
Step 1	**Calculate Annual Grams of NOx Reduction** (Annual Vehicle Miles x 0.226)	
Step 2	**Convert to Annual Pounds of NOx Reduction** (Result of Step 1 x 0.0022)	
Step 3	**Calculate Pounds of NOx Reduction over Vehicle Useful Life** (Result of Step 2 x Useful Life)	
Step 4	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 3 divided by 2,000)	
Step 5	**Calculate Annual Grams of VOC Reduction** (Annual Vehicle Miles x (0.17)	
Step 6	**Convert to Annual Pounds of VOC Reduction** (Result of Step 5 x 0.0022)	
Step 7	**Calculate Pounds of VOC Reduction over Vehicle Useful Life** (Result of Step 6 x Useful Life)	
Step 8	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 7 divided by 2,000)	
Step 9	**Total NOx and VOC Reduction** (Sum Step 4 and Step 8) **D**	

When Using Table 3 (Spark Ignition Vehicles)		
Step 1	**Calculate Annual Grams of NOx Reduction** (Annual Vehicle Miles x 0.226)	
Step 2	**Convert to Annual Pounds of NOx Reduction** (Result of Step 1 x 0.0022)	
Step 3	**Calculate Pounds of NOx Reduction over Vehicle Useful Life** (Result of Step 2 x Useful Life)	
Step 4	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 3 divided by 2,000)	
Step 5	**Calculate Annual Grams of VOC Reduction** (Annual Vehicle Miles x (0.165)	
Step 6	**Convert to Annual Pounds of VOC Reduction** (Result of Step 5 x 0.0022)	
Step 7	**Calculate Pounds of VOC Reduction over Vehicle Useful Life** (Result of Step 6 x Useful Life)	
Step 8	**Convert to Tons of NOx Reduction over Vehicle Useful Life** (Result of Step 7 divided by 2,000)	
Step 9	**Total NOx and VOC Reduction** (Sum Step 4 and Step 8) **D**	

Table 1 - Emissions Factors: Light-Duty Vehicles (Passenger Cars and Trucks ≤ 6,000 lbs. GVWR)		
Fiscal Year of AIP Funding Request	**NOx (grams/mile)**	**VOC (grams/mile)**
2013	0.11	0.067
2014	0.11	0.067
GVWR – Gross Vehicle Weight Rating		

Table 2 – Emissions Factors: Light-Duty Trucks (≥ 6,001 - ≤8,500 lbs. GVWR)		
Fiscal Year of AIP Funding Request	**NOx (grams/mile)**	**VOC (grams/mile)**
2013	0.135	0.123
2014	0.135	0.123
GVWR – Gross Vehicle Weight Rating		

Table 3 – Heavy-Duty Vehicles (>8,500 lbs GVWR)			
Fiscal Year of AIP Funding Request	**Diesel (CI) & Gasoline (SI) Engines**	**NOx (grams/mile)**	**VOC (grams/mile)**
2013	CI	0.226	0.17
	SI		0.165
2014	CI	0.226	0.17
	SI		0.165
CI: Compression Ignition SI: Spark Ignition GVWR – Gross Vehicle Weight Rating			