

# MaineDOT Low-No Grant Application

## **Attachment C**

### **Proposed Scope of Work for *Bus Electrification: Connecting Maine to a Cleaner Future* and Benefits Calculations Methodology**

## Proposed Scope of Work for *Bus Electrification: Connecting Maine to a Cleaner Future*<sup>1</sup>

- Bangor Community Connector
  - 2 electric vans (2024)
  - 1 hybrid bus (2025)
  - 2 level 2 chargers (2024)
- BSOOB
  - 4 battery electric buses:
    - 2 Proterra battery electric buses (2024)
    - 2 battery electric buses (2026)
  - 2 dispensers for existing charging cabinets (2024)
  - 1 charging cabinet with 2 dispensers (2026)
- Citylink
  - 2 Proterra battery electric buses (2024)
  - 1 charging cabinet with 3 dispensers (2024)
  - 1 30 kW charger (2024)
- GPTD
  - 3 New Flyer batter electric buses (2024)
  - 4 dispensers for existing charging cabinets (2024)
- RTP
  - 4 electric vans (2024)
  - 4 level 2 chargers (2024)
- SPBS
  - 3 battery electric buses (2026)
  - 2 charging cabinets with 4 dispensers (2026)
- YCCAC
  - 4 electric vans (2024)
  - 1 80 kW charger (2024)
  - 3 level 2 chargers (2024)

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<sup>1</sup> To provide economies of scale, increase inter-agency knowledge sharing, and align with agency fleet replacement timelines, this grant includes three years of vehicle replacement requests.

## Demonstration of Benefits Calculation Methodology

*This document describes the methods used by the project team to determine the benefits of the proposed project per section E1b.*

Background: Applicants to the Low-No Program must demonstrate how the proposed project will support the statutory requirements of the Low-No Program (See 49 U.S.C. 5339(c)(5)(A)). In particular, FTA will consider the quality and extent to which applications demonstrate how the proposed project will: (1) Reduce Energy Consumption; (2) Reduce Harmful Emissions; and (3) Reduce Direct Carbon Emissions.

### Approach

- Estimate the petroleum consumption required annually to fuel and operate:
  - o The proposed low and zero-emission vehicle replacements
  - o The current fossil fuel vehicles
- Estimate the local harmful particles emitted annually as a result of operating:
  - o The proposed low and zero-emission vehicle replacements
  - o The current fossil fuel vehicles
- Estimate the greenhouse gases emitted annually as a result of operating:
  - o The proposed low and zero-emission vehicle replacements
  - o The current fossil fuel vehicles

### Tools

- Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Tool developed by Argonne National Laboratory

### Inputs

- Agency location (used by AFLEET to estimate emissions generated by local electric utilities and petroleum fuel pathways)
- Annual vehicle miles traveled (VMT) estimations for current vehicles and proposed replacements
- Fuel type and fuel economy of current vehicles and proposed replacements
- Purchase price and maintenance costs for current vehicles and proposed replacements

### Relevant Output

- Reduced Energy Consumption: the difference between the estimated annual petroleum consumption of current vehicles and proposed vehicle replacements
- Reduced Harmful Emissions: the difference between the estimated annual particles emissions of current vehicles and proposed vehicle replacements (PM 2.5, PM 10)
- Reduced Direct Carbon and other Greenhouse Gas Emissions: the difference between the estimated annual carbon and nitrous oxide emissions of current vehicles and proposed vehicle replacements
- Related costs: social cost of carbon dioxide emissions (at suggested 3% discount rate); damages per metric ton of emissions (recommended monetized values)

## Assumptions

- Estimations of vehicle costs and maintenance costs for electric, gasoline, hybrid, and diesel fueled vehicles are provided in the transition plans
- Estimations of fuel economy for electric, gasoline, hybrid, and diesel fueled vehicles are provided in the transition plans
- When diesel vehicle fuel economy was not provided, 5 MPGDE was assumed
- Estimations on annual vehicle miles travelled (VMT) for each agency were made based on total revenue miles travelled in 2021 and the number of vehicles in the current fleet
- Assumptions about which vehicles in each transit agency's current fleet will be replaced by the vehicles outlined for purchase in the project are outlined below:
  - o Bangor
    - Project scope: 2 electric vans (2024) and 1 hybrid bus (2025)
    - Assumptions: The agency will acquire 2 electric van vehicles, as a fleet expansion to serve unmet paratransit demand, and replace 1 existing 5 MPG diesel bus with 1 hybrid bus
      - Emissions savings were based on the assumptions that alternative expansion of fleet would include 2 gasoline-fueled vans
  - o BSOOB
    - Project scope: 4 battery electric buses - 2 Proterra battery electric buses (2024), 2 battery electric buses (2026)
    - Assumptions: The agency will replace 4, 5 MPG diesel-fueled vehicles with proposed electric buses
  - o Citylink
    - Project scope: 2 Proterra battery electric buses (2024)
    - Assumptions: The agency will replace 1, 4.3 MPG diesel-fueled vehicle with 2 electric buses
      - Emissions savings were based on the assumption that alternative to the expansion, the agency would operate with 1 diesel-fueled bus
  - o GPTD
    - Project scope: 3 New Flyer battery electric buses (2024)
    - Assumptions: The agency will replace 3, 5 MPG diesel-fueled vehicles with electric buses
  - o RTP
    - Project scope: 4 electric vans (2024)
    - Assumptions: The agency will replace 4, 7.6 MPG gasoline-fueled vehicles with electric van vehicles
  - o SPBS
    - Project scope: 3 battery electric buses (2026)
    - Assumptions: The agency will replace 3, 4.8 MPG diesel-fueled vehicles with electric buses
  - o YCCAC
    - Project scope: 4 electric vans (2024)

- Assumptions: The agency will replace 4, 8.9 MPG diesel-fueled vehicles with electric van vehicles

## References

- Alternative Fuel Life-Cycle Environmental and Economic Transportation (AFLEET) Online Tool: [AFLEET Online \(anl.gov\)](https://anl.gov/afleet)
- U.S. Department of Transportation Benefit-Cost Analysis Guidance for Discretionary Grant Programs: [Benefit Cost Analysis Guidance 2022 \(Revised\).pdf \(transportation.gov\)](https://www.transportation.gov/sites/dotgov/files/2022-05/benefit-cost-analysis-guidance-2022-revised.pdf)
- The Social Cost of Carbon: [The Social Cost of Carbon | Climate Change | US EPA](https://www.epa.gov/climate-change/scenario-social-cost-carbon)
- Benefit-Cost Analysis Guidance for Discretionary Grant Programs, [Benefit Cost Analysis Guidance 2022 \(Revised\).pdf \(transportation.gov\)](https://www.transportation.gov/sites/dotgov/files/2022-05/benefit-cost-analysis-guidance-2022-revised.pdf)