APPENDIX C

DATA COLLECTION REQUIREMENTS

Clean Mobility in Schools Pilot Project

Mobile Source Control Division
California Air Resources Board
August 23, 2019

Data Collection Requirements

Table C-1 through C-7, below, list the types of data elements CARB requests the Grantee to collect from projects receiving funding under this solicitation. Additional data elements may be collected beyond what is presented below. CARB and the Grantee will collaborate on finalizing the list of data to be collected. A final data collection plan requires CARB's approval.

The Grantee shall collect and monitor vehicle and electric vehicle charging equipment data, if applicable, such as vehicle specifications, performance, operation and maintenance data, and capital and operations and maintenance costs. Any data collected that contains personally identifiable information (PII), such as the names, personal phone numbers, and home addresses of staff, car share, or bicycle share participants, should be secured and protected. All information and data collected as a response to the Clean Mobility in Schools Pilot Project's data collection requirements is the property of CARB and will become a public record. As such, any information or data which contains PII should be reported only in aggregate or with PII removed.

In addition to data collection and monitoring, the Grantee will be required to provide analysis of the data, including comparison of the advanced technology vehicle(s) with baseline vehicles, and compilation and summarization of data for quarterly and final reports. The Grantee shall identify baseline vehicles already existing in its fleet that represent the types of vehicles and equipment that would be displaced by each of the funded project vehicles and equipment.

Table C-1. Minimum Data Items for School District's Fleet Vehicles, including School Buses, Service/Utility/Delivery Vehicles, Passenger Vehicles, and Associated Charging/Fueling Equipment

A. Vehicle and Charging/Fueling Equipment Specifications
i) Vehicle specifications, e.g., manufacturer, model, model year, gross vehicle weight rating, battery/fuel capacity (kWh/gallons/kg), vehicle identification number (VIN), vehicle license plate number ii) Full propulsion system specifications, including legible emissions control label photo (for vehicles) iii) Charging equipment specifications (e.g., manufacturer, model, model year, serial number, charger level, etc.) iv) Purchase date, purchase amount v) Registration date (for vehicles) vi) Insurance information and date of next renewal (for vehicles) vii) First date of operation (for both vehicles and charging equipment)
B. Vehicle Operation
i) Description of typical daily use of vehicles

ii) Vehicle usage, e.g., hours of operation per day, days of operation per year, GPS data (including route; also, must be able to distinguish between key off and key on but not moving)
iii) Origin and destination
iv) Miles traveled per trip and per day, including odometer readings
v) Average speed per trip
vi) Number of stops per route
vii) Idling/queuing time

C. Vehicle / Equipment Performance

i) Date of road call (breakdown)
ii) Miles (vehicles) or hours (charging/fueling equipment) between road calls, if applicable
iii) Reason for road call (including propulsion-related, energy storage system-related)
iv) Vehicle availability (i.e. percentage of time vehicle was available for use, and was not in need of maintenance or repairs)
v) Vehicle zero-emission range (manufacturer's claim, school district's findings)
vi) Battery degradation (battery charge capacity/power output over the length of the project)

D. Energy / Fuel Consumption

i) Amount of fuel/electricity dispensed per vehicle, per refueling/recharging; odometer reading; date; fuel price per unit when a vehicle is fueled (include electricity rates, as applicable)
ii) Battery's state of charge before and after each recharge, as applicable
iii) Length of time needed to recharge/refuel
iv) Distance traveled to recharge/refuel if charged/fueled off-site
v) Recharging/refueling source (e.g., on-site energy storage, grid, delivery, etc.)
vi) Off-peak and renewable energy load shifting potential (e.g., battery recharging optimization with smart meter)
vii) Recharging/refueling frequency
viii) Fuel efficiency—energy consumption rate per distance driven
ix) Energy/fuel consumption while idling (for hybrid service/utility/delivery vehicles, if applicable)
x) All-electric range and average electric usage in hybrids, as a function of trip duration, if applicable
xi) How vehicle's load weight affects electricity/fuel consumption (for school buses, service/utility/delivery vehicles)
xii) How change in terrain affects electricity/fuel consumption (for school buses, service/utility/delivery vehicles)
xiii) How change in duty cycle affects electricity/fuel consumption (for school buses, service/utility/delivery vehicles)
xiv) How air conditioner or heater use affects electricity/fuel consumption (for school buses, service/utility/delivery vehicles)
xv) Total amount of fuel/electricity dispensed per month (for charging/fueling infrastructure)

E. Maintenance and/or In-House Repairs
i) Description of maintenance performed, parts replaced, cost of parts replaced, cost of labor, odometer reading, and date performed ii) Type of maintenance: scheduled, unscheduled, configuration change iii) Repairs: date, description of problem, description of repair performed, parts replaced, costs of parts replaced, cost of labor, odometer reading iv) Time out of service with an explanation of reason for any extended delay
F. Service Calls
i) Date of service call, length of repair, description of problem, description of repair performed, parts replaced, odometer reading ii) Time out of service iii) Service response time to call regarding new trouble
G. Safety
i) Description of any accidents or incidents, including collisions, maintenance, and fueling incidents
H. School District-Owned Charging / Fueling Infrastructure and Maintenance Infrastructure
i) Infrastructure facility description, including station throughput/capacity, for both charging/fueling station and maintenance bay ii) Infrastructure reliability (i.e. percentage of time available for use, not under repair or maintenance)
I. Capital Costs
i) Capital costs for advanced technology vehicles and their related baseline vehicles, or cost of vehicle upgrade ii) Infrastructure/facility capital costs, or cost of facility modification/upgrade, for both charging/fueling station and maintenance bay
J. Operating and Maintenance Costs
i) Itemized operating and maintenance costs for both baseline and advanced technology vehicles, including the cost of electricity/fuel consumed, parts and labor (total labor cost and mechanic labor cost in $/hour) ii) Charging/fueling infrastructure and maintenance bay O&M costs (e.g., type of maintenance, costs for parts and labors, problems) iii) O&M costs for facility safety systems related to gaseous fuels (e.g., type of maintenance, costs for parts and labor, problems), if applicable
K. Cooperative Intelligent Transportation Systems (C-ITS)
i) Describe any applications of C-ITS. Identify the vehicles that make up the network, including their drive cycles and the resulting benefits (e.g., work cycle efficiency productivity optimization, safety--collision/accident avoidance), cost reductions, emissions reductions, etc.). ii) Log the opportunities encountered to use the C-ITS technology.

L. User / Fleet Experience Survey
i) User/fleet experience of the advanced technology vehicles and equipment, e.g., vehicle availability, power, capacity to meet fleet operation demand, O&M challenges, service and parts availability, perceived safety, refueling experience, and any barriers ii) Describe the workforce training programs, if any, related to the use and maintenance of the advanced technology vehicles. Evaluate the effectiveness of such programs and the costs associated with them. iii) Describe warranty claims and insurance policy claims, as well as the experience of working with vehicle/equipment manufacturers in the instance of an accident or a major period of unexpected down time, as applicable. iv) Describe the vehicle or equipment manufacturer's response/service for warranty claims and/or trouble shooting.

Table C-2. Minimum Data Items for Car Share Vehicles and Associated Charging/Fueling Infrastructure

CARB requests that the same data as described in Table C-1 be collected for school-district-owned car share vehicles and charging equipment, with the following exceptions: To ensure PII is not compromised, do not include origin and destination or location information of vehicles, unless such data is aggregated in such a way as to not reveal PII.

In addition to the data described in Table C-1, include:

A. Vehicle Operation
i) Number of participants and passengers reported for each vehicle trip ii) Miles driven and fuel consumed for re-location costs, if any
B. Participants
i) List of unique identifiers for all participants (including denied applicants and removed participants) with census tract of residence and Zip Code ii) Date of application, date of approval, date of denial or removal and reason for denial or removal iii) Total number of applicants approved iv) Total number of participants removed
C. Identified problems or concerns and proposed solutions, if applicable

Table C-3. Minimum Data Items for Bicycles in Bicycle Sharing Program and Associated Charging Infrastructure, if applicable

A. Bicycle and Charging Equipment Specifications
i) Bicycle specifications (e.g., class and charging capacity, if applicable, manufacturer, model, model year, serial number, etc.) ii) Charging equipment specifications (e.g., manufacturer, model, model year, serial number, voltage output, amperage, etc.)

iii) First date of operation (including bicycles and charging equipment)
B. Bicycle Operation
i) Bicycle usage, e.g., hours of operation per day, days of operation per year ii) Number of trips taken per day iii) Miles traveled per trip and per day, including odometer readings
C. Bicycle / Equipment Performance
i) Date of road calls (breakdowns), if applicable ii) Miles traveled (bicycles) or hours of use (charging equipment) between road calls iii) Reason for road calls (including propulsion-related, energy storage system-related) iv) Battery degradation (battery charge capacity/power output over the length of the project), if applicable
D. Energy Consumption for Electric Bicycles
i) Amount of electricity needed to recharge bicycle; odometer reading; date ii) Battery's state of charge before and after recharge iii) Time it took to recharge iv) Charging source (e.g., on-site energy storage, grid, delivery, etc.) v) Recharging frequency vi) Energy efficiency—energy consumption rate per distance ridden vii) Total amount of fuel/electricity dispensed per month (if dedicated charging docks are installed)
E. Maintenance and/or In-House Repairs
i) Type of maintenance: scheduled or unscheduled ii) Repairs: date, description of problem, description of repair performed, parts replaced, costs of parts replaced, costs of labor, odometer reading iii) Time out of service with an explanation of reason for any extended delay
F. Service Calls
i) Date of service call, length of repair, description of problem, description of repair performed, parts replaced, odometer reading ii) Time out of service with an explanation of reason for any extended delay iii) Service response time to new trouble call
G. Safety
i) Description of any accidents or incidents, including collisions, maintenance, and charging incidents
H. Charging Infrastructure and Maintenance Infrastructure
i) Infrastructure facility description, including docking station location and throughput/capacity, for both charging station and maintenance bay, if applicable ii) Infrastructure reliability (i.e. percentage of time available for use, not under repair or maintenance) iii) Charging infrastructure and maintenance bay O&M (e.g., type of maintenance/repairs needed, problems encountered)

I. Capital Costs
i) Capital costs for bicycles/electric bicycles ii) Infrastructure/facility capital costs, or cost of facility modification/upgrade, for both charging station and maintenance bay, if applicable
J. Operating and Maintenance Costs
i) Detailed operating costs for bicycles (e.g., cost of electricity consumed, miles driven by a vehicle and fuel consumed for re-location costs) ii) Detailed maintenance costs for bicycles/electric bicycles including parts and labor (total labor cost and mechanic labor cost in $/hour) iii) Charging infrastructure and maintenance bay O&M costs (e.g., type of maintenance, costs for parts and labor, problems)
K. User / Fleet Experience Survey
i) User experience of the bicycles/electric bicycles e.g., availability, power, capacity to meet travel needs, perceived safety, recharging experience, and any barriers) ii) Describe any O&M challenges, service and parts availability issues iii) Describe the workforce and user training programs, if any, related to the use and maintenance of the bicycles/electric bicycles. Evaluate the effectiveness of such programs and the costs associated with them. iv) Describe warranty claims and insurance policy claims, as well as the experience of working with bicycles/electric bicycles/charging equipment manufacturers in the instance of an accident or a major period of unexpected down time,(as applicable. v) The bicycles/electric bicycles or charging equipment manufacturer response/service for warranty claims and/or trouble shooting.
L. Participants
i) List of unique identifiers for all participants (including denied applicants and removed participants) with census tract of residence and Zip Code ii) Date of application, date of approval, and date of denial or removal and reason for denial or removal iii) Total number of applicants approved iv) Total number of participants removed
M. Identified problems or concerns and proposed solutions, if applicable

Table C-4. Minimum Data Items for Lawn and Garden Equipment and Associated Charging Infrastructure

A. Equipment and Associated Charging Infrastructure Specifications
i) Lawn and garden equipment specifications (e.g., manufacturer, model, model year, charging capacity, serial number, etc.) ii) Charging equipment specifications (e.g., manufacturer, model, model year, serial number, charging capacity, etc.) **iii)** First date of operation (including lawn and garden equipment, batteries, and charging equipment)

B. Equipment Operation and Performance
i) Description of typical daily use of baseline lawn and garden equipment; duty cycle (e.g. hours of use per day, number of days per week used) ii) Description of daily use of project's zero-emission lawn and garden equipment; duty cycle (e.g. hours of use per day, number of days per week used) iii) Number of hours equipment was used between charges iv) Any required changes to use pattern of lawn and garden equipment as a result of recharging needs. v) Location of equipment use each day, hours of use at each location (school name and address)
C. Energy Consumption
i) Amount of electricity needed to recharge lawn and garden equipment; date recharged ii) Battery's state of charge before and after recharge iii) Time it took to recharge iv) Charging source (e.g., on-site energy storage, grid, delivery, etc.) v) Energy consumption rate per length of time used vi) Where equipment was recharged (each recharge) and whether equipment had to be driven to that location specifically for recharge, or whether the charge lasted the full length of time it was needed for each day/job. vii) Number of batteries used per day, per piece of equipment
D. Capital Costs
i) Capital costs for zero-emission lawn and garden equipment and baseline lawn and garden equipment ii) Infrastructure/facility capital costs, or cost of facility modification/upgrade, for both charging station and maintenance bay, if applicable
E. Operating and Maintenance Costs
i) Detailed operating costs for both baseline and zero-emission lawn and garden equipment ii) Detailed maintenance costs for both baseline and zero-emission lawn and garden equipment, including parts and labor (total labor cost and mechanic labor cost in $/hour) iii) Charging infrastructure and maintenance bay O&M costs (e.g., type of maintenance, costs for parts and labor, problems)

Table C-5. Minimum Data Items for Facility Improvements

A. School District Facilities Improvements
i) Data collection elements for facility improvements, such as installation of renewable energy generation/storage system or changes to active transportation infrastructure, should focus on benefits such as: ii) Reduced electrical demand due to the use of more efficient technologies iii) Shifts in processes or strategies toward zero-emission

iv) Costs/savings from on-site energy generation/storage/production

Table C-6. Minimum Data Items for Outreach and Community Engagement Events

A. Planned Events
i) Location, date, time of event ii) Type of event (e.g., workshop, in-person meeting, webinar, educational forum) iii) Approximate number of attendees iv) Number of speakers or other active participants v) Title of event

Table C-7. Minimum Data Items for California Climate Investments Co-benefits Assessments

A. Job Co-benefit of the Project
i) Type of job (e.g., construction, procurement, consultant) ii) Full-time equivalent hours iii) Location of job iv) Date of job creation