APPENDIX F

DATA COLLECTION REQUIREMENTS

Zero- and Near-Zero Emission Freight Facilities Project

Mobile Source Control Division
California Air Resources Board
March 21, 2018

CALIFORNIA
AIR RESOURCES BOARD

DATA COLLECTION REQUIREMENTS

Table F-1 and F-2 below list the minimum requirements for data collection elements to be collected as part of a project requesting funding under this solicitation. Additional data collection elements may be collected beyond what is presented below.

Table F-1. Minimum Data Items

Vehicles and Equipment
Vehicle Specification
Vehicle specification (e.g., manufacturer, model, model year, gross vehicle weight, fuel capacity etc.) Full propulsion system specification, including legible engine label photos
Vehicle Operation
Description of daily use of vehicles; duty cycle Vehicle usage, e.g., hours of operation per day, days of operation per year, odometer reading, GPS data (must be able to distinguish between key off and key on but not moving) Origin and destination Miles traveled per trip Average speed Number of stops per mile (applicable to buses) Duration per trip (applicable to buses) Idling/queuing time (helpful in determining efficiency of use) (applicable to trucks) Weight of load Battery degradation (battery charge capacity/power output over the length of the project), if applicable
Vehicle / Equipment Performance
Miles between roadcalls, if applicable Number of road calls (including propulsion-related, energy storage system-related) Battery degradation (battery charge capacity/power output over the length of the project) Vehicle availability Vehicle zero emission range
Fuel / Energy Consumption
Amount of fuel/electricity; odometer reading; date; fuel price per unit when a vehicle is fueled (include electricity rates as applicable) State of charge (SOC), if applicable Refueling time/charging time Distance traveled to refuel/charge if fueled off−site Refueling/charging source (e.g., on-site energy storage, grid, delivery, etc.) Off-peak and/or renewable energy load shifting potential (e.g., battery recharging optimization with smart meter) Refueling/charge frequency Fuel efficiency, energy consumption rate per distance driven Fuel/energy consumption while idling (if applicable)

All-electric range and average electric usage in hybrids as a function of trip duration and work output, if applicable
Maintenance
Type of maintenance: scheduled, unscheduled, configuration change Repairs: date, description of problem, description of repair performed, parts replaced, costs of parts replaced, costs of labor, odometer reading Time out of service with an explanation of reason for any extended delay
Service Calls
Date of service call, length of repair, description of problem, description of repair performed, parts replaced, odometer reading Time out of service Service response time to new trouble call
Safety
Description of any accidents or incidents, including collisions, maintenance and fueling incidents
Emissions Testing
Tailpipe emissions test for vehicles/equipment that are not 100% zero emission, and their respective baseline vehicles/equipment using PEMS technology.
Fueling / Charging Infrastructure and Maintenance Infrastructure
Infrastructure facility description, including station throughput/capacity, for both fueling/charging station and maintenance bay Infrastructure reliability
Capital Costs
Capital costs for advanced technology vehicles and baseline vehicles, or cost of vehicle upgrade Infrastructure/facility capital costs, or cost of facility modification/upgrade, for both fueling/charging station and maintenance bay
Operating and Maintenance Costs
Detailed operating costs for both baseline and advanced technology vehicles Detailed maintenance costs for both baseline and advanced technology vehicles, including parts and labor (total labor cost and mechanic labor cost in $/hour) Fueling/charging infrastructure and maintenance bay O&M costs (e.g., type of maintenance, costs for parts and labors, problems) O&M costs for facility safety systems related to hydrogen and fuel cells (e.g., type of maintenance, costs for parts and labors, problems), if applicable
Cooperative Intelligent Transportation Systems (C-ITS)
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, emission reductions, etc.). Log the opportunities encountered to use the C-ITS technology.
User / Fleet Experience Survey
User/fleet experience of the advanced technology vehicles/equipment, e.g., vehicle availability, power, capacity to meet fleet operation demand, O&M challenges, service parts availability, perceived safety, refueling experience and any barriers

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. Describe warranty claims and insurance policies, 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). The vehicle or equipment manufacturer response/service for warranty claims and/or trouble shooting

Table F-2 Minimum Data Items of Facility Improvements

Facility Improvements
Data collection elements for freight facility improvements should focus on either reduced electrical demand due to the use of more efficient technologies or shifts in processes or strategies toward zero-emission.