

# EPA SmartWay Truck Emissions Test Protocol Workshop

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## Metrics and Modeling General Topics



# Metrics

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## ➤ Fuel Consumption Metric

- Protocol: currently specifies fuel consumption calculations per SAE J1321 for gravimetric or SAE J1094a for carbon-balance.  
Requesting comment on appropriate metric.
  - Comment: Don't use mpg – need to recognize work done by trucks
  - Comment: Gallons/ton-mile is improvement, but doesn't capture grade
  - Comment: Different metrics may be appropriate for different vehicle applications.
- Protocol: Suggests that PTO energy demand be calculated as a load and factored into overall vehicle efficiency
  - Comment: Recommend gallons/time for vocational trucks using PTO
  - Comment: Emission a “g/kWh” basis cannot be obtained on the track
  - Comment: Since the test method does not cover non-driving work performed by the vehicle, why is a metric for work needed? Should be a completely separate procedure

# Role of Modeling

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- Extend value of testing using tools such as modeling
  - Protocol: Consistent use of vehicle modeling could potentially broaden value of test data
    - Comment: Models require very specific and accurate input data – details on engine maps, drive train components, etc. Much of the needed information is proprietary, costly to obtain for modeling, and could be subject to gaming
    - Comment: Models and simulation are more cost-effective and have fewer uncontrolled variables
    - Comment: Vehicles can be effectively modeled if have accurate aerodynamic, rolling resistance, engine and drive train data

# Role of Modeling, con't

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- Extend value of testing using tools such as modeling – continued
  - Comment: Defining the inputs (trucks, engine map, etc) will require effort and consensus-reaching, as well selection of appropriate models
  - Comment: Several models available – AVL Cruise, PSAT, GT Drive, Easy 5 – use of these would avoid need for truck and engine OEMs to release internal proprietary codes
  - Comment: Validation of models is essential... need real-world data

# Measuring and Modeling Drag

- Need accurate methods to measure rolling and aerodynamic resistance
  - Protocol: Incorporates SAE Coastdown methods; suggests consider calculation of road load
    - Comment: If calculate road load, needs to be accurate for hybrid vehicles

# Contact

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