New Technologies in Transportation

Philip Saunders DSL, MCFE, LSSGB
Agenda

• City of Seattle Fleet Overview
• Aftermarket Electrification/Hybridization of Medium/Heavy Duty Vehicles
• Electric Vehicle Implementation
• Renewable Diesel/Fuels
• Vehicle Telematics
• Closing/Questions
City of Seattle Transportation Snapshot
Electrify the Fleet

Fleet Operations
- 4,000 vehicles maintained
- 11 garages & 5 warehouses
- All city departments: Police, Fire, Utilities, Parks, SDOT, etc.

Alt Fuel Fleet
- 100 Battery electric (BEV)
- 65 Plug-in hybrids (PHEV)
- 500+ conventional hybrids

EVSE Infrastructure
- 250 Fleet EVSE over 11 locations
- 1 DCFC for fleet use (480v)
- Large EVSE expansion project underway – 400 EVSE installed by 2023
Electric Vehicle Implementation (EVSE)

- EV Infrastructure
- 156 “level 2” charging stations, increasing the total in this City-owned parking garage to 188
- More charging infrastructure with new Green Fleet Action Plan
Aftermarket Electrification/Hybridization

- XL Hybrids
- Odyne/JEM Systems
- Auxiliary Power Units (APU)

COMFORT 93%
MAINTENANCE 75%
FUEL 85%

- 93% of drivers are more satisfied when operating a truck with an APU
- 75% of tractor downtime is attributed to auxiliary systems maintenance
- 85% reduction of fuel used during idling
Electric Vehicle Implementation (TCO)

- Total Cost of Ownership (TCO) - Sedans
- https://atlaspolicy.com/rand/fleet-procurement-analysis-tool/

## Results - Fleet Procurement Analysis Tool

### Procurement Name: Demo Fleet Procurement

#### Procurement Summary

- **Procurement Details**
  - **Procurement Type**: Purchase (Cash)
  - **Number of Vehicles Procured**: 19 (19)
  - **Years of Use/Owning**: 7 (7)
  - **Miles Procured**: 1,995,000 (1,995,000)
  - **Total NPV Vehicle and Operating Cost**: $887,762 (808,042)
  - **Total Tax Incentives Captured**: $-142,500 (0)
  - **Total Non-Tax Incentives Captured**: $- (0)
  - **Total Discounts Captured**: $- (0)
  - **NPV Vehicle Total Cost less Incentives and Discounts**: $887,762 (808,042)
  - **NPV Total Cost of Infrastructure**: $- (0)
  - **Total NPV Cost**: $887,762 (808,042)
  - **Total NPV Cost / Mile**: $0.445 (0.405)

### Procurement Details

- **Vehicle Cost per Mile (Nominal)**
  - **Depreciation**: $0.025 (0.029)
  - **Financing**: $0.050 (0.050)
  - **Fuel**: $0.000 (0.000)
  - **Maintenance and Repair**: $0.000 (0.000)
  - **Insurance**: $0.000 (0.000)
  - **Taxes & Fees**: $0.000 (0.000)
  - **Charging Infrastructure**: $0.000 (0.000)
  - **Carbon**: $0.000 (0.000)

#### Lifecycle CO2 Fuel Emissions

- **2017 Chevrolet Malibu ICE (Baseline)**
  - 0.000 lb/mi
- **2017 Chevrolet Bolt EV BEV (Comparison)**
  - 0.000 lb/mi

#### Lifecycle Other Emissions

- **NOX (mg/mi)**
  - **2017 Chevrolet Malibu ICE (Baseline)**
    - 0.000 mg/mi
  - **2017 Chevrolet Bolt EV BEV (Comparison)**
    - 0.000 mg/mi
- **SOX (mg/mi)**
  - **2017 Chevrolet Malibu ICE (Baseline)**
    - 0.000 mg/mi
  - **2017 Chevrolet Bolt EV BEV (Comparison)**
    - 0.000 mg/mi
- **PM10 (mg/mi)**
  - **2017 Chevrolet Malibu ICE (Baseline)**
    - 0.000 mg/mi
  - **2017 Chevrolet Bolt EV BEV (Comparison)**
    - 0.000 mg/mi
- **PM2.5 (mg/mi)**
  - **2017 Chevrolet Malibu ICE (Baseline)**
    - 0.000 mg/mi
  - **2017 Chevrolet Bolt EV BEV (Comparison)**
    - 0.000 mg/mi
- **VOC (mg/mi)**
  - **2017 Chevrolet Malibu ICE (Baseline)**
    - 0.000 mg/mi
  - **2017 Chevrolet Bolt EV BEV (Comparison)**
    - 0.000 mg/mi

### Societal Benefit Summary

- The baseline is 8.98% more expensive than the comparison vehicle.

### Fleet Gasoline Use (Total All Vehicles)

- **2017 Chevrolet Malibu ICE Based Fleet**: 65,576 gallons
- **2017 Chevrolet Bolt EV BEV Based Fleet**: 0 gallons

The baseline fleet uses 65,576 more gallons of gasoline than the comparison fleet.
Market Ready EVs

- Light-duty (sedans, SUVs and light trucks) electrification

- Medium and heavy-duty electrification and hybridization
Renewable Diesel

- Renewable diesel is essential in Transportation due to its immediate impacts on air quality and reducing GHG emissions by up to 80% (based on fleet size).

- Same specification/chemical structure as petroleum diesel (ASTM-D975).

- Hydrogenated (no oxygen), and therefore users will not encounter the challenges biodiesel presents relating to freezing temperature and storage.

- A “drop in” fuel that can be immediately used without any special treatment.

- Can be used in engines that are designed to run on conventional diesel fuel - with no blending required.

- Contracting is key aspect to bring fuel to the City.
Telematics

- TELEMATICS is a method of monitoring an asset (car, truck, heavy equipment, or even ship) by using GPS and onboard diagnostics to record movements on a computerized map.
- Telematics is a key element in tracking fleets by tracking immediate details of driver behaviors to include idling.
Telematics cont’d

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- Telematics data is sent from the vehicle to a fleet management software portal.
Questions
Contact Us

City of Seattle
Department of Finance and Administration (FAS)
Fleet Management Division

Philip Saunders, DSL, MCFE, LSSGB
Green Fleet Program Manager
Fleet Management Division
206-684-0137
Philip.Saunders@seattle.gov