



Metro Transit Fuel Economy Test



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Houston, TX

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Test Concept

- MNDOT track, Sept. 2013
 - Controlled drive train comparison
 - Same test course, weather conditions, drivers, fuel # 2, B-20
- Four buses tested
 - 2010 engines
 - Series hybrid (ISB)
 - Electric accessories
 - Parallel hybrid (ISB)
 - Beltless alternator, e-fans
 - Two diesel (ISL)
 - One w/ e-fans, one w/ hyd. fans
 - Acceleration management



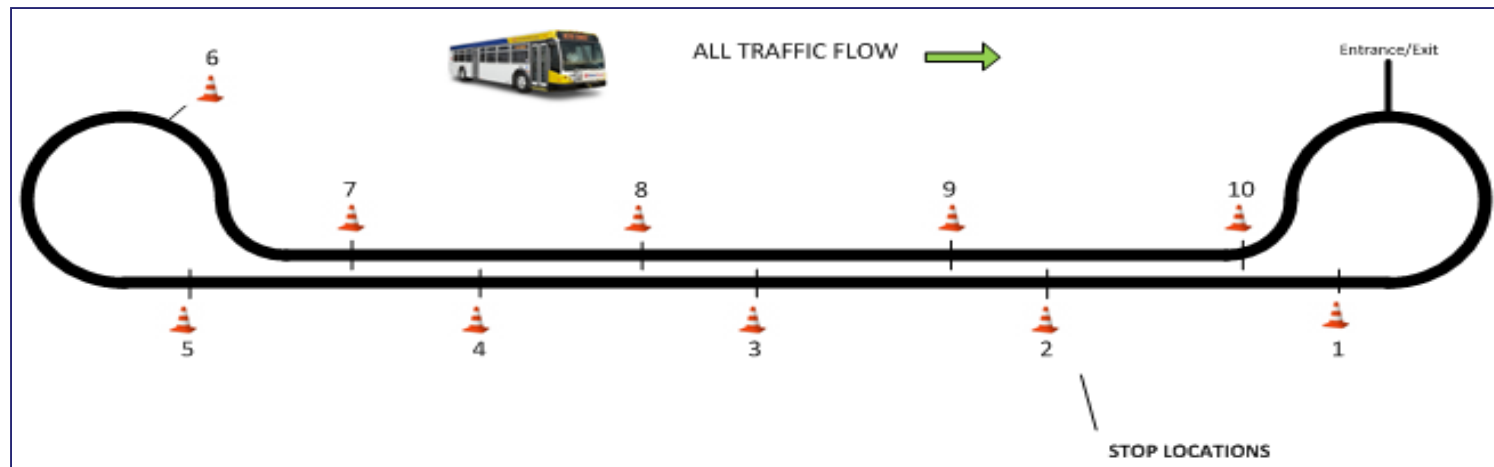
Test Procedure

- Weather monitored
 - 60° F avg. temp.
 - Wind < 10 MPH
- Same engine loads
 - Empty buses, no HVAC or auxiliary heater
- Coast-down tests
- Brake / hub temps checked
- Drivers changed buses
- “Coach” on each bus
- Fuel measured by weight

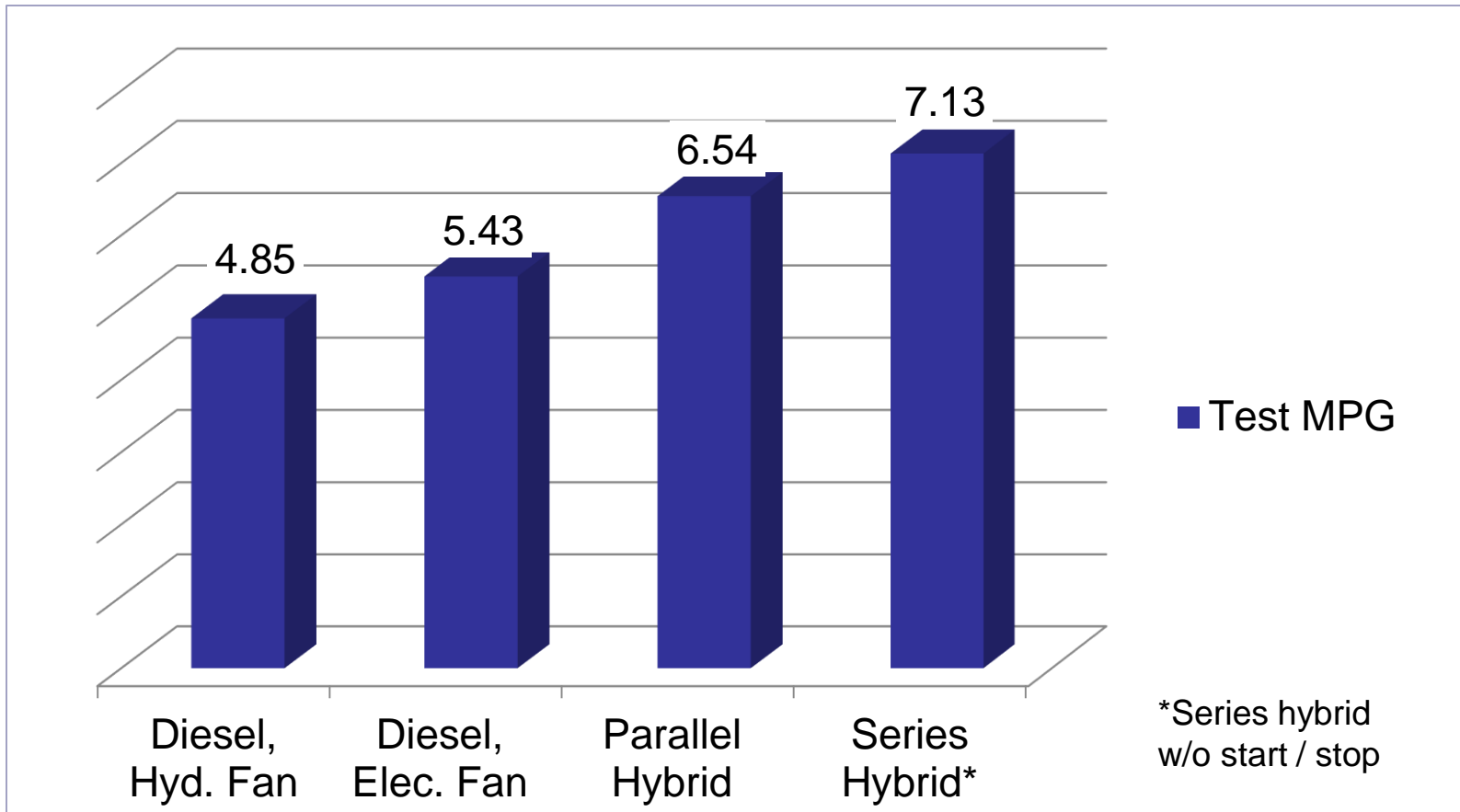


Test Route

- Test route profile
 - 14 MPH avg. speed 2.5 mile track 64.2 total miles
- 10 stops / lap
 - 20 seconds / stop doors opened bus kneeled
- 2 segments / bus
 - Segment = 3 cycles cycle = 4 laps fuel weighed after each cycle



Test Results



Metro Transit fleet fuel economy – 4.316 MPG (2013, all buses)

Related Topics

- Driver effect noted during test
 - Higher hub temps, lower MPG
- U of M analysis
 - Three buses, four seasons
 - Match bus type / technologies to route profile
- Hybrid w/ electric accessories
 - Electric power in garages
 - Reduced building energy costs
 - Start / Stop feature
 - Improved MPG
- Bio-diesel
 - Favorable price - reduced fuel costs



Questions?

