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### OVERVIEW

#### TIMELINE

- **Project Start:** 10/1/05
- **Project End:** 3/31/12
- **Percent Complete:** 80%

#### BUDGET

- **Total Project:** $13,197,679
- **DOE Share:** $10,659,094
- **Contractor:** $2,538,585
- **CY 2010:** $1,362,845

#### BARRIERS

- Vehicle Availability
- Vehicle Reliability
- Infrastructure Requirements

#### PARTNERS

- Roush Industries
- EZ Messenger
- Idaho National Laboratory
- Argonne National Laboratory
Relevance

OBJECTIVES

◆ Provide benchmark data for advanced technology vehicles

◆ Develop lifecycle cost data for production vehicles utilizing advanced power trains

◆ Provide fleet operations data to the Idaho National Laboratory

◆ Disseminate testing results to industry and other DOE programs
MILESTONES

2010 (Completed)
- Vehicles Purchased: 19
- Tests Initiated: 36
- Tests Completed: 19

2011 (Scheduled)
- Vehicles Purchases: 10
- Tests Completions: 75
- Contract Termination
Approach

PROCEDURE DEVELOPMENT

- Administrative Procedures For Control Of Test Conduct
- Vehicle Specification Defining Key Performance And Safety Parameters
- Vehicle Test Procedures Defining Tests Verifying Vehicle Specification Requirements
- Battery Test Procedures Defining Implementation Of Standard Test Requirements
BASELINE TESTING

- Benchmark Performance
- Acceleration
- Maximum Speed
- Driving Cycle Range (ANL Dynamometer)
- Without Accessory Loads
- With Accessory Loads
- Braking
- Gradeability
## Approach

### Accelerated Testing

<table>
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<tr>
<th>Cycle (mi)</th>
<th>Urban (10 mi)</th>
<th>Highway (10 mi)</th>
<th>Charge (hr)</th>
<th>Reps (N)</th>
<th>Total (mi)</th>
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<th>Miles (%)</th>
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| Total     | 2,340        | 3,100           | 1,344       | 162      | 5,440      |          |          |
| Average   | 43%          | 57%             | 8.3         | 18       |            |          |          |
FLEET TESTING

- Production Vehicles
- 160,000 Mile Test Duration
- EZ Messenger Delivery Fleet
- On Board Data Logger
- Fuel And Maintenance Logs
Approach

BATTERY TESTING

◆ Hybrid Vehicles
◆ C₁ Capacity
◆ Hybrid Pulse Power Characterization
◆ Vehicle New & End Of Test
◆ Start-Stop - C₁ Capacity
◆ Battery Electric Vehicles
◆ C₁ Capacity
Accomplishments

2010 PROC EDURES

- Update Battery Test Procedures To Clarify Test Conditions
- Modify Baseline Test Procedures To Reflect New Test Facility
- Update Accelerated Test Procedures To Incorporate Driver Requirements
- Collaborate With INL To Develop Test Procedures For USPS Electric Vehicles
Accomplishments

2010 BASELINE TESTS

- 2010 Honda Insight
- 2010 Toyota Prius
- 2010 Ford Fusion
- 2010 Mercedes S400
- 2011 Honda CRZ
- 2010 Smart For Two
- 2010 VW Golf Diesel
- 2010 Mazda 3
- 2010 EVI E-Mega
- 2010 Ford Escape
## Accomplishments

### 2010 ACCELERATED TESTS

#### 2010 Ford Escape PHEV

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<th>Repetitions (N)</th>
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2010 FLEET TESTS

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- 2010 Ford Fusion
- 2010 Mercedes S400
- 2011 Honda CRZ
- 2010 Smart For Two
- 2010 VW Golf Diesel
- 2010 Mazda 3

Two of Each Vehicle
Accomplishments

2010 BATTERY TESTS

- Initial Tests
  - 2010 Honda Insight
  - 2010 Toyota Prius
  - 2010 Ford Fusion
  - 2010 Mercedes S400
  - 2011 Honda CRZ
  - 2010 Smart For Two
  - 2010 VW Golf Diesel
  - 2010 Mazda 3

- Test Reports
  - Initial & Final Test Data
    - 2007 Nissan Altima
    - 2007 Toyota Camry
    - 2006 Lexus 400h
  - Final Test Data
    - 2006 Honda Civic
    - 2005 Ford Escape
    - 2005 Honda Accord
    - 2004 Toyota Prius
Accomplishments

2010 SPECIAL TESTS

- Start-Stop Fuel Economy Study
  - Dynamometer Testing
  - Fuel Economy Test Cycles
  - USA, Europe, Japan
- Fleet Testing Validation
  - With & Without Start-Stop Enabled
  - Real World Validation
- USPS Long-Life Vehicle Prototypes
Collaborations

Idaho National Laboratory
- Procedure Development
- Data Collection & Analysis

Argonne National Laboratory
- Procedure Development
- Dynamometer Testing
Collaborations

INDUSTRY PARTNERS

- Roush Industries
  - Vehicle Development
  - Regulatory Compliance Analysis
  - Special Testing
- EZ Messenger
  - Mileage Accumulation
  - Route Design
Future Work

CONTRACT CLOSEOUT

◆ 2011 Testing
  ◆ Grid-Connected Vehicle Testing
  ◆ Industrial Equipment Using Advanced Batteries
  ◆ Fast Charge Test Procedures

◆ Work Completion
  ◆ Testing Complete 12/31/2011
  ◆ Fleet Testing Wrap Up
  ◆ Reporting Closeout
SUMMARY

◆ 175 Separate Testing Tasks Completed
◆ Ten Million Fleet Test Miles Accumulated
◆ Vehicles Using With Six Different Fuels Tested
◆ $2.5 Million Cost Share Provided
◆ All Test Reports Posted To AVTA Website