Geographic Information System for Visualization of PHEV Fleet Data

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Project ID # VSS029

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Idaho National Laboratory

OVERVIEW

Budget

- Total project funding
  - $50k DOE Share
  - $50k Contractor Share
- Funding received in FY09
  - $0
- Funding for FY10
  - $50k

Barriers

- Barriers
  - GPS (Global Positioning System) data from vehicles is not always transmitted
- Targets
  - Support the Laboratory and field evaluations of large-scale demonstration fleets of advanced commercial and passenger Plug-in Hybrid Electric Vehicles (PHEV) and Electric Vehicles (EV)

Timeline

- Start – 3/1/2010
- Finish -12/15/2010
- 35% complete

Partners

- Electric Transportation Engineering Corporation (eTec)
- Idaho State University

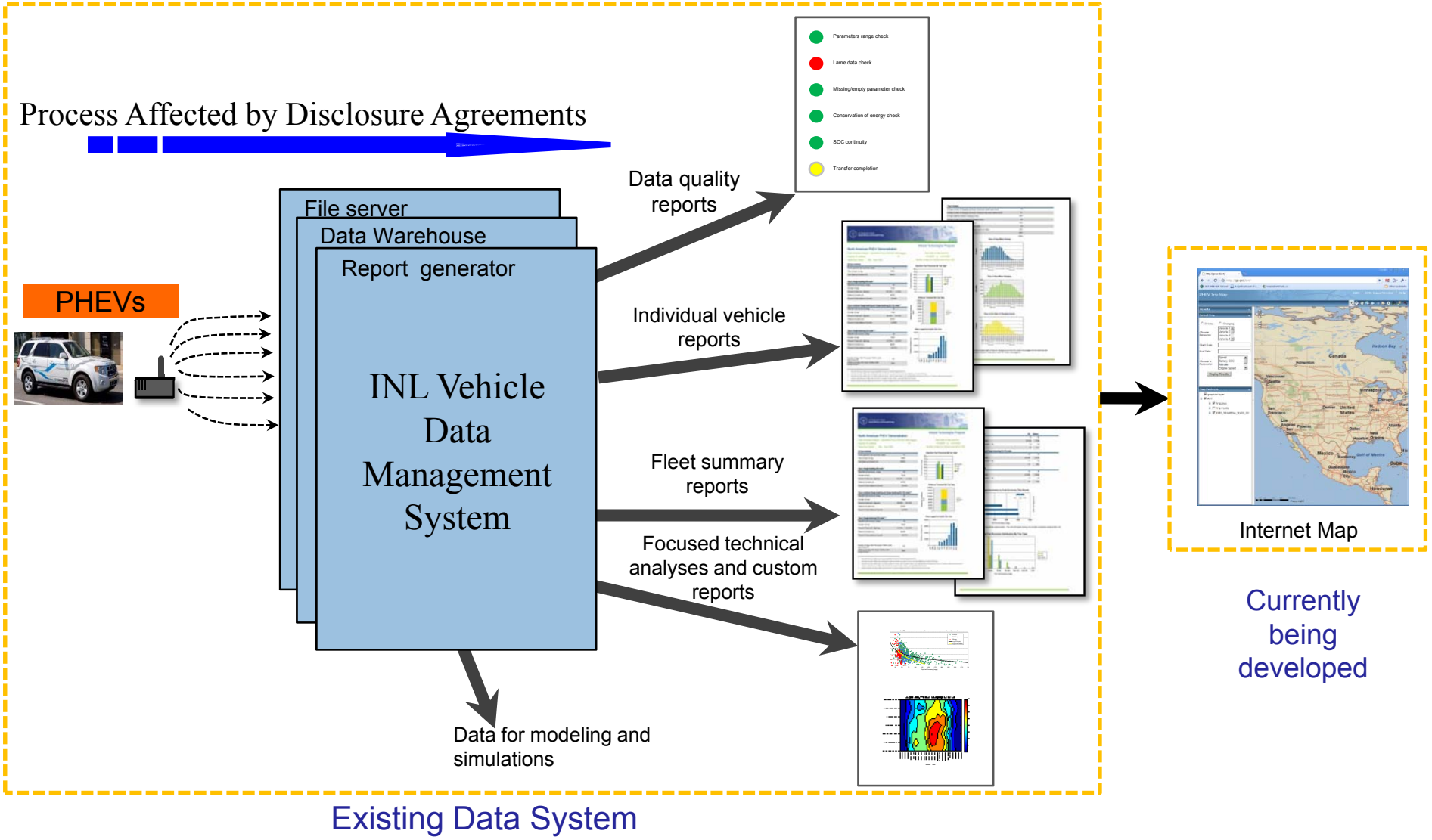
Objectives

- Use Geographic Information Systems (GIS) to enhance the analyses of Idaho National Laboratory (INL) PHEV Fleet Data
- Use GIS to enhance INL Quality Assurance (QA) processes
- Use GIS to increase effectiveness of the algorithms used by INL Data Analysis Engineers
  - Aggressiveness calculations
  - Highway vs. city trip type determination

Milestones

- **June 1, 2010**
  - Complete development of web based map used to visualize PHEV fleet data
- **July 30, 2010**
  - Complete Digital Elevation Model (DEM) slope calculation
  - Integrate new slope calculation into current aggressiveness algorithms and evaluate its effectiveness
- **August 30, 2010**
  - Complete city vs. highway trip type determination
  - Compare results to current trip type determination and evaluate new algorithms effectiveness
- **September 30, 2010**
  - Integrate map interface into current QA processes
- **October 1 – December 30, 2010**
  - Beta test and documentation

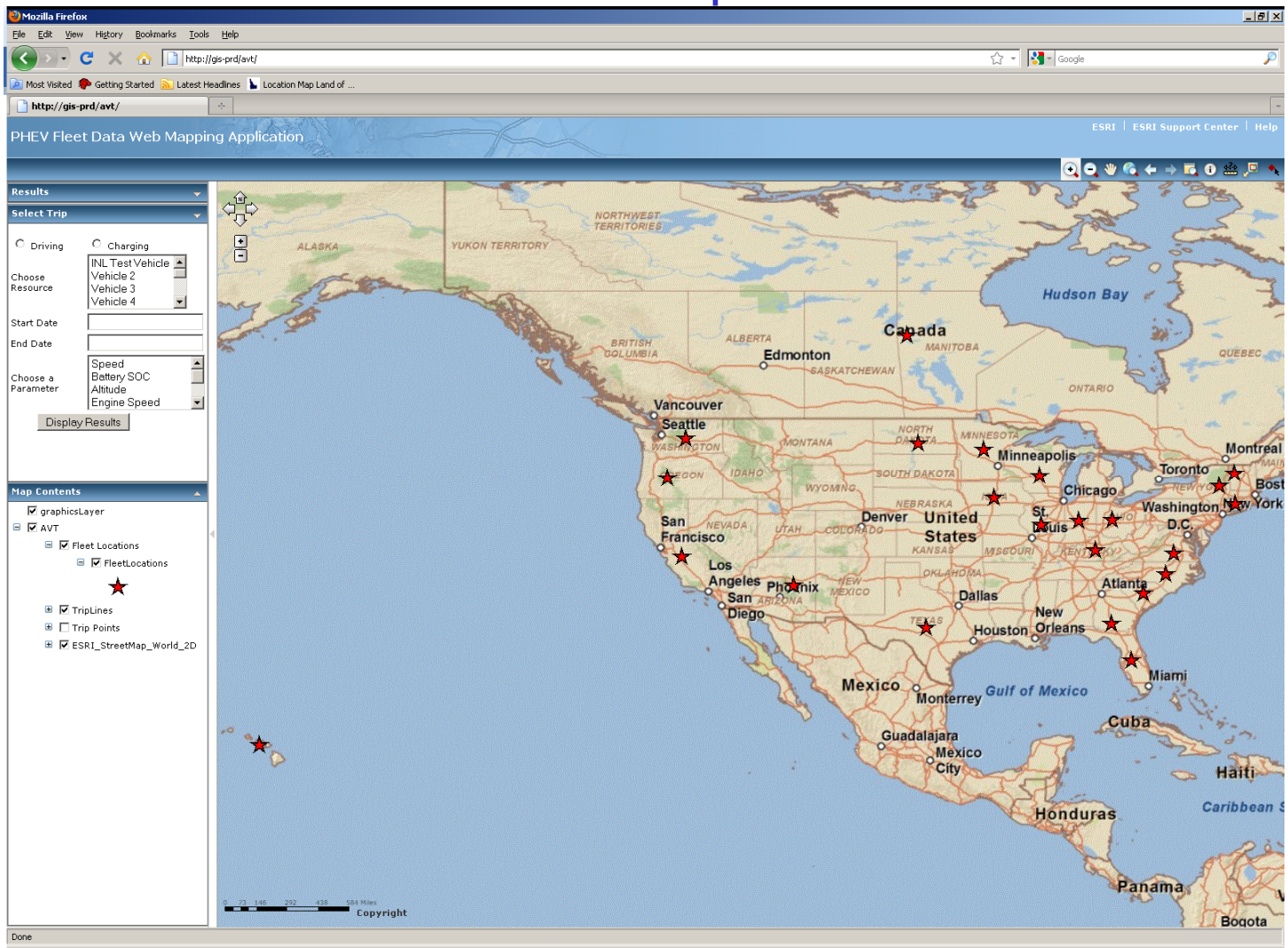
Approach – Enhance Current INL PHEV Data Analysis



Accomplishments – FY10

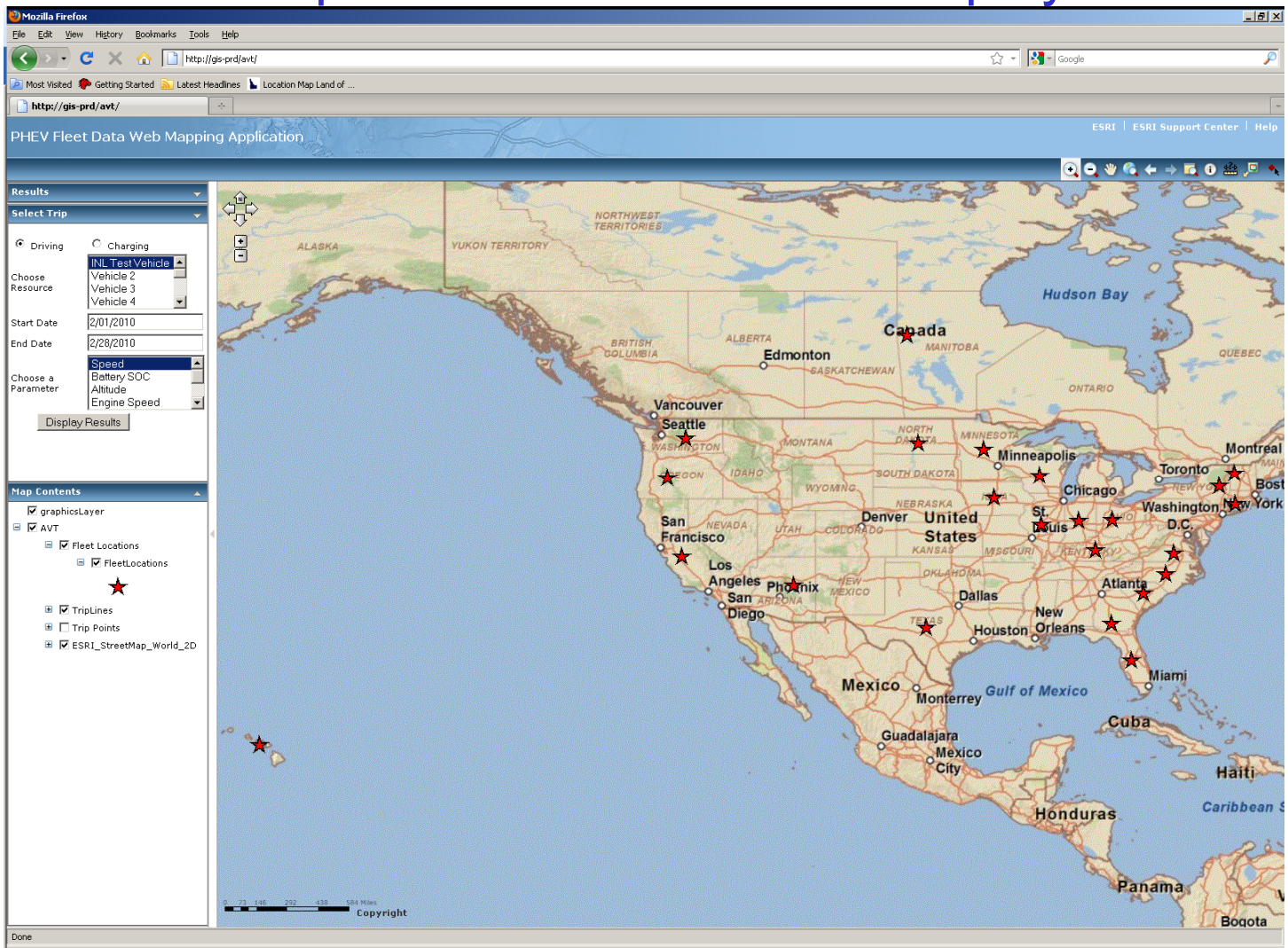
- Developed the internet map server that graphically displays trip data

Initial Map View



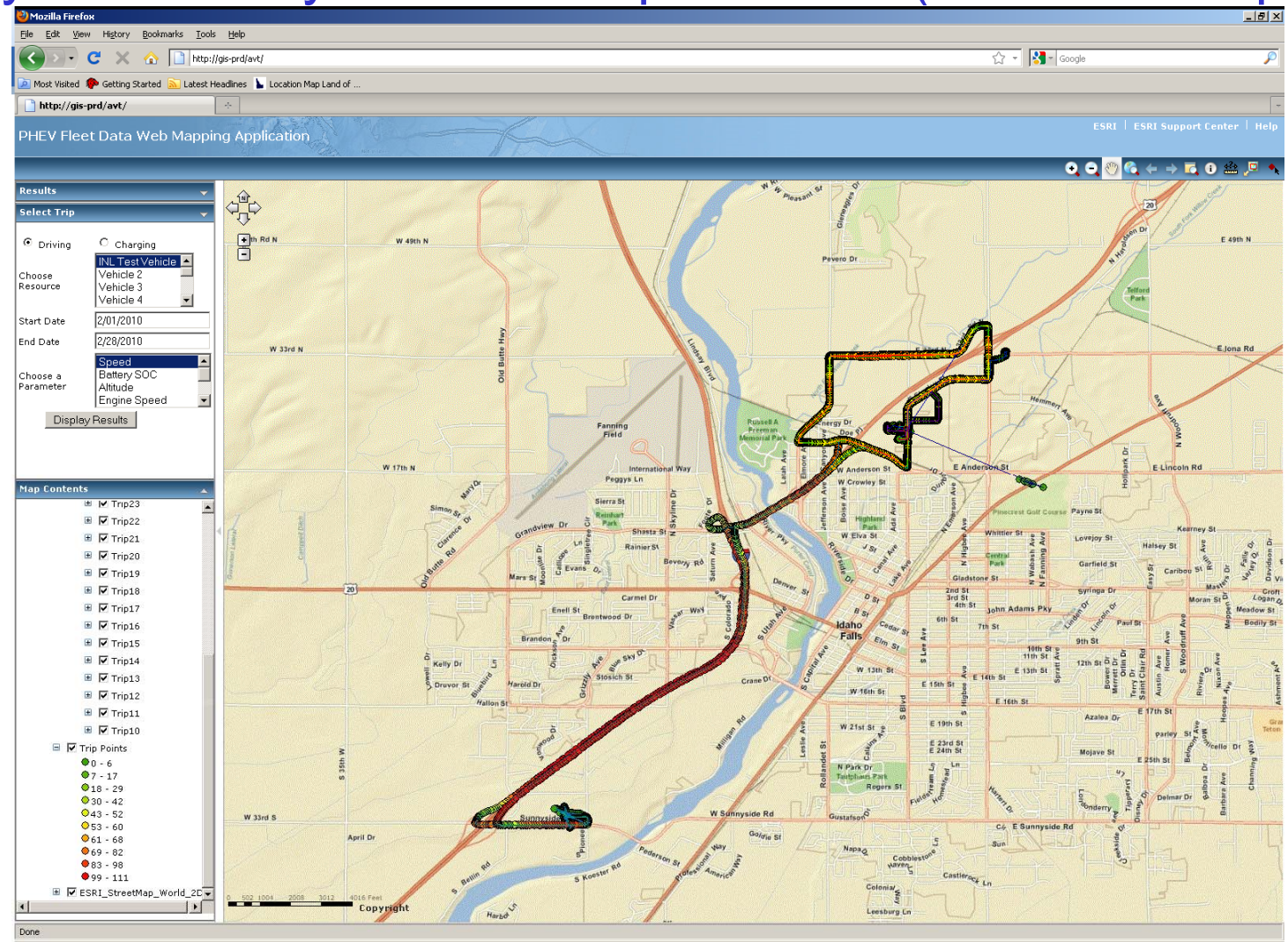
Accomplishments – FY10

User selects parameters and clicks Display Results



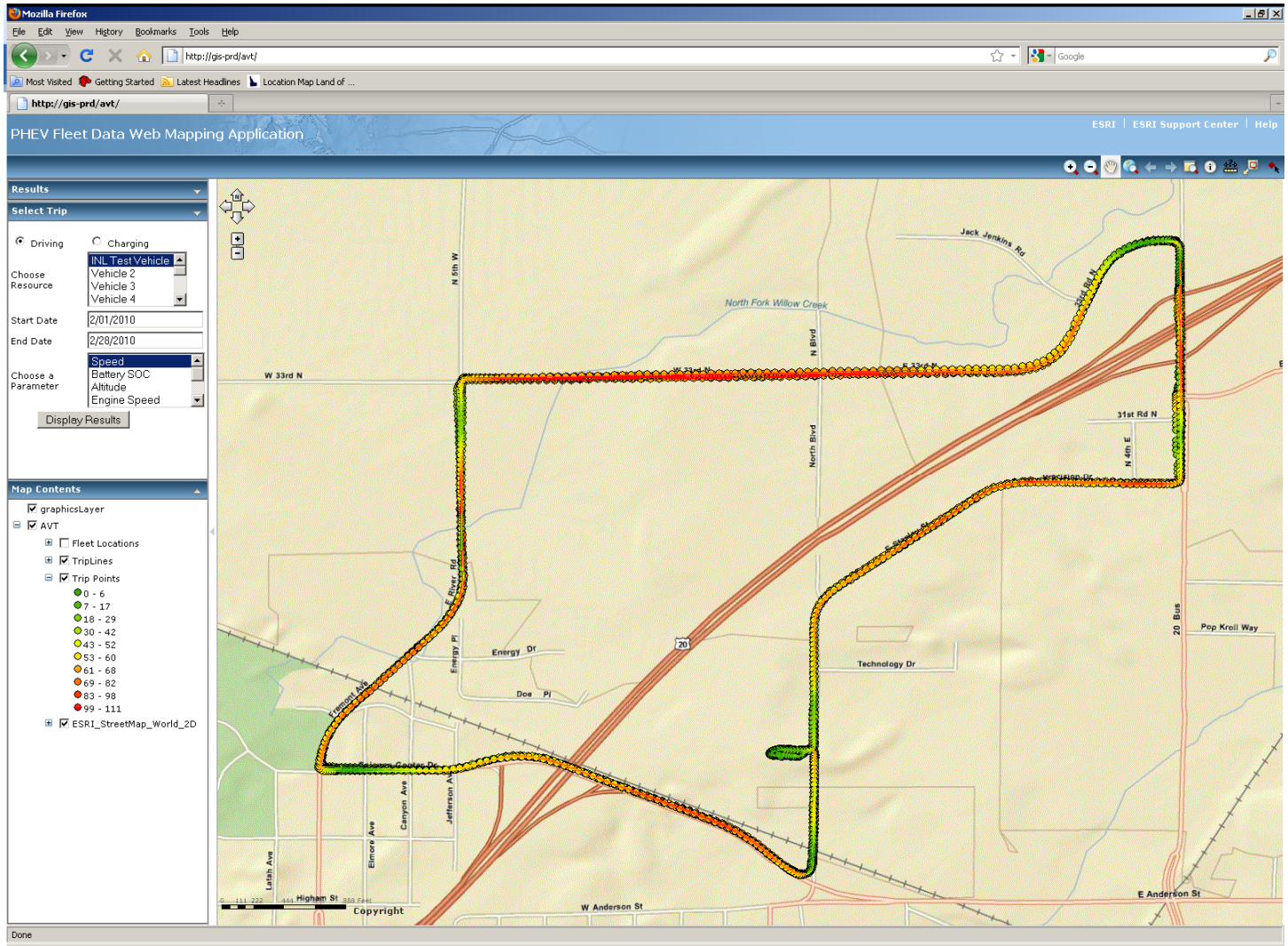
Accomplishments – FY10

Map zooms to location and displays all trips points & lines symbolized by the chosen parameter (in this case speed)



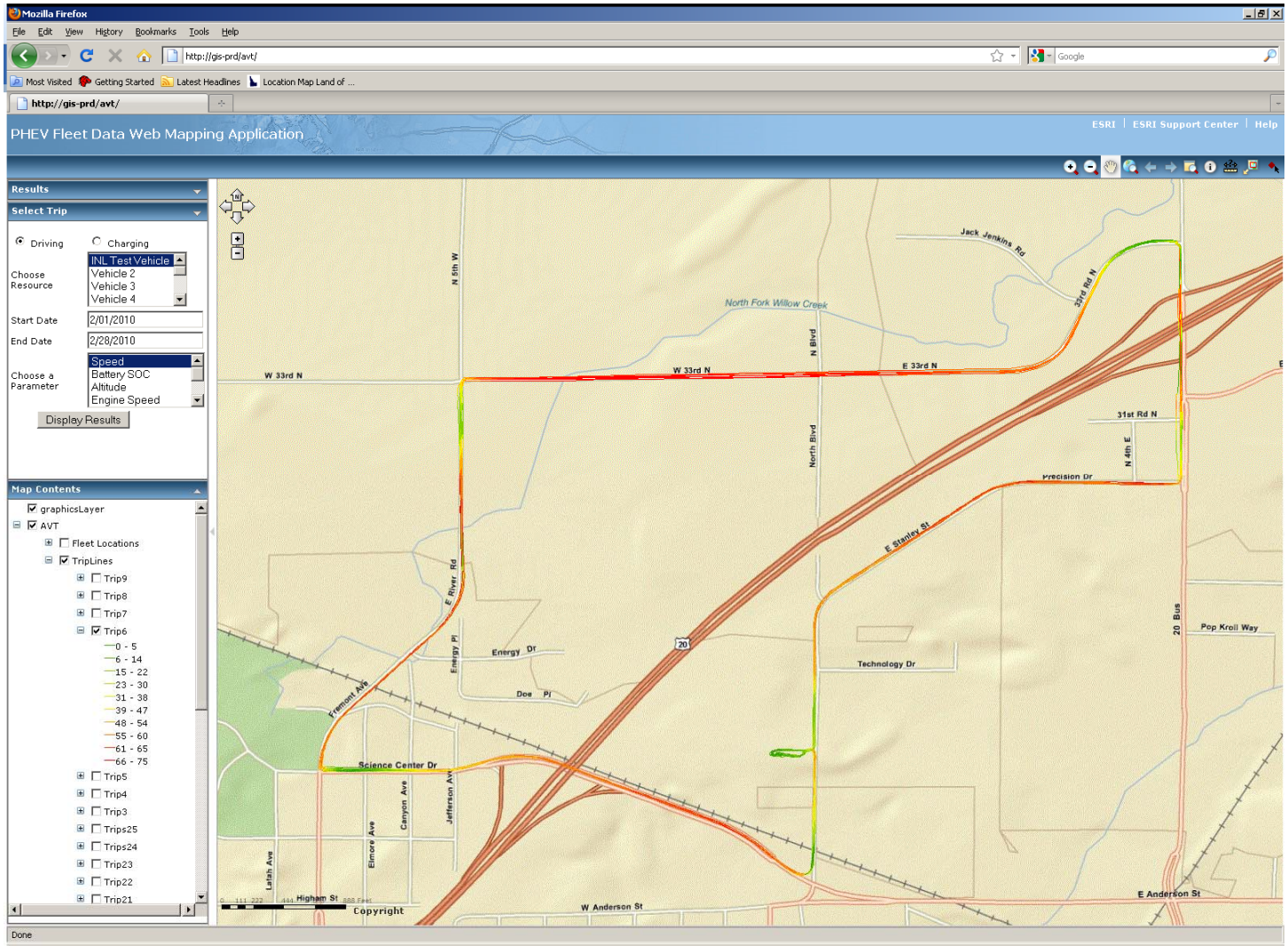
Accomplishments – FY10

Simplify the view and only display one trip



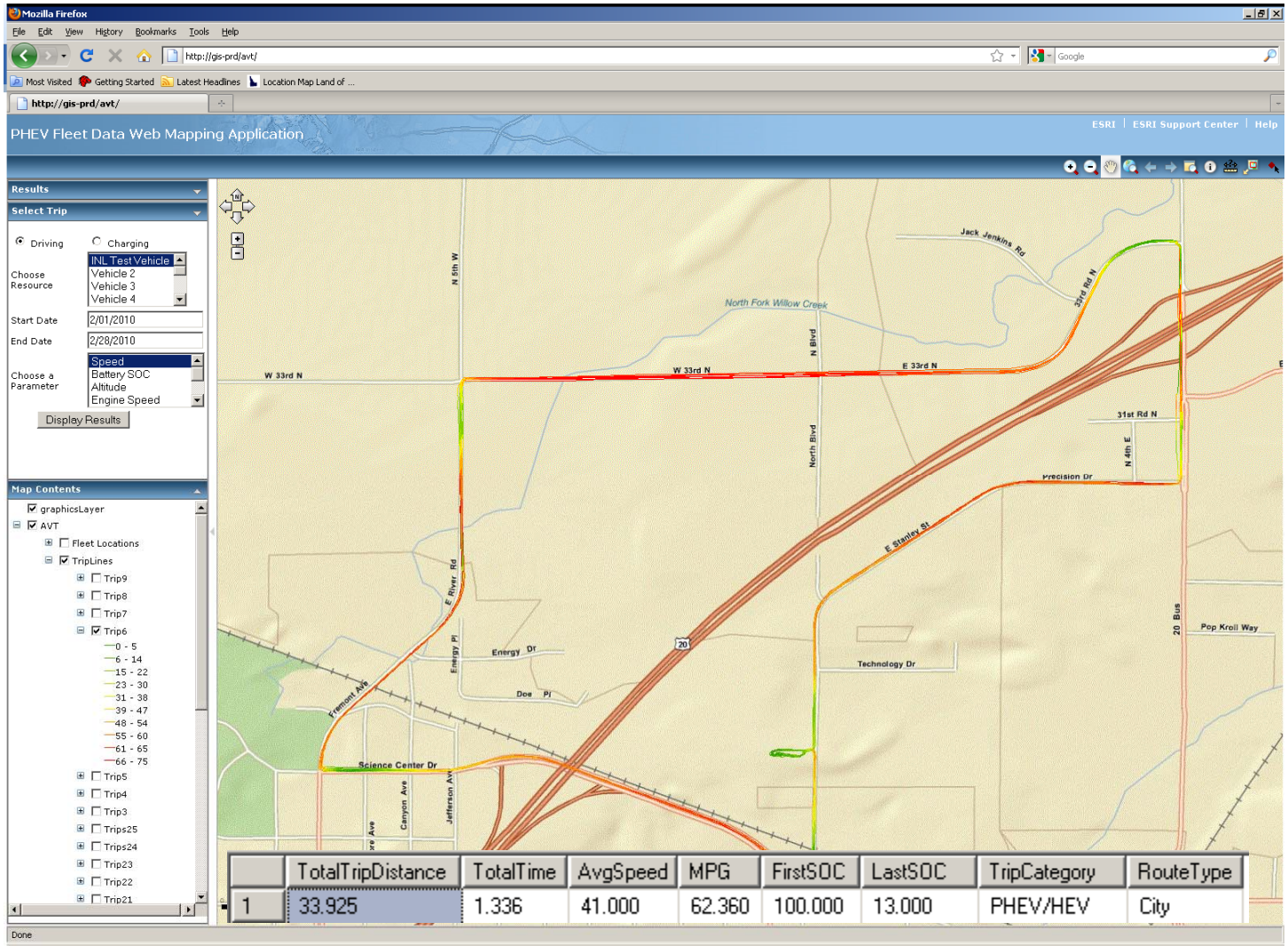
Accomplishments – FY10

Display only the line data and symbolize by speed



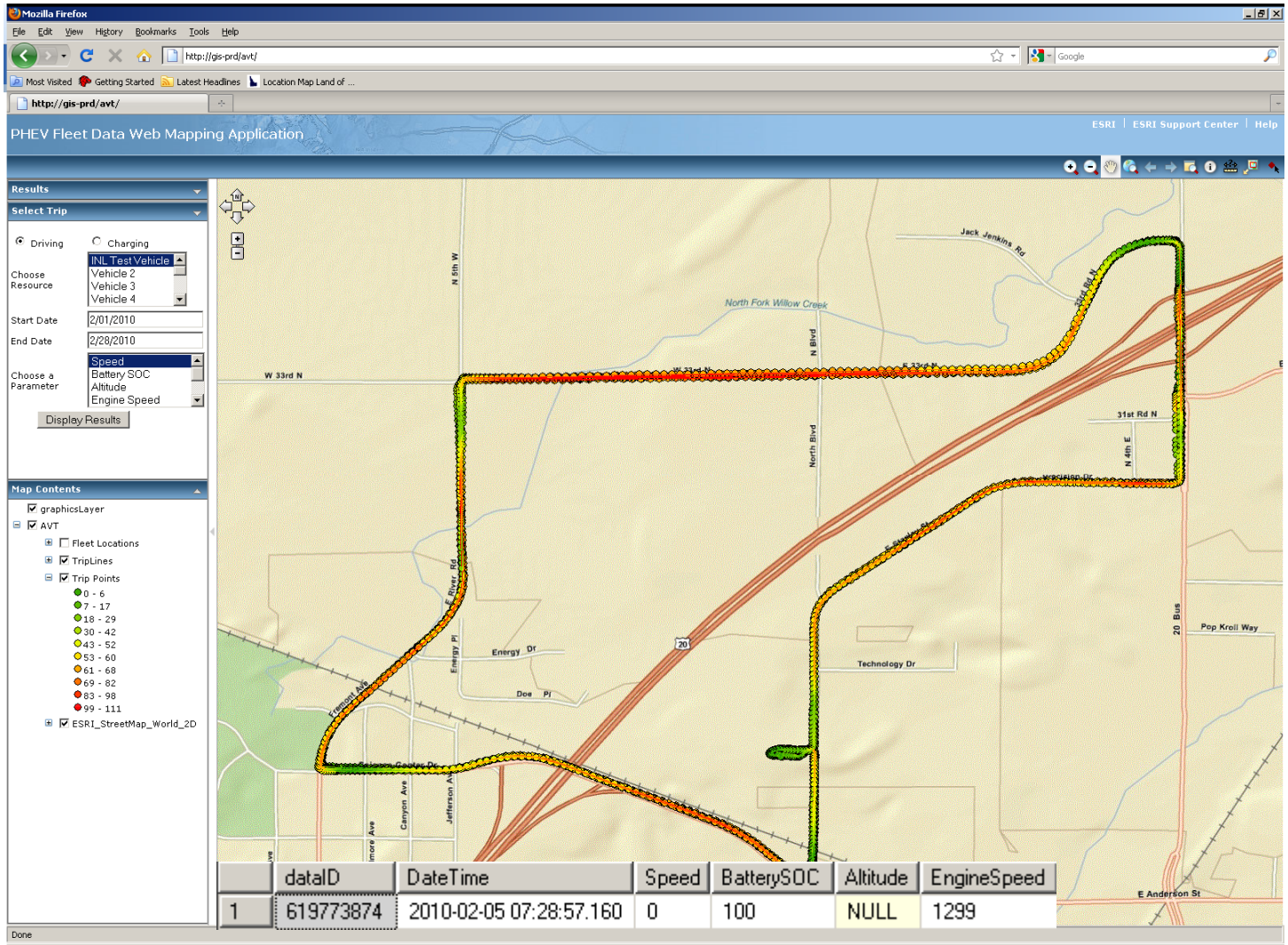
Accomplishments – FY10

Click on the line to display trip summary information



Accomplishments – FY10

Click on a point to display individual point data



Collaborators

- **Idaho State University**
  - provides design advice and GIS technical expertise
- **ETEC**
  - provided the vehicle for which the data is display within this presentation

Proposed Future Work

- Use Digital Elevation Model of the US to calculate instantaneous slope
  - Enhance our current aggressiveness algorithm
- Attribute data points with a road type (city vs. highway)
  - Intersecting point data with Environmental Systems Research Institute (ESRI) street map data
  - Evaluate results vs. current trip type determination algorithm
- Integrate GIS Map Application with QA
  - Enable graphic display of trips failing INL QA procedures
- Document Results and Application Design

Summary

- INL developing a web based GIS to help visualize PHEV Fleet Data

- Project scheduled to be completed in December 2010
  - Will include:
    - Trip Type Determination
    - Slope Calculation
    - QA Integration
    - Project Documentation

- INL is working with Idaho State University and ETEC to develop the GIS application