Research Statement Title:

Promoting transportation data efficiency *to improve transportation, environmental and energy planning*.

Problem Description and Discussion:

Cost of primary data collection are high, so methods to improve the ability to share the costs of collection, avoid duplication of effort, and to improve the accessibility of already collected data will benefit many.

Benefits of increased cooperation and coordination will accrue to transportation analysts in traffic operations, long range transportation planning, financial forecasting, vehicle design, air quality and climate change analysts, and energy infrastructure planners. Challenges to increased coordination include: organizational silos, privacy concerns to protect high resolution (e.g. GPS) data, and xxx.

Expanded data accessibility would also assist new stakeholders from emerging or previously unrecognized analysis areas. The below list summarize just a few of the currently isolated efforts that could experience synergetic benefits if coordinated.

Travel Behavior Surveys –

Probe Vehicle Surveys – have similarly proliferated due to GPS technology advancements and can provide an alternate assessment of network transit times and speed calculations. System operators require real-time reporting of vehicle speeds and the presence of vehicles within the stream to resolve incidents and improve roadway performance. Companies involved in Intelligent Transportation System (ITS) work and in-vehicle navigation systems desire this same information in order to provide intelligent traffic routing, accurate travel time predictions and information to help drivers avoid traffic jams. Air quality analysts also benefit from data on temporal and seasonal variation of speeds and operating states for the different types of vehicles on the roadway.

Climate Change and Energy Security Concerns – are at the forefront of contemporary challenges driving new analysis and data needs. •

Automobile researchers and manufacturers developing hybrid and plug-in hybrid electric vehicles (HEVs and PHEVs) When combined with vehicle simulation tools, this information helps inform design decisions (engine, motor, battery sizing, etc), permits analysis of different vehicle charging scenarios and fueling/recharge station locations, and allows estimation of fuel savings relative to conventional technologies under “real-world” operating profiles.

Analysts assessing various strategies to reduce green house gas (GHG) emissions require better access to on-going data from panel surveys or passive data collection instruments. This information is needed to give more rapid feedback to policymakers on the actual outcomes of GHG reduction initiatives and to sort out phenomena such as rebound effects (i.e. simply driving efficient vehicles farther).

Lastly, policy makers are concerned with resource needs, allocation and how to pay for infrastructure improvements, and look at public and private partnerships as well as congestion pricing mechanisms to share costs.

Proposed Research Activity:

Task 1a – Review existing data collection efforts from planning, operations, private and administrative sources, as well as recent advancements in passive data collection. Determine the value of combining and repurposing these existing sources to meet the range of traditional and emerging needs. Outcomes could include efficiency-improving principles such as "collect once, use many times" and data recycling, with special attention toward the implementation of **efficient archiving procedures.**

Task 1b – Recommend a protocol or framework for how to integrate presently siloed efforts with varying survey focuses. Highlight methods for maintaining awareness amongst the different constituencies so that they can form partnerships.

Task 2a – Examine the issues involved with integrating GPS/ITS technology and

traditional data collection methods to meet the needs of the diverse planning, operation, engineering, manufacturing and research stakeholders. Include consideration of the new analyses required for moving to a **“greener” transportation** system.

Task 2b – Develop a protocol or framework for how GPS/ITS and traditional survey data should be interrelated, integrated, formatted, collected and stored for **archival purposes**.

Task 3a – Evaluate ways to address privacy concerns from integrating GPS and diary survey data while maintaining the ability to use the data for analyses. (Note that modeling, simulation and calibration of analysis engines often require availability of data in its native form).

Task 3b – Recommend a protocol or framework to strike an appropriate balance between privacy protection and data accessibility.

Estimate of Problem Funding and Research Period:

Estimated Time: 24 months Estimated Cost: $600,000

Urgency, Payoff Potential and Implementation:

This project will improve coordination and partnership opportunities between organizations—leading to more efficient and effective use of limited resources The project will improve the ability to share GPS and other detailed geographic data to transportation, environmental and energy analysts.

Persons Developing the Research Proposal:

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