

# Integrated Assessment: Potential for Innovative and Disruptive Applications of Technology in Personal Vehicles



## **Connected Vehicle Proving Center**

*Mohammad Poorsartep*

*Steve Underwood (Principal Investigator)*

## **Center for Advanced Transportation and Energy Solutions**

*Steve Marshall*

*John Niles*

## **Sponsor**

*Graham Environmental Sustainability Institute*

*University of Michigan*

**Project Objective:** this project aims to frame several conspicuous problems associated with today’s automobiles, engage stakeholders in an investigation of the emerging technologies and the impact they could have on those problems, and explore future scenarios where technology is applied to overcome problems. The project time frame is through September 2013.

In this effort, five “wicked problems” in surface transportation are identified. This project suggests that future vehicles will have five attributes that incrementally address the identified “wicked problems”.

**Integrated Assessment:**

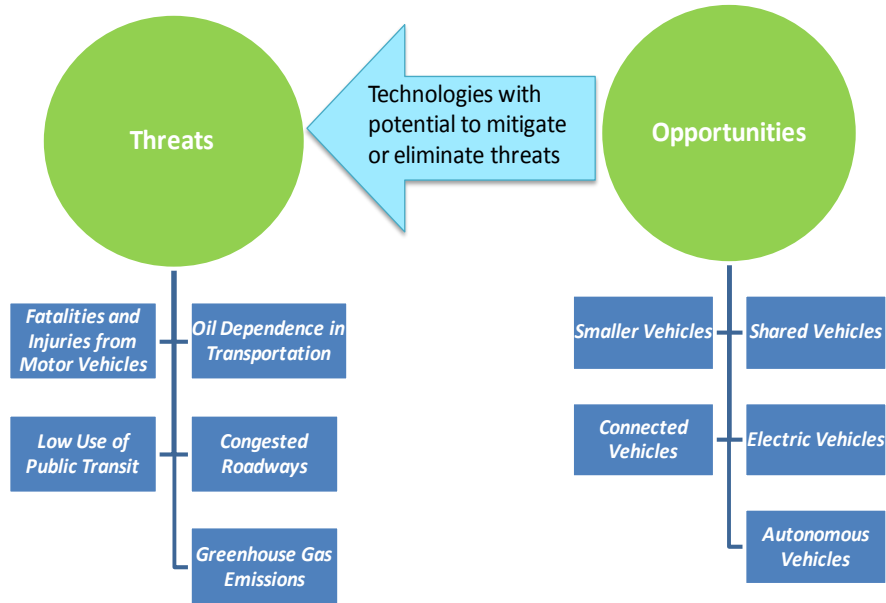
The IA methodology is an interdisciplinary approach based on combining, interpreting and communicating knowledge

from diverse scientific disciplines to policy in such a way that an entire cause–effect chain of a problem can be evaluated from a synoptic, overall public policy perspective.

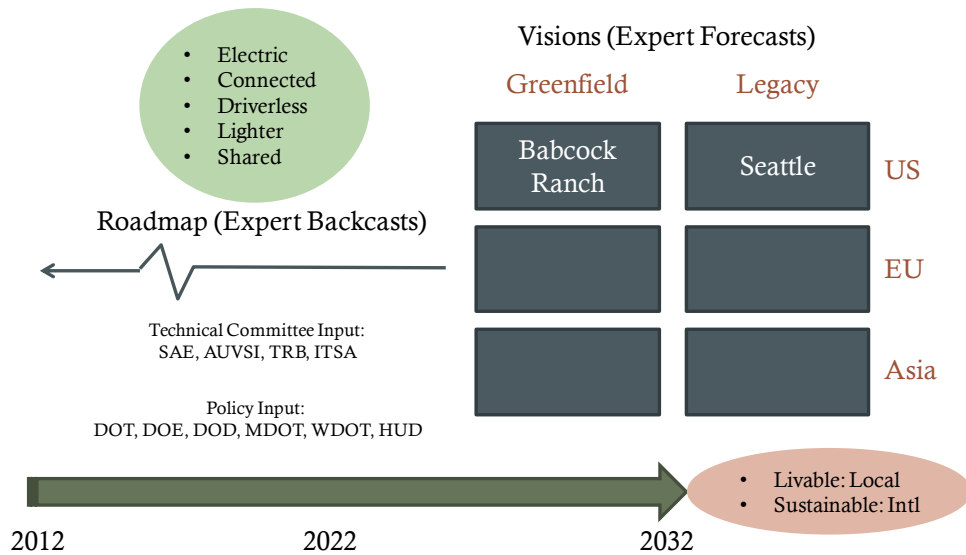
**Wicked Problem:** This term describes a problem that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize. The term ‘wicked’ is used, not in the sense of evil but rather its resistance to resolution. Moreover, because of complex interdependencies, the effort to solve one aspect of a wicked problem may reveal or create other problems.

**Approach:** After quantifying and framing the problems and their interdependencies, this project will use stakeholder input to predict and generate several future scenarios where some or all the vehicles attributes are realized and implemented in addressing the problems. Then the project will employ backcasting from the given scenarios to learn the technological, societal, and regulatory frameworks required to realize each given future scenario. The process is depicted in the diagram below with inputs from example policy and technology organizations identified.

**Partnership:** Connected Vehicle Proving Center (CVPC) at University of Michigan-Dearborn has partnered with Center for Advanced Transportation and Energy Solutions (CATES) located in Seattle area to execute this project. CATES is a new non-profit think-and-do organization founded to understand and promote technology-based improvements in personal mobility, with an initial focus on battery-powered cars increasingly equipped with capabilities based on computerization and wireless communications, described in one word as *telematics*. Most



importantly, CVPC and CATES also seek participation from organizations, associations, and individuals desiring to participate in assessment activities from any knowledge-based perspective.



**Location:** The Seattle-Tacoma urban region in Washington State – with a strong popular focus on environmental protection and technological innovation – has been chosen as a geographic focus for examining alternatives. The research teams has further specified a sub region—an urban area south of Seattle along Interstate 5 centered on Joint Base Lewis-McChord (JBLM)—that has unique and favorable attributes for considering what new sustainable, livability prospects may be possible with future vehicles. This location also enables the leveraging of existing grants and programs with federal, state and local government agencies, and with private companies that have expressed an interest in the design and conduct of a demonstration pilot project in this region. One key linkage is to existing Federal HUD/EPA/DOT Livable Communities grants to the Metropolitan Planning Organizations north and south of JBLM on one of the most congested transportation corridors in the region. Another linkage is the existing South Sound Military and Communities Partnership addressing problems associated with the 152,000 vehicle trips per day generated by JBLM.

**How can you contribute?** Given that Integrated Assessment is at the heart of our approach, we are looking to connect with policy and technology experts related to autonomous, connected, and electric vehicles -- as well as transportation planners and decision makers shaping the environments for these vehicles -- to participate in our scenario generating and analysis processes.

**Contact:** If you seek further information, or wish to explore your potential participation in the Integrated Assessment, please send an email to [cvpc-grahamproject@umich.edu](mailto:cvpc-grahamproject@umich.edu) and a member of the project team will get in touch with you.