



UNITED STATES
DEPARTMENT OF TRANSPORTATION

Applications for the Environment: Real-Time Information Synthesis (AERIS) – Overview

Fall/Winter Webinar Series
Webinar #2

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AERIS

Overview

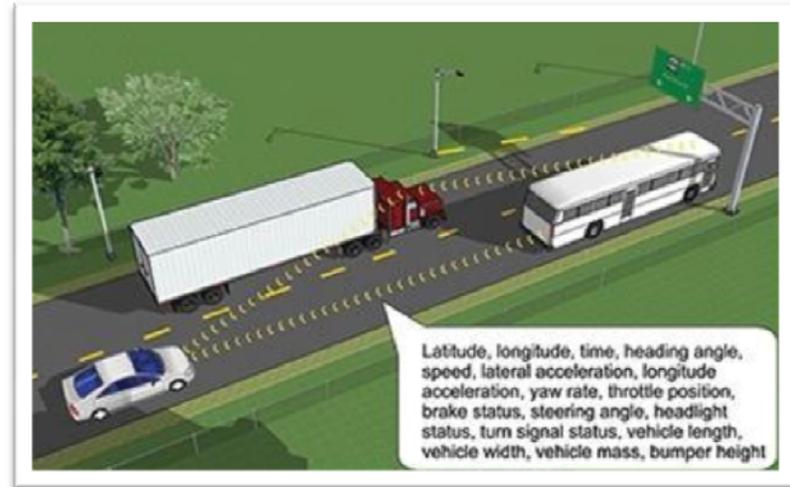
- What is Connected Vehicle Research?
- Transportation and the Environment
- AERIS Research Program
- BAA Research Projects
- AERIS Fall/Winter Webinar Series



What is Connected Vehicle Research?

Connected vehicle research is a suite of technologies and applications that use wireless communications to provide connectivity:

- Among vehicles of all types
- Among vehicles and roadway infrastructure
- Among vehicles, infrastructure, and wireless consumer devices



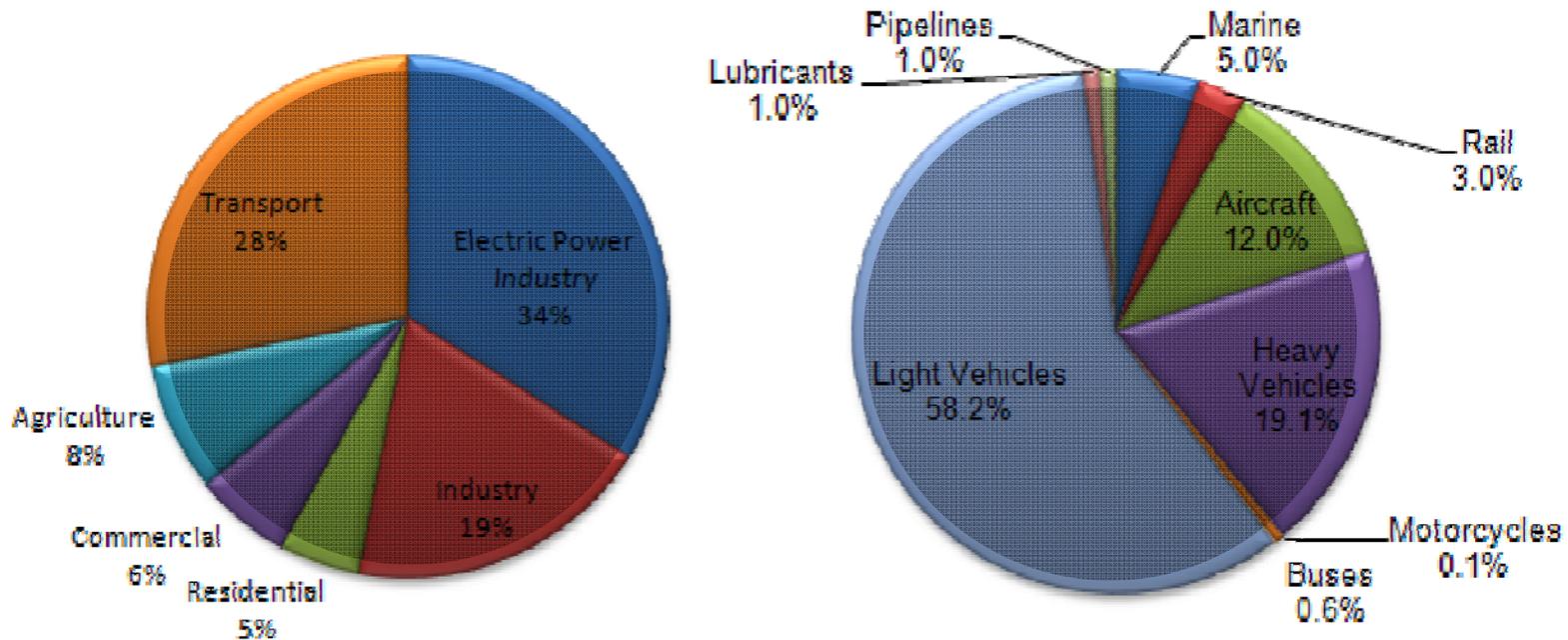
Why Is Connected Vehicle Research Needed?

- USDOT connected vehicle research aims to tackle some of the biggest challenges in the surface transportation industry in the areas of safety, mobility, and environment
 - **Safety** | In 2009, there were 5.5 million crashes, resulting in 33,808 fatalities and 2.2 million injuries. Motor vehicle crashes are the leading cause of death for people ages 3 through 34.
 - **Mobility** | U.S. highway users waste 4.8 billion hours a year stuck in traffic – nearly one full work week (or vacation week) for every traveler. The overall cost (based on wasted fuel and lost productivity) reached \$115 billion in 2009 – more than \$808 for every U.S. traveler. Delays in truck operations alone resulted in \$33 billion in wasted fuel and lost productivity.
 - **Environment** | The total amount of wasted fuel topped 3.9 billion gallons in 2009 according to the Texas Transportation Institute.

Transportation and the Environment

Surface transportation has a significant impact on the environment:

- 3.9 billion gallons of wasted fuel each year
- Transport sector accounts for 28% of GHG emissions in the US
- Vehicles represent almost 80% of the transport sector GHG



Source: EPA. *Inventory of U.S. Greenhouse Gas Emissions and Sinks, 1990 to 2006*. 2008.

AERIS Research Objectives

- **Vision** | Cleaner Air through Smarter Transportation
- **Objectives** | Investigate whether it is possible and feasible to:
 - Generate/capture environmentally-relevant real-time transportation data (from vehicles and the system)
 - Use this environmental data to create actionable information that can be used by system users and operators to facilitate “green” transportation choices for all modes
 - Assess whether doing these things yields good enough environmental benefits to justify further investment by the USDOT

TRANSFORMATIVE and INNOVATIVE



The AERIS Program



- Five Years, Six “Tracks”
- Multimodal Approach
- Working with Data Capture and Management Program and Dynamic Mobility Applications Program

Track 1: Foundation

Establish the foundation by reviewing the state of the practice

Track 2: Identification

Identify initial candidate strategies, scenarios and applications that appear to improve decisions by public agencies and travelers

Track 3: Analysis

Analyze and evaluate candidate strategies, scenarios and applications that make sense for further development and evaluation

Track 4: Recommend

Recommend strategies, scenarios and applications

Track 5: Policy

Develop the facts and evidence needed to inform and respond to possible future policy and regulatory issues/needs

Track 6: Stakeholders

Engage stakeholders and foster technology transfer



Track 1: Establish the Foundation

AERIS State-of-the-Practice Assessments

- Applications for AERIS State of the Practice Assessment
- State of the Practice Assessment of Techniques for Evaluating the Environmental Impacts of ITS Deployment
- State of the Practice Assessment of Behavioral and Activity-Based Modeling
- State of the Practice Assessment of Environmental Models
- State of the Practice Assessment of Technology to Enable Environmental Data Acquisition

***All reports are now complete and will be
publicly available soon***



Track 1: Establish the Foundation

Broad Agency Announcement (BAA) Research Projects

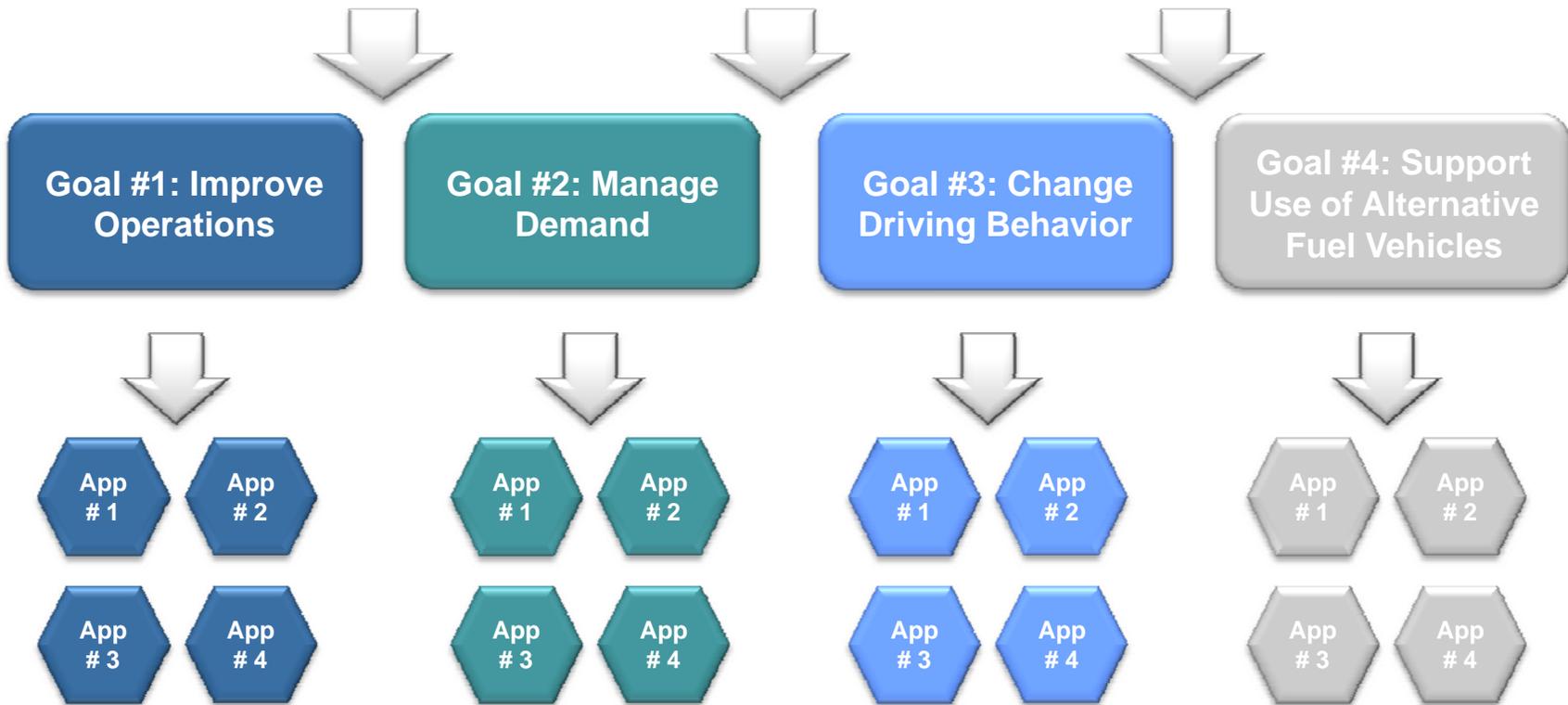
- **Purpose of Issuing the BAA:**
 - To expand knowledge of and experience with implementation of ITS applications to improve environmental performance by leveraging partners' research results and investments

- **Objectives of BAA Research:**
 - Foster innovative research on ITS applications that improve environmental performance, and possibly develop new applications
 - Promote capture and management of real-time data that are relevant to environmental applications development and performance measurement
 - Support development and enhancement of evaluation techniques, performance measurement, and technologies to capture environmentally-relevant data

BAA Research Partners

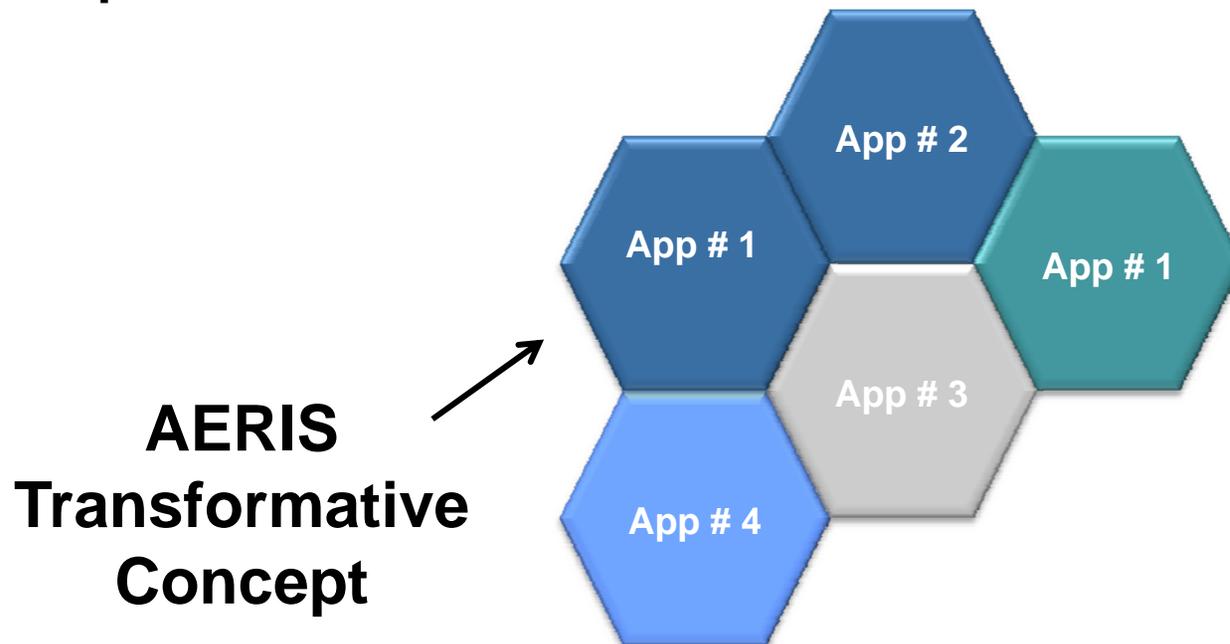
1. An Evaluation of Likely Environmental Benefits of Lowest Fuel Consumption Route Guidance in the Buffalo-Niagara Metropolitan Area | [University at Buffalo](#)
2. Developing and Evaluating Intelligent Eco-Drive Application | [Virginia Tech](#)
3. Developing Eco-Adaptive Signalized Intersection Algorithms | [Virginia Tech](#)
4. Preliminary System Development Plan for an AERIS Data Capture and Management System | [Mixon Hill](#)
5. Eco-ITS | [University of California – Riverside \(UCR\)](#)
6. Use of Trucks' On-board Data for Real-Time Emission Modeling | [Calmar Telematics and UCR](#)
7. Engaging the International Community | [University of California Partners for Advanced Transit and Highways \(PATH\) Program](#)

AERIS Transformative Concepts



AERIS Transformative Concepts

- Integrated operational concepts that use connected vehicle and other data and communications in **innovative ways** to operate surface transportation networks **to reduce environmental impacts resulting from transportation-related emissions and fuel consumption.**



AERIS Transformative Concepts | Context

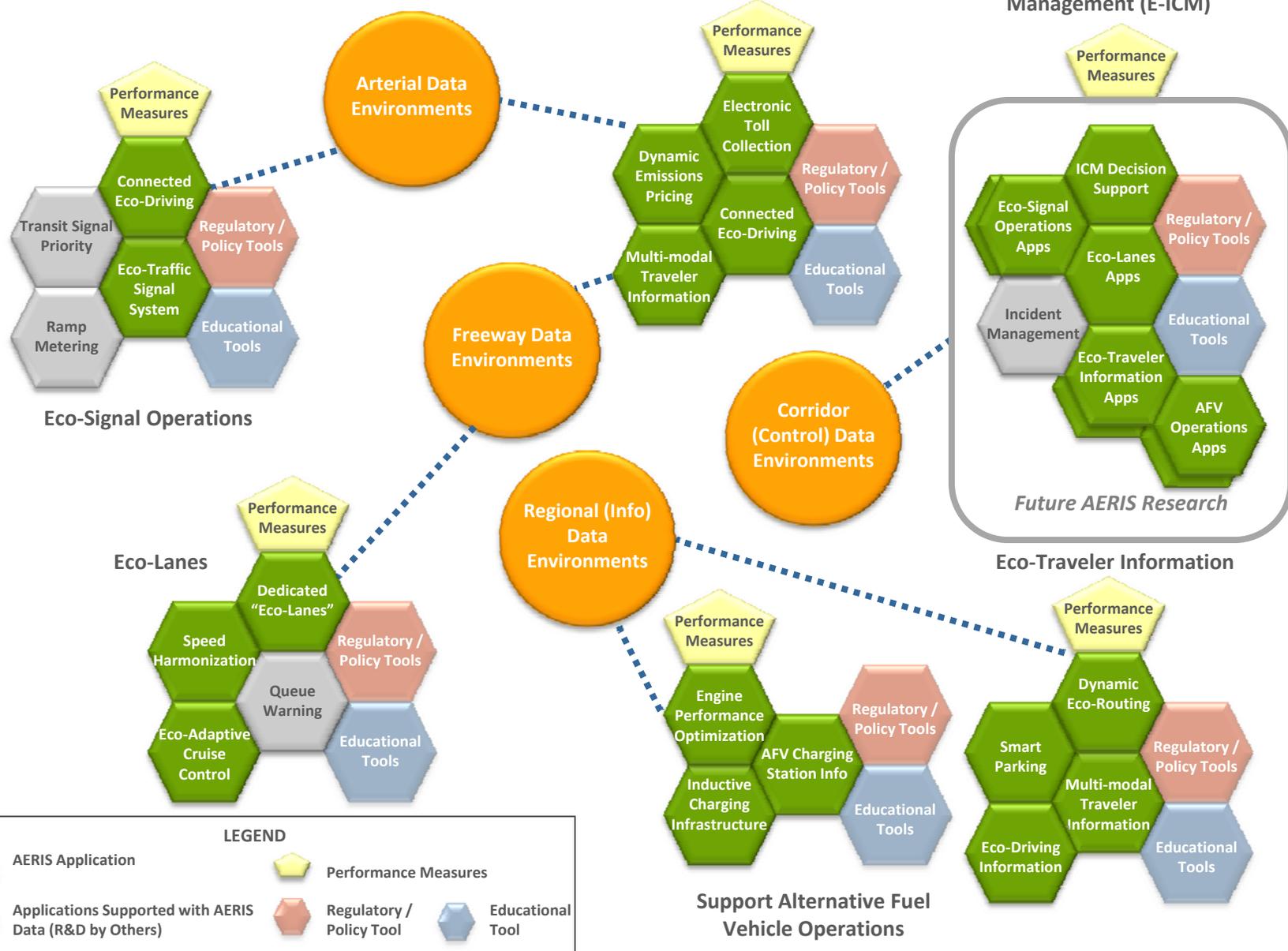
- AERIS Transformative Concepts are scalable; varying in complexity, geographic limits, and deployment timeframes (30+ years in some cases).
- AERIS Transformative Concepts consider multi-modal applications understanding that significant environmental benefits can be achieved by transit and freight communities.
- AERIS Transformative Concepts include technical, policy, and other issues.
- At this time, AERIS Transformative Concepts are not recommendations for deployment.
- AERIS Transformative Concepts are “modeling scenarios” developed to: (1) determine potential environmental benefits, (2) understand mobility trade-offs, (3) assess data needs and availability of data within a connected vehicle environment, and (4) facilitate development/enhancement of environmental algorithms.



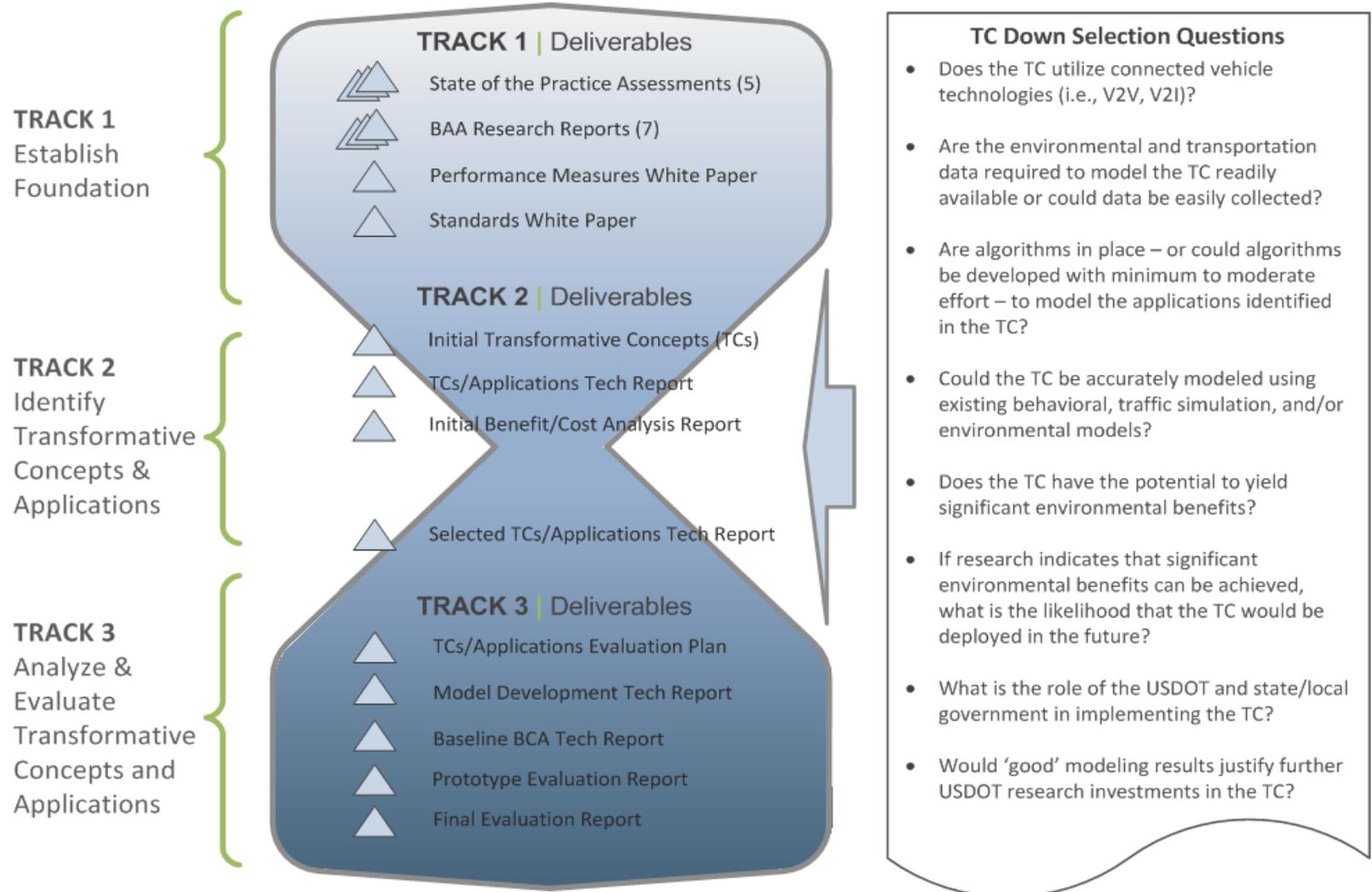


AERIS TRANSFORMATIVE CONCEPTS

Cleaner Air through Smarter Transportation



AERIS Transformative Concepts Down Selection



AERIS Fall/Winter Webinar Series

- **AERIS Broad Agency Announcement Foundational Research: Webinar #1**
Wednesday, September 14, 2011 *1:00 p.m. ET*
- **ARIES State-of-the-Practice Modeling Assessments Webinar**
Wednesday, October 5, 2011 *1:00 p.m. ET*
- **AERIS Broad Agency Announcement Foundational Research: Webinar #2**
Wednesday, November 9, 2011 *1:00 p.m. ET*
- **AERIS Broad Agency Announcement Foundational Research: Webinar #3**
Wednesday, December 14, 2011 *1:00 p.m. ET*



AERIS

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<http://www.its.dot.gov/aeris/index.htm>