



UNITED STATES
DEPARTMENT OF TRANSPORTATION

Applications for the Environment: Real-Time Information Synthesis (AERIS) State-of-the-Practice Assessments

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AERIS

**Sponsored by the ITS Joint Program Office, Research and Innovative
Technology Administration (RITA).**

Overview

- Transportation and the Environment
- AERIS Research Program
- State of the Practice Assessments
- Webinar Purpose

Transportation and the Environment

- Surface transportation activities accounted for 23 percent of all U.S. greenhouse gas (GHG) emissions in 2006. Transportation is the fastest growing source of U.S. GHG emissions
- Today's motor vehicles are responsible for up to half of all the emissions released into the air. Specific pollutant categories include 45 percent of the volatile organic compound (VOC) emissions, 50 percent of the nitrogen oxides (NOx) emissions, 60 percent of the carbon monoxide (CO) emissions, and 50 percent of the hazardous air pollutants in urban areas.
- Combustion of fossil fuels is the largest source (97 percent) of U.S. transportation GHG emissions
- ITS can play a vital role in reducing vehicle miles traveled, improving vehicle efficiency, and reducing petroleum consumption – all of which can reduce GHG emissions.



Source: www.enotrans.com



U.S. Department of Transportation

What is AERIS?

AERIS = Applications for
the Environment: Real-
time Information Synthesis

AERIS Research Program

- The AERIS program vision is to generate, capture, and analyze vehicle-to-vehicle and vehicle-to-infrastructure data to create actionable information that allows surface transportation system users and operators to make “green” transportation choices.

- The research program will be executed:
 - over 5 years,
 - through 6 tracks
 - that cover 3 phases.

- In Track 1 the program is establishing the foundation by reviewing comprehensively the state-of-the-practice. In 2010:
 - 7 AERIS partners began foundational research

 - AERIS contractors began 5 state of the practice assessments

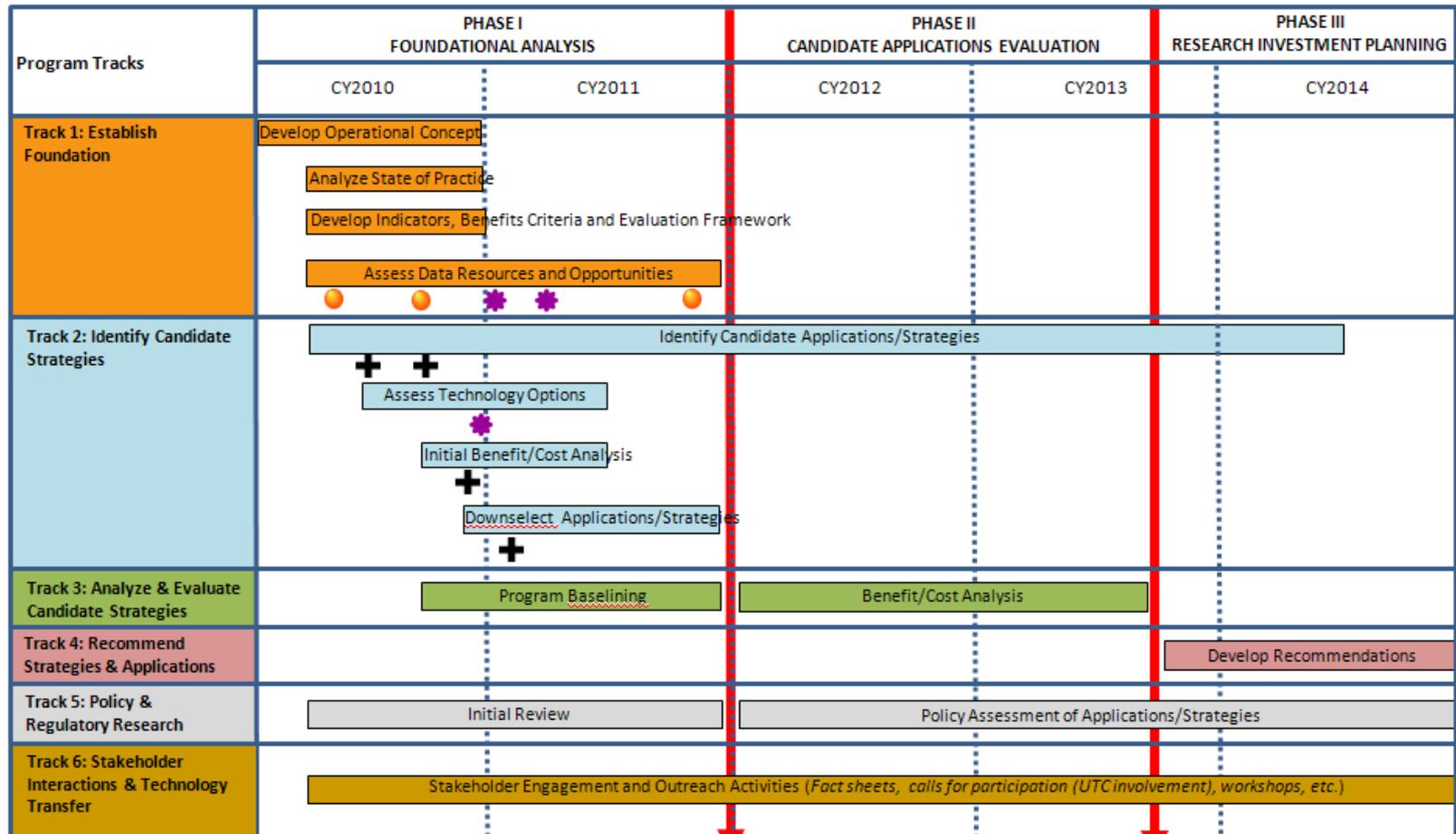


High-Level AERIS Roadmap

DRAFT

05/12/2010

Applications for the Environment: Real-Time Information Synthesis (AERIS) High-Level Roadmap



Do the applications/strategies show enough environmental benefits to warrant further investment? Are the stakeholders engaged?

Do the benefit/cost analyses indicate need for continued research?

- LEGEND:
-  Decision point
 -  Coordination with FHWA/FTA/FMCSA/NHTSA Research
 -  Coordination with Data Capture and Management and Dynamic Mobility Applications programs
 -  Resource from Data Capture and Management program

AERIS State of the Practice Assessments

- **State of the Practice Assessment of Behavioral and Activity-Based Modeling**
 - Draft report outline under USDOT review

- **State of the Practice Assessment of Environmental Models**
 - Draft report outline under development

- **State of the Practice Assessment of Technology to Enable Environmental Data Acquisition**
 - Draft report outline under development

- **Applications for AERIS State of the Practice Assessment**
 - Initial assessment complete
 - Draft report under USDOT review

- **State of the Practice Assessment of Techniques for Evaluating the Environmental Impacts of ITS Deployment**
 - Assessment complete
 - Draft report under USDOT review



Assessments in Progress

- **State of the Practice Assessment of Behavioral and Activity-Based Modeling**
 - Examine how behaviors may be influenced to reduce negative environmental impacts of surface transportation
 - Examine sensitivity and validity of models in representing traveler choices

- **State of the Practice Assessment of Environmental Models**
 - Assess sensitivity and validity of environmental models in representing various environmental measures for evaluating ITS strategies
 - Determine what data are needed (e.g., types, quantity, latency, granularity)
 - Make recommendations to improve models

- **State of the Practice Assessment of Technology to Enable Environmental Data Acquisition**
 - Determine what environmental data can be acquired or derived from vehicle-based and infrastructure-based sensors
 - Determine if more advanced sensors are needed
 - Determine if sensors need to measure and acquire different data or capture data at different levels of granularity



Completed Assessments

The purpose of this webinar is to summarize findings from two assessments.

- **Applications for AERIS State of the Practice Assessment**
 - Identify applications that have demonstrated environmental benefits through use of ITS technologies
 - Identify opportunities for the AERIS Program to leverage existing research

- **State of the Practice Assessment of Techniques for Evaluating the Environmental Impacts of ITS Deployment**
 - Identify techniques to evaluate environmental impacts of ITS deployments
 - Inform the AERIS Program on the use of appropriate techniques for assessing applications and strategies



Broad Agency Announcement (BAA)

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

- BAA Objectives:
 - 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 – Awardees

1. ECO-ITS | University of California – Riverside (UCR)
2. Developing IntelliDrive Eco-Adaptive Signalized Intersection Algorithms | Virginia Tech
3. Research on ITS Applications to Improve Environmental Performance | Mixon/Hill and the Texas Transportation Institute (TTI)
4. Engaging the International Community | University of California Partners for Advanced Transit and Highways (PATH) Program (UC Berkeley)
5. Developing and Evaluating Intelligent Eco-Drive Applications | Virginia Tech
6. An Evaluation of Likely Environmental Benefits of Lowest Fuel Consumption Route Guidance in Buffalo-Niagara Metropolitan Area | University of Buffalo
7. Research on ITS Applications to Improve Environmental Performance | Calmar and University of California – Riverside (UCR)



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AERIS Web Site

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

