Disseminating new findings. Each EAR Program-sponsored project includes a transition plan for finding appropriate research follow-up activities through disseminating new findings and pursuing the potential for continued research. Where the findings suggest the value of further investigation, the EAR Program identifies appropriate activities to engage interested stakeholders who may want to continue the research. For example, when new technologies developed in a project are meeting anticipated objectives, there may be interest in applied research at FHWA or among State departments of transportation, Transportation Research Board cooperative research programs, or private industry. Other research projects may lead to unexpected findings or clarification about questions and approaches, which could suggest continued investigation under the EAR Program.

Building capacity. The EAR Program also furnishes value by increasing the capacity of organizations and individuals to conduct research. For example, the EAR Program supports the National Research Council Research Associateship Program, which provides postdoctoral and senior scientists and engineers with opportunities to conduct research on projects that complement other EAR Program research.

GETTING INVOLVED WITH THE EAR PROGRAM

To take advantage of a broad variety of scientific and engineering discoveries, the EAR Program involves both traditional stakeholders (State department of transportation researchers, University Transportation Center researchers, and Transportation Research Board committee and panel members) and nontraditional stakeholders (investigators from private industry, related disciplines in academia, and research programs in other countries) throughout the research process. Since 2006, the EAR Program involved stakeholders throughout the following program activities:

- Identifying and scoping topics as part of over 50 meetings and scanning trips.
- Reviewing proposals and projects. More than 200 experts provided assessments of proposals, ongoing projects, or possible new projects. Most reviewers are from academic institutions and, in descending order, State and local departments of transportation, other Federal agencies, private companies, and the international community.
- Conducting research. The program has awarded 75 research projects on 43 different topics between 2007 and 2014. The research awards include work by multidisciplinary teams at 56 academic institutions, 35 private companies, 12 State and local agencies, and 10 Federal laboratories.

LEARN MORE

For more information, see the EAR Program Web site at www.fhwa.dot.gov/advancedresearch. The site features information on research solicitations, updates on ongoing research, links to published materials, summaries of past EAR Program events, and details on upcoming events.

VISIT THE EAR PROGRAM WEB SITE AT

www.fhwa.dot.gov/advancedresearch
About Exploratory Advanced Research

Exploratory advanced research focuses on longer-term, higher-risk research with a high payoff potential. It matches opportunities from discoveries in science and technology with the needs of specific industries.

The uncertainties in the research approach and outcomes challenge organizations and researchers to be innovative problem-solvers, which can lead to new research techniques, instruments, and processes that can be applied to future high-risk and applied research projects.

International Collaboration

Access to international expertise is critical for the EAR Program. In some research areas, governments, industries, and universities in other parts of the world have developed important advances that could be applied to U.S. highway transportation.

The FHWA EAR Program has engaged international experts by sponsoring scanning tours, convening forums, inviting expert reviewers, and offering postdoctoral research fellowships. FHWA expects to continue these ad hoc collaborations and to formalize longer-term relationships.

EAR PROGRAM FOCUS AREAS

The EAR Program funds research across a range of issues that are critical to the transportation industry:

- **Connected Highway and Vehicle System Concepts**—Emphasizes the longer-term needs to reach critical FHWA safety and mobility goals by developing the theory and assessing feasibility for systems that leapfrog current technological approaches for linking infrastructure with future vehicle and personal mobility technology.

- **Breakthrough Concepts in Material Science**—Leverages new approaches in materials science to produce innovative new highway materials with characteristics that enable enhanced functionality (including multifunctionality), constructability, sustainability, cost effectiveness or operating characteristics of highway infrastructure and system monitoring sensors to enhance highway safety, reliability, and resilience.

- **Human Behavior and Travel Choices**—Leverages research concepts from the social sciences, including psychology and economics, along with more traditional research for improving safety, reducing congestion, and improving the liability of the Nation’s communities.

- **Technology for Assessing Performance**—Seeks novel approaches and breakthrough technology that will revolutionize the use of performance management in the highway sector.

The EAR Program strives to develop partnerships with the public and private sectors because the very nature of EAR is to apply ideas across traditional fields of research and stimulate new approaches to problem solving. Through seven solicitations, the EAR Program has awarded 75 projects involving both government and academic researchers. These projects represent the investment of $72 million in FHWA funds and leverage $26 million in matching funds.

The EAR Program bridges basic research (e.g., academic work funded by National Science Foundation grants) and applied research (e.g., studies funded by State departments of transportation). Research may include improved understanding of phenomena that can accelerate or allow for new lines of applied research. An example is a project called “Driver Behavior in Traffic,” in which investigators characterize driver behavior using naturalistic driving data and agent-based modeling techniques for development of effective strategies to improve transportation safety and operations. This work will assist in future safety research.

In addition to sponsoring EAR Program projects that advance the development of highway infrastructure and operations, the EAR Program is committed to promoting cross-fertilization with other technical fields, furthering promising lines of research, and deepening vital research capacity.

- **Cross-fertilization**. Research may include the application of scientific and technological discoveries in other fields to transportation. An example is a project entitled “Intelligent Multisensor Measurements to Enhance Vehicle Navigation and Safety Systems,” in which researchers developed a robust and reliable vehicle-positioning system capable of providing accurate, high-update-rate, lane-level measurements for future vehicle navigation and control. In this project, investigators applied technology developed and tested in other industries, including aerospace, to improve highway safety.