

Measuring the Impact and Performance of Transport Research Programs

Effective research is critical for meeting emerging transport challenges.

Research, however, is difficult to measure. There can be significant time lags between the conduct of research and the return on the investment. Impacts can be diffuse, accruing to unexpected parties who build on the work of others.

The FHWA Exploratory Advanced Research (EAR) Program has been developing a suite of measures to monitor and improve overall Program portfolio performance and predict the potential impact of research.

The EAR Program uses different measurements of performance to provide a balanced scorecard for day-to-day program management and communication of results to internal and public stakeholders.

This poster provides information on EAR Program measures and background on the search for appropriate measurements that could suggest approaches for other transport research programs.

- Development began by scanning commonly used measurements from other transportation agencies research programs as well from other federal programs with a focus on engineering research.
- Like many research programs, measurement issues included finding an appropriate scale of effort and maximizing use of available data.
- Discussions with internal and external stakeholders lead development of baseline and target measurements from an initial set of possible measures.
- The Balanced Scorecard aligns measures under four perspectives – Financial, Customer, Internal business process, and Innovation and learning – to improve communication of performance.
- The EAR Program currently is refining measurements that reflect quality and availability of program data.

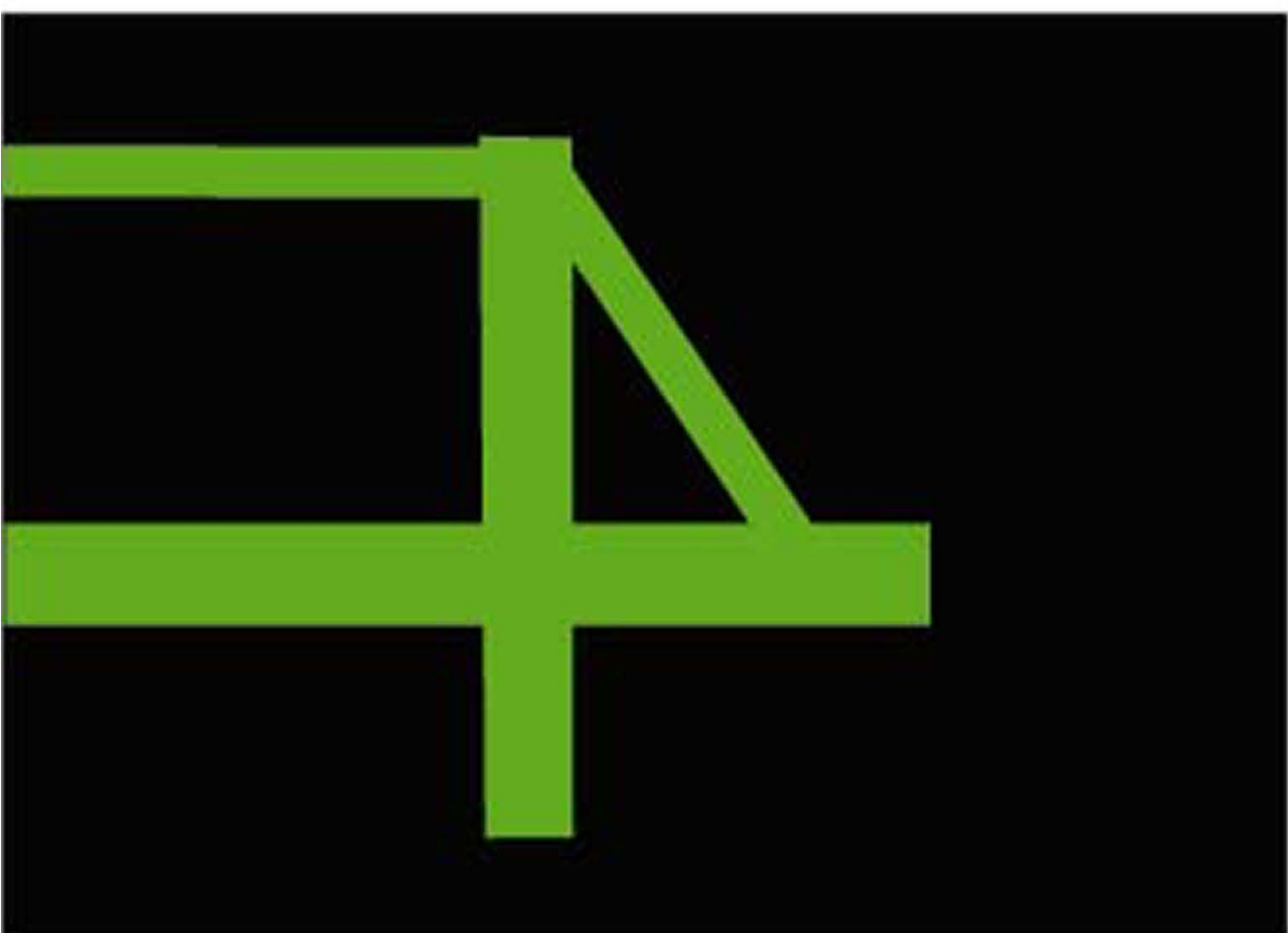
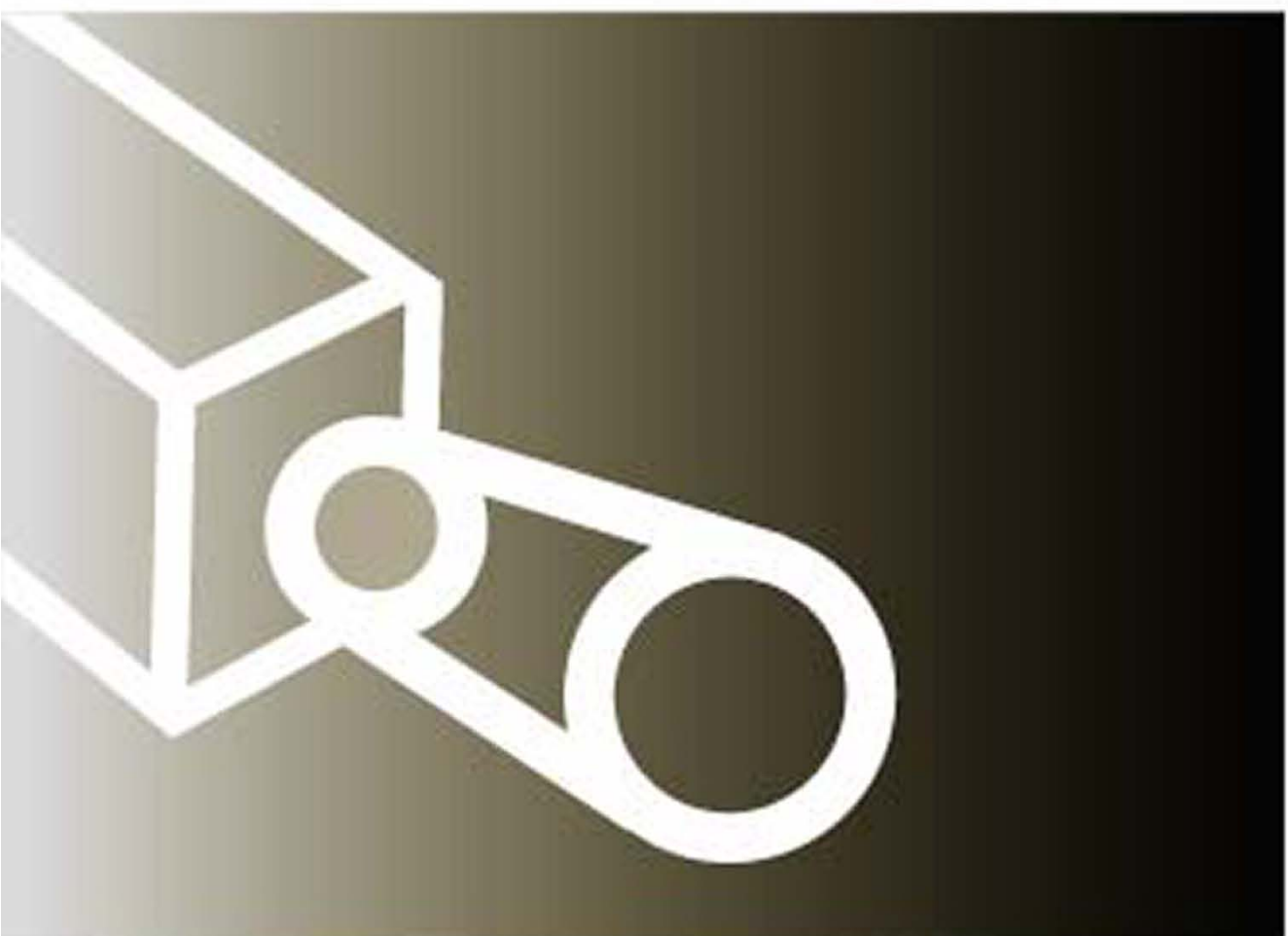
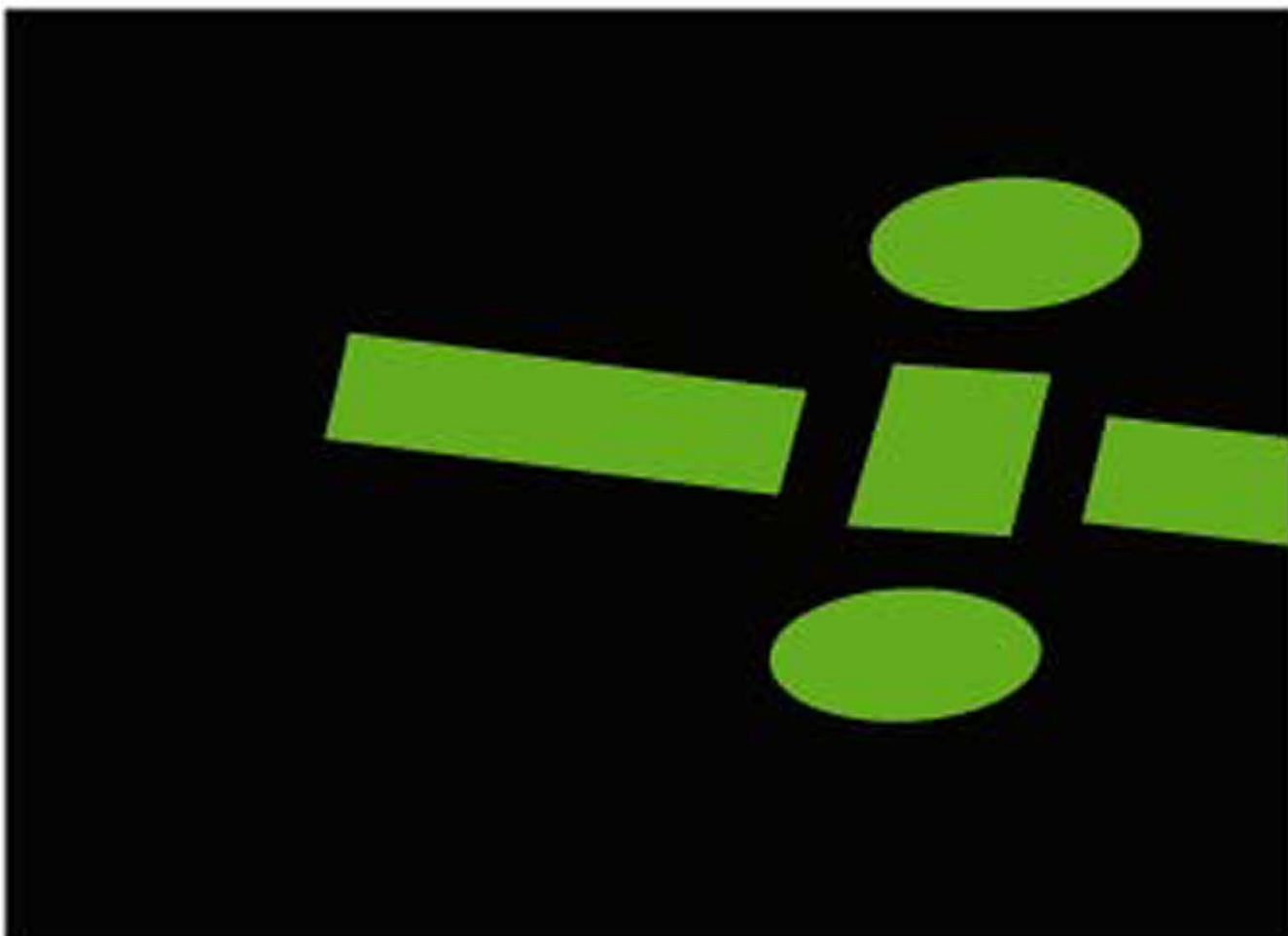
Financial Perspective		
How efficient does the program appear to congress, leadership?		
FY 2010 Baseline	Target	Comment
94 percent in FY 2010 92 percent of cumulative Program funding for research projects	At least 80 percent of funding for research projects	Internal and public measure of efficiency
For FY 2010 (funds obligated), 27 percent match	Amount of matching non-federal funds by sector	Internal indicator of leverage, partnership <i>Percent by solicitation rather than fiscal year more meaningful</i>
<i>Measurement being refined</i>	Funds committed, obligated, expended	Internal indicator of efficient management process <i>Annual amount appears misleading using fiscal year</i>
<i>Under development</i>	Time from budget delivery to awards	Internal and public measure of efficiency <i>Consider median time and max time.</i>

Customer Perspective		
How does the program appear to internal and external stakeholders?		
FY 2010 Baseline	Target	Comment
For most recent round 14 percent (but awards not complete yet) For program overall, 17 percent	Proposals submitted and awards made (yield rate)	Public indicator <i>Cumulative percent assumes only full proposals (not FY 2007 BAA pre-proposals) and completion of five awards in process</i>
<i>Under development</i>	Number of institutions and external experts involved (and the number who are involved for the first time)	Internal and public indicator of stakeholder engagement and outreach
<i>Under development</i>	Full-time equivalent of researchers, graduate students supported	Internal and public indicator of building capacity but difficult to measure <i>Requires common definition for FTE across proposals</i>
<i>Under development</i>	Percent of initial stage topics open over one year	<i>Internal indicator of efficient process or complex topics</i>
<i>On hold till new project management system adopted</i>	Number of projects or funding contributing to Agency Strategic Plan by goal area	Public indicator of potential impact. Difficult to measure without adoption of new program management support system (PMSS) <i>Measurement by EAR Program focus areas also could be meaningful</i>

FHWA's Exploratory Advanced Research (EAR) Program focuses on long-term, high-risk research with a high payoff potential. The program addresses underlying gaps faced by applied highway research programs, anticipates emerging issues with national implications, and reflects broad transportation industry goals and objectives.

Internal Business Process		
In which process should the program excel?		
FY 2010 Baseline	Target	Comment
Integrated highway system concepts: 4 in FY 2010 and 10 cumulatively (since FY 2006) Nanoscale research: 3 and 6 Human behavior and travel choices: 4 and 15 New technology and advanced policies for energy and resource conservation: 4 and 12 Information sciences: 4 and 7 Breakthrough Concepts in material science: 5 and 8 Technology for assessing performance: 5 and 15	Number of initial stage investigations in each EAR Program focus area	Internal and public indicator of program balance and breadth <i>Based on all active projects in FY 2010 including continuing and new topics</i> <i>There may be some duplication with linked topics that are assigned to different focus areas</i>
Cumulatively about 20 percent	Percent initial stage topics that lead to solicitations or intramural research projects	Internal and public indicator of program risk <i>Does not reflect some topics leading to multiple awards</i> <i>Difficult to assess for FY 2010 since topics still active</i>
<i>Under development</i>	Percent of projects that demonstrate use of effective research approaches	Retrospective indicator as determined by independent reviewers
<i>Under development</i>	Percent of awardees who gain follow-on funding from other sources as a result of EAR Program funded work	Retrospective indicator of building capacity; a possible start towards return on investment
<i>Under development</i>	Percent of projects that lead to continued, applied research with the potential for breakthrough advances	Retrospective indicator of risk and impact

Innovation and Learning		
Where should the program improve and change?		
FY 2010 Baseline	Target	Comment
5 in FY 2010 32 cumulatively	Number of new FHWA personnel involved in initial stage research	Internal indicator of building capacity
10 percent in FY 2010 10 percent cumulatively	Percent of initial stage research involving multiple offices or results that have been picked up by a different office	Internal indicator of program breadth
<i>Under development</i>	Percent of projects that lead to adoption of new research processes or approaches	Retrospective indicator of impact
<i>Under development</i>	Percent of projects that close persistent knowledge gaps, result in new fundamental data, or significantly change current understanding	Retrospective indicator of impact
<i>Under development</i>	Use of merit review in each stage of process	Internal but difficult to measure
<i>Under development</i>	Publications and presentations of project results	Internal and public indicator but difficult to monitor



EXPLORATORY ADVANCED RESEARCH

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