Transforming Transportation Through Innovation

Thomas Harman
Director
Resist CHANGE and DIE.

Accept CHANGE and Survive...

Lead CHANGE and Thrive!
Our Visit Today

Authorization

Innovation

Opportunities for Engagement
Tom’s question(s) for our visit today…

“Yes, and if…”

(BLANK)

“…we will ACCELERATE innovation”

Where are our opportunities to increase engagement? With Who? How? When?
Transforming Transportation Through Innovation

- Authorization
- STIC Network
- Every Day Counts
- AID Demo
- Other Resources
Fixing America’s Surface Transportation Act

December 4, 2015
Key Highway Facts

$226.3 B for highways over five years (FY 2016-2020)
  • $225.2 B in contract authority
  • $1.1 B from the General Fund

Builds on the program structure & reforms of MAP-21

Continued focus on accelerating project delivery

Adds a new freight formula & expands freight network

Adds a new discretionary program for nationally significant freight & highway projects

Provides a new tribal self-governance option
Creating a Culture of Innovation
Define *Innovation*

1: the introduction of something new

2: a new idea, method, or device

- Save Lives
- Save Money
- Save Time
- Improve Mobility / Connectivity
- Resource Responsible
National STIC Network
The COMPLETE Network established – April 2016

FY2014 (39 STICs)

FY2015 (49 STICs+FTIC)

FY2016 (53 STICs+FTIC)
## STIC Incentive Program

Program Coordinator: Sara Lowry

<table>
<thead>
<tr>
<th>Complete!</th>
<th>STIC Incentive Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>to Wyoming</td>
</tr>
<tr>
<td></td>
<td>to D.C.</td>
</tr>
<tr>
<td></td>
<td>to Puerto Rico</td>
</tr>
<tr>
<td></td>
<td>to Virgin Islands</td>
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<tr>
<td></td>
<td>to Federal Lands (FTIC)</td>
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**Up to $100k/ea./FY**
## Examples of STIC Incentive Project

<table>
<thead>
<tr>
<th>Northeast</th>
<th>Examples: STIC Incentive Projects</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>Advancing the use of mobile devices for <strong>e-Construction</strong> in field inspection applications</td>
<td>$100,000</td>
</tr>
<tr>
<td>DE</td>
<td>1. Procurement of an Automated Cylinder End Grinder for the purpose of <strong>testing UHPC</strong> ($16,000)...</td>
<td>$79,854</td>
</tr>
<tr>
<td>MA</td>
<td>Develop and implement a statewide <strong>Construction Project Documentation</strong> (CPD) SharePoint System</td>
<td>$100,000</td>
</tr>
<tr>
<td>ME</td>
<td>1. Establishing <strong>Planning and Environment Linkages</strong> by incorporating environmental and NEPA-related risks assessments into candidate project screening ($38,400)...</td>
<td>$100,000</td>
</tr>
<tr>
<td>NH</td>
<td>1. Strategic Highway Research Program (SHRP2) <strong>Traffic Incident Management (TIM) Training</strong> ($16,000)...</td>
<td>$100,000</td>
</tr>
<tr>
<td>PA</td>
<td>Local Government <strong>Safety Seminar</strong></td>
<td>$80,000</td>
</tr>
<tr>
<td>VA</td>
<td>1. Development of standard Specification and drawings for <strong>Carbon Fiber Pre-stressed piles</strong> ($30,000)...</td>
<td>$100,000</td>
</tr>
<tr>
<td>VT</td>
<td>Development of a mapping framework for <strong>data integration</strong></td>
<td>$100,000</td>
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</table>
## MEMORANDUM OF UNDERSTANDING
Signed 5/25/2016

<table>
<thead>
<tr>
<th>Whereas</th>
<th>Scope of Partnership</th>
<th>2016-</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Partnership in EDC</strong></td>
<td>Collaboration on the deployment of the EDC-3 e-Construction innovation is a testament to the impact partnership can have on accelerating the deployment of an innovation when working together. A.I.I. will partner with the FHWA CAI on the EDC initiative and support deployment of selected innovations.</td>
<td></td>
</tr>
</tbody>
</table>
| **POC for EDC** | i. Serve as AASHTO’s voice for EDC;  
ii. Foster EDC pipeline by identifying market ready of potential innovations for future EDC cycles;  
iii. Provide recommendations for innovations to deploy through the EDC initiative (2-year cycle);  
iv. Vet and solicit AASHTO member review of proposed innovations; &  
v. Provide leadership and support for deployment of specific EDC innovation (e.g., e-Construction). | | |
| **Foster EDC pipeline** | All will foster the EDC pipeline by evaluating innovations and identifying market ready technologies for potential deployment in future EDC cycles. | Up to $200k/ FY |
State Transportation Innovation Council – **STIC Excellence Award**

“This award recognizes a STIC that has made significant impact toward fostering a strong culture for innovation.”

**Process:**

- Self-nominating process... no more than 2 pages. 1 to 3 awards. A.I.I. selects winner(s).
- Presented at AASHTO Annual meeting.
“In 2009, the FHWA launched EDC in cooperation with AASHTO to speed up the delivery of highway projects and to address the challenges presented by limited budgets. EDC is a state-based model to identify and rapidly deploy proven but underutilized innovations to shorten the project delivery process, enhance roadway safety, reduce congestion and improve environmental sustainability.”
Q. How many Innovations were implemented under EDC-1?

A. Fourteen (14)

B. Eleven (11)

C. Twelve (12)

D. Fifteen (15)
Heading into Round 4

EDC-1
2011-2012
14 Innovations

EDC-2
2013-2014
13+ Innovations

EDC-3
2015-2016
12+ Innovations

EDC-4
2017-2018
11 Innovations
Q. Name the EDC-1 Innovation that…? **What is the SafetyEdge℠**

✓ Save Lives

✓ Is a proven solution that requires minimal cost and time

✓ Reduces driver over-correction

✓ Lessens potential impact of lane departure
Every Day Counts
Better, Faster, Smarter

EDC-1 (2011-2012)

Adaptive Signal Control Technology
Clarifying Scope of Prelim Design
CM/GC
Design-Build
Enhanced Technical Assistance
Environmental Impact Statements

Flexibilities in Right-of-Way
Flexibilities in Utility
GRS-IBS
Planning and Environmental Linkages
Prefabricated Bridge Elements and Systems

Programmatic Agreements
Safety Edge™
Use of In-Lieu Fee & Mitigation
Warm Mix Asphalt
Every Day Counts
Better, Faster, Smarter

Measuring Success

- Institutionalized
- Post-Demonstration
- Demonstration
- Pre-Demonstration
- Opt Out of EDC Innovation

IMPACT

Marketing, Communication, Partnership, Education, Demonstration….

Key: 2-yr Implementation Plan

Innovation Deployment Teams

Prefabricated Bridge Elements and Systems

Prefabricated and bridge elements and systems, also part of EDC or, are structures or components built offsite or next to an existing structure. They include features that reduce onsite construction time and mobility impact and improve quality and safety.
Q. Name the EDC-1 Innovation that…? **What is Warm Mix Asphalt**

- Improves Performance
- Improves Worker Comfort
- Saves Fuel
- Reduces Emissions
WMA Usage

Percentage of Total Asphalt Production in US
source: National Asphalt Pavement Association
Every Day Counts
Better, Faster, Smarter

EDC-2
(2013-2014)

3D Engineered Models for Construction
Accelerated Bridge Construction (ABC)
CM/GC
Design-Build
Alternative Technical Concepts (ATC)

Geospatial Data Collaboration
High Friction Surface Treatments
GRS-IBS
Implementing Quality Environmental Doc
Intelligent Compaction

Programmatic Agreements
Intersection & Interchange Geo.
Locally Administered Federal-Aid Projects
National Traffic Incident Management Responder Training (SHRP2 L12)
EDC-2 HIGH FRICTION SURFACE TREATMENTS

Milwaukee, WI

- IH 94, IH 43, & IH 794

Jan ‘09 to Sep ‘11 (~ 3 years)
- 219 Crashes!!!

EDC FHST in Sep ‘11

Oct ‘11 to Oct ‘12
- 2 Crashes
Every Day Counts
Better, Faster, Smarter

EDC-3 Overview Video
3D Engineered Models
Data-Driven Safety Analysis
e-Construction

eNEPA and IQED
Geosynthetic Reinforced Soil-Integrated Bridge System
Railroad Coordination
Regional Models of Cooperation

Road Diets
Smarter Work Zones
Stakeholder Partnering
Ultra-High Performance Concrete Connections
Q. Name the EDC-3 Innovation that...? What is Road Diets

✓ Improves Safety
✓ Low Cost Solution
✓ Enhances Quality of Life
✓ Makes shared spaces more livable and contributes to a community-focused, Complete Streets environment.
Ultra-High Performance Concrete Connections for Prefabricated Bridge Elements (UHPC)

Benefits

Accelerated **Construction.** Durable and simplified details that facilitate the fabrication and construction efforts needed to connect prefabricated bridge elements.

Simplified **Connection Details.** Significant simplification to the design of the component connections.

Improved **Long-Term Performance.** Provides better long-term performance

*steel fiber-reinforced, cementitious-based material*
§1444 Every Day Counts Initiative.

(a) IN GENERAL.—It is in the national interest …—

(1) to identify, accelerate, and deploy innovation aimed at shortening project delivery, enhancing the safety of the roadways of the US, and protecting the environment;

(2) to ensure that the planning, design, engineering, construction, and financing of transportation projects is done in an efficient and effective manner;

(3) to promote the rapid deployment of proven solutions that provide greater accountability for public investments and encourage greater private sector involvement; and

(4) to create a CULTURE OF INNOVATION within the highway community.

(b) EVERY DAY COUNTS INITIATIVE.—…to identify and deploy proven innovative practices and products that—

(1) accelerate innovation deployment;
(2) shorten the project delivery process;
(3) improve environmental sustainability;
(4) enhance roadway safety; and
(5) reduce congestion.

(c) INNOVATION DEPLOYMENT.—

(1) IN GENERAL.—At least every 2 years…
EDC-3 to EDC-4

Jan 2015

EDC-3

Jan 2016

Baseline Report

6-month Progress Reports

Jan 2017

Idea Solicitation

Innovation Selection

Regional Summits

State Implementation Plans

Jan 2018

EDC-4

Establish Teams

Baseline Report

Final Report

Dec - Jan

May - June

Oct - Dec

Jan
Safe Transportation for Every Pedestrian (STEP)

- Pedestrians 16% of roadway fatalities
- 6 cost-effective countermeasures with known safety benefits
- Including: Road Diets
  - Save Lives
Collaborative Hydraulics: Advancing to the Next Generation of Engineering (CHANGE)

- Current modeling applies several simplifying assumptions... overly conservative or inaccurate results.
- AHMT offers planners... to ... designers more accurate modeling technology through 3D visualization
  - Save Money, Improved Performance
Ultra-High Performance Concrete (UHPC) Connections for PBES

• Address a key challenge in PBES
  o Improved performance
  Faster construction
  Save money / time
Pavement Preservation (When, Where, and How)

• at the right time (when), on the right project (where), with quality materials and construction (how) is a critical investment strategy to help meet pavement performance expectations.
e-Construction and Partnering: A Vision for the Future

• Today, highway agencies can take advantage of e-Construction technologies to enhance partnering among the project team to improve communications and workflow for the efficient delivery of projects in the electronic age.
# EDC-4 Innovations

<table>
<thead>
<tr>
<th>Program Area</th>
<th>New EDC</th>
<th>EDC-3 Cont...</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td>3</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Safety</td>
<td>1</td>
<td>1+</td>
<td>2</td>
</tr>
<tr>
<td>Infrastructure Quality</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Shortening Project Delivery</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Environment</td>
<td>2</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>8</td>
<td>3+</td>
<td>11</td>
</tr>
</tbody>
</table>
EDC-4 Regional Summits

https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/summit.cfm
Q. What is the total INNOVATION INVESTMENT that occurred from August 2014 to May 2016 for the 61 AID Demo grants awarded?

A. $ 27,897,211

B. $ 42,527,000

C. $ 43,012,594

D. $ 61,000,000
AID Demonstration

- Continuing in FY16 with **new NOFO**
- Opened September 1\(^{st}\) 2016
- Up to $10M/year ($50M over FAST Act)

- Reminders
  - Funds are used to pilot an innovation for a **project**
  - Activity must be eligible under 23 CFR for federal-aid
  - 20% match is required
Increased Federal-share for Project-level Innovation
Increased Federal-share for Project-level Innovation

https://www.fhwa.dot.gov/innovation/resources/increased_federal_share.cfm

§ 120(c)(3) title 23 U.S.C. provides…

- ...the option of an increased Federal share for projects using innovative project delivery methods.
- Established by MAP-21 / amended FAST Act
- ...builds off EDC initiative
- The increased Federal share (up to 5%) for innovative techniques incentivizes use of innovations to help deliver projects more efficiently and to deploy rapidly proven solutions that make a difference.
Center for Accelerating Innovation

Get Connected

https://www.fhwa.dot.gov/innovation/resources/
Questions / Discussion

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And now our next speaker...