Innovation Activities from FHWA
Kevin Michel
Engineering Services Team Leader
Federal Highway Administration
2016 ND Asphalt Conference
Where would we be without Innovation?

Once upon a time we had this:

And now things are like this:

What will future innovations bring?
Where does innovation come from?

- Can come from anywhere !!!

- FHWA/AASHTO
  - *Every Day Counts (EDC)*
  - Turner Fairbank Highway Research Center (TFHRC)
  - SHRP2
What is “Every Day Counts”? 

Rapidly Deploy Proven, Underutilized Innovations 

Strategic DOT Selection of Chosen Innovations 

Necessity is the Mother of Invention
Every Day Counts

- Not about inventing the next “big thing”
- Advancing effective, proven and market-ready technologies into widespread use
- **Will not succeed if nobody tries the new technologies, so how do we give people the incentive?**

U.S. Department of Transportation
Federal Highway Administration
Funding incentive programs:

- **State Transportation Innovation Council (STIC) Incentive Program**
  - Up to $100,000 available to each STIC per year
  - Fund activities that have a statewide impact on making an innovation a standard practice

- **Accelerated Innovation Deployment (AID) Demonstration Program**
  - Incentive funding (up to a maximum of $1,000,000) to offset risk of using an innovation on a project
Current STIC Incentives

- NDDOT Transportation Innovations Program (TRIP)

  - NDDOT/UGPTI have developed an avenue to submit innovate ideas (website)

TRIP Ideas Being Advanced

- Using a Texas Underseal on HBP Overlay projects
- Studying the use of Fiberglass Rebar & Dowels Bars in Bridges and Pavements
- Using Fiber Reinforced HBP
- Installing Culvert Movement Monitoring/Instrumentation
- Using URETEK Deep Polymer Injection on frost heaves
- Monitoring traffic flows with Distributed Acoustic Sensing
- Using Geogrid Reinforcement under aggregate base for flexible pavement
- Using a MIT Scan T2 for collecting concrete pavement thicknesses
- Using Hydrated Lime as an anti-stripping agent in new full-depth HBP pavements
- Developing a digital driver’s license application process
- Using TheSmartCone™ technology for security, work-zone safety and surveillance applications
- Using Jointbond to address longitudinal HBP joint deterioration
- Using WatershedGeo HydroTurf® for drainage way armoring
Current STIC Incentives

- **E-Construction**
  - NDDOT/Iowa DOT held Peer Exchange
  - Purchased iPad for field personnel

From this:  
To this:
Results of EDC

• Creating an Innovation Culture
  – A new way if thinking?

• Accelerating Innovation Deployment
  – Shortening project delivery
  – Enhancing safety
  – Reducing congestion
  – Improving environmental sustainability
Building on our Achievements

EDC-3 (2015-2016)
- 11 innovations (2 from EDC-2)

EDC-2 (2013-2014)
- 13 innovations (4 from EDC-1)

EDC-1 (2011-2012)
- 14 innovations

Accelerated deployment of 32 innovations to date
EDC-3 Innovations

- Data-Driven Safety Analysis
- Road Diets (Roadway Reconfiguration)
- Smarter Work Zones
- Regional Models of Cooperation
- Improving Collaboration and Quality Environmental Documentation (eNEPA and IQED)
- Ultra-High Performance Concrete Connections for PBES
- Geosynthetic Reinforced Soil-Integrated Bridge System (GRS-IBS)
- 3D Engineered Models: Schedule, Cost, and Post-Construction
- e-Construction
- Locally Administered Federal-Aid Projects: Stakeholder Partnering
- Improving DOT and Railroad Coordination
EDC Cycle Timeline

North Dakota Division Office

Jan 2014

Dec - Jan
Establish Teams

Jan 2015

May - June
Idea Solicitation

July - Aug
Innovation Selection

Oct - Dec
Official Rollout

Jan
Regional Summits

EDC-2

Jan 2016

EDC-3

April
State Implementation Plans

6-month Progress Reports

EDC-4 is coming.....
EDC-4 Innovations (Double Secret Info)!

North Dakota Division Office

Sample EDC-4 Proposals:

- Cold In-place Recycling - Wielinski
- Concrete Overlay Treatments - Taylor
- Concrete Pavement curling and warping tool - Merritt
- High Tensile Strength Fiber Reinforced Asphalt Concrete - Kluttz
- Highly Modified Asphalt - Ruiz
- HIPERPAV Cloud System - Dietz
- In-Place Recycling - Harper
- Longitudinal Joint Stabilization - Castrodale
- LWA for Surface Treatments - Wandel
- Nanomaterial Strengtheners for Pavements - Wandtke
- Pavement recycling - Wandtke
- Permeable Pavements - Lee
- Rapid reconstruction of concrete pavements - Copeland
- Roller Compacted Concrete - Harper
- Thinlays - Copeland

- Advance Highway Technology 2-0 for bridges - Akiu
- Bridge Information Modeling - Maier
- Connecting devices for bridges - Hao
- Hillman Composit Beam - Hillman
- HMA Waterproofing for Bridge Decks - MASSDOT
- Low cracking deck concrete - Wandel
- LWA for Structural Concrete - Castrodale
- Non-contact optical detection for bridge inspection - Wallace
- CFRP strips for bridge decks - Wallace
- Using Unmanned Aircraft for Bridge Inspections - Wallace
- Bridge Preservation Toolkit - Dangelo
- Mobile IT for Asset Management - Sturgill
- Neatstreets for Asset Management - Lee
- Pavement Preservation Toolkit - Lee
- Advanced Geotechnical Systems - White
- Culvert Relining - Lee
- Lightweight Aggregate for Geotechnical Fill - Castrodale
- Sheet Pile Abutments - Ford
- Corrosion Control Meter - Doucette
- Cost Share Program - Harper
- Embedded Data Collector Pile - Putcha
- Fiber reinforced polymer - Chynoweth
- Galvanized Pile - Harper
- IR Scanning - Harper
- LWA for Internal Curing of Concrete - Castrodale
- Mobile IT Devices - Dadi
- Radio Frequency Identification - MASSDOT
- Steel Fiber Reinforcement - Harper
- Tools for Risk Based Analysis - Varma
- Underground Utility Electronic Marker Systems - Lee

5 Dimensional Project Management - Gransberg
ATC-VE Benchmarking - AGC-Deery
Construction Workforce Diversity - Harper
Consultant Procurement - Richins
Flash Tracking for Accelerated PD - Wandtke
Headlight for Construction partnering - Feliz
Smart safety process management system - Grant
FHWA’s TFHRC
(Turner Fairbank Hwy Research Center)

TFHRC plays vital leadership role in developing and implementing coordinated highway research

- Vehicle/highway interaction
- Nanotechnology
- Safety
- Pavements
- Bridges/structures
- Human-centered systems
- Operations
- ITS
- Materials
- International research
SHRP2 Solutions have the power to change the way transportation agencies do business. SHRP2:

- Provides new research-based tools and innovative products and processes
- Creates efficiencies
- Uses State and Federal taxpayer investment more effectively
**Proof of Concept Pilot**

To evaluate product readiness.
Contractor support to collect data and evaluate the product application.

**Lead Adopter Incentive**

To help offset costs associated with product implementation and risk mitigation.
Recipients required to provide specific deliverables designed to further refine the product.

**User Incentive**

To support implementation activities, such as conducting internal assessments, changing processes, and organizing peer exchanges.
Further Information

- Every Day Counts
  - http://www fhwa dot gov/everydaycounts/
- Turner Fairbank Hwy Research Center
  - http://www fhwa dot gov/research/
- SHRP2
  - http://www fhwa dot gov/goshrp2/
- Transportation Innovations Program (TRIP)
  - https://www dot nd gov/business/innovate
• All of our USDOT agencies each have emerging innovations
  – Smart Car and “V2V” – NHTSA
  – Rail crossing safety – FRA
  – Pipeline safety – PHMSA
  – Commuter safety – FTA
  – Airport Security – FAA
Questions?

Kevin Michel, PE
FHWA Engineering Services Team Leader
701-221-9465

Kevin.Michel@dot.gov