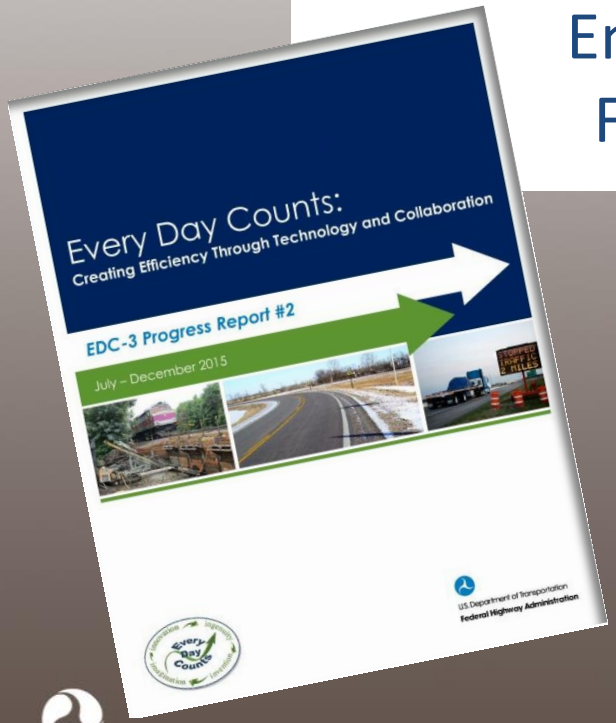
2016 ND Asphalt Conference

Rugged North Dakota Landscape

North Dakota Division Office

Innovation Activities from FHWA

Kevin Michel
Engineering Services Team Leader
Federal Highway Administration



U.S. Department of Transportation
Federal Highway Administration

2016 ND Asphalt Conference

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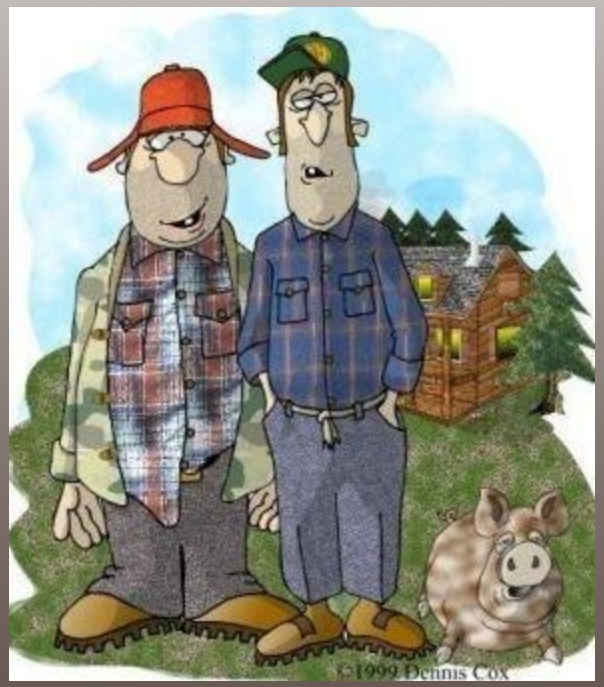

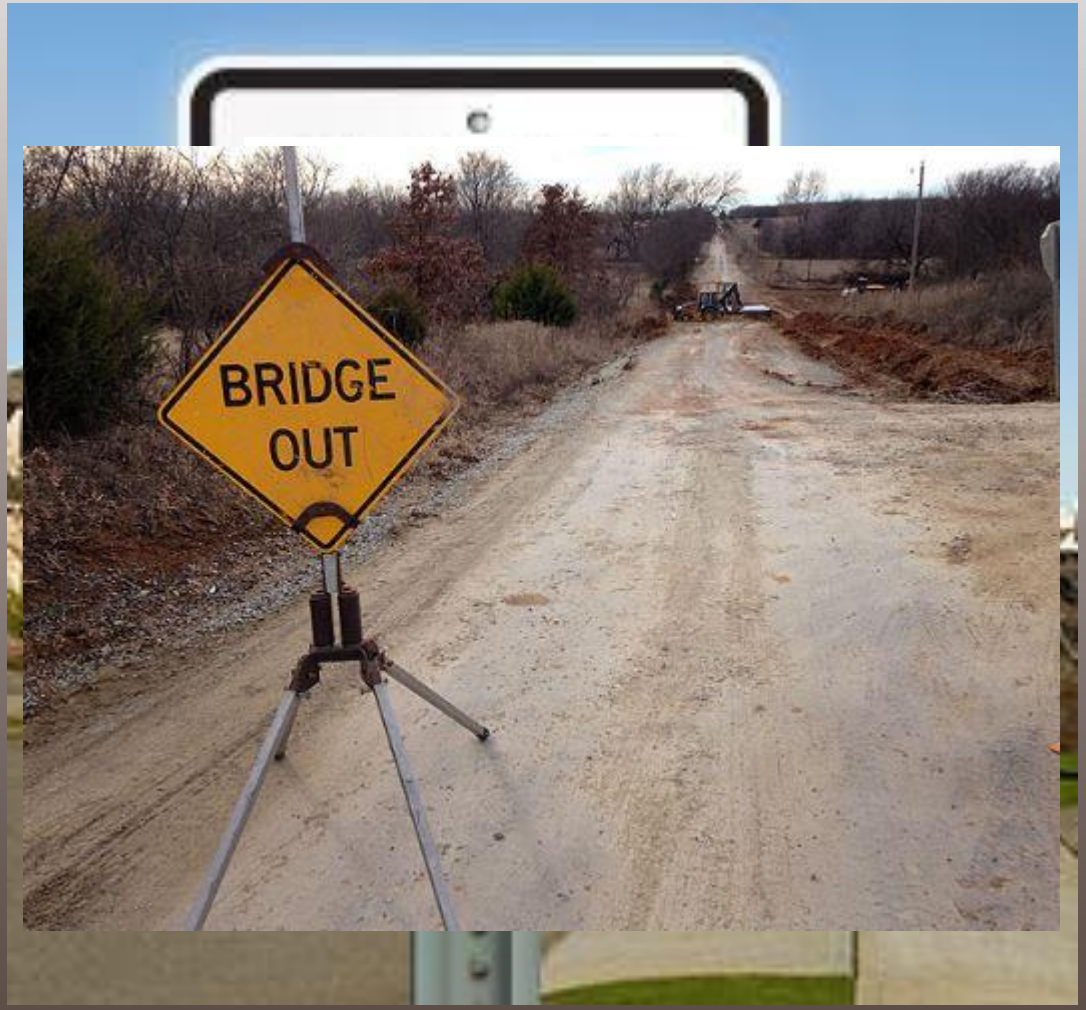

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Where would we be without Innovation?

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Once upon a time we had this:

And now things are like this:

What will future innovations bring?

Where does innovation come from?

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- Can come from anywhere !!!
- FHWA/AASHTO
  - ***Every Day Counts (EDC)***
  - Turner Fairbank Highway Research Center (TFHRC)
  - SHRP2

What is "Every Day Counts"?

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Necessity is the Mother of Invention

Strategic DOT Selection of Chosen Innovations

Rapidly Deploy Proven, Underutilized Innovations

Every Day Counts

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Other Research Products

Other Proven Innovations

SHRP2 SOLUTIONS

AASHTO Innovation Initiative

- 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?***

How EDC Works: Incentives

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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

TRIP Program
e-Construction

Current STIC Incentives

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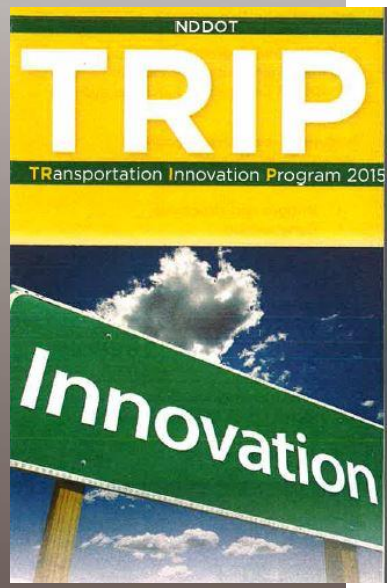
- NDDOT Transportation Innovations Program (TRIP)
  - NDDOT/UGPTI have developed an avenue to submit innovate ideas (website)



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

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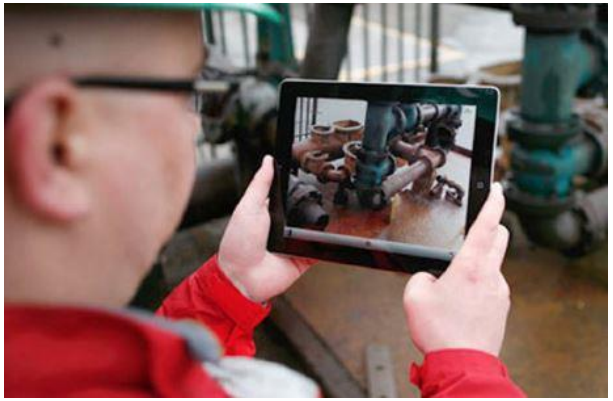
- E-Construction
  - NDDOT/Iowa DOT held Peer Exchange
  - Purchased iPad for field personnel

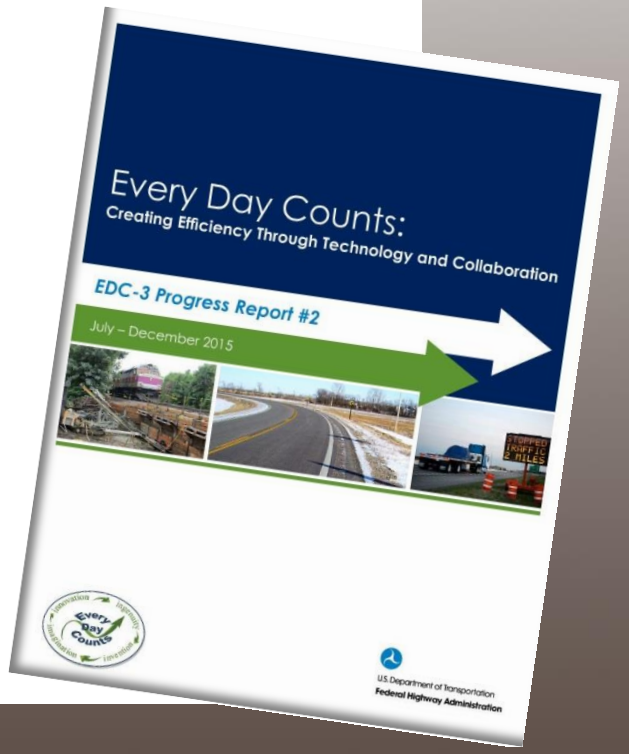
From this:

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

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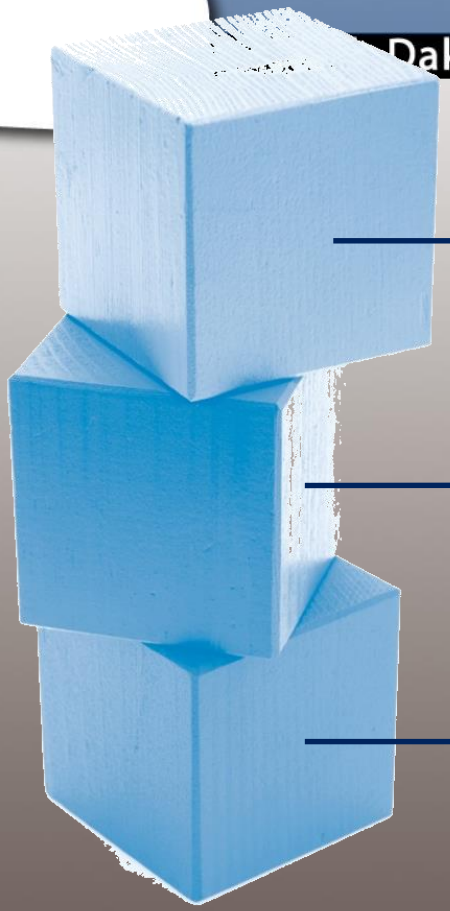

EDC-3 *(2015-2016)*

- 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

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Jan 2014 | Jan 2015 | Jan 2016 | April | Jan 2017

EDC-2

Idea Solicitation

Innovation Selection

Official Rollout

Regional Summits

State Implementation Plans

Dec - Jan

May - June

July - Aug

Oct - Dec

Jan

EDC-3

Establish Teams

Baseline Report

6-month Progress Reports

Final Report

EDC-4 is coming.....

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EDC-4 Innovations (Double Secret Info) !

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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
Highly Modified Asphalt - Kluttz
HIPERPAV Cloud System - Ruiz
In-Place Recycling - Dietz
Longitudinal Joint Stabilization - Harper
LWA for Surface Treatments - Castrodale
Nanomaterial Strengthener for Pavements -
pavement recycling - Wandtke
Permeable Pavements - Lee
Rapid reconstruction of concrete pavements
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 - Wandtl
LWA for Structural Concrete - Castr
Non-contact optical detection for bri
CFRP strips for bridge decks -
Using Unmanned Aircraft for Bridge Inspections - Wallace

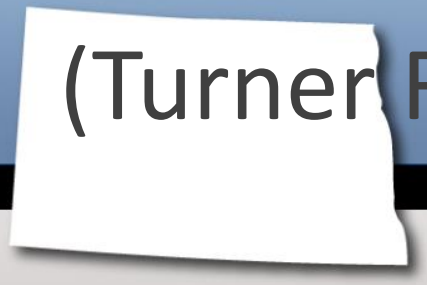
Bridge Preservation Toolkit - Dangelo
Mobile IT for Asset Management - Sturgill
Neatstreets for Asset Management
Pavement Preservation Toolkit - Lee

Advanced Geotechnical Systems - White
Culvert Relining - Lee
Lightweight Aggregate for Geotechnical Fill - Castrodale
Sheet Pile Abutments - Ford

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

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

FHWA's TFHRC (Turner Fairbank Hwy Research Center)



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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

What is SHRP2?

(Second Strategic Highway Research Program)

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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*

SHRP2 Implementation Assistance Levels of Engagement

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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

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- 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

Other Innovations

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- 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

FHWA Office

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STUDENT AIDE
Vacant

Questions?

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