Mission: The EDC initiative is designed to identify and deploy innovation aimed at reducing the time it takes to deliver highway projects, enhance safety, and protect the environment.
Agenda

• Welcome- Rich Tetreault and Matthew Hake
• STIC Overview
• EDC-3 Innovations
• AID Award
• Tri-State ATMS—511 Project & Bluetooth Monitoring
• SHRP II Overview
• Roundtable
  – STIC Incentive Grant
  – STIC Website
WELCOME

Mission: The EDC initiative is designed to identify and deploy innovation aimed at reducing the time it takes to deliver highway projects, enhance safety, and protect the environment.

2ND Annual Member’s Meeting
June 17, 2015
Creating an Innovation Culture

www.fhwa.dot.gov/stic/

• State-based leadership and management of innovation deployment
• Engages highway community stakeholders
• National innovation deployment network
Creating an Innovation Culture

- **Vermont Charter** signed 2/13/14
- **Monthly Executive Member meetings**
- [http://vtransengineering.vermont.gov/STIC](http://vtransengineering.vermont.gov/STIC)
- **STIC Incentive Grants, AID Grants, EDC, SHRP2**
Resources & Incentives

• FHWA technical assistance
• Technology transfer funding and support:
  – Web conferences
  – Peer exchanges
  – Demonstration showcases
• Funding incentive programs:
  – STIC Incentive Program
  – Accelerated Innovation Deployment (AID) Demonstration Program
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
• FY14 Incentive Allocations:
  – 36 STICs
  – $3,517,420
• Vermont FY14
  – Design-build guidance documentation and website
  – Blue tooth monitoring in Chittenden County
Sample STIC Incentive Allocations

- VT: Development of Design-Build Guidance Document ($100,000)
- NC: Development of Local Public Agency Certification Program ($100,000)
- NM: Development of informational and educational materials on Diverging Diamond Interchanges ($100,000)
- UT: Development of a 3D Utility Database ($100,000)

www.fhwa.dot.gov/stic/incentive.cfm
AID Demonstration Program

• Incentive funding (up to a maximum of $1,000,000) to offset risk of using an innovation on a project

• Eligible projects may be in any aspect of highway transportation including: planning, financing, operation, structures, materials, pavements, environment, and construction.

• Project must be ready to initiate within 6 months
AID Demonstration Program

- Application process through www.grants.gov using an open, rolling solicitation

- State DOTs (MPOs and local governments), Federal Land Mgmt. Agencies, and tribal governments are eligible

- Vermont, Maine, and New Hampshire (Tri-State) Advanced Transportation Management (ATMS)/Traveler Information System (TIS) including 511

- CCRPC Advancements in Micro-Urban Metropolitan Corridor Monitoring: Blue Tooth to Dedicated Short-Range Communication Deployment in Vermont
Focused, State-based approach for rapid deployment of proven innovations
Significant Impacts of EDC

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

EDC-1 (2011-2012)
- 14 innovations
  - 4 from EDC-1

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

EDC-3 (2015-2016)
- 11 innovations
  - 2 from EDC-2
Accelerated Bridge Construction (ABC)

Accelerated Bridge Program (ABP)
• ABP was initiated in 2012 to accelerate the design and replacement of structures
• Programmatic approach for expediting project delivery
• Anticipate 9 - 12 projects per year
• 24 month performance goal from project defined to procurement (80% to meet 24 months)
• Promote and standardize the use of Accelerated Bridge Construction (ABC)
• FHWA – Everyday Counts Initiative

Contact: Wayne Symonds 802-828-0503 wayne.symonds@state.vt.us
Projects Designed for ABC

- Prefabricated bridge elements and system (PBES)
- New construction techniques
- New materials
- Standardized drawings
- New special provisions
- ABC Project Outreach
Design Build (DB)

- From 2010 – 2012 VTrans Issued nearly $47 million in design build contracts.
- From 2013 to date, VTrans granted approximately $97 million more in design build jobs.
- In 2014 VTrans implemented Electronic Bidding for the sealed cost component of the selection process.
- Along with our Federal partner (FHWA), VTrans began work on a Comprehensive to Design-Build Project Delivery Guide. The lessons learned from our initial projects are greatly enhancing this process.

Contact: Wayne Symonds  802-828-0503  wayne.symonds@state.vt.us
Richmond Bridge Rehabilitation

Before (20 feet wide)  After (30 feet wide)
Construction Manager/General Contractor (CM/GC)

- Hartford Bridge Slide - Under Construction
- E. Montpelier Rt 14 Bridge Replacement
- Middlebury Tunnel project
- North Hero - Grand Isle Bascule Bridge Replacement
A new method for this project
Intelligent Compaction

On Board Display

GPS

Temperature

Accelerometer

Control Panel
EDC-3 Innovation Selection

• Solicitation of ideas in January – February 2014
• Over 100 unique ideas were submitted by highway community
• Ideas evaluated considering:
  – urgency and scale
  – market readiness
  – national impact
• Collaboration with AASHTO and industry association partners
• 11 innovations selected
EDC-3 Innovations

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

- **Electronic Contract Documents**
  - Paperless initiative in CA
  - Exploring tablets
  - Not for everybody

- **E-Books**
  - Finished training all staff
  - Mandatory for 2016

- **Construction Contract Finals**
  - Fully deployed, working beautifully

- **Mobile Inspector**
  - 25 users
VTrans is at the Development Stage

- Many different agreements currently being used
  - Railroad Crossing Agreements (Private/Farm/Utility)
  - Finance and Maintenance Agreements (VTrans/RR)
    - Conditions included in construction contracts (VTrans/Contractor)
  - Maintenance Rental Agreements (VTrans/Contractor)
  - Three-Way Agreements (VTrans/RR/Contractor)
- **VTrans’ Objectives**
  - Master Agreement that can be used as a template
    - Would include all necessary contract language as per Bulletin 3.5 and 23 CFR §646.216(d)
  - Separate targeted objectives would be provided as attachments
Data Driven Safety Analysis

Bruce Nyquist
Office of Highway Safety

Infrastructure
- High Risk Rural Roads
- Highway Safety Improvement Program

Highway & Crash Data
- CRASH Program
- Webcrash Query Tool

Governor's Highway Safety Program
- Education & Enforcement Grants
- Public Awareness Campaigns
- Safety Contractors

Vermont Highway Safety Alliance
- Strategic Highway Safety Plan
- Board of Directors
- Focus Groups
Data-Driven Infrastructure Safety Programs

• Highway Safety Improvement Program
  - High Risk Rural Roads Program
  - Systemic Local Road Safety
  - High Crash Intersections/corridors
  - Systemic Safety Projects
Systemic Safety Programs/Projects

- Centerline Rumble Stripes
- Pavement Marking Contracts
- High Speed Signalized Intersections
- Protected-permitted phasing
Centerline Rumble Stripes

Cross Centerline Crashes (2008-2013)

- 5851 Crashes
- 94 Fatalities
- 1320 Injuries

(DATA-DRIVEN EXAMPLE)
Stakeholder Partnering–EDC III

- Have reached out to the Vermont League of Cities and Towns to begin a partnership. Have met with them several times to discuss.
- A meeting is planned to be convened later this summer that will include members of their VLCT Policy Committee. Also looking to invite a representative from APWA and Vermont Local Roads.
Road Diets 101

- Good up to ~20,000 AADT
- Significant reduction in sideswipe & rear end crashes
- Room for bike lanes
- Better for left turning vehicles
Road Diets – EDC III Safety

- Form a VTrans team that includes:
  - Highway, Safety and Design
  - Policy, Planning and Intermodal Development
  - Maintenance and Operations

- Conduct Outreach – Internal and External
- Develop Selection Criteria
- Develop Evaluation Methodology
- Document Results
- Draft Policy/Process
Guidance

• Use FHWA Road Diet Guide and Case Studies
Vermont’s Smart Work Zones

By Nancy Avery
Vermont Agency of Transportation
Smart Work Zone

Two strategies for managing work zones and work zone traffic that can minimize travel delays and help maintain motorist and worker safety are coordination of roadway construction projects to reduce work zone impacts and using technology applications to dynamically manage traffic in the work zone environment.
Benefits

- **Minimize Travel Delays.** Project coordination among different agencies allows them to be proactive in reducing construction time and the resulting traffic congestion. Technology applications can reduce travel delays by dynamically managing traffic according to real-time conditions.

- **Enhance Safety of Motorists and Workers.** Combining queue and speed management technologies can raise driver awareness as they approach work zones, provide delay and routing information, and increase their compliance with displayed speed limits.

- **Maintain Business and Resident Access.** Communication and coordination between agencies helps lessen the extended impacts of work zones and minimize effects on local access.
Vermont Projects
- I-91 Brattleboro
- I-91 Hartford
- I-89 Waterbury
Types of Systems

- ASTI Transportation – Contractor Control
  - Brattleboro
  - Hartford

- VR-MAC/ Jam Logic – Agency Control
  - Waterbury
Traffic-Responsive Systems

Traffic-responsive systems continuously monitor real-time traffic conditions and automatically respond with appropriate and dynamic messaging, such as driving instructions and traffic condition information. These systems are designed to manage work zone traffic control and to meet temporary traveler information needs. They include:

- **Travel Time Information** systems are continuously updated to provide current travel time between the driver’s location and a specific destination downstream location.

- **Route Management Information** systems may be provided to various audiences based on their informational needs. For instance, public websites for extended projects and integration with Highway Advisory Radio or 511 networks providing real-time information.

- **Stopped Traffic Warnings** automatically alert drivers to an upcoming traffic slowdown or stopped traffic and provide time to stop safely.

- **Dynamic Speed Displays** automatically indicate the current speed and the posted speed limit to each passing driver.

- **Dynamic Lane Merge** systems alert drivers to upcoming traffic slowdowns or stopped traffic when two lanes of traffic merge to one lane.
What is Bluetooth BlueToad™ Technology?

- Bluetooth Travel-time Origin and Destination
- An advanced wireless device that directly computes travel times and vehicle behaviors from the detection of Bluetooth signals emanating from passing vehicles.
BlueTOAD™ Technology

As mobile devices inside vehicles move through the 50 meter detection radius, BlueTOAD identifies and time stamps their Bluetooth MAC Address. Timestamps of subsequent detections determine travel time across the known distance between BlueTOAD units.
### Vermont BlueTOAD™ Projects

<table>
<thead>
<tr>
<th>Projects</th>
<th>Routes</th>
<th>Proposed Advertisement Dated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berlin NH STP 2938(1)</td>
<td>VT Route 62</td>
<td>6/17/2015</td>
</tr>
<tr>
<td>Berlin NH STP 2947(1)</td>
<td>US Route 302</td>
<td>6/17/2015</td>
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<tr>
<td>Rockingham-Clarendon NH SURF(49)</td>
<td>US Route 7</td>
<td>07/21/2015</td>
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<tr>
<td>South-Burlington-Williston NH 2944(1))</td>
<td>US Route 2</td>
<td>05/06/2015</td>
</tr>
<tr>
<td>Westfield-Troy STP 2903(1)</td>
<td>VT Route 242</td>
<td>06/10/2015</td>
</tr>
</tbody>
</table>
What questions do you have for me now?
EDC 3 Ultra High Performance Concrete (UHPC)

• What is UHPC?
• Why is it important for our Accelerated Bridge Program?
• Implementation Project Waitsfield BF 013-4(39)
• Public Interest Finding – Ductal CS1000 bagged

• [Website Link](www.fhwa.dot.gov/everydaycounts/edc-3/factsheets/edc-3_factsheet_uhpc_pbe.pdf)
Break
Intelligent Transportation Systems ITS

- Road Weather Information Stations (RWIS)
- Variable Message Signs (VMS)
- ATMS-511
  www.511vt.com
- Weight in Motion Stations (WIMS)
- Smart Work Zones
- Connected Vehicles
- Fiber Optic Infrastructure
- Tourism
VTrans SHRP 2 Activities

- Strategic Highway Research Program – 2
  - VTrans efforts focused in two areas
    - Capacity - Expedited-Schedule Case Studies to the Collaborative Decision-Making Framework Database
    - Renewal - Performance Specifications for Rapid Renewal
- EDC deployment of SHRP 2
  - capacity
VTrans SHRP 2 Activities

- C19 Accelerated Bridge Construction
  - Early adopter status
  - Continued and Expanded Deployment
- R07 Performance Specifications
  - Reclaimed Stabilized Base Specifications
  - Revised to address broader reclamation techniques
  - Responsive to climate, materials and stakeholders
VTrans SHRP 2 Activities

- Existing issues in delivery
VTrans SHRP 2 Activities

- Performance relationships from objectives
  - Safety  vertical alignment, superelevation, roadside hdwe.
  - Consistency  continuity of pavement condition, uniformity of improvement, strength
  - Customer Satisfaction ride, comfort
  - Durability service life, ensuing asset recovery costs
  - Economic viability  risk allocation, risk durations
VTrans SHRP 2 Activities - RSB

- Issues from stakeholder groups
- Regional and national expert assistance

- Draft specification defining linkage between performance objectives and construction deliverables

- Specification revision and outreach
Roundtable