Federal Highway Administration
Every Day Counts
Innovation Initiative

SHRP2 SOLUTIONS
TOOLS FOR THE ROAD AHEAD

AASHTO
Innovation Initiative

VT STATE TRANSPORTATION INNOVATION COUNCIL (STIC)

VTrans Working to Get You There
Vermont Agency of Transportation

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

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

Federal Highway Administration
Every Day Counts
Innovation Initiative

SHRP2 SOLUTIONS
TOOLS FOR THE ROAD AHEAD

AASHTO
Innovation Initiative

VT STATE TRANSPORTATION INNOVATION COUNCIL (STIC)

VTrans Working to Get You There
Vermont Agency of Transportation

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/

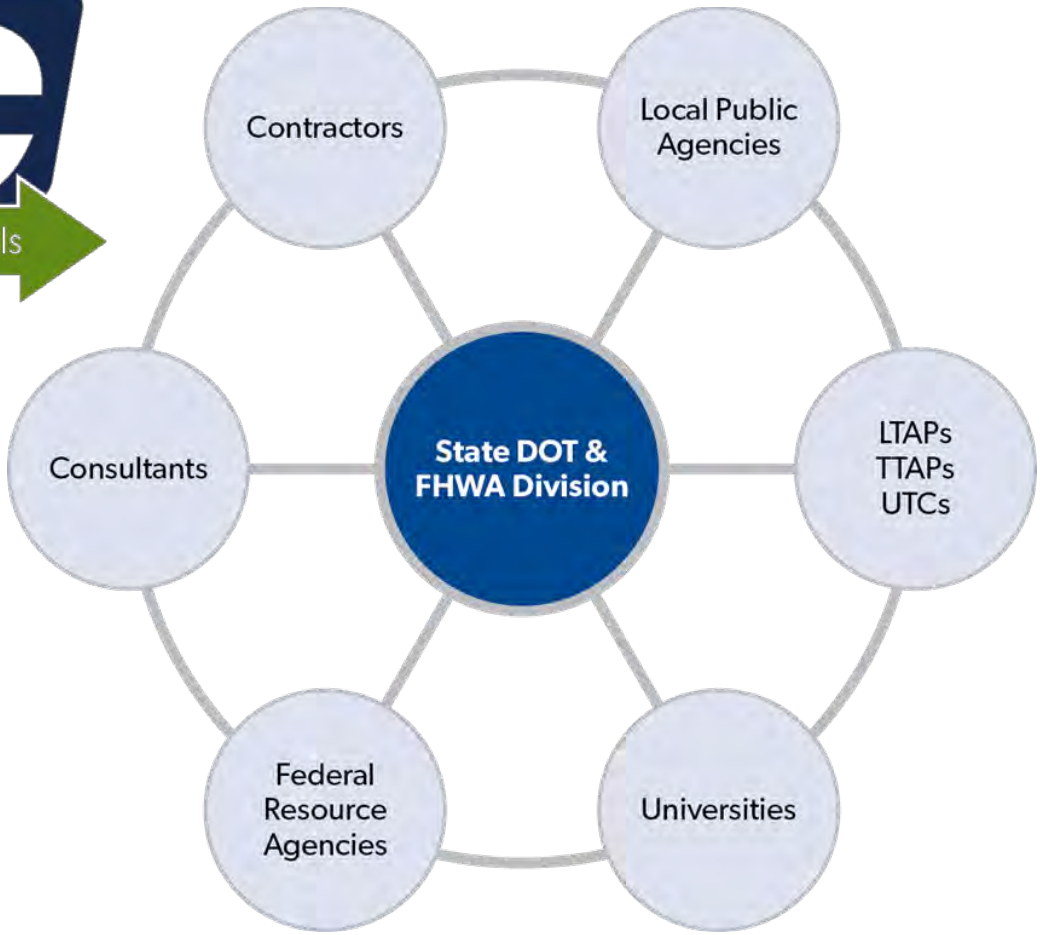
- State-based leadership and management of innovation deployment
- Engages highway community stakeholders
- National innovation deployment network

Creating an Innovation Culture

VERMONT

STIC
State Transportation Innovation Councils

- Vermont Charter signed 2/13/14
- Monthly Executive Member meetings
- 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

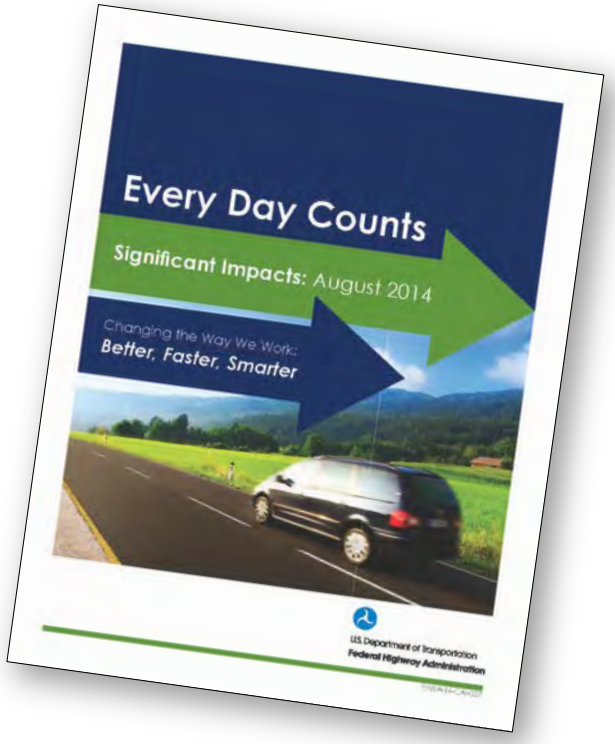
- Application process through www.grants.gov using an open, rolling solicitation
- State DOTs (MPOs and local governments), Federal Land Mgmt. Agencies, and tribal governments are eligible
- Vermont, Maine, and New Hampshire (Tri-State) Advanced Transportation Management (ATMS)/Traveler Information System (TIS) including 511
- CCRPC Advancements in Micro-Urban Metropolitan Corridor Monitoring: Blue Tooth to Dedicated Short-Range Communication Deployment in Vermont

Every Day Counts

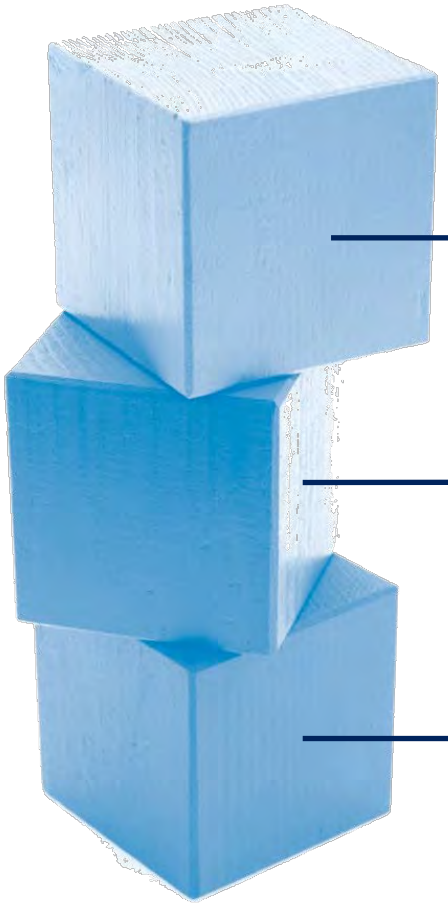
Focused, State-based approach for rapid deployment of proven innovations

Significant Impacts of EDC

- Accelerating Innovation Deployment
  - Shortening project delivery
  - Enhancing safety
  - Reducing congestion
  - Improving environmental sustainability



Building on our Achievements



EDC-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 Bridge Construction (ABC)

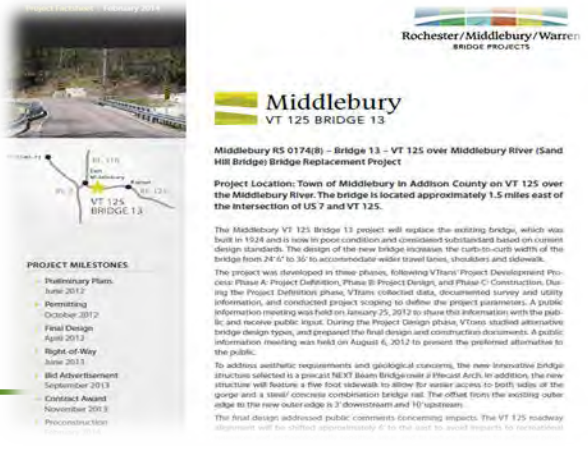
Accelerated Bridge Program (ABP)

- 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

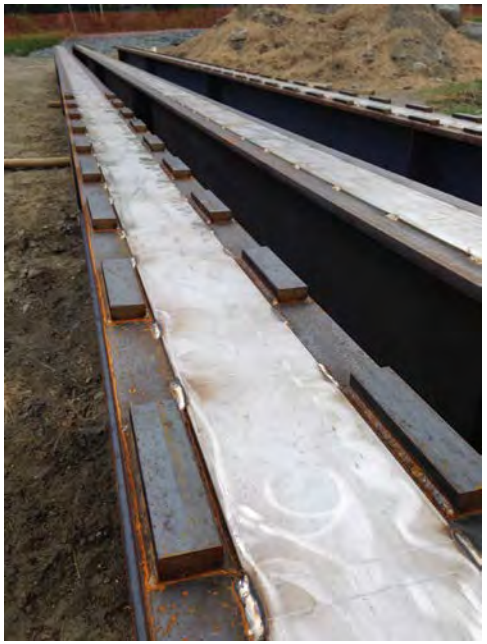
VERMONT

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



I-91 Hartford
BRIDGES PROJECT

Accelerated Bridge Program
VTRANS

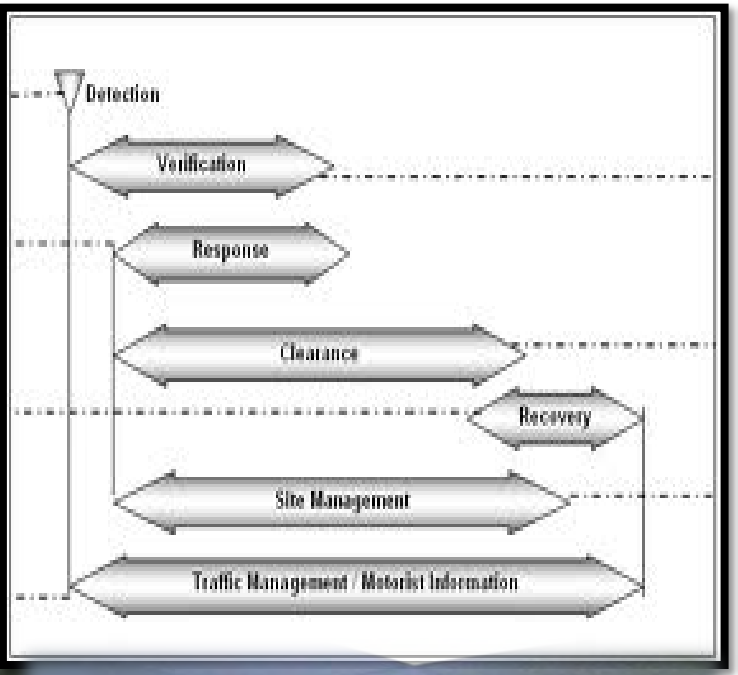
VERMONT

Main Street and Merchants Row Bridges
Middlebury WCRS(23)
Tunnel Simulations

Before
(View from Merchants Row)

After

TIMs Training

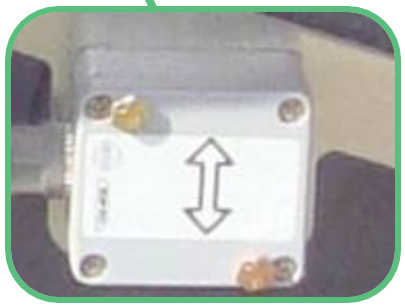


Intelligent Compaction

On Board Display

GPS

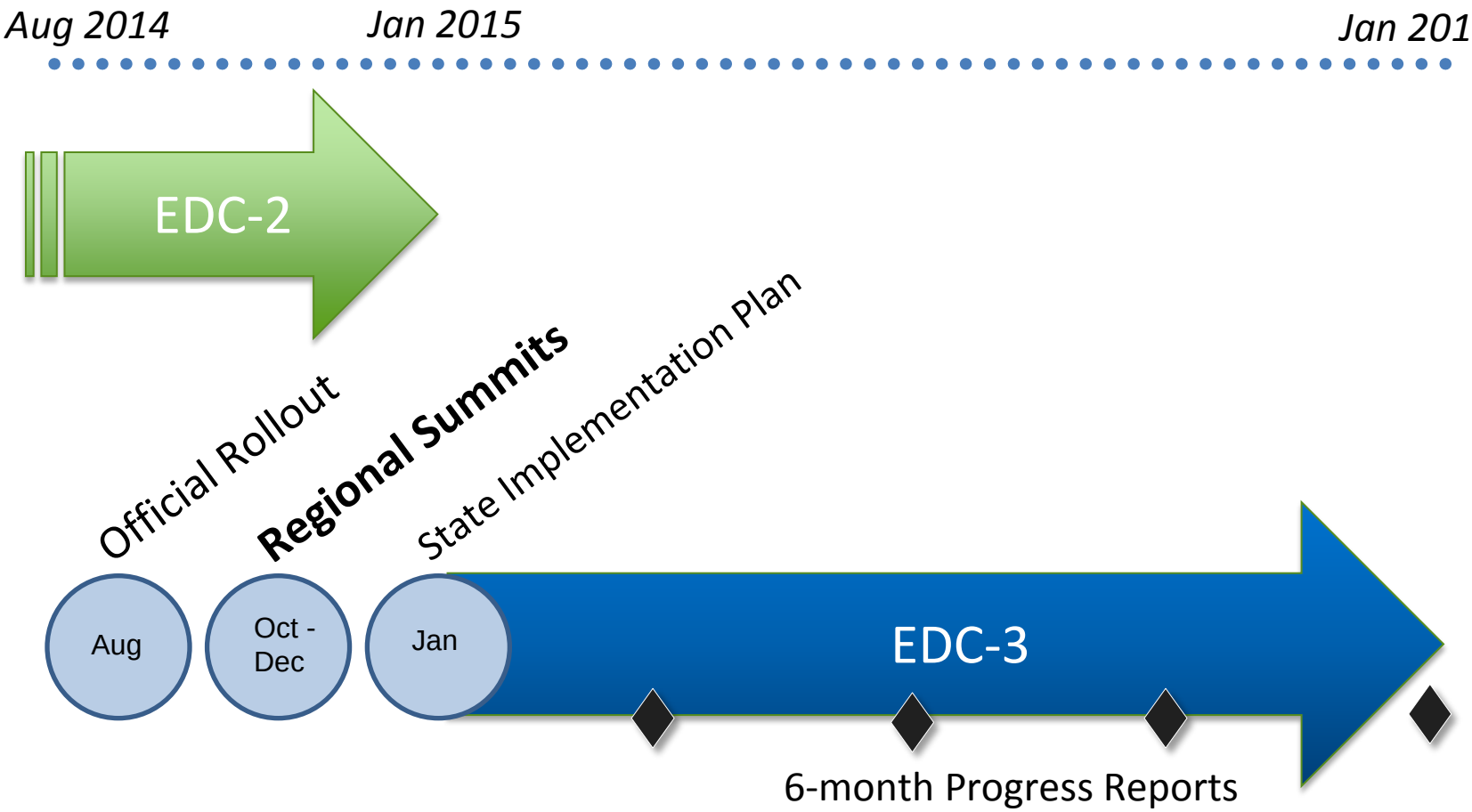
Temperature



Accelerometer

Control Panel

EDC-3 Timeline



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

IMPROVING DOT AND RAILROAD COORDINATION

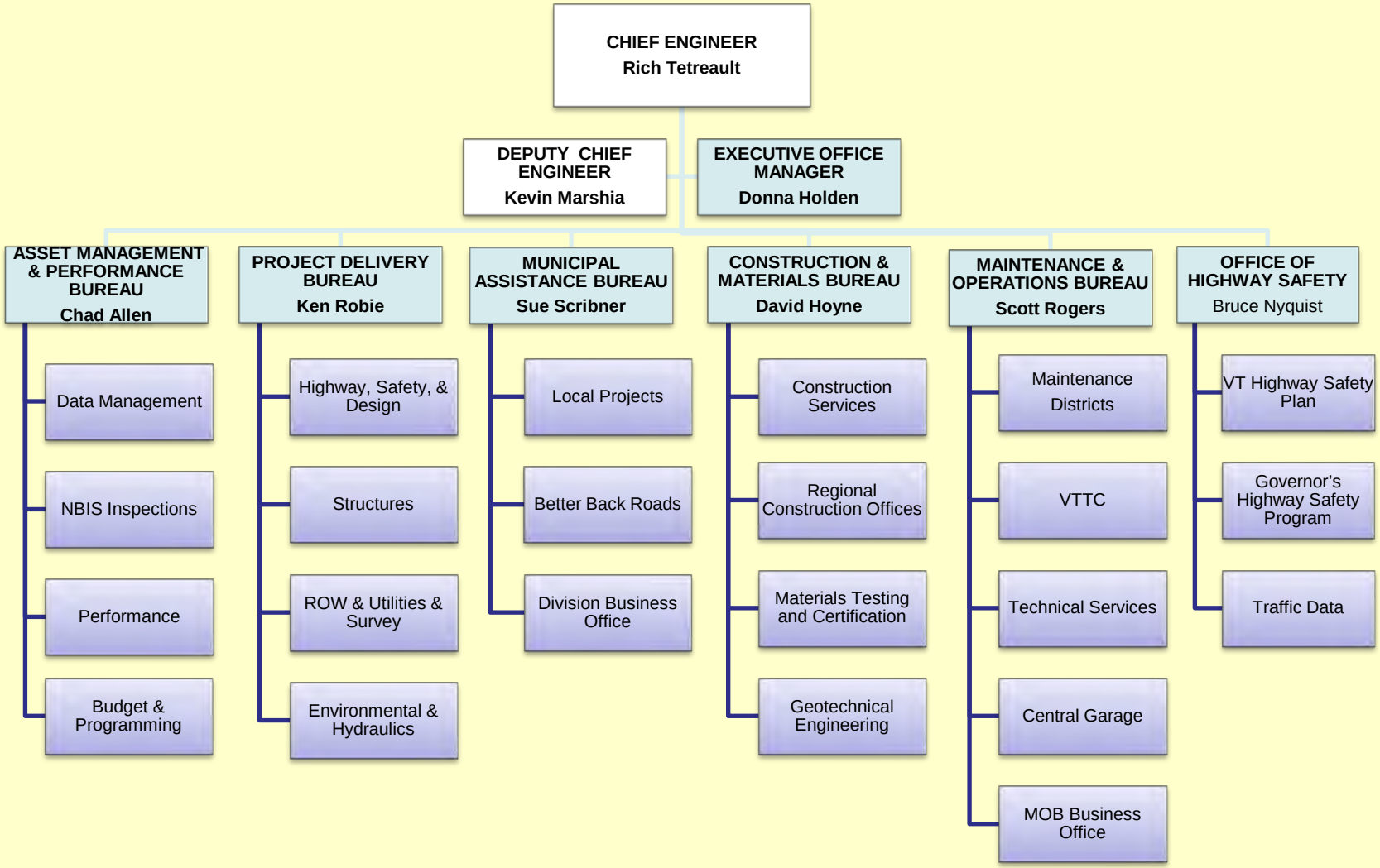
VTrans is at the Development Stage

- 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

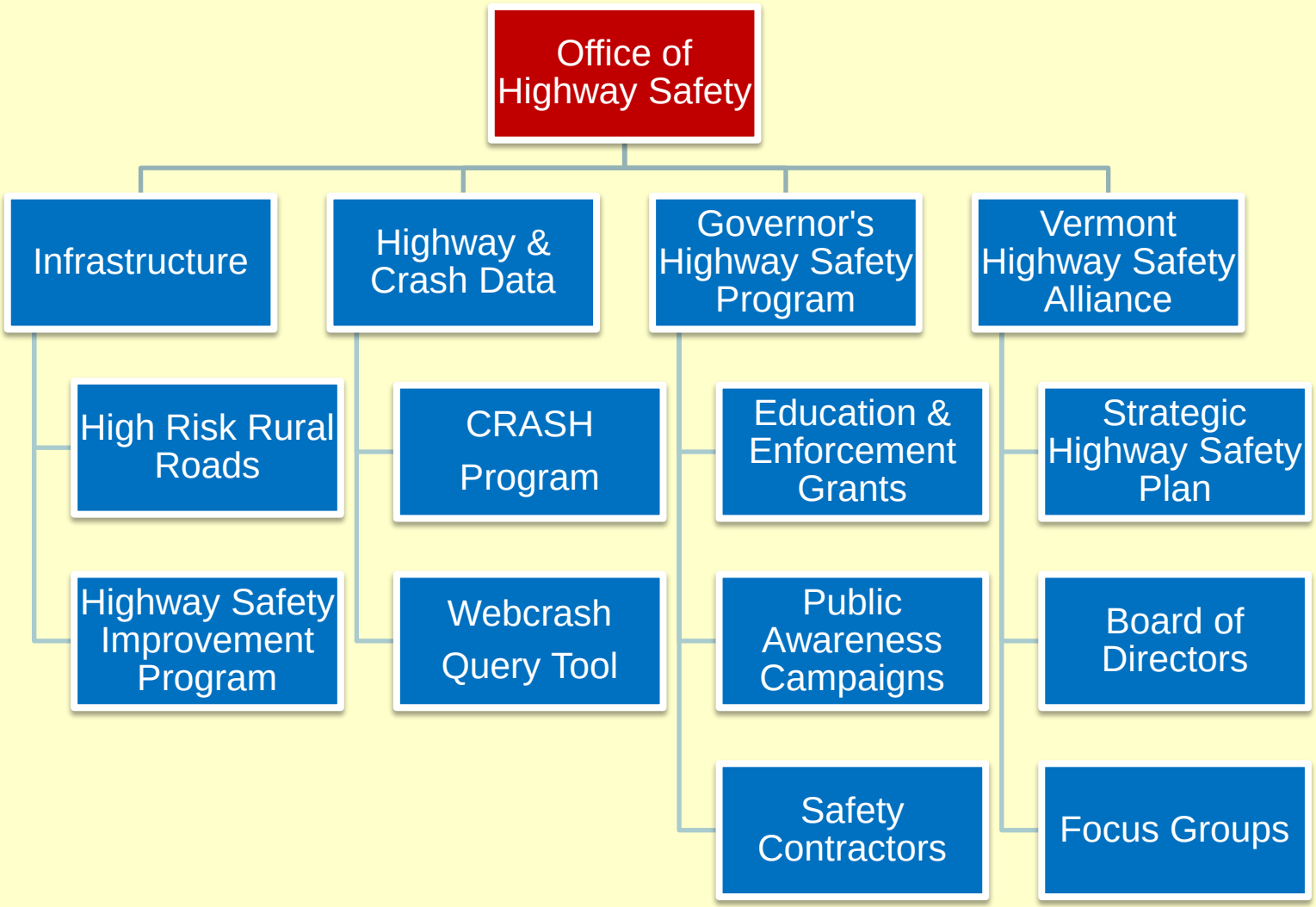
Data Driven Safety Analysis

Bruce Nyquist

HIGHWAY DIVISION



Office of Highway Safety



Data-Driven Safety Management

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

Data-Driven Safety Management

Systemic Safety Programs/Projects

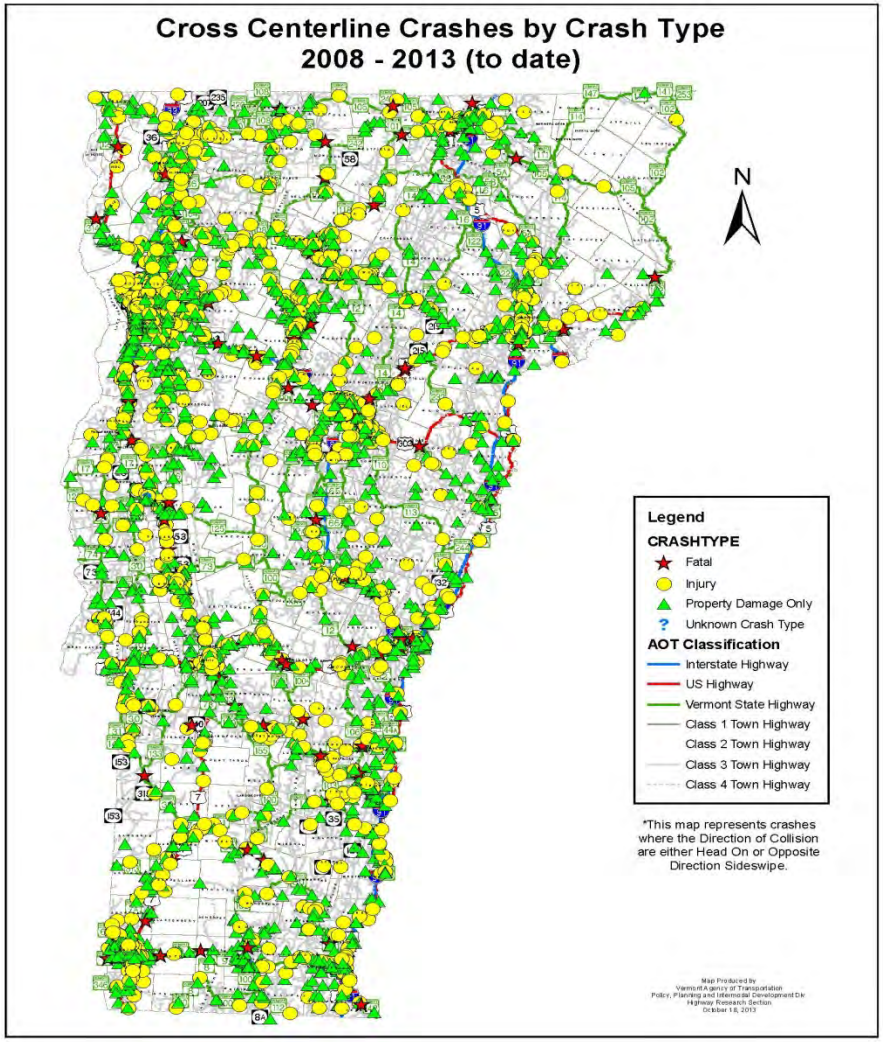
- Centerline Rumble Stripes
- Pavement Marking Contracts
- High Speed Signalized Intersections
- Protected-permitted phasing

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

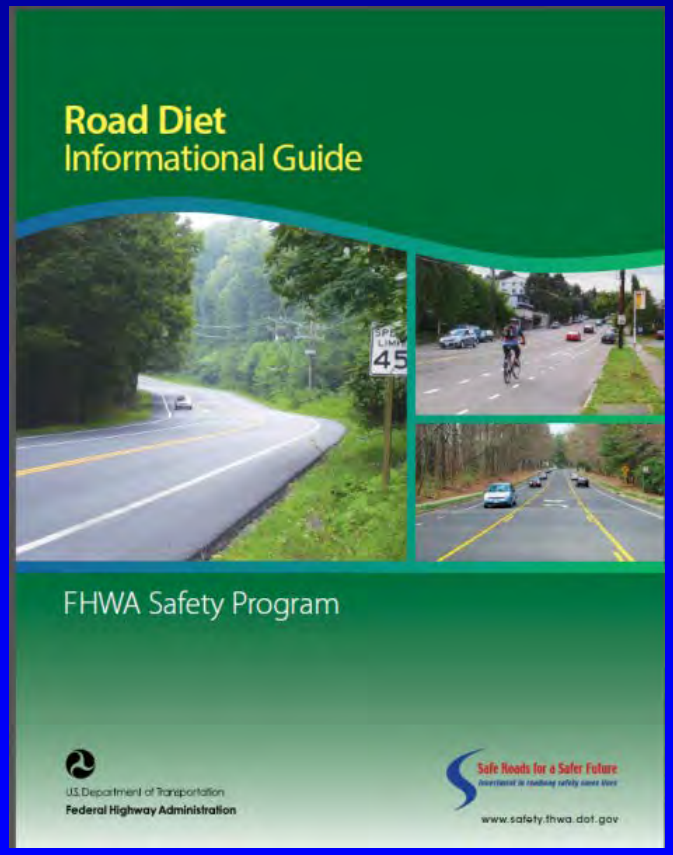
- Good up to ~20,000 AADT
- Significant reduction in sideswipe & rear end crashes
- Room for bike lanes
- Better for left turning vehicles

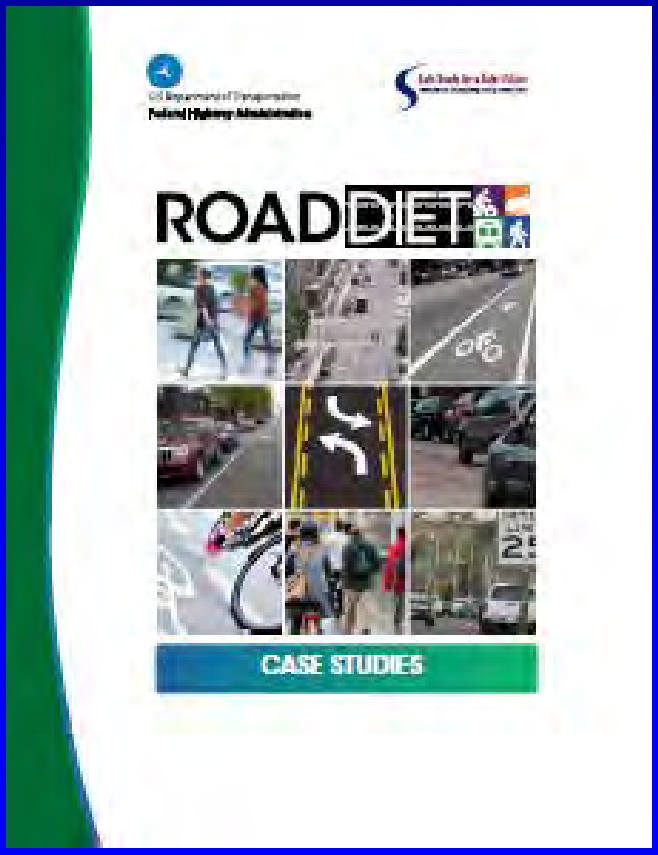
Road Diets – EDC III Safety

- 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

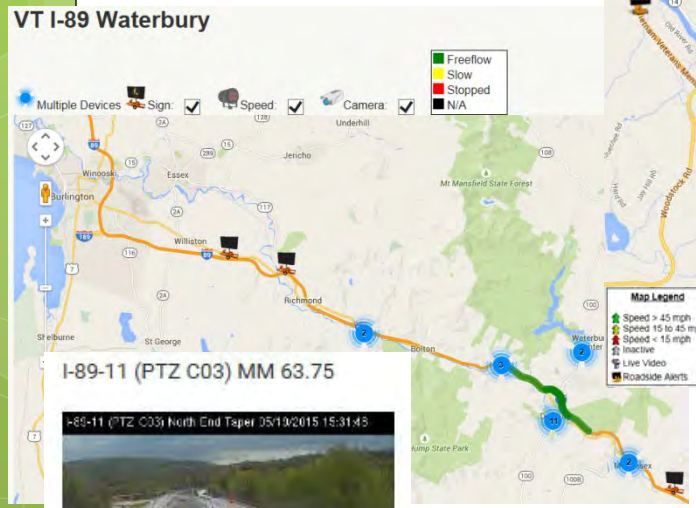
- Two strategies for managing work zones and work zone traffic that can minimize travel delays and help maintain motorist and worker safety are coordination of roadway construction projects to reduce work zone impacts and using technology applications to dynamically manage traffic in the work zone environment.

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

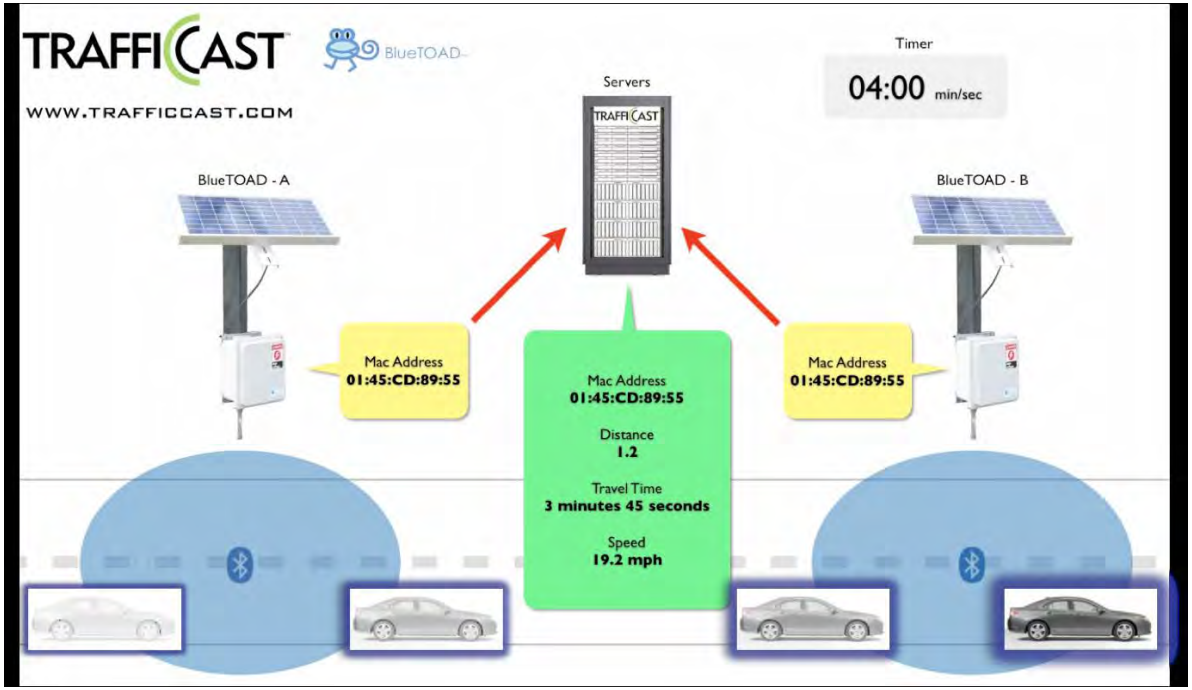
Traffic-responsive systems continuously monitor real-time traffic conditions and automatically respond with appropriate and dynamic messaging, such as driving instructions and traffic condition information. These systems are designed to manage work zone traffic control and to meet temporary traveler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

Projects	Routes	Proposed Advertisement Dated
Berlin NH STP 2938(1)	VT Route 62	6/17/2015
Berlin NH STP 2947(1)	US Route 302	6/17/2015
Rockingham-Clarendon NH SURF(49)	US Route 7	07/21/2015
South-Burlington-Williston NH 2944(1))	US Route 2	05/06/2015
Westfield-Troy STP 2903(1)	VT Route 242	06/10/2015

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

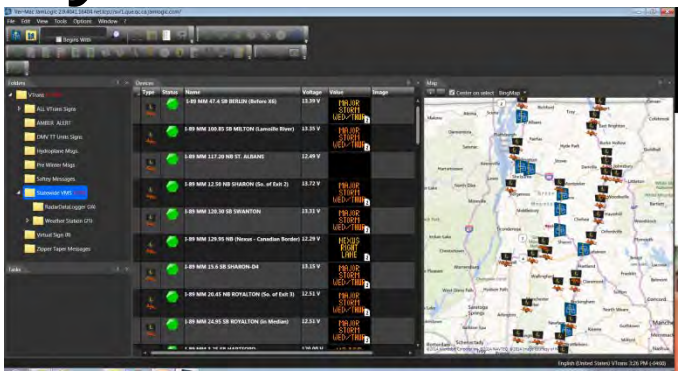
- www.fhwa.dot.gov/everydaycounts/edc-3/factsheets/edc-3_factsheet_uhpc_pbe.pdf

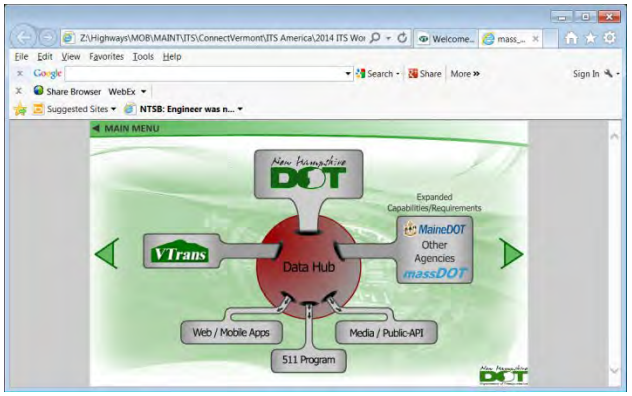
Accelerated Bridge Program
VTRANS

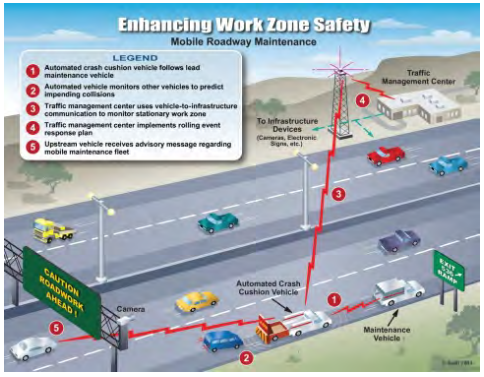
Break

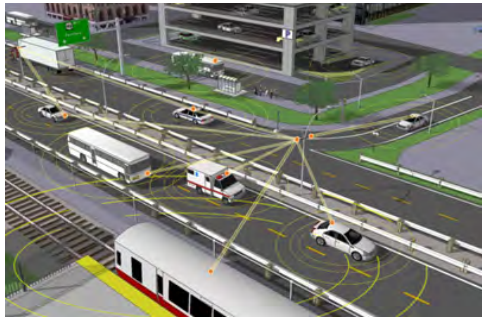
Intelligent Transportation Systems ITS

- 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