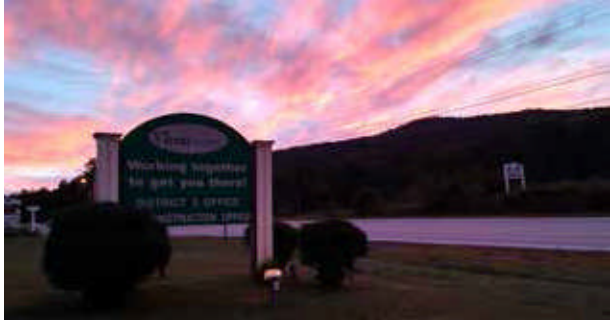
VERMONT AGENCY OF TRANSPORTATION

2017 FACT BOOK and Annual Report



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VERMONT AGENCY OF TRANSPORTATION

2017 FACT BOOK and Annual Report

Welcome

Welcome to this year's edition of the VTrans Fact Book and Annual Report.

Inside you'll find a review of the Agency's progress this past year, as well as quick answers to many of the perennial questions we receive from the media, the public and legislators.

This is the same tool that many of our staff uses internally when researching questions about our infrastructure and we hope you will appreciate the information it provides.

As we continue to develop more efficient ways to share our data directly, I encourage you to explore the VTrans website for even more up-to-date information about projects, maintenance activities, and the overall performance of our transportation system.

As always, your comments help us to improve this report each year and we look forward to hearing from you.

Sincerely,

Joe Flynn
Secretary of Transportation

VTrans Working to Get You There
Vermont Agency of Transportation

VERMONT

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About the Agency

Vermont has an extensive multi-modal transportation system.

With oversight from the Vermont Legislature, the Vermont Agency of Transportation (VTrans) is responsible for planning, development, implementation, and maintenance of a variety of transportation infrastructure including but not limited to roads, bridges, state-owned railroads, airports, park and ride facilities, bicycle facilities, pedestrian paths, public transportation facilities and services, and Department of Motor Vehicles operations and motor carrier enforcement. VTrans serves the entire population of the State of Vermont.

VTrans has more than 1,300 employees organized in three divisions: Policy, Planning and Intermodal Development; Finance and Administration; and Highway. The **Department of Motor Vehicles** is also housed within the Agency of Transportation, with a main office in Montpelier and ten satellite offices statewide.

VTrans interacts with all State agencies, the United States Department of Transportation and other federal agencies, numerous regional and state governments, international jurisdictions and cross-border organizations, local governments, transit agencies, airports, railroads, and other private and non-profit entities engaged in transportation-related activities.

The **Highway Division**, which has the largest number of employees, is organized into five bureaus: Municipal Assistance, Construction and Materials, Maintenance and Operations, Project Delivery, Asset Management and Performance, and the Office of Highway Safety. Together, the Highway bureaus handle year-round maintenance of the road network; provide oversight for construction projects; ensure the quality of materials; provide grants and technical support for municipal projects; procure and maintain the fleet of trucks; provide information to the traveling public on road conditions; inspect and maintain bridges, culverts, signs, and signals; and is the lead entity on safety and training.

BURLINGTON. Green Mountain Transit's new transfer station in downtown Burlington.

The **Division of Policy, Planning and Intermodal Development** (PPAID) manages public transit, aviation, and rail programs. In addition to providing statewide planning, policy, and research support, the division works with Vermont's eleven Regional Planning Commissions and, in the Burlington region, the Metropolitan Planning Organization, to develop regional transportation plans and generate input on prioritizing transportation projects in the regions. The division's work is supported by public input from the Rail Advisory Council, Aviation Advisory Council, and the Public Transit Advisory Council. PPAID also is the lead on research, mapping, development review, and public outreach.

The **Division of Finance and Administration** provides services across the Agency to support the delivery of VTrans' mission, including contract administration, information technology, continuous improvement, accounting, budgeting, audit, civil rights, labor compliance, and recruitment. As in all aspects of our work, state and federal statutes provide the guidance and boundaries for Finance and Administration's work.

The transportation budget is composed of Federal, State, and Local funds. Federal fund sources come from the Federal Highway Administration, Federal Transit Administration, Federal Railroad Administration, Federal National Highway Traffic Safety Administration, and the Federal Aviation Administration. State funds are appropriated from the State Transportation Fund. The State Transportation revenues are derived primarily from three sources: the gas tax, the purchase and use tax, and Department of Motor Vehicle fees.

To meet these various objectives, VTrans has established a set of five goals that act as guiding principles in everything the Agency does. These goals are:

- Provide a safe and resilient transportation system that supports the Vermont economy.
- Preserve, maintain and operate the transportation system in a cost effective and environmentally responsible manner.
- Provide Vermonters energy efficient travel options.
- Cultivate and continually pursue innovation, excellence and quality customer service.
- Develop a workforce to meet the strategic needs of the Agency.

The Year In Review

To achieve our vision, the Agency's activities are focused on five strategic goals. Highlights related to each of these goals are provided below.

GOAL ONE

Provide a safe and resilient transportation system that supports the Vermont economy

Safety is the first consideration in everything that we do at VTrans. We strive every day to provide a safe transportation network for the users of our highways and for the women and men that work to build and maintain it.

Although Vermont has seen over a 25% reduction in major crashes in the last ten years, the work of VTrans and our many partners in highway safety is never done. When there is a loss of just one life on our highways, it impacts families and communities throughout our state. In 2016 we suffered 64 lives lost.

Work zones remain a high priority for highway safety. Speeding and distracted driving are two of the biggest factors. Even with new texting and cell phone laws and increased enforcement, there are still significant safety concerns in our work zones. Speeding and distracted drivers are putting at risk some of the most vulnerable users on our highways; pedestrians, bicyclists, and our state's construction and maintenance workers. This year, we embarked on a pilot program with DMV Enforcement and the State Police to staff work zones with undercover officers to cite distracted drivers. The program was a great success and we anticipate more activity like this in the coming year.

At the heart of improving the safety of highways is our partnership with the Vermont Highway Safety Alliance. Through collective efforts, we are bringing more resources to bear and coordinating public and private entities to continue to bend the curve toward safer roads. This past year, we updated the Strategic Highway Safety Plan which is the guiding document for both infrastructure and behavioral effort throughout our state. This plan lays out the data, the critical emphasis areas, the goals, and the strategies that are necessary to continue reducing crashes.

As technology advances and cars get smarter, our infrastructure must keep pace. The way we build and maintain our highways must maximize the value of other safety enhancements. Improved pavement markings, smarter signals, and policies that match the new technology are all part of developing a system that eventually, even autonomous vehicles will be able to connect to. This is a challenge that is advancing on us with great speed, but we are working with our national partners and other DOTs to ensure that Vermont will be ready for the next generation of vehicles.

The transportation sector is a major contributor to greenhouse gas emissions and VTrans is committed to mitigating our overall carbon footprint through efficiencies in our fleet operations and buildings, as well as using appropriate sites on properties we control for generating renewable energy. To that end, the Agency completed a comprehensive solar plan in 2016 that will serve as a roadmap to help guide future decisions on solar deployment.

We continue to look at our transportation investments through the lens of economic development, targeting improvements to key corridors of commerce and helping downtowns become more business-friendly and pedestrian-friendly.

GOAL TWO

Preserve, maintain, and operate the transportation system in a cost effective and environmentally responsible manner

Asset management resides at the core of our efforts to implement the right treatments at the right time to balance safety with the need to get the longest possible life out of the components of our system. Making decisions based on data and consistent standards ensures that our system is as strong as it can be with the limited funds available.

Efficiency means ensuring that our internal processes are constantly reviewed and updated to match the current state of technology and the capabilities of our workforce. Our Performance, Innovation and Excellence section has championed the deployment of electronic signatures throughout the Agency and has trained a cadre of employees in "lean" techniques to shepherd process improvements.

ST. ALBANS. Plows affixed, VTrans trucks of all sized.

The public-facing New England Compass Traveler Information System is the publicly visible part of an Advanced Traffic Management System (ATMS) that is the result of a collaborative effort between Maine, New Hampshire, and Vermont that will eventually expand to include other states in New England and beyond. The new ATMS makes it possible to remotely control signals, message boards, and other devices and allows other member states to provide operational backup for Vermont.

As part of our effort to keep the Agency's plow trucks in good repair, Central Garage has outfitted a service truck to respond, with adequate tools and parts, to breakdowns. A quick response can get a truck back on the road to help keep the highways safe and open.

DUXBURY. Construction of new Precast Concrete Rigid Frame culvert on VT 100.

GOAL THREE

Provide Vermonters energy efficient travel options

Growing a multi-modal public transportation system is not as simple as "build it and they will come." Anticipating demand and promoting ease of use, comfort, and reliability are important factors in developing a robust network in which the traveling public can have confidence in.

The grand opening of the downtown Burlington transit center capped decades of planning and now serves as a hub for the continued redevelopment of Burlington's commercial core. As the flagship station for Green Mountain Transit (GMT), formerly CCTA, the new facility offers a more efficient and comfortable point of transfer between city buses and regional services.

In Rockingham, the new municipal Park and Ride now provides 47 spaces to serve commuters, offer's level one electric vehicle charging stations, and serve's as the new headquarters and maintenance facility for Southeast Vermont Transit.

New technology is being tested across the state to make transit easier than ever to ride. Fixed public transit routes throughout the state are now available on Google and other open source mapping apps making it easier to plan trips across multiple modes and service providers. GMT riders and riders in the White River Junction area can use an app to see where their bus is and get an estimated time of arrival.

Throughout the state, Park and Rides are being upgraded and the Agency continues to work with municipalities, regional planning commissions, and businesses to establish new transit options that serve more Vermonters. Plans are in the works to use technology to tap the excess capacity of demand response and para-transit services—dispatching small buses using an app like Uber—to fill critical gaps in under-served rural areas.

The Agency recently completed a study of commuter rail service between St. Albans and Montpelier and track upgrades continue along the Western Corridor in preparation for providing Amtrak service to Burlington's Union Station. The passage of pre-clearance in the United States Congress is another step on the way to restoring passenger services to Montreal. Amtrak added carry-on bicycle service on the Vermonter line and pets are now permitted on-board.

The VTrans On-Road Bicycle Plan is an effort to categorize State roads into high-, moderate- and low-use/priority corridors based on current and potential bicycle use. The completion of this plan, which included extensive public participation, will help VTrans prioritize on-road bicycle improvements on State roads and allow better integration of these improvements into Agency projects and activities.

GOAL FOUR

Cultivate and continually pursue innovation, excellence, and quality customer service

As a part of the implementation of the Agency's Strategic Plan, VTrans completed a Customer Service Improvement Plan to assess current levels of internal customer service and to establish a road map for how to improve customer service culture within the Agency.

VTrans has created an Application Development and Support Information Technology (IT) plan to guide IT innovation investments for the next five years. Information from research of industry trends and best practices, coupled with existing initiatives within the Agency and statewide, are documented. The plan will be reviewed annually to reflect rapidly changing trends in technology and adjustment of priorities and will be the guiding document for annual work plans for IT.

This year we established the IT Project Management Office (IT PMO) to provide a consistent methodology for engaging the IT unit for Agency projects and help evaluate projects for alignment with the Agency's vision and mission. This office will also coordinate interactions with Division of Information and Innovation for Agency IT activities with lifecycle costs exceeding $500K. By providing a consistent approach to IT activities, we can ensure an understanding of the scope and cost of the project is understood before a commitment is made.

Through its Performance, Innovation, and Excellence (PIE) Section, VTrans continued expansion of its Business Process Management (BPM) and Lean programs, and advanced the VTrans E-Sign initiative. The BPM Right-of-Way project, and numerous Lean Kaizen events helped participants identify and implement efficiencies in their everyday work. These activities have contributed to a culture of innovation and continuous improvement.

The Department of Motor Vehicles recently moved its Bennington office to a more convenient, downtown location and is in the process of rolling out an Automated Vehicle Inspection Program, providing more accurate and consistent inspections.

VTrans has been piloting the use of automatic vehicle location systems internally to improve our fleet management practices and aid in storm response. In 2016 all operational plow trucks were equipped with transmitters and the Agency soft-launched a plow truck location map that gives the history of each active plow truck for the previous hour, along with critical weather and road condition data.

Combining the 18 websites associated with the Agency of Transportation into a single portal has greatly improved information accessibility with enhanced search capabilities and a mobile-friendly interface. By integrating VTransparency, social media feeds, and other information resources, we can provide our customers a shorter path to answers. We continue to work with See Click Fix to improve work flows and communication with the public on maintenance issues and are looking for other opportunities to apply the mobile app.

Communicating with our customers as technology and expectations advance means embracing new tools for transparency but resisting the temptation to abandon more traditional methods. Big data and social media can work wonders, but they are no substitute for knocking on a door or attending a selectboard meeting. VTrans will continue to work to maintain strong relationships with the communities we serve.

WATERBURY. Construction of I-89, Exit 10 north bound off-ramp bridge.

GOAL FIVE

Develop a workforce to meet the strategic needs of the Agency

Significant focus was placed on recruitment activities this past year. As in previous years, we lost many experienced employees to retirement in 2016. The Department of Human Resources and our Civil Rights team has continued to support VTrans in reaching a wider, more qualified, and more diverse pool of applicants. We can be found at job fairs, business events, and at school campuses seeking out the next generation of VTrans workers while highlighting the value of public service. Launched in 2016, Build Vermont Pathway is a partnership between VTrans and Vermont State Colleges to create multiple pathways to education and a direct pathway to a fulfilling career through access to internships and job shadowing, as well as permanent employment.

2016 also saw the launching of our Respectful Workplace Commitment. We strive for a workplace that maintains an atmosphere of respect, collaboration, openness, safety and equality, and firmly established that all employees have the right to be treated with dignity and respect, and should be able to voice concerns without fear of retaliation. Training and resources were developed and delivered to support the adoption of this commitment.

The VTrans Training Center (VTTC) supports our employees by providing a variety of learning opportunities. Focused on employee productivity, development, and retention, employees can improve the skills they need for their current role and/or develop skills for future roles. Supervisory classes, safety classes, computer classes, and other technical training are some of the course offerings. Trainings are offered in the classroom or online and ensure compliance with Federal and State regulations and the Affirmative Action Plan (AAP). Mentoring and tools to assist in knowledge transfer in preparation for promotions or future retirements are a key priority. VTTC implemented a Learning Management System which was so successful that the rest of Vermont state government has adopted it, allowing all state employees and managers more access to learning opportunities.

A total of 43 project managers and design staff, and 12 Right-of-Way staff were trained in the BPM Right-of-Way application, enhancing their ability to streamline workflow. The VTrans Lean Training Program produced 147 White Belt, 58 Yellow Belt, and 36 certified Green Belt graduates.

Emergency management training remains a focus for the Agency with all staff required to complete incident command training annually to ensure everyone speaks the same language should disaster strike. Managers and other critical staff train at even higher levels and stand ready to support other agencies through Vermont Emergency Management.

Agency History

1892
The first state supervision of roads in Vermont came with the establishment of a Highway Commission.

1898
The Highway Commission was supposed to conduct a two-year survey of the state's roads, but it ended up as a six-year survey. As a result of the commission, Act 65 established a State Highway Commission, to supervise the state money to be paid out for permanent highway construction.

1921
Act 123 established the first State Highway Board, which operated through the Commissioner of Highways. The Board's members were the Governor, who served as the chairman ex officio, and two others appointed with the advice and consent of the Senate.

1923
Act 7 established the Department of Highways, which was administered by the State Highway Board (the Governor, at this point, was no longer a member of the Board). The Department was responsible for administrative details and policy information.

1960
Act 329 brought an organizational change, and the Department of Highways was now made up of the Commissioner of Highways, the State Highway Board, and the Board of Public Works.

1973
Act 259 established a Transportation Advisory Board, whose duty it was to assess the various organizations and financing alternatives for transportation within Vermont and to submit a ten-year plan to the 1975 general assembly.

1975
Act 120 established the first Agency of Transportation. It included four departments: Aeronautics; Highways; Motor Vehicles; and Bus, Rail, Waterways and Motor Carrier services. Attached to the Agency was a seven-member Transportation Board that exercised functions of a policy making, regulatory, or quasi-judicial nature related to transportation.

1986
Act 269 established the current organization. The Agency is under the direction and supervision of a Secretary who is appointed by the Governor along with the advice and consent of the Senate. It is comprised of the Department of Motor Vehicles; the Divisions of Policy, Planning and Intermodal Development; Highway; Finance and Administration; and all other boards, councils, committees, or components assigned to or created within the agency. All transportation and transit authorities established by law or executive order are attached to the agency for administrative support.

1988
Act 150 established that the Agency shall also respond in writing to concerns raised during Transportation Board hearings and inform the Joint Transportation Oversight Committee of any anticipated loss or reduction of federal funding for transportation purposes.

1991
Act 175 granted the Secretary of the Agency of Transportation the power to create divisions within the agency, necessary to carry out laws. Directors appointed by the Secretary head each division.

The Agency administers the provisions of Titles 5 (Aeronautics and Surface Transportation), 19 (Highways), and 23 (Motor Vehicles), as well as other related provisions of the law. The Agency has the authority and administrative jurisdiction to develop, promote, supervise, and support safe and adequate transportation services. It exercises general supervision of all transportation functions.

Quick Facts

Infrastructure Inventory

- 16 Public-Use Airports
- 10 State-Owned Airports (Included in Total)
- 90+ Runway Lane Miles

- 305 Miles of State-Owned Operating Rail
- 295 Miles of Privately-Owned Railroads
- 145 Miles of State-Owned Rail-Banked Trail Facilities

- 392 Public Transit Vehicles
- 30 State-Owned/Maintained Park-and-Ride Facilities
- 5 State-Owned/Maintained Park-and-Ride Facilities with EV Level 1 or 2 Charging
- 1,525 Parking Spaces at State-Owned/Maintained Park-and-Ride Facilities
- 62 Municipal Park-and-Ride Facilities Funded with State Grants
- 1,221 Parking Spaces at Municipal Owned/Maintained Park-and-Ride Facilities

- 14,171 Total Miles of Local and State Roadway
- 772 Miles National Highway System (NHS)
- 2,331 Miles State Highway System (SHS)
- 139 Miles of Class 1 Town Highways
- 1,986 Miles of Guardrail

- 2,723 Inventoried Local and State Long Bridges (Over 20 FT. Long)
- 1,089 Inventoried Long Bridges on SHS (State-Owned/Maintained)
- 44 SHS Bridges Classified Structurally Deficient in 2016 (5.7%)

- 156 Traffic Signals
- 1,100 Roadway Lights
- 2,321 Official Business Directional Signs (OBDS)

- 274 Dump Trucks with Plows and Wings
- 72 Pickups with Plows
- 374 Licensed CDL Drivers
- 64 Garages Operated
- 151,676 Hours of Plowing in Winter 2015-2016

- 4.7 Million Public Transit Ridership in 2016

- 25.7% Decrease in Major Crashes Reported 2004-2015

- 17,430 Tons of Material Applied to Protect Banks and Slopes
- 73 Operational Stormwater Permits
- 23 Miles of Linear Stormwater Treatment
- 57 Acres of Area Stormwater Treatment

- 381 Tons of Trash Collected at a cost of $1,483,478

- 6.7 Million Tons of Rail Freight Shipped Each Year

- 16,596 Acres Mowed

- 121 Total Public Records Requests Processed
  - 75.2% processed in 3 days
  - 22.3% processed in 10 days
- 20,953 Pages of VTrans Records Delivered
- 186 Walk-in Requests Accommodated
- 27 Estimates Issued

Department of Motor Vehicles

The Department of Motor Vehicles (DMV) is responsible for issuing driver licenses, permits, motor vehicle registrations (including snowmobile and motorboat registrations), driver license suspensions and reinstatements, enforcement of motor-vehicle-related laws, and collecting motor fuel revenue for the state of Vermont. The department also manages several safety programs, including vehicle inspections, motor carrier safety, school bus safety and those related to motorcycle training. The Vermont DMV serves a resident population of over 626,000, as well as a significant number of nonresidents.

Revenues FY2016 (fees, taxes and permits)

Purchase & Use Tax	$69,232,418
Registrations	$55,336,523
Gas Tax	$39,313,297
2013 Motor Fuel Assessment Fee	$34,303,341
Tax - Up To 6,099	$16,998,603
Diesel Tax	$16,773,433
Motor Fuel Assessment Fee TIB	$12,455,879
License (Non-CDL)	$9,520,180
Tax - Up To 25,999	$8,886,270
Titles	$5,822,336
IRP In State	$4,793,014
Rental Vehicle Tax	$4,133,954
Overweight Permit	$3,221,051
Inspections	$3,015,333
IFTA	$2,501,930
IRP To Foreign	$2,313,300
Diesel Fuel Assessment	$1,717,819
Tax - 26,000 And Over	$1,519,059
Sales Tax	$1,349,272
Other	$5,651,710
Total	$298,858,723

MONTPELIER. A DMV enforcement vehicle parks in front of the main office in Montpelier, across from the State House.

DMV Rates

Gas Tax, Assessments, and Clean Up Fee	$0.121 plus MFTIA plus MFTA plus $0.01 Clean Up Fee
Motor Fuel Transportation Infrastructure Assessment	$0.0396 per gallon or 2% of the adjusted retail price upon each gallon of motor fuel sold by the distributor, whichever is greater.
Motor Fuel Tax Assessment	$0.134 per gallon or 4% of the tax-adjusted retail price upon each gallon of motor fuel sold by the distributor not to exceed $0.18, whichever is greater
Diesel Tax, Clean Up Fee, and Infrastructure Fee	$0.28 and $0.01 and $0.03
Sales Tax, Purchase and Use Tax, Motor Homes, Trucks up to 10,099 lbs.	6%
Driver Training	$50 – $150
Clean Air Fund	$2/year
Conservation Plates	$26/pair, in addition to registration fee
Title Fees (Vehicle)	$35
Title Fees (ATV, Boats, Snowmobiles)	$22
Oversize Permits	$1 – $500
Survey Fee	$300 – $10,000

Vehicle Registration

- 425,495 Cars
- 148,103 Trucks
- 96,110 Trailers
- 28,062 Motorboats
- 31,910 Motorcycles
- 12,772 Snowmobiles
- 14,187 ATVs
- 2,907 Agriculture

Vehicle Licenses

- 539,826 Operators
- 61,520 Motorcycle Endorsements
- 31,599 Non-Driver IDs
- 20,957 Learner Permits
- 8,974 Junior Operators

Vehicle Registrations Processed

- 483,321 Registration Renewals
- 154,203 Vehicle Titles
- 148,581 New Registrations
- 44,649 Registration Transfers
- 12,351 Duplicate Registrations
- 6,262 Duplicate Titles

License Transactions Processed

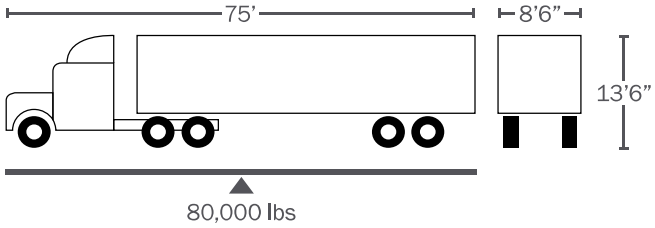
- 140,884 Operator Renewals
- 16,122 Duplicates
- 15,451 New Operators
- 9,169 New Learner Permits
- 5,145 Junior Operators
- 2,562 Learner Permit Renewals

Vermont Rider Education Program

115	8	1,184	1,115	1,055	1,003	69
Courses Offered	Training Sites Available	Students Registered	Students Attending	Students Completing the Program	Students Passing the Program	No Shows

Truck Legal Size and Load Limits

The maximum load on any vehicle axle shall not exceed a gross weight of more than 600 pounds per inch of tire width in conformity with the manufacturer's designated width. Axle weight must conform to federal bridge formula.



DMV Contact Information

Montpelier
Washington County - Main Office
120 State Street
802-828-2000, 888-998-3766

Bennington
Bennington County - Branch Office
530 Main Street

Dummerston
Windham County - Branch Office
870 US Route 5

Middlebury
Addison County - Branch Office
7 Addison County Courthouse
Mahady Court, 2nd floor

Newport
Orleans County - Branch Office
100 Main Street

Rutland
Rutland County - Branch Office
101 State Place

Saint Albans
Franklin County - Branch Office
27 Fisher Pond Road

Saint Johnsbury
Caledonia County - Branch Office
1998 Memorial Drive

South Burlington
Chittenden County - Branch Office
4 Market Street

Springfield
Windsor County - Branch Office
100 Mineral Street, Suite 103

White River Junction
Windsor County - Branch Office
226 Holiday Drive

Highway Safety

The Office of Highway Safety is comprised of the Highway Safety Data Unit, Governor's Highway Safety Program, Infrastructure Safety Unit, and the Vermont Highway Safety Alliance.

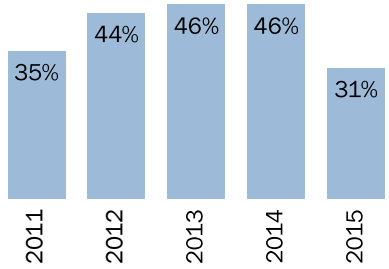
Highway Safety Data Unit

The Highway Safety Data Unit collects and manages data related to highway system conditions, collects highway video, reports highway sufficiency rating data, manages the Crash, Fatality Analysis Reporting System (FARS), and the VT Highway Performance Monitoring System (HPMS) databases, and coordinates highway classification system reviews (both state and federal). Staff are actively involved in the Traffic Records Coordinating Committee and the Vermont Highway Safety Alliance and work closely with statewide law enforcement in the area of crash reporting.

Public Data Query Tool

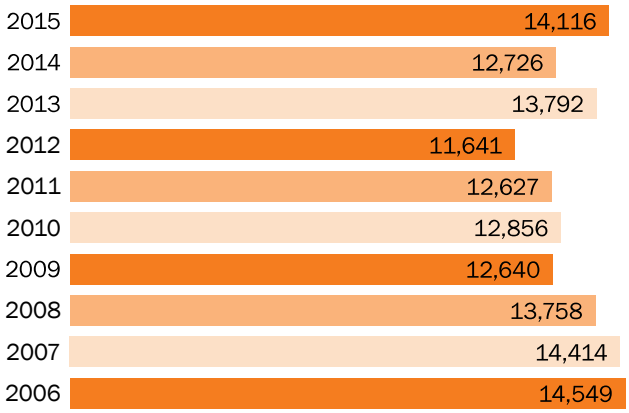
Additional crash information is available at:
app.vtrans.vermont.gov/CrashPublicQueryTool

Occupant Fatalities With No or Improper Restraint

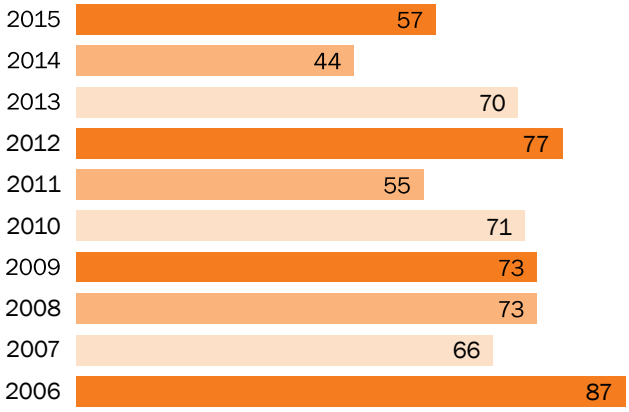


Data source: VTrans in-house VCSG database or FARS. Data reflected as submitted by law enforcement. Where restraint is "None Used" (VCSG) or "No" (FARS). Includes "Improper Use" and "Non-DOT Compliant Helmet."

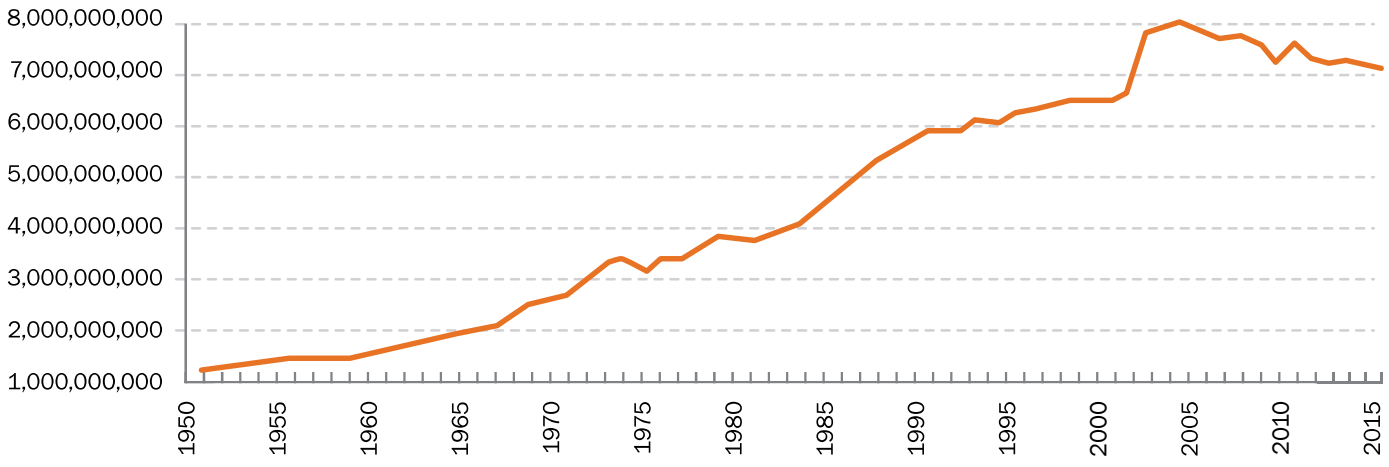
Crashes Reported, by calendar year



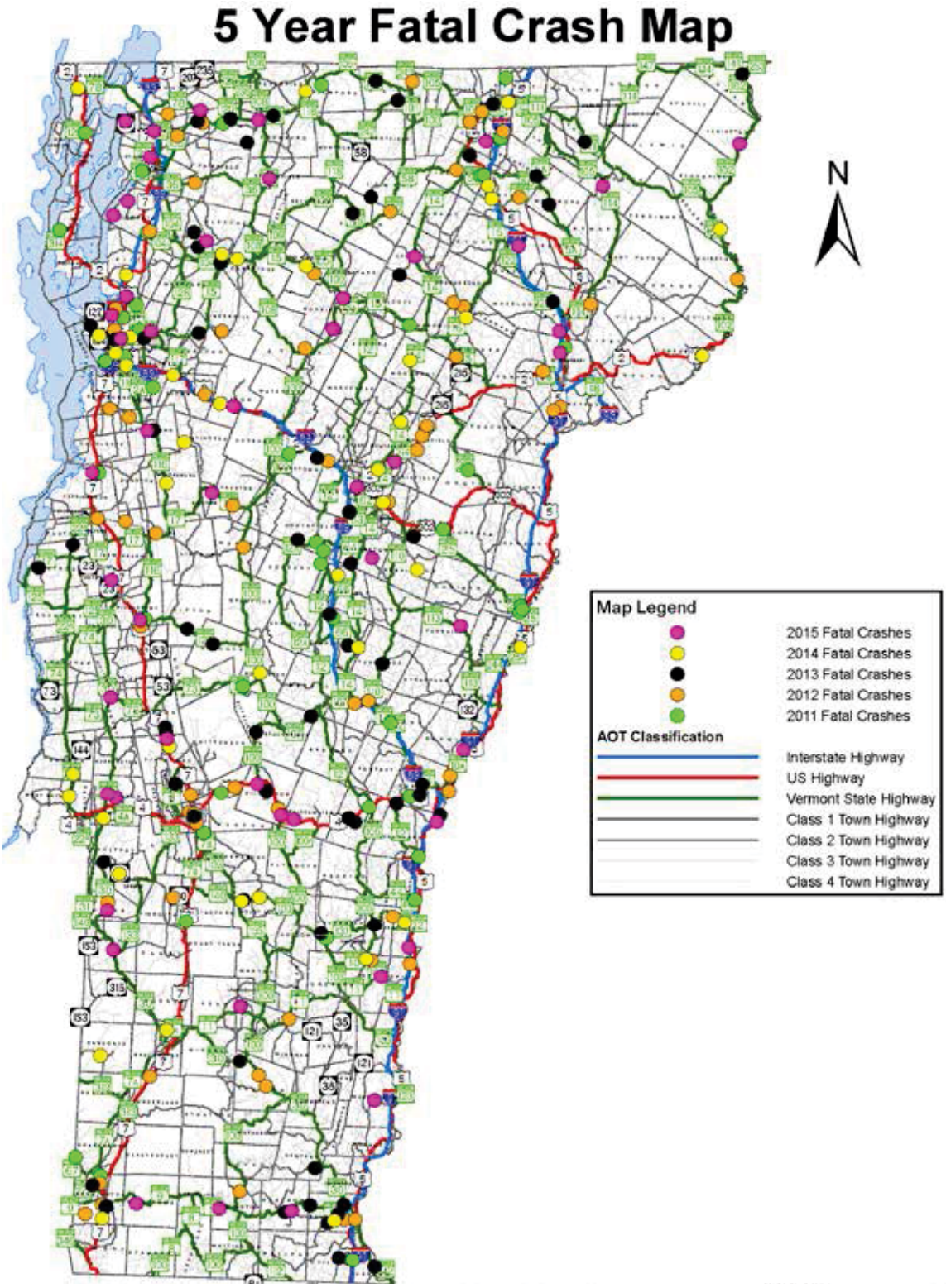
Fatalities, by calendar year



Vehicle Miles of Travel: 1950 – 2015



Fatal Crash Map, 2011–2015



Governor's Highway Safety Program

The Governor's Highway Safety Program (GHSP) awards federal highway safety grant funds to local, state, and non-profit agencies for projects to improve highway safety and reduce deaths and serious injuries due to crashes. The programs administered through GHSP are federally funded through the National Highway Traffic Safety Administration (NHTSA). GHSP programs are defined and approved each year through the Highway Safety Plan (HSP) and align with the State's Strategic Highway Safety Plan (SHSP). The Federal Fiscal Year 2016 (FFY16) HSP was constructed by incorporating data from the Moving Ahead for Progress in the 21st Century Act (MAP-21). GHSP used data to identify persistent and emerging trends, promoting successful highway safety strategies, developing strong partnerships, and implementing performance-based solutions. The HSP is designed to educate drivers, passengers, pedestrians, bicyclists, and motorcyclists about highway safety. Our programs employ the use of countermeasures that focus primarily on the modification of driver behavior through enforcement and education.

Infrastructure Safety Unit

The Highway Safety Improvement Program (HSIP) focuses on roadway locations and characteristics that exhibit unusually high numbers of crashes. The HSIP develops and implements infrastructure changes to reduce crashes. This past summer, via construction contracts, VTrans restriped all roadways under its responsibility, and added miles of centerline rumble stripes in an effort to reduce run-off road crashes. In addition to these system wide efforts, VTrans reviewed 12 different sites using the Road Safety Audit Review multi-disciplinary format. Two major intersection improvement projects for the US 2 & Clay Point Rd, Colchester and US 2 & Bear Trap Rd, Milton intersections were completed this past summer. The US 302 paving project in Berlin installed a Road Diet configuration in order to facilitate mobility and safety for all roadway users.

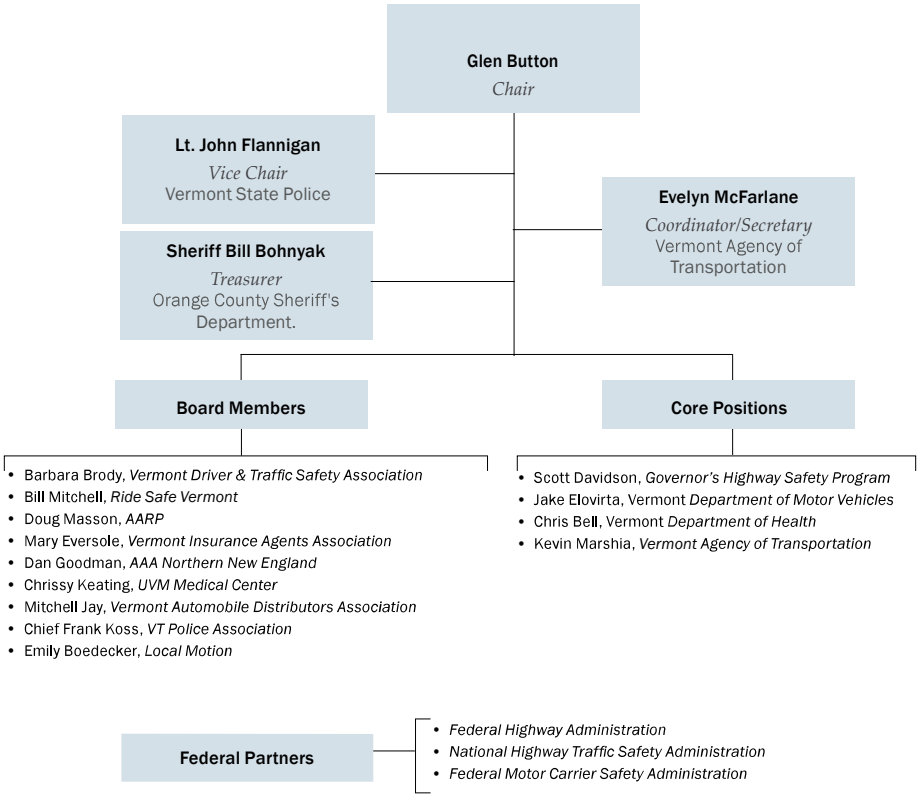
Vermont Highway Safety Alliance

The Vermont Highway Safety Alliance (VHSA) is a network of like-minded private and public organizations working together to collect, share and use data to develop highway safety strategies integrating: road engineering and infrastructure; law enforcement and emergency medical services; and education and outreach. The VHSA is tasked with developing and carrying out the Agency's Strategic Highway Safety Plan, which is updated every five years.

2017-2021 Strategic Highway Safety Plan Critical Emphasis Areas

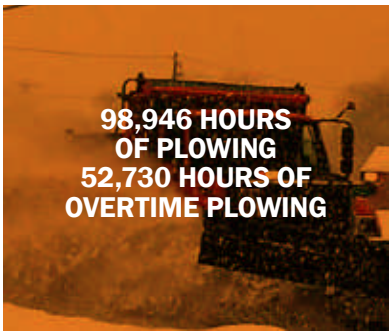
1. Improve Infrastructure
    a. Minimize Lane Departure
    b. Improve the Design and Operation of Highway Intersection
2. Reduce Speeding and Aggressive Driving
3. Increase Use of Occupant Protection
4. Vulnerable Users and Motorcyclists Safety
    a. Increase Pedestrian Safety
    b. Increase Bicyclist Safety
    c. Increase Motorcyclist Safety
5. Age Appropriate Solutions
    a. Improve Younger Driver Safety (Under 25)
    b. Improver Older Driver Safety (65 and Over)
6. Reduce Impaired Driving
7. Curb Distracted and Inattentive Driving

Vermont Highway Safety Alliance Board and Federal Partners



Winter Maintenance

2015–16 Data

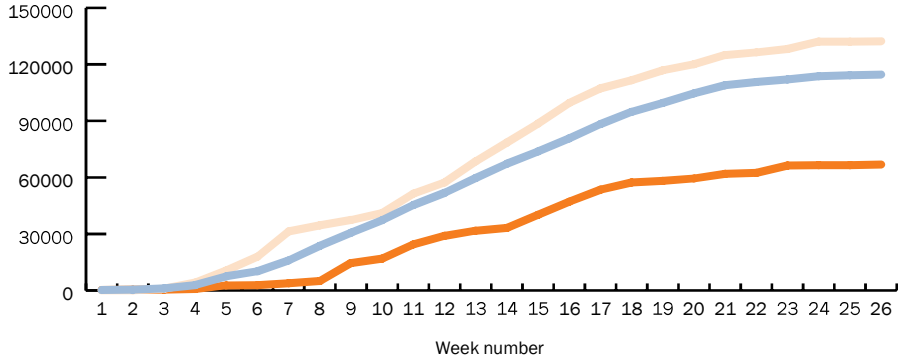


Five-Year Salt Price Comparison

Location	FY2013 Price	FY2014 Price	FY2015 Price	FY2016 Price	FY2017 Price
District 1	$59.59	$53.79	$73.79	$76.74	$74.44
District 2	$61.90	$58.65	$78.65	$81.80	$79.35
District 3	$62.17	$54.02	$76.02	$79.06	$76.69
District 4	$62.67	$56.52	$75.52	$78.54	$76.18
District 5	$61.58	$58.73	$72.18	$74.35	$74.35
District 7	$65.21	$60.16	$76.76	$79.83	$77.44
District 8	$63.28	$61.67	$78.44	$80.79	$80.79
District 9	$68.05	$67.95	$82.26	$84.73	$84.73

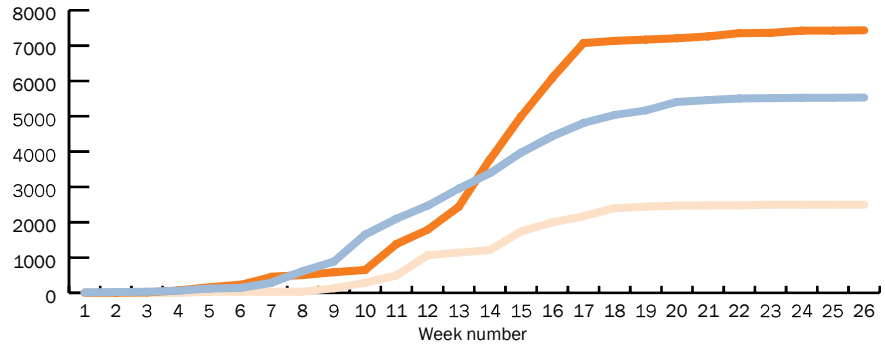
Salt Usage (in tons)

FY2016:	66,821
FY2015:	131,684
5-yr average:	114,607



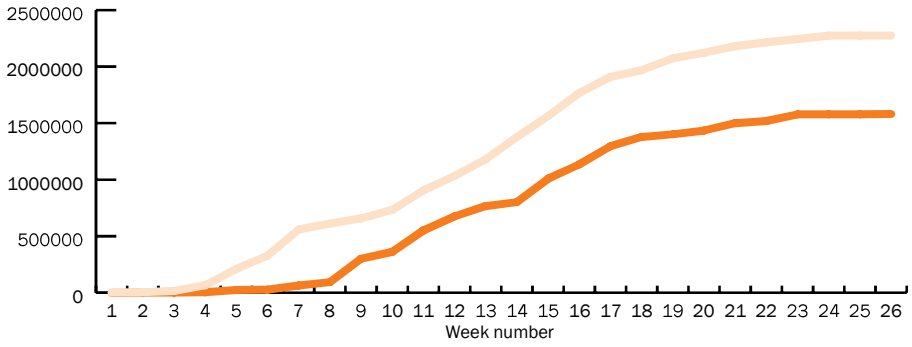
Sand Usage (in cubic yards)

FY2016:	2,496
FY2015:	6,489
5-yr average:	5,530



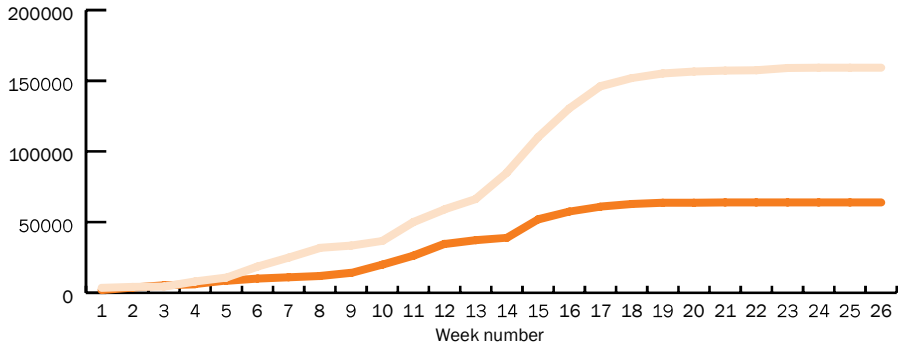
Brine Usage (in gallons)

FY2016:	1,579,628
FY2015:	2,274,378



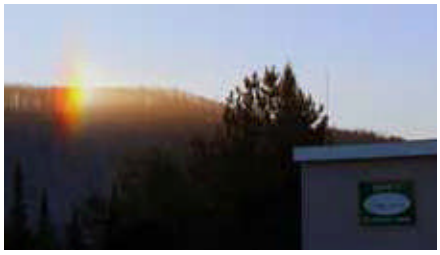
De-Icer Usage (in gallons)

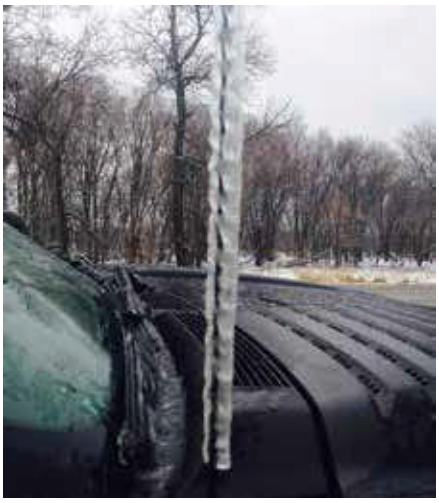
FY2016:	63,912
FY2015:	159,284



Winter Maintenance Events

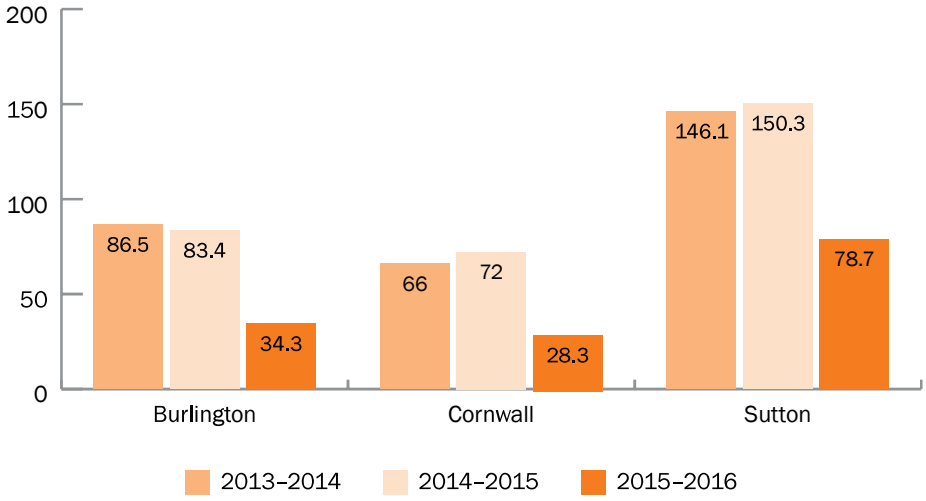
A Winter Maintenance Event is defined as one in which three or more districts are engaged in winter maintenance activities requiring snow plowing, salting, or sanding. These can last anywhere from a few hours to several days.



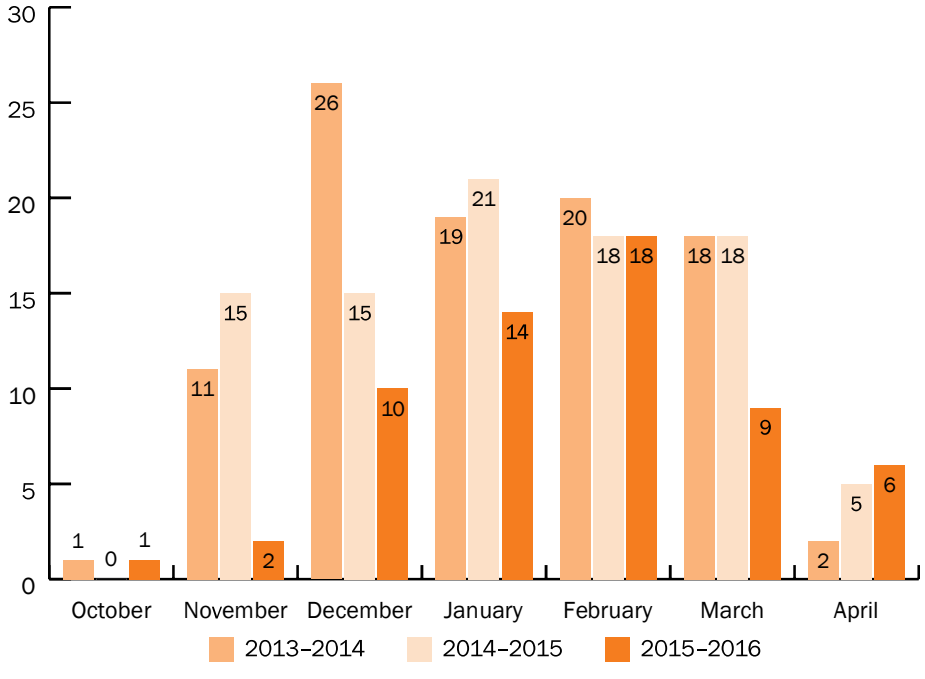


Total Winter Events, Three-Year Comparison

Total Snowfall, Three-Year Comparison (in inches)



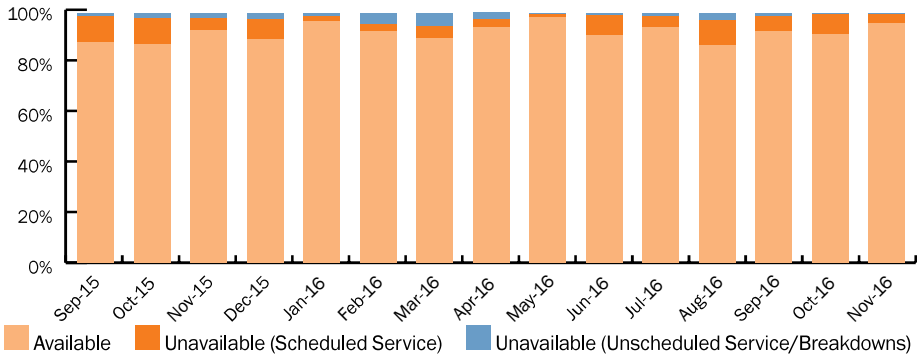
Average Winter Maintenance Event Days, Three-Year Comparison



Equipment Performance Measures

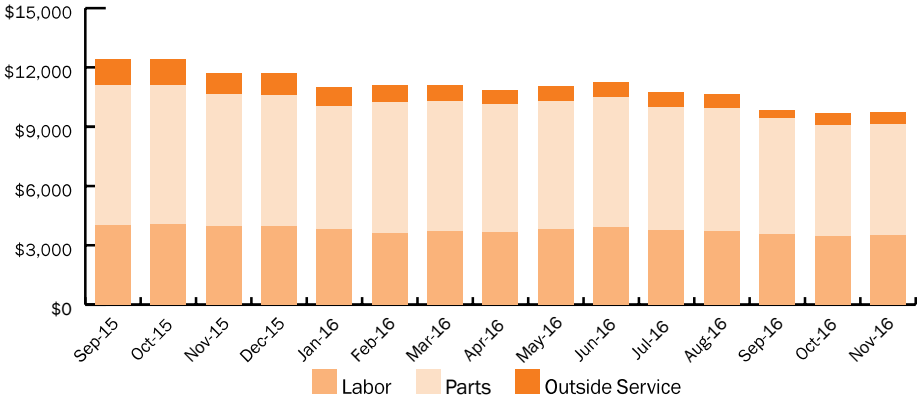
Plow/Dump Truck Availability

Target: ≥ 90% Available; ≤ 2% Breakdowns



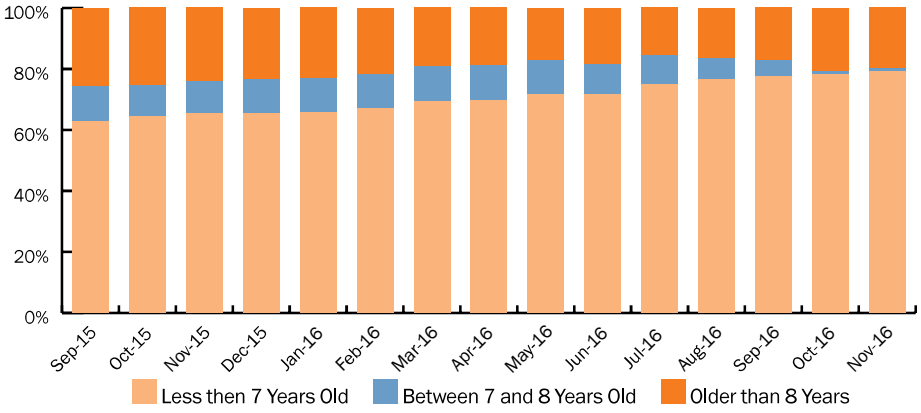
Plow/Dump 12-month Average Service Cost

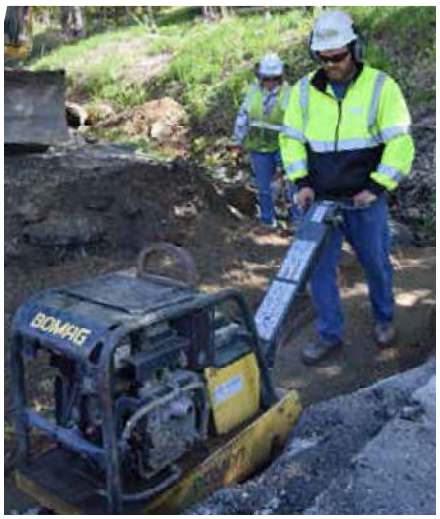
Target: Minimize as practical



Plow/Dump Truck Age

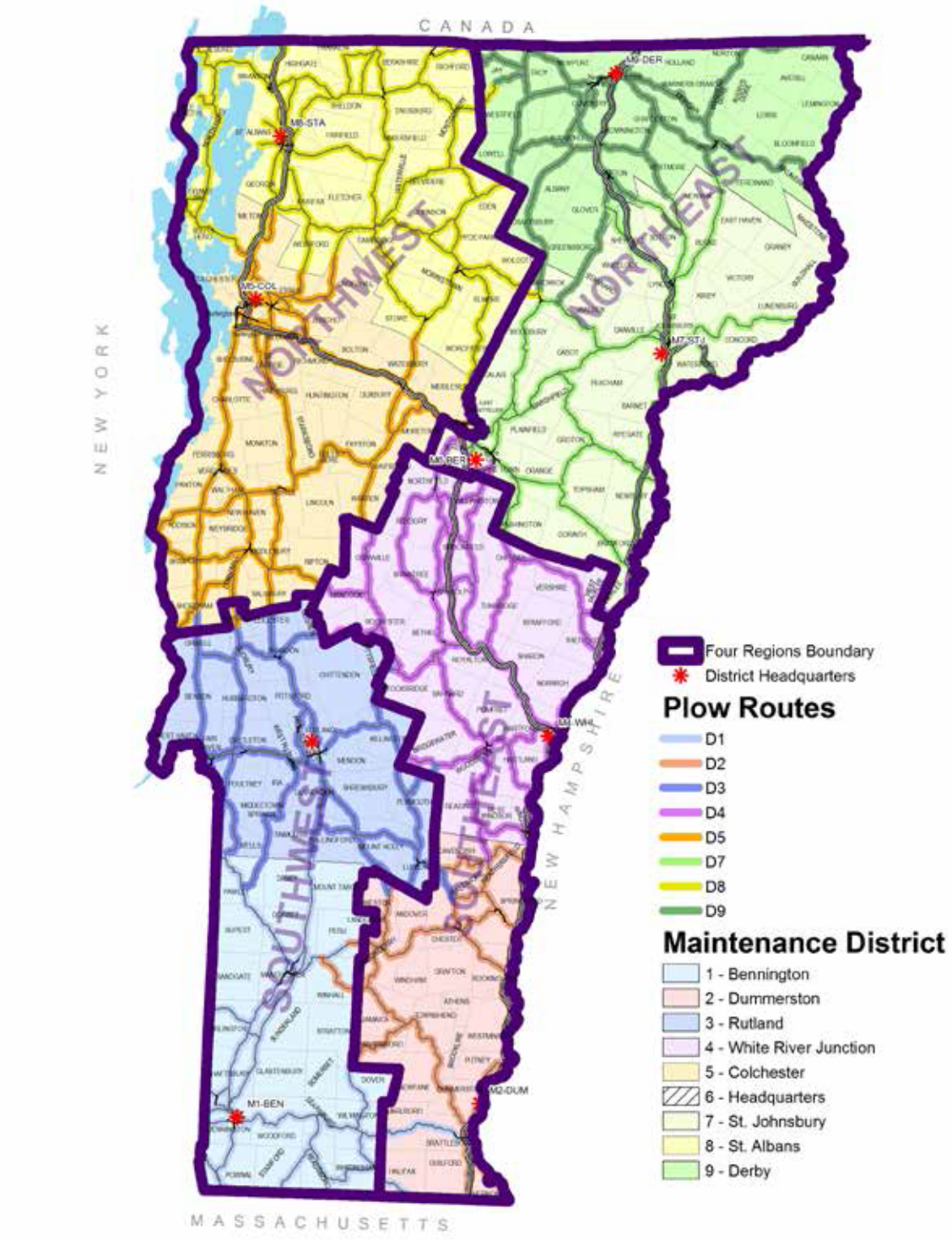
Target: ≤ 15% Older than 8 years





Operations Statistics

BY DISTRICT



Southwest Region

District 1

359 Bowen Road
Bennington, VT 05201
(802) 447-2791

507 Lane Miles

District Transportation Administrator
Rob Faley

General Maintenance Manager
William Leach Jr.

Project Manager
Christopher Taft

Facility Locations
Bennington
East Dorset
Readsboro
Wilmington
Marlboro

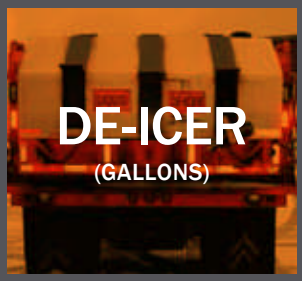
40
FULL TIME POSITIONS

46
PIECES OF CENTRAL GARAGE ASSIGNED EQUIPMENT

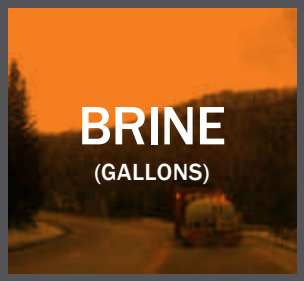
$1,827,218
WINTER MAINTENANCE COSTS

4,470

242



14,803



317,216

District 3

61 Valley View, Suite 2
Mendon, VT 05701
(802) 786-5826

637 Lane Miles

District Transportation Administrator
Rob Faley

General Maintenance Manager
Bruce Nichols

Project Manager
Brian Sanderson

Facility Locations
Brandon
Castleton
Clarendon
Ludlow
Mendon
Rutland
Sudbury

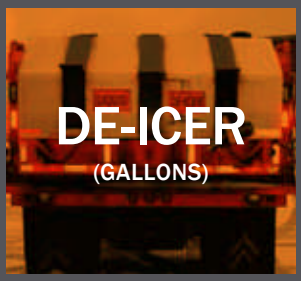
48
FULL TIME POSITIONS

61
PIECES OF CENTRAL GARAGE ASSIGNED EQUIPMENT

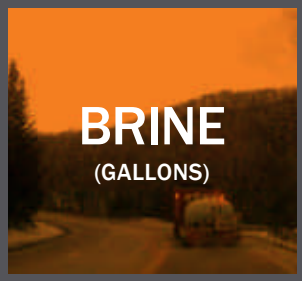
$2,375,963
WINTER MAINTENANCE COSTS

8,875

161



9,651



201,380

Southeast Region

District 2

870 US 5
Dummerston, VT 05301
(802) 254-5011

658 Lane Miles

District Transportation Administrator
Tammy Ellis

General Maintenance Manager
Joseph Ruzzo

Project Manager
Marc Pickering

Facility Locations
Ascutney
Chester
Dummerston
Jamaica
Londonderry
Rockingham
Springfield

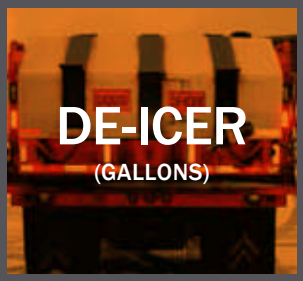
45
FULL TIME POSITIONS

49
PIECES OF CENTRAL GARAGE ASSIGNED EQUIPMENT

$1,702,651
WINTER MAINTENANCE COSTS

6,677

0



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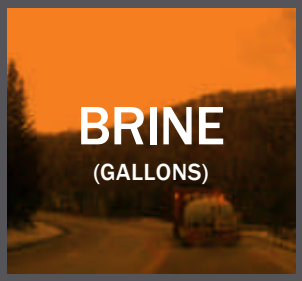


4,090

District 4

221 Beswick Drive
White River Jct., VT 05002
(802) 295-8888

1,126 Lane Miles

District Transportation Administrator
Tammy Ellis

General Maintenance Manager
Trevor Starr

Project Manager
Chris Bump

Facility Locations
Fairlee
Randolph
Reading
Rochester
Royalton
Sharon
Thetford
Tunbridge
White River Jct.
Windsor
Williamstown
Woodstock

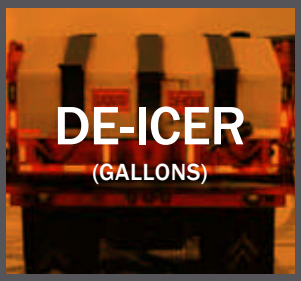
69
FULL TIME POSITIONS

86
PIECES OF CENTRAL GARAGE ASSIGNED EQUIPMENT

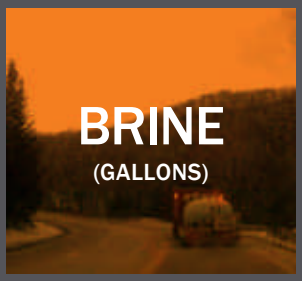
$3,481,247
WINTER MAINTENANCE COSTS

13,110

376



10,262



51,723

Northwest Region

District 5

PO Box 168
Essex Jct., VT 05453
(802) 655-1580

952 Lane Miles

District Transportation Administrator
David Blackmore

General Maintenance Manager
Rejean Lafleche

Project Manager
Richard Hosking

Facility Locations
Chimney Corners
Colchester
Essex
Middlebury
New Haven
Waitsfield
Middlesex

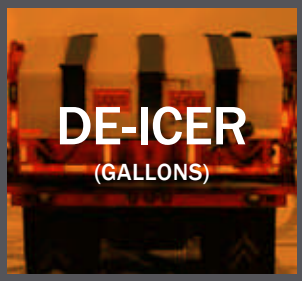
67
FULL TIME POSITIONS

82
PIECES OF CENTRAL GARAGE ASSIGNED EQUIPMENT

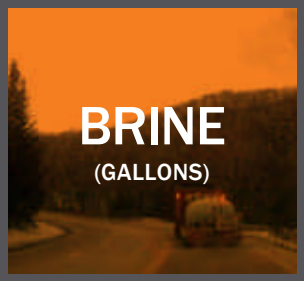
$2,800,230
WINTER MAINTENANCE COSTS

7,426

532



8,674



257,654

District 8

680 Lower Newton Road
St. Albans, VT 05478
(802) 524-7927

939 Lane Miles

District Transportation Administrator
David Blackmore

General Maintenance Manager
Ernie Patnoe

Project Manager
Jim Cota

Facility Locations
Cambridge
Eden
Enosburg
Georgia
N. Hero
Highgate
Montgomery
Morrisville
St. Albans

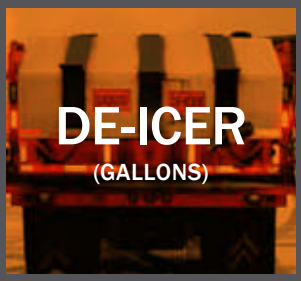
57
FULL TIME POSITIONS

73
PIECES OF CENTRAL GARAGE ASSIGNED EQUIPMENT

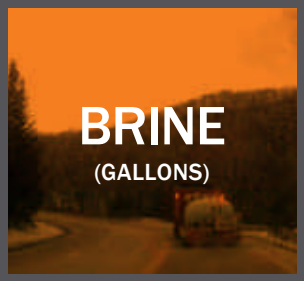
$3,590,226
WINTER MAINTENANCE COSTS

11,294

112



5,650



477,177

Northeast Region

District 7

1068 US 5, Suite 2
St. Johnsbury, VT 05819
(802) 748-6670

967 Lane Miles

District Transportation Administrator
Dale Perron

General Maintenance Manager
Kevin Gadapee

Project Manager
Shauna Clifford

Facility Locations

Bradford
W. Danville
Lunenburg
Lyndon
Newbury
North Montpelier
Orange
St. Johnsbury

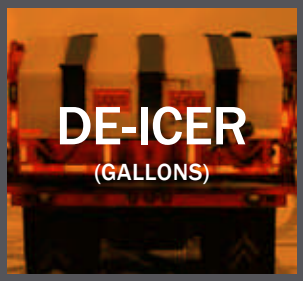
59
FULL TIME POSITIONS

75
PIECES OF CENTRAL GARAGE ASSIGNED EQUIPMENT

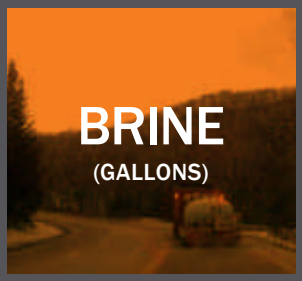
$3,176,051
WINTER MAINTENANCE COSTS

8,345

731



11,208



160,934

District 9

4611 US 5
Newport, VT 05855
(802) 334-7934

736 Lane Miles

District Transportation Administrator
Dale Perron

General Maintenance Manager
Bill Jewell

Project Manager
Shane Morin

Facility Locations

Barton
Bloomfield
Canaan
Derby
Irasburg
Island Pond
Westfield
Westmore

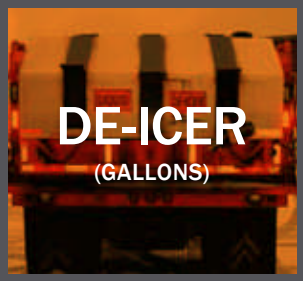
47
FULL TIME POSITIONS

50
PIECES OF CENTRAL GARAGE ASSIGNED EQUIPMENT

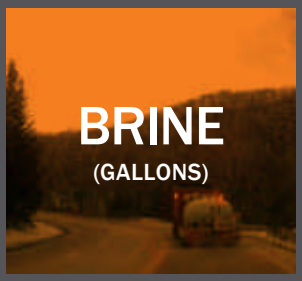
$2,354,811
WINTER MAINTENANCE COSTS

6,624

343



2,835



109,454

Statewide Services

Maintenance Operations Bureau Headquarters

One National Life Dr.,
Montpelier, VT 05633
(802) 828-2692

Director, Scott Rogers

Deputy Director, Wayne Gammell

Maintenance Engineer, Todd Law

Facility Locations
Berlin
Montpelier

Headquarters includes administrative support and oversight and the business office for maintenance and operations.

11
FULL TIME POSITIONS

25
PIECES OF DISTRICT OWNED EQUIPMENT

Tech Services

One National Life Dr.,
Montpelier, VT 05633
(802) 828-1776

Tech Services Engineer, Alec Portalupi

Services
Logistics/Facilities
Transportation System Management & Operations (TSMO)
Statewide Bridge Crew
Emergency and Engineering Support
Pavement
Environmental

66
FULL TIME POSITIONS

Central Garage

US 302 #31756,
Berlin, VT 05602
(802) 828-1776

Superintendent, Ken Valentine

Facility Locations
Berlin
Colchester
Lyndonville
Rutland
White River Junction

54
FULL TIME POSITIONS

54
PIECES OF CENTRAL GARAGE OWNED EQUIPMENT

VTrans Training Center (VTTC)

1716 US 302, Berlin, VT 05633
(802) 828-3768

Program Manager, Christine Hetzel

Health & Safety, Camille Erwin

Employee Development, Colleen Montague

Finance & Logistics, Jo Ann Stevens

Technical, Lance Duquette

The VTrans Training Center (VTTC) provides a wide spectrum of health and safety and employee development training for VTrans staff to ensure regulatory compliance, a safe and respectful workplace and offers the necessary tools for employees to grow their careers at VTrans.

Vermont Local Roads

1716 US 302, Berlin, VT 05633
(802) 828-2537
localroads.vermont.gov

Branch Manager, Stu Johnson

Circuit Rider, Todd Eaton

Program Coordinator, Holly Hayden

The Vermont Local Roads Program provides information, training and technical assistance to cities, towns and villages in Vermont. This is done through seminars and workshops, distribution of materials, and technical assistance to fulfill service requests.

Bridge Population

In conformance with the National Bridge Inventory (NBI), Vermont maintains a historical record of all bridges subject to the National Bridge Inspection Standards (NBIS). These standards establish requirements for inspection procedures, frequency of inspections, qualifications of personnel, inspection reports, and both the preparation and maintenance of a state bridge inventory. The NBIS apply to all structures defined as bridges that are longer than 20 feet in length and located on public roads. These assets are commonly referred to as long structures. Short structures are those having a span length of greater than six feet up to or equal to 20 feet.

"Highway" Structure Population (as submitted to FHWA in April 2016)

	Interstate	State Highway	Town Highway	Other	Totals
Long Structures	310	779	1,640	7	2,736
Short Structures	210	1,055	*	*	1,265
Totals	520	1,834	1,640	7	4,001

Long Structures

	Interstate	State Highway	Town Highway	Other	Totals
Above Ground	262	716	1,529	6	2,513
Buried	48	63	111	1	223
Totals	310	779	1,640	7	2,736

Short Structures

	Interstate	State Highway	Town Highway	Other	Totals
Above Ground	0	174	*	*	174
Buried	210	881	*	*	1,091
Totals	210	1,055	*	*	1,265

Vermont's "Off-Highway" Structure Population (as of April 2016)

	State Highway	Town Highway	Totals
Retaining Walls	160	**	160
Recreation Path Structures	0	121	121
Overhead Sign Support Structures	138	***	138
Totals	298	121	419

DEFINITIONS

Long Structure
Bridges having a span length greater than 20 feet in length and located on public roads.

Short Structure
Bridges having a span length of greater than six feet up to or equal to 20 feet and located on public roads.

* VTrans does not maintain an inventory of or inspect town highway or other short structures.

Buried Structure
These structures include metal culverts, concrete box culverts, frames, masonry arches, and concrete arches.

Retaining Wall
Height greater than 3 feet

Recreation Path Structures
Span length greater than 6 feet

** VTrans does not maintain an inventory of or inspect municipally-owned retaining walls or overhead sign support structure bases.

*** This number is expected to change as inspection criteria are refined (i.e., minimum sign size, attachment, etc.).

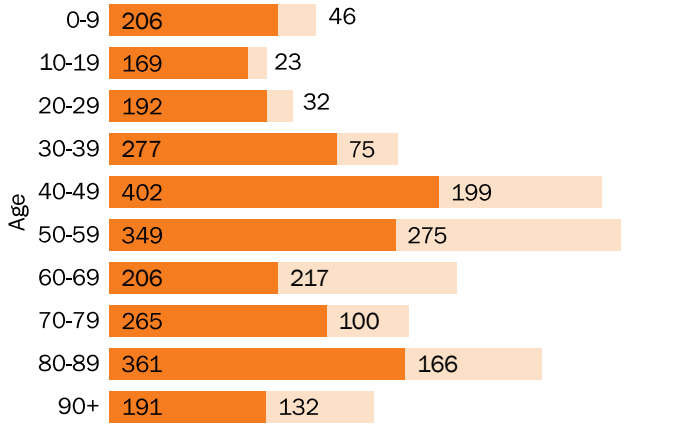
Bridge Condition

Aging Bridge and Culvert Inventory

With 1927 flood-era bridges now over 80 years old and nearing the end of their useful design life, as well as the 1958-to-1978 Interstate-era bridges averaging around 50 years old and in need of repairs or rehabilitation, a wave of structures in need of major investment is quickly approaching.

- Interstate, State Highway, and Town Highway Long Structures
- Interstate and State Highway Short Structures
- * Based on year of original build (as submitted to FHWA, April 2016). Does not include Division of Historic Preservation, rail or private bridges.

Structure Count by Age (in years*)



Restrictions

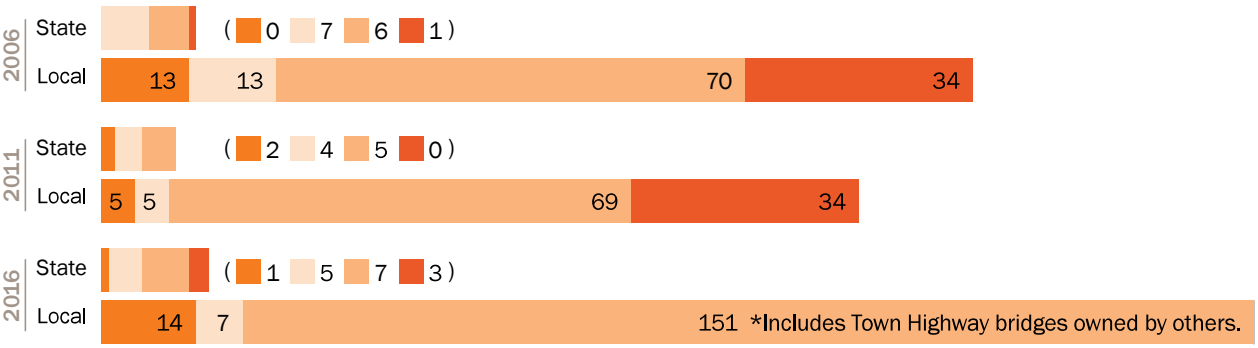
VTrans continually evaluates the most appropriate performance measures to target which structures are in highest need of repair or rehabilitation, weighed against what is either being lost or gained in terms of keeping our assets open and unrestricted for public travel.

Due to recent public attention on the condition of our bridges, many believe Vermont has more restricted bridges than it did 10 years ago. In fact, prior to 2012 (which showed an increase as a result of infrastructure damage caused by Tropical Storm Irene), the state trend had been decreasing. As large storms become more frequent and infrastructure continues to age, downward trends will become more difficult to maintain in the future.

Restricted Structures (as submitted to FHWA April, 2016)

Restrictions—a limitation of or inability to use a structure—come in four basic categories:

- **Closed** — Bridge closed to all traffic.
- **Temporary** — Open but with a temporary structure in place to carry legal loads while original structure is closed and awaiting replacement or rehabilitation.
- **Posted** — Reduced maximum allowed weight. Posted structures may include other restrictions such as temporary bridges which are load posted.
- **Restricted** — Posted for other load capacity restrictions such as speed, number of vehicles, vertical clearance, etc.



*Includes Town Highway bridges owned by others.

Bridge Inspection and Condition Ratings

The nation's current bridge inspection practice was established largely as a response to disasters involving bridge failures. With each failure, new information emerged and new standards were implemented. Some of the events that have dramatically influenced national inspection and maintenance practices are listed here:

- 1967. The 2,235 foot Silver Bridge at Point Pleasant, West Virginia collapsed into the Ohio River killing 46 drivers and passengers. This aroused national concern about bridge safety inspection and maintenance, and motivated Congress to enact improvements to the Federal Highway Act of 1968. In 1971, National Bridge Inspection Standards (NBIS) were created, setting national policy for inspection frequency, inspector training and qualifications, reporting formats, and procedures for inspection and rating.
- 1970s. Attention was directed to culverts after several collapses.
- 1983. The Mianus River Bridge in Connecticut collapsed after one of its pin-and-hanger assemblies failed, leading to a national emphasis on fatigue and fracture-critical elements.
- 1987. The fall of the Schoharie Creek Bridge on the New York Thruway focused attention on underwater inspection of bridge foundations.
- 2007. The I-35W highway bridge over the Mississippi River in Minneapolis collapsed, killing 13 people and injuring 145. Undersized gusset plates and the stress of 287 tons of stockpiled construction material were singled out in the National Transportation Safety Board (NTSB) Accident Report as reasons for the failure. Federal safety investigators said the collapse was unavoidable once gusset plates in the bridge's center span failed, dragging other sections and rush-hour commuters into the Mississippi River. This led to an emphasis on gusset plate inspection and design.

Guided by federal requirements, all bridges in excess of a 20-foot span and located on public roads receive regular, biennial inspections by qualified personnel to ensure safety of the traveling public. Short structures, those greater than 6 feet and up to 20 feet in span length, located on either the interstate or state highway systems are inspected once every 60 months. Bridge safety is taken very seriously. If deemed necessary because of deteriorating conditions, bridges are inspected more frequently.

FHWA recently strengthened oversight of bridge inspections and maintenance with the introduction of a new bridge initiative using systematic, data-driven, and risk based reviews and analysis to improve oversight of how states are performing their bridge inspections. This new process, using and reporting on key metrics, each linked directly to NBIS requirements, will help identify opportunities for improvement in achieving consistent compliance with the National Bridge Inspection Standards (NBIS).

The new process is based on objective, statistical data, providing for greater consistency in bridge inspections nationwide and more strategic approaches to identifying problem areas. Key metrics include inspection records; determination of bridge load limits; qualifications of inspection personnel; procedures for underwater, fracture-critical, and complex bridge inspections; and inspection frequency.

Through periodic safety inspections, data is collected on the condition of each structure's primary components. Condition ratings are collected for the following bridge components:

Deck
The portion of a bridge that provides a surface for vehicular or pedestrian traffic

Superstructure
The portion of a bridge above the substructure that supports the deck, including beams, girders, trusses, and bearing devices which support traffic and transfer the loads to the substructure

Substructure
The portion of a bridge below the bearing device, built to support the superstructure and transmit loads to the foundation

The culvert condition rating describes all structural elements of culvert designs which do not have a distinct deck, superstructure or substructure and are buried under fill. The channel and the channel protective system are also rated, describing the physical conditions of slopes, as well as the channel or water flow through the bridge.

Bridge inspectors utilize a point system from zero to nine, where nine indicates an excellent condition and zero indicates a failed condition. Inspectors visually assess the ratings based on engineering expertise, training, and experience. These ratings form the basis for assessing the structural condition of the bridge.

Recommendations for maintenance or repair needs, load restrictions, posting, or closure originate with, and are based on, inspection findings. Inspection provides a visual record of structural health—including deterioration—and the consequent determination of a structure's ability to continue to perform in a safe manner.

The challenges faced in the northeast—having an older and aging infrastructure, seasonal limitations on performing inspections, extensive use of deicing salts and accelerated corrosion rates—are among the more demanding and the importance of routine inspections cannot and should not be underestimated.

Structurally Deficient and Functionally Obsolete

The Agency is evaluating a number of performance measures by which to judge how well we are maintaining our structure assets. Measures such as bridge health index; averaged condition; worst condition; numbers and deck area of structurally deficient and functionally obsolete bridges; and the number of restricted, posted, closed, or temporary bridges are all being considered.

For many years, the Federal Highway Administration (FHWA) has used structural deficiency and functional obsolescence measures. Similarly, VTrans has used percent bridges structurally deficient by system (interstate, state highway, and town highway).

Where do the terms structurally deficient and functionally obsolete come from and how are they defined? Both are terms FHWA uses to classify bridges "according to serviceability, safety, and essentiality for public use" to meet the requirements of Title 23 of the United States Code (23 U.S.C. 144). The technical definitions are as follows (source: 23 C.F.R. 650D):

Structurally Deficient (SD)

A bridge becomes structurally deficient when at least one of six items from the National Bridge Inventory (NBI) reaches a set threshold. The criteria are a Deck Condition Rating, Superstructure Condition Rating, Substructure Condition Rating, or Culvert Condition Rating of 4 (Poor Condition) or less, or a Structural Evaluation Appraisal Rating or Waterway Adequacy Appraisal Rating of 2 (basically intolerable, requiring a high priority of replacement) or less. Any bridge that is classified structurally deficient is excluded from the functionally obsolete category.

Functionally Obsolete (FO)

A bridge becomes functionally obsolete when at least one of five items from the National Bridge Inventory reaches a set threshold. The criteria are a Deck Geometry Appraisal Rating, Underclearances Appraisal Rating, Approach Roadway Alignment Appraisal Rating, Structural Evaluation Appraisal Rating or Waterway Adequacy Appraisal Rating of 3 (basically intolerable, requiring a high priority of corrective action) or less. Any bridge that is classified structurally deficient is excluded from the functionally obsolete category.

BRATTLEBORO. Two aging steel bridges are being replaced with a single concrete span on I-91.

Highway bridges classified as functionally obsolete are not structurally deficient, but according to federal standards their design is outdated. They may have lower load carrying capacity, narrower shoulders, or less clearance underneath than bridges built to the current federal standard. Vermont, due to the historic nature of its bridges as well as environmental concerns associated with bridge widening, has established state standards that differ from federal standards. As a result, it is possible for a new bridge built in Vermont to be classified as functionally obsolete. Also, Vermont does not always "modernize" its functionally obsolete bridges. An example is the state's covered bridges, which are functionally obsolete, but no one wants them altered.

While functional obsolescence is not one of our performance measures, we report it here as a federal measure. It is important to note that when structural repairs are made to structurally deficient bridges the functional obsolescence count may rise.

The fact that a bridge is structurally deficient (SD) or functionally obsolete (FO) does not mean the bridge is inherently unsafe. The VTrans inspection unit takes bridge safety very seriously. If unsafe conditions are identified during an inspection, the structure will be restricted or closed.

Functional Obsolescence/Deficient (FO) and Structural Deficiency (SD) Population

(as of or reported to FHWA, April 2016)

	FO	% FO	SD	% SD
Interstate "Long" Structures	95	30.65%	6	1.94%
State Highway "Long" Structures	93	11.94%	44	5.65%
Town Highway "Long" Structures	370	22.56%	96	5.85%
On-System "Short" Structures	N/A	N/A	79*	6.25%
System Total	558	—	225	—

* FO and SD are federal definitions not applied to "short" structures. This number represents "short" structures having a condition rating of poor or less.

Performance Goals and Measures

In the past, VTrans relied on the Federal Highway Administration's measures of structural deficiency and functional obsolescence to evaluate bridge condition. Vermont, however, is evaluating new performance measures that VTrans believes better model the average condition of Vermont's bridge network. The federal measures do not do a good job evaluating a bridge's true condition, so VTrans is exploring the use of measures that better quantify critical conditions.

VTrans is not doing away with the federal measures and the agency will continue to supply FHWA data for these determinations.

With the passage of MAP-21, the federal transportation bill, government created a performance measure stipulating in law a minimum condition level requirement. National Highway System (NHS) bridge deck area on SD bridges must not exceed 10% of total NHS bridge deck area for that state, and national measures, with targets set by the state, must be established.

Still being used, the previous federal measures—Structural Deficiency and Functional Obsolescence—imply but do not really tell us anything about the bridge's overall condition, nor do they tell us how bad a particular bridge component is. The federal measures only indicate that one or more bridge components have deteriorated to a point where they are within a range that requires assessment. They may or may not need treatment.

For example, our interest in fitting bridges into the historic Vermont landscape—all covered bridges and many historic truss bridges are considered functionally obsolete—lead to the development of Vermont specific standards that allow us to design bridges narrower than the federal standards. Many of Vermont's new designs and rehabilitations are considered functionally obsolete though they function very well.

To better evaluate our structures, VTrans, together with Maine and New Hampshire, is working to develop and implement a more holistic approach to measuring the condition and performance of our structures. Although these efforts are still in development, Vermont and our partner states see promise in utilizing a condition index as an effective management tool that can be compared across state lines.

Bridge condition index (BCI), percent structurally deficient by deck area and the national deficiency comparison (number of SD/FO bridges) are all measures being used and evaluated at the tri-state level (Maine, New Hampshire, and Vermont). The goal is to develop a network measure which reflects the relative health of our bridge population.

As the Agency moves to new performance measures, structural deficiency performance goals will continue.

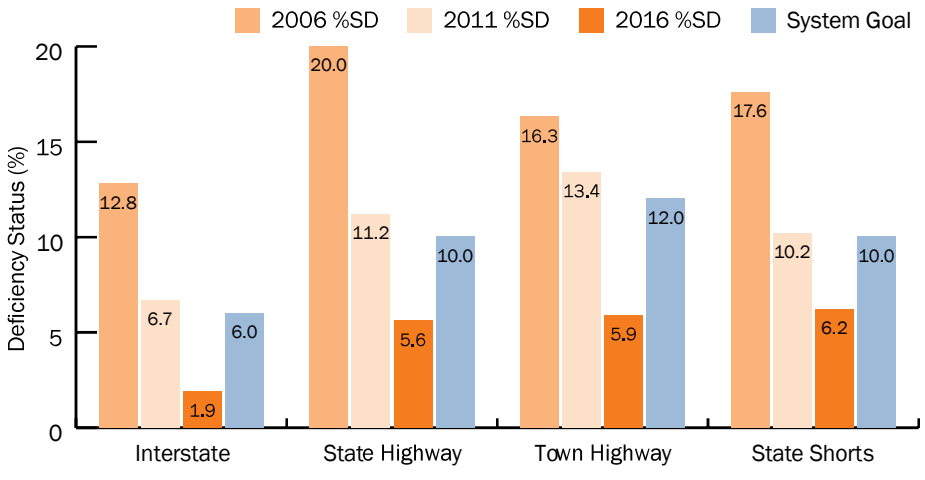
- 6% on the interstate system (18 bridges)
- 10% on the state highway system (77 bridges)
- 12% on the town highway system (195 bridges)
- 10% on interstate/state highway system culverts (126 culverts)

The following chart represents the change in percent of structural deficiency by system over a 10-year period.

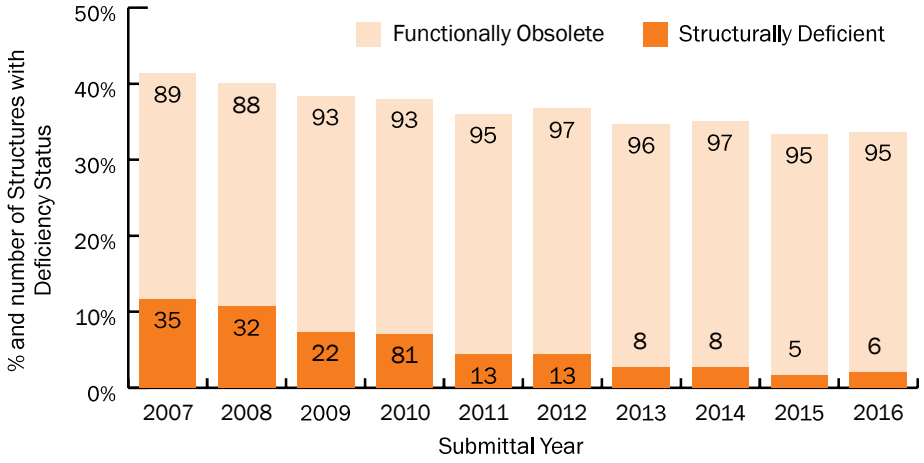
WAITSFIELD. Accelerated bridge construction in Waitsfield utilized innovative approaches by using partial depth deck panels as opposed to full depth panels. These lightweight panels reduced the risk of conflicts during placement and were much easier to lift into place.

Structural Deficiency Over Time by System

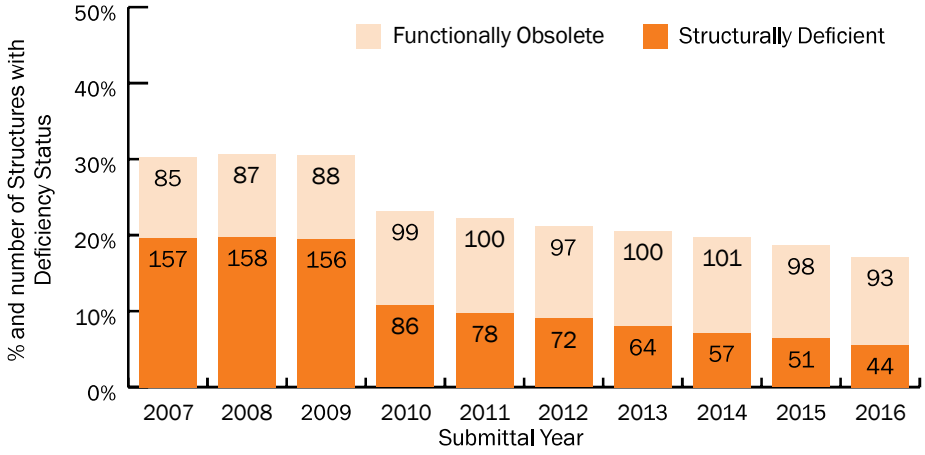
* 2006, 2011 and 2016 represent year data submitted to FHWA



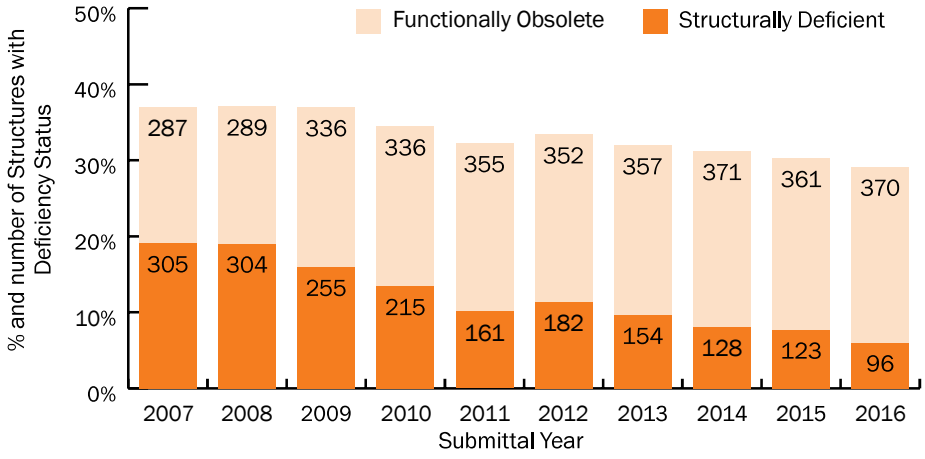
Interstate Structure Trends



State Highway Structure Trends



Town Highway Structure Trends



Structures and Hydraulics Highlights

Structures and Hydraulics

The Structures and Hydraulics Section (SHS) is responsible for the delivery of bridge and culvert rehabilitation and replacement projects including project initiation, hydraulic analyses, design, and construction support. SHS staff streamline the project delivery process and reduce construction duration and associated traffic impacts through public engagement, customer service, resiliency to future flood events, effective collaboration with partners, and innovative construction and contracting methods.

Expediting Project Delivery

In 2013, the SHS was the recipient of a $250,000 grant from the Strategic Highway Research Program 2 (SHRP2) program to apply strategies to expedite project delivery. Over the past three years, the grant has been applied to both the Project Initiation and Innovation Team (PIIT) and Accelerated Bridge Program (ABP) to improve collaboration, coordination, project delivery processes, and internal and external customer satisfaction. This multifaceted initiative included over 100 interdisciplinary participants from within and outside of VTrans including three neighboring state DOTs. Significant accomplishments include creating a team approach to delivering projects, encouraging meaningful public engagement, improvements to transfer of knowledge, a more standardized approach to project delivery, and efficiency gains in project scheduling.

Preserving Bridge Infrastructure

Bridge and culvert preservation is the act of applying a cost-effective treatment to retard deterioration, maintain or improve functional condition and/or extend the remaining service life at a lower lifetime cost (also known as the "right treatment at the right time"). With nearly 4000 bridges in the state of Vermont, it is critical to seek a balanced approach between preservation and replacement. Focusing only on replacing deficient bridges and culverts is inefficient and cost-prohibitive.

The Asset Management and Performance Bureau (AMP) and SHS partnered to create a "Deck Replacement Program" to extend the service life of 10 bridge decks located along our interstates, state routes, and town highways. The 10 projects were programmed with a goal of advertising several for the upcoming construction season, which decreased the typical 24-month design phase to only 6 months. This was accomplished by eliminating project impacts along with heightened coordination with resource groups and other project stakeholders (like the construction section and contract specialists), and expediting the design process. Other innovative approaches included 60-day road closures for conventional construction, to a 10-day short term closure utilizing pre-cast deck panels, to creative measures for managing traffic control such as temporary access to the interstate.

2D Modeling for Bridge Hydraulic Analysis

Historically, hydraulic analysis has been performed using a one-dimensional model which assumes that key variables like channel velocities and depth only change in one direction along the centerline of the channel. One-dimensional models are best suited for small streams, in-channel flows, and when floodplain flows are minor. With two-dimensional modeling, hydraulic engineers can model steams and flood flows in two directions as opposed to one providing a significant improvement in calculating hydraulic variables at bridges and culverts. The Hydraulics Unit successfully completed its first two dimensional hydraulic model using SRH-2D. The software is currently being promoted by FHWA as an innovation in the state of practice. It was used on a project in Leicester where backwater from the Otter Creek and very flat grades made older one dimensional models less accurate.

2016 Celebration of Success

Overall Program

- 31 bridge replacement, rehabilitation and preventative maintenance projects were under construction during 2016 totaling $87 million dollars.
- 34 projects were advertised in 2016 representing a 76% success rate of advertising on-time. Of the 34 projects, 50% (17 projects) are state highway projects, 38% (13 projects) are town highway projects, and 12% (4 projects) are interstate.

Accelerated Bridge Program (ABP)

- 5 projects were designated into the ABP in 2016, all state highway projects.
- 7 ABP projects were advertised in 2016. Of the 7 projects, 71% (5 projects) were advertised within 24 months. The remaining 2 projects were delivered in 27 and 28 months.
- All 7 ABP projects advertised in 2015 were successfully constructed during 2016 construction season.

Conventional Project Delivery

- 10 projects were designated into the conventional project delivery program in 2016. 40% (4) are interstate projects, 50% (5) are state highway projects, and 10% (1) is town highway.
- 11 projects were advertised in 2015.
- 10 bridge projects were under construction during the 2015 construction season.

Hydraulics

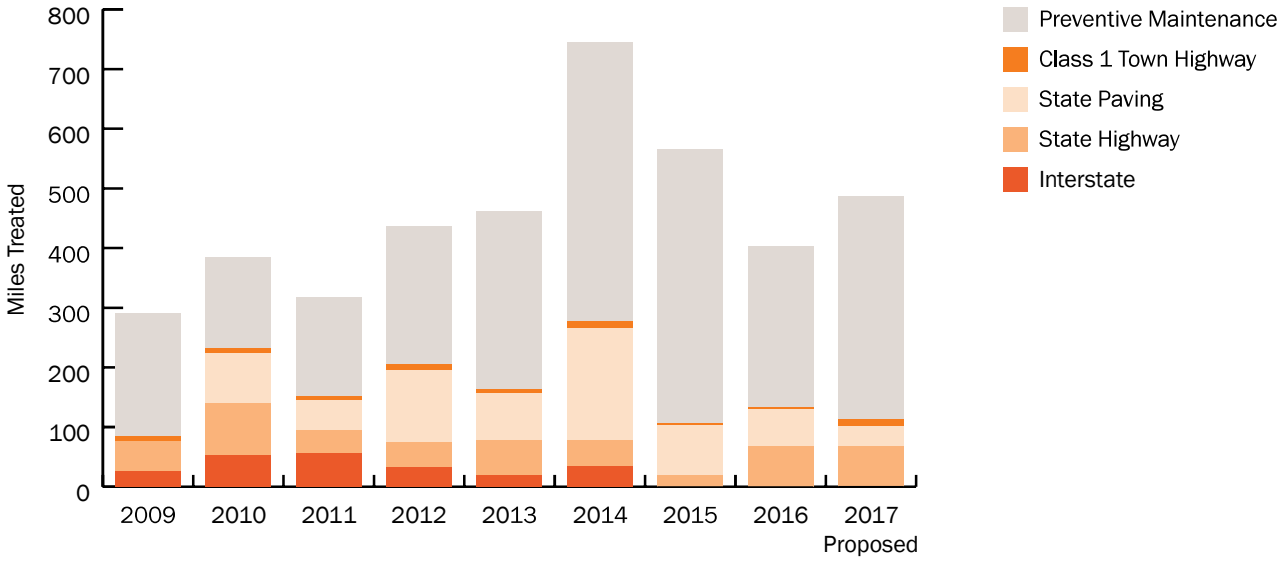
- The Hydraulic Unit sized approximately 100 culverts for towns and 55 culverts on state routes for the Maintenance and Operations Bureau in addition to working on 40 programed projects from the Project Delivery Bureau.

Pavement Management

Paving Mileage Summary (Two-lane miles, rounded to the nearest mile)

Category	Construction Season								
	Proposed 2017	2016	2015	2014	2013	2012	2011	2010	2009
Interstate	0	0	0	33	18	32	55	53	25
Carried forward from previous year	0	0	0	0	31	0	6	0	0
Incomplete, to be carried forward	0	0	0	0	0	31	0	6	0
Rut Filling (single lane miles)	0	2	10	0	0	0	0	0	0
Surface Treatments	52	0	64	50	61	37	44	45	52
Carried forward from previous year		0	12	0	31	0	*	*	*
Incomplete, to be carried forward	0	0	0	12	0	31	0	*	*
State Highway	68	67	18	44	59	43	39	87	50
Carried forward from previous year	37	22	20	13	7	0	3	27	0
Incomplete, to be carried forward	0	37	22	20	13	7	0	3	27
Surface Treatments	23	46	0	43	25	85	12	26	7
Carried forward from previous year	10	0	11	13	*	*	*	*	*
Incomplete, to be carried forward	0	10	0	11	13	*	*	*	*
Class 1 Town Highway	10	4	4	11	6	10	6	8	9
Carried forward from previous year	8	5	7	0	0	0	1	0	2
Incomplete, to be carried forward	0	8	5	7	0	0	0	1	0
State Paving	34	63	85	189	80	120	51	84	0
Crack Seal	300	220	361	362	212	110	111	82	147
Carried forward from previous year	0	0	0	0	0	0	0	0	0
Incomplete, to be carried forward	0	0	0	0	0	0	0	0	0
Paving Project Total (items in orange)	157	161	134	290	201	205	161	259	86
Preventive Maintenance Total (items in gray)	375	268ß	458	468	298	232	167	153	206

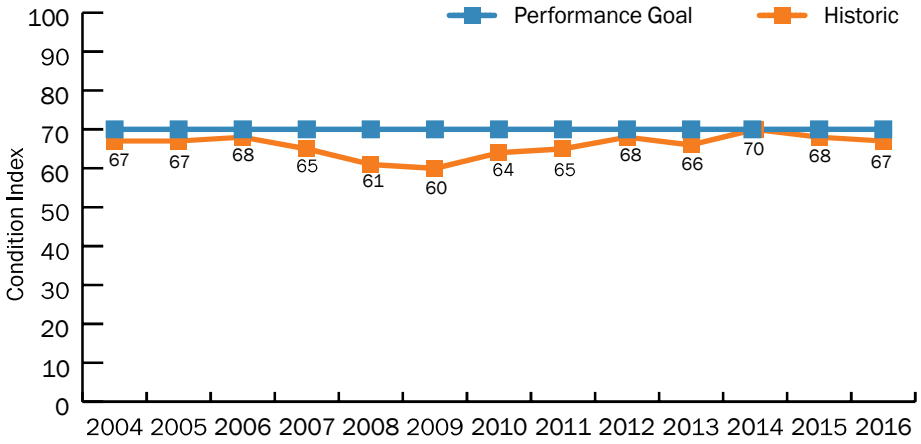
Paving Mileage Summary (as per table above)



Performance Measures

Automated surveys are conducted annually to determine pavement conditions across the state. Each segment of road is rated on a scale of 1 to 100 based on rutting, cracking, and roughness. These are then weighted by their respective traffic volumes. The VTrans goal for this performance measure is 70.

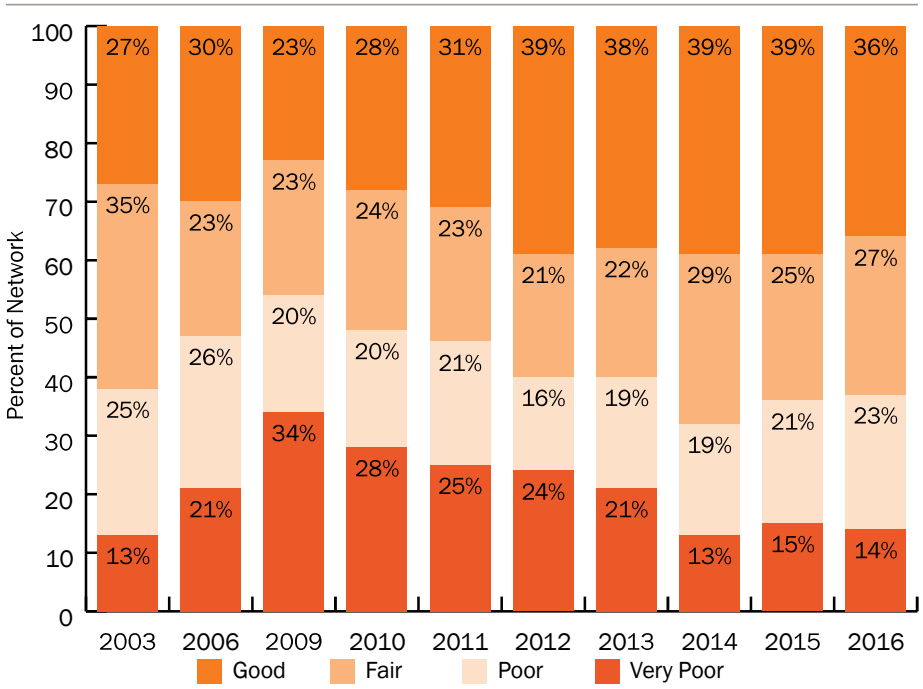
Travel Weighted Average Network Condition



Percent of Network in "Very Poor" Condition

While the "Travel Weighted Average Network Condition" graph measures VTrans performance for the majority of road users, the "Conditions Over Time, Unweighted" graph measures the agency's performance for all users, including those on low volume roads. The VTrans goal for the percentage of roads in very poor condition is no more than 25%.

Conditions Over Time, Unweighted



Pavement Condition Descriptions

Good
Like new pavement with few defects perceived by drivers
Composite Pavement Condition Index 80-100

Fair
Slight rutting, and/or cracking, and/or roughness become noticeable to drivers
Composite Pavement Condition Index 65-79

Poor
Multiple cracks are apparent, and/or rutting may pull at the wheel, and/or roughness causes drivers to make minor corrections
Composite Pavement Condition Index 40-64

Very Poor
Significant cracks may cause potholes, and/or rutting pulls at the vehicle, and/or roughness is uncomfortable to occupants. Drivers may need to correct to avoid defects.
Composite Pavement Condition Index 0-39

Network Pavement Structural Types

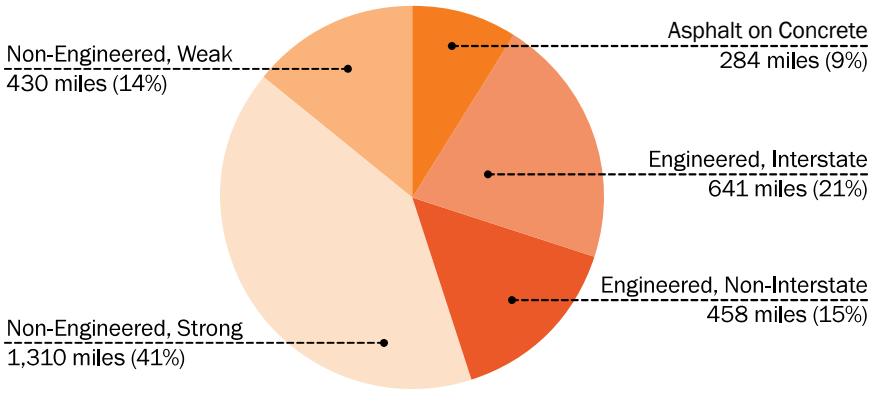
The "Pavement Type Distribution" chart represents the breakdown of the various pavement structural types a motorist will encounter throughout the Agency's highway network. This information provides a sense of how the network structures vary, and how that can pose a challenge from a management perspective.

Interstate travel provides a motorist the best example of an engineered pavement/highway. Engineered pavement is designed and constructed from the bottom up with the expectation that if maintained properly over time, the pavement will stand up very well to Vermont's harsh climate for 40 years or more. About 36 percent of the state's pavements are engineered, and it is these pavements which can be managed the most effectively, both in terms of cost and serviceability.

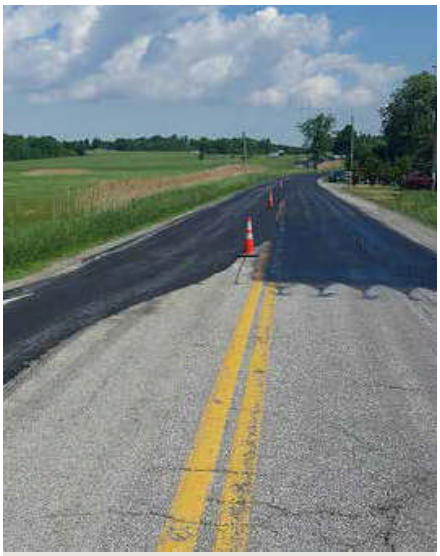
About 55 percent of the network is composed of non-engineered pavements. A non-engineered pavement is a structure that has been built-up over the years based on minor treatments and maintenance activities. The end result is a highway evolving from what may have once been a logging road into what is now a paved roadway. Some of these pavements perform reasonably well over time. Fortunately, 41 percent of the network's pavements respond in this manner and are considered non-engineered Strong. It is the remaining percent—the 14 percent of the network that is non-engineered weak pavements—that pose the greatest challenge to the agency. A significant investment is required to keep these pavements in good condition for a reasonable amount of time.

The last pavement structure classification is Asphalt on Concrete. These comprise 9 percent of the state highway network pavements, and they are a challenge to manage effectively. Often times they are discernible to the untrained eye where cracks reflect through the asphalt revealing the slabs beneath. While strong, problems exist where a lane has been widened beyond the slab's edge because the additional pavement will distress or settle differently creating a poor ride. Unfortunately, these structures are typically maintenance intensive and do not perform well with a conventional resurfacing treatment.

Pavement Type Distribution (Two-lane miles, percent of network miles)

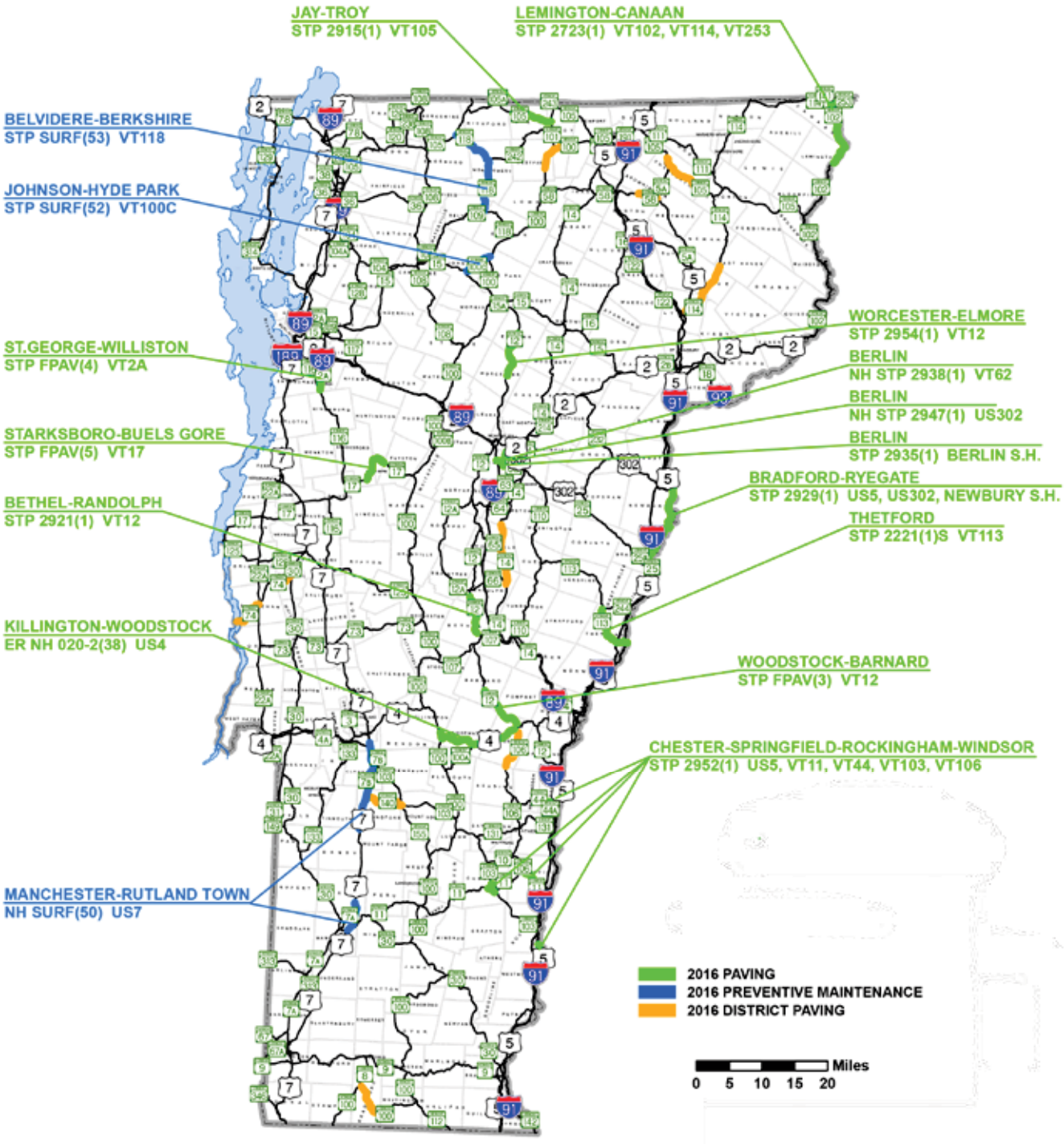


The VT100 bridge project in Waitsfield is the first use of Ultra-High Performance Concrete in Vermont. UHPC provides added resilience over traditional concrete.

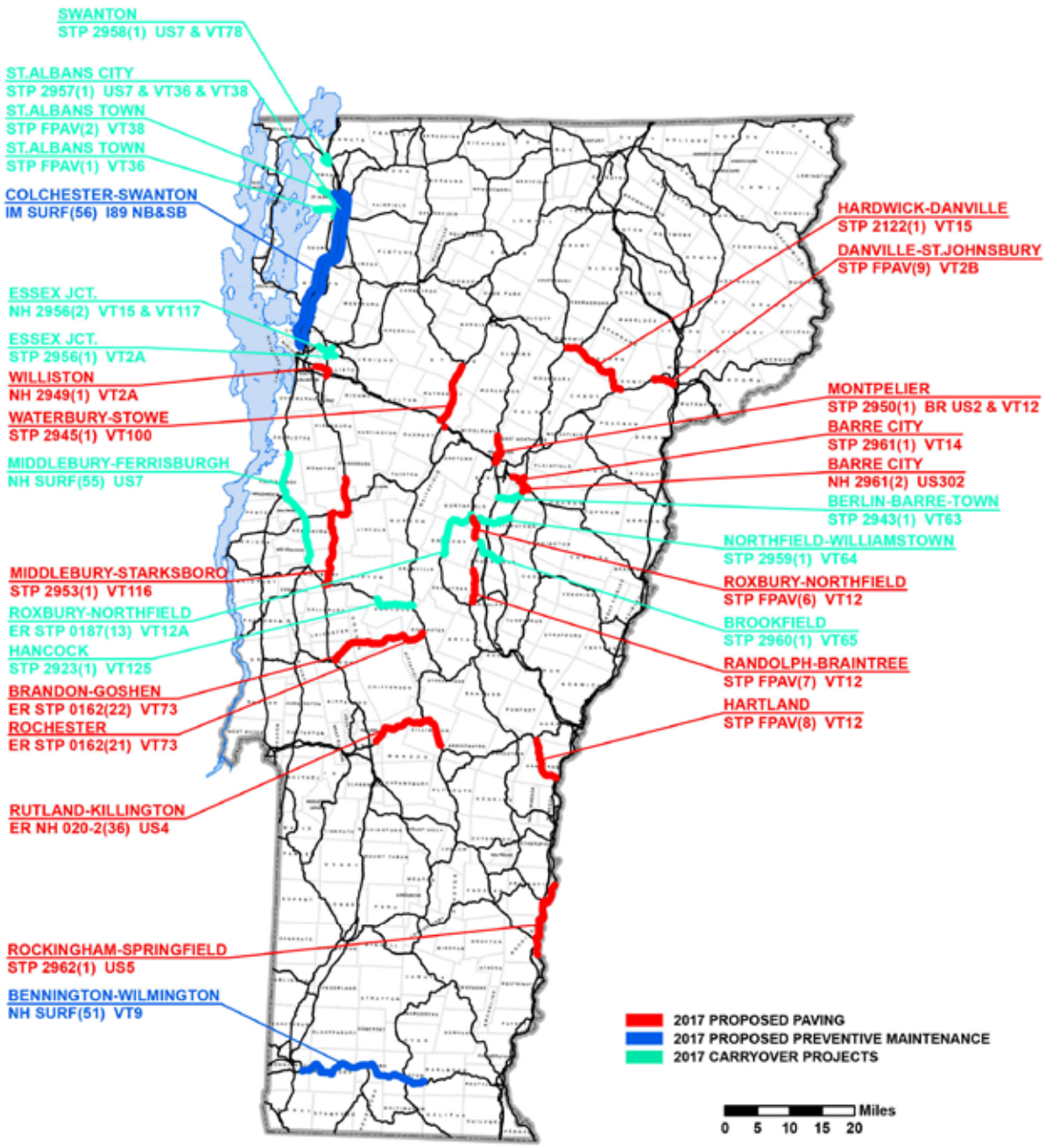


Resurfacing of US 7 in Highgate Springs.

2016 Paving Accomplishments

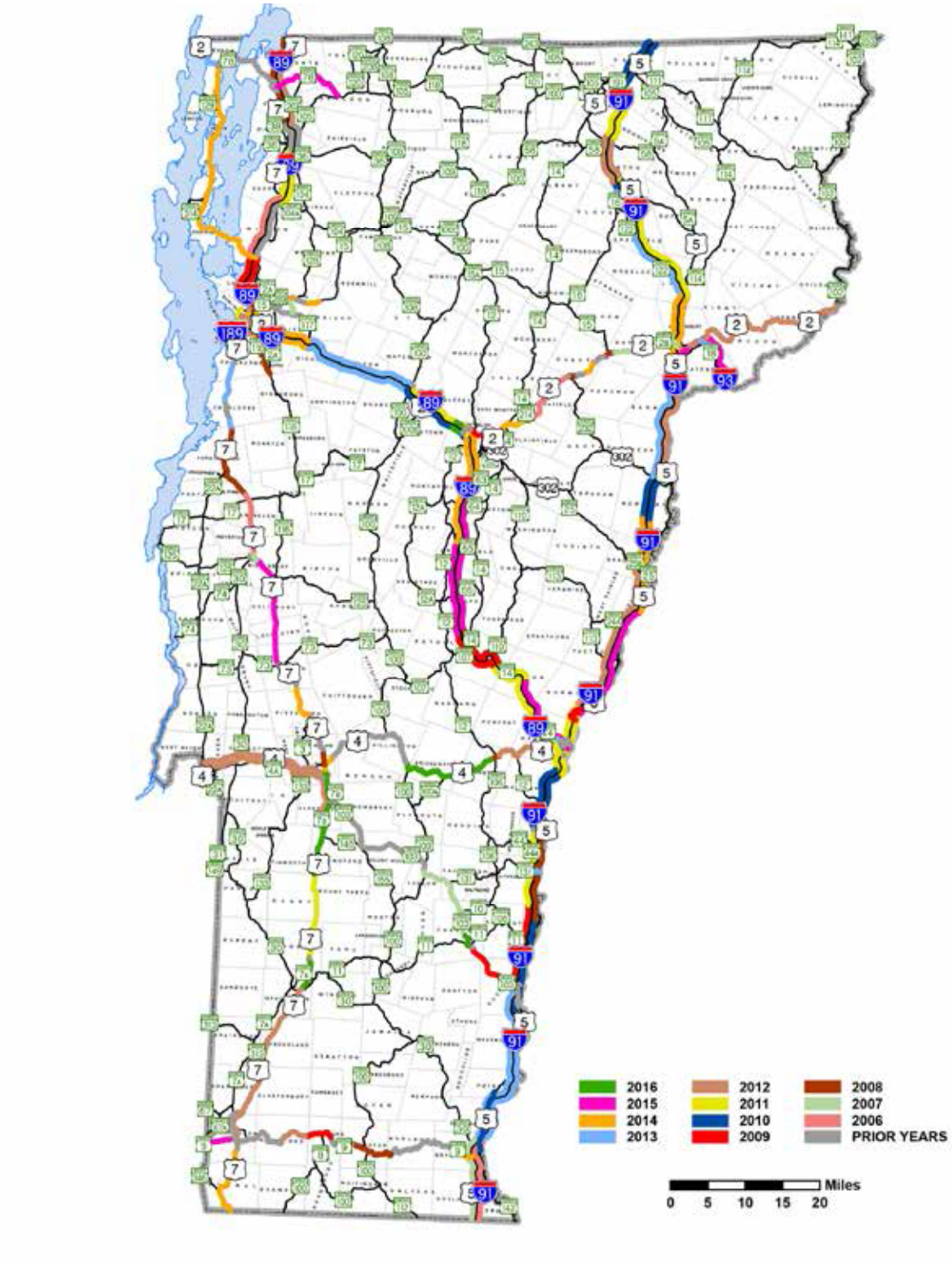


2017 Proposed Paving Program



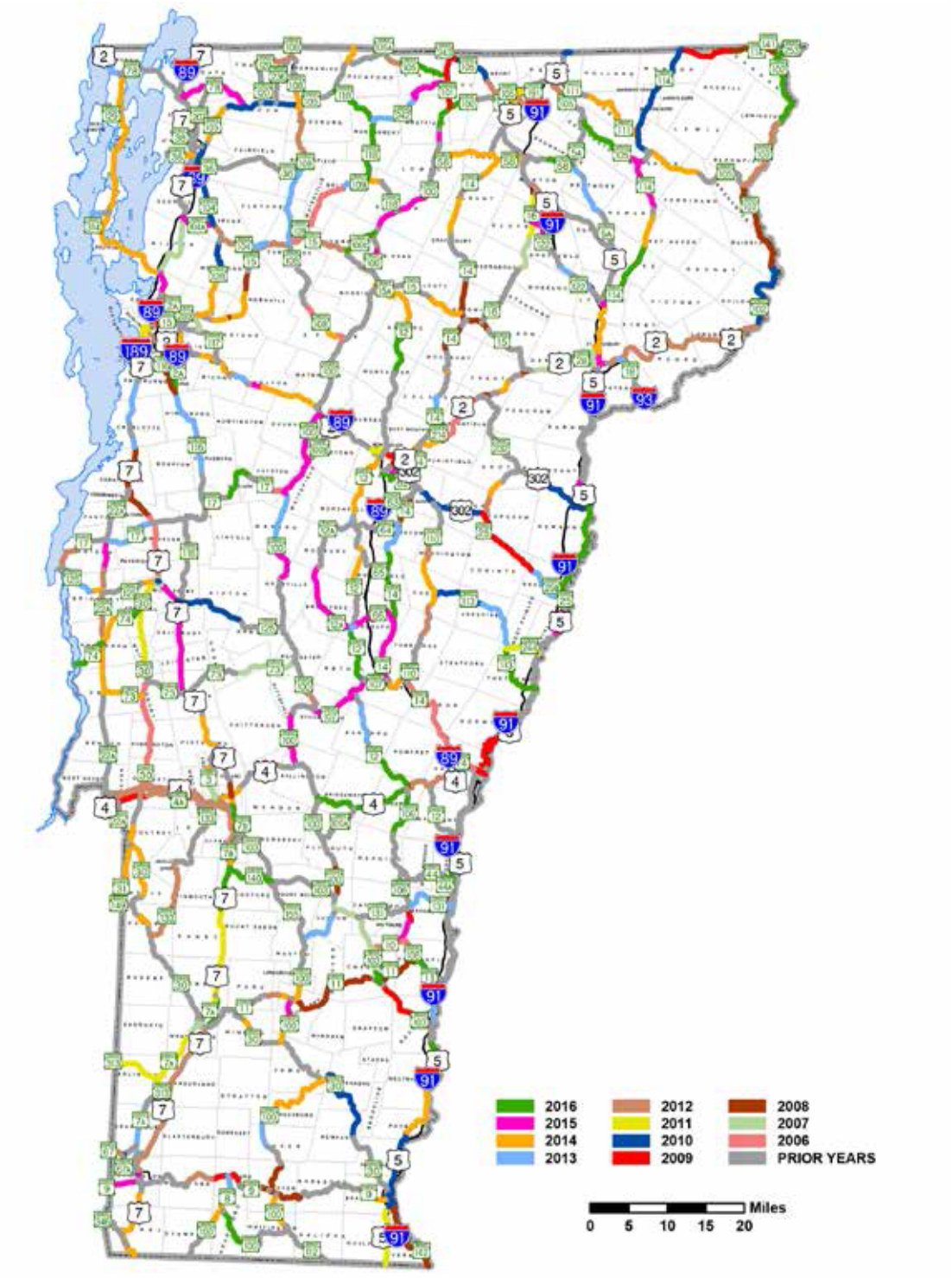
National Highway System Pavement Conditions

National Highway System Pavement History



State Highway System Pavement Conditions

State Highway System Pavement History



Asset Management

Introduction

Vermonters depend on VTrans to be good stewards of the State's transportation, environmental and financial resources. This trust is something that VTrans does not take lightly; VTrans has consistently and diligently worked hard to build accountability for its actions and gain credibility with the public and the Legislature. In 2013, the message to the Legislature was that VTrans has renewed its commitment to asset management and that "asset management was going to change how VTrans conducts its business." In 2016 these words continue to have a transformative impact on VTrans' plans and operations. VTrans is in development of its initial Transportation Asset Management Plan or TAMP. At 60% complete the TAMP will outline a plan to manage the Agency's assets; starting with pavements and bridges.

Asset management is and has always been tightly woven into VTrans' culture. Asset management encompasses the planning, programming, design, construction and maintenance phases of an asset's lifecycle and is supported by all Agency employees.

Asset Management Philosophy

Asset management is the strategy that allows VTrans to invest the right amount of funds in the right asset at the right time. Asset management, when fully implemented, will allow the Agency to monitor asset status and condition, determine appropriate customer service levels performance and determine the level of unmet needs. The primary goal of VTrans Asset Management is to conduct effective and efficient decision-making processes based on a combination of quality data and well-defined performance objectives, enabling VTrans to effectively program construction and maintenance activities at strategic points in an asset's life. Asset management at VTrans represents a best practices approach to managing infrastructure performance that is both strategic and proactive. In addition, asset management seeks to identify risks across the Agency and managing these risks to reduce threats while increasing innovations and opportunities. Effective management of infrastructure risks increases the likelihood that the Agency will achieve its strategic goals and associated performance objectives.

Asset Management Best Practices

Asset Inventory	Customer Service and Continuous Improvement	Risk Management	Life Cycle Cost Management	Trade-off Analysis
Identify and prepare an accurate asset inventory database, graphically represented spatially on a GIS platform	Work with stakeholders to determine Customer Service Levels (CSLs). Identify performance measures and indicators to continuously monitor status.	Develop Agency risk registry. Identify, quantify and prioritize risks associated with asset management. Develop risk mitigation plans to reduce exposure.	Determine minimum life cycle costs for maintaining, rehabilitating and replacing assets to provide the highest levels of service over time.	Develop ability to predict asset condition over time and to use this information to establish long term funding strategies to maintain assets at sustainable CSLs.
EXAMPLES				
Interactive GIS map of asset locations with "pop-up" information of asset condition.	Condition Target: Maintain a minimum of 75% of pavements above a "Very Poor" Condition.	Analyze freight corridors for bridge restrictions and economic impacts. Develop strategies to remove restrictions.	Apply the right treatment, using the right materials, at the right location and at the right time.	Manage customer expectations in a fiscally responsible and environmentally sensitive manner for present and future generations.

Fiscal Management

Asset management is a collection of best practices targeted at utilizing available funding strategically and efficiently. VTrans asset management practices are performed with a "preservation first" principle rather than "worst first." The Agency applies this principle by optimally balancing regular preventive maintenance activities with construction of carefully planned and programmed rehabilitation and replacement projects. These activities are performed with the intent of increasing the asset's useful life. Typically, an asset with a long useful life requires multiple intervention points including a combination of repair and maintenance activities. The strategic timing of these intervention points effectively optimizes the balance between the asset's useful life and its overall lifecycle costs, thereby maximizing the value of the Agency's financial resources.

VTrans' Asset Management and Performance Bureau coordinates the management of effective and realistic scopes, accurate cost estimates, and reliable schedules for these activities. The Bureau is committed to providing these services at an acceptable level of risk to the Agency and within current forecasted revenue projections while delivering customer service levels that the public expects and decision makers require. Maintaining our highways at a fair, good or very good condition is more cost-effective than allowing it to erode to a poor or very poor condition where replacement costs dramatically increase. VTrans utilizes asset management, performance management and risk management principles to effectively manage both the physical and financial condition of its assets to achieve its strategic objectives. This renewed commitment and focus on asset management complements the Agency's customer service focus.

Customer Service Levels

Assets provide services to our customers by providing them with the ability to get where they need to go in a safe and timely manner. VTrans' customers are Vermont residents, businesses and visitors who rely on VTrans to manage the needs of our transportation system in a cost-effective, efficient, safe and sustainable manner. Through asset management and its commitment to the stewardship of public resources, VTrans manages the condition and performance of highway assets by minimizing life cycle costs through the timely programming of capital improvement projects and maintenance activities. Simply stated, VTrans is developing an initial asset inventory and documenting where it is located while at the same time evaluating the asset's condition and understanding the financial costs required to maintain the State's infrastructure at an acceptable condition state to maintain a required level of customer service.

These actions form the foundation of VTrans' commitment to providing quality customer service, for both present and future customers. VTrans is currently engaging stakeholders in discussions of customer service levels. Recent progress in this area has resulted in the Maintenance and Operations Bureau collaborating with the Asset Management and Performance Bureau to develop customer service levels based on VTrans' current understanding of customer expectations and past policies.

Risk Based—Performance Driven

Asset management is risk-based and performance driven; driven by policy goals and performance objectives outlined in the Agency's Strategic Plan. Asset management represents an approach to managing infrastructure that is both strategic and proactive, and places a premium on quality data and information. Many of these objectives have time frames that span several years. Failure to acknowledge, measure and manage both short and long term uncertainties is to overlook obvious risks that affect the credibility and success of the Agency's decisions. Thus the effective management of VTrans' highway assets must rely on risk management to enhance its decision making processes.

In 2016, VTrans continued a journey that it began in 2014; to develop an Agency-wide risk registry that will ultimately enhance its decision making processes by documenting internal and external risks that may affect its performance objectives. These risks have and will continue to be identified at the enterprise level and across Agency programs, projects and activities. Both performance and risk management play an integral role in supporting asset management activities towards the achievement of the Agency's strategic goals

To summarize, the risks and challenges to manage transportation infrastructure assets in a fiscally responsible and sustainable manner has led VTrans to emphasize an asset management policy and incorporate business processes that ensure that quality decisions are made based on accurate data and analysis while mitigating identified risks.

Asset Management Framework and the TAMP

Currently there are significant efforts being expended to develop a transportation asset management plan (TAMP). The TAMP is the tactical plan for managing the Agency's assets and one of its primary objectives is to support the Agency's Strategic Plan. This effort is being coordinated through the Agency's Transportation Asset Management Plan Working Group (TAMP-WG). This group is comprised of 27 individuals representing asset management functions across VTrans; they are participating and leading 9 task forces that are focused on developing different parts of the overall plan.

The collective efforts of the TAMP-WG combined with the energy and on-going activities of the Asset Management and Performance Bureau team are synergistically developing an asset management framework to support the Agency's asset management efforts to comply with future MAP-21 requirements and Vermont State Statute 19 V.S.A §10k. The components of this framework reflect the recommendations of the Federal Highway Administration (FHWA), MAP-21 and best practices of the international community.

VTrans' asset management framework is designed to support the Agency's policies and goals related to accountability, mobility, resiliency, safety, sustainability and transparency. The proposed framework is envisioned to include a continuous cycle of asset condition and inventory, performance, and risk and cost assessments. These activities will provide data and information that asset managers can use to develop, implement and support the TAMP.

Conclusion

The Asset Management and Performance Bureau is committed to measuring and monitoring the Agency's performance relative to its assets and provision of those assets to VTrans' customers. VTrans believes that through education and effective communication that it can provide its customers with a deeper understanding of the costs and benefits of individual functions (asset maintenance, resurfacing, rehabilitation and replacement) and how these costs impact overall Agency programs and budgets. In return, the customers (the public) can then use this information to communicate more clearly to the decision-makers (the legislators) the level of infrastructure investment, maintenance and condition they expect. The decision-makers can then use this information in partnership with VTrans to collaboratively make the decisions they believe reflect the best stewardship of the public resources.

In summary, VTrans is in the process of adopting asset management policies and processes consistent with internationally accepted best practices to maximize the value of its infrastructure assets and to guide its decision-making processes. VTrans is committed to responding proactively to Vermont's transportation needs and is responsible for ensuring that Vermont's transportation system remains in a state of good repair; regardless of its age.

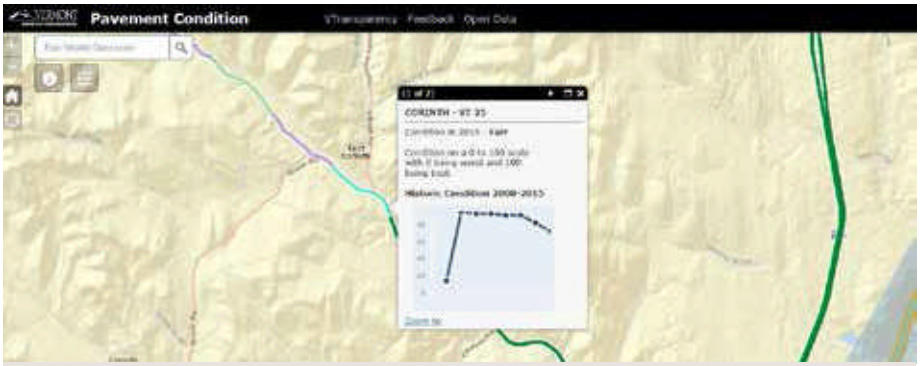
Asset Inventory

As stewards of Vermont's highway infrastructure, the Agency of Transportation is responsible for understanding the components of the State's transportation system and how asset improvements to these components can be budgeted to preserve the integrity of our highway system in a cost effective and efficient manner. To support this understanding, several Asset Management projects have been undertaken across the Agency.

Small Culvert Inventory

In response to several maintenance and safety issues associated with aging culverts, the Agency has dedicated significant resources to generating an inventory of small culverts with diameters ranging between 12 and 72 inches. Through a collaborative effort between the Asset Management and Performance Bureau (AMP) and the Maintenance and Operations Bureau (MOB), crews have been working over the last several years to locate drainage structures within the highway right-of-way, storing location and inspection information in a centralized GIS database. In 2016 the initial effort is now complete; resulting in a database of over 50,000 small culverts statewide. With the initial inventory complete, the focus of the small culvert inventory project now moves into a secondary phase including the reinspection of 20% of the culvert inventory on an annual basis.

VTrans employees install a culvert liner. Liners are cost effective solutions for prolonging the life of culverts.



VTRANSPARENCY. A powerful tool for asset management and public information.

These reinspection activities will maintain current asset information as well as ensure the utilization of the small culvert data to prioritize maintenance and repair activities.

Maintenance Assets

The Agency is exercising its performance management muscles by focusing AMP and MOB energies on its core maintenance activities. Historically, the Agency has done an excellent job of reporting its maintenance activities and asking "How much work is being done?" but now the question of "How much of each activity should we be doing?" is being asked as well.

To answer the second question, the Agency has focused on several core maintenance activities and is developing asset inventories, thereby enhancing its capabilities to report on infrastructure condition. This year the Agency continued to focus on developing its guardrail inventory, pavement markings, and mowing areas. An inventory of each of these assets is being developed and integrated into VTrans' mapping systems and maintenance management system. Once these inventories are complete, the Agency will analyze the cyclical, routine and major maintenance needs to understand how much work needs to be done on an annual basis to achieve Agency performance measures.

Statewide Roadway Data Inventory

Roadway data collection technology and tools have developed over the years and as the capabilities of the data have expanded over time so too has the desire for this data to assist different programs within the Agency. Information about the highway surface and roadway geometry is used by several groups within the Agency and has been historically acquired through various means. In recent years the collection of roadway data has been continually consolidated into one contract. In 2016, the consolidation of these data needs continued with the inclusion of pavement conditions, forward facing photography, lane width, shoulder width and bike lanes, all within a singular vendor contract. This consolidation has decreased data acquisition and administrative overhead costs while greatly reducing the need for data integration across the Agency.

The AMP continues to investigate new tools and technology like the rolling wheel deflectometer to increase the quality of its pavement data inventory. The collection of the statewide roadway data will provide the Agency with effective corridor management tools and technology increasing its ability to ensure that the right asset is being treated at the right time.

Project Prioritization

In compliance with 19 V.S.A. paragraph 10b(c), a priority ranking system was developed for each asset type.

Structures

Bridge Condition
30 points maximum

Remaining Life
10 points maximum

Functionality
5 points maximum

Load Capacity and Use
15 points maximum

Waterway Adequacy and Scour Susceptibility
10 points maximum

Project Development and Momentum
5 points maximum

Regional Input and Priority
15 points maximum

Asset—Benefit Cost Factor
10 points maximum

Points are then summarized for each program, with the highest score receiving the top ranking. Rankings will change from year to year as projects are completed, as bridges change in condition, or as regional planning commissions' priorities change. These priorities are used in developing the capital program, help in deciding which bridges to advance next, and have enabled us to clear a backlog of projects in a defined, documented, and efficient manner.

Selection for proposed rehabilitation and reconstruction projects will continue to utilize the priority system. To become a project and have design initiated, the bridge will need to be among the highest ranked.

The bridge priority system, which is used to rank major bridge replacement and rehabilitation projects, will continue to be used for project selection and determining funding needs. However, this system is not inclusive as it does not rank short structures or maintenance needs, both preventive and routine.

Bridge replacement and rehabilitation projects progress through the VTrans Project Development Process. With its current reorganization, the Structures Section is aggressively looking for opportunities to streamline project delivery while reducing project scope, impacts and costs.

Scope reduction can be achieved by various methods: reducing approach work, minimizing or eliminating enhancements, phased construction or road closures. Although inconvenient for a community, the elimination of a temporary bridge reduces timelines, cost, need for significant right-of-way acquisition and resource impacts. Swiftness of construction and improved safety conditions are benefits of road closures.

Where appropriate, accelerated bridge construction (ABC) and materials are utilized. The technique minimizes traffic disruptions and congestions, improves work-zone safety, and lessens environmental impacts. Additionally, prefabrication can improve constructability, increase quality, and lower life-cycle costs.

The establishment of the bridge maintenance program gave us a start, enabling us to perform much-needed preventive maintenance on a limited number of bridges, but it was just the beginning. Preventive maintenance is not a high-profile activity; if done on a routine schedule, however, its benefits will be obvious as it will extend service life and delay the rate at which our bridges become structurally deficient. The agency has substantially grown the program from its origins and has now integrated it into the regular program.

Focusing efforts toward preventive maintenance activities will slow, but not reduce, the number of bridges becoming structurally deficient. Preventive maintenance does not correct existing structural deficiencies, but instead retards deterioration so that a bridge's lifespan can be extended, thus preventing the structure from becoming structurally deficient. To this end, preventive maintenance is essential to slowing the rate at which structural deficiencies evolve over time.

The value of preventive maintenance will be appropriately demonstrated in the future through new performance measures that evaluate a bridge's overall core unit condition or network health.

WAITSFIELD. Construction of a replacement bridge over the Mad River along VT100 in Waitsfield. The new bridge is being constructed using Accelerated Bridge Construction methods to minimize the length of the bridge closure.

Pavement

Asset Condition (PCI)

Pavement Condition Index

- Combination of; Ride, Rut, Cracking
- Scoring structured to recognize need to address roads in very poor condition regardless of traffic

Project Economics (Benefit Cost)

Benefit Cost Ratio

- Benefit compares condition difference between the selected treatment and doing nothing on the project section over the lifespan of the treatment
- Benefits are weighted by traffic volume
- Cost is present value financial cost to the state
- Measures the "Bang for the buck" amongst candidate projects

Regional Planning Commission (RPC) Rank

Regional Importance

- Allows RPCs to address socio-economic, cultural/local importance and impact on local economy of candidate projects
- Scoring structure helps create a geographically distributed program

Roadway

Highway System

(40 points)

This factor looks at the Highway Sufficiency Rating and the network designation. Interstates are held to the highest standard, followed by non-Interstate primary and then off-primary roads. The Highway Sufficiency Rating considers traffic, safety, width, subsurface road structure, and more.

Cost per vehicle mile

(20 points)

This is the project cost divided by the estimated number of miles vehicles will travel on the project. This is a relatively easy method to get a benefit/cost ratio for comparing similar projects.

MORRISTOWN. Fresh pavement before the installation of a new signal on VT 100 in Morristown.

Regional Priority

(20 points)

The top RPC Roadway project is assigned 20 points. The score is reduced for lower RPC priorities. Projects listed as priority #10 and lower get two points.

Project Momentum

(20 points)

This factor considers where the project is in the development process and anticipated problems such as right of way or environmental permitting. Some projects are so far along that they must be completed or the Agency would have to pay back federal funds.

Designated Downtown project

Per 19 V.S.A. § 10g(l)(3), VTrans awards ten bonus points to the base score for projects within a designated downtown development district established pursuant to 24 V.S.A. § 2793.

Traffic Design

Intersection Capacity

(40 points maximum)

This factor is based on Level of Service (LOS) for the intersection and the number of intersections that are in the coordinated system. Projects with a lower LOS and that are part of a larger coordinated system receive higher scores for this category.

Accident Rate

(20 points maximum)

This factor is based on the critical-accident ratio for the intersection. Projects with higher critical-accident ratios receive higher scores for this category.

Cost per Intersection Volume

(20 points maximum)

This factor uses the estimated construction cost and average-annual-daily traffic through the intersection. VTrans calculates the construction cost of the project for each anticipated user through the intersection. Projects with lower costs per intersection volume receive higher scores for this category.

Regional Input and Priority

(20 points maximum)

This factor is based on the ranking of projects from the RPCs/MPO. The RPCs/MPO rank the projects based on criteria they develop. Projects with higher regional rankings receive higher scores for this factor.

Project Momentum

(10 points maximum)

This factor considers:

- Where the project is in the development process
- Anticipated problems such as right of way or environmental permitting
- Funding

Aviation

Aviation

The Aviation Program manages 90 runway lane miles at 10 state-owned airports in Vermont, providing a safe environment for users of the system, preserving the publicly-owned infrastructure, promoting aviation-related activities, and expanding travel opportunities.

In 2016, Rutland Southern Vermont Regional Airport (RSVR) had over 6,000 enplanements including regular passenger service offered via Cape Air. 1,500,000 pounds of cargo moved through RSVR in 2016 and 545,000 pounds moved through Knapp State Airport in Berlin.

NEWPORT. Completed runway extension to the Northeast Kingdom International Airport and the ongoing taxiway project.

Airport Contact Information

MUNICIPAL AIRPORTS

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STATE AIRPORTS

Caledonia County
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John Roberti
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Franklin County
Cliff Coy
(802) 868-2822

Hartness
Larry Perry
(802) 886-7500

John H. Boylan
Jennifer Davis
(802) 272-3574

Middlebury
Cisco Herrera
(802) 505-8479

Morrisville-Stowe
Cody Long
(802) 253-2332

Newport
Dan Gauvin
(802) 334-5001

Rutland Southern Vermont Regional
Chris Beitzel
(802) 786-8881

William H. Morse
Rob Luther
(802) 595-5830

PRIVATE AIRPORTS

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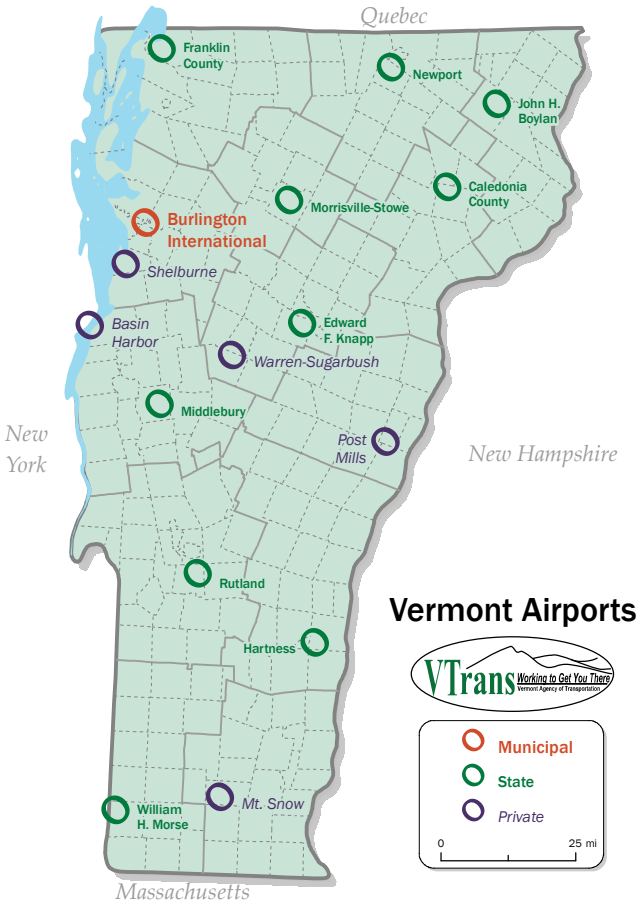
Mt. Snow
Jim Barnes
(802) 457-3151

Post Mills
Brian Boland
(802) 333-9254

Shelburne
Ray Magee
(802) 985-2100

Warren-Sugarbush
Rick Hanson
(802) 496-2290



Passenger Rail Service

The State of Vermont partners with Amtrak to provide intercity rail service for Vermonters and visitors to the Green Mountain State.

The **Amtrak Vermonter** runs on the New England Central Railroad (NECR/GWI) from Saint Albans to Brattleboro, continues through Massachusetts and Connecticut, and then down the Northeast Corridor to New York City and Washington, DC. In 2015, the Vermonter route in Massachusetts was changed to run along the Connecticut River Line to New Haven, reducing track miles and travel times, and providing a much smoother ride over brand-new rails. To learn more visit: www.amtrak.com/vermonter-train

Amtrak's Ethan Allen Express runs on the Clarendon and Pittsford Railroad (CLP) from Rutland to Whitehall, New York, and from there continues south to Albany and on to New York City. To learn more visit: www.amtrak.com/ethan-allen-express-train

Amtrak Vermonter or Ethan Allen Express reservations:
1-800-USA-RAIL (1-800-872- 7245)
TDD/TTY (1-800-523-6590)
www.AMTRAK.com

2016 Ridership and Revenue

Lines	Ridership	% Change	Revenue	% Change
Vermonter	89,318	-3.6%	$5,718,268	-1.8%
Ethan Allen Express	50,717	-3.5%	$2,873,155	-2.8%

Federal Grants

TIGER V

Awarded in 2013, work is nearly complete

Award total: $9 million Federal Railroad Administration grant
Project total: $11.2 million
Work includes: 10.12 miles of Continuous Welded Rail (CWR) upgrades
11 farm crossings
1 siding
9 switches

TIGER VII

Awarded in 2015, work began in 2016

Award total: $10 million Federal Railroad Administration grant
Project total: $26.4 million
Work includes: 4.98 + 6.33 = 11.31 miles of CWR upgrades
Rutland and Burlington Wye
Florence and Leicester siding
Bridge, crossing, and platform upgrades

PITSFORD. Construction on Pittsford Bridge 219, Vermont Railway, Northern subdivision.

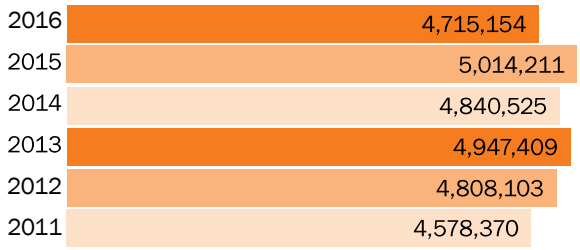
Public Transit

Public Transportation

The Public Transit Section is responsible for the planning, administration, funding and oversight of the statewide network of public transit providers. Transit providers operate multiple types of service including fixed-route, commuter runs, demand response, health care and shopping shuttles, winter seasonal routes, ADA complimentary transit, special services for the state's elderly and disabled citizens and intercity bus services. Transit services provide vital access to communities, local businesses, educational institutions, employment, national bus connections, adult day services, medical services, and tourism destinations.

www.connectingcommuters.org/bus-info/city-to-city/

Total Ridership



Public Transit Providers

Addison County Transit Resources (ACTR)
Jim Moulton / jim@actr-vt.org
Phone (802) 388-1946 / Fax: (802) 388-1888

Advance Transit, Inc.
Van Chesnut / van@advancetransit.com
Phone: (802) 295-1824 / Fax:(802) 295-3010

Green Mountain Community Network (GMCN)
Donna Baker / dbaker@greenmtncn.org
Phone: (802) 447-0477 / Fax: (802) 447-2550

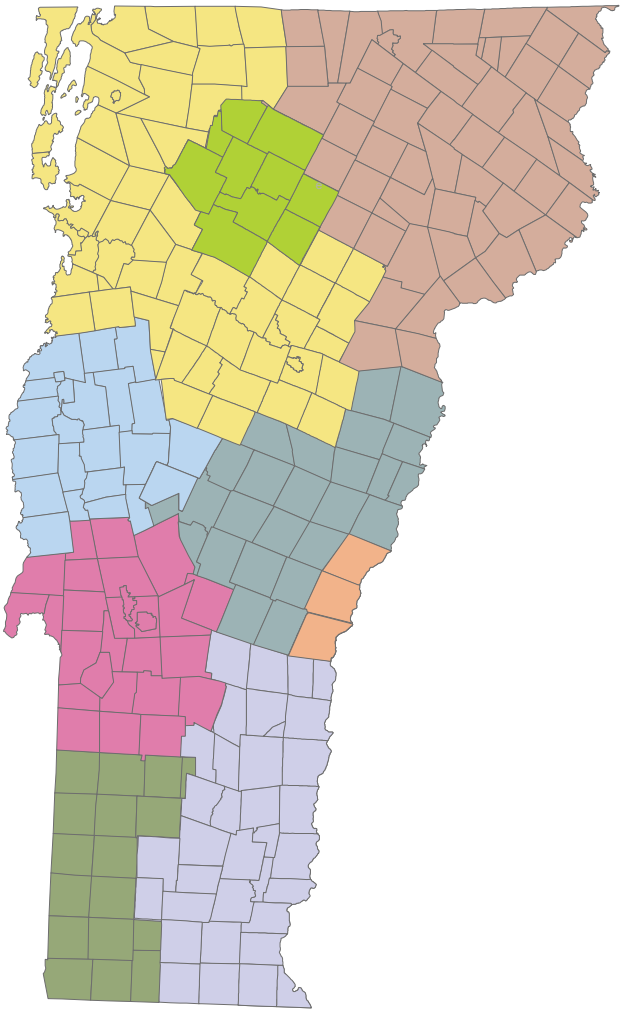
Green Mountain Transit (GMT/CCTA):
Karen Walton / kwalton@cctaride.org
Phone: (802) 223-7287 / Fax (802) 223-6236

Marble Valley Regional Transit District (MVRTD; The Bus)
Minga Dana / minga@thebus.com
Phone: (802) 773-3244 / Fax: (802) 773-0840

Rural Community Transportation, Inc. (RCTI)
Mary Grant / marygrant.rct@gmail.com
Phone: (802) 748-8170 x301/ Fax: (802) 748-5275

Southeast Vermont Transit - Current and Moover Division
Randy Schoonmaker / randys@moover.com
Phone: (802) 464-8487 / Fax: (802) 464-0164

Stagecoach Transportation Services, Inc. (STSI)
Jim Moulton / jim@actr-vt.org
Phone: (802) 728-3773 / Fax: (802) 728-6232



Intercity Bus Service Providers:

Vermont Translines
Info@vttranslines.com
Phone: (802) 888-7267
www.vttranslines.com

Greyhound Bus Lines
ifsr@greyhound.com
Phone: (800) 231-2222
www.greyhound.com

Ridership Trends

Statewide public transit ridership continues to grow steadily in general. In SFY 2016, Vermont's public transit systems provided over 4.7 million trips. Most routes and categories had modest increases in ridership but the poor skiing season dramatically reduced ridership on tourism routes and caused an overall ridership decline of 6% from SFY 2015.

Statewide non-tourism transit ridership saw a modest increase, but the ski season decrease has reduced the 6-year increase to about 3%. Just over half of those rides are provided in the Chittenden County region, and the other half is spread throughout the rest of the State.

There are many types of riders and VTrans is proud to serve the spectrum of the population from those needing one on one volunteer rides to medical appointments to commuters riding coach buses.

Route Performance

The Public Transit Section has established route categories based on the type of service provided. Transit providers submit monthly Service Indicator Reports for each route and all services reflecting total cost, ridership, miles, etc. and each service category is compared to VT and comparable routes in other states. This data reveals overall route performance and trends. Routes that are underperforming or losing ridership over time will be changed or canceled. VTrans looks for areas to add more routes where ridership is likely to be high and seeks to provide technical support to improve ridership on low-performing routes.

Intercity Bus Service

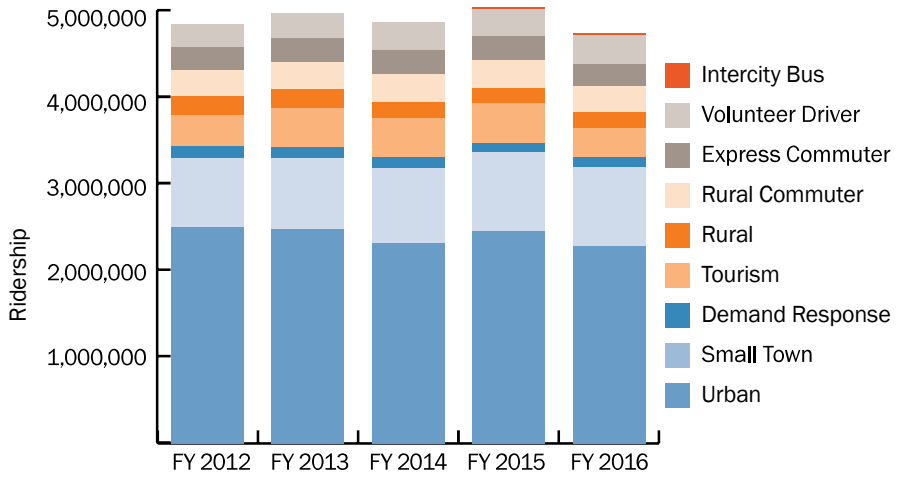
VTrans has entered into partnerships with commercial bus services to bring more connectivity and travel options to the state. In addition to ongoing services provided by Greyhound, Megabus, and Yankee Trails, two new intercity routes were developed with Vermont Translines in 2014 and bus service now includes routes between Burlington to Albany, NY and/or Rutland and White River Junction. All intercity routes connect to national bus networks. All intercity service and routes can be found at the Go Vermont website or by calling 1-800-685-RIDE.

Farebox Revenue & Local Share

VTrans has an established statewide goal of 20% local share participation for public transportation adopted as part of the 2012 Public Transit Policy Plan. Local share includes fare revenue, private contributions, contracts from outside agencies, payments from cities and towns and in-kind contributions.

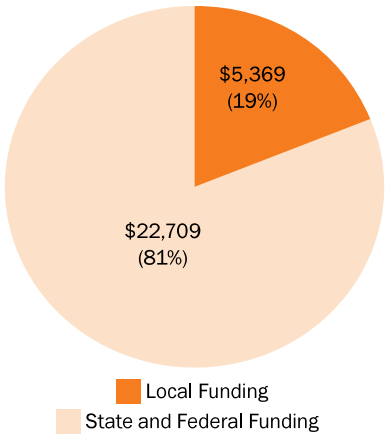
The local share analysis found that 27% of statewide transit funding comes from local sources including fares. Of 8 agencies in the state, seven charge fares on at least some routes. Other routes are offered fare-free because of local contributions from towns and institutions. Total fare revenue collected statewide in SFY2016 was $3.325 million. Fare recovery ratios (% of operating costs covered by fares) range from roughly 1% on some rural routes to 69% on the Montpelier-Burlington LINK Express. The average among all routes that collect fares is 12%. Fare revenue makes up between 20% and 25% of the operating budget for CCTA.

Statewide Transit Ridership by Service Category



Local Funding Share Statewide

in $ thousands



Elders and Persons with Disabilities "E&D" Program

In SFY 2016, the total amount spent on the E&D program in Vermont was $3.5 million, 80% of which ($3.87 million) was federal money. Overall, 158,431 E&D trips were provided in Vermont, with GMTA accounting for the largest share at 27%. While GMTA provided a majority of the E&D trips, SEVT had the highest percent of cost (23%). STSI had the highest cost per mile at $2.38 while RCT had the lowest at $1.08. GMCN had the highest cost per hour at $65.26 while SEVT had the lowest cost per hour at $34.32. STSI had the highest cost per passenger at $36.06 while GMTA had the lowest cost per passenger at $18.87.

E&D Trips by Mode

Approximately 15% of E&D trips are provided by bus or by the use of a bus pass, 37% by van, and 4% by taxi. Volunteer drivers operating their personal vehicles account for the largest percentage of E&D trips provided at 44%. This is an increase of 8% since FY15.

Go Vermont Program

Go Vermont is a resource for Vermonters who want to reduce the costs and environmental impact of driving alone. Services provided through the Go Vermont program include automated matching for carpools, a public/private vanpool program, links to all public transit routes, and an emergency ride home service. In addition, we offer program development and transportation demand management program (TDM) assistance to Vermont employers. Our one-click/one-call clearinghouse of transportation-related resources allows Vermonters to examine their travel options and make educated transportation choices.

VTrans' Public Transit Section administers the Go Vermont program in-house with the assistance of the ride matching software, Zimride, and the Vermont Energy Investment Corporation, which provides a call center service with live operations and a messaging service. In order to raise the profile of Go Vermont, VTrans is implementing an intensive statewide marketing plan, promoting efficient modes of transportation.

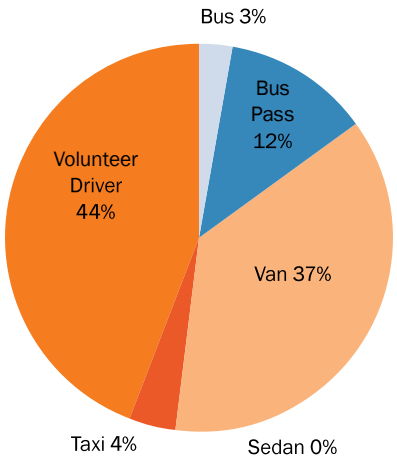
go! VERMONT
CONNECTINGCOMMUTERS.ORG

Capital Commuters

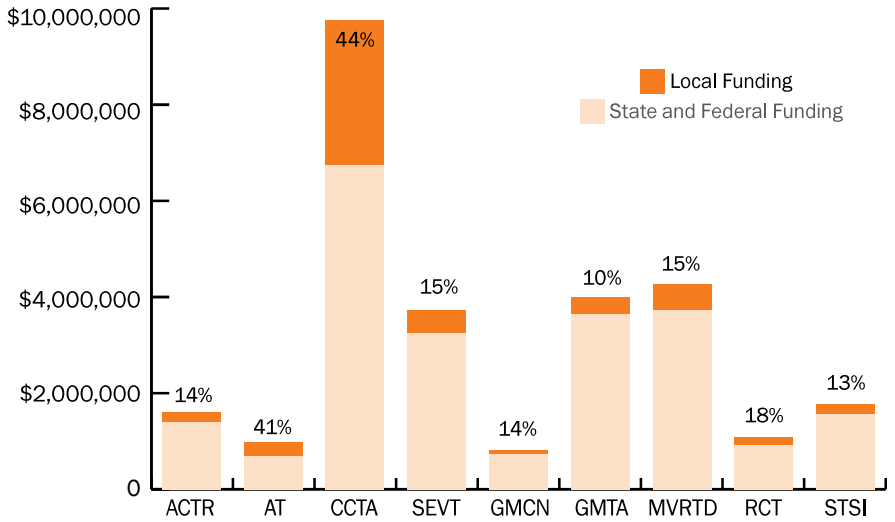
Go Vermont continues to expand its services through contracts with existing Transportation Management Associations to bring employer assistance to any interested employer in the state. An example of this is Capital Commuters, a pilot project for state employees to Montpelier. The goal of this plan is to reduce the parking pressures in downtown Montpelier and provide incentives for efficient commuting options. Incentives include 50% discounted bus passes, preferential parking for carpools and vanpools, and bike/walk "rewards." All registrants are eligible for the Guaranteed Ride Home Program, where VTrans will reimburse an individual for up to $70 for alternative transportation (taxi, rental car, bus) home in the event of an emergency.

Elders and Persons with Disabilities "E&D" Trips

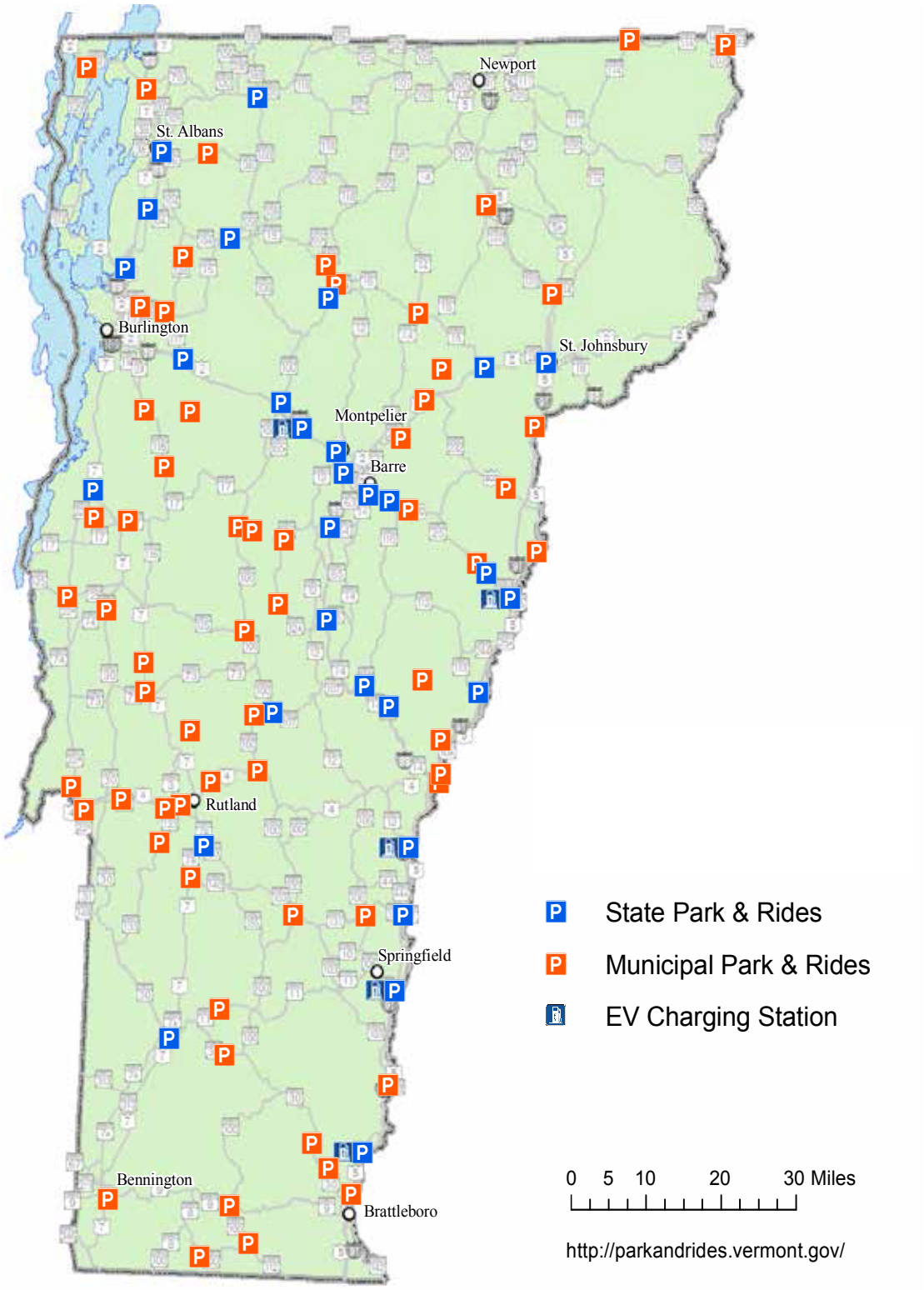
by mode, SFY 2016



2015 Funding and Local Share by Transit System



Park and Ride Locations

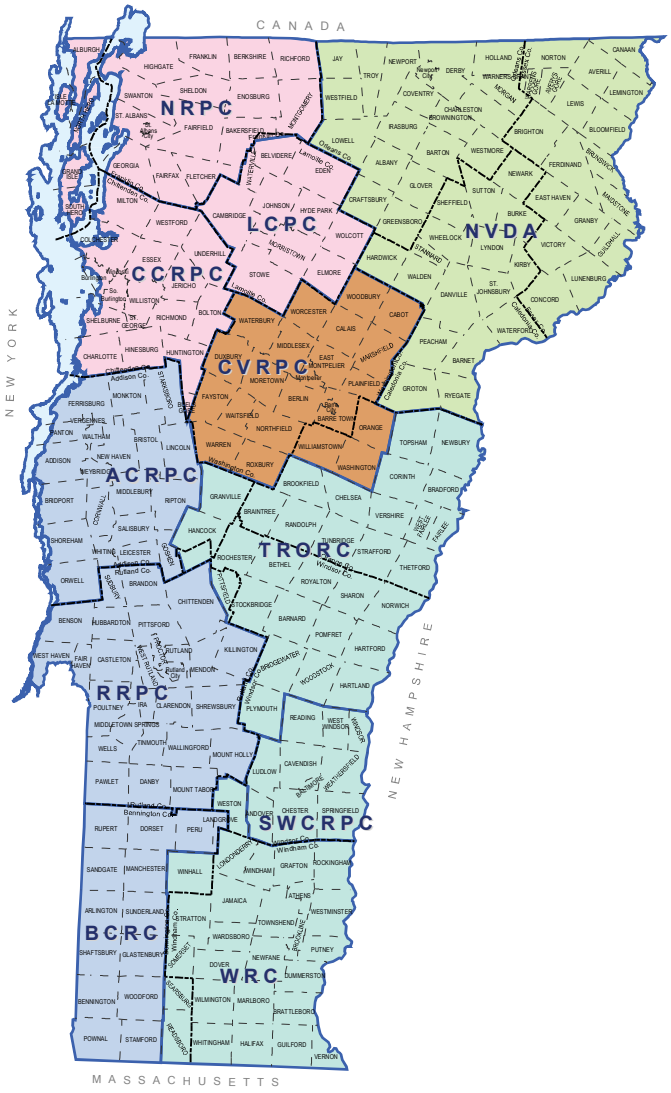


Regional Planning

Regional Planning

The Policy and Planning section coordinates and collaborates with all agency divisions, other state agencies, regional planning commissions, the public and other stakeholders as it considers all modes of travel in the context of broader economic, land use, environmental, energy and equity goals.

Through the Transportation Planning Initiative (TPI), VTrans provides grants to Vermont's 11 Regional Planning Commissions (RPCs) for transportation planning and to facilitate collaboration between municipalities and the agency.



Transportation Planning Coordinators

CCRPC, LCPC, NRPC
Amy Bell
(802) 828-2678, amy.bell@vermont.gov
CCRPC: Chittenden County Regional Planning Commission
LCPC: Lamoille County Planning Commission
NRPC: Northwest Regional Planning Commission

NVDA
Matthew Langham
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NVDA: Northeastern Vermont Development Association

CVRPC
Amy Bell
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CVRPC: Central Vermont Regional Planning Commission

SWCRPC, TRORC, WRC
Jackie Cassino
(802) 272-2368, jackie.cassino@vermont.gov
SWCRPC: So. Windsor County Regional Planning Commission
TRORC: Two Rivers-Ottauquechee Regional Commission
WRC: Windham Regional Commission

ACRPC, BCRC, RRPC
Sommer Bucossi
(802) 828-3884, sommer.bucossi@vermont.gov
ACRPC: Addison County Regional Planning Commission
BCRC: Bennington County Regional Commission
RRPC: Rutland Regional Planning Commission

2016 Transportation Planning Initiative Objectives and Accomplishments

Cooperation & Coordination between VTrans, RPCs, and Municipalities	Conformance with Act 200 & Facilitation of Decentralized Decision-Making	Provide Transportation Planning Support to Municipalities
88 Transportation Advisory Committee (TAC) Meetings	**11** Regional Transportation Plans	**35%** of TPI Budget Spent on Local Technical Assistance
583 Counts: Traffic, Bike/Ped, Park and Ride	**28** Act 250 Hearings with Transportation Comments	**39** Scoping Studies Completed
150 Safety Forums, Standards, Road Foreman, Other Meetings	**16** Accelerated Bridge Project Meetings	**104** Inventories: Bridge, Culvert, Erosion, Sidewalk, Sign

Civil Rights

The Civil Rights Section is responsible for ensuring compliance by VTrans with all federal and state requirements regarding equal employment opportunity, contract compliance, and the participation of disadvantaged, minority and women-owned businesses on contracts and grants awarded by VTrans. Civil Rights works to ensure equal opportunity and access for all VTrans employees, job applicants, contractors and the public, and to promote inclusion, fairness and equity, and a culture of dignity and respect.

Employment Opportunity

Recruitment

In 2016, the Civil Rights Section worked closely with the Agency's hiring managers to coordinate participation in over 30 job fairs, career panels, conferences, and other outreach and recruitment events. Agency employees are the best ambassadors to promote VTrans as an employer of choice.

Youth Outreach

Today's students represent the pool of workers from which the transportation industry will recruit its future work force. VTrans promotes year-round youth outreach to expose students to rewarding and diverse careers in the transportation industry. The Agency's participated in numerous career fairs, panels, and conferences; serves as a host site for students engaged in Community Based Learning or short term job shadows; and provided an annual summer residential program for high school students as part of FHWA's National Summer Transportation Institute (NSTI). In 2016, 26 high school students participated in the VTrans NSTI Program.

Partnerships - Build Vermont Pathway Program

Civil Rights networks extensively with other state agencies, academic institutions, trade groups, and community based organizations to build a robust applicant pool and to build a workforce that thrives and embraces the VTrans culture of respect, teamwork, safety and innovation. In 2016, VTrans partnered with the Vermont State Colleges (VSC) to launch the Build Vermont Pathway program, with the goal of promoting internships and permanent jobs at VTrans to students at Vermont Technical College and other VSC schools.

Training

Civil Rights supports the Agency's goal of welcoming all new employees, providing them with the tools to be successful through New Employee Orientation - 241 new employees participated in 2016. Additionally, Civil Rights works in collaboration with the VTrans Training Center and the Vermont Department of Human Resources to develop and deliver training that promotes the Agency's Respectful Workplace Commitment. Since 2013, more than 1,100 employees have received Ouch! training.

The 2016 National Summer Transportation Institute (NSTI) group poses with then Lieutenant Governor, Phil Scott.

Economic Opportunity

Federal law requires all state departments of transportation to maintain a Disadvantaged Business Enterprise (DBE) Program and a Small Business Program to ensure that minority, women, and small business owners have an equal opportunity to participate in federally funded projects. These programs help to develop and promote historically disadvantaged businesses, to assist eligible businesses in becoming certified, and to encourage their participation in government contracting and procurement opportunities.

In addition to meeting its federal mandate, VTrans promotes the DBE and Small Business Programs as an affirmative means to fulfill the philosophy that all business, regardless of ownership, should be allowed equal freedom and opportunity to compete for contracts. VTrans is committed to policies and procedures that ensure nondiscrimination in the award and administration of all contracts.

Approximately 200 women and minority owned businesses are currently certified as DBEs by VTrans, performing a wide range of transportation related services, from bridge and highway construction to engineering and design services, environmental consulting, marketing and public relations, information technology, community participation and outreach, and transportation planning.

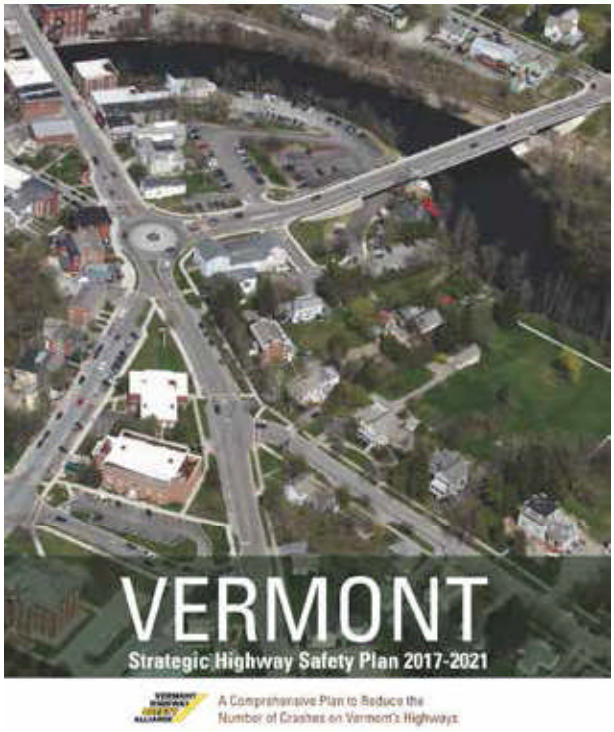
In FY 2016, certified DBEs were awarded 9.92% of all VTrans federally-funded contracts, totalling more than $19.5 million in DBE awards and commitments, out of approximately $200 million in prime contract awards.

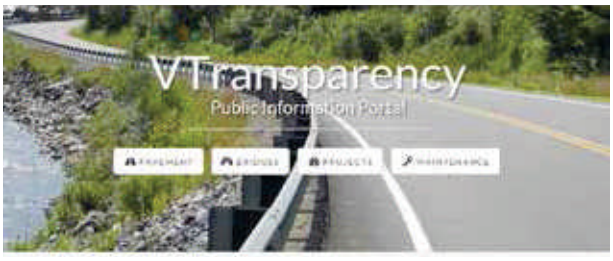
Resources

Additional reports available from the Agency of Transportation include:

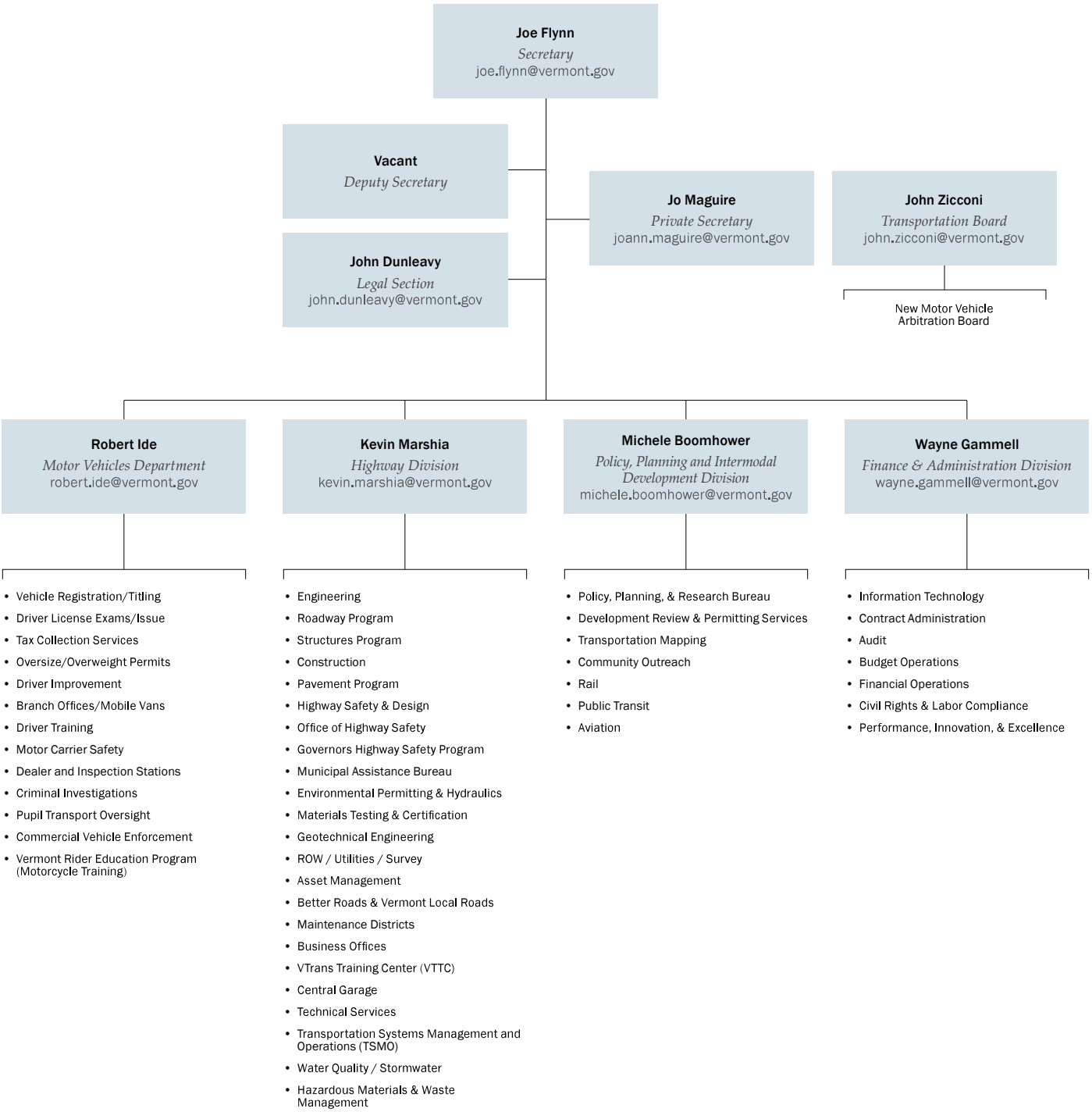
Vermont Strategic Highway Safety Plan
VTrans On-Road Bicycle Plan: Phase 1 Report
Vermont State Rail Plan
Public Transit Route Performance Reviews
Annual Report to the State Aviation Council
Tri-State Performance Measures Annual Report

http://vtrans.vermont.gov/docs





Agency of Transportation Organizational Chart



Boards and Councils

Transportation Board

John Zicconi
Executive Secretary

Vanessa Kittell
Chair

David Coen
Richard Bailey
Larry Bruce
William Tracy Carris
Wendy Harrison
Faith Terry

Motor Vehicle Arbitration Board

Pauline Liese
Lemon Law Administrator
(802) 828-2943
LemonLaw@vermont.gov

Mitchell Jay, Chair
New Car Dealer Member

David Baker, Vice-Chair
Technician Member

David Curtis
Citizen Member

Peter Hood
Citizen Member

John Manahan
Citizen Member

Alternates
Vacant
Technician Member

Gina Germond
Citizen Member

Michael Loschiavo
New Car Dealer Member

Vermont Traffic Committee

Joe Flynn
Secretary, Agency of Transportation

Robert Ide
Commissioner, Department of Motor Vehicles

Tom Anderson
Commissioner, Department of Public Safety

Public Transit Advisory Council

Joe Flynn
Secretary, Agency of Transportation
Michele Boomhower, *Director of Policy, Planning & Intermodal Development* (VTrans) is his designee

Mary Grant
Rural Community Transportation

Randy Schoonmaker
South East Vermont Transit

Jim Moulton
Addison County Transit Resources

Karen Walton
Chittenden County Transportation Authority

Al Gobeille
Secretary, Agency of Human Services

Lindsay Kurrle
Secretary, Department of Labor

Mike Schirling
Secretary, Agency of Commerce and Community Development

Peter Johnke
Vermont Center for Independent Living

Lee Cattaneo
Council of Vermont Elders (COVE)

John Sharrow
Mountain Transit

Bob Young
Premier Coach

Katherine Otto
Southern Windsor County Regional Planning Commission

Karen Horn
Vermont League of Cities and Towns

Bethany Whitaker
Citizen, Vermont Energy Investment Corp.

Senator Jane Kitchel of Danville

Rep. Mollie Burke of Brattleboro

Aviation Council

Joe Flynn
Secretary, Agency of Transportation, Chair

Russell Barr
Paul Carroccio
Kelly Colling
George Coy
Robert Flint
Janice Peaslee
Edward Peet
William Rozensky
Patricia Sears
Douglas White
James MacKay

Rail Council

Joe Flynn
Secretary, Agency of Transportation, Chair

David Allaire
Christopher Andreasson
Arthur Whitman
Joann Erenhouse
Carl Fowler
Charles Hunter
David Wulfson
Jan Eastman
Charlie Moore
Rick Moulton
Jeff Munger

Snow and Ice Control Plan

FOR STATE AND INTERSTATE HIGHWAYS

The Vermont Agency of Transportation (VTrans) is responsible for nearly 3,313 miles of roads and 2,655 bridges statewide, which equates to 6,626 snow-lane miles. Standing at the ready to battle winter weather are 275 dump trucks with plows and wings, 72 pickups with plows, and 68 loaders and graders, along with 375 licensed department operators.

Purpose and need

The purpose of the Snow and Ice Control Plan is to define the operational procedures and best management practices (BMPs) for storing and utilizing snow and ice control materials, and for performing winter maintenance activities. It defines the levels of service that VTrans will strive to provide at our facilities and on our highways. This plan allows for and encourages improvement in operational efficiency in providing the desired levels of service. It also provides guidance to help minimize leaching of salt-laden and other winter maintenance material runoff from state-owned paved surfaces and storage facilities into the ground or into surface waters.

Since storms vary dramatically across the state and occur over a variety of paved surfaces and traffic conditions, this Snow and Ice Control Plan (SIC Plan) is intended to be flexible. It is a guide structured to fit average conditions, but able to accommodate the wide variety of conditions that will be encountered by maintenance crews who are working to maintain safe roads at safe speeds.

Level of service: General information

VTrans Maintenance District snow and ice control operations are limited by the resources (budget, personnel, equipment and materials) available for winter maintenance. Consequently, VTrans' SIC Plan calls for "safe roads at safe speeds," and not "bare roads." This means that roads during a storm are maintained to allow safe travel at safe speeds, but that drivers should expect to see snow on the roadway during a storm. Most travel takes place during the day, so the majority of VTrans resources are used between 4 am and 10 pm. During those hours, the average plow routes will be between 2 to 2-½ hours. However, motorists should anticipate reduced coverage and varying road conditions at night, and should drive accordingly.

Corridor priorities

Four color-coded levels of service have been established and are shown on the "Corridor Priority Map" (see page 28). Priorities were established based on winter traffic volumes, roadway classification, and expected truck traffic. Note that critical areas such as intersections, areas of extreme curvature and problem grades may have to be treated differently to retain proper mobility and safety regardless of the corridor designation assigned to the balance of the route.

Corridor priority 1

Interstate and limited access highways (orange roads)

Snow will be removed between 3 am and 10 pm. Equipment such as tow plows and graders will be utilized to facilitate snow removal activities. During off hours, resources will be shifted to prioritize coverage on these routes. Materials noted under Section E will be applied as needed to keep the roads open for traffic and provide a safe surface on which to operate, though road surface may be snow covered at times during the storm. After the storm has subsided, bare travel lanes shall be provided as soon as practical and on these roads before all others. In most cases, this will occur within 4 daylight hours. A bare pavement shoulder to shoulder will be provided as soon as practical. The suggested maximum travel speed during the storm for "Orange Roads" is 50 mph, or 10 mph below the posted speed limit, whichever is less.

Corridor priority 2

High traffic highways & truck routes (blue roads)

Snow will be removed between 4 am and 10 pm. During off hours a skeleton crew will be used as needed. Materials noted under Section E will be applied as needed to keep the roads open for traffic and provide a safe surface on which to operate, though road surface may be snow covered at times during the storm. After the storm has subsided, a bare pavement shoulder to shoulder will be provided as soon as practical. The suggested maximum travel speed for "Blue Roads" is 45 mph, or 10 mph below the posted speed limit, whichever is less.

Corridor priority 3

Medium traffic highways (green roads)

Snow will be removed between 4 am and 10 pm. During off hours a skeleton crew will be used as needed. Materials noted under Section E will be applied as needed to keep the roads open for traffic and provide a safe surface on which to operate, though road surface may be snow covered at times during the storm. During the next regular working day after the storm has subsided, a bare pavement shoulder to shoulder will be provided as soon as practical. The suggested maximum travel speed for "Green Roads" is 40 mph, or 10 mph below the posted speed limit, whichever is less.

Corridor priority 4

Low traffic highways (yellow roads)

Snow will be removed between 4 am and 10 pm. During off hours a skeleton crew will be used as needed. Materials noted under Section E will be applied as needed to keep the roads open to traffic and provide a safe surface on which to operate. Road surface may be snow covered during and immediately following the storm. During the next regular working day after the storm has subsided, one third bare pavement, in the middle of the road, will be provided as soon as practical. As soon thereafter as practical, a bare pavement

shoulder to shoulder will be provided. The suggested maximum travel speed for "Yellow Roads" is 35 mph, or 10 mph below the posted speed limit, whichever is less.

Performance measurement and program effectiveness assessment

Performance during and immediately following individual storm events will be periodically monitored by the District General Manager and the Area Maintenance Supervisors to ensure VTrans is providing safe roads at safe speeds and performing snow and ice removal in accordance with established priorities noted under "Corridor Priorities."

In addition, to monitor performance, the following information will be reviewed by the Director of Operations, the Maintenance Transportation Administrator (MTA) and the District Transportation Administrators ("DTAs") annually to gauge program effectiveness:

- Material application rates
- Vehicle speeds during and after storm events
- Condition of travel lanes and shoulders during and after storm events
- Storm data (precipitation, air temperature, road surface temperature, wind speed, etc.)
- Plowing frequency

Overall performance during and following the winter season will be measured by monitoring material usage, labor costs, and equipment costs with respect to the number of lane miles maintained and the number of storm events addressed. Assessments will be made based upon consideration of the resources used versus the winter severity encountered, as well as through comparisons between adjacent and nearby geographical areas that have encountered similar winter conditions.

VTrans Operations Division will publish an annual report each spring which summarizes the previous winter, and VTrans' performance according to the above mentioned metrics.

Materials and application procedures

The materials in this section are those that are primarily used by VTrans for snow and ice control on highways throughout Vermont. This section describes the general purpose of each material, the typical use that is expected under normal conditions, and the application procedure. Choice of materials will depend on experienced consideration of the following variables: pavement temperature, nature of the particular snow and ice event, forecast storm conditions, air temperature and wind velocity, traffic volume, time of day/year, and the availability of resources.

Procedures for determining application rates and methods will be the responsibility of District Personnel based on this SIC Plan, available material application technology, and other factors that vary across the state from region to region.

Salt (NaCl)

Unless otherwise designated for specific routes, salt is the primary material used on the majority of roads maintained by VTrans. Salt is used to prevent the bonding of snow and ice onto the pavement surface, and to melt snow and ice that cannot be removed by plowing. Unless salt is pre-wetted with a liquid having a lower working temperature than sodium chloride, the lowest effective working temperature is approximately 15 degrees F.

Application Rates shall normally be selected from the "Salt Application Quick Reference Guideline" and shall be based

Salt Application Quick-Reference Guidelines *(**Double these rates for centerline applications**)*

Pavement Temp. Range	Application Rate (#/LM)	Pre-Wet Material	Comments
Above 32˚	0 to 100	Salt Brine or Blend	A little salt goes a long way when temperatures are near freezing.
25˚ to 32˚	100 to 200	Salt Brine or Blend	Salt is very effective here. Pre-wetting with a blend will allow lower application rates.
20˚ to 25˚	200 to 300	Salt Brine, Chemical, or Blend	Salt effectiveness is dropping off in this range. A blend or straight chemical will help.
15˚ to 20˚	300 to 400	Chemical or Blend	Pre-wetting is especially important. Liquids will provide the extra boost needed.
15˚ or Below	Snow is usually dry and blowing in this range. If no ice or pack exists, plow only—DO NOT APPLY MATERIAL.		If necessary, spot treat icy patches with abrasives. If glazing occurs on high-volume, high-speed, sand will not last and higher salt applications, with pre-wetting, will be needed.

General Notes

- Application rates should be on the lower end when temperatures are on the higher side of the range or remaining steady. Falling temperatures, and temperatures on the lower side of the range, will require applications on the higher side, and possibly in the next range if dropping rapidly.
- In any of the ranges, if the snow is dry and blowing off the roadway, do NOT apply material.
- Pre-wetting under wet storm conditions is not required. In cases where the only pre-wetting liquid available is a high-performance chemical, it is better to save those products for the drier and colder conditions.
- This is a guideline only. Application rates will vary based on climatic conditions experienced in the field, as well as corridor priority.

upon the pavement temperature, snow-ice conditions encountered, and anticipated trends. Initial applications should normally be 25% higher than the average rate indicated by the chart. Generally, salt will be used when the pavement temperatures are 15 degrees F or higher. When pavement temperatures are less than 15 degrees F and not rising, winter sand may be used when necessary for temporary traction. During cold storms, when the pavements are dry and the snow is blowing off the travel lanes, the application of salt or winter sand is to be avoided for as long as possible since it will hasten the formation of ice on the pavement. When ice does begin to form under these conditions, considerable judgment will be required on whether to use salt that is pre-wetted with liquid or spot applications of winter sand.

"Application Rates vs. Miles You Can Treat" is provided as a quick reference guide for maintenance workers and supervisors.

Salt Application Rates vs. Miles You Can Treat

Application Rate (Pounds Per Lane Mile)

Number of Tons \ Lane Miles You Can Treat	100	150	200	250	300	350	400
1	20.0	13.3	10.0	8.0	6.7	5.7	5.0
2	40.0	26.7	20.0	16.0	13.3	11.4	10.0
3	60.0	40.0	30.0	24.0	20.0	17.1	15.0
4	80.0	53.3	40.0	32.0	26.7	22.9	20.0
5	100.0	66.7	50.0	40.0	33.3	28.6	25.0
6	120.0	80.0	60.0	48.0	40.0	34.3	30.0
7	140.0	93.3	70.0	56.0	46.7	40.0	35.0
8	160.0	106.7	80.0	64.0	53.3	45.7	40.0
9	180.0	120.0	90.0	72.0	60.0	51.4	45.0
10	200.0	133.3	100.0	80.0	66.7	57.1	50.0

Winter Sand

Winter sand shall consist of coarse, clean, sharp sand or other granular material. Sand is generally used to provide traction at intersections and corners during icy conditions. When conditions warrant, salt may be mixed with sand to break the bond between the ice pack and road surface.

Sand should generally be used in the following situations:

- On hills, curves and intersections where the supervisor determines that temporary traction is needed
- In situations where salt cannot work fast enough (i.e. accident scenes involving excessive ice)
- When pavement temperatures are too low for salt to work properly
- When wet pavements exist on lower volume corridors and falling nighttime temperatures may cause glazing

Liquids

A variety of liquids are used to either "pre-wet" solid materials that are applied from the plow trucks or to "anti-ice" the highways in advance of a storm event. Following are descriptions of the types of liquids used by VTrans, and descriptions of the "anti-icing" and "pre-wetting" process.

Salt Brine

Salt brine is a 23% solution of salt in water. It can be used to either "pre-wet" solid materials that are applied from the plow trucks or to "pre-treat" the highways in advance of a storm event. However, unless salt brine is mixed with additives, the effective working temperature is the same as salt in its solid form—approximately 15 degrees F or greater.

Chemical Additives

Chemical additives are used to pre-wet the solid materials that are applied by the plow trucks to lower the effective working temperature of salt and to help keep the solid materials on the road during the application process. Examples of such chemicals may include magnesium chloride ($MgCl_2$), calcium chloride ($CaCl$) and a number of proprietary products including an "Organic Based Performance Enhancer". Chemical additives shall include a corrosion inhibitor. A 3% solution of the corrosion inhibited chemical product shall have a corrosion value at least 70% less than that of a 3% solution of sodium chloride.

Liquid Chloride Blends

Liquid Chloride blends are used to stretch the working range of salt brine without incurring the full cost of a chemical product.

Anti-icing

For anti-icing with salt brine, the application rates per lane mile may vary when pavement temperatures during the storm are anticipated to be 15 degrees F or greater. Application will generally occur on designated routes 6 to 8 hours prior to the projected start of the storm, however, up to 12 hours may be permissible based on timing of the storm. Anti-icing may also be used to spot treat bridge decks and other problem areas located on any priority corridor whenever weather forecasts indicate the possibility of glazing. When anti-icing the roads with a blend, application rates may be cut back.

Pre-wetting

Pre-wetting is the application of liquids onto solid materials. In general, salt brine shall normally be used when the pavement temperatures are above approximately 15 degrees F and chemical additive or blend shall be used when below 15 degrees F.

Equipment

Washing Equipment

Snow and ice control equipment are to be thoroughly washed during regular working hours as soon after use as practicable. Particular attention is to be paid to the areas of equipment in contact with sand, salt and liquid chlorides. With heated power washers, truck washing will normally be accomplished outdoors in designated areas.

Overnight Loads

In general, trucks should not be left loaded overnight since it subjects the equipment to unnecessary wear. However, in the event that a winter storm is forecast at some point during the approaching night, a crew may load trucks to enable a quicker response to the storm. Such loading shall be in compliance with the following:

a) Load size shall not exceed a level-load;

b) If the storm does not occur, the truck(s) loaded in advance shall be unloaded and washed out the following working day.

Spreaders

Each spreading unit shall be calibrated annually, and after any spreader or hydraulic maintenance, to insure that selected rates of application are attained.

Operations

Mailboxes and Other Structures Within the Highway Right-Of-Way

Occasionally mailboxes or other devices are damaged by snow plowing operations due to poor visibility, the mailbox being buried in a snow bank or the weight/volume of the snow being plowed. This damage is not deliberate and in most cases is unavoidable. VTrans is not responsible for damage and does not repair, replace or re-erect boxes that are located within the highway right-of-way unless physically struck by a VTrans plow truck. In these cases, VTrans will replace the mailbox at no cost to the property owner with a generic United States Post Office approved box.

Widening or Pushing Back Snow Banks

Following storms with heavy snowfall or when several storms result in substantial snow banks, VTrans will undertake a roadway widening procedure, which will push back the snow banks. This is generally done during normal working hours, and is a necessary operation because it accomplishes the following:

a) Provides room for future snow storage;

b) Reduces or prevents melted snow from running out onto the roadway pavement and creating icing conditions;

c) Increases safe sight distance at intersections and driveways;

d) Maintains a uniform line by eliminating protrusions at driveways and intersections.

Unfortunately, there is no way to prevent depositing snow in previously cleaned driveways or walkways except to leave a hazardous projecting mound of snow. With thousands of driveways of all sizes and descriptions along our highway system it is impossible to clear these individual drives as the cost would be prohibitive.

Sidewalks

The maintenance of the sidewalks, including snow removal, is the responsibility of the local community. This is firm and longstanding statewide. In addition, in those communities where on-street parking is permitted, snow removal from the parking areas, including plowing and or hauling away, is a local responsibility.

Tow Plows

Tow plows will be used primarily on limited access facilities and interchanges to clear multiple lanes at the same time. An effort will be made to avoid impacts to traffic during morning and evening commute times.

State and federal regulatory oversight

Winter Maintenance Practices located within designated National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) areas, including Watersheds of Sediment Impaired Waterways, and in the Lake Champlain Watershed Basin

Winter maintenance activities in these areas have and will continue to be regulated and addressed under the VTrans MS4 Stormwater Management Plan. Please refer to the VTrans Operations Environmental Program web site for more information regarding the above referenced designations as they may change from time to time and for information regarding the VTrans MS4 Stormwater Management Plan.

Winter Maintenance Practices: Statewide Implementation and Jurisdiction

VTrans SIC Plan has and will continue to be implemented across the state and will not be subject to ANR jurisdiction outside the designated MS4 & Lake Champlain Basin areas. The Operations Environmental Program will forward to the state Agency of Natural Resources (ANR) the SIC Plan as often as updates are made.

Best management practices, tracking and reporting

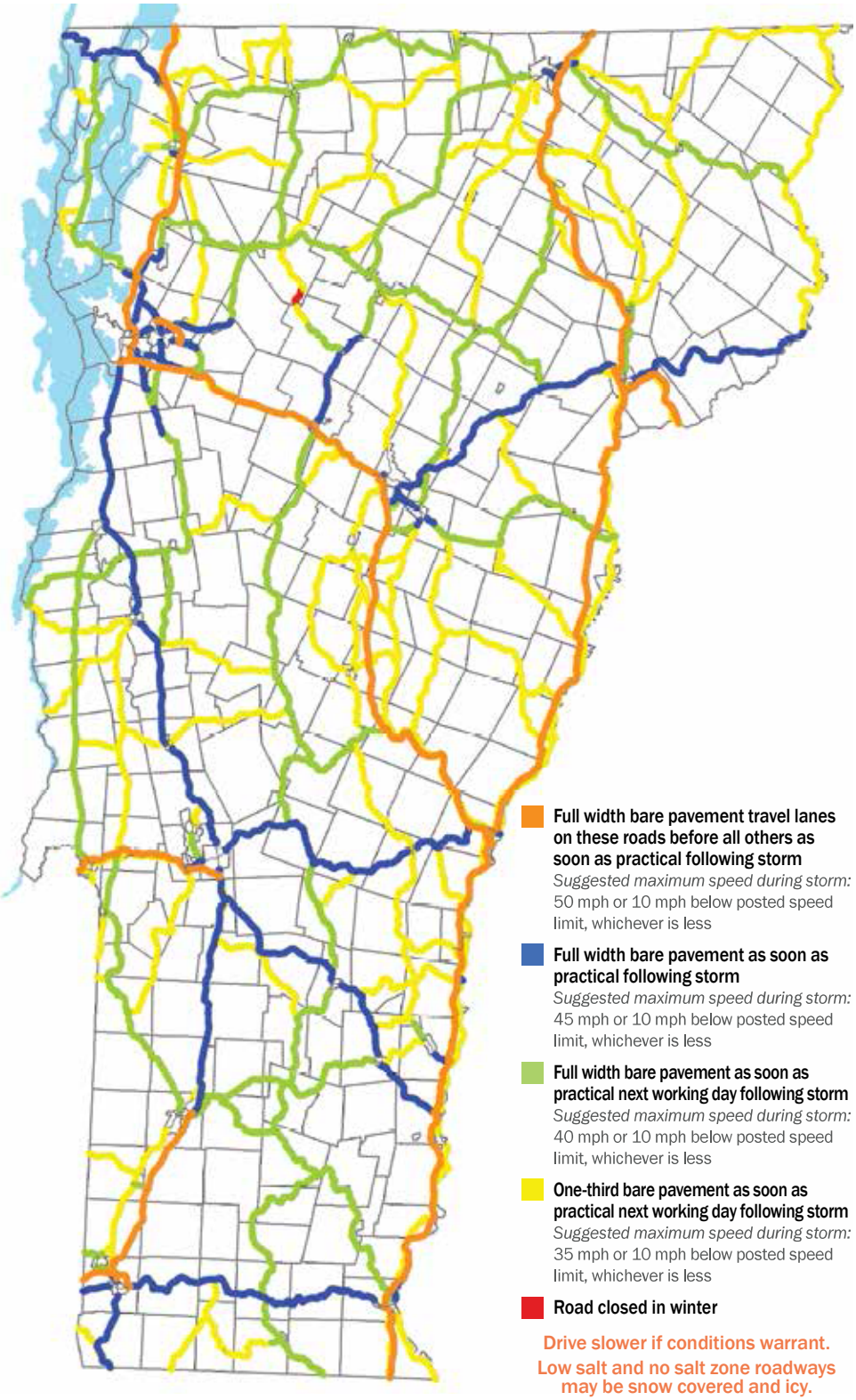
Best management practices associated with winter maintenance activities in conformance with the provisions of the VTrans SIC Plan include, but are not limited to:

1. Normal winter maintenance will conform to the provisions of the current VTrans winter maintenance standards included in this SIC Plan.
2. VTrans shall disseminate the SIC Plan statewide to employees involved in the application and storage of winter snow and ice control materials and train such employees in the proper performance of these standards. The Operations Environmental Program Manager will ensure that this information is posted on the VTrans Web Site, kept current, and made available to ANR.
3. Low salt and no salt roads (zones) will be signed in the field accordingly.
4. Weekly internal reporting of salt/sand usage will be completed by Operations Division staff commencing on the first week of November and terminating 26 weeks later, typically with the last week of April. VTrans shall make note of any single de-icing salt application

in excess of 800 pounds per two-lane mile and report such incidents as part of the weekly reporting. The Director of Operations will make this information available to ANR upon request.

5. VTrans shall fully cover with impervious material all bulk salt storage areas under their control to reduce the amount and concentration of salt to the runoff of stormwater from these storage areas. All bulk salt storage shall be situated on an impervious material so as to minimize leaching of salt-laden runoff into the ground.
6. VTrans shall locate sand piles at District Maintenance Facilities in areas that will not result in sediment-laden runoff into surface waters. If sand piles are located in close proximity to surface waters then VTrans shall install adequate erosion prevention and sediment control practices to ensure sediment-laden runoff will not impact surface waters.
7. When it is desirable to charge sand piles with salt to prevent freezing (resulting in mixes or blends), the percentage of salt in the pile shall not exceed 5%.
8. VTrans will implement these activities on a statewide basis in accordance with the protocols and best management practices established within the MS4 and Lake Champlain Basin areas for seamless operational efficiencies across the state and to support the stated purpose of this SIC Plan. The Operations Environmental Program will report on these tasks as a part of each annual MS4 report to ANR.
9. VTrans will plan, organize and conduct an annual public outreach campaign associated with safe winter driving, as funding allows.
10. Nothing in this SIC Plan shall preclude the agency from utilizing experimental and new technologies to achieve higher efficiency in a cost effective and environmentally sensitive manner. VTrans actively supports innovation and promotes the idea of finding new and better ways to reach our goals.

Corridor Priorities (Effective November 2014)



Projects Completed in 2016

Rail Projects

Maintenance Projects Completed in 2016

Project Name & Number	Line	DOT Crossing #	Project Type	Asset
Berlin	WACR M&B	837-333R	Maintenance	Crossing
Barton	WACR	850-892W	Maintenance	Crossing
Burlington	VTR Northern	837-101B	Maintenance	Crossing
Burlington	VTR Northern	851-419J	Maintenance	Crossing
Burlington	VTR Northern	837-102H	Maintenance	Crossing
Burlington	VTR Northern	837-098V	Maintenance	Crossing
Burlington	VTR Northern	837-100U	Maintenance	Crossing
Coventry	WACR	850-866G	Maintenance	Crossing
Manchester	VTR B&R	851-202W	Maintenance	Crossing
Montpelier	WACR M&B	837-321W	Maintenance	Crossing
Orleans	WACR	850-882R	Maintenance	Crossing
Roxbury	NECR	847-499R	Maintenance	Crossing
Shelburne	VTR Northern	851-409D	Maintenance	Crossing
St. Johnsbury	WACR	850-931K	Maintenance	Crossing
Wallingford	VTR B&R	851-234C	Maintenance	Crossing

Standard and Emergency Projects Completed in 2016

Project Name & Number	Line	DOT Crossing #	Project Type	Asset
Arlington STP 0114(4)	VTR B&R	851-184B	Programmed Project	Crossing
Barnet-Orleans (site 1-4) RRE4178C	WACR Lyndonville		Emergency	Slope
Bellows Falls-Chester GMRC(19) - Phase 1	GMRC Bellows Falls		Programmed Project	Track
Cavendish RREW12K / (Re-Advertised)	GMRC Bellows Falls		Emergency	Slope
Highgate RREW001F	LVRT		Emergency	Slope
Hydeville (Castleton) STP 2033(26)	CLP	248-947A	Programmed Project	Crossing
New Haven RREW001B	VTR Northern		Emergency	Culvert
Rutland-Leicester FRTII(024)	VTR Northern		Programmed Project	Track

Highway Projects

Regular Projects Substantially Completed in 2016

Project Name & Number	Route Number	Description of Work
ARLINGTON STP 0114(4)	Legion Road	Roadway Reconstruction
BARRE CITY STP 026-1(42)	VT 62	Rail Crossing
BELVIDERE-BERKSHIRESTPSURF(53)	VT 118	Paver Placed Surface Treatment
BENNINGTON BRF 1000(16)	Benmont Ave	Replace Bridge 57
BENNINGTON-MT. TABOR BF BPNT(16)(RE-ADVERTISED)	US 7	Bridge Painting
BERLIN STP 2935(1)	Berlin State Highway	Resurfacing
BERLIN NH STP 2938(1)	VT 62	Resurfacing
BERLIN NH STP 2947(1)	US 302	Resurfacing
BETHEL-RANDOLPH STP 2921(1)	VT 12	Reclaim and Resurfacing
BRADFORD-NEWBURY IM BPNT(14)	I-91	Bridge Painting
BRADFORD-RYEGATE STP 2929(1)	US 5 & US 302	Resurfacing
BRATTLEBORO BF 2000(26)	Elliot Street	Bridge Rehabilitation
CASTLETON STP 2033(26) (Re-ad)	Blissville Road	Rail Crossing
CALAIS-GREENSBORO STPG SIGN(50)	VT 14	Install New Traffic Signs
CAVENDISH RREW12K(RE-ADVERTISED)	GMRC	Rail Line Slope Stabilization
CHARLOTTE BO 1445(36)	TH 39	Seguin Covered Bridge
CHESTER-SPRINGFIELD-ROCKINGHAM-WINDSOR STP 2952(1)	US 5, VT 44, VT 11, VT 103	Resurfacing
CLARENDON BRO 1443(48)	TH 3	Replace Bridge 11
CRAFTSBURY BO 1449(34)	TH 4	Replace Bridge 4
COLCHESTER HES 028-1(28)	US 2, TH 58	Install New Left-Turn Lanes
DUXBURY BF 013-4(47)	VT 100	New Rigid Frame Culvert
EAST WALLINGFORD REW4140A	GMR	Rail Line Improvements
ESSEX STP 2912(2)	VT 128	Roadway Stabilization Flood Resiliency
FERRISBURGH NHG SGNL(42)	US 7	Install Signalized Intersection
GRANVILLE ER STP 013-4(40)	VT 100	Roadway Stabilization Flood Resiliency
HARTFORD-ROYALTON IMG SIGN(48)	I-89	Install New Traffic Signs
HIGHGATE RREW001F	LVRT	Reconstruct Storm Damaged Rail Trail
HUNTINGTON BRO 1445(35)	TH 22	Replace Bridge 30
HYDE PARK HES 030-2(34)(RE-AD)	VT 15	Reconstruct Roundabout Truck Apron
IRASBURG IM DECK(46)	I-91	Bridge Rehabilitation
JAY-TROY STP 2915(1)	VT 105	Reclaim and Resurfacing
JOHNSON-HYDE PARKSTPSURF(52)	VT 100C	Paver Placed Surface Treatment
KILLINGTON-WOODSTOCK ER NH 020-2(38)	US 4	Paver Placed Surface Treatment & Ledge Removal
LEMINGTON-CANAAN STP 2723(1)	VT 102, VT 114, VT 253	Resurfacing
LUNENBURG NH CULV(27)	US 2	New Rigid Frame Culvert
MANCHESTER-RUTLAND NH SURF(50)	US 7	Paver Placed Surface Treatment

Regular Projects Substantially Completed in 2016, continued

Project Name & Number	Route Number	Description of Work
MENDON ER 020-2(39)	US 4	New Culvert, Slope Stabilization and Drainage Improvements
MIDDLEBURY WCRS(9)	VTR	Bridge Rehabilitation
MILTON HES 028-1(27)	US 2, TH 58	Install New Roadway Delineation and New Dynamic Warning Signs
MORRISTOWN BF 0239(3)	Cadys Falls	Bridge Rehabilitation & Painting
MORRISTOWN STPG SGNL(47)	VT 100	Install Signalized Intersection
NEW HAVEN BRF 0183(1)	TH 2	Replace Bridge 10
NEW HAVEN RREW001B	VTR	New Box Culvert
NORTH HERO-GRAND ISLE BF EWP(1)	US 2	Bridge Rehabilitation
NORTH HERO-GRAND ISLE BF EWP1(2)	US 2	Bridge Rehabilitation
RANDOLPH-BERLIN STPG SIGN(52)	VT 12	Install New Traffic Signs
ROCKINGHAM IM 091-1(71)	I-91	Ledge Removal
RUTLAND-LEICESTER FRTII(024)	VTR	Continuous Welded Rail
RUTLAND-BURLINGTON VTRY(5)	VTR	Continuous Welded Rail
RYEGATE STP CULV(10)	US 5 & NECR	New Rigid Arch Culvert
ST. GEORGE-WILLISTON STP FPAV(4)	VT 2A	Resurfacing
STAMFORD STP 1441(29)	TH 14	Replace Bridge 26
STARKSBORO-BUELS GORE STP FPAV(5)	VT 17	Resurfacing
STATEWIDE HES GARD(2)	VARIOUS	Guardrail Replacement
STATEWIDE HES MARK(404)	VARIOUS	Pavement Markings
STATEWIDE IMG MARK(115)	INTERSTATE	Pavement Markings
STATEWIDE NE STPG SIGN(56)	US 5, VT 5A, VT 114	Install New Traffic Signs
STATEWIDE NORTH REGION STPG MARK(304)	VARIOUS	Pavement Markings
STATEWIDE SOUTH REGION STPG MARK(305)	VARIOUS	Pavement Markings
STATEWIDE STP CRAK(34)	VARIOUS	Crack Sealing
STATEWIDE SW REGION STPG SIGN(51)	VT 17, Bus. US 4	Install New Traffic Signs
STOWE BRF 0235(15)	VT 108	Replace Bridge 3
STOWE-BERKSHIRE STPG SIGN(49)	VT 108	Install New Traffic Signs
THETFORD STP 2221(1)	VT 113	Reclaim and Resurfacing
WAITSFIELD BRF 013-4(39)	VT 100	Replace Bridge 177
WARDSBORO BRF 013-1(15)	VT 100	Replace Bridge 68
WESTON BF 013-2(13)	VT 100	Replace Bridge 98
WINOOSKI HES 5100(13)	US 7	Circulator Improvements
WOODSTOCK BRF 0151(21)	VT 106	Replace Bridge 24
WOODSTOCK-BARNARD STP FPAV(3)	VT 12	Resurfacing
WORCESTER-ELMORE STP 2954(1)	VT 12	Reclaim and Resurfacing

Municipally Managed Projects

Scoping Projects Substantially Completed in 2016

Project Name & Number	Description of Work
Bennington TAP TA13(12)	Study for multi-modal improvements on Franklin Lane
Burke TAP TA14(11)	Study for Bike/Ped improvements on E. Darling Hill Rd.
Dover STP BP14(16)	Study for Bike/Ped improvements on VT 100
Enosburgh Falls BP14(19)	Study for sidewalk on Elm St. from VT108 to Pleasant St.
Enosburg Falls TAP TA15(7)	Study for a sidewalk/bike facility along Duffy Hill Rd.
Essex SSMG(74)	Flow restoration plan for Indian and Sunderland Brooks
Hartford TAP TA14(13)	Study for pedestrian and bicycle accommodations on VT 14 and the Quechee-West Hartford Rd.
Huntington STP BP13(17)	Study for bicycle and pedestrian alternatives in Huntington Lower Village
Hyde Park STP BP14(12)	Study on Bike/Ped connectivity between schools and trail networks
Hyde Park TAP TA13(11)	Study on streetscape and stormwater assessment for various routes
Jericho BP14(17)	Study for safety improvements at intersection of VT 15 and Lee River Rd.
Killington TAP TA14(15)	Study for a walkway connecting existing walkway at Killington Rd. to the Killington Ski Resort
Milton STP BP14(18)	Study for sidewalk along Railroad St.
Montgomery STP EH12(16)	Study for restoring the Longley covered bridge on TH 4 over the Trout River
Montgomery TAP TA15(6)	Study for relocating and restoring the Hectorville covered bridge
Morristown STP EH10(16)	Study for bike/ped improvements on VT 100
Springfield TAP TA14(12)	Study for sidewalk improvements for Elm School area
St. Albans SSMG(77)	Flow restoration plan for Rugg Brook
St. Albans Town STP BIKE(56)	Study for bicycle and pedestrian improvements to Collins Perley Sports Center
St. Johnsbury STP BP14(14)	Study to improve bicycle and pedestrian safety at the intersection of US Route 5, Main Street and South Main Street.
Sunderland STP BP14(21)	Study for safety improvements on Sunderland Hill Rd and Hill Farm Road
Woodstock STP SRIN(43)	Study for improvements to School St.

Construction Projects Substantially Completed in 2016

Project Name & Number	Description of Work
Burlington STP ST EH00(16)	Burlington Intervale improvements with kiosk, signs and other amenities
Dover STP EH12(3)	Sidewalk and pedestrian bridge along VT 100
Enosburg Falls STP BP14(9)	Sidewalk along Pleasant St.
Essex Jct. STP SDWK(17)	Shared-use path between North St. and Central St.
Essex Jct. TAP TA13(6)	Shared-use path between North St. and Central St.
Guilford STP EH11(4)	Restoration of the Green River Covered Bridge on TH 1
Johnson STP EH10(2)	Pedestrian improvements along School St. and College Hill Rd.
Killington STP EH11(7)	Pedestrian walkway along Killington Rd.
Lake Champlain SB VT06(004)	Signage, interpretive information and improvements for multi-modal travel on the Lake Champlain Scenic Byway
Middlebury STP SRIN(39)	Shared path and sidewalk along Creek Rd.
Middlebury SB VT04(006)	Wayfinding, interpretive signs, and planning for future interpretive facility
Milton STP BP13(3)	Sidewalk along McMullen Rd. from Hobbs Rd. to Railroad St.
Montpelier STP EH08(8)	Crosswalks and pedestrian amenities at various locations
Morristown ST PRDP(154)	New park and ride facility
Pittsford STP EH09(3)	Sidewalk along Pleasant St.
Poultney STP BIKE(55)	Sidewalk along York St. from York St. Ext. to Wilson Ave.
Putney STP SRIN(16)	Sidewalks and radar speed signs on Westminster Rd. near school entrance
Rockingham (Bellows Falls) STP EH10(22)	Rehabilitation of bridge over the canal on Bridge St.
Rockingham STP SRIN(31)	Sidewalk, bus drop-off lane and other improvements from the school to the village
Shaftsbury BP13(1)	Sidewalk, pedestrian safety improvements and street lighting along VT 7A and Church St.
Shaftsbury STP EH10(3)	Sidewalk from the Shaftsbury Graded School to the High School
Shires of Vermont Byway SB VT12(2)	Signage, interpretive panels and information kiosk on the Shires of Vermont Scenic Byway
Stamford STP EH07(2)	Sidewalks in the village along VT 100
Stone Valley Byway SB VT12(003)	Multi-modal access and interpretive information along the Stone Valley Scenic Byway
Waterbury-Stowe SB VT11(002)	Green Mountain Byway interpretive program
Weathersfield PLH MAPL(1)	Reconstruction of Maple St.
Williston TAP TA13(3)	Shared-use path and bridge over Allen Brook to the New Alliance Church, parallel to VT 2A
Williston TAP TA14(3)	Sidewalk along Harvest Lane
Better Roads Projects	Municipal Mitigation projects at various locations statewide
Westford ST PRDP(127)	New park and ride facility
Williston STP SDWK(15)	Sidewalk along VT 2A
Windsor STP SRIN(22)	Sidewalk improvements along VT 44
Better Back Roads Projects	Municipal Mitigation projects at various locations statewide

Highway Safety Improvement Program Projects

Infrastructure Safety Projects Substantially Completed in 2016

Route Number	Description of Work
US 2	New signs, markings and beacons to convert US 2/VT 78 intersection to 4-way stop
VT 100	New signs, markings and beacons to convert VT 100/Main St intersection to 4-way stop
VT 131	Install a double arrow behind rail facing Weathersfield Traffic
VT 131	Clear trees, cut back the bank and do some slope work on the south side of VT 131 to improve corner sight distance
US 7	Southwest corner of US 7 and Leicester Whiting Road. Remove selected trees to improve corner sight distance
US 7	Relocate the intersection signs closer to the intersection
VT 78	Relocate the curve/intersection sign closer to the intersection, add a left hand stop sign, move the street name sign, and a distance plaque under the hill sign
VT 100	Install a speed feedback sign at the school as well as at the NB 35 MPG transition on VT 100.
VT 7a	Install an interactive flashing beacon on the existing NH intersection advance warning sign. Radar detection will be installed on the stop sign at Houghton Lane.

We hope you've enjoyed this year's edition of the Fact Book. There's always something new happening here at VTrans. For all the latest on what's going on, we encourage you to visit our website where you can download many other reports, statistics, maps and other information about Vermont's transportation network at http://vtrans.vermont.gov.

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