TAC Packet

04-17-2019

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Addison County Regional Planning Commission

14 Seminary Street Middlebury, VT 05753

www.acrpc.org

Phone: 802.388.3141

TRANSPORTATION ADVISORY COMMITTEE MEETING

Wednesday, April 17th, 2019

Location: Addison County Regional Planning Commission office, 14 Seminary Street, Middlebury, VT

AGENDA

- Call to Order: 6:30PM
- Approval of March 20, 2019 TAC Meeting Minutes
- Election of chair and vice-chair (15 minutes)
- Transportation Updates from Mike (5 minutes)
 - 22A report public meeting
 - o 2020 Walk/Bike Summit update
 - Report from Road Foremen meeting
- Systemic Local Roads Systems (20 minutes)
 - Action Item: Select a town for participation
- Road and Bridge Standards (20 minutes)
- Other Business/Roundtable (10 minutes)
- Adjourn

Note: adopted meeting minutes are also available online at the ACRPC website under agendas and minutes. For your convenience, the latest version of the TAC Bylaws are linked here also: <u>http://www.acrpc.org/tac/</u>

UPCOMING GRANTS, DEADLINES, ETC.

April 26 - Deadline for comments on revised road and bridge standards

May 15	September 18
June 19	October 16
July No Meeting	November 20
August 21	December No Meeting

2019 REMAINING TAC MEETING SCHEDULE

Unless notified otherwise, all meetings will be scheduled for 6:30PM at the ACRPC office at 14 Seminary Street, Middlebury, VT 05753, Telephone Number: (802) 388-3141

Cancellations due to weather will be made for winter storm warnings and will be posted on the homepage of ACRPC's website at: <u>http://www.acrpc.org</u>

Addison County Regional Planning Commission

14 Seminary Street Middlebury, VT 05753

<u>www.acrpc.org</u> Fav· 202 222 0022 Phone: 802.388.3141

TRANSPORTATION ADVISORY COMMITTEE MEETING

Wednesday, March 20th, 2019

Location: Addison County Regional Planning Commission office, 14 Seminary Street, Middlebury, VT

Members Present:

Addison:	Jeff Nelson	Orwell:
Bridport:	Andrew Manning	Panton:
Bristol:	Peter Grant	Ripton: Norm Tjossem
Cornwall:	Brian Kemp	Salisbury: Tom Scanlon
Ferrisburgh	: Steve Huffaker	Shoreham: Karen Shacket
Goshen:		Starksboro:
Leicester:		Vergennes: Brent Rakowski, Shannon
		Haggett
Lincoln:	Will Sipsey, Chair	Waltham:
Middlebury	•	Weybridge:
Monkton:		Whiting:
New Haven	: Mike Audy	

GUESTS: Rick Bryant (Stantec), Joe Segale (VTrans) ACRPC Staff: Mike Winslow

AGENDA

Call to Order: 6:30PM

Approval of February, 2019 TAC Meeting Minutes

Moved: Peter Seconded: Karen Passed Unanimously

Presentation on the 22A Vergennes Truck Study – Stantec, Rick Bryant

Rick reviewed the draft study and sought comments from the TAC in anticipation of the April 2nd public meeting in Vergennes. Latest draft of the study can be found at http://acroc.org/programs_services/transportation/transportation_projects/

 $\underline{http://acrpc.org/programs-services/transportation/transportation-projects/}\ .$

- Rick identified the next steps in moving toward construction of an alternative route as: 1. April 2 public meeting, 2. TAC approval, 3. ACRPC full commission approval, 4. Build support from surrounding towns.
- The Capital budget has no capacity for the next five years. Joe mentioned that other work can be done before the project gets into the Capital budget including planning for land use along the alternative route including changing zoning, considering the possibility of a TIF district along the route to help finance the match for federal loans, and including the

project in the regional plan. Shannon noted that the Vergennes Planning Commission has been considering such changes.

- Will asked if the alternative alignment created an opportunity for an intermodal center for freight from the rail cars. Joe said maybe. That is one of many possible opportunities along a new route.
- Tom asked if the study had looked at commodity flow studies. Rick said they had looked at such studies to identify the volume of hazardous materials moving along the existing route.
- Jeff and Will disputed the conclusion of major improvements to quality of life for Alternative C. Rick explained that the conclusion was reached because improvements in quality of life along Route 22A roughly cancelled out harm to quality of life along Route 17, and there would be major improvements in quality of life in downtown Vergennes.
- Brent asked about the need for improved signalization at the ends of Route 17 in Alternative C. Rick said their studies showed the intersections would still operate at level of service C and therefore no improvements were warranted.
- Tom recommended noting that much of the land that would be used for Alternative B is state-owned.
- Jeff asked when the complete document would be available for review. Rick said it would be ready by the May TAC meeting. Jeff requested that it be made available one or two weeks before that meeting.
- Brent asked about the public notice process for the April meeting. Mike noted that it would be posted on Front Porch Forum in Vergennes and invited TAC members to post in their communities as well. The Addison Independent would be notified of the meeting. Joe mentioned that we may have an email list from the prior meeting that we could use to notify people as well.

Transportation Updates

- Road and Bridge Standards- Mike shared these with members last week. They will be discussed at our next meeting and comments are due to the state by April 26.
- Update from Road Foremen meeting Road Foremen had reviewed the standards and were generally okay with them. There's been some concern about the guardrail standard and about the need for two culverts per road segment with slopes from 5-8%. The latter standard is driven by the MRGP. VTrans expects to complete the standards by May and towns would then have a month or two to sign-on. Tom noted that they would likely not be in place before towns had to sign the next commitment on ERAF funds which is due May 1.
- Clean Water Block Grants a new round is anticipated in the spring, but the FY19 funds have been exhausted.
- Systemic Local Road Safety Program The TAC will have to identify a town for participation at our next meeting.
- TAC studies A consultant has been selected for the Ripton study. The RFP for the Monkton study closes on Monday.

- Rt. 125 safety letter update the letter has been sent to VTrans
- Notice of officer elections at our April meeting. Will noted that he is willing to serve as chair for another term. Jeff indicated that he would like to step down as vice-chair.
- Project prioritizations prioritizations agreed to by the TAC at the January and February meetings have been forwarded to VTrans.
- Request for volunteer drivers ACTR and Agewell are both looking for volunteer drivers to take elderly and disabled people to appointments and to deliver meals on wheels. Mike shared brochures on the programs. Tom mentioned the VA also needs drivers to bring patients to appointments in White River Junction

Other Business

• Peter asked if there had been any response from VTrans about the change in level at Route 116 and River Rd. following the paving project. Mike said there has not been a response.

Adjourn 8:07 PM

From:	Dupigny-Giroux Mario	
То:	Bethany Remmers; currier@cvregion.com; Doug Morton (morton@nvda.net); Sai Sarepalli; manders@bcrcvt.org; Rita Seto; rob@lcpcvt.org; Chris Campany; devon@rutlandrpc.org;	
	<u>mwinslow@acrpc.org; Anthony Summers</u>	
Cc:	Nyquist, Bruce; Bell, Amy; Cassino, Jackie; Bucossi, Sommer; Neaderland, Zoe; Langham, Matthew	
Subject:	Systemic Local Roads Safety Program Updates	
Date:	Tuesday, February 26, 2019 11:02:49	
Attachments:	image001.png	
	SRLS Handout Curves with Greatest Risks.pdf	
	2019 SLRS Program Participation Form.pdf	
	SLRS Curves to Review.xlsx	

Hello All,

Here are some updates concerning the Systemic Local Roads Safety Program (SLRS).

VTrans is planning to construct the HRRR/SLRS statewide project for the sites that we reviewed in 2015 and 2016 in May and June.

If most of the statewide project is completed in May and June, we are hoping that we could get started on constructing the statewide project for the sites that we reviewed in 2018 between July and November. However, not all the sites may be constructed by that time and some may have to be done in 2020.

Given this, we will not be doing reviews of new sites from the onset of the nice weather as in the past.

We may conduct some reviews in the latter part of the summer/fall once we have more information about how many projects will still have to be constructed in 2020.

We determined last year that curves with radii of less than 750 feet that were on paved roads had the greatest risk for crashes. We want to focus our efforts on theses curves, and in particular, on the curves that also have at least three crashes.

Attached is the list of paved road curves with radii of less than 750 feet that were identified has having at least three crashes. As you will see by reviewing this list, many of them have already been reviewed in the past.

Our intent is to only do reviews in the towns listed in this table. If a town is selected for review, we would then look at the paved road curves with radii of less than 750 feet that have at least three crashes as well as the other paved road curves with radii of less than 750 feet that have not been reviewed in the past.

In preparation for future reviews, if there are towns in your region on this list, please select one town from the list and have them return the attached participation form.

Let me know if you have any questions.

Thanks.

Mario Dupigny-Giroux, P.E.

Vermont Agency of Transportation Operations and Safety Bureau State Highway Safety Office Dill Building, Unit A 2178 Airport Road Barre, Vermont 05641 Phone: 802 793-4408

Email: <a href="mailto:



VTrans' Systemic Local Road Safety Program Targeting Horizontal Curves with the Greatest Risks

Minimizing roadway lane departure has been identified by VTrans as one of the most critical highway safety concerns in Vermont. Lane departure crashes represent over 50% of fatal and serious injury crashes. More than 25% of the fatal and serious injury crashes in Vermont are happening on rural townmaintained roads. This is a substantial number of crashes that cannot be ignored.

What is a Rural Town-Maintained Road?

Rural town-maintained roads are the roads that are maintained by a municipality and that are outside the adjusted Urbanized Area and Small Urban Area boundaries, established in 2016 for transportation planning purposes by VTrans in conjunction with regional planning partners.



The Rural Road Safety Challenge

Crashes on rural town-maintained roads pose a challenge when it comes to figuring out how to eliminate them.

We know crashes are happening, we know where some happened in the past, but we cannot predict exactly where they are going to happen in the future.

If you look at your town's road system over a two-to-three year period, most likely you will observe that crashes occurred at different locations and that clusters of crashes were infrequent. This is because crashes on rural roads are random, and several crashes are not reported by motorists.

The unique characteristics of rural crashes requires that highway safety on rural town-maintained roads be done in a systemic manner.

The Systemic Approach

Rural

Crashes

Head-On

5.5%

Single

Vehicle

59.3%

Right

Angle

5.2%

The systemic approach looks at the crash history on a systemwide basis in order to identify the way that most people crash (i.e., the manner of crash, for example, a rear-end crash) and then looks at the roadway characteristics (i.e., risks) that are common to these crashes.

A specific treatment that is known to be successful at eliminating the type of crash in question is then implemented across the road system at the locations that have these particular roadway characteristics. This way, all locations with the greatest risks on the entire network are treated to help deter crashes, eliminating the need to chase crashes, trying to fix one spot while crashes are happening at other locations.



To implement the systemic method, we need to first identify the predominant manner of crash (step 1) and the roadway characteristics or risks (step 2) associated with that manner of crash.

Step 1. What Manner of Crash Stands Out on Vermont Rural Town Roads?

Vermont data tell us that single vehicle crashes represent almost 60% of all crashes on rural townmaintained roads.

Step 2. What are the Risk Factors Associated with Single Vehicle Crashes?

Vermont data tell us that 58% of all single vehicle crashes on rural townmaintained roads happen on curve sections of roads.

Horizontal curve alignments are thus the primary risk factor on rural townmaintained roads. But are all horizontal curves equally at risk? The answer is no.

Vermont data tell us that crashes on curves with radii less than 750 feet are overrepresented. The data also tell us that crashes on curves with radii less than 750 feet that are also paved are overrepresented when compared to non-pave roads.





Curve Straight



The type of curves that present the most risk to motorists on rural town-maintained roads are <u>Paved Horizontal Curves with</u> <u>Radii less than 750 feet</u>

Horizontal Curve Safety Toolbox

The final task to complete the systemic process is to implement a countermeasure that will greatly help reduce the occurrence of crashes at the horizontal curve that have the greatest risks.

The proven solution with the most potential to save lives and prevent injuries at horizontal curves is to install curve warning signs. Research has shown that this solution can reduce crashes by 18% to 44%.

Curve warning signs consist of advance warning signs, advisory speed plaques, chevrons, large arrows and delineators. Requirements for curve warning signs are based on the difference between the speed limit and the speed at which a curve can be safely driven. When the difference is 5 mph, an advance warning sign and an advisory speed plaque are used. In addition, chevrons or large arrows are used when the difference in speed is 10 mph or more. Delineators can be used around the curve when the difference in speed is less than 10 mph.



Example 1: Advance Warning Sign, Advisory Speed and Chevrons



Example 2 – Large Arrows



Example 3 – Delineators





Town	Road Number	Name #1	Name #2	Reviewed When	# Crashes as of 2018
BRISTOL	TH-4	NORTH ST	MONKTON RD	2007	5
FERRISBURGH	TH-2	MONKTON RD	MONKTON RD	2018	3
FERRISBURGH	TH-35	MIDDLEBROOK RD	MIDDLEBROOK RD	2016	3
FERRISBURGH	TH-1	OLD HOLLOW RD	OLD HOLLOW RD	2018	8
LINCOLN	TH-1	W RIVER RD	E RIVER RD	2013	3
LINCOLN	TH-2	LINCOLN GAP RD	LINCOLN GAP RD		3
LINCOLN	TH-3	LINCOLN RD	LINCOLN RD		3
MONKTON	TH-1	MONKTON RDG	SILVER ST	2008	3
MONKTON	TH-3	BRISTOL RD	BRISTOL RD	2015	3
NEW HAVEN	TH-6	NORTH ST	NORTH ST		3
PANTON	TH-1	PEASE RD	LAKE RD	2014	3
PANTON	TH-2	JERSEY ST	JERSEY ST	2014	3
WEYBRIDGE	TH-2	JAMES RD	QUAKER VILLAGE RD	2016	3

2019 Systemic Local Road Safety Program (SLRS) Program Participation Form

The Vermont Agency of Transportation (VTrans) has developed a Systemic Local Road Safety program (SLRS) to help towns proactively prevent and reduce single vehicle crashes on their rural town-maintained roads.

VTrans has determined from Vermont data that curves with radii of less than 750 feet that were also on a paved road were more prone to single vehicle crashes (curves with these characteristics are called critical curves).

The towns that can take advantage of this program are the ones that have critical curves on their town highways and that were selected by their regional planning commission from a list of other eligible towns.

Your regional planning commission chose your town to partner with VTrans for this year's program.

Participation in the SLRS Program by a municipality involves the following:

- 1. Reviewing the VTrans handout titled "Targeting Horizontal Curves with the Greatest Risks"
- 2. Attendance to a site visit by the Road Foreman and another high ranking municipal official may be required
- 3. VTrans will review the critical curves in your municipality
- 4. A safety improvement project composed of signs, markings and/or beacons will be constructed
- 5. The improvement projects will be contracted by VTrans under regional umbrella construction projects and there will be no cost to your municipality
- 6. The signs, markings and/or beacons shall be in conformity with the current Manual on Uniform Traffic Control Devices
- 7. Signing, and returning to VTrans by the requested date, a Finance and Maintenance Agreement that will attest that the municipality has reviewed and approved the project plans, that the improvements will be done within the right-of-way of the municipality and that there will be no conflicts with utilities

We want to participate in the SLRS Program and partner with VTrans to reduce crash risks on our roads.

Signature:	Da	nte:, 2019
Official Name:		
TOWN/CITY/VILLAGE OF		

RE:	Summary of Road and Bridge Standard Changes 2019
DATE:	April 9, 2019
FROM:	Mike Winslow, Transportation Planner
TO:	ACRPC TAC

Below is a bulleted list of changes to the Road and Bridge Standards compared to the current standards.

New Standards

- Standards reorganized and generally easier to follow
- Municipalities have flexibility in choosing whether to accept Municipal Road and Class 4 Road Standards for non-hydrologically connected road segments (required for hydrologically connected segments)
- Removes language that allowed Selectboards to modify the standards for projects with unique circumstances where provisions could not be met
- Revises standard from "immediate" use of erosion prevention and sediment control practices to "within 5 days ... or, if precipitation is forecast, sooner".
- Roadway crown standards unchanged
- Shoulder berm standard more detailed but largely unchanged
- New road drainage standard largely replaces ditch and slope standard.
 - Ditch dimensions unchanged for slopes <5%. More options added for ditches of 5-8% slope. More detail on amount of stone lining required for ditches greater than 8% and greater than 10%.
 - Greater detail on required outlet protection for turnouts
 - New requirements for turnouts that vary based on turnout slope (not road slope). Three categories: 0-5%, 5+-10%, over 10%.
 - Changes how alternative treatments are considered by explicitly allowing "bioretention areas, level spreaders, armored shoulders, and sub-surface drainage." Previously, any cost-effective alternative practice was allowed but only after consultation and approval from VTrans Operations Division.
- Culverts less proscriptive than previous standards for culverts where slope is <5%. Otherwise very similar. Culvert standards apply where rill or gully erosion is present, to new construction, and to significant upgrades of stormwater treatment practices. Previously applied across the board.
- Additional driveway culvert standards to prevent erosion slight modifications of previous standard that didn't call out driveway culvers specifically.
- New standard for Catch Basin Outlet Stabilization.
- Standard for Stone Check Dams included. Previously a separate document

- Mandatory standards for perennial streams bridges and culverts very similar to previous standard for all culverts and bridges
- Sets optional town-wide standards for:
 - o Intermittent stream crossings (new)
 - Roadway construction (unchanged)
 - Guardrails (revised)
 - Driveway access (unchanged)
- Intermittent stream crossing standard consists of a culvert sizing chart based on drainage area.
- Guardrails prescribes steel beam guardrail with 6-foot posts or, if there is less than 3 feet from the rail to the hazard, the 8-foot posts. Prescribes G-1D end treatment. References Vtrans bridge and rail standards for bridges. Defers to AASHTO for situations that don't allow the above. Previously deferred to AASHTO for all guardrails
- Requires Class 4 road standards to follow the same or equivalent practices as required for Classes 2 and 3 gravel roads when gully erosion is present.
- Removes requirement 6 hours per year of maintenance crew training.
 - There will be other reasons for towns to provide training and training really isn't part of a road a bridge standard

The Vermont Agencies of Transportation and Natural Resources are updating the Town Road and Bridge Standards. The draft standards and supporting material are attached for review and comments by April 26th, 2019.

Background

The original purpose of the standards when they were first developed in 2001 was to ensure municipalities could be reimbursed by FEMA based on the cost to rebuild flood-damaged roads, bridges and culverts with designs that will better withstand future floods. The 2001 standards also included some safety and basic gravel road construction recommendations. Without adopted standards, FEMA's reimbursement will be based on the cost to replace infrastructure to its original condition before the disaster.

Adoption of the State-approved Town Road and Bridge Standards is one of several programs or measures that municipalities must take to increase the state share of the non-federal match required for FEMA Public Assistance grants. The state and municipal shares for the non-federal match were defined in the rules established for the Emergency Relief and Assistance Fund (ERAF) and vary depending on the measures implemented by the municipality. In addition, adoption of the State-approved Town Road and Bridge Standards is one of the requirements to reduce the local match for the Town Structures and Class Two Town Highway Grants from the Agency of Transportation. Additional information on the specific local match reductions is provided in the *Handbook for Local Officials* (the "Orange Book") published by the Vermont Agency of Transportation. Adoption of the standards is also a commitment that municipalities will build and maintain roads, culverts and bridges consistent with the standards always, even when there is no disaster.

In Act 110 of 2010, (19 V.S.A. § 996), the standards were required to include water quality best management practices and had to be updated every four years starting in 2013. The Town Road and Bridge standards were last reviewed and approved (unchanged) in 2017, and the next deadline is 2021. However, there is a practical need to update the standards sooner to eliminate the overlap with the Municipal Roads General (stormwater) Permit standards, which all towns must adopt and follow. The MRGP standards only cover" hydraulically connected" local roads (about 50% on average of local roads). By comparison, the Town Road and Bridge Standards are voluntary, also include stormwater management and flood resilience, construction and safety practices, and apply to all town highways. Hence the confusion and overlap.

Organization of the Town Road and Bridge Standards

The attached draft of the Town Road and Bridge Standards has seven sections and is organized around hydrologically-connected and non-hydraulically connected roads. As noted in the table, Sections 1 and 2 are required for connected roads, and Section 3 is required for all bridges and culverts over perennial streams. For the non-connected roads, municipalities can choose which specific standards they want to adopt. However, for adopted Town Road and Bridge Standards to count as one of the four mitigation measures necessary to qualify for the reduced match specified in the ERAF rules for a qualifying FEMA Public Assistance disaster, municipalities must select YES for Sections 1, 2, 3, 4, and 7.

After the revised standards are approved by the Agency of Natural Resources, municipalities will be offered the opportunity to officially adopt the standards by circling the sections that will apply in their municipality, signing the form, and returning a copy to their respective VAOT District Office.

What we are asking for now.

The update process specified in statute requires that the Secretary of Transportation consult with municipal representatives, and approval by the Agency of Natural Resources. Municipalities should provide comments directly to the Vermont Agency of Transportation by **April 26, 2019** to:

- District 1: Chris Taft; christopher.taft@vermont.gov
- District 2: Marc Pickering; <u>marc.pickering@vermont.gov</u>
- District 3: Brian Sanderson; brian.sanderson@vermont.gov
- District 4: Chris Bump; chris.bump@vermont.gov
- District 5: Ashley Bishop; ashley.bishop@vermont.gov
- District 7: Shauna Clifford; shauna.clifford@vermont.gov
- District 8: Jim Cota; jim.cota@vermont.gov
- District 9: Shane Morin; shane.morin@vermont.gov

In addition, the RPCs will be reviewing the standards at upcoming Transportation Advisory Committee and Road Foreman meetings

TOWN ROAD AND BRIDGE STANDARDS

TOWN OF _____, VERMONT

The Legislative Body of the Municipality of ________ hereby adopts the following Town Road and Bridge Standards which shall apply to the construction, repair, and maintenance of town roads and bridges.

The standards below are considered minimums. Municipalities that have construction standards / specifications in place that exceed the minimum standards: indicate adoption date and include as Appendix C. **Date of Adoption**:

Municipalities must comply with all applicable state and federal approvals, permits and duly adopted standards when undertaking road and bridge activities and projects.

Any new road regulated by and/or to be conveyed to the municipality shall be constructed according to the minimum of these standards.

For adopted Town Road and Bridge Standards to count as one of the four mitigation measures necessary to qualify for an additional 5% State share of funding under a qualifying FEMA Public Assistance disaster, municipalities must select YES for Sections 1, 2, 3, 4, and 7.

Circle YES or NO below to indicate town adoption of that section of the Standards

Road and Bridge Standards Sections	Hydrologically-connected road	Non-hydrologically-connected road
	segments*	segments**
Section 1 – Municipal Road Standards	YES (Required by Act 64)	YES NO
Section 2 – Class 4 Road Standards	YES (Required by Act 64)	YES NO
	Town wide	
Section 3 - Perennial stream- bridge and	YES (Required by DEC	Stream Alteration Standard)
culvert standards		
Section 4 – Intermittent stream crossings	YES NO	
Section 5 - Roadway construction standards	YES NO	
Section 6 - Guardrail standard	YES NO	
Section 7 - Driveway access standard	YES NO	

Road segments – ANR Resources Atlas includes a map layer of all of Vermont's municipal roads divided into 100-meter (328 foot) segments, each with a unique identification number.

*Hydrologically-connected road segments - are those municipal road segments, Class 1-4, as shown on the ANR Natural Resources Hydrologically-connected municipal road segment layer or the Road Erosion Scoring (MRGP) layer. <u>http://anrmaps.vermont.gov/websites/anra5/</u>

****Adoption of standards on non-hydrologically-connected road segments** does not indicate that these road segments are then subject to the Municipal Roads General Permit (MRGP).

Municipalities may also find additional resources in the latest version of the <u>Vermont Better Roads</u> <u>Manual</u>. <u>https://vtrans.vermont.gov/sites/aot/files/highway/documents/ltf/Better%20Roads%20Manual%20Final%202019.pdf</u>

Road and Bridge Standards Sections

Section 1 – Municipal Road standards - See Appendix A

These standards are required by Act 64 and the DEC Municipal Roads General Permit (MRGP) for hydrologically-connected roads only.

Municipalities may adopt Section 1 Road standards by road type for non-hydrologically-connected roads/segments.

Section 2 - Class 4 Road Standards - See Appendix A

Section 3 - Perennial stream - bridge and culvert standards

Bridge and culvert work on perennial stream crossings must conform with the statewide DEC Stream Alteration Standard.

"Perennial stream" means a watercourse or portion, segment, or reach of a watercourse, generally exceeding 0.25 square miles in watershed size, in which surface flows are not frequently or consistently interrupted during normal seasonal low flow periods. Perennial streams that begin flowing subsurface during low flow periods, due to natural geologic conditions, remain defined as perennial. All other streams, or stream segments of significant length, shall be termed intermittent. A perennial stream shall not include the standing waters in wetlands, lakes, and ponds.

Streambank stabilization and other in-stream work must conform with the statewide DEC Stream Alteration Standard.

For River Management Engineer Districts: https://dec.vermont.gov/sites/dec/files/wsm/rivers/docs/RME_districts.pdf

Section 4 – Intermittent stream crossings – See Appendix B for sizing table and graphic

"Intermittent streams" are defined as streams with beds of bare earthen material that run during seasonal high flows but are disconnected from the annual mean groundwater level.

Section 5 - Roadway construction standards - Sub-base and gravel standards

All new or substantially reconstructed gravel roads shall have at least a <u>12</u> inches* thick gravel sub-base, with an additional <u>3</u> inches* (minimum) top course of crushed gravel.

All new or substantially reconstructed paved roads shall have at least 15 inches* thick gravel sub-base.

*Municipalities to indicate their own construction criteria

Section 6 - Guardrail standard

When a roadway, culvert, bridge, or retaining wall construction or reconstruction project results in hazards such as foreslopes, drop offs, or fixed obstacles within the designated clear-zone, a roadside barrier shall be installed. For roadway situations, an approved barrier system is steel beam guardrail with 6-foot posts. If there is less than 3 feet from the rail to the hazard, then steel beam guardrail with 8-foot posts shall be used. The G-1D is an approved guardrail end treatment that shall be installed on guardrail approaches. For bridge rails systems, Vtrans bridge rail standards shall be referenced. For situations that don't allow for the above treatments, then the most current version of the AASHTO Roadside Design Guide will govern the analysis of the hazard and the subsequent treatment of that hazard.

Section 7 - Driveway access standard

The municipality has a process in place, formal or informal, to review all new drive accesses and development roads where they intersect town roads, as authorized under 19 V.S.A. Section 1111. Municipality may reference Vtrans Standard <u>A-76 Standards for</u> <u>Town & Development Roads</u> and <u>B-71 Standards for Residential and Commercial Drives</u>; the Vtrans <u>Access Management Program</u> <u>Guidelines</u>; and the latest version of the <u>Vermont Better Roads Manual</u> for other design standards and specifications.

Passed and adopted by the Legislative E	3ody of the Municipality of	, State of Vermont on
20		

Selectboard / City Council / Village Board of Trustees:

Appendix A

Section 1: MUNICIPAL ROAD STANDARDS

The following standards constitute the minimum required Best Management Practices (BMPs) for municipal roads. These standards shall apply to the construction, repair, and maintenance of all town roads and bridges. Municipalities are required to conform to these standards for all hydrologically-connected roads under the Municipal Roads General Permit. A municipality may elect to adopt these standards as applicable to both hydrologically-connected municipal roads. For non-hydrologically connected roads, these standards only apply to new road and drainage construction.

It is the municipality's responsibility to maintain all practices after installation. Roads not meeting these standards must implement the BMPs listed below in order to meet the required town's standards.

Feasibility

Municipalities shall implement these standards to the extent feasible. In determining feasibility, municipalities may consider the following criteria: The implementation of a standard listed in of this documentation does not require the acquisition of additional state of federal permits or noncompliance with such permits, or noncompliance with any other state or federal law. The implementation of a standard does not require the condemnation of private property; impacts to significant environmental and historic resources, including historic stone walls, historic structures, historic landscapes, or vegetation within 250 feet of a lakeshore; impacts to buried utilities; and excessive hydraulic hammering of ledge.

Standards for All Construction and Soil Disturbing Activities

Following construction and soil disturbance on a road, all bare or unvegetated areas shall be revegetated with see and mulch, hydroseeded, or stone lined within 5 days of disturbance of soils, or, if precipitations is forecast, sooner.

Standards for Gravel and Paved Roads with Ditches

Baseline Standards for Gravel and Paved Roads with Ditches

The following are the standards for all gravel and paved municipal roads with drainage ditches, whether or not erosion is present. These standards also apply to all new construction and significant upgrades of stormwater treatment practices.

A. Roadway/Travel Lane Standards

- 1. Roadway Crown
 - a. Gravel roads shall be crowned, in or out-sloped: Minimum: ¼" per foot Recommended: ¼" – ½" per foot or 2% - 4%
 - b. Paved/ditched roads shall be crowned during new construction, redevelopment, or repaving where repaving involves removal of the existing paving.
 Minimum: 1/8" per foot or 1%
 Pacemmended: 1% 2%
 - Recommended: 1% 2%
- 2. Shoulder berms (also called Grader/Plow Berm/Windrows) Shoulder berms shall be removed to allow precipitation to shed from the travel lane into the road drainage system. Roadway runoff shall flow in a distributed manner to the drainage ditch or filter area and there shall be no shoulder berms or evidence of a "secondary ditch". Shoulder berms may remain in place if the road crown is in-sloped or out-sloped to the opposite side of the road from berm side of road. The shoulder berm standard only applies to gravel roads with drainage ditches.
- B. Road Drainage Standards

Roadway runoff shall flow in a distributed manner to grass or a forested area by lowering road shoulders or conversely by elevating the travel lane level above the shoulder. Road shoulders shall be lower than travel lane elevation. If distributed flow is not possible, roadway runoff may enter a drainage ditch, stabilized as follows:

1. For roads with slopes between 0% and 5%: At a minimum, grass-lined ditch, no bare soil. Geotextile and erosion matting may be used instead of seed and mulch. Alternatively, ditches may be stabilized using any of the practices identified for roads with slopes 5% or greater included in subpart B.2 below.

Recommended shape: trapezoidal or parabolic cross section with mild side slopes; 2 foot horizontal per 1 foot vertical or flatter and 2 foot ditch depth.

- 2. For roads with slopes 5% or greater but less than 8%:
 - a. Stone-lined ditch: minimum 6" 8" minus stone or the equivalent for new practice construction. Recommended 2 foot ditch depth from top of stone-lined bottom,
 - b. Grass-lined ditch with stone check dams¹, or
 - c. Grass-lined ditch if installed with disconnection practices such as cross culverts and/or turnouts to reduce road stormwater runoff volume. There shall be at least <u>two</u> cross culverts or turnouts per segment disconnecting road stormwater out of the road drainage network into vegetated areas, or spaced every 160'.
- 3. For roads with slopes of 8% or greater: Stone-lined ditch.
 - a. For slopes greater than or equal to 8% but less than 10%:

¹ See check dam installation specifications.

minimum 6° – 8° minus stone or the equivalent for new construction. Recommended 2 foot ditch depth from top of stone-lined bottom.

- b. For slopes greater than 10%: minimum 6" 8" minus stone.
 Recommended 12" minus stone or the equivalent. Recommended 2 foot ditch depth from top of stone-lined bottom.
- 4. If appropriate, bioretention areas, level spreaders, armored shoulders, and subsurface drainage practices may be substituted for the above road drainage standards.

C. Drainage Outlets to Waters & Turnouts

Roadway drainage shall be disconnected from waterbodies and defined channels, since the latter can act as a stormwater conveyance, and roadway drainage shall flow in a distributed manner to a grass or forested filter area. Drainage outlets and conveyance areas shall be stabilized as follows:

- 1. Turn-outs all drainage ditches shall be turned out to avoid direct outlet to surface waters.
- 2. There must be adequate outlet protection at the end of the turnout, based upon slope ranges below. Turnout slopes shall be measured on the bank where the practice is located and not based on the road slope.
 - a. For turnouts with slopes of 0% or greater but less than 5%: stabilize with grass at minimum. Alternatively, stabilize using the practices identified in subpart b c below, when possible.
 - b. For turnouts with slopes 5% or greater: stabilize with stone.
 - c. For slopes greater than 5% but less than 10%: minimum 6" 8" minus stone or the equivalent for new construction.
 - d. For slopes greater than 10%: minimum $6^{\circ} 8^{\circ}$ minus stone or equivalent for new construction. Recommend 12^o minus stone or the equivalent.

Standards if *Rill or Gully Erosion is Present* on Gravel and Paved Roads with Ditches

The following are the required standards for all gravel and paved roads with ditches where rill or gully erosion is present. These standards also apply to new construction and significant upgrades of stormwater treatment practices.

- 1. Municipal Culverts
 - 1. Culvert end treatment or headwall required for areas with road slopes 5% or greater if erosion is due to absence of these structures. End treatment or headwall is required for new construction on slopes 5% or greater.
 - 2. Stabilize outlet such that there will be no scour erosion, if erosion is due to absence or inadequacy of outlet stabilization. Stone aprons or plunge pools required for new construction on road slopes 5% or greater.

- 3. Upgrade to 18" culvert (minimum), if erosion is due to inadequate size or absence of structure.
- 4. A French Drain (also called an Underdrain) or French Mattress (also called a Rock Sandwich) sub-surface drainage practice may be substituted for a cross culvert.
- 2. Driveway Culverts within the municipal ROW
 - 1. Culvert end treatment or headwall required for areas with road slopes of 5% or greater, if erosion is due to absence of these structures. End treatment or headwall is required for new construction.
 - 2. Stabilize outlet such that there will be no scour erosion, if erosion is due to absence or inadequacy of outlet stabilization. Stone aprons or plunge pools required for new construction.
 - 3. Upgrade to minimum 15" culvert, 18" recommended, if erosion is due to inadequate size or absence of structure.

Standards for Paved Roads with Catch Basins

Catch Basin Outlet Stabilization: All catch basin outlets shall be stabilized to eliminate all rill and gully erosion. Catch basin outfall stabilization practices include: stone-lined ditch, stone apron, check dams and culvert header/headwall.

Stone Check Dam Specification

- Height: No greater than 2 feet. Center of dam should be 9 inches lower than the side elevation
- Side slopes: 2:1 or flatter
- Stone size: Use a mixture of 2 to 9 inch stone
- Width: Dams should span the width of the channel and extend up the sides of the banks
- Spacing: Space the dams so that the bottom (toe) of the upstream dam is at the elevation of the top (crest) of the downstream dam. This spacing is equal to the height of the check dam divided by the channel slope.

Spacing (in feet) = <u>Height of check dam (in feet)</u> Slope in channel (ft/ft)

• Maintenance: Remove sediment accumulated behind the dam as needed to allow channel to drain through the stone check dam and prevent large flows from carrying sediment over the dam. If significant erosion occurs between check dams, a liner of stone should be installed.

Check Dam Specification:



Section 2: STANDARDS FOR CLASS 4 ROADS

Stabilize any areas of gully erosion with the practices described above or equivalent practices. Disconnection practices such as broad-based dips and water bars may replace cross culverts and turnouts.

Appendix B Active Channel Culvert Sizing for Intermittent Stream Crossings Choose the drainage area closest to your crossing site drainage area

	Minimum Diameter
Drainage Area	for Culverts on
(Acres)	Intermittent Streams
	(in inches)
4	15
8	18
16	24
20	30
40	36
50	42
80	48
120	60
160	66
200	Streams with drainage areas of 160
320	acres or greater are likely to be
350	Technical Guidance for Identification
450	of Perennial Streams
640	

Active Channel Width



Active Channel Width means the limits of the streambed scour formed by prevailing stream discharges, measured perpendicular to streamflow. The active channel is narrower than the bankfull width (approximately 75%) and is defined by the break in bank slope and typically extends to the edge of permanent vegetation.

Culvert sizing for crossings on intermittent streams: Determine the Active Channel Width by field measurements, *the culvert size should meet or exceed the Active Channel Width*. To obtain the measurements go to the crossing location and obtain several upstream Active Channel Width measurements in riffle (fast moving water) narrower channel locations. The selected channel width should be a representative average of the field measurements. In the absence of field measurements, the drainage areas in the table can be used.