

Office of Highway Safety

Road Safety Audit Review

Town:	Weathersfield	Date Reviewed:	September 3, 2015
Route:	VT 131 @ Weathersfield Center Road	Mile points:	VT 131: 6.202, S0135: 8.42

Location Map



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RSAR Process

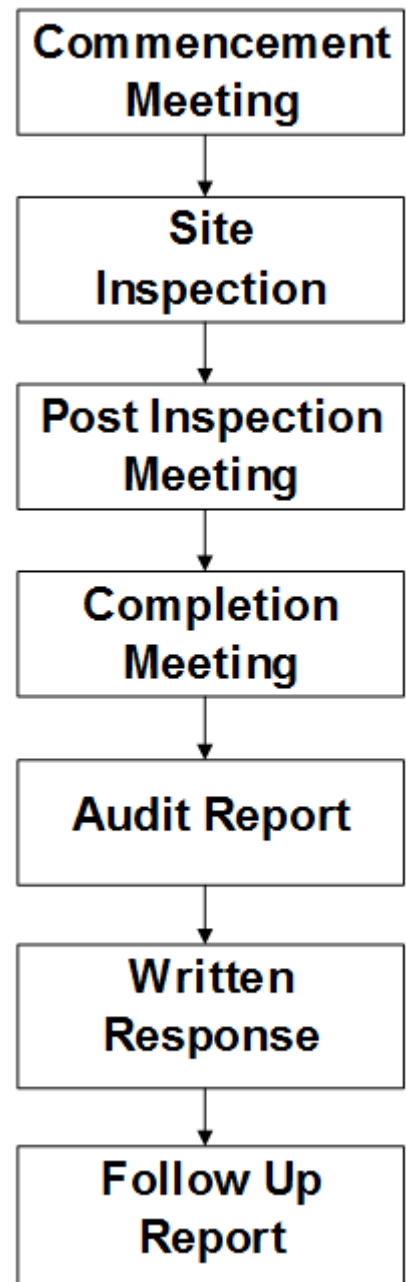
A **Road Safety Audit Review** (RSAR) is a formal examination of an existing road in which an independent, multi-discipline team (the Audit Team) reports on potential safety issues.

According to the Federal Highway Administration (FHWA), the purpose of a RSAR is to determine which elements of the road may present a safety concern, to what extent and under what circumstances as well as to identify opportunities to mitigate the identified safety concerns.

The RSAR process is composed of several steps as shown in Figure 1. The process starts with a **Commencement Meeting** during which the Audit Team reviews data and gathers community concerns. A **Site Inspection** is then performed by the Audit Team. The site visit involves the identification of safety deficiencies as seen in the field. The Audit Team will usually drive through the location of interest to “get a feel” for the area, traveling through each approach in the case of intersections. The team is to then drive at a slower speed to make observations. If needed, the team will also walk the location. Following the site inspection, the Audit Team holds a **Post Inspection Meeting**. It is during this meeting that the team members discuss their observations and identify safety issues. The team is to reach a consensus on the importance of each safety issue mentioned. Only those issues for which a consensus is reached are included in the RSAR findings. A RSAR report (Written Report) is prepared.

The **Written Report** identifies safety concerns and proposes guidance. These issues and solutions are presented in a tabular format associated to each Responsible Entity for ease of reporting. The **Responsible Entities** are any groups who own a roadway

Figure 1 - Road Safety Audit Process



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feature or who are responsible for making an improvement or for initiating further studies. These could include for example, the VTrans design section, the local town, the local police or the local RPC.

Location

The location of this RSAR is the intersection of VT 131 and Weathersfield Center Road in Weathersfield.

Purpose of the RSAR

This RSAR was conducted as part of a Vermont Highway Safety Alliance effort lead by the Enforcement Focus Group. The locations selected for this effort were originally identified as high crash locations and ranked high in terms of fatal and injury crashes. In addition, the final locations were further selected for their potential of reducing crashes through enforcement.

The RSAR herein has sought to identify potential safety hazards and physical features which may affect road user safety. However, it is possible that not every deficiency has been identified. It should further be recognized that the implementation of the guidance in this report may contribute to improve the level of safety of the facility reviewed but not necessarily remove all the risks.

RSAR Participants

Mario Dupigny-Giroux from the Office of Highway Safety, VTRANS, was the RSAR coordinator.

The other participants were:

Meghan Brunk,	District 2, VTRANS
Tom Fields,	Office of Highway Safety, VTRANS
Pat McManamon,	DMV Enforcement, VTRANS
Joe Ruzzo,	District 2, VTRANS
Katherine Otto,	Southern Windsor County Regional Planning Commission
Darrin R. Spaulding	Ascutney Fire

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Westley Hazeltine,

Town of Weathersfield

William Daniels,

Weathersfield Police Department

Information Reviewed

Geometry

This is a three-way intersection with Weathersfield Center Road meeting VT 131 at a 90-degree angle. This intersection is controlled with a stop sign on Weathersfield Center Road.

There is a 3-degree curve on VT 131 west of the intersection (ArcGIS data).

Weathersfield Center Road follows a steep incline approaching the intersection.

Speed Limit

The posted speed limit is 50 mph on VT 131. The posted speed limit is 40 mph on Weathersfield Center Road.

Traffic Volumes

The 2012 Average Annual Daily Traffic on VT 131 was 4400 vehicles per day west of the intersection and it was 5800 vehicles per day east of the intersection towards the interstate. On Weathersfield Center Road, the Average Annual Daily Traffic was 1500 vehicles per day.

The latest 12-hour turning movement count was done in August 2015.

This 12-hour count shows that most of the traffic is passing through the intersection while traveling on VT 131. On the east approach, traveling westbound, eighty percent of the traffic is continuing straight and twenty percent is turning left onto Weathersfield Center Road. From the west on VT 131, ninety-eight percent of the traffic is continuing straight and two percent is taking a right onto Weathersfield Center Road.

From Weathersfield Center Road, ninety-one percent of the traffic is turning right onto VT 131 towards I-91, while nine percent of the traffic is turning left.

The 2015 Turning Movement Report is provided at the end of this report.

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Signs and Markings

On VT 131, approaching the intersection from the west, there is a side road intersection warning sign supplemented with a street name plaque (for Weathersfield Center Road). This assembly is located at mile point 6.124. VTrans records indicate that a side road sign had been around this location since at least 1975.

The intersection is controlled by a stop sign that is located on Weathersfield Center Road. The street name sign for Weathersfield Center Road is currently located on the southeast corner of the intersection. Coming down the hill on Weathersfield Center Road towards the intersection, there is a hill symbol sign that is followed by a stop ahead sign.

Pavement markings on Weathersfield Center Road include a double yellow centerline and a stop bar with STOP word markings. The radii are also delineated with white edgelines.

Pavement Conditions

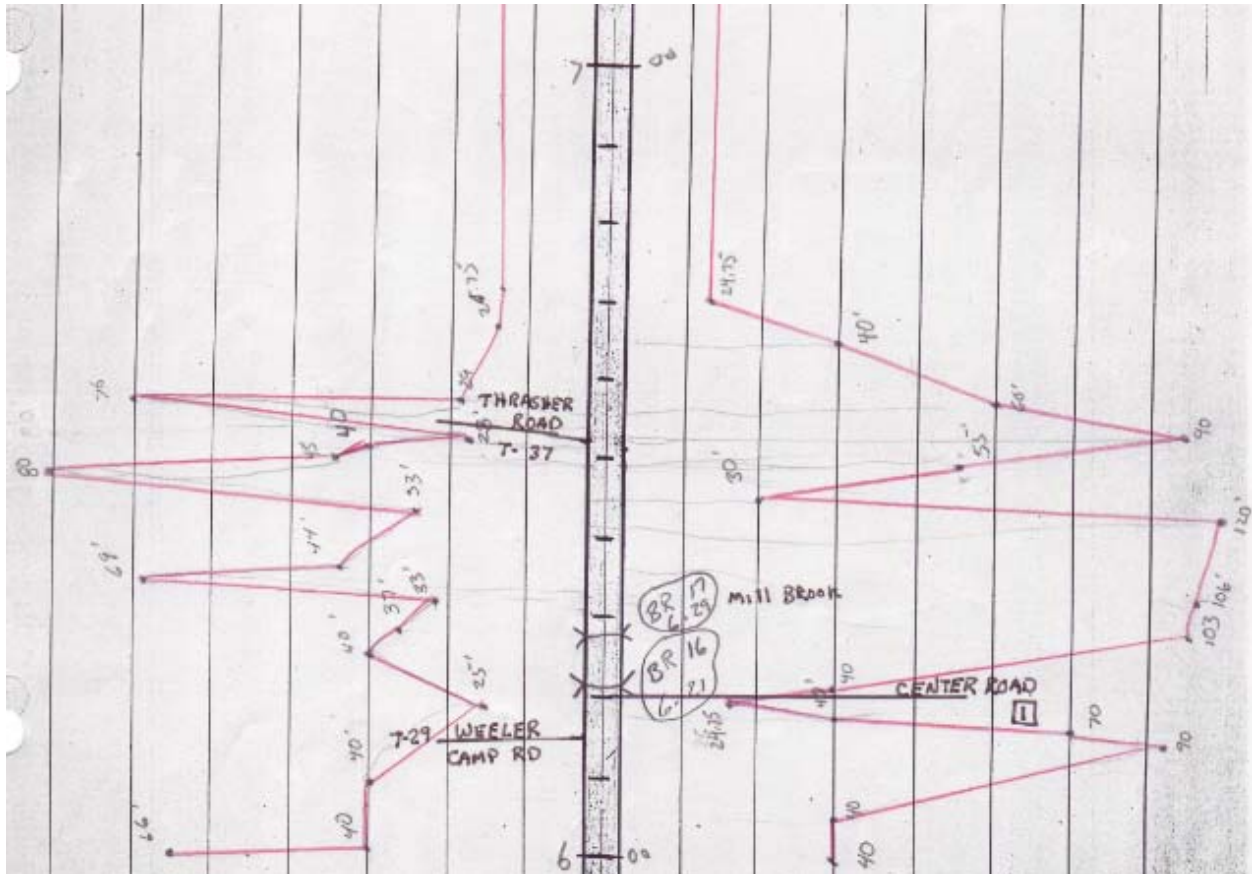
Pavement conditions on VT 131 are rated as good by VTrans. This rating is based on 2014 data.

Right-Of-Way

Right-of-way information was provided by the District and is depicted on the next figure. As can be seen, VTrans owns up to 90 feet on the south side between mile point 6 and mile point 6.2.

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Past Projects

The side road intersection sign west of the intersection was replaced in 2011 through work order number 10-655. The stop sign and legal load sign on Weathersfield Center Road were also replaced at the same time.

VT 131 was resurfaced in 2013 by project STP 2913(1).

Weathersfield Center Road was paved in 2011 through a class II highway grant. Signage was brought up to MUTCD compliance through a separate grant that was associated with the paving project but provided by VTrans Traffic Design.

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Future Projects

STP 0146(16) is a scoping project for bridge 15 on VT 131. This bridge is located west of the intersection at mile point 5.834.

Crash History

Crash history was reviewed at this intersection for the five-year period covering the years 2010 to 2014. A collision diagram and the crash narratives for each of the crashes are provided at the end of this report.

Twelve crashes occurred at this intersection between 2010 and 2014. During the same period, two more crashes took place west of the intersection with one of them happening at the turn around.

Over this five-year period, rear-end crashes represented the predominant crash pattern at this intersection (6 out of 12 or 50%). The other crash patterns at this intersection were run-off-the-road crashes (4 out of 12 or 33%) and left turn crashes (2 out of 12, or 17%).

Braking this down further, 67% of the rear-end crashes involved a vehicle that was waiting to turn left onto Weathersfield Center Road and a westbound vehicle on VT 131. The remainder of the rear-end crashes involved vehicles that were waiting at the stop sign to enter the intersection. These vehicles got rear-ended as the operators who were following them thought that they (the car in front) had moved. However, these vehicles (in front) had to stop a second time for oncoming traffic.

Of the four crashes that had a vehicle leave the roadway, three involved a vehicle that was coming down Weathersfield Center Road and that could not stop at the stop sign due to ice or snow on the road. These vehicles continued across the intersection and hit the guardrail.

As mentioned previously, there were a few left turn crashes (two instances during the review period). These left turn crashes involved a vehicle that was turning left onto Weathersfield

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Center Road and an eastbound through vehicle on VT 131. In both cases, the operator who was making the left turn had not seen the oncoming vehicle on VT 131.

Identified Safety Concerns

This section lists the areas of safety concern identified by the audit team during the site inspection and from the analysis of available data. This section also reports the potential safety enhancement suggested by the audit team. The concerns are not listed in order of importance.

Concern: Corner Sight Distance Issue, Southwest Quadrant

The corner sight distance when stopped on Weathersfield Center Road and looking to the left (or west), is inadequate. This is caused by the embankment in the inside of the curve.

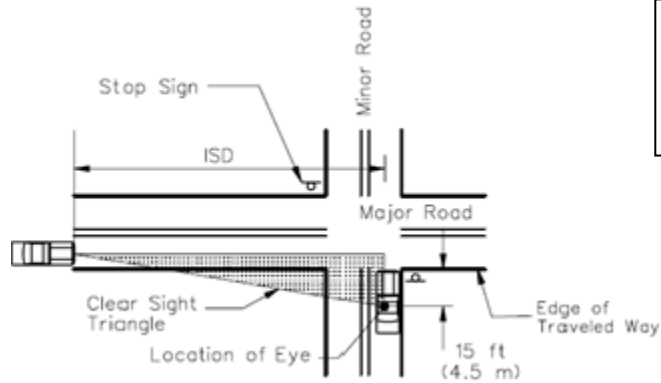
Safety Enhancements:

Clear trees, cut back the bank and do some slope work on the south side of VT 131 to improve corner sight distance.



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Note, Intersection Sight Distance (ISD) on the diagram, for 40 mph, is 445 feet as per AAHSTO and 555 feet for 50 mph.

Clear Sight Triangle Concept

Install a dynamic warning system (like the one at Rice lane and VT 67a in Bennington) that would warn traffic on VT 131 that a vehicle is stopped on Weathersfield Center Road. Alternatively, install the system so that a vehicle on Weathersfield Center Road is informed that an eastbound vehicle on VT 131 is approaching the intersection.

Add an advisory plaque to the eastbound advance warning intersection assembly that would match the speed for the corresponding available corner sight distance (about 420 feet, advisory speed would be 35 mph/40 mph).

Install (or relocate the existing sign) a street name sign on the north side of VT 131 across from Weathersfield Center Road so that the sign is visible by motorists traveling eastbound on VT 131. In this context, the sign would serve to indicate where the intersection is.

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Concern: Potential Sight Distance Issue, for Westbound Left Turners

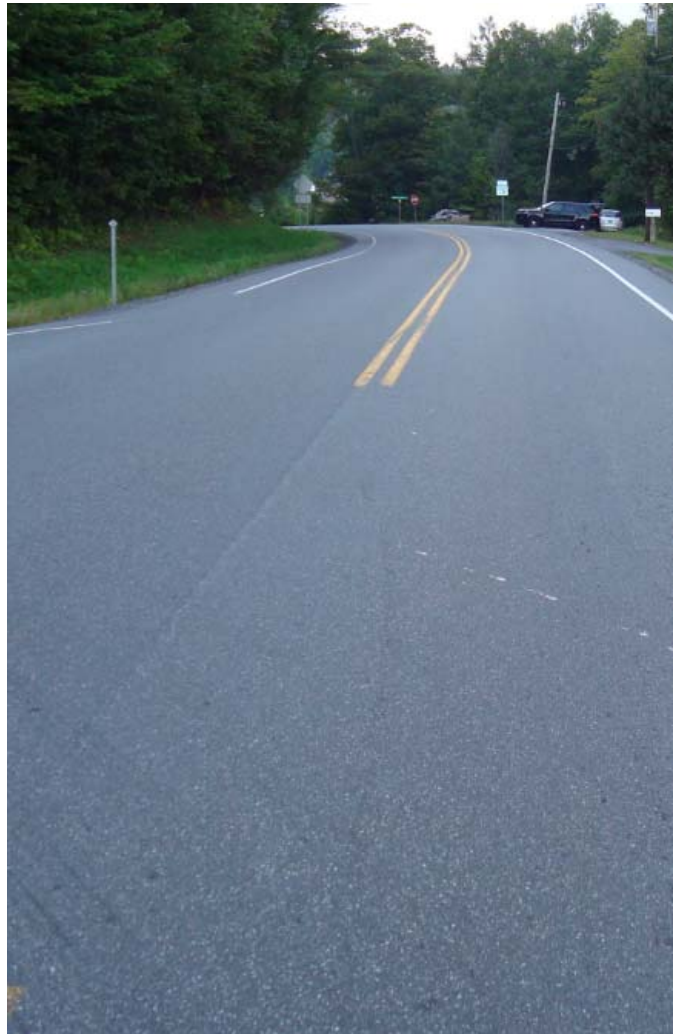
The embankment and the curve ahead are contributing to the sight distance issue.

Safety Enhancements:

Clearing trees, cutting back the bank and doing some slope work on the south side of VT 131 could help gain extra sight distance.

Install a side road sign (behind the guardrail near mm 6.253) to alert that motorists might be stopped in the road waiting to turn.

Volumes per hour do not warrant a left turn lane. However, removing left turners from the through traffic would help reduce crashes associated with one of the key patterns at this intersection.



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Concern: Vehicles on Weathersfield Center Road are sliding through the intersection

When Weathersfield Road is icy or snow covered, crash history indicates that road conditions would make some motorists unable to stop at the stop sign at the bottom of the steep grade as they continue across the intersection against the guardrail.

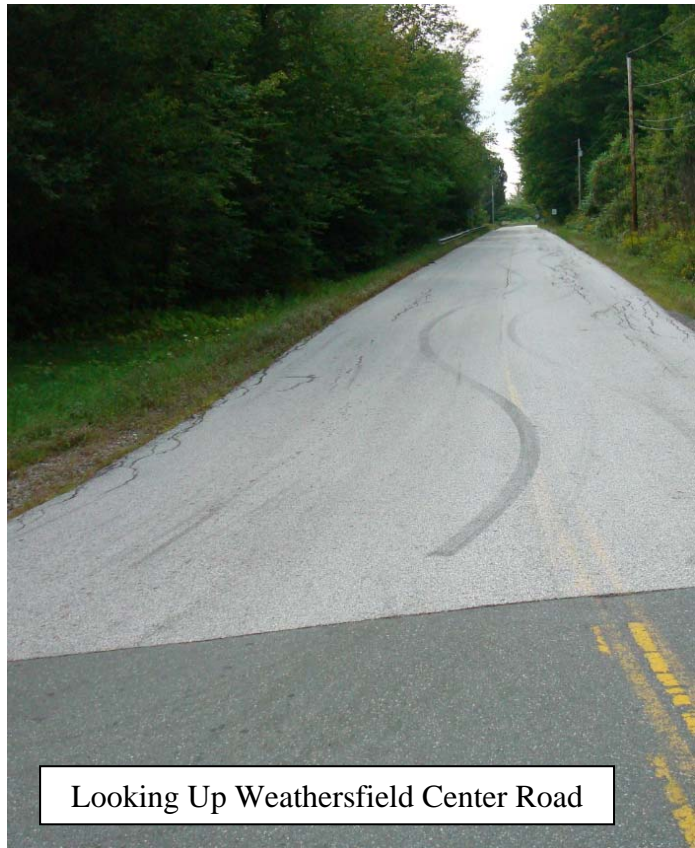
The Town indicated that Weathersfield Center Road was one of the first roads to be maintained by the Town during winter.

Safety Enhancement:

The limited crash history concerning this issue showed that this type of crashes would be common in late evening (10:00 pm). Consider this information in the winter maintenance plan.

Install a double arrow across VT 131, facing Weathersfield traffic to provide additional guidance that the road is ending.

To reduce the incidences of crashes occurring on an icy road surface, the use of an anti-icing overlay could be installed. An alternative could be to warn motorists when the road surface is icy by using a dynamic ice warning system that would have some form of flashing mechanism with the message ICING MAY OCCUR WHEN FLASHING (Detection of icy conditions would be achieved with a non-intrusive road surface sensor capable of detecting ice on the road surface).



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Weathersfield Center Road Approach

Summary of Safety Enhancements

The safety concerns and potential actions that were identified in the previous sections are further summarized in the next table. These potential enhancements will be presented to the Director of the Office of Highway Safety for further consideration.

Potential Safety Enhancements Summary Table

Safety Concern	Safety Enhancement	Responsibility	Safety Payoff	Time Frame	Cost
Corner Sight Distance Issue, Southwest Quadrant)	Clear trees, cut back the bank and do some slope work on the south side of VT 131 to improve corner sight distance	VTrans (AMP)	High (48% red Inj, 11% PDO)	Shot/Mid	Med (est \$15,000, avail \$600,000 for B/C>=1)
	Install a dynamic warning system (like the one at Rice lane and VT 67a in Bennington) that would warn traffic on VT 131 that a vehicle is stopped on Weathersfield Center Road	VTrans (TSMO)	Med	Short	Med (est \$7000 for project)
	Add an advisory plaque to the eastbound warning intersection assembly that would match the speed for the corresponding available corner sight distance	VTrans (TSMO)	Low	Short	Low
	Install (or relocate) a street name sign on the north side of VT 131 across from Weathersfield Center Road that would be more visible and indicate where the intersection is	Town	Med	Short	Low
Potential Sight Distance Issue, for Westbound Left Turners	Clearing trees, cutting back the bank and doing some slope work on the south side of VT 131 could help gain extra sight distance	VTrans (AMP)	High	Short/Mid	Med
	Install a side road sign (behind the guardrail near mm 6.253) to alert that motorists might be stopped in the	VTrans (TSMO)	Low	Short	Low
	Evaluate the constructability of a left turn lane to move left turners out of main lane of traffic	VTrans (AMP)	High	Mid	High (Avail \$400000 for B/C>1)
Vehicles on Weathersfield Center Road are sliding through the intersection	Install a double arrow across VT 131, facing Weathersfield traffic to provided additional guidance that the road is ending	VTrans (TSMO)	Low/Med	Short	Low
	This type of crashes seemed to be common in late evening (10:00 pm). Consider this information in the winter maintenance plan	Town	Low	Short	Low/Med
	Conduct a new research project for the application of an anti-icing surface (e.g., such as the new additive developed by Cargill) OR	VTrans (Planning)	High (50% reduction)	Short/Mid	High (est \$99000 for project. Avail \$17600 for B/C>1)
	Warn motorists that the road surface is icy using a dynamic ice warning system with icy conditions detected using a non-intrusive road surface sensor	VTrans (TSMO)	Med (18% reduction)	Short/Mid	Med (est \$15000 for project. Avail \$12000 for B/C>1)

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