

Road Safety Audit Review

Pond Road

Town of Hinesburg

July 9, 2008



Note: THIS DOCUMENT IS EXEMPT FROM DISCOVERY OR ADMISSION UNDER 23 U.S.C 409

Pond Road Road Safety Audit Review Review Report

Definitions

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. "Independent" means that the members of the team will not be directly involved with the location being audited.

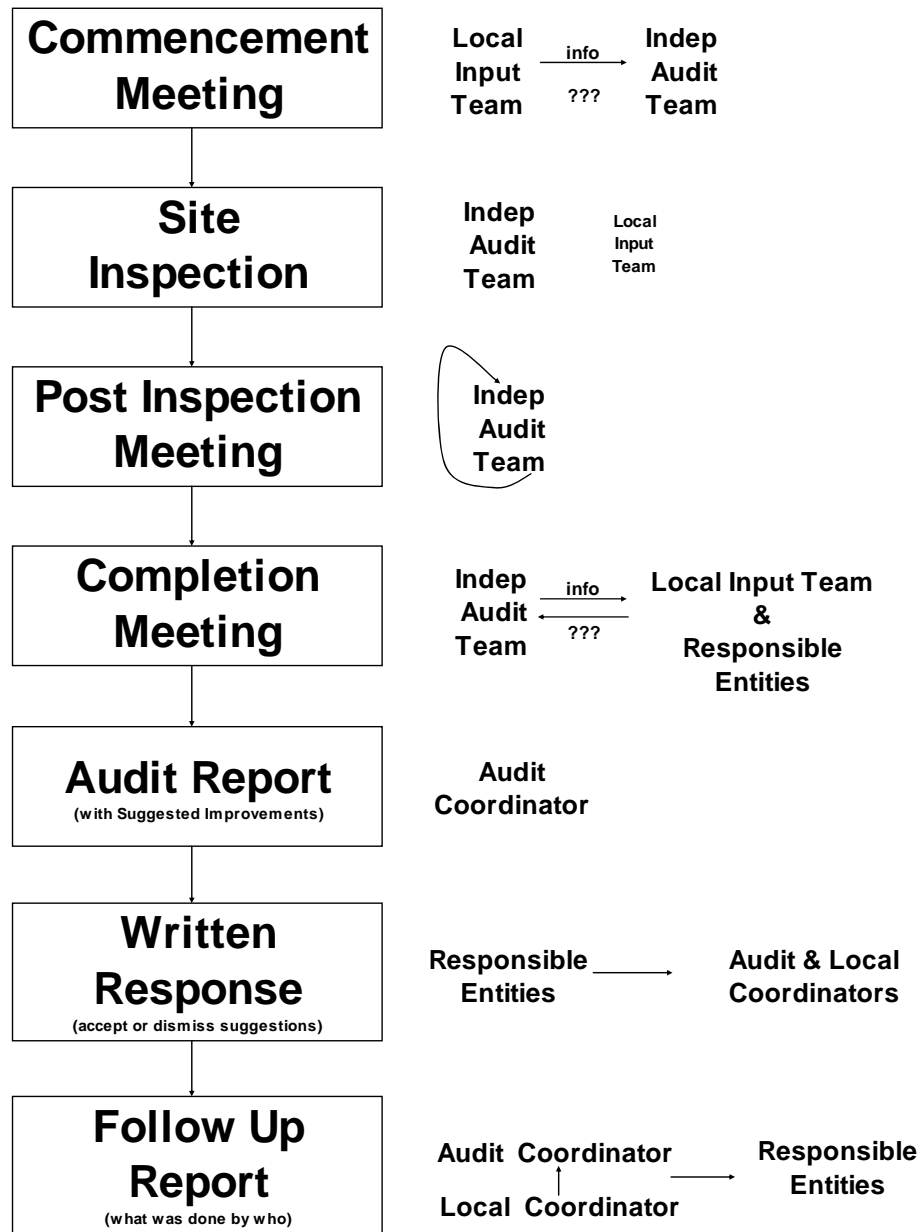
In addition to the Audit Team, a RSAR involves the following key players: Local Coordinator, Local Input Team and Responsible Entities.

The **Local Coordinator** is either a representative of the Town/City or the local regional planning commission. His/her role is to put a Local Input Team together, aggregate traffic and safety information, lead the commencement meeting and follow-up with local responsible entities. The role of the **Local Input Team** is to provide a local perspective at the commencement meeting. It is composed of representatives from the community such as Selectboard Members, Police, EMT, VAOT District, and Other Local People. The **Audit Team** is responsible for performing a site visit, identifying safety issues and coming to a consensus with respect to possible guidance. **Responsible Entities** are any groups who own a roadway feature or who are responsible for making an improvement or initiating further studies. These could include for example, the VTRANS Design Section, the Local Town, the Police or the Local RPC/MPO. The role of the Responsible Entities is to assess the viability of the suggestions provided by the Audit Team and provide a written response to the Audit Coordinator, to schedule and/or perform the improvements if deemed necessary and to follow-up with the audit or local coordinator when the project is completed. Finally, the **Audit Coordinator** is the person responsible for setting up the audit and other meeting dates, to put the audit team together, to facilitate the post inspection meeting and the completion meeting, and to prepare the audit report.

RSAR Process

The RSAR process is composed of several steps as shown in the diagram below. The process starts with a **Commencement Meeting** between the Local Input Team and the Audit Team. The purpose of the meeting is for the Local Input Team to present community concerns to the Audit Team. A **Site Inspection** is then performed by the Audit Team. Members from the Local Input Team can accompany the Audit Team to further explain concerns. 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

Figure 1. ROAD SAFETY AUDIT PROCESS



“get a feel” for the area, traveling through each approach in the case of intersections. The team is to then drive at a slower posted 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. The final RSAR report (Written Report) is finalized following the Completion Meeting during which the issues identified by the audit team are discussed with the Local Input Team and Responsible Entities. The meeting is to be constructive and

foster dialogue between the parties involved. 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 to provide a Written Response on every finding of the Written Report as to its implementation. The Responsible Entity is not obliged to implement the findings in the Written Report. However, the reasons for not implementing a finding should be documented (e.g. physical constraints, excessive cost, environmental constraints, etc.).

The RSAR herein covers physical features which may affect road user safety and it has sought to identify potential safety hazards. However, the audit team points out that no guarantee is made that every deficiency has been identified. Further, it should also be understood that the adoption of the guidance in this report should improve the level of safety of the facility but not necessarily remove all the risks.

Location

The location of this RSAR is the section of road on Pond Road between Place Road and Kozas Run.



Purpose of the RSAR

This RSAR was conducted as part of the Agency of Transportation's Transportation Planning Initiative in conjunction with the High Risk Rural Roads Program (HRRR). The location was selected by the Chittenden County Metropolitan Area (CCMPO) pursuant to the prioritization process established by CCMPO with the intent of identifying hazardous locations on rural local roads.

RSAR Team

The Road Safety Audit Review Team included the following representatives from the Vermont Agency of Transportation (VAOT):

Hank Lambert,	Traffic Safety (VAOT)
Martha Price,	Operations, District 5 (VAOT)
Bill Dailey,	Operations, District 5 (VAOT)

RSAR Team Coordinator

The road safety audit review coordinator was:

Mario Dupigny-Giroux,	Traffic Safety (VAOT)
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Local Coordinator

The local coordinator was:

Jason Charest,	CCMPO
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Local Input Team

The following individuals from the local community were present at the Commencement Meeting:

Mike Anthony,	Town of Hinesburg
Jeannie Wilson,	Town of Hinesburg

Also present were Cory Burrall and Jordan Scampoli, both interns with CCMPO.

Commencement Meeting

The commencement meeting was held at the Town of Hinesburg offices on July 9, 2008

Jason Charest explained that the site had been selected based on crash data provided by VAOT for the period 2001 to 2006.

The audit team reviewed the following information presented at the commencement meeting by

local members.

The signs within the segment consist in speed limit signs, curve signs and advisory speed signs.

Nine crashes were identified during the 2001 to 2002 period. Single vehicle crashes were predominant with 78% of the crashes. Pond Brook Road was the landmark most often cited in the crash reports.

The Town will be paving Pond Road this summer and correct the drainage issues. This is not a Class II grant project.

CVU is located at the bottom of the road. This road is used by students to go to Williston.

The ADDT of this road is above 2,500 vehicles per day.

Following the commencement meeting, the audit team, with members of the community, performed the site review of the intersection and reconvened at the town offices to discuss their observations.

Post Inspection Meeting

Mario Dupigny-Giroux mentioned that this RSAR was conducted as part of the HRRR Program. Mr. Dupigny-Giroux explained that the HRRR Program included two types of locations, namely, Programmatic Corridors and High Hazard Locations (Pond Road being a HHL) and that Programmatic corridors were sections of roads of several miles in length while High Hazard Locations were isolated locations or short segments of roads of no more than 1 mile in length. Mr. Dupigny-Giroux then clarified that High Hazard Locations were reviewed with a multi-discipline road safety audit team and that a larger number of improvements were eligible for funding.

Potential Safety Concerns

This section lists the areas of safety concern identified by the audit team. The concerns are not listed in order of importance. The safety concerns are also reported on the observation tables that are specific to each entity responsible for the improvements. These tables are found at the end of the report.

- ✓ High speed related crashes are being reported
- ✓ Motorists are losing control in various places
- ✓ Severe edge drop-offs could cause motorists to lose control
- ✓ Corner sight distance to the right on Aube Ridge is slightly obstructed

- ✓ The conspicuity of the island on Pond Brook Road could be improved

Many of these safety concerns are illustrated in the next few pages.

Problem:

High speeds related crashes are being reported

Immediate Actions:

Replace all speed limit signs (R2-1) with new 24" x 30" type III signs

Identify locations for additional R2-1 signs

The proposed new warning signs should help

Short to Mid Term:

Install recessed edgeline pavement markings (using polyurea) newly paved road (see appendix C)

Problem:

Motorists are losing control in various places:

Curve at Pond Brook Road

Immediate Actions:

SW, replace the custom made sign. Use the custom symbol without the wordings or use a modified turn sign with a side road (W1-1Md R)

Replace the advisory speed plaque with a new 21" x 21" plaque (W13-1)

Install a Pond Brook Rd sign (W16-8)

Add a new black on white, 30" x 36" Left Turn Yield to Thru Traffic (VR-615)

Clearly mark the 40' centerline break

Add a 48" x 24" arrow (W1-6) on two posts in the island and another one after Pond Brook Rd

NE, replace the custom made sign with new sign or use a 30" x 30, AOT modified curve sign (W1-1Mb L)

Replace the advisory speed plaque with a new 21" x 21" plaque (W13-1)

Add a 48" x 24" arrow (W1-6) on two posts before Pond Brook Rd and another one in the island



Pond Brook Rd



Could also use W1-1Md R with a new 21"x21 W13-1 and a W16-8



Add a new VR-615 between the mailbox and the drive

Add two new W1-6





Pond Brook Rd



Could also use
W1-1Mb L with a
new 21"x21 W13-
1 and a new W16-
8

Add two
new W1-6



Problem:

Motorists are losing control in various places:

Curve near 975 Pond Road

Immediate Actions:

SW, add a new 30" x 30" curve sign (W1-2 L)

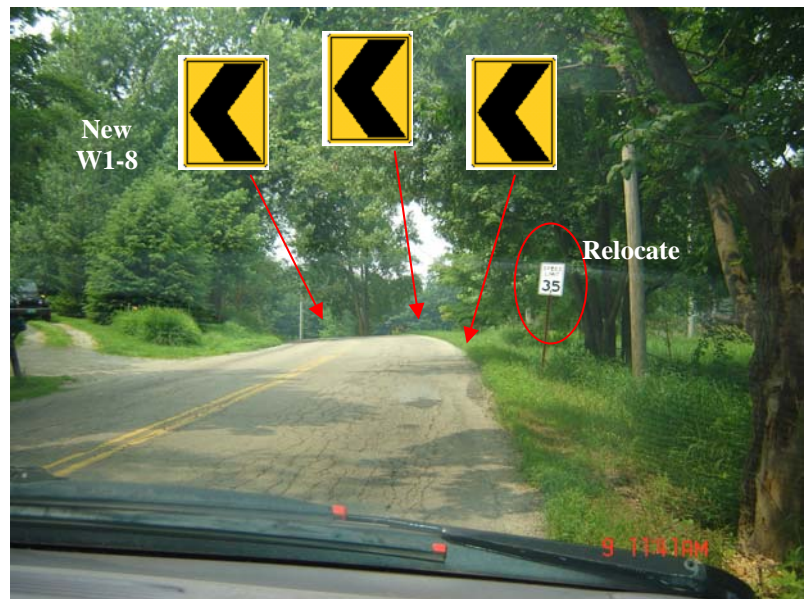
Relocate (replace with new 24" x 30", type III R2-1) the speed limit sign to 120 ft west of mail box 1081

Add 24" x 30" chevrons (W1-8) 120 ft apart

NE, Replace the Hidden Drive with a new 30" x 30" Hidden Drive Right (VW-054)



New W1-2L



New W1-8

Relocate



Replace with new VW-054

Problem:

Motorists are losing control in various places:

S curves near Aube Ridge Rd

Immediate Actions:

SW, add a new 30" x 30" reverse curve sign (W1-4 L)

Add two 24" x 30" chevrons (W1-8) near 751 Pond Road 120 ft apart

NE,

Add a 30" x 30" curve sign (W1-2 L)

Add two 24" x 30" chevrons (W1-8) near 751 Pond Road 120 ft apart



New W1-4L



Add two chevrons (W1-8)

Add two chevrons (W1-8)



Problem:

Motorists are losing control in various places:

Curve near Place Road

Immediate Actions:

SW, replace the curve sign with a new 30" x 30" curve/side road sign (W1-10 L)

Replace the advisory plaque with a new 21" x 21" advisory speed plaque (W13-1)

Add a 48" x 24" arrow (W1-6) on two posts before and after Place Road

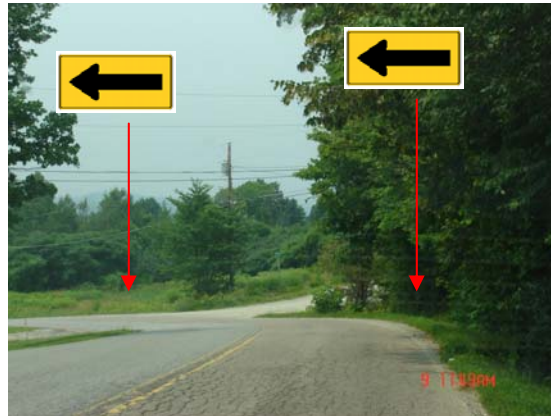


Replace with New W1-10 L



New 21" x 21" W13-1

Add two new W1-6



Problem:

The conspicuity of the island on Pond Brook Road could be improved

Immediate to Short Term:

Facing Pond Brook Road, install a Do Not Enter sign (R5-1) on the left hand side of the island & on the left hand side of the road

Facing Pond Brook Road, install a 48" x 24" arrow (W1-6) pointing to the right. The arrow should be placed in the apex of the curve

Paint the curb (all sides of the island) with reflective yellow paint

Delineate the island with a yellow edgeline on the one way slip ramp and with white edgelines the other two sides

Continue the double line centerline marking so that it follows the curve

Add a stop bar at the end of the island for SW motorists going onto Pond Brook Road

For all markings, could use recessed pavement markings if pavement is in good condition

New R5-1



New W1-6



Example of centerline markings that follow the curvature of the road

Source: AOT VisiData

Problem:

Corner sight distance to the right on Aube Ridge is slightly obstructed

Immediate to Short Term:

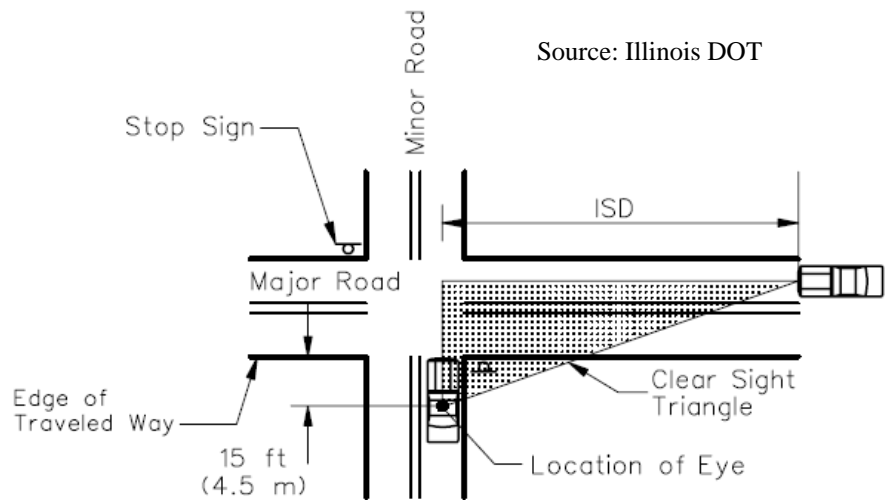
Remove obstruction outside of the corner

Promote a clear sight triangle as recommended by AASHTO

From the edge of the road, measure 15 ft back (this is the vertex of the sight triangle)

For an estimated traveling speed of 40 mph, "ISD" is 390 ft

Anything within the triangle area such defined should be as much as possible removed



Problem:

Severe edge drop-offs could cause motorists to lose control

Immediate to Short Term:

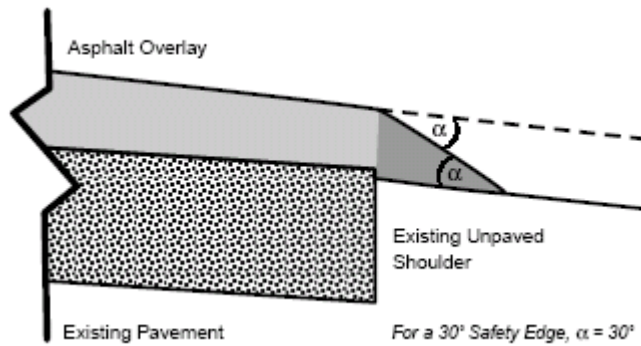
Review the locations where edge drop-offs exist

The edge drop that is being created could cause a motorist that went of the road to lose control when trying to get back on the pavement

Drop-offs of three or more inches are unsafe if the roadway edge is at a 90-degree angle to the shoulder surface

Consider specifying a 30-35 degree angle asphalt fillet (called the "Safety Edge" by FHWA) in the contract specification of the next paving project for this road

Pull up the shoulder area where applicable



Road Safety Audit Review Observations

Instruction

The next section of the RSAR Written Report contains tables that display observations and guidance. The safety issues in the first column have been identified through this road safety audit review. For each observation, the Audit Team suggests the guidance listed in the second column as a possible remedial solution. Each Responsible Entity will receive their respective tables. Please indicate in the appropriate column if you agree to implement this measure and if not, support your decision by writing a reason in the last column. Responsible Entities are not obliged to follow the findings of this Written Report. However, the reasons for not implementing a finding should be documented (e.g. physical constraints, excessive cost, environmental constraints, etc.). A written response should be submitted to the Audit Coordinator within three weeks of receipt of the Written Report.

**Written Response
Town of Hinesburg (1 of 4)**

Issue	Possible Solution	<u>Decision</u> Agree/Reject	Planned Completion Date	Comments
High speeds related crashes are being reported	Replace all speed limit signs (R2-1) with new 24" x 30" type III signs			
	Identify locations for additional R2-1 signs			
	Short to Mid Term: Install recessed edgeline pavement markings (using polyurea) newly paved road (see appendix C)			
Motorists are losing control in various places: <u>Curve at Pond Brook Road</u>	Immediate: SW, replace the custom made sign. Use the custom symbol without the wordings or use a modified turn sign with a side road (W1-1Md R)			
	Replace the advisory speed plaque with a new 21" x 21" plaque (W13-1)			
	Install a Pond Brook Rd sign (W16-8)			
	Add a new black on white, 30" x 36" Left Turn Yield to Thru Traffic (VR-615)			
	Clearly mark the 40' centerline break			

**Written Response
Town of Hinesburg (2 of 4)**

Issue	Possible Solution	Decision Agree/Reject	Planned Completion Date	Comments
	Add a 48" x 24" arrow (W1-6) on two posts in the island and another one after Pond Brook Rd			
	NE, replace the custom made sign with new sign or use a 30" x 30, AOT modified curve sign (W1-1Mb L)			
	Replace the advisory speed plaque with a new 21" x 21" plaque (W13-1)			
	Add a 48" x 24" arrow (W1-6) on two posts before Pond Brook Rd and another one in the island			
Motorists are losing control in various places: <u>Curve near 975 Pond Road</u>	Immediate: SW , add a new 30" x 30" curve sign (W1-2 L)			
	Relocate (replace with new 24" x 30", type III R2-1) the speed limit sign to 120 ft west of mail box 1081			
	Add 24" x 30" chevrons (W1-8) 120 ft apart			
	NE, Replace the Hidden Drive with a new 30" x 30" Hidden Drive Right (VW-054)			

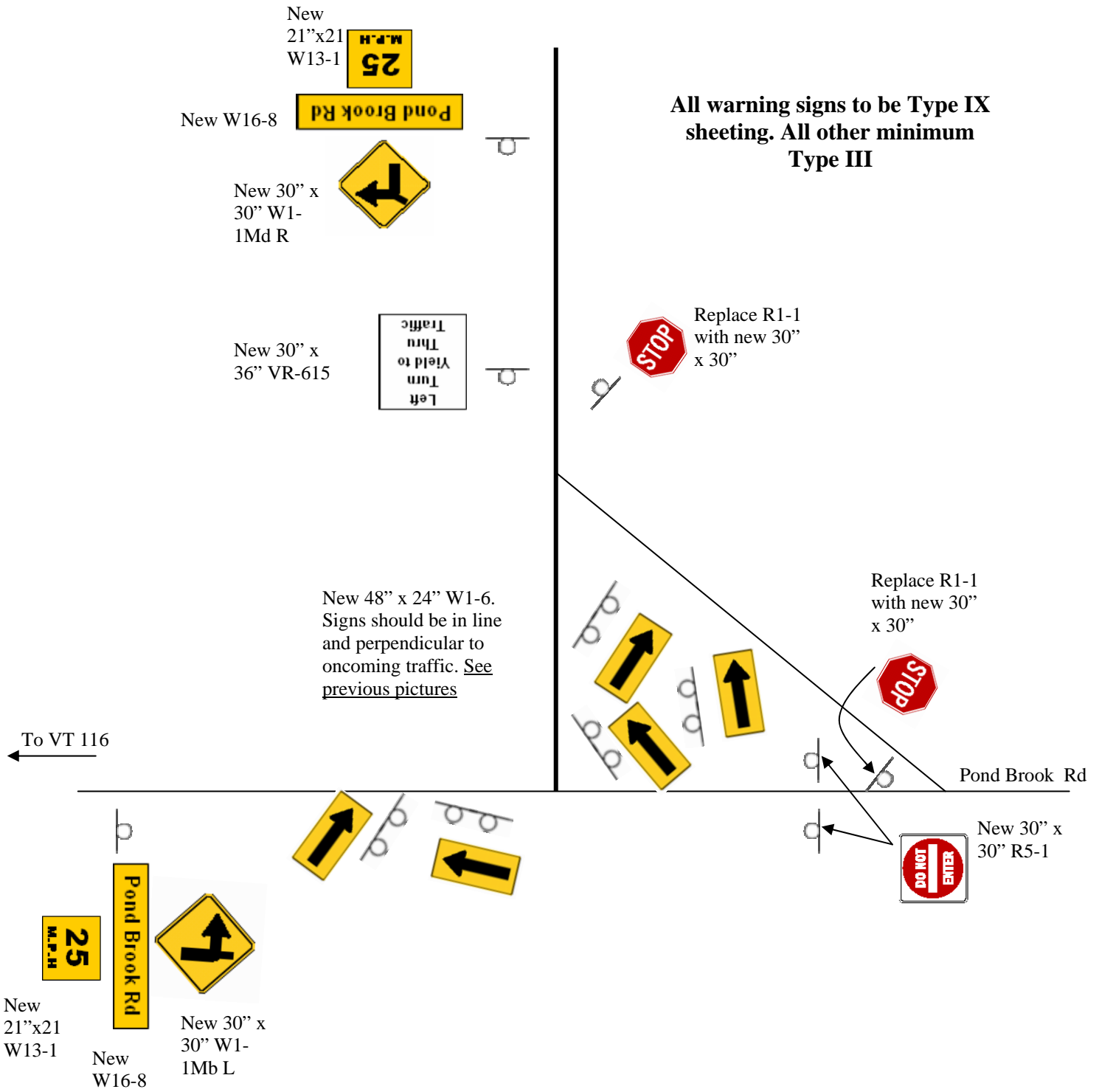
**Written Response
Town of Hinesburg (3 of 4)**

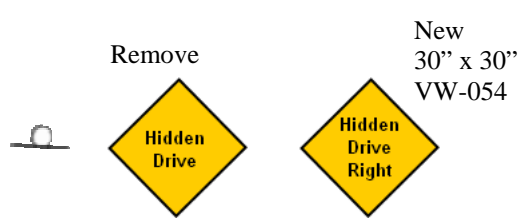
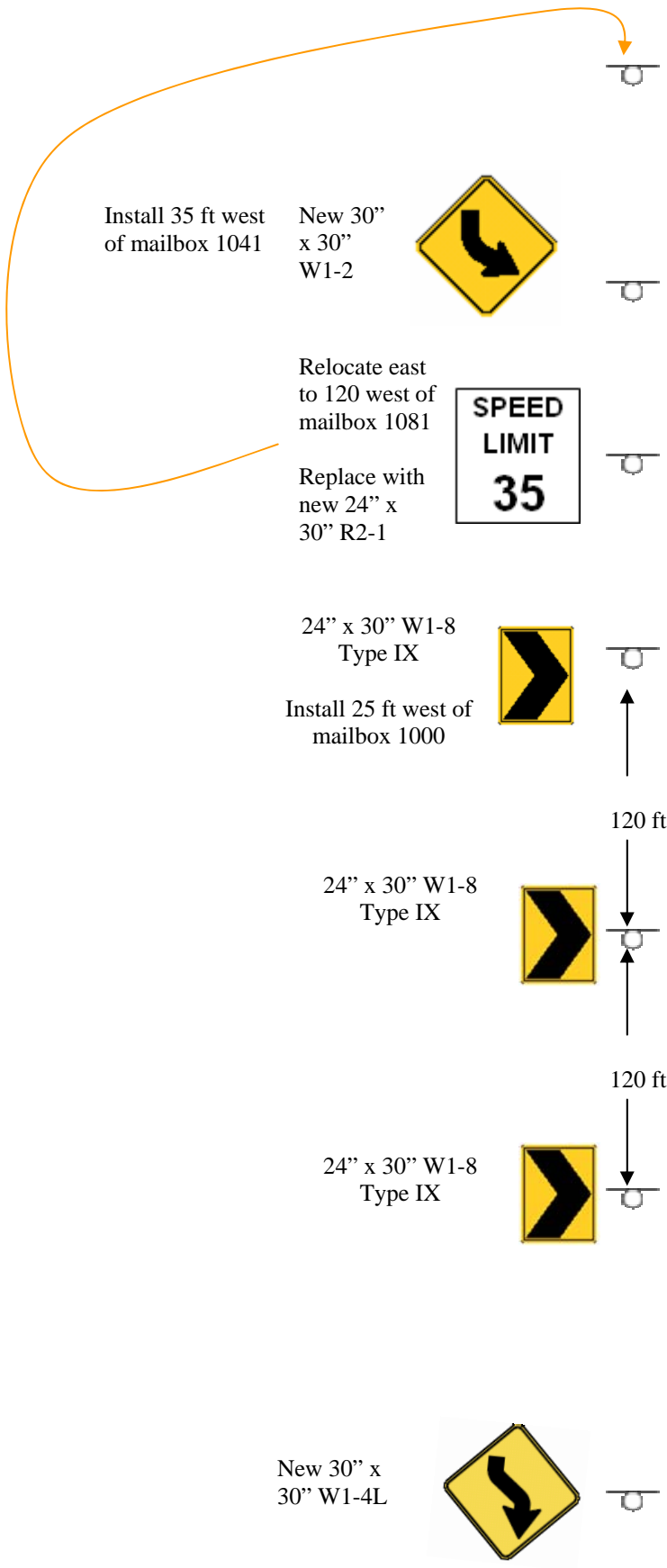
Issue	Possible Solution	<u>Decision</u> Agree/Reject	Planned Completion Date	Comments
Motorists are losing control in various places: <u>S curves near Aube Ridge Rd</u>	Immediate: SW , add a new 30" x 30" reverse curve sign (W1-4 L)			
	Add two 24" x 30" chevrons (W1-8) near 751 Pond Road 120 ft apart			
	NE , Add a 30" x 30" curve sign (W1-2 L)			
	Add two 24" x 30" chevrons (W1-8) near 751 Pond Road 120 ft apart			
Motorists are losing control in various places: <u>Curve near Place Road</u>	Immediate: SW , replace the curve sign with a new 30" x 30" curve/side road sign (W1-10 L)			
	Replace the advisory plaque with a new 21" x 21" advisory speed plaque (W13-1)			
	Add a 48" x 24" arrow (W1-6) on two posts before and after Place Road			
The conspicuity of the island on Pond Brook Road could be improved	Facing Pond Brook Rd, install a Do Not Enter sign (R5-1) on the left hand side of the island & on the left hand side of the road			
	Facing Pond Brook Rd, install a 48" x 24" arrow (W1-6) pointing to the right. The arrow should be placed in the apex of the curve			

**Written Response
Town of Hinesburg (4 of 4)**

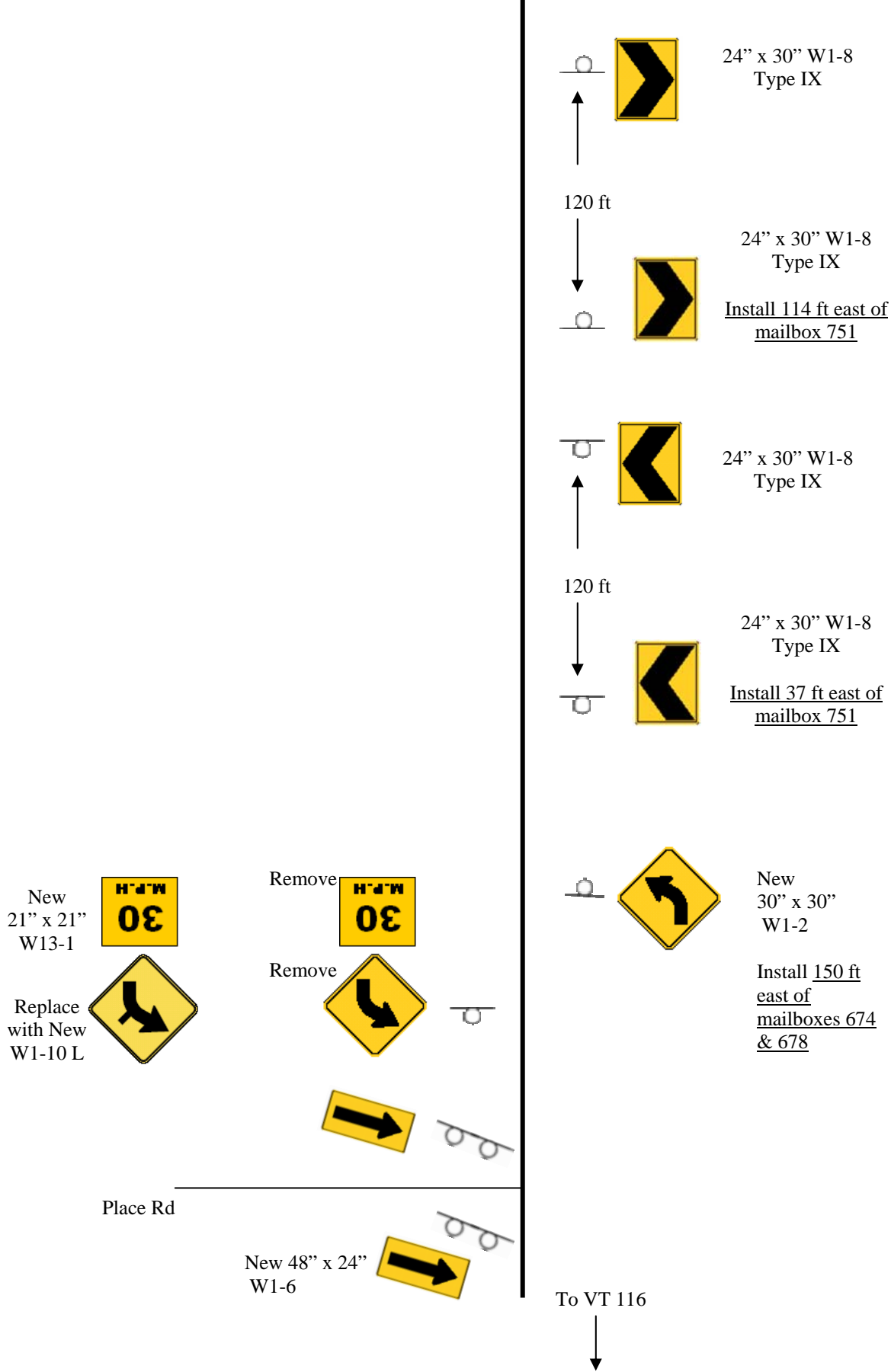
Issue	Possible Solution	Decision Agree/Reject	Planned Completion Date	Comments
	Paint the curb (all sides of the island) with reflective yellow paint			
	Delineate the island with a yellow edgeline on the one way slip ramp and with white edgelines the other two sides			
	Continue the double line centerline marking so that it follows the curve			
	Add a stop bar at the end of the island for SW motorists going onto Pond Brook Road			
Corner sight distance to the right on Aube Ridge is slightly obstructed	Immediate to Short Term: Promote a clear sight triangle as recommended by AASHTO. Anything within the triangle area such defined should be as much as possible removed			
Severe edge drop-offs could cause motorists to lose control	Review the locations where edge drop-offs exist			
	Pull up the shoulder area where applicable			
	Consider specifying a 30-35 degree angle in the contract specification of the next paving project			

Appendix A –Proposed Signage





To VT 116



Appendix B – Details of Signs

W 16-8 Pond Brook Rd Road Name Plaque

W1-1Md R Modified Turn Sign

W1-1Mb L Modified Turn Sign

21" x 21" W13-1 Advisory Speed Sign



W13-1 STD; 1.5" Radius, 0.6" Border, 0.4" Indent, Black on Yellow;
"35" E 80% spacing; "MPH" E 122% spacing;

Appendix C – Recessed Pavement Markings

Recessed Pavement Markings

Involved milling the pavement with specialized equipment and applying application of marking materials. Markings are more visible and last longer.



Source: AOT Materials and Research

General Information from VAOT 2006 Standard Specifications for Construction

646.09 OTHER RELATED MARKINGS.

(a) Pavement Marking Recess. Recessed pavement markings shall be installed as specified for permanent markings. The recess shall be a uniform depth across the width of the marking. The recess shall be controlled such that the depth provided is 125% of the marking material thickness. The recess shall be clean and dry at the time of marking placement.

From 646.07 Durable Pavement Markings, subsection 2.

(d) Polyurea Paint. Approved polyurea marking materials shall be one of the markings listed on the Approved Products List on file with the Agency's Materials and Research Section under Subsection 708.08(a). Glass beads shall be AASHTO M247 Type I incorporated at 30% mass of the combined material, unless otherwise specified.

Possible contractor

L & D Safety Markings from Berlin (800-698-6154).