Road Safety Audit Review

VT 100B and
Moretown Mountain Rd

Town of Moretown

February 6, 2009

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

VT 100B and Moretown Mountain Rd
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.

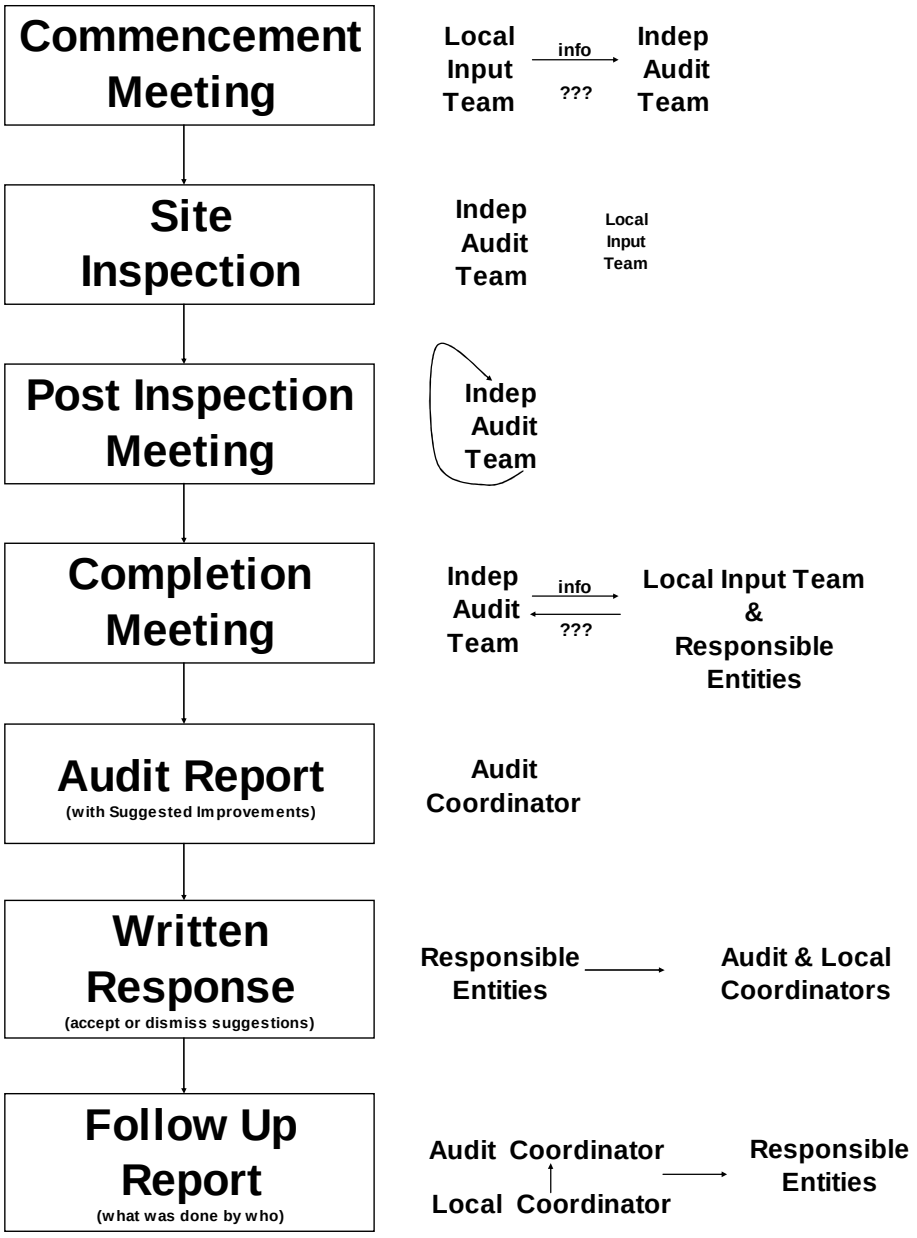
In addition to the Audit Team, a RSAR involves the following key players: Local Coordinator, Local Input Team and Responsible Entities.

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 intersection of VT 100b and Moretown Mountain Rd and its approaches in Moretown Village. This intersection is located at mile point 1.17 on VT 100b. This location is displayed on the aerial photograph shown in Handout A.

Purpose of the RSAR

This RSAR was conducted at the request of the Town of Moretown Selectboard pursuant to concerns from local citizens and the Moretown Planning Commission.

This RSAR was further conducted to satisfy the requirements of the Moretown Town Plan asking for the Town to work with the Agency of Transportation (VAOT) to explore opportunities for safety improvements at this intersection.

From the Moretown Planning Commission's point of view, the goal of the RSAR is not to solve the problem in its entirety, but to improve the safety of the intersection.

RSAR Team

The independent, multi-disciplined Road Safety Audit Review Team included the following individuals:

Jason Charest,	Chittenden County Metropolitan Planning Organization (CCMPO)
Mario Dupigny-Giroux,	Traffic Safety (VAOT)
Tom Anderson,	Operations, (VAOT)
Jon Kaplan,	Bike & Ped Program (VAOT)
Stewart Menard,	Roadway Design (VAOT)

RSAR Team Coordinator

The road safety audit review coordinator was:

Mario Dupigny-Giroux, Traffic Safety (VAOT)

Local Coordinator

The local coordinator was:

Steve Gladczuk, Central Valley Regional Planning Commission (CVRPC)

Local Input Team

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

Steve Sharp	Moretown Planning Commission
Stephanie Venema	Moretown Selectboard
Raz Washburn III	Moretown Selecboard

Information Reviewed in the Completion of the Audit Review

(1) 1998-2008 Crash Data
(2) January 5, 2009 Selectboard letter to VAOT plus attachments (CVRPC Speed Count for TH 38, Page 45 of the Town Plan, Planning Commission letter dated November 2008, Email from K. Sharpwolf, Speed Zone Ordinance Amendment)
(3) CVRPC Speed Count for VT 100b
(4) Turning Movement Report, VAOT, October 2007
(5) Speed Limit Certificate (2001)
(6) VAOT letter to Selectboard concerning school zone (June 12, 2006)
(7) May 8, 2006 Selectboard letter to DTA Englehardt (crosswalk and speed)
(8) VAOT work orders (#99-399, #03-349, Sept 30 1980)

Commencement Meeting

The commencement meeting was held at the Town of Moretown offices on February 6, 2009. Following introductions, Mario Dupigny-Giroux reviewed the key steps in the conduct of a RSAR and explained what was expected to be accomplished that day. After this overview, the audit team reviewed the following information presented at the commencement meeting by local members and VAOT staff.

Crash Data

VAOT generated the listed of the crashes reported to the Department of Motor Vehicles (DMV) between 1998 and 2008. For this period, six crashes were identified at this intersection. These crashes are listed in Table 1.

From this table, it can be seen that four of the six crashes had Failure to Yield the Right of Way or Disregarding Traffic Signs as a contributing circumstance. Furthermore, it can also be seen that, when the information was available, the crashes involved a northbound vehicle. In addition, all six crashes took place in good weather and five out of the six took place in February, March or April. With the exception of one crash that resulted in a non-incapacitating injury crash, all crashes resulted in property-damage-only crashes (PDO crashes).

Looking at the time of day, two crashes happened in the morning peak hour, and two others in the afternoon peak hour.

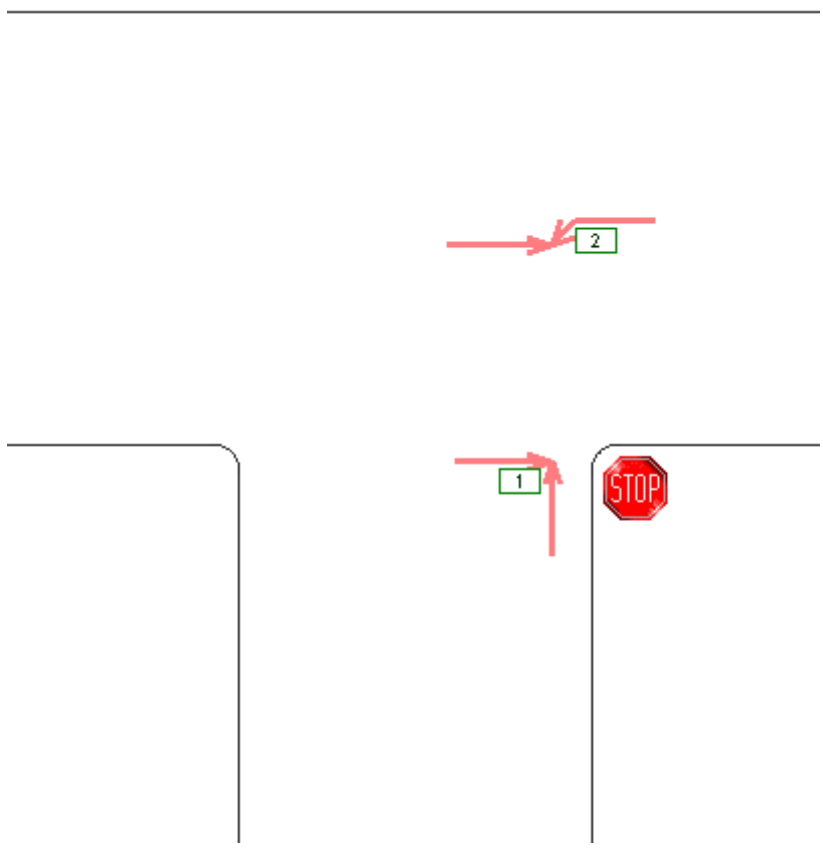
Table 1. 1999 to 2008 Crash Data (source VAOT)

Town	Mile Marker	Crash Date	Time	Weather	Contributing Circumstances	Direction Of Collision	Number of Injuries	Number of Fatalities	Crash Type	Direction
Moretown	1.17	4/5/1999	6:10	Cloudy	Failed to yield right of way		0	0	PDO	
Moretown	1.17	2/14/2000	15:55	Cloudy	Other improper action	Head On	2	0	Non-Incapacitating	
Moretown	1.17	3/4/2000	23:30	Clear	Wrong side or wrong way		0	0	PDO	N
Moretown	1.17	2/17/2002	17:08	Snow	Disregarded traffic signs, signals, road markings		0	0	PDO	N
Moretown	1.17	4/29/2005	11:00	Cloudy	No improper driving, Failed to yield right of way, Failure to keep in proper lane or running off road	Left Turn and Thru, Angle Broadside	0	0	PDO	N
Moretown	1.17	11/16/2006	7:38	Cloudy	No improper driving, Failed to yield right of way	No Turns, Thru moves only, Broadside	0	0	PDO	N

VAOT further prepared a partial collision diagram based on the available crash reports for the period 2003 to 2008. It is to be noted that the report for the 2008 October crash in which a woman ran off Moretown Mountain Rd was not available for review.

The two crashes illustrated on the collision diagram are both right angle crashes. In one, a motorist was making a left turn out of Moretown Mountain Rd and in the second crash, a motorist was trying to make a left turn onto Moretown Mountain Rd from the north. The motorist in the first crash said that he looked both ways. In the second case, the motorists said that there was a large tree in his view of the road and that it was hard to see approaching traffic.

Figure 2. Collision Diagram, 2003 – 2008 (for available reports)



Speed Data

On VT 100b, the 30 mph speed limit extends northerly from Town Highway 38 at mile point 0.39 to north of Town Highway 1 (Moretown Mountain Rd) at mile point 1.47. The speed limit is 35 mph on Moretown Mountain Rd.

The Town contracts with the Washington County Sherriff's Department to enforce speed on VT 100b and other town highways. Approximately $15,000 per year is budgeted for this purpose through out Moretown. Near Moretown Mountain Rd, the sheriff usually parks at the Town Garage.

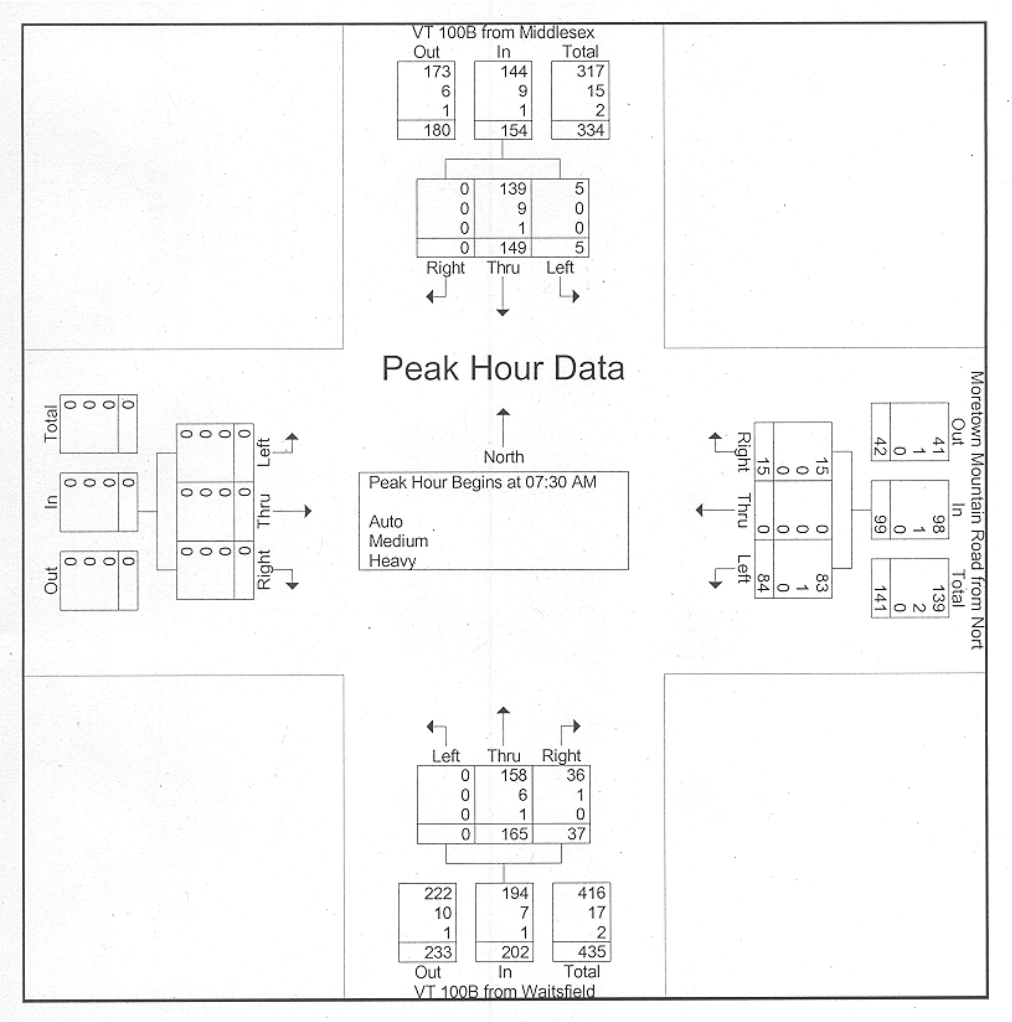
In September 2008, CVRPC conducted a speed study on VT 100b. The study site was located approximately 195 ft north of the north end of Hurdle Rd. Results show that, traveling northbound, the 85th percentile speed (the speed at which 85% of motorists are driving at or below) was 38 mph and that the 10-mile pace (the 10 mile range with the larger number of motorists) was between 26 and 35 mph.

CVRPC also conducted a speed study on Moretown Mountain Rd in October 2008. The study site was located approximately 280 ft east of the intersection of VT 100b. Results show that the 85th percentile speed was 30 mph and that the 10-mile pace was between 21 and 30 mph.

Traffic Data

A turning movement count was performed by Traffic Research (VAOT) in October 2007. The growth factor suggested to convert the count to 2009 numbers is 1.02. For the 12-hour counting period, slightly more than four hundred vehicles made a left turn out of Moretown Mountain Rd, compared to about eighty right turns. More than seventy vehicles would be making a left turn onto Moretown Mountain Rd from VT 100b. The main movements at this intersection are the north and south through movements with each having more than a thousand vehicles per day. The peak hour volumes for the morning peak hour are shown in Figure 3.

Figure 3. Morning Peak Hour Turning Count (source VAOT)



Sight Distance

Corner sight distance on the Moretown Mountain Road approach was measured for both directions along with the intersection sight distance for southbound left turning traffic from VT 100b.

In addition, sight distance to the intersection from the north and from the south was also measured. The measured values are compared to AASHTO requirements in Table 2 for speeds on VT 100b of 30 and 40 mph. From this table, it is clear that the available corner sight distance to the south and the available sight distance from the south are substandard. The intersection sight distance for the SB left turn movement is borderline with respect to a 30 mph, on-coming traffic speed and is below expected values for a speed of 40 mph.

Table 2. Corner and Intersection Sight Distances

Type	Actual	AASHTO 30 mph	AASHTO 40 mph
Corner Sight Distance to the South	**273 ft**	335 ft	445 ft
Corner Sight Distance to the North	615 ft	335 ft	445 ft
VT100B SB Left Turn	**250 ft**	245 ft	325 ft
Sight Distance from VT 100b South	**85 ft**	200 ft	305
Sight Distance from VT 100b North	444 ft	200 ft	305 ft

Figure 4. SB Left Turn Intersection Sight Distance

Figure 5. SB Corner Intersection Sight Distance

Figure 6. NB Corner Intersection Sight Distance

Pedestrian and Bicyclist Issues

The Safe Routes to School Team reported that this intersection presented a barrier to students walking to school from the Lower Village and a concern for students bicycling to school from the roads on the hill above Moretown Mountain Rd.

The Safe Routes to School Team further reported that children were walking along the east side of VT 100b (the Moretown Mountain Rd side), due to the potential pinch point along the guardrail, and that some children were also bicycling to school along VT100b and coming down the Moretown Mountain Road.

The Safe Routes to School Team indicated that bicyclist issues concerning parents were the traffic concerns at the intersection and the steep grade on Moretown Mountain Rd.

A 1996 Conceptual Sidewalk Alignment study reported that the existing pedestrian facilities were either non existent or had not been maintained properly over the years, resulting in pedestrian - vehicle conflicts. North of the intersection with Moretown Mountain Rd, the study proposed a sidewalk on the west side of VT 100b.

In the fall of 2000, the Moretown Selectboard requested VAOT to consider the installation of crosswalks in the vicinity of the intersection. This request was not approved based on the lack of adequate sight distance.

Moretown is participating in the VAOT-administered Safe Routes to School program and is developing a School Travel Plan as part of this participation. One of the improvements they have included in the draft School Travel Plan is the installation of a radar speed feedback sign for Route 100b headed south into the village.

Other Issues

An overlay was applied on Moretown Mountain Rd approximately two years ago. The Town reports that the road started to rut already.

VT 100b has a right-of-way of 3 rods or 49.5 ft with the road being 24 ft wide including 2 ft shoulders.

It was found, in VAOT's records (as far back as in 1980), that the curve near the intersection was once delineated by large arrows. The large arrows were replaced by 18"x 24" chevrons in the spring of 2000.

Field Inspection

Following the commencement meeting, the audit team, with members of the community, performed the site review. After the site inspection, the audit team met to discuss their observations and to draft solutions.

Potential Safety Concerns

This section lists the areas of safety concern identified by the audit team during the field visit and from their analysis of available data along with potential remedial actions. The concerns are not listed in order of importance. These safety concerns are also summarized on the observation table shown at the end of this section. The observation table lists the entities most likely to be responsible for making the improvements.

Problem #1

Poor sight distance to the intersection when traveling northbound

Immediate Actions

Install a modified turn sign with a side road along with a supplementary road name plaque underneath

Work with the owner of the General Store concerning snow removal (seasonal)

Short Term to Mid Term Actions

Work with the owners to remove the two large trees. At a minimum, remove the smaller of the two (the one with the "umbrella"). Ideally, both should be removed

Mid Term Actions

Once the two trees are removed, re-grade the front yard

Once the two trees are removed, replace the street name sign for Moretown Mtn Rd with a new white on green, back-to-back retroreflective sign to improve the detection of the intersection

<u>Problem #2</u>

Marginal corner sight distance to the left when stopped on Moretown Mountain Rd

Concept

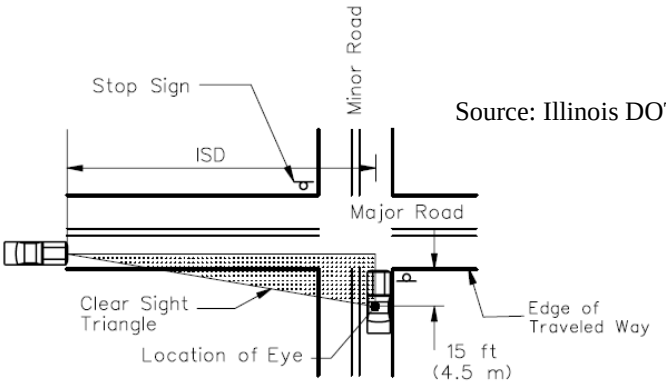
Clear sight triangle concept (AASHTO)

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", Intersection Sight Distance, is 445 ft

For an estimated traveling speed of 30 mph, "ISD", Intersection Sight Distance, is 335 ft

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



Source: Illinois DOT

Immediate Actions

Work with the owner of the General Store concerning snow removal away from the sight triangle (seasonal)

On Moretown Mountain Rd, relocate and replace the stop sign closer to VT 100b

On Moretown Mountain Rd, install (and maintain) a 24-inch wide stop bar at the location that maximizes visibility to the south

On Moretown Mountain Rd, consider the possibility of adding a double yellow centerline arranged in a way to encourage motorists to “T up” and layout the stop bar appropriately

Short Term to Long Term Actions

Promote a clear sight triangle as recommended by AASHTO (by removing/relocating obstructions such as the two trees and the porch of the house)

Problem #3

The sight distance available for making a southbound left turn is more or less adequate depending on the speed of oncoming traffic

Immediate Actions

Install northbound, a modified turn sign with a side road along with a supplementary road name plaque underneath as proposed under problem #1

Short Term Actions

Work with the owners to remove the two large trees on the southeast corner

Problem #4

Right turns off of Moretown Mountain Rd are very difficult to make by motorists due to the geometry

Immediate Actions

Consider prohibiting right turns for motorists using a static sign (bicyclists could be exempted since they can more easily maneuver around tight radii)

Short Term to Mid Term Actions

Increase the radius on the northeast corner

Mid Term to Long Term Actions

Install a right turn slip lane further up Moretown Mountain Rd

Problem #5

Steep embankment on the north side of Moretown Mountain Rd with a history of running-off-the road incidents

Immediate Actions

Install 6” x 8” white delineators on the north side of Moretown Mountain Rd spaced at 55 ft apart (Handout D)

Short Term to Mid Term Actions

Install guardrail stopping before the intersection so as not to have snow accumulate at the corner and hinder visibility (ensure that motorists will not be redirected into the utility pole at the end of the road)

Problem #6

Severe frost heave where Moretown Mountain Rd meets with VT 100b

Short Term to Mid Term Actions

Replace the road base for a short distance up Moretown Mountain Rd to eliminate the frost heave issue

Problem #7

Higher than desired northbound travel speeds for the surroundings and the geometry of the road

Immediate Actions

Replace the existing chevrons with 24” x 30” chevrons using Type IX sheeting in hope to slow down drivers as they approach the curve

Short Term Actions

Continue regular speed enforcement (focusing on northbound motorists south of the intersection) and possibly follow the approach suggested in the Vermont Strategic Highway Safety Plan (Handout B)

Possibly supplement enforcement with the utilization of an activated speed limit sign (Handout C)

Problem #8

Pedestrians and bicyclists residing in the lower end of the village must walk/bike in the roadway that has little or no shoulder. In addition, a dip in along VT 100b just north of Moretown Mountain Rd makes it difficult for NB drivers to see pedestrians from the lower village. School children are mostly affected

Immediate Actions

Complete and implement the school travel plan (consideration should be given to pedestrian/bicyclist infrastructures)

Short Term Actions

Try to work with property owners to identify an off-road route that could be used by kids walking to school

Long Term Actions

Could pedestrian/bicyclist infrastructures be provided as part of a future upgrade to VT 100b? Could this be done through another type of grant?

Problem #9

The location of the guidance information (Northfield 9 >, Moretown Com Rd >) provided to motorists is located at the intersection and does not give enough time to motorists to respond (especially NB with the large tree obstruction)

Nighttime visibility of the signs is questionable

Immediate Actions

Determine if the Moretown Com Rd > sign is necessary

If this directional sign is necessary, replace with a white on green retroreflective sign. As per statutes, the area of this sign cannot be more than one square foot in surface area.

Remove the Northfield 9 > sign and replace with a white on green retroreflective sign at the proper locations, in both directions on VT 100b

Road Safety Audit Review Observations

Instructions

The next section of the RSAR Report contains a table that displays observations and guidance by responsible entities. 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 column titled “strategy” as a possible remedial solution. Each responsible entity is to fill out the last three columns for the strategies that have an X under their name.

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 the RSAR 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 by each entity to the audit coordinator as soon as possible.

Written Response For (Write name of Organization):

Observation	CVRPC	Town of Moretown	Safe Routes to School Group	AOT District	AOT Traffic Design	Strategy	Decision Agree/Reject	Planned Completion Date	Comments
Problem #1 Poor sight distance to the intersection when traveling northbound					X	**Immediate Actions** Install a modified turn sign with a side road along with a supplementary road name plaque underneath			
		X				Work with the owner of the General Store concerning snow removal			
		X				**Short to Mid Term Actions** Work with the owners to remove the two large trees. At a minimum, remove the smaller of the two (the one with the "umbrella"). Ideally, both should be removed			
		X				**Mid Term Actions** Once the two trees are removed, re-grade the front yard			

Written Response For (Write name of Organization):

Observation	CVRPC	Town of Moretown	Safe Routes to School Group	AOT District	AOT Traffic Design	Strategy	Decision Agree/Reject	Planned Completion Date	Comments
		X				Once the two trees are removed, replace the street name sign for Moretown Mtn Rd with a new white on green, back-to-back retroreflective sign to improve the detection of the intersection			
Problem #2 Marginal corner sight distance to the left when stopped on Moretown Mtn Rd		X				**Immediate Actions** Work with the owner of the General Store concerning snow removal away from the sight triangle			
					X	Relocate and replace the stop sign closer to VT 100b (on Moretown Mountain Rd)			
		X				On Moretown Mountain Rd, install (and maintain) a 24 ft wide stop bar at the location that maximizes visibility to the south			
		X				On Moretown Mountain Rd, consider the possibility of adding a double yellow centerline arranged in a way to encourage motorists to "T up" and layout the stop bar appropriately			

Written Response For (Write name of Organization):

Observation	CVRPC	Town of Moretown	Safe Routes to School Group	AOT District	AOT Traffic Design	Strategy	Decision Agree/Reject	Planned Completion Date	Comments
		X				**Short to Long Term Actions** Promote a clear sight triangle as recommended by AASHTO (by removing/relocating obstructions such as the two trees and the porch of the house)			
Problem #3 The sight distance available for making a southbound left turn is more or less adequate depending on the speed of oncoming traffic					X	**Immediate Actions** Install NB, a modified turn sign with a side road along with a supplementary road name plaque underneath			
		X				**Short Term Actions** Work with the owners to remove the two large trees on the southeast corner			
Problem #4 Right turns off of Moretown Mountain Rd are very difficult to make by motorists due to the geometry		X				**Immediate Actions** Consider prohibiting right turns for motorists using a static sign. Could exempt bicyclists using a plaque			
		X				**Short to Mid Term Actions** Increase the radius on the northeast corner			

Written Response For (Write name of Organization):

Observation	CVRPC	Town of Moretown	Safe Routes to School Group	AOT District	AOT Traffic Design	Strategy	Decision Agree/Reject	Planned Completion Date	Comments
						Mid to Long Term Actions Install a right turn slip lane further up Moretown Mountain Rd			
Problem #5 Steep embankment on the north side of Moretown Mountain Rd with a history of running-off-the road incidents		X				**Immediate Actions** Install 6” x 8” white delineators on the north side of Moretown Mountain Rd spaced at 55 ft apart			
		X				**Short to Mid Term Actions** Install guardrail stopping before the intersection so as not to have snow accumulate at the corner and hinder visibility (ensure that motorists will not be redirected into the utility pole at the end of the road)			
Problem #6 Severe frost heave where Moretown Mountain Rd meets with VT 100b		X				**Short to Mid Term Actions** Replace the road base for a short distance up Moretown Mountain Rd to eliminate the frost heave issue			
Problem #7 Higher than desired northbound travel speeds					X	**Immediate Actions** Replace the existing chevrons with 24” x 30” chevrons using Type IX sheeting in hope to slow			

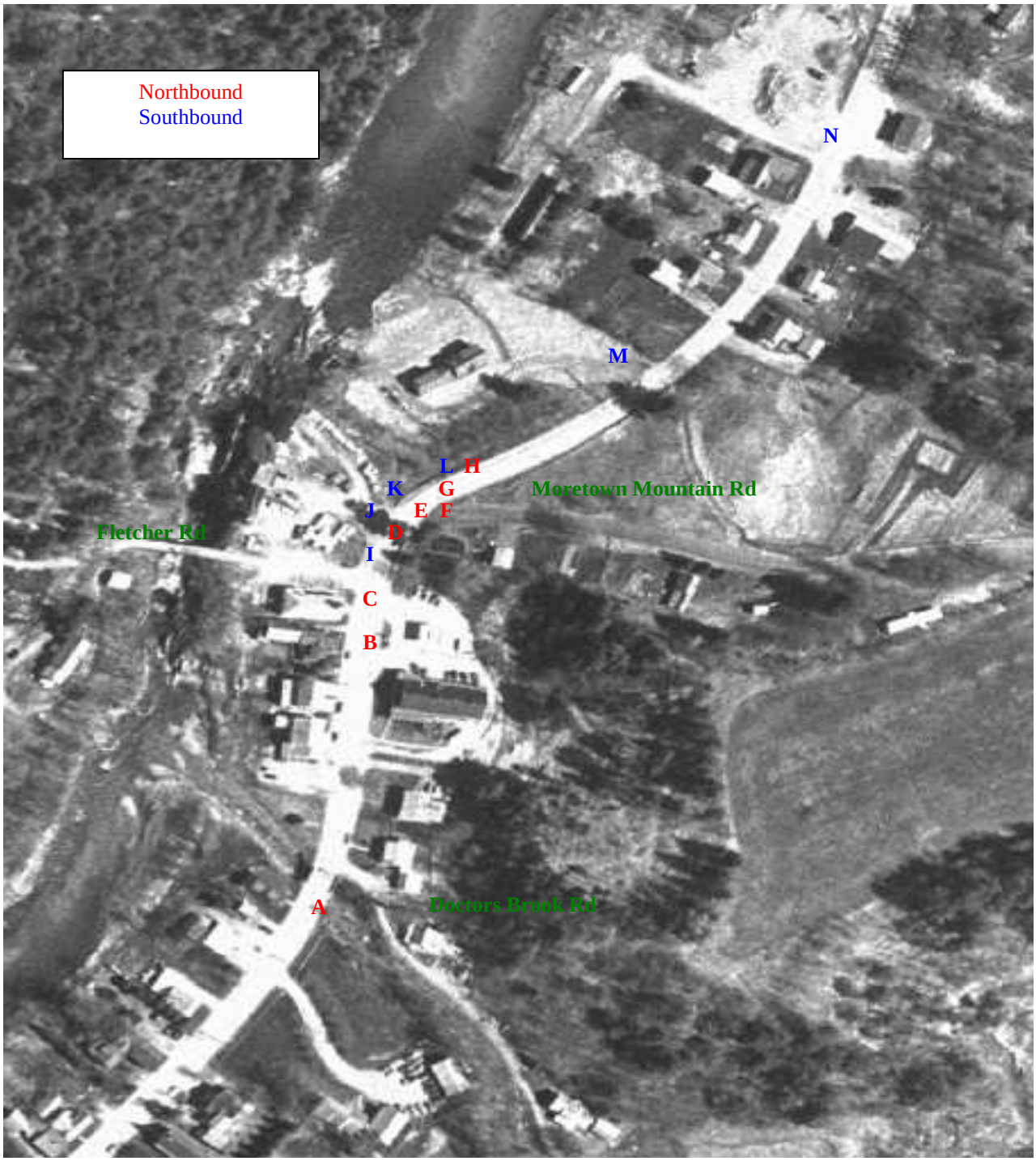
Written Response For (Write name of Organization):

Observation	CVRPC	Town of Moretown	Safe Routes to School Group	AOT District	AOT Traffic Design	Strategy	Decision Agree/Reject	Planned Completion Date	Comments
for the surroundings and the geometry of the road						down drivers as they approach the curve			
		X				**Short Term Actions** Continue regular speed enforcement and possibly follow the approach suggested in the Vermont Strategic Highway Safety Plan			
		X				Possibly supplement enforcement with the utilization of an activated speed limit sign			
Problem #8 Pedestrians residing in the lower end of the village must walk in the roadway that has little or no shoulder. School children are mostly affected			X			**Immediate Actions** Complete and implement the school travel plan (consideration should be given to pedestrian/bicyclist infrastructures)			
		X	X			**Short Term Actions** Try to work with property owners to identify an off-road route that could be used by kids walking to school			

Written Response For (Write name of Organization):

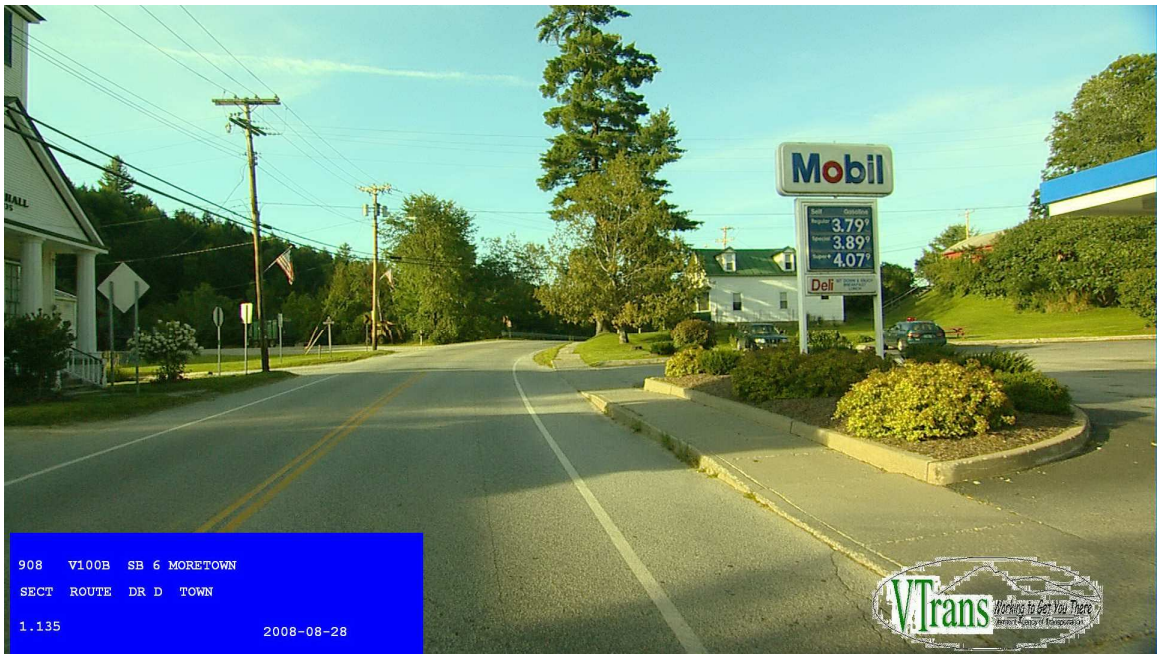
Observation	CVRPC	Town of Moretown	Safe Routes to School Group	AOT District	AOT Traffic Design	Strategy	Decision Agree/Reject	Planned Completion Date	Comments
	X	X	X			Update the conceptual sidewalk alignment study			
	X	X				**Long Term Actions** Pedestrian/Bicyclists infrastructures?			
Problem #9 The location of the guidance information (Northfield 9 >, Moretown Com Rd >) provided to motorists is located at the intersection and does not give enough time to motorists to respond (especially NB with the large tree obstruction) Nighttime visibility of the signs is questionable		X				**Immediate Actions** Determine if the Moretown Com Rd > sign is necessary If this directional sign is necessary, replace with a white on green retroreflective sign. As per statutes, the area of this sign cannot be more than one square foot in surface area.			
		X			X	Town to remove the Northfield 9 > sign VAOT to replace the sign with a white on green retroreflective sign at the proper locations, in both directions on VT 100b			

Handout A (Area Map)


Northbound
Southbound
N
M
L H
K
G
Moretown Mountain Rd
J
E F
Fletcher Rd
D
I
C
B
A
Doctors Brook Rd

908 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.060
2008-08-28
20
VTrans

View A


Mobil
3.79
3.89
4.07
Deli
908 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.135
2008-08-28
VTrans

View B

908 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.150
2008-08-28
VTrans
Working to Get You There

View C

908 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.165
2008-08-28
VTrans
Working to Get You There

View D

908 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.170
2008-08-28
VTrans
Working to Get You There

View E

908 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.175
2008-08-28
VTrans
Working to Get You There

View F

908 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.185
2008-08-28
VTrans

View G

SPEED
LIMIT
30
908 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.210
2008-08-28
VTrans

View H

911 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.140
2008-08-28
VTrans
Working to Get You There

View I

911 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.155
2008-08-28
VTrans
Working to Get You There

View J

911 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.165
2008-08-28
VTrans

View K

911 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.180
2008-08-28
VTrans

View L

911 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.225
2008-08-28
20
MPH
VTrans

View M

911 V100B SB 6 MORETOWN
SECT ROUTE DR D TOWN
1.320
2008-08-28
20
MPH
VTrans

View N

Handout B (Strategic Highway Safety Plan – Speed Enforcement)

CEA6	Curbing Speeding and Aggressive Driving
Strategy 3	Convince the public that apprehension is likely
Sub-Strategy 1	Conduct High-Visibility Enforcement
Targets	Drivers that are crash-producing speeders/aggressive
Description	High-visibility enforcement efforts that strategically address speeders, locations, and conditions most common in speed-related crashes that cause injury or death within a specific geographic area
Actions	**Step 1:** Review crash data for a given geographic area to identify road segments and intersections that have been sites of speed-related injury and fatal crashes (up to a mile in length). **Step 2:** The law enforcement function group selects at least four enforcement zones, and establishes a law enforcement officer project manager for each zone **Step 3:** Determine the 85th percentile speed for each zone **Step 4:** Conduct a speed management workshop in targeted areas **Step 5:** Establish an enforcement threshold for each zone to consistently target the occasional violator and high-risk driver, i.e., enforce 5 mph above the 85th percentile speed. **Step 6:** Create public information and education materials for each zone, including a media outreach plan **Step 7:** Publicize the enforcement efforts to the maximum extent **Step 8:** Deploy to the selected sites during the days and hours and time of year of greatest crash risk (at least 30 hours per month per zone to maximize the achievement of measurable results based on studies). NHTSA recommendation **Step 9:** Report results monthly to media **Step 10:** Sustain the enforcement for at least 3 months per zone for 30 hours, followed the next three months for 10 hours, and address as needed subsequently
Time Frame	Step 1: Within 3 months of report; Step 2: Upon completion of crash data report; Step 3: Upon selection of the zones; Step 4: Upon completion of Step 3; Step 5: Upon selection of the enforcement team; Step 6: Upon completion of Step 5; Step 7: Just prior to start of enforcement; Step 8: As decided based on crash data; Steps 9 and 10: as needed
Output	The number of enforcement zones enforced The number of enforcement hours The number of tickets/citations issued The number of crashes related to enforcement criteria Speed measurements
Data Needed	Speed/aggressive driving injury/fatal crash data by date/month/time for at least three years (see Windsor County data) Crash maps Number of enforcement hours by zone Number of tickets issued 85th percentile speed before and after
Data Collection	Analysis of crash data 85th percentile speeds: RPCs, Towns, VTRANS Number of enforcement hours/tickets: Law Enforcement Officer's/Supervisor's activity sheets
Performance Measure	Reduction in the number of high speeders (site specific) Overall reduction in the number of speed related crashes
Funding	Reallocation of priorities, 402 funds

Handout C (Example of an Activated Speed Limit Sign)

DORMAN VARITEXT

Posted Speed Limit - VATCS

SOLAR or AC POWERED

ADVISORY CATEGORY OF SIGN FOR **EDUCATION** OF DRIVER TOWARDS IMPROVED POSTED SPEED LIMIT ADHERANCE

VAMP TIMER **AUTO ADJUST FOR DAYLIGHT SAVINGS**

PIXELATED LED DISPLAY COMPLIANT AND INCLUDING MOST **MUTCD SIGN DIAGRAMS.**

BLUETOOTH WIRELESS DATA-LOGGING SPEED ANALYSIS

FCC COMPLIANT SI-3 INTEGRATED RADAR TECHNOLOGY

ALUMINIUM LIGHTWEIGHT ROBUST ENCLOSURES

MODULAR DESIGN FOR EASY INSTALL, SET UP/SERVICE

HIGH INTENSITY LED DISPLAY **VISIBLE IN ALL AMBIENT LIGHT CONDITIONS** WITH AUTO LUMINOSITY CONTROL

SIGN DESIGN SPECIFICATION (Generic)

Model Ref.	VATCS/*Sign Ref, Speed/SD slow down/L lanterns/ DL data logging*
Display Technology	High intensity LED. Auto luminosity control to suit ambient light conditions.
Display format	24" R2-1/ (60 x 75cm)RB-1 MUTCD diagrams available as standard. Visible at 480'. Display colours are inverted from the MUTCD regulatory sign diagrams . 5" 125mm beacons are located in each corner , flashing in horizontal pairs to attract drivers attention.
Vehicle Detection	FCC compliant K Band SI-3 technology , configurable trigger speeds between 5MPH/8KPH to 120MPH/192KPH, 12° beam with adjustable range from 350 to 1200 feet. Standard 600'.

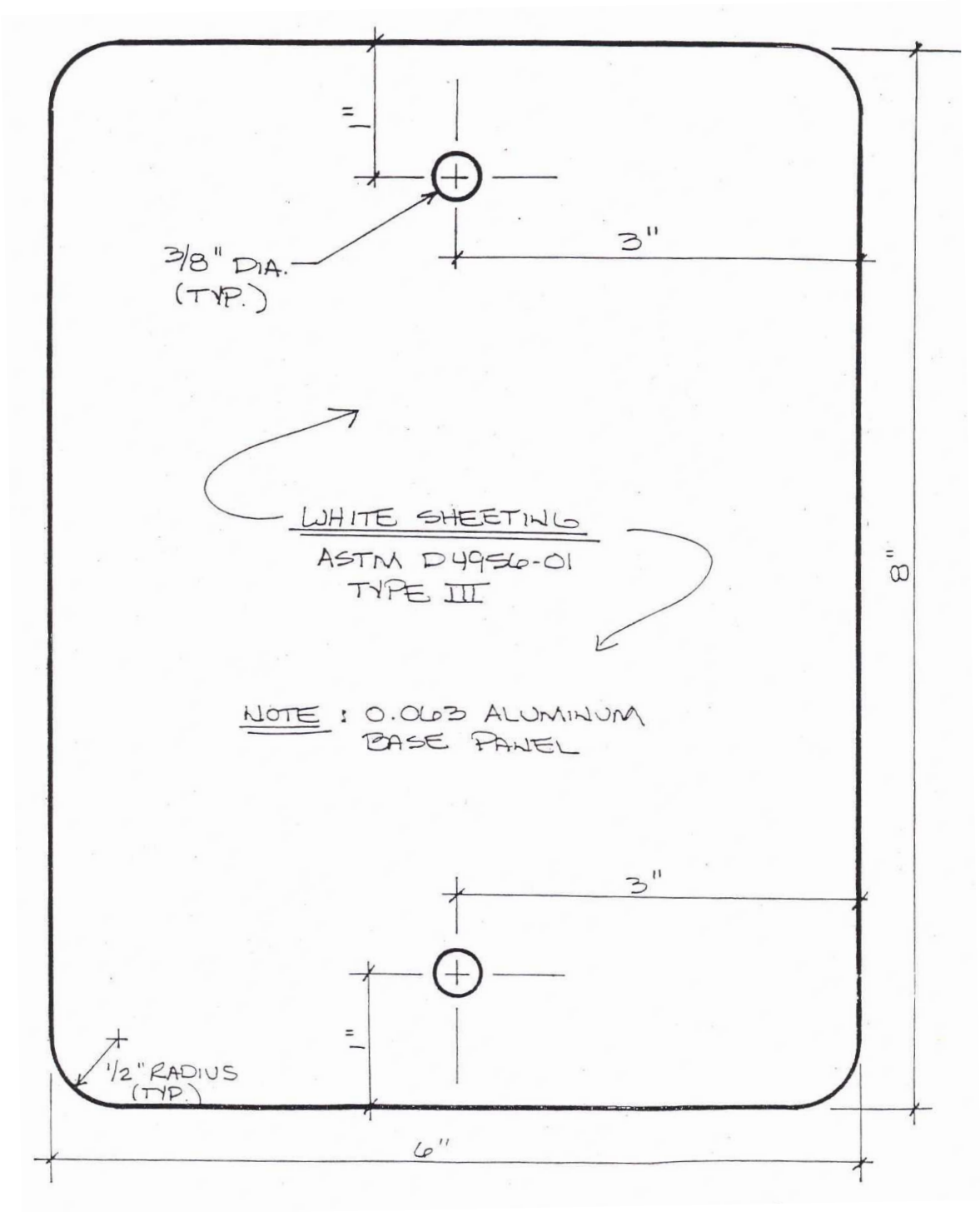
	Model No.	*Approx Dimensions Inches/mm*		
		Height	*Width*	*Depth*
Models	VATCS/R2-1,XX/SD/L/DL (US) (24")	59/1510	34/875	4/90
	VATCS/RB-1,XX/SD/L/DL (CAN) (60 x 75)	59/1510	34/875	4/90
	Smaller scaled down versions and larger size formats of sign are available on request. Dual speed versions available for rotating between speed zones and other hazard specific warning signs in accordance with MUTCD with or without slow down and lanterns. Posted speed and size to be quoted when ordering.			
Weight	45Kg 90lbs			

173 Main Street • Bath • Ontario • K0H 1G0 • Canada

613 352 3458 enquiry@dormanvaritext.com www.dormanvaritext.com

Handout D – Sign Details

6” x 8” Type III White Delineators



Handout E (FHWA Pedestrian Road Safety Audit Prompt Lists)

Master Prompt List

RSA Matrix

Universal Considerations (For Entire RSA Site)
I. Needs of Pedestrians: Do pedestrian facilities address the needs of all pedestrians?
II. Connectivity and Convenience of Pedestrian Facilities Are safe, continuous, and convenient paths provided along pedestrian routes throughout the study area?
III. Traffic: Are design, posted, and operating traffic speeds compati with pedestrian safety
IV. Behavior: Do pedestrians or motorists regularly misuse or ignore pedestrian facilities?
V. Construction: Have the effects of construction on all pedestrians been addressed adequately?
VI. School Presence: Is the safety of children in school zones adequately considered?

No

Posted Yes

Topic	Subtopic	RSA Zones			
		A. Streets	B. Street Crossings	C. Parking Areas/Adjacent Developments	D. Transit Areas
Pedestrian Facilities	1. Presence, Design, and Placement	Sidewalks, paths, ramps, and buffers	Crossing treatments, intersections	Sidewalks and paths	Seating, shelter, waiting/ loading/unloading areas
	2. Quality, Condition, and Obstructions	Sidewalks, paths, ramps, and buffers	Crossing treatments (see prompts in A)	Sidewalks and paths (see prompts in A)	Seating, shelter, waiting/ loading/unloading areas (see prompts in A)
	3. Continuity and Connectivity	Continuity/ Connectivity with other streets and crossings	Continuity/connectivity of crossing to ped network; channelization of peds to appropriate crossing points	Continuity/connectivity of pedestrian facilities through parking lots/ adjacent developments	Connectivity of ped network to transit stops
	4. Lighting	Pedestrian level lighting along the street	Lighting of crossing	Pedestrian level lighting in parking lots/adjacent developments (see prompts in A and B)	Lighting at and near transit stop
	5. Visibility	Visibility of all road users	Visibility of crossing/ waiting pedestrians and oncoming traffic	Visibility of pedestrians and backing/turning vehicles; visibility of pedestrian path	Visibility of pedestrians/ waiting passengers and vehicles/buses
Traffic	6. Access Management	Driveway placement and design along streets	Driveway placement next to intersections	Driveway placement and use in relation to pedestrian paths	n/a*
	7. Traffic Characteristics	Volume and speed of adjacent traffic, conflicting conditions	Volume and speed of traffic approaching crossing, conflicting movements	Traffic volume and speed in parking lots and developments, conflicting conditions	Volume and speed of adjacent traffic and traffic at crossings to bus stops, conflicting conditions
Traffic Control Devices	8. Signs and Pavement Markings	Use and condition of signs, pavement markings, and route indicators	Use and condition of signs, pavement markings, and crossing indicators	Use and condition of signs, pavement markings for travel path and crossing points	Use and condition of transit-related signs and pavement markings
	9. Signals	n/a*	Presence, condition, timing, and phasing of signals	n/a*	See prompts in B

A. Streets

Master Prompt	Detailed Prompt		RSA Stages			
			planning	design	construction	post-construction
A.1 Presence, Design, and Placement	A.1.1	Are sidewalks provided along the street?	Not to from the north			
	A.1.2	If no sidewalk is present, is there a walkable shoulder (e.g. wide enough to accommodate cyclists/pedestrians) on the road or other pathway/trail nearby?	Not to from the north			
	A.1.3	Are shoulders/sidewalks provided on both sides of bridges?	✔	✔	✔	✔
	A.1.4	Is the sidewalk width adequate for pedestrian volumes?	✔	✔	✔	✔
	A.1.5	Is there adequate separation distance between vehicular traffic and pedestrians?	Not to from the north			
	A.1.6	Are sidewalk/street boundaries discernable to people with visual impairments?		✔	✔	✔
	A.1.7	Are ramps provided as an alternative to stairs?	✔	✔	✔	✔
A.2 Quality, Conditions, and Obstructions	A.2.1	Will snow storage disrupt pedestrian access or visibility?	Being plowed on SE corner			
	A.2.2	Is the path clear from both temporary and permanent obstructions?	✔	✔	✔	✔
	A.2.3	Is the walking surface too steep?	✔	✔	✔	✔
	A.2.4	Is the walking surface adequate and well-maintained?		✔	✔	✔
A.3 Continuity and Connectivity	A.3.1	Are sidewalks/walkable shoulders continuous and on both sides of the street?	NB, stopped at Mtn Rd			
	A.3.2	Are measures needed to direct pedestrians to safe crossing points and pedestrian access ways?	Yes, many places have poor sight distance			
A.4 Lighting	A.4.1	Is the sidewalk adequately lit?	✔	✔	✔	✔
	A.4.2	Does street lighting improve pedestrian visibility at night?	✔	✔	✔	✔
A.5 Visibility	A.5.1	Is the visibility of pedestrians walking along the sidewalk/ shoulder adequate?	Blind vertical curve			
A.6 Driveways	A.6.1	Are the conditions at driveways intersecting sidewalks endangering pedestrians?		✔	✔	✔
	A.6.2	Does the number of driveways make the route undesirable for pedestrian travel?	✔	✔	✔	✔