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RESOURCE SYSTEMS GROUP, INC.

Old Hollow Road Traffic Calming Study

Town of Ferrisburgh, Vermont

September 27, 2013

Submitted by
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Prepared for:

Addison County
REGIONAL PLANNING COMMISSION

The Town of Ferrisburgh, VT

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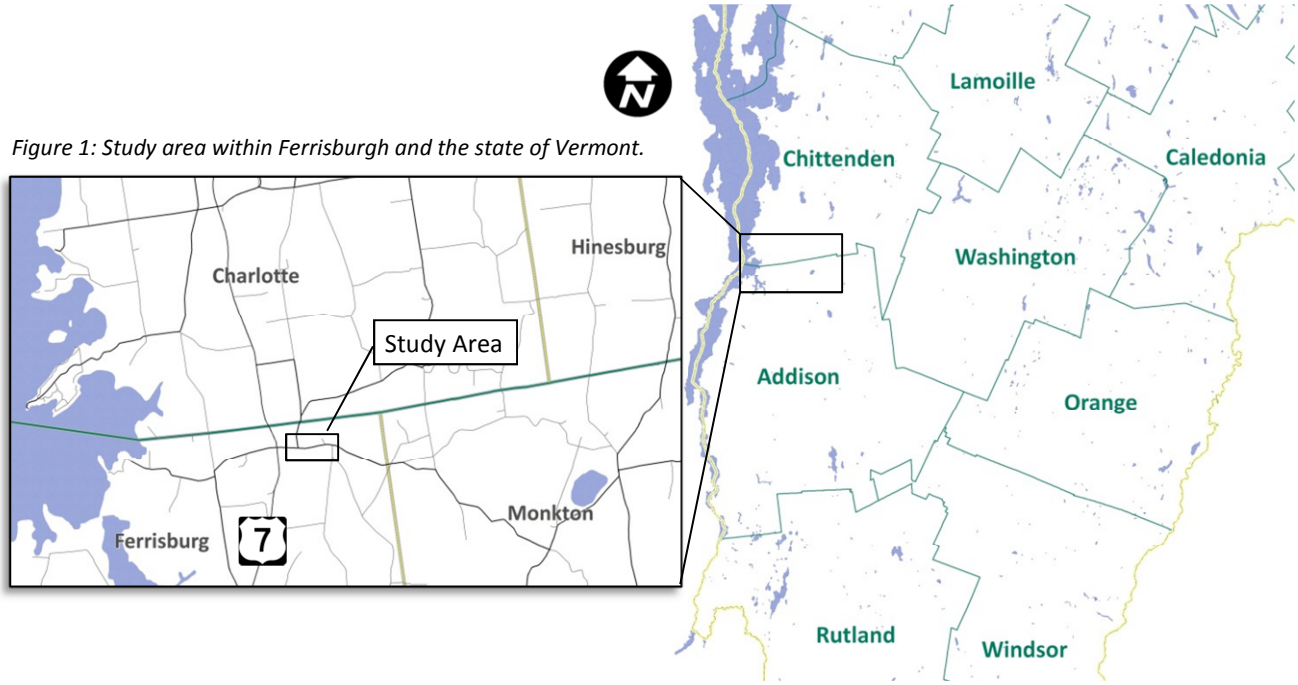
1.0 INTRODUCTION

The Old Hollow Road Traffic Calming Feasibility Study was commissioned by the Transportation Advisory Committee (TAC) of the Addison County Regional Planning Commission (ACRPC) and the Town of Ferrisburgh, Vermont to identify and evaluate appropriate traffic calming treatments in the neighborhood along Old Hollow Road. The project area within the State of Vermont is shown in Figure 1.

Figure 1: Study area within Ferrisburgh and the state of Vermont.



This feasibility study includes the following items:

- The project description and study scope;
- An introduction to common traffic calming measures;
- An evaluation of the Old Hollow Road neighborhood, including applicable traffic calming measures; and
- Recommendations and conclusions.

This study relies upon design guidance and analysis procedures documented by the Institute of Traffic Engineers (ITE) Traffic Calming Library[1] and *Traffic Calming: State of the Practice*,[2] the *Manual on Uniform Traffic Control Devices* (MUTCD),[3] National Cooperative Highway Research Program (NCHRP) Report 737 *Design Guidance for High-Speed to Low-Speed Transitions Zones for Rural Highways*,[4] and Federal Highway Administration (FHWA) *Traffic Calming on Main Roads Through Rural Communities*.[5]

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[1] ITE Traffic Calming Library: http://www.ite.org/traffic/

[2] ITE Traffic Calming State of the Practice, 1999. http://www.ite.org/traffic/tcstate.asp

[3] American Traffic Safety Services Association (ATSSA), ITE, and AASHTO, *Manual on Uniform Traffic Control Devices*, 2009 Edition (Washington DC: FHWA, 2009).

[4] NCHRP Report 737 - Design Guidance for High-Speed to Low-Speed Transitions Zones for Rural Highways :http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_737.pdf

[5] FHWA Traffic Calming on Main Roads Through Rural Communities: http://www.fhwa.dot.gov/publications/research/safety/08067/08067.pdf

1.1 Introduction to Traffic Calming

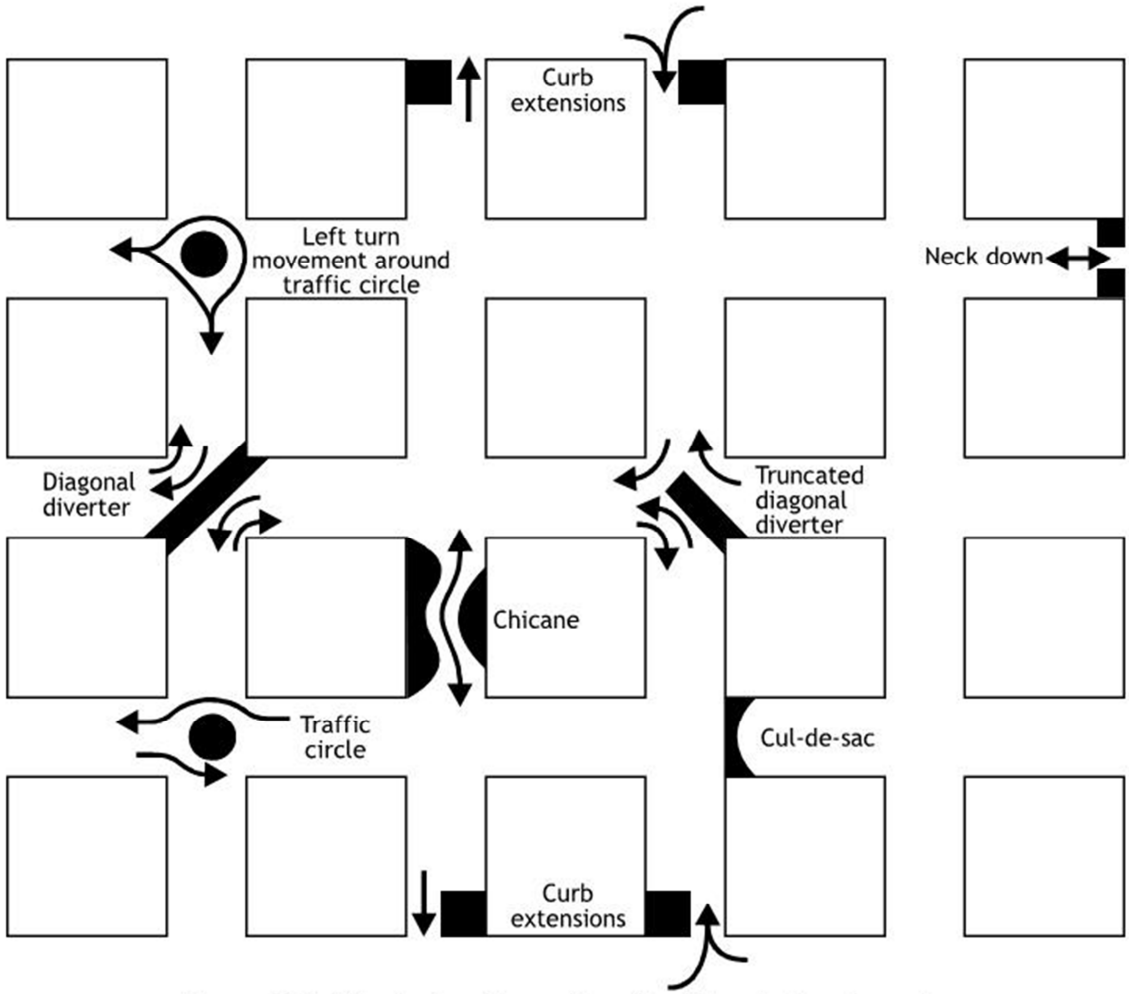
The ITE Traffic Calming State of the Practice guideline defines traffic calming as "the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for nonmotorized street users."

In general, education programs, increased enforcement, and regulatory devices such as stop signs and speed limits are not considered as traffic calming measures. Regulatory devices are placed based on warrant analysis and engineering procedures documented in the MUTCD and other guiding documents. While not considered in this report for traffic calming, stop signs and a reduced speed limit may be warranted pending further evaluation. Additional discussion on setting speed limits can be found in Attachment C.

Traffic calming devices can generally be grouped into three categories: horizontal deflection, vertical deflection, and visual cues.

Horizontal deflection involves a change in the horizontal alignment in the roadway that forces the driver to adjust their direction and speed to safely navigate. Typically, horizontal deflections require the use of curbs, bollards, or other non-traversable barriers to force the driver to comply and accomplish the traffic calming effects. Typical horizontal deflection traffic calming techniques are illustrated in Figure 2.

Figure 2: Typical horizontal deflection traffic calming techniques (FHWA University Course on Bicycle and Pedestrian Transportation, Lesson 20: Traffic Calming).



Vertical deflection devices are traffic calming measures placed above the surface of the pavement, intended to be traversed by vehicles, resulting in a change in the roadway profile. Typical vertical deflection includes speed bumps, humps, and tables, rumble strips, raised crosswalks, and raised intersections.

Visual cues are traffic calming measures that affect the driver's interpretation of the environment. Visual cues may be communicated through active feedback, such as a LED speed feedback sign, or through passive experiences that modify the driver's perception of the roadway through signs, striping, gateways, and streetscaping enhancements that increase the *perceived risk* without increasing the *actual risk*.

As with any change in roadway geometry or the roadside environment, the application of traffic calming measures needs to be designed with sensitivity to the context of the neighborhood and applied judiciously with input from local and regional stakeholders. The design decisions related to traffic calming may impact many stakeholders' daily lives, economic well-being, and the neighborhood livability. Typical issues that need to be investigated prior to the application of traffic calming measures include:

1. Emergency Vehicle Access. All traffic calming measures, particularly horizontal and vertical deflections, should be evaluated with their impact to emergency vehicle response times. Any proposed enhancements should be reviewed with local police, fire, and ambulance services.
2. Noise. Vertical deflections, rumble strips, and some striping applications may cause unintended noise increases. These devices should be placed appropriately to limit disturbances to neighboring homes.
3. Relocated Traffic: Some traffic calming measures may discourage traffic in the calmed neighborhood or street. This traffic may relocate to adjacent streets or neighborhoods, resulting in the need for more traffic calming measures in other neighborhoods.
4. Traffic as a Symptom of a Larger Issue: In some situations, traffic may be routing through a neighborhood to avoid a network bottleneck or congested area. In these cases, traffic calming may not be necessary if the network congestion can be relieved.

Additional details on the history, background, application, effectiveness, and legal and liability issues of traffic calming measures can be found in the literature cited on Page 1.

1.2 Purpose and Need

The purpose of the Old Hollow Road Traffic Calming Feasibility Study is to identify and evaluate a set of immediately implementable short-term traffic calming measures coupled with long-term strategies that can be developed to improve the non-motorized transportation environment in the Old Hollow Road neighborhood of North Ferrisburgh, Vermont. The appropriate measures will encourage a reduction in vehicle operating speed to be consistent with the speed limit, and may discourage use of Old Hollow Road as a regional through route.

Traffic speeds have been measured at various points of the neighborhood at levels above the speed limit. The neighborhood consists of a variety of land uses, including residential and commercial properties. With no bicycle or pedestrian infrastructure within the neighborhood, traffic calming measures are needed to improve the non-motorized transportation environment along Old Hollow Road.

1.3 Local Concerns Comments

In an effort to condense the project schedule, neighborhood residents were contacted via email and internet based community forums to solicit feedback regarding traffic calming in lieu of a traditional Local Concerns Meeting. Twenty written email responses were received, with 18 in favor of further study and evaluation of traffic calming measures, two against physical measures that may impact vehicle travel through the neighborhood. The comments received are compiled in Attachment B.

2.0 OLD HOLLOW ROAD NEIGHBORHOOD CHARACTERISTICS

Old Hollow Road is an east-west Major Rural Collector designated as a Class II town highway. Old Hollow Road connects US Route 7 (US-7) on the west to Monkton Ridge and Monkton Boro neighborhoods to the east. The Old Hollow Road neighborhood in Ferrisburgh is located near the crossing of Lewis Creek, approximately 4,000-feet west of US-7. The neighborhood consists of approximately 50 households and small businesses. The study area is shown in Figure 3.

Figure 3: Old Hollow Road Traffic Calming Feasibility Study project area in North Ferrisburgh, VT.

2.1 Existing Conditions

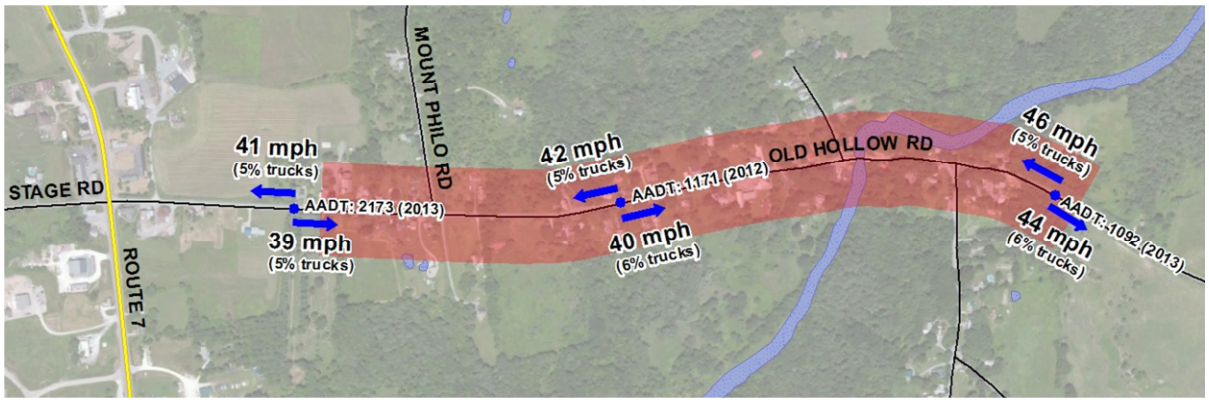
2.1.1 Roadway Characteristics

The existing roadway through the study area generally consists of one 11-foot-wide travel lane in each direction and no shoulders. The pavement is generally in acceptable condition with longitudinal and transverse cracking evident. The bridge over Lewis Creek was recently reconstructed. Following reconstruction, the bridge was restriped for a widened shoulder on the eastbound lane to accommodate pedestrian traffic. In the eastbound direction the lanes are 11-feet wide with a 3-foot shoulder. The westbound lane is 10-feet wide with no shoulder. The Vermont Agency of Transportation minimum lane width for this roadway classification is 11-feet.

There is a limited segment of narrow sidewalk on the south side of Old Hollow Road. A painted crosswalk connects Champlain Hill Road and the 3-foot shoulder on the Lewis Creek Bridge to the south side of Old Hollow Road. There are no other bicycle or pedestrian facilities in the project area.

The speed limit west of and through the study area is 35 mph. East of the study area, the speed limit increases to 40 mph. Several traffic speed and volume counts have been conducted recently along the study corridor. The results of these spot traffic and speed studies are shown in Figure 4. 85th percentile speeds represent the speed that most (85%) of motorists are traveling at or below. The 85th percentile speed is commonly referred to when performing engineering studies to set speed limits.

Figure 4: Recent traffic volume and 85th percentile speed results



2.1.2 Topography

As the name of the roadway suggests, the study area includes a river valley formed by Lewis Creek. The eastern and western boundaries of the Old Hollow neighborhood rise steeply from the river. At the western boundary near US-7, the elevation is approximately 240 feet. Moving east into the study area, the road descends for approximately 1200 feet at a 4-6% slope to an elevation of 160 feet. Most of the Old Hollow neighborhood is relatively flat near this elevation until the road crosses Lewis Creek and begins to ascend at a 6-8% slope for 1500 feet to an elevation near 280 feet at the eastern boundary of the project area. These slopes leading into the neighborhood contribute to the speed issues noted above. Additionally, the slopes create crest vertical curves and limit the sight distance near the intersections at Mount Philo Road and at Four Winds Road. The approximate slopes and profile of Old Hollow Road through the project area are illustrated in Figure 6.

2.1.3 Stormwater and Drainage

The roadside development is typical of a compact neighborhood in Vermont. The neighborhood, recognized as a historic district by the Vermont Division of Historic Preservation, contains many mature trees along the corridor with 40 historic structures, many built as near as 10 feet from the edge of pavement. The roadway is uncurbed with few drainage structures. In the steeper sections of Old Hollow Road noted above, ditches have been constructed to channelize storm water flow. Within the flat section of the Old Hollow neighborhood, storm water sheet flows unchannelized through landscaped yards.

2.1.4 Utilities

Utility poles are located primarily along the south side of Old Hollow Road, with some utility poles on the north side of the road due to the presence of structures and landscaping. Utility poles are located approximately 8 feet from the edge of pavement. There were no underground utilities identified during the site visits.

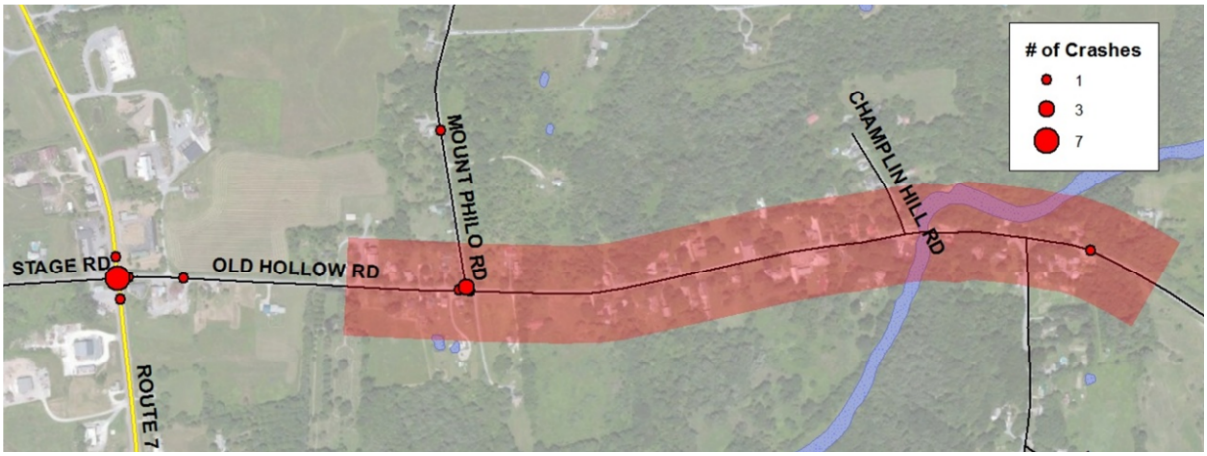
2.1.5 Natural Resources

The Vermont Agency of Natural Resources (ANR) Natural Resources Atlas (NRA) was consulted to locate existing natural resources and communities near the study area. No natural resources were identified immediately adjacent to the project area. One uncommon animal species (unspecified in the record) was identified at Lewis Creek. Hydric soils, an indicator of wetland conditions, are present on the eastern and western boundaries of the project area, but no mapped wetlands are immediately adjacent to the project area. The NRA mapping results are included in Attachment D.

2.1.6 Safety

From 2007 – 2011, there were six reported vehicle crashes along the study corridor. Five of these crashes occurred near the Old Hollow Road / Mount Philo Road intersection, and the remaining crash occurred near the eastern gateway of the project area. In three of the crashes, "Driving too fast for conditions" is listed as a contributing circumstance in the crash report. In addition, the limited sight distance due to the crest vertical curve identified earlier may contribute to the number of crashes at the Mount Philo Road intersection. The crashes in the study area (shown in transparent red) are illustrated in Figure 5.

Figure 5: Reported crashes from 2007 - 2011 near the Old Hollow Road study area



2.2 Identification of Appropriate Traffic Calming Strategy

The goal of the traffic calming strategy shall be to encourage vehicles to maintain a reasonable speed through the linear neighborhood along Old Hollow Road. US-7 to the west is a higher-speed, principal arterial carrying local and regional through traffic. Traffic entering from the west must either turn from US-7, or cross US-7 to enter the Old Hollow neighborhood. In either case, vehicles will be traveling slowly near this intersection and the goal should be to keep vehicles moving slowly as they travel down the hill into the Hollow and enter the neighborhood.

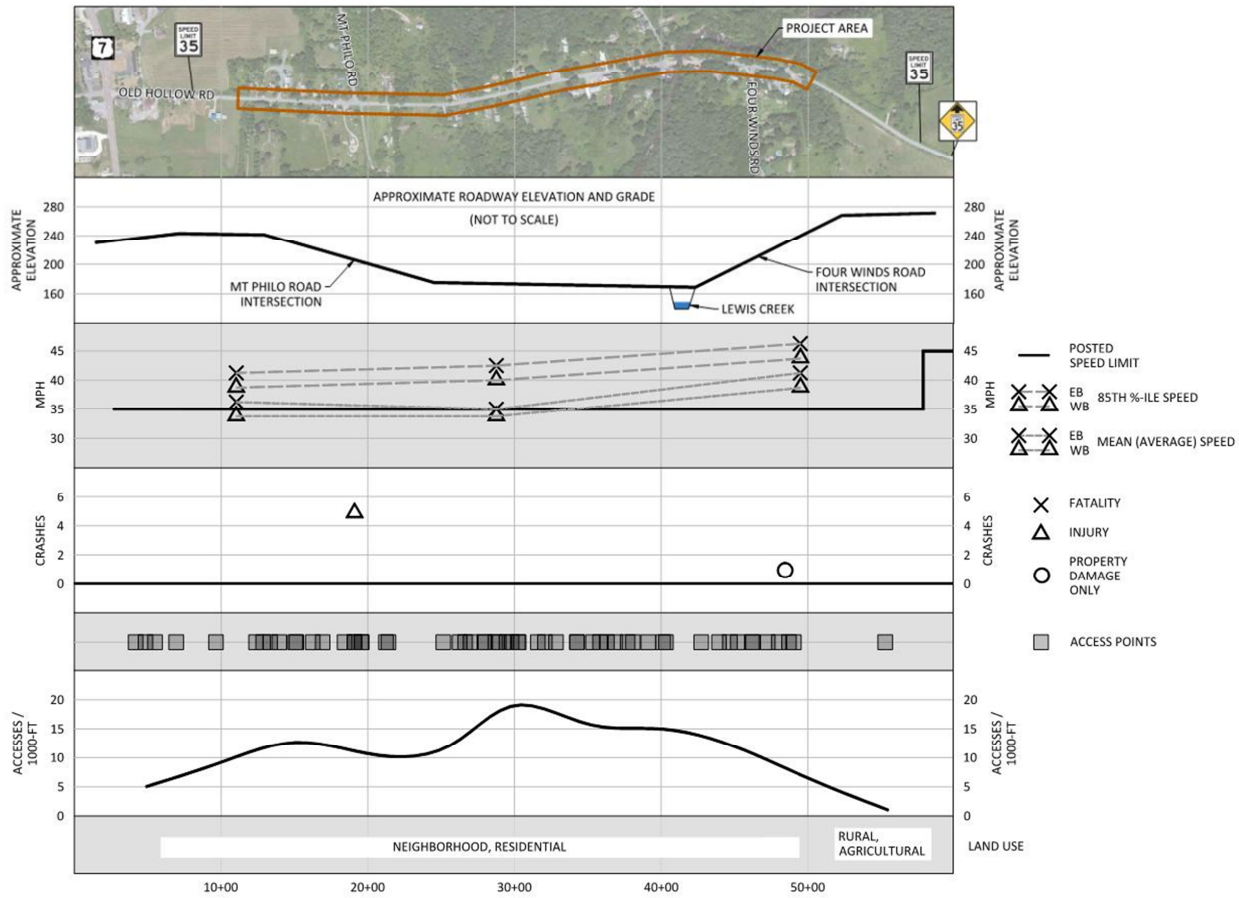
From the east, vehicles are traveling on higher-speed (40 mph) rural town highways. The traffic calming measures should encourage vehicles to slow down at the entrance to the neighborhood in a "transition zone". Through the village, traffic calming measures should encourage vehicles to maintain this reasonable speed at or near the speed limit of 35 mph.

In general, appropriate traffic calming measures will not restrict through traffic, such as diagonal diverters, cul-de-sacs, and curb extensions. Furthermore, appropriate traffic calming techniques would not likely include new curbing requiring storm water measures or lane width restrictions below 15-feet for plowing considerations.

2.3 Straight Line Diagram Tool

A straight line diagram was prepared to illustrate the opportunities and constraints along the corridor. The Straight line diagram illustrates the project area topography, posted and observed speeds, crash locations, and driveway access density along the Old Hollow Road corridor.

Figure 6: Straight line diagram



The diagram illustrates the following key points along the corridor:

- Eastbound speeds from US-7 are generally lower than westbound speeds.
- Vehicle speeds in both directions increase from west to east.
- The highest number of crashes occurs at the Old Hollow Road / Mt. Philo Road intersection where corridor speeds are generally lower.
- Mean (average, or 50th percentile) speeds are very near the existing speed limit.
- The existing westbound transition zone from the rural east into the Old Hollow Road appears to be set too far east based on operating speeds and land use.

3.0 PROPOSED TRAFFIC CALMING MEASURES

Several short- and long-term traffic calming measures have been developed to address the issue of excessive speed. The short term measures include relatively low cost (less than $10,000) and easily implementable physical measures. The long-term strategies focus more on programmatic changes in land use and policy making to emphasize the neighborhood character.

3.1 Short-Term Measures

The proposed short-term traffic calming measures are described below. Estimated costs and effectiveness statistics are from similar applications documented in the references in the Introduction.

3.1.1 Gateways

Gateways placed at the eastern and western entrances to the neighborhood, specifically before the road descends into the Hollow, will provide motorists with a visual cue that they are entering a neighborhood environment. With placement on the crest of the hill, vehicles may be more likely to recognize the neighborhood before accelerating down the hill.

Estimated cost: $7,000 each, plus annual maintenance for plantings

Estimated effectiveness: -5% to -7% in 85th percentile speed

Figure 7: Gateway treatments in Jericho, VT (left) and Vergennes, VT (right).

3.1.2 Optical Speed Bars / Dragon's Teeth

Optical Speed Bars are 12-inch by 18-inch rectangles placed on the left and right sides of the lane. The rectangles are spaced at decreasing intervals to give the motorist a sense of speeding up. The speed bars should be placed on the downslope section of the hill to further discourage excessive speed.

Similarly Dragon's Teeth are triangles placed in a similar pattern. Dragon's teeth have not been approved by the MUTCD.

Estimated cost: $2,500, plus restriping costs

Estimated effectiveness: -2% to -7% in 85th percentile speed

Figure 8: Optical speed bars (left) and Dragon's Teeth (right) application. (NCHRP Report 737)

3.1.3 Radar Speed Feedback Sign

Radar speed feedback signs (RSFS) are LED signs that display the speed of the approaching vehicle on the sign. The speed flashes when it exceeds a certain limit. Many studies have shown that RSFS are effective in encouraging speed limit compliance. A radar feedback sign would be most effective in the flat, most dense section of the Hollow where the sign would be visible for the greatest distance. An RSFS could be placed for both directions of travel, but a westbound installation would likely yield the greatest benefit.

Figure 9: Radar speed feedback sign. (radarsign.com)

A recent study conducted by the ACRPC evaluated the effectiveness of radar speed feedback signs. The study was conducted on Harbor Road in Shelburne, which is a similar neighborhood road setting with a speed limit of 25 mph. The study, available from the ACRPC[1] and included as Attachment F, measured a reduction in the 85th percentile speed of -3 to -8 mph, or -9% to -20%.

Estimated cost: $5,000 each

Estimated effectiveness: -9% to -20% in 85th percentile speed

3.1.4 Speed Tables

Speed tables are vertical deflection devices that are traversed by vehicles. A speed table is longer than both speed bumps and humps. A properly designed speed table will allow vehicles to comfortably travel across it at the intended speed. Along Old Hollow Road, a speed table that is 3-inches high and 22-feet long including two 6-foot transition approaches should be easily traversed at 30 mph by passenger vehicles, emergency responders, commercial vehicles, and farm equipment. The tables should be placed at the base of the Hollow hill to encourage slow speeds entering the neighborhood and discourage significant acceleration between tables. Speed tables are most effective when placed at approximately 500-foot intervals.

As an alternative to asphalt paving, several pre-manufactured rubber speed tables are available. These rubber mats may be installed during the warm weather months and removed for cold weather periods. Speed tables should be accompanied by appropriate warning signs.

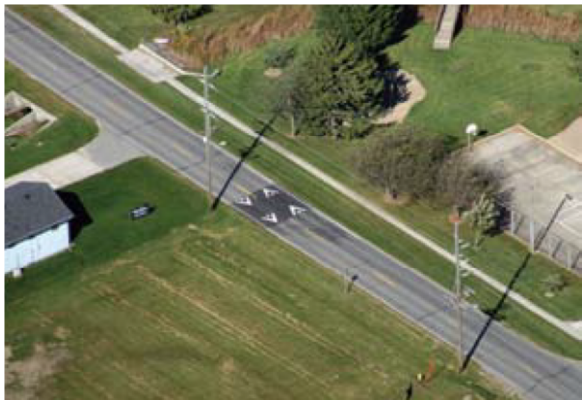
[1] "Effectiveness of Radar Speed Feedback Signs & Other Traffic Calming Techniques: A Test Case in Shelburne, Vermont", 2013, Addison County Regional Planning Commission, http://acrpc.org/transportation/

An increase in noise due to the vertical movement of vehicles crossing the table would be expected. Winter plowing operations may be impacted.

Estimated cost: $4,000 each

Estimated effectiveness: -14% to -24% in 85th percentile speed

Figure 10: Similar speed table application. (FHWA HRT-08-067)



3.1.5 Lane Reduction at the Lewis Creek Bridge

The bridge over Lewis Creek creates a natural bottleneck between the east and west sides of the Old Hollow Road neighborhood. Recently reconstructed, the 24-foot-wide bridge easily accommodates two lanes of traffic. One effective traffic calming measure would be placing concrete barriers 4 feet from the northern and southern bridge rails, reducing the width of the bridge from two lanes to one lane. This measure would require advance warning signs, particularly in the westbound direction where there is limited sight distance on a downgrade.

Figure 11: One-lane bridge across the Otter Creek in New Haven.

One-lane bridges are not uncommon in Vermont, and the shared lane requires drivers to slow and yield to traffic already on the bridge before proceeding. Additionally, the space between the bridge rail and concrete barriers would be available for pedestrians and bicyclists. The 16-foot shared lane should be large enough for town plows to maintain.

Estimated cost: $5,000

Estimated effectiveness: -3% to -8% in 85th percentile speed

3.1.6 Increased Enforcement

Lastly, increased enforcement will provide greater visibility to law enforcement in the neighborhood. While the neighborhood may risk becoming known as a “speed trap”, the traffic data show that the median vehicle speed is at or near the speed limit. Ticketing offenders traveling at excessive speeds through the neighborhood, some noted as high as 76 mph, is a necessary component of speed limit compliance.

Estimated cost: Varies based on commitment

Estimated effectiveness: Varies based on commitment

3.2 Long-Term Measures

The following measures were identified as longer-term strategies to help encourage traffic calming from a more programmatic and policy approach.

3.2.1 Enhanced streetscape environment

The streetscape environment influences the motorist's perception of the roadway. A developed streetscape, including sidewalks, landscaping, street lighting, and other features increases the perception of uncertainty resulting from the increased likelihood of activity from pedestrians, bicyclists, and on-street parking. This uncertainty may lead to more defensive driving and slower operating speeds.

The existing neighborhood maintains many historic features, including mature landscaping and on-street parking, which promotes these characteristics. Continued attention to the streetscape will further enhance the positive traffic calming effects.

3.2.2 Encourage higher-density, mixed-use development as appropriate

Likely to occur in combination with enhancements to the streetscape environment, higher-density, mixed-use development will increase the feeling of activity and uncertainty to passing motorists, which may lead to more defensive driving and slower operating speeds. Town land use zoning and planning policies that encourage this type of development have the opportunity to positively impact the traffic environment through the neighborhood.

3.2.3 Secure long-term funding for regular enforcement

Long-term funding for law enforcement of the existing speed limit will help maintain regular enforcement of the speed limit, which is necessary for compliance.

3.3 Summary

The following short-term traffic calming measures are proposed:

Short Term Measure:	Cost:	Effectiveness (change in 85th %-ile):
Gateways	$7,000 each	-5% to -7%
Optical Speed Bars	$2,500 each	-2% to -7%
Radar Speed Feedback Signs	$5,000 each	-9% to -20%
Speed Tables	$4,000 each	-14% to -24%
Lane Reduction at Lewis Creek	$5,000	-3% to -8%
Increased Enforcement	Varies	Varies

4.0 RECOMMENDATIONS

In response to the results of the August 20, 2013 Alternatives Presentation Meeting (APM), the following recommendations have been developed. The APM was held in conjunction with the Selectboard Meeting and was well attended by over 20 nieghborhood residents. In general, most neighborhood residents were in favor of the traffic calming measures, with some in opposition.

An overall plan of the improvements as presented at the APM are illustrated in Attachment E.

Neighborhood Gateway
A neighborhood gateway feature should be installed on the eastern and western entrances to the neighborhood. Typical gateways include a sign identifying the community with attractive landscape plantings. The location of the of the gateways has been tentatively identified, however the features may need to be located outside the highway clear zone. The most appropriate location will likely be agreed upon with a willing landowner. Long term maintenance of the plantings could be provided by a neighborhood volunteer group.

It is recommended that the neighborhood gateway is designed by a landscape architect to select appropriate plantings and design an attractive sign or features within the context of the neighborhood. Municipal planning grants or other funding sources may be available to assist the town in designing an appropriate gateway.

Optical Speed Bars
Optical speed bars are recommended to be placed in the travel lanes going down the hill as vehicles enter the neighborhood. On the western entrance, the optical speed bars are recommended from Mount Philo Road to the bottom of the hill; on the eastern entrance, the optical speed bars are recommended from the bridge up the hill through the Four Winds Road intersection.

The speed bars would likely be required to be restriped on an annual basis to maintain maximum visibility and retroreflectivity. This cost should be included within the annual town highway maintenance budget.

Radar Speed Feedback Sign (optional)
A solar-powered radar speed feedback sign is recommended through the flat section of Old Hollow Road through the intersection, facing westbound vehicles. The sign should display the speed of the oncoming vehicle. Above 42 mph (7 mph over the speed limit) the sign should read "SLOW DOWN" to discourage motorists from recording a high vehicle speed. If the westbound sign is acceptable to the neighborhood, an eastbound sign may be added also. The sign(s) should be sited to avoid glare into residences and avoid the appearance of sign clutter.

The signs generally represent a one-time capital expense. Small construction grants may be available to assist the town in installing, wiring, and operating the signs. The signs may also be used in gathering data to measure the effectiveness of the feature.

The remaining two alternatives, including the proposed speed tables and lane reduction at the bridge are more impactive physical features. If the three recommendations above do not yield acceptable traffic calming results, these two alternatives may be implemented. It is anticipated that these recommendations will have a greater impact to drivers in compliance with the speed limit and should be implemented as other alternatives are exhausted.

These recommendations represent short-term, easily implementable physical traffic calming features. The three longer term recommendations, including streetscape enhancements, higher-density, mixed-use development policies, and enforcement funding are all applicable strategies for enhancing the neighborhood characteristic and encouraging slower operating speeds. All alternatives may be funded through grant opportunities, and the Town and neighborhood is encouraged to discuss the available options with ACRPC staff.

ATTACHMENT A

Petition to Calm Traffic in the North Ferrisburgh Hollow

PETITION TO CALM TRAFFIC
IN NORTH FERRISBURGH HOLLOW

We, the undersigned, residents of North Ferrisburgh Hollow, are concerned about the quantity, type, and speed of motorized vehicles that come through our village on a daily basis. We feel that the danger posed and the noise created by current levels of traffic are inappropriate for Ferrisburgh's most historic, densely populated residential neighborhood. The traffic severely limits pedestrian safety, our children's outdoor activities, and our ability to interact as a community. Additionally, our indoor and outdoor activities are regularly disrupted by the noise, from early in the morning until late at night.

We therefore ask the Selectboard to take the following actions to calm the traffic on Old Hollow Road and to help re-establish The Hollow as a pedestrian-friendly, community-oriented place to live:

1. Install additional signage in The Hollow warning drivers of pedestrians and children, informing them that they are entering a village.
2. Install signage for a pedestrian crossing at the west side of the new Lewis Creek Bridge.
3. Install a flashing radar unit on the eastern "entrance" to North Ferrisburgh Hollow, uphill from the bridge.
4. Request that police maintain a regular schedule of speed and weight limit enforcement in The Hollow.
5. Install a 3-way stop at the intersection of Mt. Philo Road and Old Hollow Road.
6. Apply for a Traffic Advisory Committee Feasibility Study in the spring/summer of 2012, which would provide funds for a professional engineering firm to study and make recommendations for pedestrian safety and access in The Hollow.

NAME (Print)	SIGNATURE	ADDRESS	TOWN OF RESIDENCE

ATTACHMENT B

Local Concerns Comments and Notes

Local Concerns Comments: (Comments are compiled from electronic submission and are unedited)	**Key Words and Concepts:**
From Martha Davis:	
I think that speed is the major factor in the hollow, which in turn causes safety issues, especially with kids	Speed Children
My suggestions for slowing things down would include:	
Regular stationing of state trooper or sheriff - I know that I always slow down in 2 particular areas (one in monkton and one in jericho) due to regular police presence where the speed limit is 30-35 mph.	Enforcement
Signs at either end of the Hollow that state something like"you are entering the Neighbohood of the Hollow, please slow down for safety"	Gateway
A side walk for walking and biking - ? From bridge to route 7. Unfortunately the pedestrian lane on the bridge is opposite side of where the limited sidewalk exists and would make sense to go in.	Sidewalk Walking Biking
Change speed limit to 30 mph?	Speed Limit
From Suzanna Miller:	
We live right in the center of the Hollow on the flat zone and our experience is that cars pick up speed going through that section. In the summer we have trouble seeing down the road toward the bridge as we go to pull out of our driveway because of the trees and shrubs, and often find that we have to pull our nose out before we can see that a car is coming, which requires them to brake quickly to slow down. Motorists often tailgate when a resident slows down on approach to our house. I even had one pickup pass me as I slowed down to enter my driveway, ignoring my left turn signal. A near miss. Not only do people speed regularly, even in the mornings as children are standing next to the road waiting for the school bus, but there are frequent "honkers" at all hours of the day, who lay on their horn as they pass through.	Speed Sight Distance Children Noise
I have reviewed the slideshow with the traffic calming measures, and I'm not sure which would be appropriate for our area. Speed bumps with a reduced posted speed limit would have been my first thought, but we are on a school bus route, so I'm not sure that would be the best choice.	Appropriate
From Paul and Michele Kaplan:	
Some of the things that we have thought of is (1) more signage as in populated area slow down and 35MPH Speed Limit, we have a deer crossing near our house, children at play, etc (2) summer rubber speed bumps to slow traffic, (3) if the speed limit stays at 35MPH then people will do 45 without getting a ticket because of the 10 MPH tolerance. 45 is	Signs Temporary Speed Bumps Enforcement

too fast in the Hollow but it can't be legally in forced. If the speed limit were reduced to 25 in the Hollow people doing 38+ can be ticketed. The speed limit in Charlotte going north on Greenbush Rd. is 25. The other effect that a 25 MPH speed limit or speed bumps may cause people to take alternative routes to and from route 7. A small road divide placed between the parking lot of the Opera house and Kurt Plank's field causes traffic to slow.	
We think that the best solution if the speed limit is not lowered it to install road dividers in two locations. One near the opera house parking lot and the second just west of our house where there are fields on both sides. These dividers don't have to be large, just large enough to put a slight bend in the road to cause traffic to slow. They can have grass or even a tree in the middle to give the area a neighborhood feel but large trucks would be able to negotiate it if they slowed down.	Center Islands / Dividers
From Pamela Taylor:	
My sister and I live on Champlin Hill Road. We have major concerns about excessive speeding and safety- especially the kids and animals. We are also concerned that we do not have the Dead End sign at the foot of our hill yet (I have called numerous times) and cars speed like crazy up our hill and turn around and speed down onto the Hollow Road. If kids are riding their bikes up the hill it can become a real issue for their saftey as we have witnessed.	Speed Children
I have to admit it was heaven when he bridge was out!	
From Nina Falson:	
First we are delighted by this process!	
Some thoughts: We live at the beginning of the Hollow, so we get the brunt of traffic heading toward Mt.Philo and Spear St. Close Old Hollow Rd. to commercial traffick. Prohibit use of air brakes. Speed bumps to slow all vehicles, including motor cycles. A rotary at Mt.Philo Rd. intersection would accomplish a slowdown in all directions. Lastly, the intersection with Rt.7 needs a traffick light!	Commercial Traffic Roundabout Traffic Light
Thank you for your effort!	
From Karyn Kadar:	
Here are my ideas for the Hollow. I live on Mt. Philo Road and don't have much reason to go through the Hollow by car (most of my trips are out toward Rte 7 from the Mt. Philo/Old Hollow intersection) but I have tried to walk from my house down to the hollow with and without my children and it was a bit scary because there is no pedestrian sidewalk or safe shoulder and the cars go by a bit fast. Here are my ideas...	Children Sidewalk Shoulder
1. pedestrian sidewalks on one or both sides from Mt. Philo to Four Winds. At least on one side. Or at least a larger shoulder that is paved and safe for walking. The current shoulder is non-existent and pretty	Sidewalk

rutted.

2. a well-marked speed table down by the bridge, perhaps near the Champlin Hill intersection, that doubles as a crosswalk (if there was a sidewalk on each side), otherwise the speed table would act as a good means of slowing traffic through that dip and up and down each hill. The speed table should have adequate signage so that cars coming down each hill are made aware to slow down before they get to it.	Speed Table Raised Crosswalk
3. improved sight distance when pulling out of Four Winds onto Old Hollow. The speed table at the bridge could act as a means of slowing traffic coming up the hill. But something should be done (sign?) for the west-bound cars coming down Old Hollow toward Four Winds so they know to slow down for cars coming out of Four Winds turning west.	Intersection

From David Greenhaus:

I live on Old Hollow Road (right next To Judy Chaves). The traffic often flies by at 50 to 70 mph, and is often quite loud. The worst offenders seem to be large trucks and construction vehicles, motorcycles, and many assorted vehicles between the hours of 7:00 to 9:00 am and 4:00 to 7:00 pm.	Speed Noise
The question in my mind is whether the actual volume of traffic can be reduced. Can we enforce legal load limits to keep large trucks off the road entirely? If we take measures to slow the traffic significantly (speed bumps or dips, or bump outs) are there alternative routes they may opt to take instead? How about a stop sign at the intersection with Mt Philo Road? (I suspect this might slow down the traffic, but increase the noise).	Volume Commercial Traffic
Perhaps the most effective (yet costly?) solution would be to place a cop on the street on a ongoing routine basis. This way, the recurring offenders should receive enough tickets to incent them to slow down, or perhaps they might even lose their license to speeding "points" and stop driving entirely.	Enforcement
Whatever is done to slow down traffic on Old Hollow Road, I would also strongly suggest that a traffic light be installed at the corner with Route 7. There is bound to be some serious, perhaps fatal car, or car/pedestrian accidents there sooner, rather than later (I've witnessed many close calls) and that situation is likely to continue until a traffic light is installed.	Traffic Light
Thank you for your interest in receiving comments.	

From Jen Ruddy:

I'm emailing over with a few thoughts on slowing down the traffic in the hollow. If you could let the traffic study folks know that we are located at

the base of the bridge. Cars definitely speed through the "hollow" and there needs to be something done to slow down the traffic. What we, our family, experience daily is people accelerating before they hit the bridge in preparation for the hill that follows once they cross the bridge (if they're heading toward Monkton). Honestly, people fly over that bridge. So much so, that I refuse to be on the bridge the same time a car is traveling on the bridge. In other words, I'll wait until there is no traffic to cross over the bridge. Traffic goes so fast in the hollow that I worry letting my 11 year old daughter walk up to a friend's house. There are too many factors that make it unsafe—fast cars, sight distance, visibility. Here are some of my thoughts for slowing down traffic:	Speed Children Sight Distance
1. Make the bridge one lane.	Lane Reduction
2. Put visual markers on the bridge to make it appear smaller.	
3. Narrow the whole road—build up the sidewalk and add a bike path on the road	Sidewalk
4. Place one of the state police speed clocking devices on the road (I'm not sure what they're called but they are the devices that flash out what speed you're traveling on a road).	Radar Sign
5. Place more signage on the road to remind traveler's to slow down.	
6. Speed bumps placed through out the hollow	Speed Table
There are more than dozen children in the hollow and we need to ensure that they are able to access the outdoors via biking, walking etc and that they are safe. One way to do that is to slow down the traffic.	Children
Thanks. Let me know if you need more information.	
From Craig Heindl:	
Problems:	
1. Excessive speed, for what is appropriate and safe for this village. Even those who are adhering to the 35 mph speed limit are going too fast for safety, and for livability of residents. 35 mph is about 10 mph too high for this village.	Speed
2. Hotdoggers, particularly high-performance motorcyclists flying through. Very noisy, and dangerously high speeds.	Noise
3. Impacts on livability, walkability of the village: Many residents mentioned to me that they would like to walk along the road (to go to the P.O. or store on Rte. 7, or to walk their dog, or to walk to the cemetery, or to walk to a neighbor's, or to walk to the bridge to look at the creek, or just to take a nice walk . . .) but they don't because they are afraid for their safety. Many residents also mentioned to me the loud noise of traffic, particularly motorcycles, trucks, and trucks using engine brakes. Also some residents told me that they are nervous about pulling	

out of their driveway onto the road, or they're particularly nervous for their visitors who aren't as familiar with the traffic -- so I guess that might be a combination of excessive speed, and possibly limited sight distances at some locations.	
Possible solutions:	
1. Treatments & warnings at the gateways to the Hollow, such as:	
A. Signs. Wording could be such as:	
- "Entering Village -- Please Slow Down"	Gateway
- "Entering Village -- Please Drive Like You Live Here"	
- "Entering Village -- Please Drive Like Your Kids Are Riding Their Bikes Here"	
B. Automatic radar speed detectors / indicators. Very effective, I think.	Radar Sign
2. More patrols / stakeouts by cops with radar guns.	Enforcement
3. 25 mph speed limit. I am completely unconvinced and skeptical of the "natural road speed" concept that was explained by the ARCRPC and RSG traffic engineers, in this particular setting. Drivers coming from all directions have been travelling in rural open-land areas, or along Rte. 7. They need specific and pointed and clear reminders that everything is changing ahead, that their "natural choice of appropriate speed" is NOT appropriate for the village are that they are about to enter. The concept of natural speed makes NO sense for this situation. We can't rely on drivers' natural awareness of the safety threats and livability impacts they are having on the residents of the Hollow. Instead, we need to tell them that the safety and noise parameters are about to change dramatically in the village that they are about to enter -- they need to pro-actively slow down, and get quiet, and be highly vigilant for pedestrians, kids, bike-riders, dogs & cats, and so on.	Speed Limit
4. Elements that emphasize the village nature of the Hollow, such as sidewalk, road trees, bump-outs in the road width, etc.	
From Teresa Fama:	
I live in the blue house with the new fence, near the intersection of Mt Philo Rd and Old Hollow Rd. I think the main issue is excessive speed.	Speed
Ever since they opened up the intersection of Mt Philo Rd and Old Hollow Rd, and cleared away the trees, there have not been any accidents as far as I know (or people sliding into the guard rail in front of Whit Palmer's house). I think the only way to get people to slow down is with speed tables---possibly one at the church level, another closer to the intersection of Mt Philo Rd, and perhaps two others into the hollow. I think a 3-way stop would result in traffic backing up around rush hour, which could be a problem for people around the intersection getting out of their driveways. I wouldn't be happy with a flashing light at the intersection (which would be flashing at night too, into my bedroom window).	Speed Tables Flashing Beacon
From Susan and Al McKibben:	

A 3-way stop at the intersection of Hollow Road and 4-Winds Road would slow things down, as would a 3-way stop at the intersection of Mount Philo Road and Hollow Road.	Stop Sign
How about a pedestrian cross walk in the middle of the Hollow, with a big sign about required stop for pedestrians?	Crosswalk
Just a few thoughts for now. It wouldn't hurt to have the traffic on 4-winds slow down a bit either….people blast off from the corner going south, and also come at full tilt along the long stretch to the north (as I am sure you know!).	
From Silas Towler:	
As for traffic calming measures, I like the radar activated signs that tell you your speed. There is one on Silver St. in Hinesburg that looks to be solar powered. We saw some in France last fall that had a sign below the slashing speed that flashed a happy face if you were below the limit, and flashed a frowning face if you were above. Made me smile and slow, if needed.	Radar Sign
We also saw bolt in place speed bumps made out of a hard rubber, removable in winter. But, these seem unlikely to be wanted as they really make people slow down to 10-15 or so.	Speed Table
A lowering of the limit to 25 or even 30 would be a start. I suggested Kurt Plank park his truck along the road, but he didn't seem too enthusiastic.	Speed Limit
From Kim Hornung-Marcy:	
Here are my observations: traffic does move pretty fast out front of the parsonage. Sight lines are particularly difficult for turning left into the entry way part of the church horse shoe driveway. Our horse shoe driveway is not wide enough for double traffic and to cut down on possible problems we ask people to enter west of the parsonage and exit east of the parsonage. We have enter only and exit only signage up. Many non-church members who use the driveway to turn around, talk on a cell phone, meet others for a bike ride, etc do not observe our posted entry only /exit only signage and when I have asked them "why" out of concern they would meet a car head on--they say "But we can't see people coming up the hill if we enter west of the parsonage. You do have to come to a full stop and make sure no one is cresting the hill, but since I enter this way all the time--if you come to a full stop--it is not really an issue. But people are not taking the time to safely stop --they are in a rush so they rush into the church property from the wrong angle endangering anyone who is using the driveway correctly. It is pretty amazing the number of people who use the church parking area to turn around etc. The church itself has almost daily activities these days from AA, to church groups, to girl scouts, etc.	Speed Sight Distance

Large numbers of cars enter and exit the cemetery when it is free of snow--this means these cars are slowing down again...at a point on the hill where others may be moving too fast. Some people visit family graves monthly or more.	
Given the high banks of the church and parsonage lawn--people can get into trouble exiting the church as you have to pull out far enough to make sure you are not hit by someone who is frequently exceeding the speed limit.	
We have a large amount of traffic during the commuting time which during the school year is also when the school buses are coming through and picking up the large number of kids who live in the Hollow.	
We have a lot a bike traffic. My joke is "I know where all the young men under 40 are--they are riding by my house." We are a route to Greenbush which is a very popular biking ride. We even have a senior biking group that parks in the church lot and takes off weekly for a ride. So lots of biking this part of Old Hollow. The road is not really designed for both cars and bikers and walkers.	Bicycles
We have a lot of people walking on Old Hollow. I myself walk to the NF post office. But I only walk on the southern part of the road as cars are traveling too fast and there is no shoulder on the northern part of the road and the ditch is host to things like Giant Parsnip which are toxic for anyone who gets this plant's oils on their skin. I see others regularly walking from the bus stop to where they live in the neighborhood. They often only use the southern part of the road no matter what direction they are walking.	Walking
So solutions? posting a lower speed limit and putting out a police car even it it were "unstaffed". The sight of the car would really make a	Speed Limit
difference. Getting the reputation that this is a place where the police hand out tickets--they are expensive and other old parts of Vermont--like Hinesburg town, Essex near IBM and Jericho village very successfully ticket regularly and people learn not to speed through those tight spots	Enforcement
as well. All of those locations do have sidewalks as well.....	Sidewalks
Putting up one of those solar "speed you are going" reminder signs.	Radar Sign
It is unusual to have this many homes, this close to the road on a major commuting route but that is what this very old neighborhood has now become.	
Side walks --at least one side of the road, would be the safest option yet but I do not know what the cost would do for the town.	

From George Gardner:

*Regarding the traffic study for Old Hollow Road, *the speed limit is already reduced, *current speed studies show that vehicles are following the speed limits, *it is a road that goes to destinations beyond us and out of town, *speed bumps cause damage to vehicles and the roads, *they also make it hard for road maintenance IE; snow plows, *they also impede the response of emergency vehicles, maybe to your house.*

No Traffic Calming

If you mess with a road that was designed to be safe by putting obstacles; in, on, around or beside it you reduce the safety factor of that road and are directly responsible for the accidents that occur. Please consider that we all have to drive on this road to complete our daily business. When you fool around with that it affects the road year around and with heavy rain or snow and ice it creates a very dangerous situation.

Please do not mess with something that works.

From Judy Elson:

I would love to see traffic slow down. Any strategies to get people to slow down are my goal. I learned from the select board meeting that speed limits don't work, but perhaps the speed machine that tells you your speed on either end of the hollow would work. I personally find these effective. I also think that the lawn signs on people's yards that say we care about our pedestrians, dogs, kids, please slow down catch my eye in other towns. If lines on the road work great! I would appreciate seeing data from other towns on how effective the strategy is before we go and spend money on it. I would like to see a walking lane lined out on the road. This would narrow the car lanes and perhaps slow people down. It would also speak to bikers and pedestrians to travel in that lane. The bridge was supposed to have a larger pedestrian lane. To bad that didn't work out then. Can we change the pedestrian lane size now on the bridge? Too late? Thanks for listening to input.

Speed

Radar Sign

Shoulder

From Ted Pappadopoulos:

What are the problems?

Road design
The Road does not curve at the bridge. It is really a turn and should be treated as such with a lower speed. The road itself does not match up to the bridge and new bridge construction emphasized this.
The road is bent at the West entrance to Lewis Creek bridge so traffic headed east naturally swerves across the center line. The slump on the road, off the south west corner, creates a difficult line to follow, and makes cars "lurch" treacherously at normal speeds crossing the bridge.
The road is poorly defined headed west. Drivers, by nature, swerve over the center line headed west other direction because the road is angled

not curved. *Morning and Evening commutes face the direct east/west low sun, which drivers headed east in the morning encounter just as they hit the bridge and drivers headed west in the evening encounter just as they hit the bridge headed back.*	
Parking *Often times there are parked cars from the east side of the bridge up the hill on both sides of the road. People disembarking and opening doors, many times with children and pets, create sudden needs to slow and in some cases stop when two cars are passing that area simultaneously.*	Parking
Size and frequency *The increase in size and frequency of large truck traffic is notable. Over the 15 years I have lived here, truck frequency and size has increased, and the stopping power/time/distance at 35 + is the same. It is hair raising and difficult to exit the drive each time, and to back in, which is now 100% necessary.*	Commercial Traffic
There has been an increase in pedestrian use and cyclist use. Even with the small walk area in the expanded bridge layout, the road on either side does not allow for room to negotiate two cars and a person across it.	Bicycles Pedestrians
Town Upkeep *This center line is routinely worn away as is cross pattern. Aggressive painting was promised with the new bridge plan but discarded since.*	Maintenance
Proposals *No parking within 250 ft of the bridge with the exception for breakdowns and such. This does not prevent or reduce access to the fishing area, just limits the potential pile ups and actual slowdowns.*	
Regrade the road so that the turn is a bend, fix the dip and sag on the south west corner.	
Build the walkway proposed, signed, and paid for in the original bridge plans and commission.	
Engage the owners of the big truck companies, Hinesburg Sand and Gravel and Parker Excavation to come up with solutions they can adhere to as well	
Personal notes: *Two trucks/vehicles headed by my drive way at just a few miles over the speed limit are equivalent to one car headed at me at 80 miles an hour, with no stopping or swerving possible. I need to guess from which direction the truck appears. This is analogous to a batter in baseball*	

facing two pitches each a strike, but each coming from opposite directions, and you cannot miss.

I see red tail lights all the time as cars cross the bridge headed west. Why? If cars were at or below the limit there is no need. Traffic does not slow as it enters the Hollow area it slows at the bridge if at all. Same goes for the other direction, cars do not maintain speed headed east over the bridge; they are approaching a hill so the foot is on the gas. Trucks are especially prone to this as the operator is forced to accelerate or down shift, one involves work, one does not. The bigger the weight load the bigger the incentive to step on the gas, every time. Trucks are paid by the load, there is incentive to make the runs as quickly as possible, this is not going to change. Winter, makes all of this worse.

From Kurt Plank:

I have a few thoughts about what I would like to see considered, and the reasoning for them:

Lower the speed limit to 25 mph. When the sheriff used to sit at my shop he told me he did not stop a car unless it was going 15 mph or more over the limit. Presently that makes acceptable speed through the Hollow 50 mph.	Speed Limit
Increase enforcement. Notice in my first suggestion I said "When the sheriff used to sit at my shop". I think the sheriff's office does a lousy job, if they do it at all. *Ask the selectboard to open a conversation with Vergennes police to contract for speed limit enforcement in designated areas of Ferrisburgh, not only the Hollow.*	Enforcement
Erect signs at all entrances to the Hollow stating "No Through Trucks", and enforce it with a town-wide policy on unnecessary use of our roads. Parker and others use this as their route home. I know that is legal, let them beat up the roads in their own towns.	Commercial Traffic
On this next point, let me say, I would be willing to pay the entire cost. I would seek only the approval of the selectboad on this with no town funds involved. Erect signs at all entrances to the Hollow stating, "Please Respect Our Neighborhood. Obey The Speed Limit".	Gateway
I am not an advocate of speed bumps, even the removable kind. I think of fire and emergency vehicles. It will slow their response time.	No Speed Bumps
I am not an advocate of signs flashing the speed of an approaching vehicle. I think they are ugly and mildly distracting.	No Radar Signs

I am not an advocate of sidewalks in the Hollow. Who will maintain them in the winter? The land owner adjacent to the section of sidewalk? Not me. The town does not own a sidewalk plow for snow removal. The one small section of sidewalk in the Hollow is heaved, unkempt and not cleared in the winter.	No Sidewalks
Nick, as you know I always have an opinion or two. I hope these will be considered in the formation of a plan for our neighborhood	

From Diane Nadon:

Sorry to wait til the last minute but I did want to share my thoughts on the study. My husband and I live at 189 Old Hollow Rd - close to Route 7. We've been here about three years, but he grew up in this house.	
I'd like to be involved in this process but I'm not sure i have specific feedback. I feel like the time frame for comments is extremely short-I can't stress that enough. I feel like we just got the flyer at the very end of last week. I'm not sure that gives folks enough time. Second, I've looked at the ITE website and gone thru the slideshow. There's lots of info there, but none of it seems pertinent or applicable to Old Hollow Rd. the only thing that even begins to seem feasible are the speed humps and I've never seen speed humps used on a hilly road. Kudos for trying, but I'm just not seeing how any of these solutions could be implemented here.	Speed Table
Really, I don't mean to be negative, just pointing out what I see. Again, I'm interested in this process, so please feel free to add me to lists, pass along my email, etc	

From Nick Patch:

Hazards:	
Speed is the biggest hazard. The narrowness of the road and the amount and size of traffic conspire to create a very dangerous and uncomfortable environment for this densely populated residential neighborhood. Kids are constantly put at risk as the volume and speed of traffic increases over the years. My 11 yr. old daughter and I walk over the bridge quite often and it can be quite frightening. Unfortunately a recent opportunity to create a sensible pedestrian lane on the bridge was missed. The community was promised a 5' pedestrian lane and what exists is 3' at best. Traffic accelerating up the hill to the east and traffic heading west down the hill to the bridge often is travelling at a high rate of speed. In addition to the hazard of walking across the bridge taking a left turn onto Hollow Rd from Four Winds rd is at times frightening. Cars appear at a high rate of speed from the east as you are making the turn. Slowing traffic needs to be a priority. I think radar activated signs at both ends of the Hollow would be helpful. To the east it should be placed well up the hill where the speed limit drops to 35.	Speed Children Radar Signs

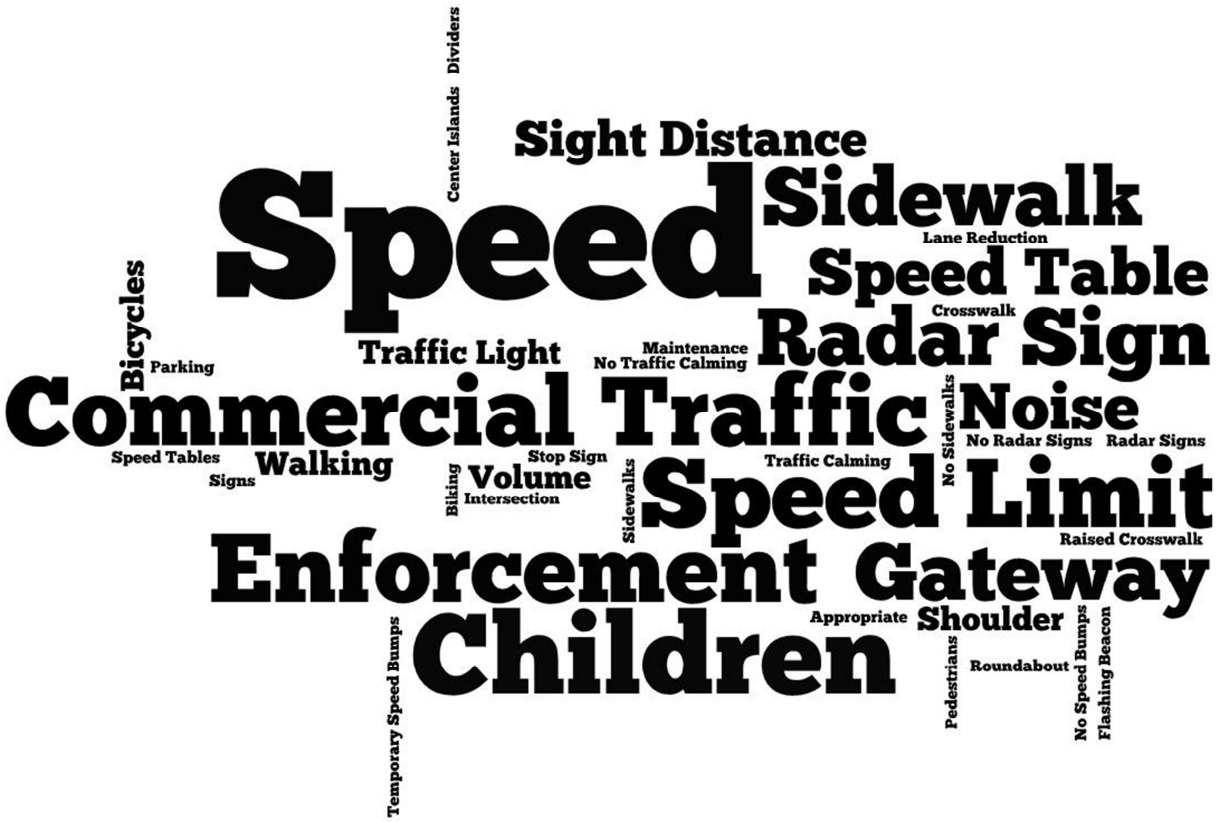
I think signage at both ends of the Hollow announcing a residential village would be helpful.	Gateway
Narrowing the lines on the road to increase the bike and pedestrian lane would be helpful.	
Too many large trucks are moving too fast. The road is not designed to accommodate them. Are we enforcing weight limits on the bridge.?	Commercial Traffic
This is a community blossoming with young children wanting to feel safe in their own front yards.	
Clearly the road was never designed to accommodate as much traffic as it receives. Many of the houses are built in the 1800s and are very close to the road. As traffic has increased over the years it has gotten less and less safe for kids, pedestrians and bikers. Slowing traffic needs to be a priority. People deserve to feel safe in their front yards.	

From Judy Chaves:

Problems:	
The amount, speed, and noise of traffic on Old Hollow Road deprive residents of the experience of living in a village. It is unsafe and unpleasant to be outside, on or near the road, whether you're walking, riding a bike, working or sitting in your front yard, playing, or visiting with neighbors. These activities, which should be a major component of village life, are severely diminished. During the summer, when windows are open, traffic noise is disruptive to indoor activity, as well. For example, I cannot teach in my music studio with the windows open in the summer.	Volume Speed Noise
Bottom line: Our community's needs have for too long been subservient to the needs of traffic. It's time we reversed this.	
Solutions:	
1. Drivers need considerable visual indications that this is a village they are driving through--i.e., that it's time to slow down. These indications need to be at the gateways of The Hollow, as well as throughout The Hollow. (For example, it is possible to turn east onto Old Hollow Road from Mt Philo Road--i.e., already within a "gateway"--and pick up enough speed to be over the 35 mph speed limit by the time you're in the middle of Old Hollow Road.) Drivers need to feel that it would be unsafe to drive faster than 25 or 30 mph.	Gateway Traffic Calming
Visual indications need to be in character with--and even enhance--the historic, cozy nature of the village. There could be many more trees planted along the road, fog lines that narrow the road, and very visible pedestrian crossings that are perhaps of a different texture than the	

pavement.	
2. A sidewalk on the bridge over Lewis Creek would narrow the road on the bridge and make it a traffic-calmer, which it currently is not.	Sidewalk
3. Truck traffic is a major contributor to both the speed and noise problems. Parker Excavation trucks (based in Monkton) use Old Hollow Road constantly. An alternate route for them, using roads that do not go through the most heavily populated area of Ferrisburgh, should be designed. There should also be an enforced weight limit for the road. If there were some way to make Old Hollow Road unattractive to truck drivers, we should do it.	Commercial Traffic
4. Lowering the speed limit to 25 mph would indicate to drivers that this is an area that is very different from other areas along this road. The 85% rule, which doesn't take into account residents' needs, should not be the sole factor determining speed limit. Other towns have figured out how to do this. Charlotte has established a 25 mph speed limit along Greenbush Road, north of The Brick Store, where there are far fewer houses than in the Hollow.	Speed Limit

Key words aggregated into a word cloud, with relative word and term size corresponding to the frequency in which the concept was noted:



ATTACHMENT C

Setting Speed Limits in Vermont

2012

Setting Speed Limits- A Guide for Vermont Towns

Vermont Local Roads

Saint Michael's College

Updated May 2012

Special thanks to the following people who made substantial contributions to the production of this handbook and to the 1994 videotape "Setting Speed Limit".

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We work to foster a safe, efficient, and environmentally sound surface transportation system by improving the skills and knowledge of the municipal transportation workforce and leaders.

- Vermont Local Roads Mission Statement

Setting Speed Limits

Introduction

State law and the Manual on Uniform Traffic Control Devices (MUTCD) regulate the procedures for establishing effective and enforceable speed limits. Title 23 V.S.A. Section 1007 authorizes the local governing body to establish effective and enforceable speed limits on town highways at not more than 50 MPH or less than 25 MPH and to do so on the basis of a traffic engineering investigation or study. This provision mandates that any speed limit must be justified and reasonable, based on the conditions that prevail on the particular road or street being considered. Refer to page 29 of this handbook for the text of 23 V.S.A. Section 1007.

This handbook is a guide to be used by Vermont municipal officials in setting reasonable and safe speed limits on town roads and streets. Together with the ten-minute videotape entitled "Setting Speed Limits", this handbook provides the basic information necessary to set speed limits on municipal roads and streets.

Assistance Available

Vermont Local Roads
Saint Michael's College
1 Winooski Park, Box 260
Colchester, VT 05439
1-800-462-6555

Vermont Agency of Transportation
Roadway, Traffic and Safety
One National Life Drive
Montpelier, VT 05633-5001
1-802-828-2664

(The Traffic and Safety Division may be able to print out spot speed study information for towns who send in their raw data. Call the Traffic and Safety Division for information first.)

Check with the staff of your regional planning commission who may be able to assist.

Principles for Setting Speed Limits

There are basically two principles for setting speed limits to achieve reasonable and safe speeds.

The first is to protect the public and curb unreasonable behavior. Motorists should have some assurance that the risk of having an accident is low on that particular road or street if the obey the speed limit.

Of course, operators have responsibilities. They should drive at speeds that are reasonable and proper for the prevailing conditions such as snow and ice, fog, darkness, heavy traffic, and so on. Speed limits tell the motorist what the maximum speed is. Drivers should use common sense and drive according to the prevailing conditions and surroundings. They also must heed other traffic control devices such as black/yellow warning signs, pavement markings, flashing beacons, and so on.

Second, to effectively enforce a law, the public must believe that the law is reasonable. Local officials should not set a uniform speed limit for all roads and streets, nor should they succumb to pressure by residents to lower speed limits. The random installation of signs and speed limits can be detriment to safety by breeding disrespect for all speed limits. The majority of motorists will drive at a speed that they perceive to be safe. In the absence of a study identifying that speed limit, setting a speed limit too low merely punishes motorists who otherwise obey the law. Studies indicate that the measured average speed that most drivers perceive safe is at or very close to the speed limit established by a traffic engineering study.

Gravel roads are particularly difficult to assess. They typically do not exhibit the same characteristics as paved roads. Most are more narrow, have more horizontal and vertical curves and are not as heavily traveled as paved roads. One school of thought is not to set a speed limit at all due to the difficulty in assigning a uniform speed limit. Residents often oppose this concept. Each situation should be thoroughly investigated and scrutinized before assigning a speed limit.

Conducting a traffic engineering study provides information for basing judgments on facts and not on guesses or political pressure.

Recommended Practice

A traffic engineering study allows you to carefully consider the characteristics of each road, its surrounding features, and other factors. You then have the information you need to make a reasonable judgment in assigning a speed limit that is "reasonable and safe."

Conducting a traffic engineering study does not mean you have to be an engineer. But you do have to investigate the conditions. The following criteria comprise the minimum requirements for a traffic engineering study.

Only three forms are necessary. All can be copied. Use the "Traffic Engineering Report" on page 22 for items one through six. Use the "Spot Speed Study Field Data Sheet" on page 24 and the "Spot Speed Study Summary" on page 26 for item 2, monitoring vehicle speeds.

1. Consider the road itself, such as the characteristics of the travel surface, the condition of the shoulder, the road's alignment and sight distance, the width of the road and shoulders and the number of lanes.

Determine the presence of passing zones.

Determine the maximum grade and the degree of critical curves. Steep roads and sharp curves usually require slower speeds.

Consider what motorists might do if you lowered the speed limit because of the presence of a hazard. Would this create a situation where motorists would risk passing slow moving vehicles, for example, thus creating greater danger?

As you travel the road, look for these and other characteristics and record the information on the "Traffic Engineering Report" form.

2. Monitor the speed at which vehicles are traveling. Do this by performing a spot speed study and recording the speeds on the "Spot Speed Study Field Data Sheet." This consists of monitoring a minimum of 100 vehicles and identifying that speed under which most (85%) vehicles are traveling. (Surveying exactly 100 vehicles makes it easier to calculate percentages.) Experience has shown that a posted speed limit near this value is safe and reasonable.

On low volume roads, instead of gathering a sample of 100 vehicles, you might use several time runs and estimate the speed. In fact, the Vermont Agency of Transportation suggests that obtaining the 85th percentile speed on low volume roads may not be practical. It may require too much time to obtain a significant sample.

Another method is to determine the pace speed to obtain the 85th percentile speed. It is the ten mile-per-hour band of travel speeds containing the largest number of observed vehicles. See the explanation on page 25.

3. Look for roadside development and culture. Is it a densely residential area? A commercial area with many driveways entering the highway? A school zone? A trailer park? Or is it rural farmland? Considering the type and the density of development along the road will help you to decide what is a reasonable and safe speed for those conditions. Record the information on the form.

4. Determine the safe speed for curves or other hazardous locations within the zone, such as intersections.

You can determine the advisory speed for a curve by driving the section in a conventional automobile. Make several passes along the centerline of the travel lane at constant speeds, increasing the speed by 5 mph on each pass. Select the speed that allows you to negotiate the curve safely and comfortably, without excessive braking or feeling a concern for safety. If you find you are leaning in the seat while negotiating a curve, it is an indication you are going too fast.

The Vermont Agency of Transportation sometimes uses a ball bank indicator, also known as a slope meter, to determine the advisory speed of a curve. They cost about $200.

Use the following chart to determine the maximum safe speed for approaching an intersection based on stopping sight distance.

HIGHWAY CONDITIONS (THREE OR MORE MUST BE SATISTFIED)

Design speed (mph)	Minimum Length of Zone Equals or Exceeds (miles)	Average Distance Between Intersections Equals or Exceeds (feet)	Number of Roadside Businesses does not Exceed (per mile)	PRELIMINARY ESTIMATE OF MAXIMUM SPEED (mph)
20	0.2	no min	no max	20
30	0.2	no min	no max	30
40	0.3	125	8	40
50	0.5	250	6	50
60	0.5	500	4	60
70	0.5	1000	1	70

Use a black on yellow advisory speed plate placed below the warning sign to indicate the safe speed. The advisory speed plate cannot be the same or higher than the posted speed limit.

5. Record the parking practices and pedestrian activity in the area. Record whether parking is on the roadway or off street. Is parking controlled by signs or markings or meters?

Make a note about pedestrian activities. Higher pedestrian activity may require a lower speed.

6. Record the reported accident experience for a recent twelve month period. High accident experience may indicate a need to moderate the speed limit. Consider, however, that accidents are caused by other contributing factors such as turning movements, intersections, DWI, ice and snow, and the like.

On the "Traffic Engineering Report" form, note any other features that may influence traffic movement.

Determining the Speed

With the data you have collected, you can determine a proper speed for the road under consideration. A reasonable and safe speed will give a driver time to react and stop or slow down sufficiently to avoid potential conflicts while driving at a comfortable speed. You can test for the proper speed by driving the road section at constant speeds, increasing the speed by 5 mph on each pass. This is similar to testing for safe speeds on low volume roads.

Towns sometimes tend to set speed limits too low. This merely creates more speeders, since the majority of motorists drive at speeds they perceive to be safe. Speeds set too love can also create more, and sometimes dangerous, passing. Many people will strictly obey the speed limit regardless of whether is is too slow for the majority of drivers.

Generally speaking, the Vermont Agency of Transportation's Traffic and Safety Division does not recommend setting speed limits on Class 3 gravel roads. Most people tend to drive on gravel roads at speeds slower than what towns might set them.

The traffic engineering survey is a reasonable method for helping you make an informed decision about the proper speed for a particular road. No one of the criteria by itself determines "reasonable and safe". To make an informed decision, consider all the criteria.

Adopting a Traffic Ordinance

Once you have decided the speed limits for your streets and highways, the next step is to adopt an ordinance, making speed limits official municipal policy.

A traffic ordinance establishes speed limits and other traffic regulations (STOP, YIELD, parking, etc.) as municipal policy. (Refer to 23 V.S.A. Sections 1007 and 1008, and 24 V.S.A. Section 2291(4).) The ordinance makes the speed limits and other traffic regulations a matter of local law and therefore enforceable. A traffic ordinance can be passed by the local governing body unless petitioned by at least 5% of the people, in which case a vote of the townspeople is also required.

Provisions for passing an ordinance are in Title 24 V.S.A., Section 1972. Follow them carefully. People who challenge speed limits in court often question the procedures the town followed, especially whether the town conducted a traffic engineering study and whether the town followed all the steps in adopting the ordinance.

The traffic ordinance should describe the speed zone accurately. This can be done by referring to a town map, stating a distance from the beginning point to an identifiable point such as an intersection or town line, as well as the direction and distance to the end of the zone. Several speed zones of the same or of different limits may be included in one ordinance. Amendments to the ordinance can be made as the needs arise. Make sure to record the completed traffic study forms and the ordinance in the permanent town records. However, the lack of evidence of a traffic engineering study will not invalidate a local speed limit ordinance as adopted or amended under V.S.A. Title 23 Motor Vehicles 1007 Local Speed Limits, after 5 years following the day on which the speed limit ordinance took effect.

The following model suggests what might be contained in a municipal traffic ordinance. A town should produce an ordinance that reflects its own unique conditions.

A Model Traffic Ordinance

TRAFFIC ORDINANCE

Town of _____, Vermont

Pursuant to the provisions of Title 23, Vermont Statutes Annotated, Section 1007 and 1008, and Title 24, Vermont Statutes Annotated Sections 1971 and 2291(1)(4) and (5), and such other general enactments as my be material hereto, it is hereby ordained by the Board of Selectmen of the Town of _____ that the following Traffic Ordinance is adopted for the Town of _____, Vermont.

ARTICLE I
DEFINITIONS

The definitions of Title 23, Vermont Statutes Annotated, Section 4 are incorporated by reference.

ARTILCE II
SCOPE

The ordinance establishes special traffic regulations on public highways within the Town of _____, Vermont.

ARTICLE III
TRAFFIC CONTROL DEVICES

Section 1. It shall be unlawful for any person to disobey the direction of a traffic control device except in response to the direction of a low enforcement officer.

Section 2. It shall be unlawful for any person to intentionally remove, injure, obstruct, deface, alter or tamper with any traffic control device.

Section 3. It shall be unlawful for any person to install any sign or device which may resemble or be mistaken for an official traffic control device, without prior approval of the Town of _____, Board of Selectmen.

ARTICLE IV
SPEED REGULATIONS

On the basis of engineering and traffic studies, the following speed limits are hereby established.

T.H. #1 - A maximum speed of 25 m.p.h. from the intersection of VT. Route _____ easterly to the intersection of T.H. #2, then a maximum speed of 40 m.p.h. from the intersection of T.H. #3 easterly and southerly to the _____Town Line.

T.H.#2 - A maximum speed of 35 m.p.h. from the intersection of VT. Route _____ to the _____Town Line.

T.H.#3 - A maximum speed of 35 m.p.h. from the intersection of T.H.#1 to the _____ Town Line.

T.H.#4 - A maximum speed of 35 m.p.h. for the entire length.

T.H.#6 - A maximum speed of 35 m.p.h. from the intersection of VT. Route _____ to the _____Town Line.

T.H.#7 - A maximum speed of 30 m.p.h. from the intersection of VT. Route _____ to the _____Town Line.

T.H.#8 - A maximum speed of 30 m.p.h. for the entire length.

T.H.#16 - A maximum speed of 35 m.p.h. from the intersection of T.H.#20.

T.H.#26 - A maximum speed of 30 m.p.h. for its entire length.

T.H.#31 - A maximum speed of 25 m.p.h. from the intersection of Vt. Route _____, extending easterly a distance of 0.83 miles east of Vt. Route _____, to intersection of T.H. #1

The above speed limits shall be posted in accordance with the standards set forth in the Manual of Uniform Traffic Control Devices and shall be in effect when so posted.

ARTICLE V
STOP AND YIELD INTERSECTIONS

Section 1. The following intersections shall be designated is stop intersections and shall be so signed:

T.H. #4 entering T.H. #3
T.H. #16 entering T.H. #3
T.H. #18 entering T.H. #3
T.H. #24 entering T.H. #3

Section 2. The following intersections shall be designated as "YIELD" intersections and shall be so signed:

T.H. #3 entering T.H. #1
T.H. #4 entering T.H. #1
T.H. #28 entering T.H. #4

ARTICLE VI
PARKING REGULATIONS

Section 1. It shall be unlawful to park at any time on either side of T.H. #1 from the intersection of Vt. Route _____ easterly for a distance of forty-five (45) feet.

Section 2. It shall be unlawful to park on the south side of T.H. #1 from a point two hundred fifteen (215) feet east of Vt. Route _____ easterly to the covered bridge.

Section 3. It shall be unlawful to park at any time on T.H. #24 between the intersection of Vt. Route _____ and the _____ town line.

Section 4. It shall be unlawful to park on T.H. #1 between the intersections of Vt. Route _____ and the covered bridge, and within any municipal parking lot between the hours of 12:00 P.M. and 7:00 A.M. from November 15th to April 30th.

Section 5. Any vehicle parked in violation of the provisions of this Article may be summarily removed at the owner's expense, by order of any law enforcement officer, road commissioner, or selectman.

Section 6. If the owner of a vehicle summarily removed under section 5 hereof does not claim such vehicle and pay all towing and storage expenses within thirty (30) days of the date of such removal, the title to such vehicle shall escheat to the Town and the vehicle may be sold or otherwise disposed of in accordance with Title 27, Vermont Statutes Annotated, Section 11.

Section 7. Nothing in this Article shall be construed to make unlawful vehicular stops in obedience to the direction of a law enforcement officer or for causes beyond the control of the operator.

ARTICLE VII
DESIGNATED ONE-WAY STREETS

The following street or portion of said street is hereby designated as a one-way street and the direction of travel shall be as follows.

_____ Street: Legal direction of travel, from intersection of _____ Street and Vermont State Highway Route No. _____ shall be south to the intersection of _____ Street and _____ Street.

_____ Road: Legal direction of travel, from intersection of _____ Road with _____ Road, shall be west to the intersection of _____ Road with _____ Road.

ARTICLE VIII
LOADED VEHICLES

No vehicle shall be driven or moved on any street unless such vehicle is so constructed or loaded so as to prevent its contents from dropping, sitting, leaking of otherwise escaping there from.

ARTICLE IX
GENERAL PROVISIONS

Section 1. Separate Offenses:

Each violation of a provision of this ordinance shall be deemed a separate offense.

Section 2. Penalties:

The provisions of this ordinance shall be cumulative to the fullest extent permitted by law with respect to all other statutes or ordinances now or hereafter adopted regardless of their order of passage or enactment.

Section 3. Severability:

The provisions of this ordinance are declared to be severable and it any provisions hereof be adjudged invalid such judgment shall not affect the validity of any other provisions.

Section 4. Designation:

This ordinance may be referred to as the _____ Traffic Ordinance and in a prosecution hereunder a copy of such ordinance, certified by the Town Clerk shall be prima facie evidence thereof. An allegation that the act constituting the offense charged is contrary to a specified provision of this ordinance shall be a sufficient reference hereto.

Section 5. Repeal of Prior Ordinances:

Any other ordinance or traffic regulation heretofore adopted by the Town of _____ is hereby repealed.

Section 6. Publication and Posting:

This ordinance shall be published in the _____ on _____, 20___ and shall be filled with the _____Town Clerk on _____, 20___.

Adopted by the Board of Selectmen, Town of _____ at its meeting held on the _____ day of _____, 20___.

QUESTIONS OFTEN ASKED ABOUT LOCAL SPEED LIMITS

Q. Should the local ordinance be approved by the State Traffic Committee?

A. No. Title 23 V.S.A., Section 1007, provides an avenue of appeal if there is dissension over the adoption process.

Q. Can a single speed limit, for example 35 MPH, be established for all the roads in town and posted at each highway entering the town?

A. It is doubtful that an engineering and traffic study would indicate that any one speed limit would be proper for all highways in a town. Signing only at the town line does not fulfill the mandate of the law for posting speed limits.

Q. What is wrong with installing a few signs where they are needed for whatever good they can do without enforcement?

A. This does not conform to the law and it will breed disrespect for all speed limits. An enforcement officer who cites someone on the assumption that a speed zone is valid will be embarrassed when trying to prove the case in court. The officer will be reluctant to enforce local regulations further.

Q. When is a traffic engineering study required?

A. To lower or raise existing speed limits. A study is not required to initially establish a 50-mph zone.

Q. Do we have to hire a professional engineer to do the study?

A. No. Anyone can gather the information needed.

Q. What if the selectmen receive a petition from a significant number of residents demanding a speed limit in a certain area?

A. The law states that the speed limit must be based on an engineering and traffic study. A petition may result in a survey, but the decision to establish a speed limit must be based on the results of the study, not the opinion of the petitioners.

Q. Should the speed limit be set 5 or 10 mph below what the investigation indicates to make up for the tolerance allowed by enforcement officers?

A. No. The statutes do not provide for a tolerance. A speed limit set too low is not realistic and will not command the respect of motorists.

Q. Should towns install speed limit signs on all of their town highways?

A. Probably not since the minimum/maximum speed limits are 25 mph and 50 mph respectively. A speed limit of 25 mph might be too high for most class 4 town highways and some class 3 town highways. By the same token, 50 mph signs on gravel town highways would suggest it is safe to drive at that speed when, in fact, it might not be.

Q. Are advance signs such as "Reduced Speed Limit Ahead" signs required on the approach to the speed limit zone?

A. No. Such signs are not required, but they are recommended where the speed limit is being reduced by more than 10 mph, or where engineering judgment indicates the need for advance notice to comply with the posted speed limit.

Q. Should a speed limit be set at the safe speed for the worst spot in the proposed zone?

A. No. A spot hazard such as a sharp curve or intersection should be treated with the appropriate warning sign for the particular hazard. The warning sign may or may not include an advisory speed plate. An established speed limit is not a guarantee that the speed can be maintained throughout the zone. It is a speed that will allow the driver time to react to a variety of situations which may occur within the zone.

Q. How does a town go about making a change in speed limits on state highways?

A. The governing body of the community (Town Administrator, Town Manager, Selectboard, etc.) should write a letter to the Traffic Committee Coordinator, State of Vermont, Roadway, Traffic & Safety, One National Life Drive, Montpelier, VT 05633-5001 requesting a speed limit change indicating the route, the exact location, and citing their reasons for the change. A copy of the letter should be sent to the District Transportation Administrator. Staff of the State's Traffic Committee will conduct a traffic and engineering study of the location and present their findings to the Traffic Committee at an open meeting, in which the Town will be notified and invited, to present their testimony before a ruling is determined.

SIGNS

1. Postings Signs

Title 23 V.S.A. Section 1025 adopts the MUTCD as the standard for all traffic control signs, signals, and markings on town highways in Vermont. The MUTCD lists basic requirements for signs, signals and markings to be effective. They must

- fulfill a need
- command attention
- convey a clear, simple meaning
- allow adequate time for a proper response

Basic suggestions for the selection and use of signs are:

- Use approved signs (size, shape, colors, text)
- Try to achieve uniformity among signs (size, message)
- Keep messages simple.
- Place signs in locations where they sill be easily seen; avoid locations just over the brow of a hill or just around a curve
- Use signs only when necessary

2. Categories of Signs

Regulatory signs inform drivers that specific regulations apply at specific places and times. Speed limit and stop signs are regulatory signs.

Warning signs advise drivers of potentially hazardous locations, maneuvers or activities.

Guide signs give information about routes, directions, destinations, points of interest and services.

3. Size and Spacing of Signs

The MUTCD has guidelines for the size, shape, color, height, distances, and retro-reflectivity of signs. The standard size and color for a regulatory speed limit sign is 24” wide x 30” high with a black border and legend on a white background. The 24”x 30” size sign shall be used for all conventional highways. On a low-volume road the minimum size 18” wide x 24” high size sign can be used.

Note that a low-volume road shall be defined as follows:

A. A low-volume road shall be a facility lying outside of built-up areas of cities, towns, and communities, and it shall have a traffic volume of less than 400 AADT.

B. A low-volume road shall not be a freeway, an expressway, an interchange ramp, a freeway service road, a road on a designated State highway system, or a residential street in a neighborhood. In terms of highway classification, it shall be a variation of a conventional road or a special purpose road as defined in Section 1A.13 of the 2009 MUTCD.

C. A low-volume road shall be classified as either paved or unpaved.

Basically, the above states that low-volume roads typically include agriculture, recreational, resource management and development, such as, mining and logging and grazing and local rural roads.

The “Reduced Speed Ahead” regulatory sign (R2-5A) have been replaced in the 2009 MUTCD with the “Reduced Speed Limit Ahead” warning sign (W3-5 or W3-5a). If used, the “Reduced Speed Limit Ahead” sign shall be followed by a “Speed Limit” sign (R2-1) installed at the beginning of the zone where the speed limit applies. The speed limit on the “Reduced Speed Limit Ahead” sign shall be identical to the “Speed Limit” sign displayed on the subsequent “Speed Limit” sign. Also a “Speed Limit” sign should be installed following each major intersection in both directions of travel. Intermediate signs should be posted as needed to remind motorist what the speed is in that zone. See page 18 for sign spacing.

There is no set minimum distance between signs within a speed limit zone. Since intermediate signs remind drivers of the speed limit, the distance between them should be determined based on time and roadside distractions. Based on a 1-minute time span, for example, a 25 or 30 mph limit could be signed about every 1/2 mile and a 40 of 45 mph limit could be signed about every 3/4 mile. This assumes that there are no unusual distractions to occupy a driver's attention such as recreation activities, shop windows, other types of signs, panoramic views and the like.

Another rule of thumb could be 0.3 to 0.4 miles for 25 to 30 mph speed zones and 0.5 to 0.8 miles for 35 to 45 mph zones. Signs within a 50 mph zone can be a mile of two apart since State law indicates the speed limit is 50 mph unless otherwise posted.

Do not use speed zones to warn motorists of hazardous conditions. On rural roads, for example, avoid posting speed limits, say from 40 to 30 to 35 to 45 back to 30 and son on. Rather, try to establish one speed limit and use advisory speed plates as needed for curves, hills and other hazardous conditions.

4. Inspecting and Maintaining Signs

Signs must be maintained if they are to be effective and enforceable. Survey road signs for damaged or come up missing at least twice a year, under daytime, nighttime (for reflectivity), and inclement weather conditions. Clean all signs to improve reflectivity. Clear away brush, limbs or grass which may obstruct signs. Straighten leaning posts. Missing STOP signs should be considered an emergency and replaced immediately.

Keep a detailed inventory for every traffic sign. This information may be necessary for legal purposes and for planning replacement of signs. A good record system will list the sign type, date of installation, type of support, and maintenance or replacement activities. It is a good practice to mark the date on the back of each sign panel when it is put in place.

If you prefer a hand written method, this one comes from Thomas Szebenyi at the Cornell Local Roads Program.

Create a file of 4 X 6 cards and lay each card out as follows:

Date: (Today)
Road: (Name)
Direction of Travel:
Starting point: (In miles or kilometers)
Location: (from reference starting point)
MUTCD sign code: (This is essential when ordering signs.)
Text on sign:
Size: (width x height, and cost)
Placement: (left, right, center, overhead)
Pointing which direction: (forward, reverse)
Support type and cost: (steel channel, pipe, etc.)
Date installed:

On the back of each card, you can then record:

Inspection date:
Condition of sign:
Defects:
Date of work order:
Work order purpose:
Date work completed:

Enforcement

A speed limit will only be as effective as the enforcement it receives. To be enforceable, a speed limit must conform to both the state statutes and the MUTCD. Enforcement officers need the backing of a traffic ordinance based on an engineering and traffic study.

Enforcement of speed limits is sometimes necessary for maintaining conformance by motorists. Irrational drivers cannot be controlled except by enforcement. Never establish speed limits artificially low to slow irrational drivers. It doesn't work. If speed limits are set too low for a particular road or street, even responsible drivers will usually exceed the limit. Enforcement then becomes unnecessarily time consuming and a drain on resources.

Also consider that local drivers tend to be the frequent violators because they claim to know the road "by heart". This should not give them license to exceed the speed limits.

Forms

The form on the facing page, "Traffic Engineering Report for a Spot Speed Limit Study" was developed for use by the Vermont Agency of Transportation. It encourages a thorough investigation of a road or street for purposes of setting a speed limit.

Gather as much information as you can.

M.P. = mile post

TH = Town Highway

Make copies of this form. One copy is needed for each road section you survey.

State of Vermont, Agency of Transportation

TRAFFIC ENGINEERING REPORT FOR A SPEED LIMIT STUDY ON A State Hwy. _____ Town Hwy. _____ Other: _____ (In accordance to Title 23 VSA, Section 1003			Date
CHARACTERISTICS	Left Side	Right Side	Town
No. of Roadway Lanes			
Roadway, Width (feet)			County
" , Surface Type			
" , Condition			Route No.
Shoulder, Width (feet)			
" , Surface Type			Village
" , Condition			
Sidewalk, Width (feet)			From M.P.
" , Surface Type			
" , Condition			Thru M.P.
Curbing, Type of			
" , Condition			Length (miles)

TOPO	No. of Drives	No. of Houses/Farms	List Small Businesses	State/TH Junctions
Left				
Right				

ALIGNMENT	No. 1	No. 2	No. 3
Curves, From/Thru M.P.			
" , Degree of			
" , Ballbank Reading			
" , Current Adv. MPH			
" , Proposed Adv. MPH			
Grades, From/Thru M.P.			
" , Percent of			
Passing Zone M.P. (NB/EB)			
" " (SB/ WB)			
Crosswalk Milepoints			
Bridge, Milepoints			
" , Widths c/c (ft.)			

PARKING INFO: From/Thru M.P. _____ Meet Needs? _____

Controlled by: Signs_____ Markings _____ Meters _____

Hinders: Thru Traffic? _____ THS? _____ Drive? _____

PARKING ZONES: From/Thru M.P. _____

ACCIDENTS: From 19___ Thru 19___ Actual/Critical Accident Rate _____

Total No. ___ Injured ___ Fatalities ___ Drives ____

Types of (1) _____ (2)_____

RECOMMENDATIONS (by_____): _____

_____

Report done by: _____

Spot Speed Survey Field Data Sheet

1. Fill out the information required at the top of the form. (M.P. stands for mile post.)

2. Circle appropriate direction of travel for vehicles being monitored, either northbound/southbound (NB/SB) or eastbound/westbound (EB/WB).

3. Aim the radar gun in the appropriate direction and wait for a car to drive by. When the car passes through the radar field a number will flash in the target window of the unit. Go down the appropriate column for cars or for trucks and buses, and then the column for direction. Find the speed along the left of the column which coincides with the speed of the vehicle and put down a tic mark. Preceding or following the placement of the tic mark make another tic mark on some scrap paper to represent the vehicle. Continue in this manner until your scrap paper has 100 tic marks, representing 100 vehicles. Count the tics to be sure you have enough information.

   Make copies of this form. One copy is needed for each road section you survey.

Vermont Agency of Transportation
Spot Speed Survey Field Data Sheet

Study No.	Setup M.P.
Date	Day
Town	
Route No.	
Posted Speed Limit	

From M.P.	To M.P.
Weather	
Survey Hours	
Observers	
Passing Zones (Begin/End)	

Describe Setup Locations _____

	CARS					TRUCKS AND BUSES			
MPH	NB EB		SB WB		MPH	NB EB		SB WB	
70&OVER					70&OVER				
69					69				
68					68				
67					67				
66					66				
65					65				
64					64				
63					63				
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31					31				
30					30				
29					29				
28					28				
27					27				
26					26				
25					25				
24					24				
23					23				
22					22				
21&Under					21&Under				
Totals									

Summary of a Spot Speed Survey

Modal Speed The modal speed is the speed at which the highest number of vehicles are travelling. Place a check mark next to the modal speed.

Average (Median) Speed The average (median) speed is the speed at which at least 50% of the vehicles are travelling.

85th Percentile The 85th percentile is the speed at or below which 85% of the sample of vehicles surveyed are travelling. So, of 100 vehicles surveyed, 100 X .85 represents 85 vehicles from the bottom of the column. The 85th percentile for sixty-two vehicles, for example, would be 62 X .85 = 52.7. Round up the number to 53.

Ten Mile Pace The ten mile pace is the block of ten miles per hour which contains the most vehicles. Look for an area that appears to have the most vehicles in it and add them up. Put a line above the ten miles per hour block and another one below it. Now check to see if you can move the lines up or down simultaneously, to increase the total number of cars. If not, then this is the ten mile pace.

Speed Limit Range The speed limit range has two numbers. It has a high number and a low number. The high number of the speed limit range is the lowest of two numbers minus three. The two numbers are 1) the 85th percentile, and 2) the high number of the ten mile pace. Choose the lowest of those two numbers and subtract three from it. That is the high number of the percent in pace. Now, the low number of the speed limit range is the low number of the ten mile pace.

Percent in Ten mile Pace This is the percent of vehicles travelling within the ten mile pace. Sum the vehicles in the ten-mile pace and divide them by the total number of vehicles (which should be 100). So, for example, if you have a total of 100 vehicles, 62 of which are in the ten-mile pace, you would have 62 percent in pace.

Make copies of this form. One copy is needed for each road section you survey.

State of Vermont, Agency of Transportation

SUMMARY OF A SPOT SPEED SURVEY Date_____Page_____
(Use one sheet for Each Spot Speed Survey)

Setup No. _____ Setup M.P. _____ Setup Area: From _____ Thru _____

Town _____ County_____ Route No. _____

Present Speed Limit _____ ADT_____ Year ADT _____ DHV_____

General Remarks on Traffic (Only for the Area Covered by this Spot Speed Survey)

_____

_____

_____

	Cars, Vans and Light Trucks	Large Trucks and Buses	All Vehicles
Median Speed			
85th Percentile Speed			
Modal Speed			
10- Mile Pace			
Percent in 10-Mile Pace			
Speed Limit Range (Use all vehicles column)			

MPH	Cars, Vans and Light Trucks	Accum. Pct.	Large Trucks and Buses	Accum Pct.	All Vehicles	Accum Pct.
Over 60						
56-60						
51-55						
46-50						
41-45						
36-40						
31-35						
26-30						
Under 26						
Totals						

Summary done by _____

Definitions

85th percentile speed - the speed at or below which 85 percent of the sample of free flowing vehicles are travelling. This speed should be determined by conduction a spot speed study.

Advisory speed - the speed at which a specific feature along the street or highway can be safely traversed.

Basic Speed Law - no person shall operate a motor vehicle at a speed greater than is reasonable and proper for the prevailing conditions.

Manual on Uniform Traffic Control Devices (MUTCD) - the national standard adopted by state law as the standard to be followed by state and municipal authorities in Vermont.

Pace - the 10 miles per hour band of travel speeds containing the largest number of observed vehicles.

Speed Limit - the maximum (or minimum) speed permitted on a section of street or highway.

Tolerance - the numerical difference between the speed limit and the minimum speed at which enforcement action is taken.

References

Chittenden County Regional Planning Commission Speed Limit Handbook, CCRPC, Essex Junction, VT, 1989.

Manual of Traffic engineering Studies, fourth Edition, Institute of Transportation Engineers, Washington, D.C., 1976.

Manual on Uniform Traffic control Devices, U.S. Government Printing Office, Washington, D.C., 2009 edition.

Speed Zone Guidelines: A Proposed Recommended Practice, Institute of Transportation Engineers, 525 School Street., S.W., Suite 410, Washington, D.C. 20024-2797, 1993, 5 pages.

Setting Speed Limits: A Guide for Vermont Towns, Vermont Local Roads Program, Saint Michael's College, Colchester, VT, 1986.

Sign Inventory Program Using 4 X 6 Index Cards, From "Nuggets and Nibbles", Winter, 1994, Cornell Local Roads Program newsletter.

Vermont State Statutes of Note

This reference list is not intended to be an all-inclusive listing of what may be helpful information in state statute. Vermont State Statutes can be viewed online at: http://www.leg.state.vt.us/statutesmain.cfm

Title 23: Motor Vehicles. Chapter 13- Operation of Vehicles

§ 1007. Local speed limits

§ 1007a. Neighborhood electric vehicles; speed limit

§ 1008. Regulations in municipalities

§ 1008a. Regulation of motor vehicles at state airports

§ 1025. Standards

§ 1081. Basic rule and maximum limits

§ 1082. Slow-moving vehicles

§ 1083. Special speed limitations

§ 1431. Height and width limits

§ 1432. Length of vehicles; authorized highways

Title 24: Municipal and County Government. Chapter 61- Regulatory Provisions; Police Power of Municipality

§ 2291. Enumeration of powers

Title 24: Municipal and County Government. Chapter 59: Adoption and Enforcement Of Ordinances And Rules

§ 1972. Procedure

Title 13: Crimes and Criminal Procedure. Chapter 223- Fines, Costs, & Penalties

§ 7251. Municipalities; payment to and liability of

Title 20: Internal Security and Public Safety. Chapter 151- Vermont Criminal Justice Training Council

§ 2358. Minimum training standards

Sections of note from the 2009 Manual on Uniform Traffic Control Devices (MUTCD)

This reference list is not intended to be an all-inclusive listing of what may be helpful information from the 2009 MUTCD.

For a free PDF version of the manual visit http://mutcd.fhwa.dot.gov/

Section 2B.13 Speed Limit Sign ffi2-D

Section 2B.14 Truck Speed Limit Sign (R2-2)

Section 2B.15 Night Speed Limit Plaque (R 2-JP)

Section 2B.17 Higher Fines Signs and plaque (R2-6P, R2-JO, and R2-JJ)

Section 2C.05 Placement of Warning Signs

Section 2C.38 Reduced Speed Limit Ahead Signs (W3-5, W3-5a)

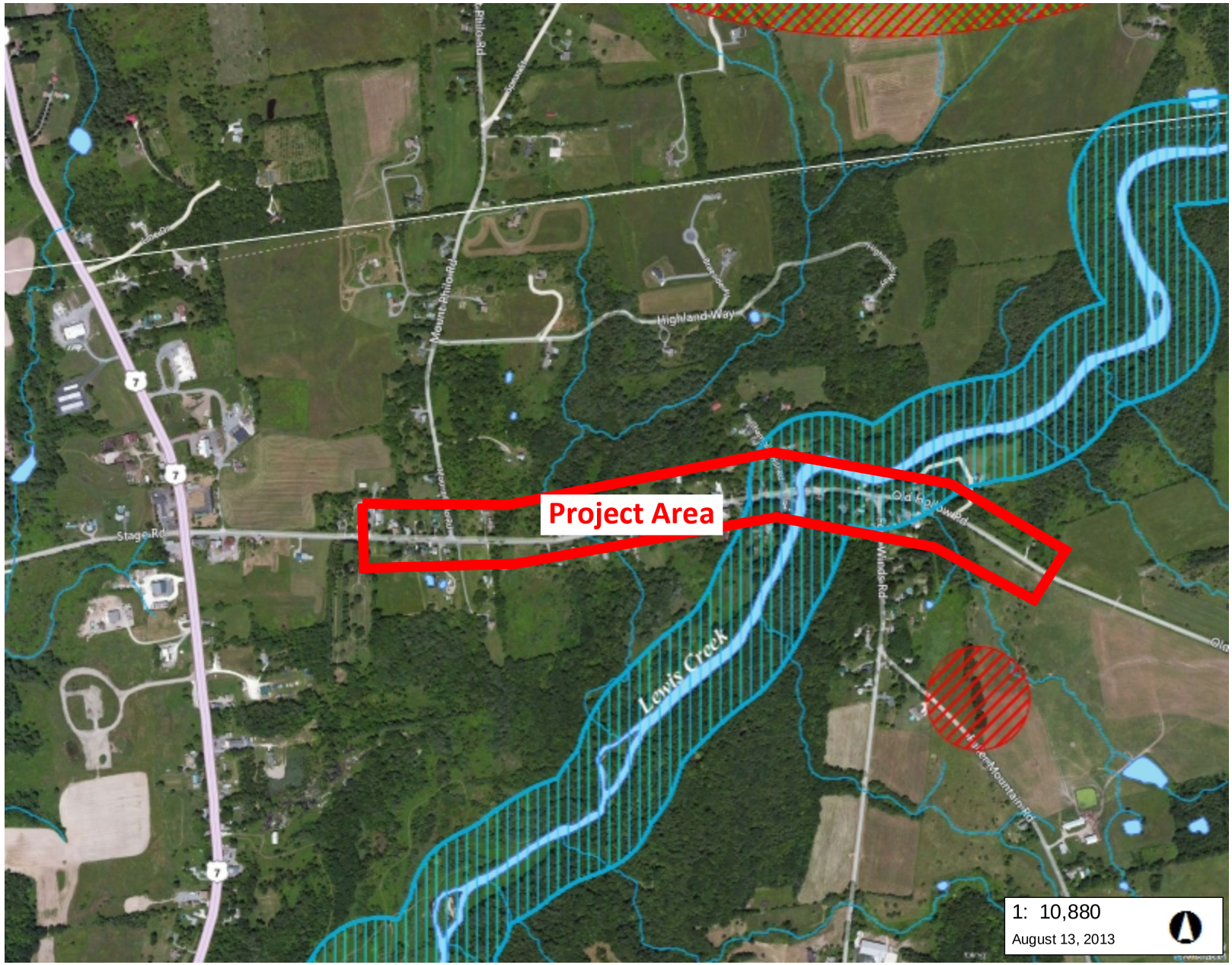
ATTACHMENT D

Vermont Agency of Natural Resources Natural Resource Atlas Results

Natural Resources Atlas

Vermont Agency of Natural Resources

vermont.gov



LEGEND

Invasive Plant Atlas
- Acer platanoides
- Berberis thunbergii
- Euonymus alatus

Rare Threatened Endangered
- Threatened or Endangered
- Rare

Significant Natural Community

Uncommon Species and Other
- Animal
- Plant
- Natural Community

Deer Wintering Areas

Indiana Bat Hibernacula

Waterbody

Stream

Town Boundary

NOTES

Map created using ANR's Natural Resources Atlas

553.0 0 276.00 553.0 Meters

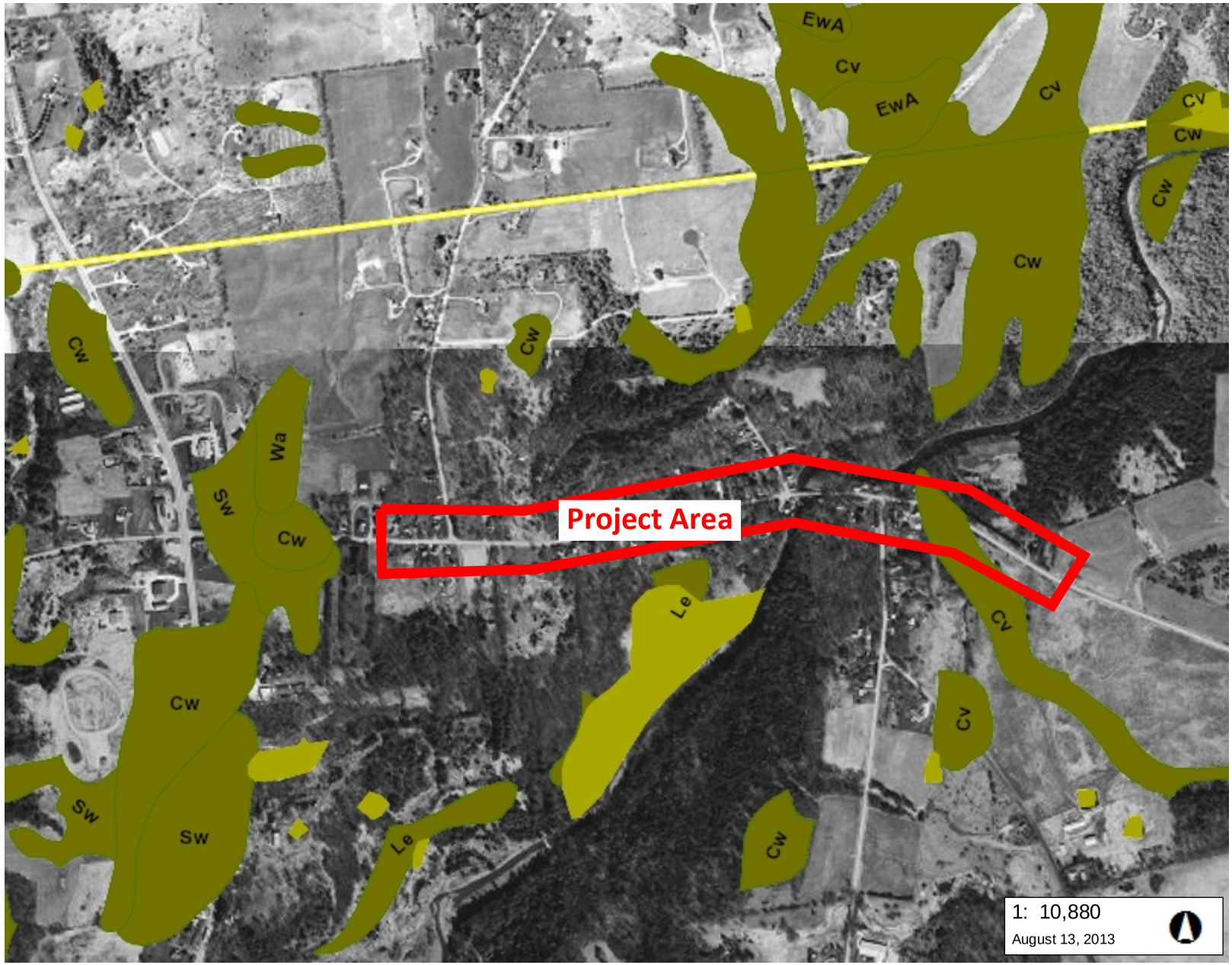
WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 907 Ft. 1cm = 109 Meters

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Natural Resources Atlas

Vermont Agency of Natural Resources

vermont.gov



LEGEND

- Wetlands - VSWI
  - Class 1 Wetland
  - Class 2 Wetland
- Wetlands - VSWI Advisory Lay
- Soils - Hydric
- Town Boundary
- County Boundary

NOTES

Map created using ANR's Natural Resources Atlas

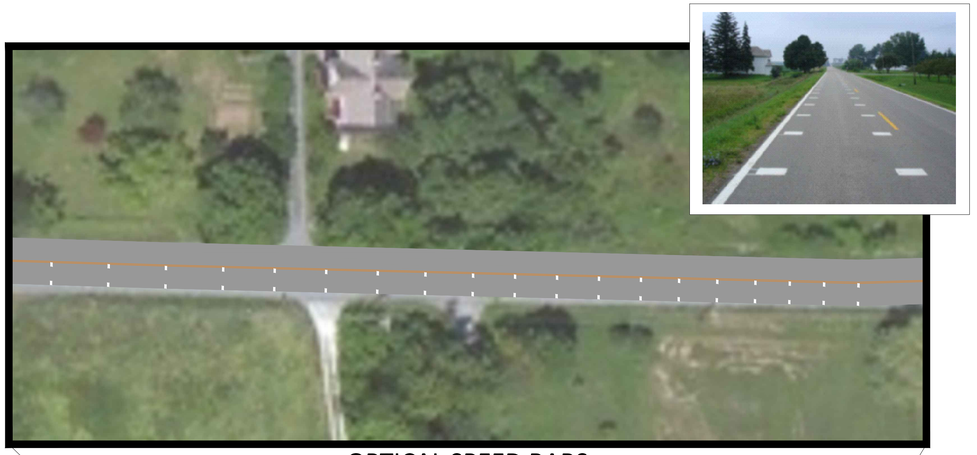
553.0 0 276.00 553.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 907 Ft. 1cm = 109 Meters

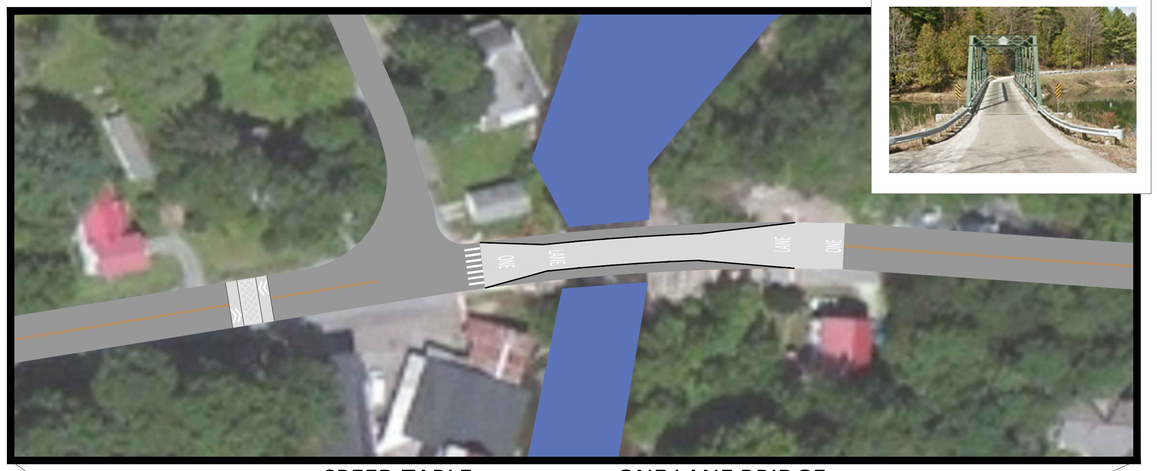
THIS MAP IS NOT TO BE USED FOR NAVIGATION

ATTACHMENT E

Recommended Traffic Calming Measures

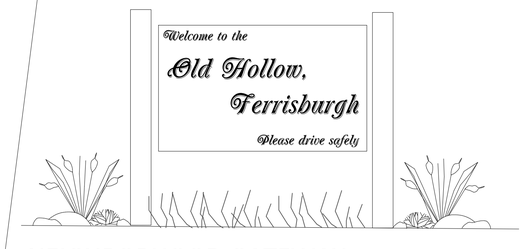


OPTICAL SPEED BARS



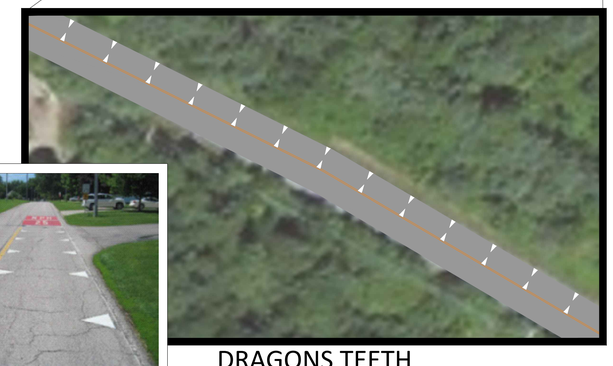
SPEED TABLE - ONE LANE BRIDGE

SPEED TABLE



NEIGHBORHOOD GATEWAY

RADAR SPEED FEEDBACK SIGN



DRAGONS TEETH

DRAFT

Town of Ferrisburgh
3279 Route 7
PO Box 6
Ferrisburgh, VT 05456
p: (802) 877-3429

Resource Systems Group, Inc
55 Railroad Way
White River Jct. VT 05400
p: (802) 295-4999 f: (802) 295-1006
www.rsginc.com

OLD HOLLOW ROAD TRAFFIC CALMING

FERRISBURGH, VT

DRAFT TRAFFIC CALMING ALTERNATIVES

REV	DESC.	DATE	BY	CHK

SCALE: NTS	SHEET 1 OF 1
DESIGNED BY: FG	
CHECKED BY: CM	
DATE: 8/19/13	
PROJ.NO: 13088	

Q:\Projects\VT\Addison County Regional Planning Commission\13088 - Ferrisburgh Old Hollow Road Traffic Calming\CAD\13088-Ferrisburgh Old Hollow Road.dwg

Old Hollow Road Traffic Calming Feasibility Study: Comments

From Al and Susan McKibben, residents of The Hollow:

We support a phased approach as implied by the report whereby one or more changes would be made and the results measured before deciding whether or not to implement more 'drastic' changes. Gateways and speed bars first, feedback signs next, and speed tables if necessary. We think the one-lane-bridge idea is unworkable for a variety of reasons.

First, a general comment, the report frequently refers to the "neighborhood". I assume that this is a convenient way to refer to the entire study area as shown in Figure 4 and not a reference to only the relatively flat area between Mt. Philo Rd. and Lewis Creek. The entire study area requires traffic relief and this needs to be made really clear in the report.

We have a specific concern about one statement in the draft report. On page 7, the last bullet states that: "The existing westbound transition zone from the rural east into the Old Hollow Road appears to be set too far east…." We live near this eastern end and are concerned about where the reduced speed zone begins. We have very limited sight lines from our driveway both east and west. As such, when on foot, we rely on being able to hear approaching traffic before crossing Old Hollow Road. We need as much warning as possible; any actions that did not slow down traffic as it passes our driveway (such as might happen if the speed zone was moved farther west) would put us at greater risk.

We have two suggestions:

SPEED TABLES - These appear to be highly effective. The report, however, suggests them only for "the neighborhood" "at the base of the Hollow Hill". What about east of the bridge? I think that the population density here is similar to many locations west of the bridge and, in fact, this area is where the highest speeds occur. With this in mind, we suggest a speed table at the eastern end of this corridor, perhaps east of Four Winds Road.

VISUAL CUES - Much of the focus on traffic calming appears to be on actions that will "increase the perceived risk without increasing the actual risk". We own the property that borders the road on the north side, east of the new bridge. There is a very wide shoulder here that the Town has developed as an open parking area. Opposite this on the south side is a steep bank with overhanging trees in front of our house and, next to this, Ted Pappadopoulos's house. If the openness of the north side shoulder was eliminated and replaced with a guardrail, fence, and/or substantial plantings the downhill approach to the bridge would appear to be more of a narrow corridor, much like the corridor of "old elms" described at Tuesday's meeting.

As you may know, we have been in dispute with the town for many years about their creation of this parking area. We would very much support its removal as part of an effort at traffic calming and would be willing to contribute financially to an effort along the north side of the eastern approach to the bridge that would create the visual effect of a

narrowing corridor, which I believe would have a significant calming effect on traffic in both directions. Additionally, with the parking removed, it would be possible to create a path or sidewalk that would connect from the bridge nearly to Four Winds Rd.

Also from Al: I have an additional thought about the placement of the eastern reduce speed sign/zone. The draft suggests that the current sign maybe too far east. The sign does certainly appear to be set in open farm land in advance of the village. However, I suggest that it may need to be set in this location in order to give sufficient warning to certain vehicles before they encounter the congestion, downhill grade, and curve at the eastern edge of the village.

A significant number of large, heavy vehicle use this route. Undoubtedly, these vehicles require more distance and, presumably, more warning than cars or motorcycles in order be able to slow down to a safe operating speed when approaching the village from the east. Hopefully, the report will not imply that this sign/zone could be moved farther west without consideration of the safe stopping distances of these vehicles at this location.

Also from Susan: I am not sure if this falls within the purvue of the traffic study, but I think the signs for the speed limit approaching from the east could be done with more visibility. The first one, that I believe means this speed is coming ahead, I think should actually say that, "Speed 35 ahead," and then the actual speed of 35 sign could be on the same pole with the curve graphic, for more impact, and could say, "start speed 35."

When it is time for a discussion of the actual speed limit and the possibility of changing it, I would like to give my opinions at that time. I realize that is a separate issue from this study.

From David Greenhaus, resident of The Hollow:

The issue is as much the type of vehicles that speed as the average speed. We know from observation that the worst offenders are large trucks and motorcycles. Why aren't these singled out in the analysis? It seems to me that speed bumps, or dips, are most likely to slow these guys down -- but I don't see those on the list of recommendations.

I like the idea of lowering the speed limit to 25 or 30mph, and installing radar speed feedback signs. Speed tables are my next choice, but I doubt they are as effective as bumps or humps. A gateway is a nice idea, because it looks nice and creates a neighborhood setting, however it seems to have limited effectiveness on the speeders.

Enforcement should be done regardless of the other measures employed. Speeding tickets are expensive, and points on one's license can be a great deterrent if you are a commercial truck driver or a motorcyclist that enjoys high speeds.

From Tom Drumheller, Ferrisburgh resident:

I was at the town meeting on the 20th of this month and got the impression that vertical and horizontal deflections were not favored, as is my opinion. I think that reducing the speed to 25mph and visual cues would work best. One sign on both the east and west slopes ought to be effective and possibly denoting the fact of a community in existence. There is a handmade sign now at the bottom of the hollow that says "Be Kind, Drive Slow", it is pretty effective.
A sign like this would be good.

From Eugenie Delaney, Ferrisburgh/Monkton resident:

I thought the report was great. I like all the measures proposed except the 1 lane on the bridge, which might prove dangerous?

From Alan Gebo, Monkton resident:

My name is Alan Gebo and I live in Monkton Vt. Although I am not a resident of Ferrisburgh, I feel that I must express my concerns about the Hollow traffic calming proposals, as these measures will also affect me, and others, as we travel thru the Hollow every day.
Last week I attended the traffic calming meeting and got a sense of what is going on. It appears that there are a certain group of Hollow residents that feel that “their” Hollow is not open to the public and want to take drastic measures to discourage outsiders from travelling thru “their” hollow. Remember, this is a public highway for use by everyone. Before I get into this too far, I want to say that this group of residents were spoiled when the bridge was out for repair and thru traffic was stopped. They got a taste of the perfect situation for themselves, and they really enjoyed it by having street parties and social gatherings in the roadway. I remember reading letters in the Addison Independent from Hollow residents saying how much nicer things were without the bridge there, and didn’t want it replaced. One person even said they considered putting something in the fuel tanks of the heavy equipment to hinder the progress of the new bridge construction, but they didn’t. Since the bridge has reopened and the situation is back to normal, some of the residents in the Hollow want Nirvana back.

It seems that the most vocal person was the woman who lives in the old Shortsleeve home (I don't know her name). She complained of all the traffic and the noise was making her life unbearable. Seems to me she made a bad decision when she moved into the place, as the road and her house have not moved since she moved in, and now she wants everyone that travels thru "their" hollow to be punished for making her life miserable. The others in the group that did the most complaining, are the ones who want the town to be run as they see fit, regardless of what the other town residents want. These are the ones who were instrumental in getting the Grange hall rebuilt and are now fighting the Champlain Oil convenience store project. I am sure you know who I am referring to.

After listening to the expert that was hired to study the situation and make recommendations, I sat back and listened to the Hollow residents really suck up what this guy was saying. Seems like the more drastic the traffic calming measure was to make travel more difficult (and dangerous), they liked it even more. For example, when he said that making the new bridge a one lane bridge was a crazy idea, they immediately jumped all over it. Do you see where I am getting at here?

I have no problem with some of his proposals, for example the gateways, optical speed bars/dragon's teeth, the radar feedback signs and increased law enforcement. The proposals that should not be considered are any measures that would alter the surface height or width of the road (speed tables, speed bumps, and the lane narrowing on the bridge). The bridge lane narrowing is just plain dangerous for motorist at any time, but especially dangerous in the winter time when roads are snow covered.

I travel the speed limit as I drive thru the Hollow. I know the sheriff sits down there fairly often, but you know, there always will be someone who has total disregard of the rules and speed thru the area. These are the people who need to be ticketed by law enforcement and fined. If the proposals that alter the road surface are implemented, it would be punishing the law abiding motorist. The posted 35 m.p.h. speed seemed to be acceptable to the traffic calming expert as it meets the 85th percentile speed. Slowing the speed limit to below 35 m.p.h. would be very difficult to comply with, as you have to ride your brakes now all the way upon entering the Hollow, as you have a long downhill from the West and a steep hill coming in from the East.

After the meeting broke, some folks including myself, chatted with other folks in the parking lot and expressed our thoughts about the situation. The woman from the old Shortsleeve home came over and we chatted. I explained to her that she should be careful on what she asks for, and I gave her an example. Speed bumps were installed in Vergennes as residents were complaining about the speed of vehicles going by. Some of the motorist returned the favor by honking their horns when they had to slow to crawl over the speed bumps. Needless to say, residents were irate and were getting into confrontations with motorist. Long story short, no more speed bumps.

Over the weekend, I entered the Hollow from Mt. Philo Rd. a few times, as I have to detour thru the Hollow to get home from the North, as the covered bridge is out in Charlotte (this detour is another factor of the increased Hollow traffic). I could not help but notice the sign as I approached the Ferrisburgh town line. It said "Welcome to Ferrisburgh". I did not get this feeling while I was sitting in the traffic calming meeting. Maybe that sign should be changed to "We don't want you in Ferrisburgh", or "Stay out of our Hollow".

I have said enough. I just wanted to explain that there are two sides to the situation, and not just the one sided opinions of the folks in the meeting. Thanks for listening.

From Martha Davis, resident of The Hollow:

I like a lot of the ideas put out there. It seems that the flashing speed sign is very effective, esp. for westbound traffic. I also like the idea of very clear signs at either end reminding people they are entering a "village" or neighborhood, though they may not be as effective long term. Kurt had a good idea of adding something "drive like your kids live here"
Maybe the cost is too much, but I think police/trooper presence over time is effective. Like was said, let's be known as a speed trap area. We are willing to give written permission to whomever to have police park in front of our barn.
The one lane bridge is interesting, but my first thought is safety of cars that come down the hill. Also how would that effect pedestrian traffic.
I wonder if it would be best to implement whatever strategies we decide on first, then reevaluate speed, the 85%, before starting any engineering study. Might have better success in lower limit.

From Melissa MacDonough, resident of The Hollow:

I have two comments:

1. I worry that creating a one-way bridge might create a traffic build up that may be a nuisance
2. It seems speed tables would be most effective, based on the percentages, at reducing the speed of traffic going through

And, a question:
1. Is the road too narrow to create a sidewalk? (I may have missed this if it was an earlier dialogue)

From Nina Falsen and Ken Oboz, residents of The Hollow:

While it seems good logic to focus on speed, which in turn addresses some noise concerns, noise does not appear to be a consideration of this study. Huge diesel trucks using air brakes and motorcycle "gangs" tear through the street making deafening noise.
Is there a way to direct truckers to not use airbrakes?
I believe some of the suggestions of the study are viable. But will pretty flowers and a sign really stop certain vehicle owners who speed towards rt.7 every morning? I rather doubt it. In my view the best deterrant to both noise and speed has always been speed bumps/tables.

I have noticed an increase in use of the Hollow by pedestrians and bicyclists. I would like to walk my dog but this is a scary undertaking! What about a sidewalk, costly no doubt, but it would get lots of use and would be a great visual cue that this is a neighborhood with kids, dogs and old folk like us.

From Roxie and Gene Lauer, residents of The Hollow:

Background information:

To put them in context, the following comments come from someone who lives at the far east end of Old Hollow Road. We are the last house on the right in the old village as you head toward Monkton, and, from the other direction, the first house on the left, just down from the crest of the hill heading west into the village. Hollow Road, and the hill, literally curves around our house (and outdoor deck -- traffic noise effectively, and frequently, renders conversation impossible).

We are acutely aware that this hill is all-too-often a place of noisy acceleration -- in both directions -- and we were not at all surprised to read that the highest speeds in the speed study were recorded here.

Having said that, here are some random thoughts and ideas re. the Traffic Calming study (and the project in general):

_____

1.1 -- Regulatory devices

Even though it was not included in this study, I think that a speed limit reduction to 25 mph should be pursued and, hopefully, implemented -- along with all of the appropriate signage warning of it well back from the crest of both hills leading into the hollow.

_____

3.1.1 -- Gateways

I love the idea of having beautifully-designed signs placed at the top of the hills leading into the village from BOTH sides of the Hollow, similar to the ones in Vergennes. There are several graphic designers in the village (including myself) who might be happy to donate their design skills to the
cause, though the signs would need to be purchased and installed.

They could say something like:

Welcome to [the [historic] village of]

[include a vintage photo here]

North Ferrisburgh, Vermont

Est. 1762.

Thickly settled.

(many signs in Massachusetts say "thickly settled" -- I love that -- it's quaint but gets the idea across that you're entering a residential area)

-- OR --

You are entering
North Ferrisburgh, Vermont

[vintage photo here]

Est. 1762.

Welcome to our village!

(the "Welcome...." message is somewhat personal and conversational and may appeal to the humanity of the driver).

_____

3.1.2 -- Optical Speed Bars

Like this idea, but the ones on Mt. Philo Road are already fading, so some thought to a more lasting medium might be considered.

_____

3.1.2 -- Dragon's Teeth

I don't like the look of these, compared to the bars.

_____

3.1.3 -- Radar Speed Feedback Sign

These always work for me -- at least the first few times I encounter them.

_____

3.1.5 -- Lane Reduction at the Lewis Creek Bridge

I have a number of concerns about the "one lane bridge" idea:

- Safety. I fear that it would create many accidents as people try to beat each other through -- or don't yield -- or con't stop in time to yield -- or don't notice in time even though there would, I'm sure, be many warning signs. Big trucks would probably bully the cars to be first to enter the lane.

- Noise. The large trucks would use their air brakes heading West down the hill, beginning right after our driveway.

- Winter. We live at the top of the steep hill, heading east toward Monkton, and often need to build up momentum to get up the slope on snowy days, and then up our driveway, successfully. To have to come to a complete stop at the bottom of the hill, might (under certain road conditions) mean that we'd lose momentum and couldn't make it all of the way to the top. This sometimes happens under current conditions.

- Someone suggested that the one lane bridge might be seasonal, only in the summer, but then I think there would be too much confusion. It would be hard enough to unlearn the two lanes, even more difficult to switch from one to two, seasonally. Plus, in the winter the markings might not even be visible.

The only good things: There would be more room for pedestrians, in theory anyway. And, when it worked, it would definitely slow the traffic.

_____

3.2.1 -- Enhanced streetscape environment

Street / village landscaping -- or village beautification -- to enhance the recognition that's it's a village, not a thoroughfare:

- Again, there are several landscape designers and/or engineers in the village who might be willing to donate their various skills toward coming up with a plan for the cause (my husband, Gene Lauer, for one). Cost could be a careful consideration.

- Sidewalks could be more organic than the classic concrete curbed ones, and therefore less expensive, perhaps. Depending upon regulations.

- Perhaps donations of time (labor) and materials could be organized and solicited?

- Maybe other opportunities for signage could be identified, too, to enhance the village identity, graphically.. Is the Mud Church sign still there? A sign for Lewis Creek access showing the mills from the past? A plaque for the Opera House? Assuming this can all be done informally and is not regulated heavily.

- - -

This relates to the Street / Village landscaping, above, and is just an observation I made while driving through the village after having read the draft of the Traffic Calming Report, recently.

Privacy hedges obscure the village streetscape.

As you drive in the village, many of the houses have thick privacy hedges. This is wonderful for the people in the houses, as it protects them from the sounds and sights of the traffic and from awareness of being near the street. To
someone driving along the street itself, though, it renders the houses invisible and it appears as though there are many fewer houses on Old Hollow Road than there actually are. The historic village "streetscape" is no longer visible. The impression is that North Ferrisburgh village is
much less populated than is truly the case.

Any changes to this would need to be voluntary, of course, since they involve private property. But if
there were a plan and discussions between the landowners and designers might come
up with some happy compromises like strategic hedge removal or selective pruning or peek-a-boo views.

_____

From Ted Pappadopoulos, resident of The Hollow:

I thought that the lane reduction and speed tables offered the highest potential speed reduction resource while we plan to use other methods and propose a sidewalk and visual reminders in the long term.

I would suggest they are also easily sustained, where as paint and signs tend to fade quickly and become ubiquitous and are a stretch for our currently underfunded and over-matched roads manager and team.

I like the idea of removing the lane reduction for the winter months NOV - APR

I am surprised, the parking on the side of the road just east of the bridge was not mentioned in the study, but clearly, no time was spent by RSG actually observing how this road functions with eyeballs. This data (the remedies and %s) is readily available anywhere and was just added to the street sensor data for our neighborhood.

I would personally match the town money spent dollar for dollar for both these implementations.

Also from Ted: It would be nice to request a parking ban for 200 ft on either side of the bridge in the proposal. It costs nothing and there is plenty of space to access the creek area without parking in it.

From Judy Chaves, resident of The Hollow:
I'd be in favor of any measures that would not only slow traffic but make Old Hollow Road a less desirable route for heavy trucks. There are other roads in the area that are less densely populated and more appropriate for such traffic. So I'd be in favor of reducing the bridge to one lane and installing speed tables. Each of these measures could be installed/removed as seasonal needs dictate.

Radar speed feedback signs are a great idea. I'd suggest one for each direction—not on the flat of the road as suggested (this strikes me as too far into the Hollow, i.e., too late to have much effect) but as drivers are coming down the hills into The Hollow.

Gateway signs would be nice and could probably be designed and possibly made by Hollow residents (there are graphic artists and woodworkers living here).

Enhancing the streetscape—planting roadside trees, building a narrow footpath (rather than an elaborate and expensive sidewalk), coming up with other village-like enhancements—is a long-term project that those of us living in the Hollow need to start discussing and planning with the select board.

Finally, I think the speed should be reduced to 25 or—at the very least—30, and there should be more enforcement of that speed limit. As others said at the Aug. 20 meeting, I'd love for The Hollow to be known as a speed trap.

ATTACHMENT F

Effectiveness of Radar Speed Feedback Signs & Other Traffic Calming Techniques: A Test Case in Shelburne Vermont, 2006 - 2012

Effectiveness of Radar Speed Feedback Signs & Other Traffic Calming Techniques:

A Test Case in Shelburne, Vermont
2006-2012
Sep 2013

Addison County
REGIONAL PLANNING COMMISSION

Final Draft

Effectiveness of Radar Speed Feedback Signs & Other Traffic Calming Techniques:
A Test Case in Shelburne, Vermont: 2006-2012
Final Draft: 16 September 2013

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http://www.acrpc.org/

The effectiveness of deploying radar speed feedback signs as a traffic calming strategy is up for some debate. A number of studies have indicated that these units have a varying level of success in slowing traffic (FHWA, 2009). Roads posted with slower speed limits (generally 40 mph or less), such as school zones or neighborhood collectors may yield more favorable results, where higher speed roadways may tend to demonstrate less effective reduction in traffic speeds. Furthermore, some Vermont municipalities have reported that drivers actually speed up to see how high a speed they could register. In such case, some signage may be set-up to display the text "Slow Down" when a driver exceeds a pre-determined speed limit. Nevertheless, the installation of radar feedback signs is often perceived as a positive effort to control speed by nearby residents. Further information on the effectiveness of radar speed signs may be reviewed in the paper: *"Effective Deployment of Radar Speed Signs"* (Veneziano, Hayden & Ye, 2010).

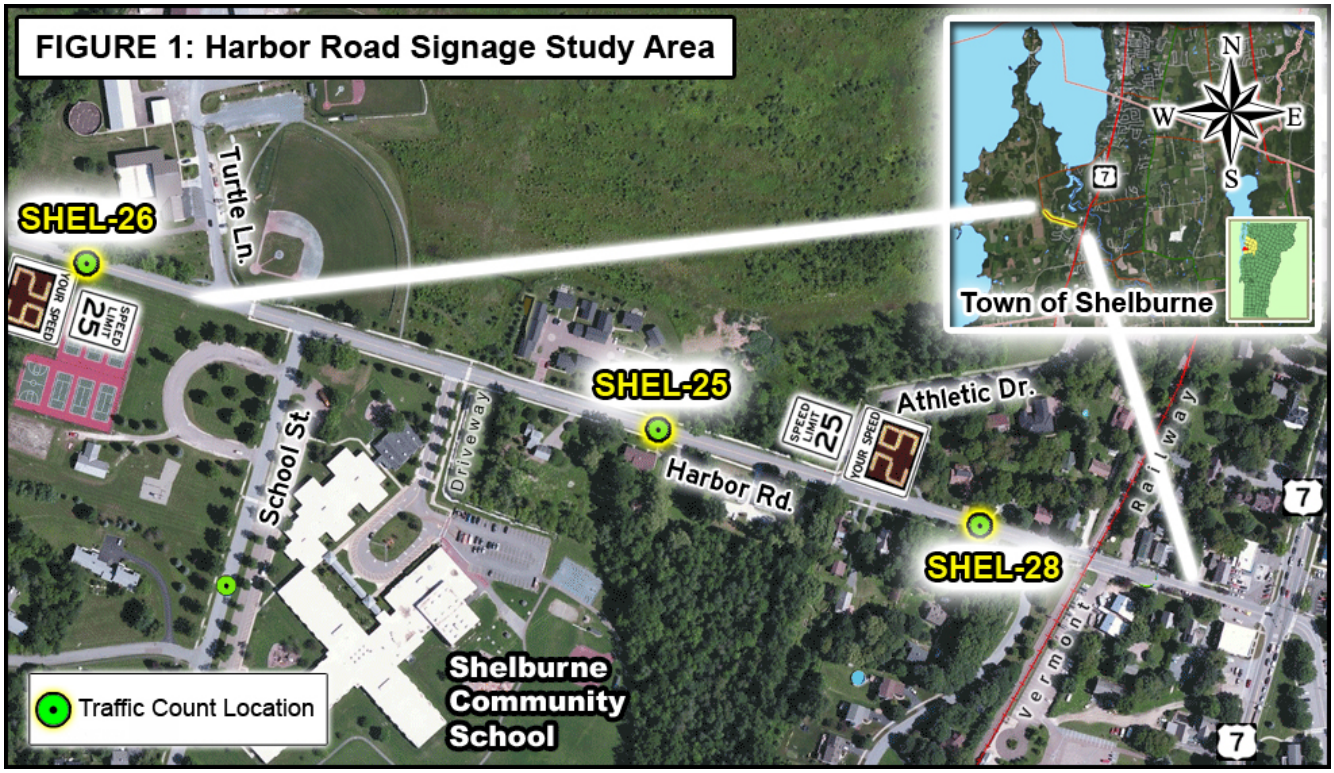
Impacts on Speeds

In response to requests from Addison County municipalities to research the effectiveness of radar speed feedback sign applications within a rural Vermont context, Addison County RPC (ACRPC) implemented evaluation of traffic speed captured at locations where signs had been installed. Thus far, two sites in the nearby community of Shelburne, Vermont have been successfully evaluated for observed reduction in traffic speeds utilizing Automatic Traffic Recorders (ATRs).

There are numerous models of solar and/or battery powered signs available, which utilize radar technology to display to drivers (and record) their vehicle speed. The State Agency of Transportation has adopted a policy to enable communities to install Radar Speed Feedback Signs within the rights-of-way of the State Highway System (VTrans, 2009). Within rural Vermont there are local examples of municipalities which use this equipment as an intended low-cost strategy (when compared to increased speed enforcement) to lower traffic speeds. Examples of small portable sign mounted units have been utilized by the Town of Middlebury (which are planned for future evaluation). There are permanent installations of larger pole-mounted, solar-powered units in Hinesburg, Vermont on Silver Street, and in Shelburne, Vermont on Webster Road and Harbor Road (near the Shelburne Community School). This paper attempts to evaluate the installation of two signs at the latter location using traffic speed data collected before and after the signs were installed.

A Time-Comparison Study on Harbor Road in Shelburne, Vermont

ACRPC tested the change in 85th Percentile Speed of two radar speed feedback signs at three locations along Harbor Rd. in Shelburne (see **Figure 1**), using ATR data, which was collected before and after the signs were installed in 2012 (*a time-series animation of traffic calming implementation on Harbor Road from 2006-2012 is available at this link*).



Harbor Road is a Class 2 roadway with a Functional Classification of 17 – Urban Major Collector. Most of the study area exists within the Shelburne Community School's school traffic zone. **Table 1** indicates the Annual Average Daily Traffic (AADT) and Truck AADT calculated along Harbor Rd. during the study period.

Table 1. Annual Average Daily Traffic (AADT) and (Truck Traffic) for Harbor Rd.			
Year of Count	SHEL-26	SHEL-25	SHEL-28
2012	***2100*** *(70)*	***3500*** *(130)*	***3700*** *(120)*
2010	***1800*** *(150)*	***3600*** *(130)*	***4500*** *(170)*
2006	***1700*** *(130)*	***3600*** *(160)*	*n/a*

Test Site 1 (SHEL-26) Harbor Road: Western Location *(Eastbound speed limit changes from 35 to 25 mph)*

ATRs were set up in 2006, 2010 and 2012 at the signpost west of the Turtle Lane intersection on Harbor Road (see **Figure 1**). This location is also where a new radar speed feedback sign was installed to replace the 25 mph posted speed limit sign in 2012. This is the exact position where each ATR count occurred in for all three time periods. **Table 1a** indicates the changes in measured 85th percentile speed captured between 2006-2012.

TABLE 1a. SHEL-26 : 85th Percentile Speed Data		
Posted Speed : 25 mph	Eastbound Direction	Westbound Direction
Oct/Nov 2006	*41 mph*	*43 mph*
Nov 2010	*39 mph*	*40 mph*
Oct 2012	*33 mph*	*37 mph*
Δ from 2010-2012	***-8 mph***	***-6 mph***

The reduction of 85th percentile speed between 2006 and 2010 may have resulted from the installation of a fluorescent pedestrian warning sign just to the east of the SHEL-26 count location in 2009. Nevertheless, there was an additional 3-6 mph reduction between 2010 and 2012. The significant 6 mph reduction in the eastbound direction during this period is likely indicative of an often observed effect of a radar feedback sign installed within a transition zone between a rural high-speed location, and a lower speed suburban school zone (Sandberg, Schoenecker, Sebastian & Soler, 2006). This reduction is also reflected in the 10 mph Pace Speed (which averages a little over 60% of the total traffic counted at this location) and the Average Speed (See **Table 1b** and **1c**).

TABLE 1b. SHEL-26 : 10 MPH Pace Speed Data		
Posted Speed : 25 mph	Eastbound Direction	Westbound Direction
Oct/Nov 2006	*31-40 mph*	*31-40 mph*
Nov 2010	*31-40 mph*	*31-40 mph*
Oct 2012	*24-33 mph*	*29-38 mph*
Δ from 2010-2012	***-7 mph***	***-2 mph***

TABLE 1c. SHEL-26 : Average Speed Data		
Posted Speed : 25 mph	Eastbound Direction	Westbound Direction
Oct/Nov 2006	*35 mph*	*37 mph*
Nov 2010	*33 mph*	*34 mph*
Oct 2012	*28 mph*	*33 mph*
Δ from 2006-2012	***-7 mph***	***-4 mph***

FIGURE 2: Harbor Road (SHEL-26) Eastbound (left) / Westbound (right), 2012

Figure 2 illustrates the transition zone along Harbor Rd. where eastbound traffic (left) transitions from a 35 mph posted speed limit to 25 mph with a clear view of the sign's readout. The westbound traffic (right) does not face the readout.

Test Site 2 (SHEL-25) Harbor Road: About 430 ft. East of School Driveway *(Posted speed limit: 25 mph)*

ATRs were set up in 2006, 2010 & 2012 at GMPC Pole #12 between Athletic Drive and the Shelburne Community School on Harbor Road (see **Figure 1**). This is the exact position each ATR was installed during all three data collection periods. **Table 2a** shows the primary speed reduction occurred between the 2010 and 2012 period.

TABLE 2a. SHEL-25 : 85th Percentile Speed Data		
Posted Speed : 25 mph	Eastbound Direction	Westbound Direction
Oct/Nov 2006	*35 mph*	*38 mph*
Nov 2010	*35 mph*	*37 mph*
Sep 2012	*32 mph*	*33 mph*
Δ from 2006-2012	***-3 mph***	***-5 mph***

Unexpectedly, the results (illustrated in greater detail in the *time-series animation*) appear to indicate that the installation of pedestrian crossing signs, painted crosswalks, and accompanying curb extensions (i.e. bulb-outs) in 2009 had little to no effect in reducing the 85th percentile speed at this location. However, after the 2012 installation of a radar feedback sign (about 300 ft. to the east of the ATR setup), this location had an observed 3-5 mph reduction in 85th percentile speed. This reduction is minimally reflected in the 10 mph Pace Speed, which averaged just under 70% of the total traffic counted at this location for all of the 2006-2012 counts (See **Table 2b**). The Average Speed had reduction particularly in the westbound direction (See **Table 2c**), heading towards the School driveway from Athletic Drive. This direction of travel had the view of the sign's readout.

TABLE 2b. SHEL-25 : 10 MPH Pace Speed Data		
Posted Speed : 25 mph	Eastbound Direction	Westbound Direction
Oct/Nov 2006	*26-35 mph*	*26-35 mph*
Nov 2010	*26-35 mph*	*26-35 mph*
Sep 2012	*24-33 mph*	*25-34 mph*
Δ from 2006-2012	***-2 mph***	***-1 mph***

TABLE 2c. SHEL-25 : Average Speed Data		
Posted Speed : 25 mph	Eastbound Direction	Westbound Direction
Oct/Nov 2006	*29 mph*	*32 mph*
Nov 2010	*29 mph*	*31 mph*
Sep 2012	*28 mph*	*28 mph*
Δ from 2006-2012	***-1 mph***	***-4 mph***

Figure 3 illustrates the school zone traffic just after school had been dismissed for the afternoon. Although pedestrians had been observed to consistently use the sidewalks (left), there were also a high number of bicyclists and school busses sharing the road, which ensured low traffic speeds during this time-period. The 2006-2012 ATR installations were setup on the 1st telephone pole shown in the eastbound view of **Figure 3**, and in the westbound view in **Figure 4**,

FIGURE 3: Harbor Road (SHEL-25) Eastbound (left) / Westbound (right), 2010

FIGURE 4: Harbor Road (SHEL-25) East of School Driveway ~ Westbound, 2012

which also shows the ATR setup capturing a westbound vehicle's speed after passing view of the radar sign's readout.

Test Site 3 (SHEL-28) Harbor Road: Eastern Location *(Posted speed limit: 25 mph)*

ATRs were setup in 2010 and 2012 at GMPC Pole #6 between Athletic Drive and the Railroad crossing on Harbor Road, about 350 ft. east of where the radar feedback sign was eventually installed in 2012 (see **Figure 5**). This is the exact position where each of the ATRs were installed for both count periods.

FIGURE 5: Harbor Road (SHEL-28 ATR setup) West of RR X-ing ~ Eastbound, 2010

Figure 6 is a westbound view of this location where it is observable that a sidewalk had been constructed along the northern side of Harbor Rd. (right) between 2010 and 2012.

FIGURE 6: Harbor Road (SHEL-28 with ATR) West of RR X-ing ~ Westbound, 2012

The new sidewalk was installed from Athletic Drive to a location near the railroad crossing to the east of this location (see **Figure 5**). It is inconclusive whether the presence of the sidewalk had any effect on driver perception, and hence the speed of traffic. Nevertheless, the radar feedback sign may be seen roughly 340 ft. ahead of this position (circled area within **Figure 6**). Although it may not seem evident from the view in **Figure 6**, vehicle speed feedback is clearly observable to drivers from this location. **Figure 7** shows a closer view of the sign and pedestrian crossing ahead.

FIGURE 7: Harbor Road Radar Feedback Sign & Ped Crossing ~ Westbound, 2012

Table 3a indicates an observed 85th percentile speed reduction of 3 mph for each direction of travel between 2010 and 2012 (captured at the location shown in **Figure 5** and **Figure 6**).

TABLE 3a. SHEL-28 : 85th Percentile Speed Data		
Posted Speed : 25 mph	Eastbound Direction	Westbound Direction
Nov 2010	*34 mph*	*34 mph*
Oct 2012	*31 mph*	*31 mph*
Δ from 2010-2012	***-3 mph***	***-3 mph***

Table 3b & **Table 3c** indicate the same 3 mph reduction occurred in both the Average Speed and the 10 mph Pace Speed (which averaged between 70-78% of the total traffic count conducted in 2010, and 60-68% of the total 2012 count).

TABLE 3b. SHEL-28 : 10 MPH Pace Speed Data		
Posted Speed : 25 mph	Eastbound Direction	Westbound Direction
Nov 2010	*26-35 mph*	*26-35 mph*
Oct 2012	*23-32 mph*	*23-32 mph*
Δ from 2010-2012	***-3 mph***	***-3 mph***

TABLE 3c. SHEL-28 : Average Speed Data		
Posted Speed : 25 mph	Eastbound Direction	Westbound Direction
Nov 2010	*28 mph*	*29 mph*
Oct 2012	*25 mph*	*26 mph*
Δ from 2010-2012	***-3 mph***	***-3 mph***

Further Observations

It may be observed that the greatest reduction of speed occurs where traffic faces the sign readout (e.g. Westbound traffic for SHEL-25 after passing the sign, and Eastbound traffic for SHEL-26 at the signpost). Although this model of the radar speed feedback signage faces only one lane of traffic, there is an observable collateral speed reduction effect for the opposite lane.

The cause of this "effect" is unclear from a review of published literature. It may be possible that since most of the traffic within the study area originated from either end of Harbor Rd. (and not School St. – see **Figure 1**) where it passed view of a feedback sign readout, that a slower traffic speed was therefore established. Drivers may have then chosen to maintain their slower speed because they perceived the internal school zone characteristics (e.g. MUTCD-compliant fluorescent signage, bump-outs, crosswalks, etc.). It is also possible that the slower speed of oncoming traffic may have simply influenced drivers to reduce their speed.

Conclusion

Pedestrians experience vehicle speed much faster than do drivers. Findings from a recent study indicate that the average rate for a "severe injury" to occur for a pedestrian struck by a vehicle (e.g. auto, light-truck, and SUV) is about 10% at an impact speed of 16 mph. These "severe injury" statistics increase to a rate of 25% at 23 mph, 50% at 31 mph, 75% at 39 mph, and 90% at 46 mph (AAA, 2011). For children and elders, these statistics are more dramatic.

"The average risk of death for a pedestrian reaches 10% at an impact speed of 23 mph, 25% at 32 mph, 50% at 42 mph, 75% at 50 mph, and 90% at 58 mph. Risks vary significantly by age. For example, the average risk of severe injury or death for a 70-year-old pedestrian struck by a car travelling at 25 mph is similar to the risk for a 30-year-old pedestrian struck at 35 mph." (AAA, 2011)

The example of count location SHEL-26 demonstrates a successful scenario of good traffic calming practice. It may further emphasize the sign's effectiveness by observing a traffic count conducted less than a mile to the west of this location, which measured an 85th percentile speed of 48 mph (Chittenden County RPC, 2007). In any event, for this sign installation both the potential "severe injuries" and the "average risk of death" for pedestrians decline by about 25% when considering the aforementioned crash statistics.

It can be a daunting task to convince drivers to obey posted speed limits without deploying greater enforcement. The data presented from this study demonstrates that radar speed feedback signs offer municipalities a somewhat low-cost solution to help meet the need of lowering speeds on local roads.

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Glossary

10 mph Pace Speed (or "Pace Speed"): The 10 mph range in which the highest percentage of vehicles are traveling,

85th Percentile Speed: The maximum speed at which 85% of all vehicles are travelling.

Annual Average Daily Traffic: A statistical indicator for roadway counts (i.e. traffic volume), known as the 'Annual Average Daily Traffic', or AADT, has been developed to represent the average amount of vehicular traffic in both directions of travel, passing on a given point of road, over a 24-hour period, on a typical day (i.e. seasonally adjusted) of a specified year.

Average Speed: The statistic used to describe the typical (average or mean) value for a group of values that is calculated by dividing the sum of the observed values by the number of observed values.