HUNTINGTON TRAFFIC CALMING PLAN

Final Report

Prepared for:
Chittenden County Metropolitan Planning Organization
Town of Huntington, Vermont

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With
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INTRODUCTION

The Town of Huntington is concerned about the high speeds of traffic through the village centers of Lower Village and Huntington Center, and has approached the Chittenden County Metropolitan Organization (CCMPO) for technical assistance on this issue.

This report describes a plan of traffic calming strategies that can be implemented over time to achieve the desired reductions in travel speeds. "Traffic Calming" is a set of traffic engineering strategies that through a variety of mechanisms result in lower traffic speeds. A brief introduction to traffic calming is attached to this report.

Traffic calming should result in a safer and more pleasant village environment. Slower traffic speeds greatly increase safety for both vehicles and pedestrians, as through drivers are more likely to be able to detect and avoid potential conflicts with other road users. In addition, it can help to create a quieter and more pleasant environment for the Huntington's village centers.

BACKGROUND

The Town of Huntington has experienced gradually increasing traffic volumes over the past twenty years, with traffic speeds high enough to create an unsafe and uncomfortable environment for pedestrians in Lower Village and Huntington Center. CCMPO has provided technical assistance to the Town of Huntington to explore traffic calming concepts as a response to this situation. Smart Mobility, Inc. is under contract to the CCMPO to provide technical assistance to CCMPO communities, and has prepared this draft report on possible approaches to traffic calming in Huntington's villages.

The following sources and information were reviewed in developing this report:

- April 2, 2007 Memorandum from David Roberts, CCMPO to Ed Wildman, Town of Huntington with results of traffic speed monitoring in Lower Village and Huntington Center.
- October 16, 2007 Memorandum from David Roberts, CCMPO to Ed Wildman, Town of Huntington with additional results of traffic speed monitoring in Lower Village.
- Public Meeting on Wednesday, November 7, 2007, facilitated by the selectboard, which included a presentation by Smart Mobility on traffic calming concepts and discussion and reaction by the community.
- Site Visit with CCMPO and Town Officials on December 4, 2007.
- Review of Huntington Town Plan, dated June 18, 2007.
- Input and discussion at meeting with Traffic Calming Committee, February 27, 2008.
- Public Meeting in Huntington to present draft report, May 14, 2008.

Huntington Town Plan Guidance

The town plan frequently references goals to strengthen the role of the village centers, and to encourage growth that follows the historic settlement patterns emphasizing village center growth. In particular, the following passages suggest the importance of a safe and attractive pedestrian and residential environment in the village.

> "reinforcing historic settlement patterns, to the extent that is feasible, by focusing growth in the village centers" . . .
>
> "In an effort to reduce the stress on agricultural and forestland, the Huntington Town Plan provides for greater development densities in the areas designated as Village Districts I and II—which include the Lower Village, Huntington Center, and Hanksville." . . . .
>
> "The purpose of the Village District is to: 1) encourage a concentrated mix of higher density residential, commercial, and civic development that is compatible with traditional patterns of subdivision and development in the district; and 2) protect agricultural land and open space areas that functionally and visually define village boundaries. Efforts should continue to revitalize the village neighborhoods, especially in Huntington Center, the Lower Village, and Hanksville.
>
> Overall goals for this district are to:
> - Encourage the social, cultural, and historic aspects of the village communities
> - Provide community services efficiently
> - Preserve the viability of Prime Agricultural Soils in the district
> - Promote safe and efficient transportation and pedestrian patterns
> - Protect open space" . . . .

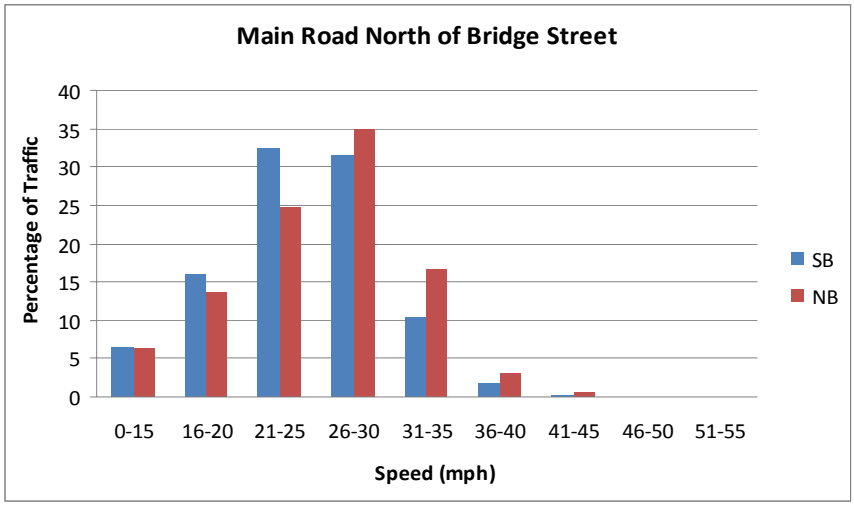
Traffic Speed Data

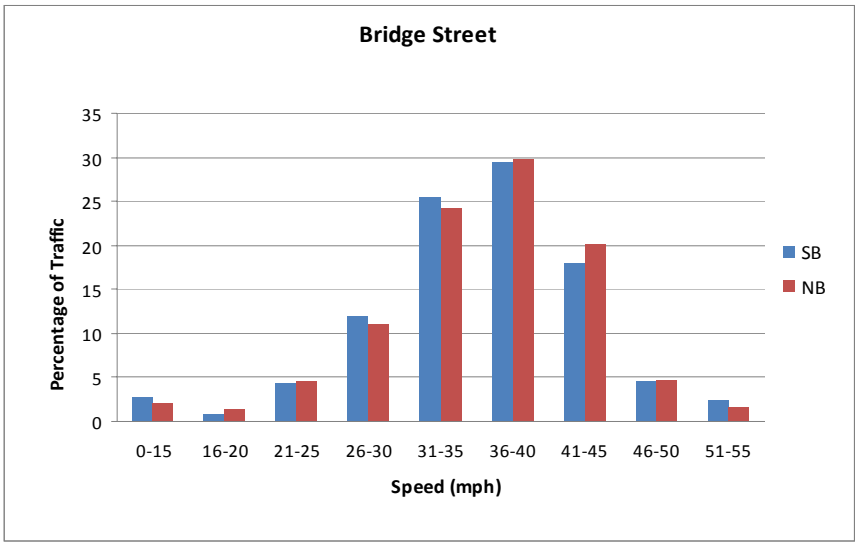
The CCMPO staff collected traffic volume and speed data in April and October, 2007, which provides detailed information about the traffic speed profiles in several locations in Huntington's two villages. The two memorandums summarizing the data are attached. The following charts show more information about when and where speeding is more prevalent. In all three locations shown below, the speed limit is posted at 25 mph. However, actual travel speeds are substantially higher, shown in the table below: The 85th percentile speed is the speed at which 15% of drivers are exceeding. Speed limits are generally set with a goal of the 85th percentile speed equaling the speed limit, i.e. on average, 15% of drivers are "speeding".

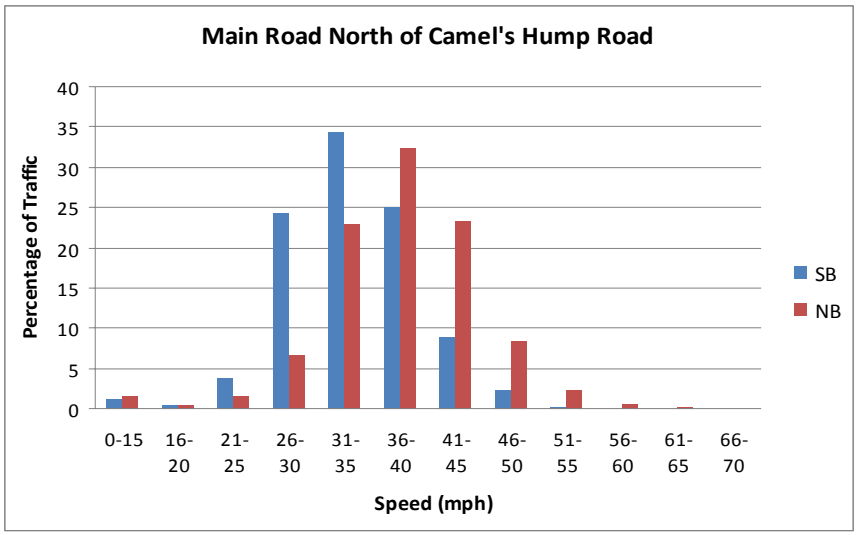
Table 1: 85th Percentile Speeds

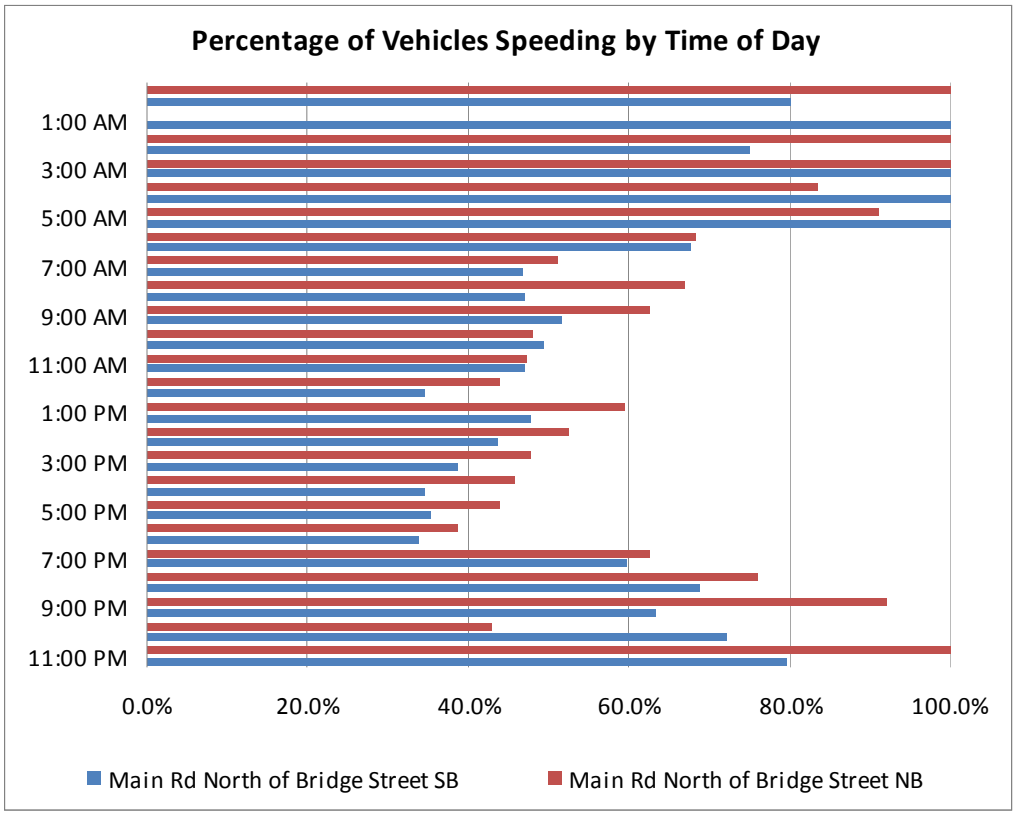
Street	Direction	85th Percentile Speed
Main Road 0.2 mi North of Bridge St	NB	46 mph
	SB	44 mph
Main Rd immediately north of Bridge St	NB	32 mph
	SB	30 mph
Bridge St 0.8 mi north of bridge	NB	32 mph
	SB	32 mph
Bridge St 0.1 mi north of bridge	NB	44 mph
	SB	43 mph
Main Road 0.5 miles north of Camels Hump Rd	NB	44 mph
	SB	40 mph

The following charts show the traffic speed data in more detail.









The above chart shows that there are relatively fewer speeders during the mid-day hours on Main Road near Lower Village, but during the evening hours, speeds are substantially higher. The patters for the other two locations (Bridge Street, Main Road near Camels Hump Road) show high levels of speeding throughout the day.

A few things can be determined from the above data. Speeds in the central portion of Lower Village, both on Bridge Street and Main Road, are well above the posted speed limit of 25 mph. Just north of both Huntington Center and Lower Village, speeds are very high for a village location, well above the speed limit. These speeds are high enough to cause concern for the safety of pedestrians, bicyclists, and other drivers for this village area. The following general conclusions can be drawn from this data:

- The traffic speeds in both villages are too high to provide a safe environment for pedestrians, especially as there are no sidewalks and pedestrians share the right-of-way with vehicular traffic.
- The prevailing speeds also pose safety concerns given the level of on-street parking activity in Lower Village.
- Traffic speeds seem to be lower during the middle of the day, and higher during commuting hours and nighttime.

Public Meeting Input

A public meeting was held November 4, 2007, as part of a selectboard meeting to discuss concerns related to traffic speeds in the village areas and to introduce the concepts of Traffic Calming as part of a solution. A number of issues were discussed at the meeting, with the following items to be considered in this project:

- Effectiveness of Speed Enforcement by Vermont State Police should be reviewed, and possibly increased
- Need for a cross walk on Main Road by the Post Office
- Main Road at the curve by Jaques' (particularly coming down the hill and directly in front of the store)
- Bridge Street – particularly between the Bridge and Mayo Road
- Intersection of Main Road and Camels Hump Road in Center
- Need to look at a more gradual speed transition – currently, the speed change is very abrupt in some places, like at the cemetery in the Lower Village

Site Visit

A site meeting was held on December 7, 2007 with MPO staff and Town Officials. This included observations of traffic patterns, field measurements of road widths, and identifying locations with restricted sight distance. The following photographs (taken in October, 2007) illustrate some of the observations and locations of concern. The photos below were generally taken while traveling in a southbound direction, starting at the north end of Lower Village, and then continuing through Huntington Center.

Main Road new Library: Road width is 25 feet, which would allow for re-allocation of the right of way to allow more space for pedestrians.

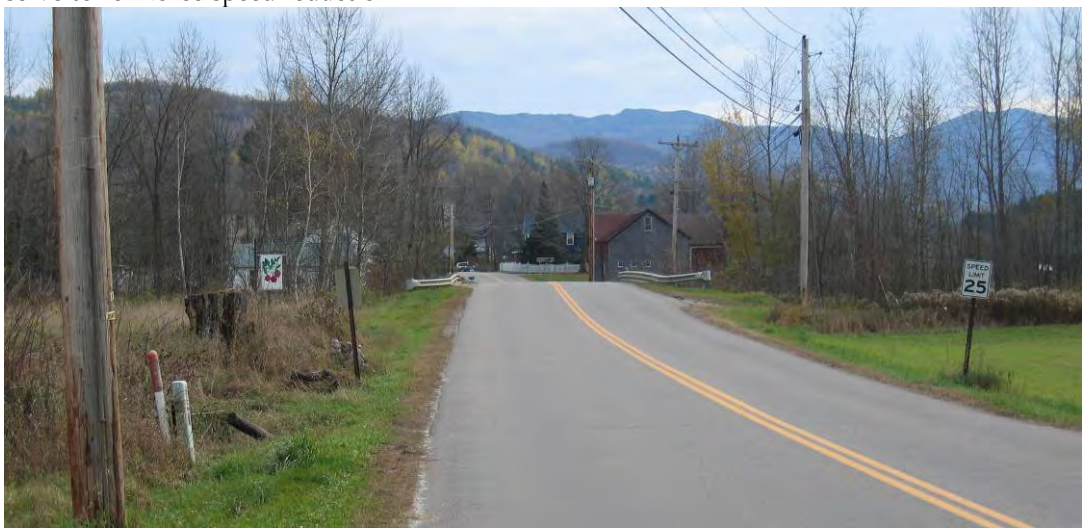
Approaching Store: Undefined edge of roadway/pedestrian area/parking area. Width approximately 27 feet.

Width betweens Jacques Entrance and Triangle is approximately 39 feet, with little definition of traveled way, parking areas, and pedestrian areas.

Poor sight distance for northbound and southbound (shown below) traffic on Main Road and traffic exiting East Street; wide paved area with undefined and variable traffic behavior

Huntington Center

Entrance to Huntington Center is an abrupt change from 45 mph to 25 mph, with straight road that does not serve to reinforce speed reduction.



Wide area at intersection with Camels Hump Road, school traffic turning. Main Road is very straight through village with no features serving to reduce speed.

Pedestrian Crossing for school use is on a diagonal, which means children are exposed in traffic for longer than necessary.

Leaving Huntington Center traveling south, with rural setting and very straight road provides few features to reduce speeds.

TRAFFIC CALMING TEHCNIQUES

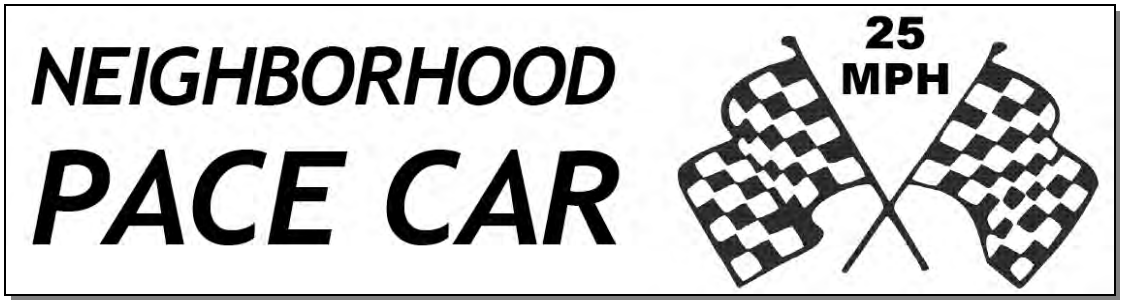
Traffic calming, or reducing speeding, can be accomplished using a variety of different tools. It is important to consider the specific goals of a traffic calming effort. In general, traffic calming is more effective at reducing the number of people who are speeding excessively, such as 10 mph over the speed limit, rather than reducing the average speed. Many monitoring studies of traffic calming programs have found that there is little change in the average speed, and perhaps very little change in the 85th percentile speed, but a noticeable reducing in the number of drivers at very high speeds. The following are proposed as goals for a traffic calming effort in Huntington:

- Reduce the number of drivers with excessive speeds
- Provide more reinforcement to drivers of posted speeds
- Increase safety and comfort for pedestrians
- Support economic and civic life of Lower Village and Huntington Center

These goals will best be accomplished by a combination of "behavioral" and physical traffic calming. Among the behavioral types of activities include speed enforcement, and efforts to increase awareness of speeding.

Enforcement can be conducted through contracting with the Vermont State Police, which is already conducted to some degree in Huntington.

Another type of activity that can help result in a noticeable decrease in speeding is the "pace car" concept, where through an education campaign, local drivers make a commitment to drive the speed limit whenever they pass through town. Many Vermont communities are participating in "Safe Routes to School" activities, supported through CCMPO or VTrans, and are undertaking "Traffic Tamers" education campaigns. This involves working through the schools to encourage parents to consider themselves "pace cars" as they travel through areas with reduced speed limits. The following is an example of bumper stickers that are distributed in these communities.



The attached overview maps show the locations of the major "physical" traffic calming features proposed for each village. The features can generally be described as gateway elements, cross section treatments, and roadway reconfigurations. Below is discussion of the specific features included in the proposed plan.

Gateway Treatments

There are several possible elements that can be used to better define the gateways into each village. These will be primarily "information" traffic calming, alerting drivers to the change in conditions and expectations. The following are possible treatments to include in the gateway areas.

Speed Radar Feedback Signs

Radar feedback signs are an element that can be both educational, as drivers often don't realize how fast they are going, and also can provide information to the town about the success of the traffic calming efforts, as these signs also have data collection options.

Research compiled by the Transportation Research Board in recent years has indicated that these signs are very effective for reducing speeds in areas where pedestrians are common.

Sign manufacturers are willing to install signs temporarily on a trial basis at no charge, and use universal mounting systems that can attach to any type of pole.

Gateway Signs

Gateway signs can be used to help reinforce the change in character that is still very much present in Huntington between the rural lands and village centers. While signs alone will be unlikely to have a significant, lasting effect in speed reduction, they are an important way to communicate to visitors.

Transition Zones

Reduced speed limits within the village centers of Huntington Center and Lower Village should be established with speed transition zones, where the speed limit lowers to 35 mph in a buffer area around each village, and then to 25 mph within the village core. "Reduced Speed Ahead" signs can also be effective to alert drivers.

Dynamic Striping

Dynamic striping is a technique to alert motorists to a roadway feature or transition area using a series transverse (i.e. across road) markings that become longer, bolder and more pronounced while approaching the features. The example at right shows dynamic striping in advance of a speed hump. The illustration below shows how it can be used to highlight a gateway sign and speed transition.

The following illustration shows a possible design of a gateway, which would include a splitter island, landscaping, gateway sign, and installation of a radar feedback sign shortly after the gateway elements.

Existing Gateway

Possible Gateway Elements

Village Treatments

The following traffic calming strategies are appropriate to consider for the village centers of Lower Village and Huntington Center, where the lower speed limit of 25 mph should be reinforced by a variety of design strategies.

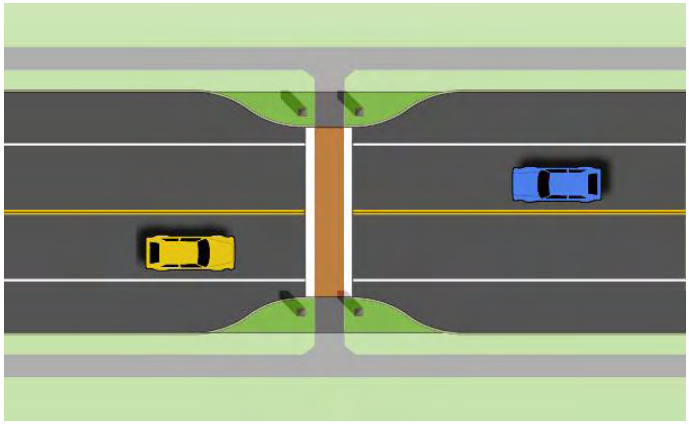
Edge Striping

A relatively inexpensive technique that can be applied relatively easily is edge striping of the roadway. In general, the Main Road through Huntington and Huntington Center have a paved width of at least 24 feet. This paved cross section would be striped to have 2-10 foot lanes, allowing 2 foot shoulders on either side for pedestrians. The edge striping will visually narrow the road, and reinforces slower driving speeds. The following photos show a simulation of how the edge stripes can change the look and feel of the Main Road.

Existing	With Edge Striping
	
	

Raised Crosswalks

While a marked and signed crosswalk in Lower Village would be an aid for pedestrian travel, there are techniques to more aggressively demarcate a crosswalk by raising and providing curb extensions to provide for a traffic calming effect as well.



Rubber Speed Humps

Traffic calming on Bridge Street is more challenging as it is not currently paved. In the long term, paving the portion of the street near the bridge, where the street is posted with a 25 mph speed limit, would allow for more traffic calming options. In the short term, on option is the installation of a temporary rubber speed hump, which can be installed with spikes, and removed during the winter months. An example is illustrated at right.

Intersection Reconfiguration for the Lower Village

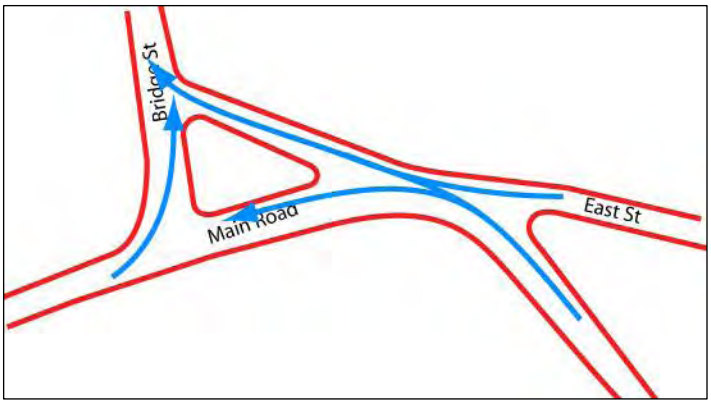
Two long range alternatives have been prepared for the Lower Village area, which are illustrated in the accompanying overview maps. The following figures compare alternatives A and B, although virtually all of these elements can be interchanged and developed into a preferred alternative in the next phases of this project.

Traffic Patterns in Lower Village

Among the most effective types of traffic calming measures are those that create a "self-enforcing" road network. Creating this type of environment in Lower Village can be achieved by tightening corner radii at the major intersections in the village, which will require any traffic that is turning to reduce speed compared to the existing conditions. The following paragraphs describe several possible options for reconfiguring the intersections in the center of Lower Village. The described in the following paragraphs can essentially be "mixed and matched" as desired.

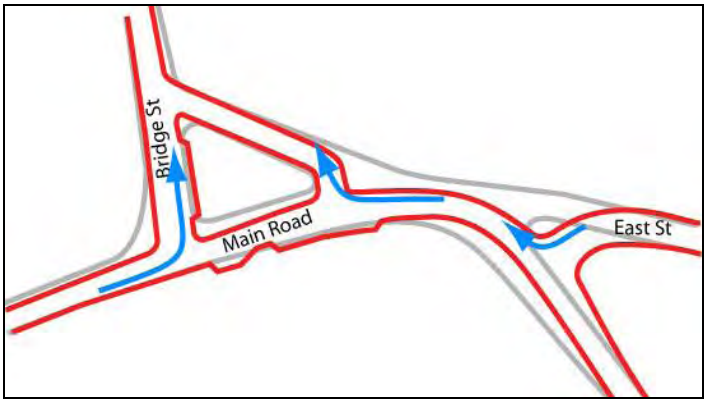
The traffic circulation patterns in the Lower Village are in the vicinity of the Triangle and the East Street intersection are complex, and addressing these would both serve to improve safety for vehicles and pedestrians, and reduce speeds of traffic. The following illustrations show some of the current patterns.

Existing Circulation



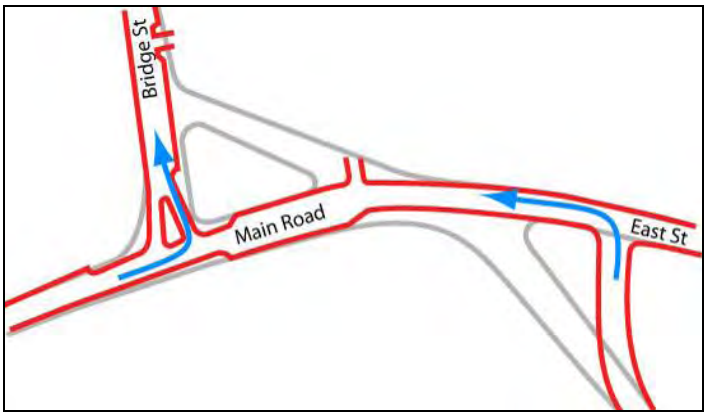
The existing circulation in the core of Lower Village allows for relatively high radius, hence higher speed turning movements. Also, there is a lack of definition of vehicle movements for traffic exiting East Street, and turning onto Main Road. For traffic moving from East Street to Bridge Street, it is possible to slip through without entering Main Road. While volumes are relatively low, this can lead to a chaotic and potentially unsafe traffic situation.

Alternative A Circulation



This alternative maintains the triangle, but narrows the entrances to each intersection with Main Road. This will also reduce the turning radii, and therefore reduce speeds. Main Road is realigned to improve sight distance, and East Street is realigned to be a "T" intersection, also tightening the turning radius and better defining the appropriate traffic circulation.

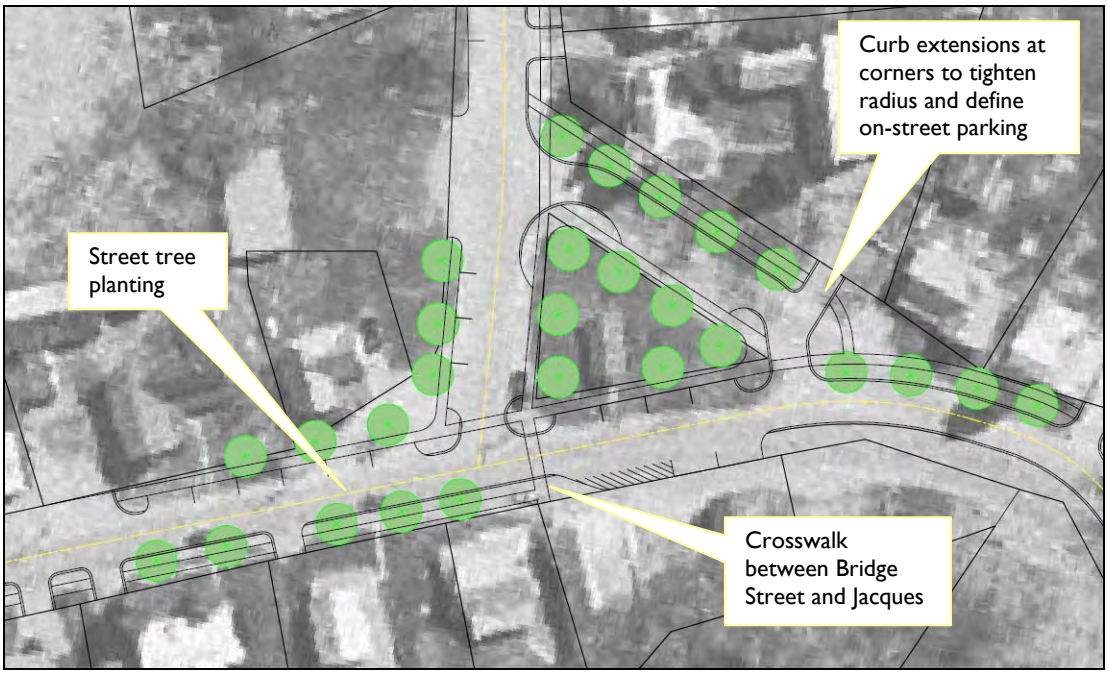
Alternative B Circulation



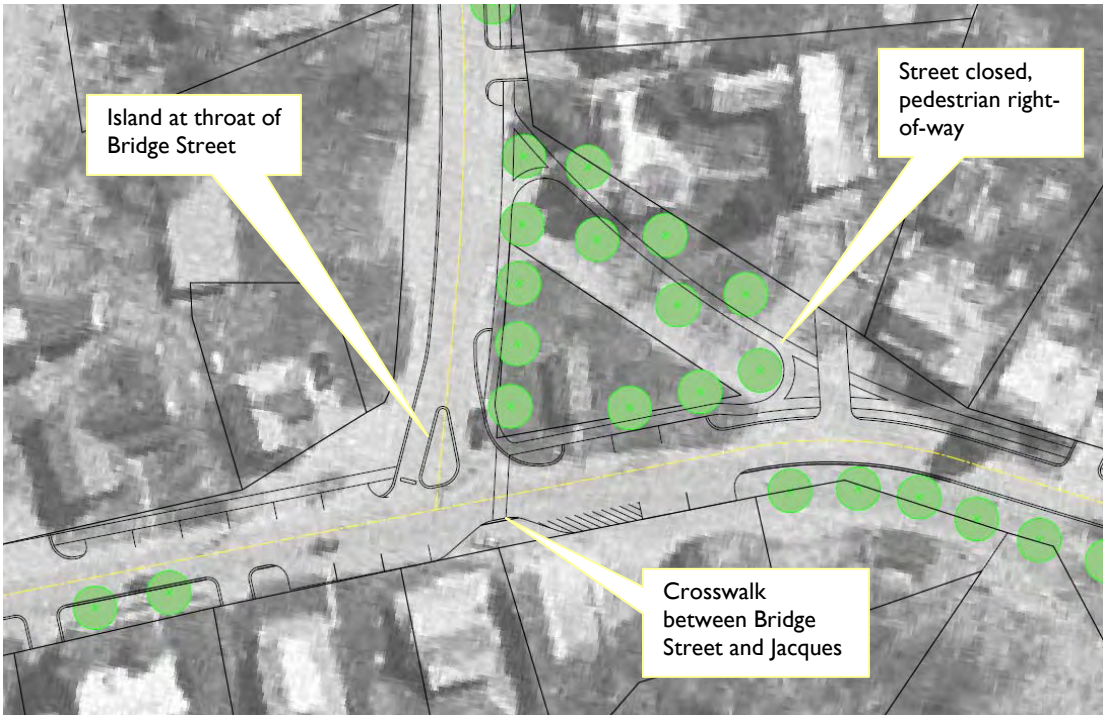
In this plan, the side of the triangle is closed, and the intersection of Bridge Street and Main Road is narrowed and defined. This results in smaller turning radii for traffic movements in this area, which will substantially reduce traffic speeds. This alternative also includes realignment of Main Road to a "T" intersection with East Street, in which Main Road traffic would be required to stop. This will significantly reduce northbound speeds into the village core.

These plans are illustrated in more detail in the attached graphics, and will reinforce the traffic calming elements by creating a "self enforcing" traffic environment.

Alternative A: Bridge Street/Main Road Intersection Area

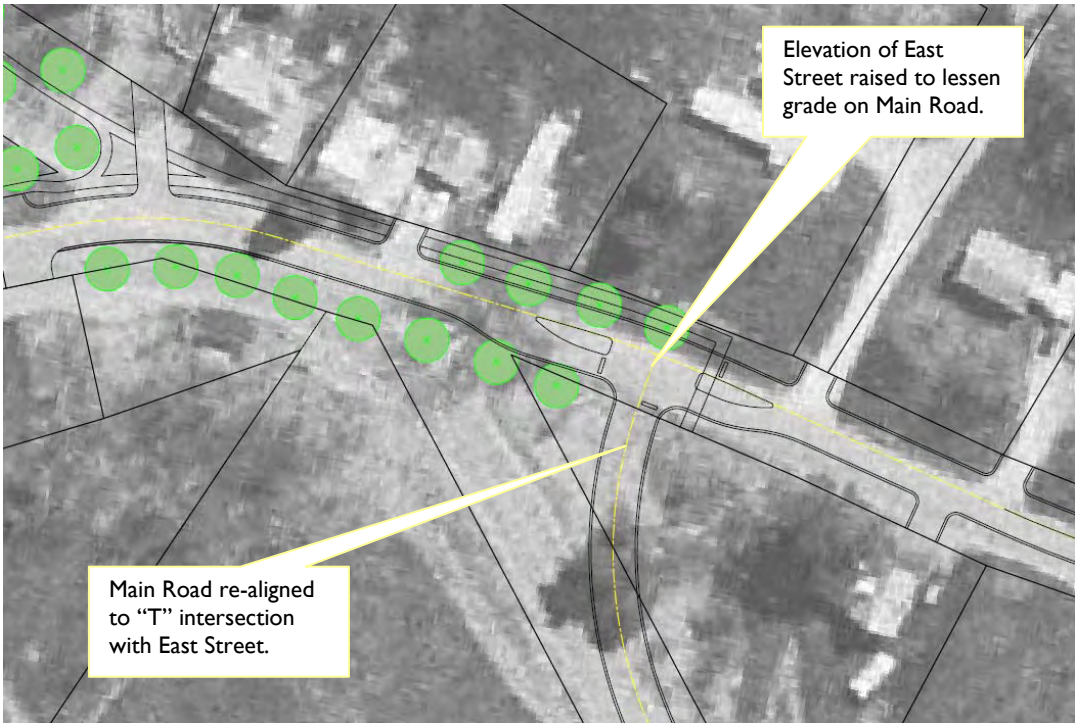


Alternative B: Bridge Street/Main Road Intersection Area



Alternative A: East Street/Main Road Intersection Area

Alternative B: East Street/Main Road Intersection Area



Huntington Center Plan

The plan for Huntington Center is shown on the overview map, with detailed elements discussed below. In many ways, this is a more challenging location because Main Road is very straight, and there are fewer opportunities for reconfiguring intersections that will be effective in traffic calming. The major features of the plan are discussed below:

Gateway Treatments

The village gateways should be established with village entrance identity sign and radar feedback signs. On the north end of the village, it may be possible to establish a bridge railing treatment at the culvert to reinforce a gateway. At the south gateway, a splitter island may be more effective, as this is a very straight section of roadway that visually gives motorists little reason to reduce speed.

Roadway Cross Section

Inside the village gateways, edge stripes should be established that identify 10 foot travel lanes and an area for pedestrians outside the lanes. The overall width is approximately 24 feet, allowing for 2 foot shoulders, or one 4 foot pedestrian way on one side.

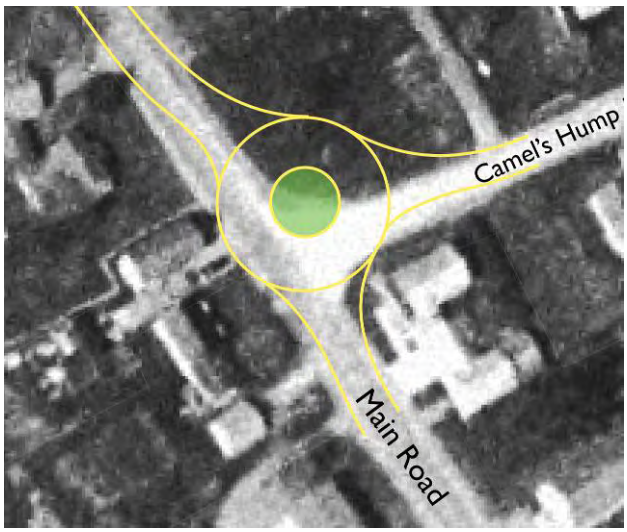
Raised Crosswalk

The crosswalk providing for schoolchildren access recreation facilities could be a traffic calming feature as well with more accentuated marking, and possibly reconfiguration as a raised crosswalk or incorporating a central refuge island (see examples below).

Intersection with Camels Hump Road

This intersection could be reconfigured in a way that would support speed reduction through the village, including as a modern roundabout. The figure below shows a possible location for a roundabout with an outside diameter of 100 feet, which can be designed to allow longer trucks through. At the right is a photograph of a similarly sized roundabout in Lisbon, Maryland.

Possible Roundabout Layout in Huntington Center



Single Lane Roundabout in Lisbon, MD

Project Phasing

The following lists show possible action steps based on likely cost and complexity:

Phase 1: Short Term (within 2 years)

- Establish a "traffic tamers" education program, possibly through the elementary school, to educate the community about the safety benefits for the entire community that would result from greater observance of the speed limits.
- Increased speed enforcement following the initiation of the above education program.
- Edge striping in Lower Village and Huntington Center to define 10 foot travel lanes.
- Establish informational gateway traffic calming treatments including gateway signs, radar feedback signs, and dynamic striping
- Striped Crosswalks in Huntington Center and Lower Village near Post Office.

Phase 2: Medium term (2 to 10 years)

- Establish tighter turning radii in Lower Village at Bridge Street
- Establish tighter radii at Camels Hump Road and Main Road, and raised median at crosswalk in Huntington Center.
- Pave and construct sidewalks on Bridge Street
- Establish splitter islands at gateways

Phase 3: Long Term (10 to 20 years)

- Reconfiguration of Camels Hump Road and Main Road intersection as roundabout
- Construction of sidewalk in Lower Village and curbing.
- Construction of sidewalk in Huntington Center.

Further survey and engineering will be required for the medium and long term implementation.

Cost Estimates

The traffic calming elements are described below in three phases. Phase 1 is "Signs and Stripes", which include edge striping of 10 foot lanes, crosswalks and appropriate signs, and radar feedback signs in both Lower Village and Huntington center.

A detailed break down of estimated costs is provided on the following table. This includes itemized estimated costs based on information from vendors, other communities, and the VTrans cost estimate guidelines. In addition, a 25% allowance for management, contingencies, unforeseen additional costs, etc. is included.

The total cost for the "Signs and Strips" phase is estimated to be $32,000 for both Huntington Center and Lower Village. One approach would be to implement the striping portion and crosswalks in year 1, for approximately $10,000, and use radar feedback signs available from the vendors for a temporary trial. If the trial experience is successful, permanent signs can be implemented in year 2 for about $20,000.

Detailed Cost Estimate for Phase 1

Lower Village

Treatment	Unit Cost	#	Units	Total Cost	
Reduced Speed Ahead signs	$ 500	3	each	$ 1,500	
Radar Speed Signs	$ 3,000	2	each	$ 6,000	Basic unit -- needs power connection, no data collection
Data collection capability	$ 1,000	2	each	$ 2,000	Allows for monitoring of effectiveness of traffic calming
Solar Power Units for above	$ 1,000	2	each	$ 2,000	Avoids need to connect to power
Rubber Speed Hump	$ 300	1	each	$ 300	Bridge Street (can be relocated)
Pedestrian Bollards	$ 300	1	each	$ 500	Identifies cross walks
Pedestrian Crosswalk Signs	$ 200	2	each	$ 400	Identifies cross walks
Crosswalk Striping	$ 400	1	each	$ 400	Identifies cross walks
Edge Striping	$ 1,000	1.4	miles	$ 1,400	Visually narrows road; provides space for pedestrians
TOTAL				$ 14,300	

Huntington Center

Treatment	Unit Cost	#	Units	Total Cost	
Radar Speed Signs	$ 3,000	2	each	$ 6,000	Basic unit -- needs power connection, no data collection
Data collection capability	$ 1,000	2	each	$ 2,000	Allows for monitoring of effectiveness of traffic calming
Solar Power Units for above	$ 1,000	2	each	$ 2,000	Avoids need to connect to power
Pedestrian Crosswalk Signs	$ 200	2	each	$ 400	Identifies cross walks
Crosswalk Striping	$ 400	1	each	$ 400	Identifies cross walks
Edge Striping	$ 1,000	0.8	miles	$ 800	Visually narrows road; provides space for pedestrians
TOTAL				$ 11,600	

Cost Elements: Phase 1	$ 25,900
Miscellaneous contingencies (start up, over-runs, engineering)	$ 6,500
Grand Total: Phase 1	$ 32,400

Phase 2: Define Edges

This phase includes several "hardscape" features that will have a more deliberate traffic calming effect through physically narrowing the roadway and tightening turning radii. These include splitter islands at the gateways of both villages, curbing around the triangle and Bridge Street intersection in Lower Village, and curbing and a median crosswalk in Huntington Center. Bridge Street would be resurfaced to allow for road striping, and a sidewalk would be included at that time. In addition, this phase includes installation of more attractive gateway signs to be installed at the splitter islands.

Phase 2 Costs

Survey			each	$ 15,000
Splitter Islands	$ 15,375	4	each	$ 61,500
Defining Edge: Lower Village			each	$ 47,500
Defining Edge: Huntington Center			each	$ 7,000
Paving and Sidewalk on Bridge St	$ 250	500	feet	$ 125,000
Gateway Signs	$ 2000	4	each	$ 8,000
TOTAL Phase 2:				$264,000

Details of this cost estimate are provided in the appendix. This cost estimate is for long range planning purposes, and more detailed design and engineering should be conducted to develop a more refined estimate at such time that the town is ready to pursue any of these project elements. Possible sources of funds would be from the VTrans Enhancement Program of Bicycle Pedestrian Program (sidewalk).

Phase 3: Sidewalks and Intersection Reconstruction

The following cost estimates are extremely preliminary, for long term planning purposes. As of this time, there are not specified plans for the length or design of sidewalks, but the following cost estimates reflect the general conditions in the attached street design drawings. In addition, the reconstruction of East Street with Main Road, and a small roundabout at the intersection of Camels Hump Road and Main Road are included, which both safety and traffic calming benefits.

Phase 3 Costs

Lower Village Sidewalk	$290,000
Huntington Center Sidewalk	$ 85,000
Roundabout Construction	$375,000
East St Realignment	$200,000
Total	$950,000

Funding Sources

The traditional funding source for these projects involves establishing a town capital improvement program with annual contributions made until enough funds are available to build one or more of the budgeted items.

In addition, possible grant funding sources for the sidewalks include the CCMPO's Sidewalk program and the Vermont Agency of Transportation's Enhancement program. Both of these sources require a town contribution of 20% of the awarded funding amount.

There may be funding available through state and local Safe Routes to School programs for improvements related to the elementary school.

The grant funding programs are competitive and require an application process. These programs are usually funded by the federal government and so there may be federal requirements for review and design which can increase total project costs.

Attachments

Overview Map-Lower Village
Overview Map - Huntington Center