City of Barre, Vermont August 16, 2023, 6:30 PM

Regular Meeting of the

Transportation & Public Works Committee

Venue (online participation only):

Zoom https://us02web.zoom.us/j/83518130235?pwd=TXVOR2tRU0hWbk50Zkx6NDE2THVuUT09
Meeting ID: 835 1813 0235 Passcode: 666100

Agenda

1. Call to order - 6:30 PM
2. Adjustments to the agenda
3. Approval of minutes
    1. May 17, 2023 view draft minutes
4. Visitors and communications
5. Department of Public Works monthly report (10 minutes)
    1. Department staff reports on relevant work and planning since the previous meeting
    2. Note new resident concerns as raised to staff
6. New business
    1. Advisement on safety improvements at Hill Street and Camp Street (30 minutes)
    2. Review low-cost treatments for speed transition zones and recommend locations (15 minutes)
    3. July 2023 flood status and response roundtable (30 minutes)
7. Confirm date of next meeting
    1. September 20, 2023
8. Roundtable
9. Adjourn

Previous Minutes

These were created from memory, and are sure to contain inaccuracies. Corrections are appreciated.

City of Barre, Vermont May 17, 2023, 6:30 PM

Minutes DRAFT

Transportation & Public Works Committee

Present: Michael Hellein (Chair), Alan Burnor (Vice-chair), Arthur Bombardier, Ericka Reil, Joanne Reynolds

Absent: Joshua Akers, Mark Martin, Tina Routhier, Dan Souza

Staff: Brian Baker (Director of Public Works), Bill Ahearn (Engineer), Cpl. Jacob Frey (Traffic Safety Supervisor, Police Department)

Visitors: Ernie Drown, Beth Hilgartner, Janelle Starr (residents of Hill Street)

NOTE: These minutes were constructed from memory too long after the meeting, and it's likely that motions and seconds are not attributed correctly, though the votes and outcomes are correct. This will be addressed before the final minutes are published.

1. Call to order - 6:30 PM
2. Adjustments to the agenda
    1. No adjustments
3. Visitors and communications
    1. Members of the public expressed concern and frustration about vehicle speeds and safety at the intersection of Hill and Camp Streets following a recent crash that did significant damage to the home of Drown and Hilgartner at the corner. Staff agreed to look into painting crossings as soon as feasible, and Hellein committed to put further advisement for further intervention on the agenda for the next meeting.
4. Old business
    1. Adopt committee charge

        Motion: Reynolds, to adopt charge as presented, Bombardier second. Unanimous in favor.
5. New business
    1. Decision to restore approved digital speed sign locations
        1. The committee discussed how the approved speed sign locations were inadvertently changed.

        Motion: Burnor, to advise staff to restore digital speed signs to their previously approved locations, Bombardier second. Unanimous in favor.
    2. Receive update on RRFB installation at North Main and Second Street
        1. Ahearn pointed out that the signs were installed in November 2022, but that they are hard to see because the signs purchased do not have bright enough LED panels.
    3. Review streets and sidewalks maintenance plan

1. Baker informed the committee that work is proceeding on streets and sidewalks, with the city engaging a contractor for the next two years of planned projects. The contractor has latitude to complete them early if they desire, and it's expected that they do. Baker would look into posting projects on the city website.

4. Review lane and crosswalk striping conditions and plan
    1. Baker informed the committee that crews are hard at work painting pedestrian crossings around the city.
5. Review Barre City sidewalk inventory produced by CVRPC
    1. The committee reviewed the map of existing sidewalks within the city.

6. Confirm date of next meeting
    1. June 21, 2023
7. Adjourn
    1. Motion: Reynolds, Bombardier second. Unanimous in favor. 7:53 PM

Department of Public Works
Monthly Report

City of Barre, Vermont August 16, 2023, 6:30 PM

Department of Public Works

Transportation & Public Works Report, June - August 2023

Department Activity

- Overlay paving completed on Beckley Hill, Richardson Road, Jorgenson Lane, and South Main Street.
    - Warren and Merchant Street are to be striped and repaved. Started on Warren St Monday.
    - South Main Street south of Cumberland Farms has been overlaid, we are receiving a $45,000 grant from VTrans. Barre's Class 1 highways are to be repaved by the State of VT in 2027.
- DPW garage process has slowed down due to land slide from Kinney Place is active and needs to be resolved.
- Minor sewer improvements planned for Merchant Street prior to paving. Precast structures are here, waiting to schedule installation.
- First of three new dry hydrants was installed on June 27th at the reservoir in Orange. This dry hydrant was damaged during the flood. Additional dry hydrants to be installed on Boynton Street and West Second Street. Program has been extended due to the flood.
- Preparing a request for "Statement of Qualifications" for water engineering on the Route 302 Water Transmission Main Project. This is a requirement for use of the Congressional Directed Spending grant we received.
- New DPW radios are about installed and operational. Firewall at Auditorium needs to be upgraded for system to work as designed.
- Wastewater Treatment Plant 20 Yr evaluation by Wright-Pierce on going. We had the 30% review meeting. Consistent message from meeting was that our equipment "has lived its useful life".
- North Main Street paving complete, line striping is pending. This project will be funded by VTrans through a Federal Highway Emergency program.
- Drain basins continue to be a problem, the basins and pipe have been filled with silt from the flood. Our crew has been trying to systematically work street by street to clean the drainage system. This has been slow progress as the department has other responsibility to attend to. The City of Rutland has a vactor truck helping a week ago and the City of St Albans is here this week helping.
- Starting Monday August 7th, our water department has been conducting a system wide flush to eliminate the discolored water. The flushing will continue through at least the end of this week.
- Working with Sanborn-Head, Geotechnical Engineer, to determine the plan moving forward on landslide issues in the City. Chose the top 4 locations and S-H will provide scope and fee to proceed.
- Paving RFP has been issued for pavement repair damaged by the flood. This RFP had to be issued per FEMA guidance on reimbursement.
- Street cleanups continue. Majority has been completed. City crews are still picking up mud and silt from properties. Estimate 15,000 – 20,000 CY of mud removed from downtown area.

- DPW lost 2 front end loaders during the flood. We are currently renting a replacement. Hopefully we can finalize with the insurance company and get new ones ordered. The machine we are currently renting will be in the replacement for the smaller of the 2 loaders, but the larger loader might be out until sometime in October for replacement. This is critical as the blower is used to clear snow after plowing. This snow blower only fits on the larger loader.

Resident Concerns

- Resident on Washington St. had sewer backing into basement. City staff cleaned the manhole at the service line. City also to get quote to have a back flow preventer installed to avoid the problem again.
- Discolored water, many calls on this issue. Our water operator has testing the water at over 40 locations throughout the city during the last month. All samples have come back all negative. Meaning that the water is safe to drink.

Hill and Camp Streets Intersection Safety Improvements

Excerpts from the National Association of City Transportation Officials (NACTO) *Urban Street Design Guide*.

Design Speed

Speed plays a critical role in crashes and the severity of their outcomes. Traditional street design was grounded in highway design principles that forgive driver error and accommodate higher speeds. This approach based the design speed and posted speed limit on 85th-percentile speeds—how fast drivers are actually driving rather than how fast drivers ought to drive. By designing for a faster set of drivers, crashes increase and drivers actually traveling the speed limit are put at risk. This passive use of design speed accommodates, and indirectly encourages, speeding by designing streets that account for the worst set of drivers and highest potential risks. Higher design speeds, moreover, degrade city streets and walkable neighborhoods by mandating larger curb radii, wider travel lanes, guardrails, streets with no on-street parking, and generous clear zones.

Lowering injuries and fatalities remains a crucial goal for our cities. In 2011, 4,432 pedestrians were killed and 69,000 injured in motor vehicle crashes, according to the National Highway Traffic Safety Administration (NHTSA). Of the fatalities, 73% occurred in urban areas. This equates to 146 people killed or injured in cities everyday. To counteract these gruesome and unnecessary injuries and fatalities, cities should utilize speed control mechanisms that influence behavior, lower speeds, and in turn, reduce injuries and fatalities. Embracing a proactive design approach on new and existing streets with the goal of reducing speeds "may be the single most consequential intervention in reducing pedestrian injury and fatality."[1]

DISCUSSION

Speed plays a critical role in the cause and severity of crashes. There is a direct correlation between higher speeds, crash risk, and the severity of injuries.[3]

On city streets, designers should select a design speed to use in geometric decisions based on safe operating speeds in a complex environment.

10–15 MPH

Driver's peripheral vision

Stopping distance

Crash risk

20–25 MPH

Driver's peripheral vision

Stopping distance

Crash risk

30–35 MPH

Driver's peripheral vision

Stopping distance

Crash risk

40+ MPH

Driver's peripheral vision

Stopping distance

Crash risk

As a driver's speed increases, his peripheral vision narrows severely.[2]

Higher speeds =
Higher crash risk =
Higher injury severity =
Lower safety

SPEED (MPH)	STOPPING DISTANCE (FT)*	CRASH RISK (%)†	FATALITY RISK (%)†
10–15	25	5	2
20–25	40	15	5
30–35	75	55	45
40+	118	90	85

* Stopping Distance includes perception, reaction, and braking times.

† Source: Traditional Neighborhood Development: Street Design Guidelines (1999), ITE Transportation Planning Council Committee 5P-8.

Higher design speeds often mandate larger curb radii, wider travel lane widths, on-street parking restrictions, guardrails, and clear zones. Lower design speeds reduce observed speeding behavior, providing a safer place for people to walk, park, and drive.

MASS DIFFERENTIAL

Mass differential between street users results in more severe injuries to the lighter of the two colliding bodies.

Bus
24,000 lbs

Car
2,000 lbs

Cyclist/ Pedestrian
30–250 lbs

CONVENTIONAL HIGHWAY DESIGN:

Operating Speed = Design Speed = Posted Speed

PROACTIVE URBAN STREET DESIGN:

Target Speed = Design Speed = Posted Speed

CRITICAL

Design streets using target speed, the speed you intend for drivers to go, rather than operating speed. The 85th percentile of observed target speeds should fall between 10–30 mph on most urban streets.

The maximum target speed for urban arterial streets is 35 mph.[4] Some urban arterials may fall outside of built-up areas where people are likely or permitted to walk or bicycle. In these highway-like conditions, a higher target speed may be appropriate.

The maximum target speed for urban collector or local streets is 30 mph.

Use design criteria that are at or below the target speed of a given street. The use of higher speeds should be reserved for limited access freeways and highways and is inappropriate on urban streets, including urban arterials.

Bring the design speed in line with the target speed by implementing measures to reduce and stabilize operating speeds as appropriate. Narrower lane widths, roadside landscaping, speed humps, and curb extensions reduce traffic speeds and improve the quality of the bicycle and pedestrian realm.[5]

RECOMMENDED

Use short cycle lengths and/or slow signal progressions in downtown areas and networks with closely spaced signals.

In neighborhoods, designers should consider 20 mph zones to reduce speeds to those safe for interaction with children at play and other unpredictable behavior.

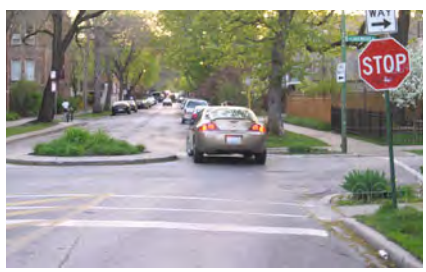
On local roads or in areas with above-average pedestrian volumes, designers may choose to select a design speed below the posted speed limit. Certain states disallow posted speeds of less than 25 mph, but do not restrict operating speeds 10 mph below the speed limit.

OPTIONAL

Shared streets and alleys may be assigned target speeds as low as 5–10 mph.

Speed enforcement cameras have proven highly effective at reducing speeds and increasing compliance with the speed limit.

NEW ORLEANS, LA
Narrow streets lower traffic speeds.



CHICAGO, IL
A mini roundabout slows speeds through a residential area.

In the range from 20-25mph, crash risk is 15% and fatality risk is 5%, but in the range from 30-35mph crash risk jumps to 55% and fatality risk jumps to 45%. Speed plays a critical role in the cause and severity of crashes.

Recommended motion:

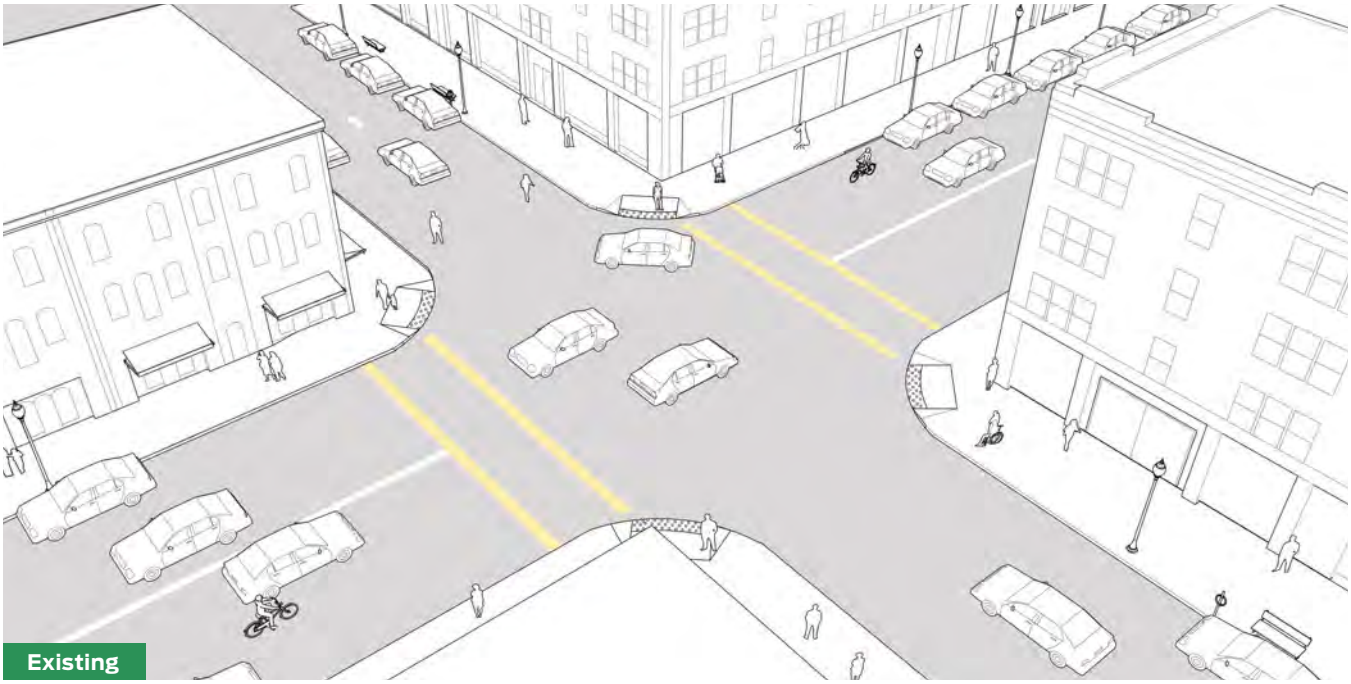
Transportation safety interventions at the intersection of Hill and Camp Streets should serve the following goals, in addition to the Committee's general transportation objectives:

- Reduce prevailing vehicle speed to a safe target speed, the posted limit of 25mph
- Improve perceived safety so people walking can cross at the intersection without fear

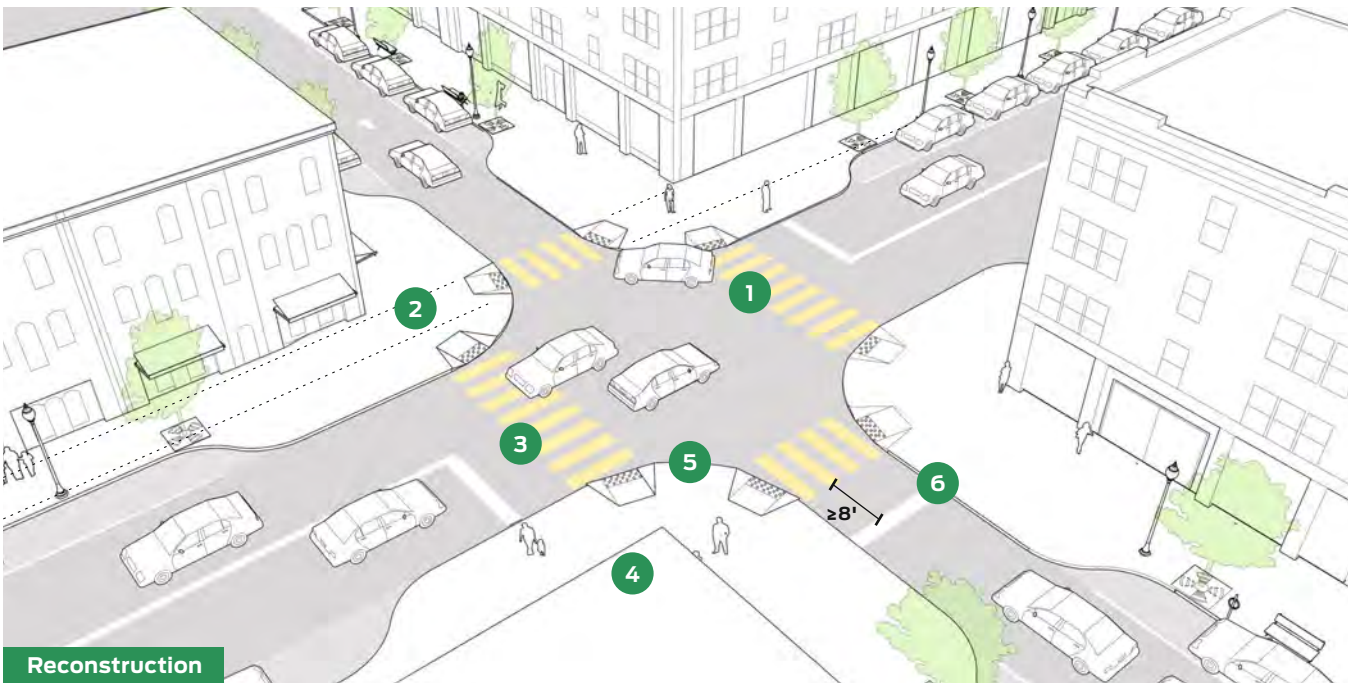
Conventional Crosswalks

Crosswalks should be designed to offer as much comfort and protection to pedestrians as possible. Historically, many crosswalks were designed using inadequate, narrow striping, setbacks, deviations from the pedestrian walkway, and considerable crossing distances.

Intersection crossings should be kept as compact as possible, facilitating eye contact by moving pedestrians directly into the driver's field of vision.



Existing

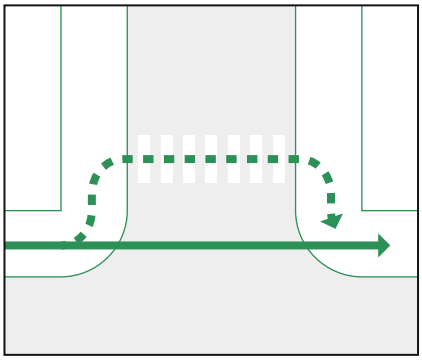


Reconstruction

CRITICAL

1 Stripe all signalized crossings to reinforce yielding of vehicles turning during a green signal phase. The majority of vehicle-pedestrian incidents involve a driver who is turning.

2 Stripe the crosswalk as wide as or wider than the walkway it connects to. This will ensure that when two groups of people meet in the crosswalk, they can comfortably pass one another. Crosswalks should be aligned as closely as possible with the pedestrian through zone. Inconvenient deviations create an unfriendly pedestrian environment.



3 High-visibility ladder, zebra, and continental crosswalk markings are preferable to standard parallel or dashed pavement markings. These are more visible to approaching vehicles and have been shown to improve yielding behavior.

Street lighting should be provided at all intersections, with additional care and emphasis taken at and near crosswalks.

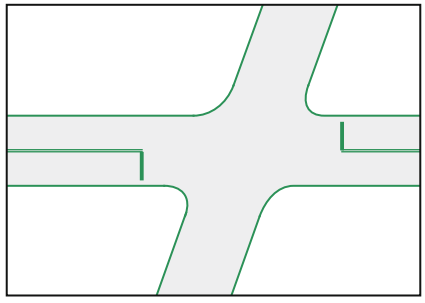
4 Accessible curb ramps are required by the Americans with Disabilities Act (ADA) at all crosswalks.

RECOMMENDED

5 Keep crossing distances as short as possible using tight corner radii, curb extensions, and medians. Interim curb extensions may be incorporated using flexible posts and epoxied gravel.

6 An advanced stop bar should be located at least 8 feet in advance of the crosswalk to reinforce yielding to pedestrians. In cases where bicycles frequently queue in the crosswalk or may benefit from an advanced queue, a bike box should be utilized in place of or in addition to an advanced stop bar.

Stop bars should be perpendicular to the travel lane, not parallel to the adjacent street or crosswalk.

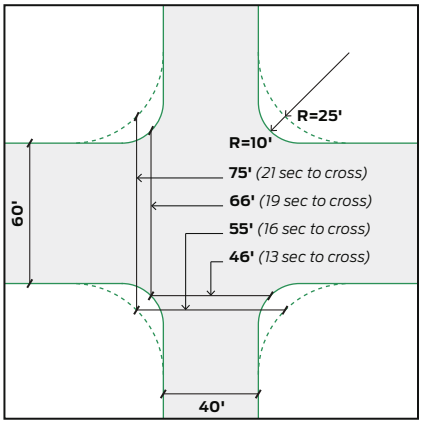


OPTIONAL

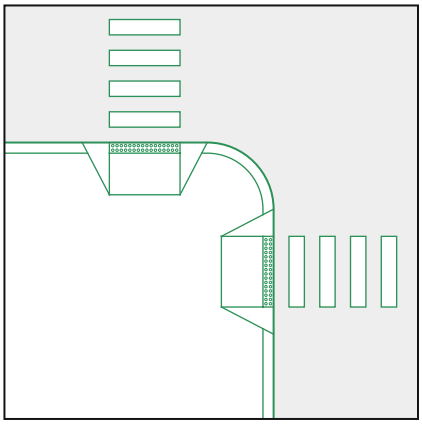
Right-turn-on-red restrictions may be applied citywide or in special city districts and zones where vehicle-pedestrian conflicts are frequent. Right-turn-on-red restrictions reduce conflicts between vehicles and pedestrians.

DISCUSSION

The size of the corner relates directly to the length of the crosswalk. Longer crosswalks take more time to cross, increasing pedestrian exposure risk and diminishing safety.[1]

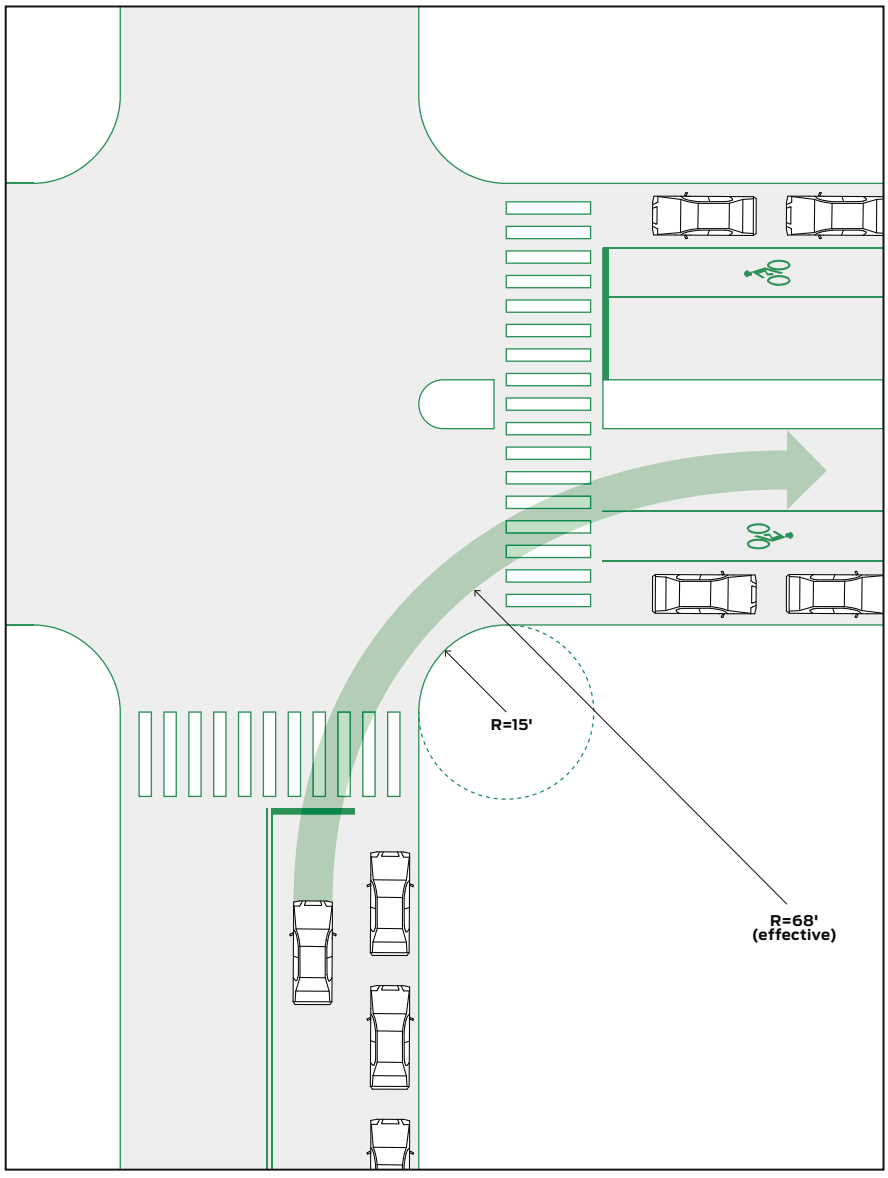


A smaller curb radius expands the pedestrian area, allowing for better pedestrian ramp alignment.



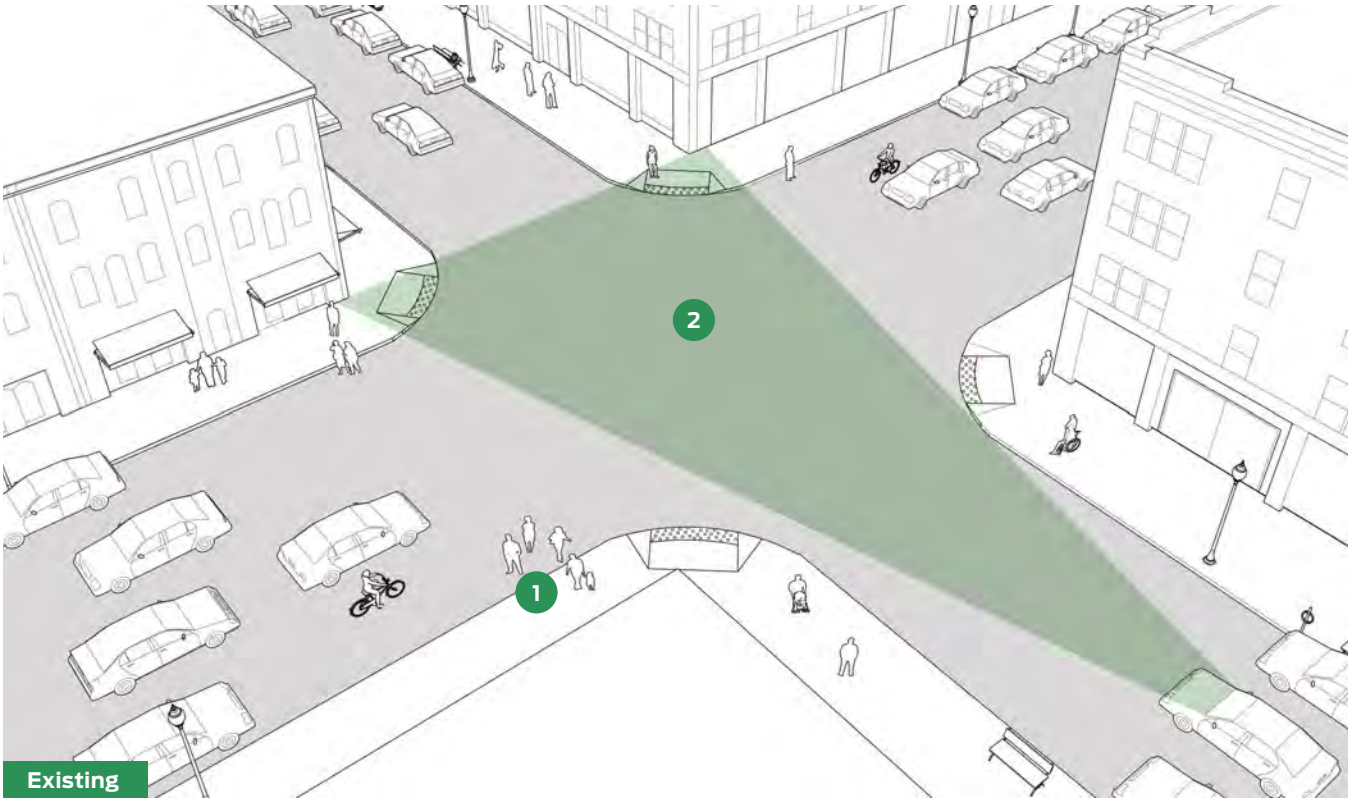
A large corner radius should not be used to facilitate a truck turning from the right lane into the right lane.[2]

Effective Turning Radius



The distinction between the corner radius and the effective turning radius is crucial and often overlooked. The corner radius may be a simple or a complex curve and depends primarily on the presence of on-street parking, bike lanes, the number of travel lanes, medians, and traffic control devices.

Designers often determine corner radii based on the intersection geometry only and overlook the effective radius. As a result, drivers making a turn on a green signal have little incentive to turn into the nearest receiving lane and routinely turn as wide as possible to maintain travel speeds.



Lower speeds at urban intersections with insufficient sight distances. Low speeds yield smaller sight triangles, meaning that drivers can focus on less activity and better react to potential conflicts.

DISCUSSION

Visibility is impacted by the design and operating speed of a roadway. Determining sightlines based on existing or 85th-percentile speeds is not sufficient in all cases. Designers need to proactively lower speeds near conflict points to ensure that sightlines are adequate and movements predictable, rather than widening the intersection or removing sightline obstacles.

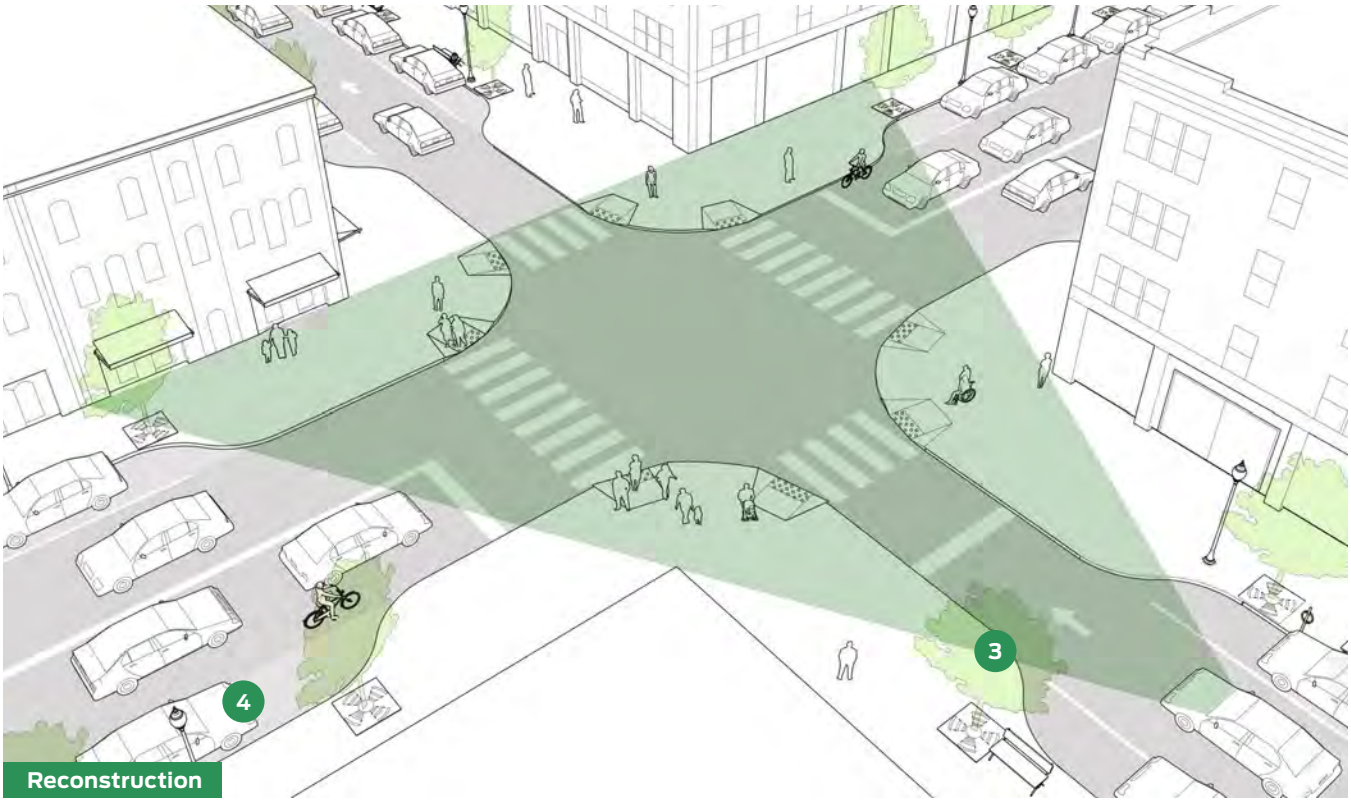
Sight triangles required for stopping and approach distances are typically based upon ensuring safety at intersections with no controls at any approach. This situation rarely occurs in urban environments, and occurs only at very low-speed, low-volume junctions. At uncontrolled locations where volume or speed present safety concerns, add traffic controls or traffic calming devices on the intersection approach.[1]

SAN FRANCISCO, CA

While this uncontrolled intersection operates at low speeds, it may still benefit from stop control or traffic calming.

1 In urban areas, corners frequently act as a gathering place for people and businesses, as well as the locations of bus stops, bicycle parking, and other elements. Design should facilitate eye contact between these users, rather than focus on the creation of clear sightlines for moving traffic only.

2 Wide corners with large sight triangles may create visibility, but in turn may cause cars to speed through the intersection, losing the peripheral vision they might have retained at a slower and more cautious speed.



Reconstruction

Intersections with insufficient visibility should be reconstructed to be more compact. Compact intersections place more activity within the sight triangle, giving all users a better view of potential conflicts.

In certain circumstances, an object in the roadway or on the sidewalk may be deemed to obstruct sightlines for vehicles in a given intersection and to pose a critical safety hazard. Removal of the object in question is a worst-case scenario based on significant crash risk and crash history. Many objects, such as buildings, terrain features, trees in historic districts, and other more permanent parts of the landscape should be highlighted using warning signage and other features, rather than removed.

CRITICAL

In determining the sight distance triangle for a given intersection, use the target speed, rather than the design speed, for that intersection.

3 Fixed objects, such as trees, buildings, signs, and street furniture, deemed to inhibit the visibility of a given intersection and create safety concerns, should not be removed without the prior consideration of alternative safety-mitigation measures, including a reduction in traffic speeds, an increase in visibility through curb extensions or geometric design, or the addition of supplementary warning signs.

Traffic control devices must be unobstructed in the intersection, and shall be free of tree cover or visual clutter.

RECOMMENDED

4 Daylight intersections by removing parking within 20–25 feet of the intersection.[2]

Beth Hilgartner
27 Camp Street
Barre, VT 05641
June 9, 2023

Michael Hellein
Transportation and Public Works Committee
Via Email

Dear Michael,

First, I'd like to thank Barre City for re-painting the crosswalks and installing warning signs at the intersection of Camp and Hill Streets, where the recent two-car accident damaged my home. I appreciate the prompt action, and hope it will mitigate some of the anxiety I and neighbors feel when attempting to cross Hill Street.

I have some further ideas and suggestions for slowing traffic on Camp and Hill Streets. I'll start with the least expensive/easiest to implement, and end with the more involved approaches.

1. Where Barre Town becomes Barre City (and the speed limit changes) install rumble strips and flashing speed limit signs that include the notice of the City speed limit of 25 mph to alert drivers to the change (and inform them of the City speed limit, in case they aren't paying attention).
2. Half a block or so after the rumble strips, install speed bumps or speed tables to further alert drivers and slow traffic.
3. For some time after these measures are put in place, have City police on site to stop and ticket people who are (still) speeding.
4. Stripe the uphill lane of Hill Street for curbside parking and encourage people to use the spaces, perhaps by parking City vehicles not in immediate use there. (Park a BIG truck on the uphill lane of Hill just after the intersection with Camp St. to make drivers slow – more – for the left turn onto hill, and to protect my brand new, reinstalled heat pump.)
5. Install and connect sidewalks on both sides of Hill and Camp Streets to narrow the road; one of these sidewalks could, instead, be a designated bike lane.
6. At the cross streets on Hill (Windywood/West Cobble Hill; Woodland Dr/Waterman St.; Nelson St; Camp St), install small roundabouts. Community buy-in could be achieved by finding businesses and individuals to donate money and/or materials/labor to create and maintain small "island" garden plantings in the centers of the roundabouts.

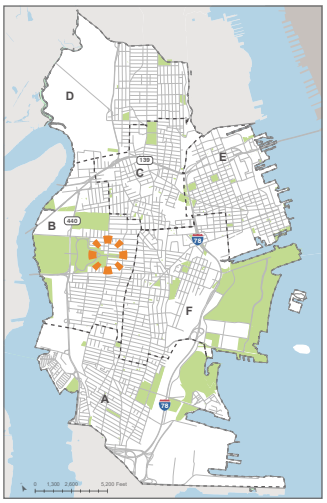
I know there is likely to be pushback about slowing traffic on Hill and Camp, but in order for these areas to feel more residential and be safer for the people who live here (and pay taxes to Barre), I think it's necessary.

Thanks for listening,

Beth Hilgartner, 27 Camp Street, Barre

Source: https://street-plans.com/jc-walks-pedestrian-enhancement-plan-jersey-city-nj/

WEST SIDE AVENUE CONCEPTS



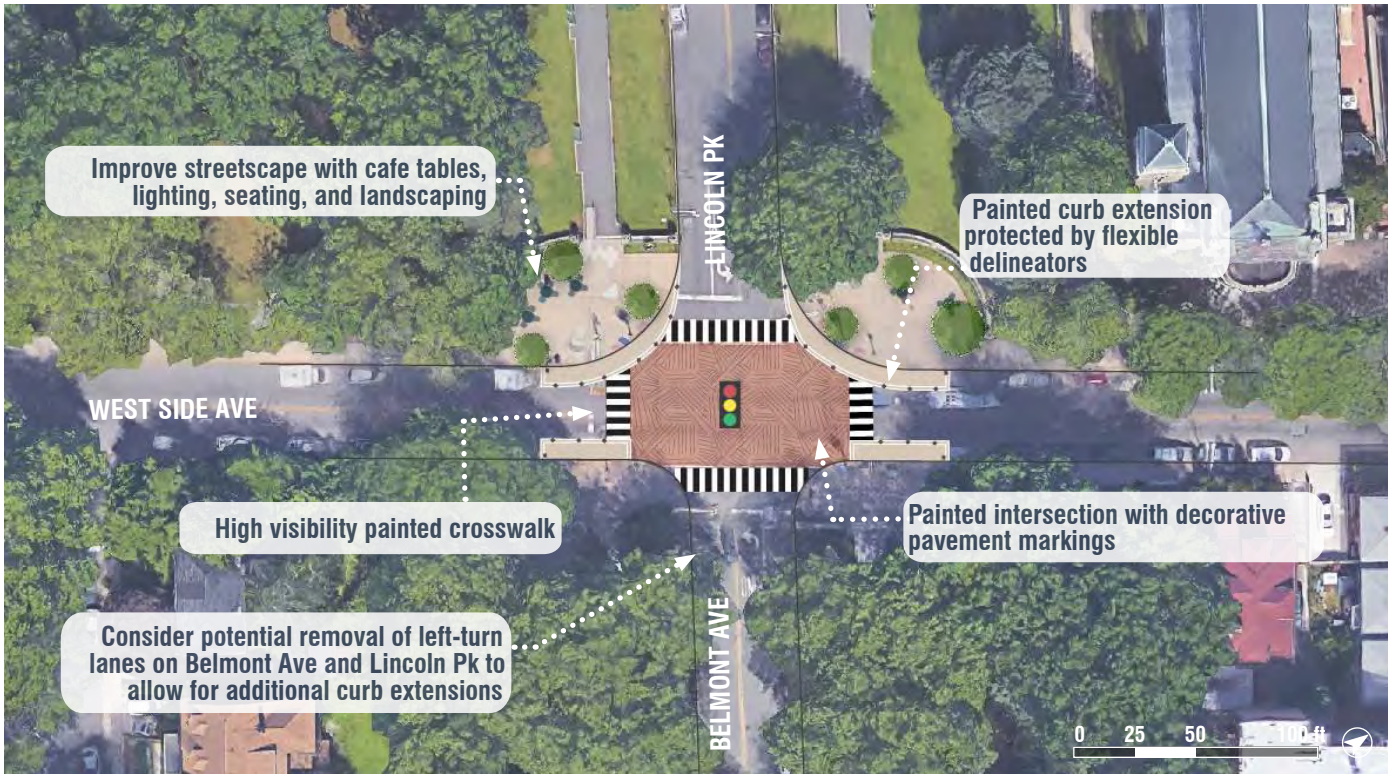
Belmont Avenue Intersection

RECOMMENDATIONS INCLUDE:

- Painted curb extensions as an interim design strategy. Concrete curb extensions are recommended in the long-term, which may require storm drain relocation.
- Painted intersection pattern
- High visibility crosswalks
- Painted intersection pattern
- Improved streetscape

The intersection of West Side Avenue at Belmont Avenue provides a grand entrance to Lincoln Park. The concept depicted below includes curb extensions to shorten crossing distances and slow turning vehicles. Since the intersection serves as a gateway into the park, a decorative intersection painting could further bolster that character. The park plazas adjacent to the intersection could be further activated with seating, landscaping, and programming in addition to the season farmer's market sited there. The necessity of the Belmont Avenue left turn lanes should be studied. Removal of those lanes would allow for larger curb extensions that could accommodate turning radii.

A demonstration of this project occurred on Saturday, November 18, 2017.



Hill Street and Camp Street

Location: https://goo.gl/maps/7JXZezNg38aDaoGq5

Hill Street and Camp Street

Location: https://goo.gl/maps/7JXZezNg38aDaoGq5

Similar treatment observed in the field (with bike lanes)

Intersection before intervention, 2021: https://goo.gl/maps/eJmJhjwdCDJDtaLg8

Crosswalks should be designed to offer as much comfort and protection to pedestrians as possible. Intersection crossings should be kept as compact as possible, facilitating eye contact by moving pedestrians directly into the driver's field of vision.

Recommended motion:

Staff should design a treatment for the intersection of Hill and Camp Streets based on the provided concept, including:

- Painted curb extensions at each crosswalk terminus protected by flexible bollards
- Curb extension radius of 10' - 15'
- Pedestrian crossing signs visible withing sight triangles at prevailing speed

The design should be presented to the Transportation & Public Works Committee at a future meeting, and an approved design should be scheduled for installation, taking seasonal operations into account.

Gateway Speed Transition Zones

U.S. Department of Transportation
Federal Highway Administration

Reducing Excessive Speeding in Rural Communities in Iowa

BACKGROUND

In rural areas, many communities are located along higher-speed roadways, but have much lower speed limits inside the city limits. Speed limits can often drop from as high as 55 mph down to 25 mph as the road feeds into the town's center where pedestrians and bicyclists are more common. Typically, changes such as on-street parking or a greater number of houses or businesses give visual cues to out-of-town travelers that speeds will be reduced. These roadside cues are not always enough though, and additional traffic calming measures need to be installed to help lower vehicle speeds as drivers enter town.

CHOOSING TRAFFIC CALMING TREATMENTS AND LOCATIONS

In 2012, several communities in Iowa employed a variety of traffic calming techniques to inform motorists of the reduced speed limits and encourage them to slow down. Located on higher-speed roadways with speeds dropping by as much as 30 mph, the towns of Hazelton, Quasqueton, Jesup, Ossian, St. Charles, and Rowley installed five types of low-cost traffic calming treatments (shown below).[1] All of these communities had the common goal of improving safety and managing the speeds into their towns.

Transverse Speed Bars

This pavement marking treatment creates a visual effect that encourages motorists to slow down. The bar placement guides motorists to direct the vehicle's wheels in gaps between the bars, which results in the driver unconsciously slowing down.

Colored Speed-Zone Entrance

Colored or textured surface treatments in the roadway draw motorists' attention to changing roadway conditions.

Temporary Island

Temporary islands made of raised curbing and/or vertical markers can be removed and replaced, as needed, and give drivers the sensation of constricted lane widths, thus encouraging deceleration.

LED Flashing Speed Limits Signs

These speed limit signs have LED lights that are activated by motorists travelling above a set speed threshold, usually 5 mph or greater above the posted speed.

Speed Feedback Signs

The speed feedback signs display the motorists' actual speed.

Photo Source: Center for Transportation Research and Education (CTRE)

1 Experimental approval was requested from and granted by the Federal Highway Administration (FHWA), Office of Transportation Operations, Manual of Uniform Traffic Control Devices (MUTCD) team for the colored speed zone entrance treatment. Any agency wishing to implement a treatment that has not been included in the most recent edition of the MUTCD must request experimental approval from the FHWA.

The communities' county engineers recommended the specific roadways and locations for the traffic calming treatments. With speed limits transitioning from 55 mph to as low as 25 mph, each of these roadways had safety and speeding-related issues. The following table shows the locations, speed limits, and specific treatments used in each community.

COMMUNITY	ROADWAY	SPEED LIMIT TRANSITION	TREATMENT USED
Hazleton	County Road C-57 / Hayes Street	55 mph to 25 mph	Transverse Speed Bars
Quasqueton	County Road W-40	55 mph to 25 mph	Transverse Speed Bars
Jesup	220th Street / State Highway 939	55 mph to 35 mph	Colored Speed-Zone Entrance
Ossian	County Road W-42	55 mph to 25 mph	Colored Speed-Zone Entrance
St. Charles	County Road R-35 State Highway 251 State Highway 251	55 mph to 25 mph	Temporary Island Temporary Island LED Speed Limit Sign
Rowley	County Road D-47 County Road D-47	55 mph to 25 mph	Speed Feedback Sign LED Speed Limit Sign

POSITIVE RESULTS

In order to evaluate the effectiveness of these treatments in reducing speeds, the communities partnered with researchers to complete before and after studies. The table below summarizes the largest reductions for each type of traffic calming treatment considered.

Treatment Used	Reduction in Excessive Speeders	Average Speed Reduction (mph)
Colored Speed-Zone Entrance Treatment	100%	2.3
Speed Feedback Signs	79%	7.6
Temporary Island	71%	2.6
Transverse Speed Bars	54%	2.3
LED Flashing Speed Limit Signs	53%	5.9

The most notable success for these treatments was the dramatic reduction in excessive speeders (vehicles traveling 15 mph or more over the speed limit).

One year after the installations, the communities saw a decrease in average speeds. However, the most notable success for these treatments was the dramatic reduction in excessive speeders (vehicles traveling 15 mph or more over the speed limit). Overall, these traffic calming measures have encouraged lower speeds and reduced the most aggressive speeders, thus improving safety for the communities.

FOR MORE INFORMATION

To view the complete research results for the speed management treatments installed in Iowa, access the report, *Evaluation of Low Cost Traffic Calming for Rural Communities – Phase II [Updated]*, at: http://lib.dr.iastate.edu/intrans_reports/94/.

To learn more about speed management countermeasures, visit FHWA's Speed Management Safety website. Also, check out FHWA's fact sheets: ***Speed Limit Basics*** and ***Speed Management: More than Just Speed Humps***.

Hill Street near Woodland

Location: https://goo.gl/maps/7n6noJyc8E9hcnz16

Washington Street near Phelps

Location: https://goo.gl/maps/Jrq373MwiTwr8S4T6

The most effective interventions in this case study not already in use by Barre City are Colored Speed-Zone Entrance Treatment (100% reduction in excessive speeders, 2.3mph average speed reduction) and Temporary Island (71% reduction in excessive speeders, 2.6mph average speed reduction).

Recommended motion:

> In two pilot locations, staff should install a Temporary Island including reflective vertical markers coupled with a Colored Speed-Zone Entrance Treatment in the inbound travel lane, taking seasonal operations into account. The two recommended locations at this time are:
>
> - Hill Street near Woodland Avenue
> - Washington Street near Phelps Place