BOROUGH OF CHAMBERSBURG

TRAFFIC CALMING PROGRAM

Administered by the

Parking, Traffic and Street Light Committee

Department of Public Works

Adopted by the Mayor and Town Council on March 8, 2010

INTRODUCTION

Speeding traffic is a major concern in the Borough of Chambersburg because of its detrimental impacts on the safety and livability of our streets.

Neighborhoods where speeding occurs experience unsafe conditions for pedestrians, bicyclists and other drivers as well as negative environmental impacts such as noise.

The Institute of Traffic Engineers defines traffic calming as, "the combination of mostly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized users".

In plain English, traffic calming is building or retrofitting streets with certain features and characteristics that induce drivers to slow down and pay more attention to their surroundings.

The Parking, Traffic and Street Light Committee developed this document to explain the Borough of Chambersburg Traffic Calming Program.

WHAT TRAFFIC CALMING IS NOT

Citizen complaints about speeding traffic are often accompanied by requests for new Stop signs, traffic signals, turn restrictions, speed limit signs and the like. These are not traffic calming devices, but rather regulatory traffic controls that are governed by the Pennsylvania Department of Transportation through an approval process that requires documented speed and engineering studies.

The Borough Department of Public Works frequently receives requests for new Stop signs to "slow down traffic" and "improve safety" on a local street. Not only are Stop signs not a traffic calming measure, but research shows that installing unnecessary Stop signs can often result in more collisions and more speeding.

Another common traffic-related request involves the lowering of posted speed limits on streets. This is another regulatory control governed by the Pennsylvania Department of Transportation. Again, most research concludes that driver speed is less a function of posted speed limits and more a function of real or perceived driving conditions.

Unlike the aforementioned regulatory traffic controls that require some form of legal enforcement, traffic calming measures are designed to be self-enforcing. Drivers are slowed down by the physical characteristics of the roadway, not by an artificially imposed speed limit or Stop sign.

While the Borough currently considers speed hump installation as the only physical traffic calming method to reduce vehicle speed, the purpose of this program is to provide a holistic, community-driven approach to traffic calming that will involve communication, education and installation methods beyond speed bump installation for every traffic calming request.

OBJECTIVES OF THE TRAFFIC CALMING PROGRAM

1. Improve the safety and livability of streets and neighborhoods by using appropriately designed and implemented traffic calming measures to mitigate the impacts of traffic while creating safer streets for motorists, pedestrians, and bicyclists;

2. Maintain a traffic calming project selection process guided by objective, needs-driven criteria to ensure that limited Borough resources are utilized in a cost-effective and efficient manner;

3. Implement traffic calming measures that are appropriate and effective for a given situation or street and improve public safety without jeopardizing emergency response needs, creating hazards or nuisances or impeding commercial truck routes;

4. Ensure that any proposed traffic calming installation has public support in the affected neighborhood before it is implemented;

5. Welcome citizen input and involvement in all phases of the program.

PROCESS FOR INITIATING AND IMPLEMENTING TRAFFIC CALMING PROJECTS

To achieve the program objectives, the following process will be followed when considering requests for developing, designing, and implementing traffic calming measures:

1. A Traffic Calming Request will be submitted to the Department of Public Works by a Borough resident, property or business owner. If the street is a State or U.S. Route, the contact person noted on form will be referred to the Pennsylvania Department of Transportation.

2. The Department of Public Works will present the traffic calming request to the Mayor and Town Council for referral to the Parking, Traffic and Street Light Committee.

3. The Mayor and Town Council will refer the traffic calming request to the Parking, Traffic and Street Light Committee.

4. The Department of Public Works will present the traffic calming request to the Parking, Traffic and Street Light Committee. Residents and property or business owners in the affected neighborhood will be mailed a meeting notice.

   If recommended by the Parking, Traffic and Street Light Committee, the Department of Public Works will conduct an assessment and recommendation for traffic calming measures based on the request as well as information gathered at the committee meeting.

   If not recommended, the Department of Public Works will send written correspondence to the contact person noted on Traffic Calming Request regarding the committee decision to not conduct an assessment and recommendation for traffic calming measures.

5. When finished, the Department of Public Works assessment and recommendation for traffic calming measures will be presented to the Parking, Traffic and Street Light Committee. Residents and property or business owners in the affected neighborhood will be mailed a meeting notice.

   The Parking, Traffic and Street Light Committee will make a recommendation to the Mayor and Town Council based on the Department of Public Works assessment and recommendation for traffic calming measures.

6. Based on the Parking, Traffic and Street Light Committee recommendation, the Mayor and Town Council will decide whether the project should proceed as recommended by the committee, as recommended with additional or subtracted measures as determined by the Mayor and Town Council or as not recommended by the committee.

   The Department of Public Works will send written correspondence to the contact person noted on Traffic Calming Request regarding the Mayor and Town Council decision and timeframe for implementation, if applicable.

7. The Department of Public Works will conduct an evaluation of the implemented traffic calming measures within 12 months of installation and provide a report to the Parking, Traffic and Street Light Committee. Residents and property or business owners in the affected neighborhood will be mailed a meeting notice.

8. If recommended by the Parking, Traffic and Street Light Committee, adjustments to the traffic calming measures will be presented to the Mayor and Town Council. Residents and property or business owners in the affected neighborhood will be mailed a meeting notice.

9. Based on the Parking, Traffic and Street Light Committee recommendation, the Mayor and Town Council will decide whether adjustments to the traffic calming measures will be made.

10. The Department of Public Works will maintain a map depicting the location of all traffic calming measures approved by the Mayor and Town Council.

SUBMISSION OF TRAFFIC CALMING REQUEST

A Traffic Calming Request must be submitted to the Department of Public Works.

One resident, property or business owner must sign the request and serve as the contact person for the request.

The contact person must secure signatures from at least 50% of the residents, property or business owners of a given neighborhood.

A neighborhood is defined as all residents, property or business owners that have driveway access to the street being considered for traffic calming measures between the nearest intersecting streets.

A copy of the Traffic Calming Request form is included as an attachment.

DEPARTMENT OF PUBLIC WORKS ASSESSMENT

The Department of Public Works will conduct an assessment that includes the information listed below to determine whether traffic calming measures are needed based on the Traffic Calming Request Form.

1. Total volume. Total traffic volume on the study street will be measured for a period of 7 consecutive days.

2. Average daily traffic (ADT). The ADT should exceed 250 vehicles for the street to be considered for traffic calming.

3. Average speed. When speeding is the primary concern, the average speed should exceed 10 mph over the posted speed limit before traffic calming is considered.

4. Crashes. Crash data on the study street for the most recent three years.

5. Facilities. Location of schools, public facilities such as parks or community centers and/or commercial uses with pedestrian and/or vehicle access to the study street.

6. Sidewalks. Location of sidewalks along the study street.

7. Adjacent streets. Determine if the increased traffic or speed on the study street is related to poor traffic conditions on adjacent streets. Adjacent streets that accommodate vehicle weight restrictions, truck or emergency routes or other variables should be evaluated to determine whether they contribute to the increased traffic or speed on the study street. Deficiencies on the adjacent streets should be addressed in conjunction with recommendations for traffic calming on the study street.

8. If the assessment includes a recommendation for traffic calming measures, cost estimates will be provided along with availability of funding in the current Borough budget and a timeframe for implementation.

9. The Planning and Zoning Department will coordinate assessment review with the Police Department, Fire Department and any other necessary Borough departments to secure comments or recommendations to be incorporated into the assessment to be presented to the Parking, Traffic and Street Light Committee.

PROJECT POINTS SYSTEM

A points system will be used to determine the score that will be used to consider what type of traffic calming design measures should be incorporated for the project.

Criteria	Points	Basis for Point Assignment
Volume	0 to 30	Average daily traffic, 1 point assigned for every 100 vehicles.
Speed	0 to 30	Average speed, 15 points if the average speed exceeds the posted speed limit by 10 mph. 15 points if the number of vehicles that exceed the posted speed limit by 10 mph is more than 10% of the total volume.
Crashes	0 to 10	1 point for every crash reported within past 3 years.
Schools	0 to 10	1 point assigned for each school crossing on the study street.
Pedestrian Generators	0 to 10	1 point assigned for each public facility such as parks or community centers and/or commercial uses that generate a significant number of pedestrians on the study street.
Pedestrian Facility	0 to 10	5 points assigned if there is no continuous sidewalk on one side of the street; 10 points if missing on both sides.
Total Points	100	

TRAFFIC CALMING DESIGN MEASURES

The project score will be used to determine the type of traffic calming design measures to be incorporated when making a recommendation to the Parking, Traffic and Street Light Committee.

0-15 Points – No traffic calming measures needed.

15-40 Points – Police Department speed enforcement.

40-65 Points – Lowering posted speed limit, increased signage, painted crosswalks and/or painted lines to narrow the street corridor.

65-100 Points – Install curb extensions, raised median islands, speed humps or raised crosswalks. Descriptions and examples of these measures are included as an attachment.

Borough of Chambersburg
Traffic Calming Request

A Borough resident, property or business owner must complete and sign this form and serve as the contact person for the request. Each request will be considered separately.

Name _____

Street Address _____

Telephone No. _____

Email Address _____

Please list the street/location/intersection where you believe traffic calming is needed:

_____

What time of day do the concerns seem most noticeable?

_____

What is causing the perceived need for traffic calming? For example, increased vehicle traffic, increased pedestrian traffic, new development, etc.

_____

Signature _____

The contact person must secure signatures from at least 50% of the residents, property or business owners of a given neighborhood. A form is provided.

A neighborhood is defined as all residents, property or business owners that have driveway access to the street being considered for traffic calming measures between the nearest intersecting streets.

Return the completed forms to:

Borough of Chambersburg
Department of Public Works
100 South Second Street
Chambersburg, PA 17201
charr@chbgboro.com

Date Received by Borough _____

Received by Signature _____

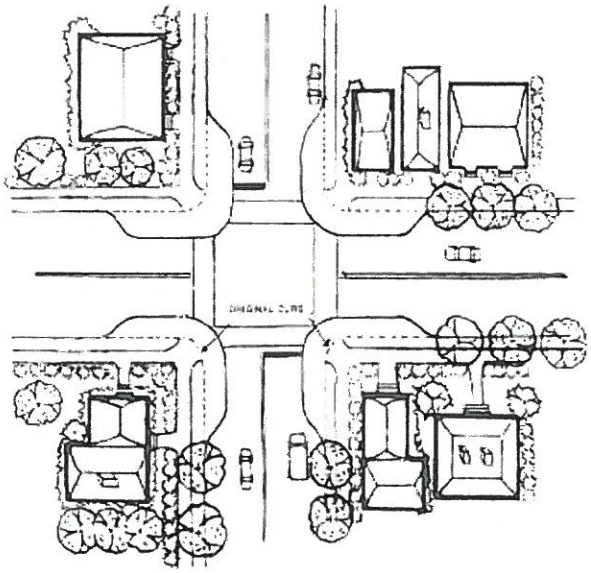
Traffic Calming Request Neighborhood Support Signatures
Please make additional copies if necessary.

No.	Printed Name	Street Address	Signature
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			

CURB EXTENSIONS / BULB-OUTS

Description:
Curb extensions, sometimes referred to as bulb-outs, are areas of expanded curbing.

Appropriate Locations:
- Appropriate for all street classifications: local roads, collectors, and arterials.
  - Many jurisdictions extend the curb only 6 feet from the existing curb, which protects parked vehicles, improves pedestrian visibility, and minimizes crossing distance, but does not typically affect the speed of motorists. For extensions that do not result in narrowing of the travel lanes, usage on streets of up to 15,000 ADT with posted speeds up to 40 mph is appropriate.
- Works well in downtown areas.
- Primarily used at intersections.
- Can be used at mid-block locations with significant pedestrian activity, school children, or senior citizens. Mid-block curb extensions may also be used to address speeding on streets where speed humps are not permitted.



Typical Uses:
- Reduce the crossing distance for pedestrians.
- Improve the line-of-sight for pedestrians.
- Make pedestrians more visible to oncoming traffic.
- Slow traffic by funneling it through a narrower street opening.
- Slow vehicles making a right turn by reducing the curb radius.

Speed/Volume Reductions:
- Most curb extensions result in speed reductions of 1-2 mph.
- Potential to reduce speeds by up to 5 mph when significantly narrowing the travel lanes. For example, some jurisdictions use extensions to briefly narrow two travel lanes to a total width of 18 feet. (This width is not recommended for arterials or high-volume collectors.)

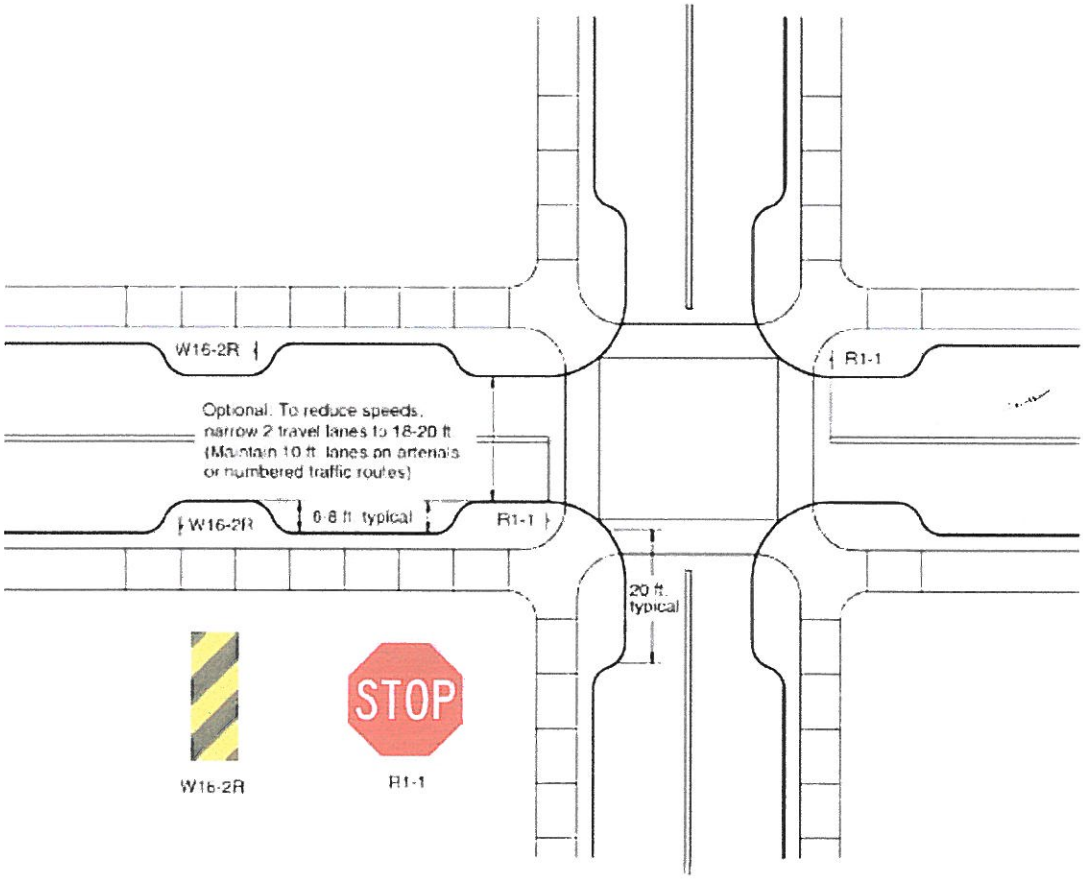
Approximate Cost:
- Each pair may cost $7,000 to $10,000. Mid-block measures may cost less ($4,000) if they are smaller.

Signing and Markings:
- Signing or pavement markings may be needed, especially when installed at a mid-block location.

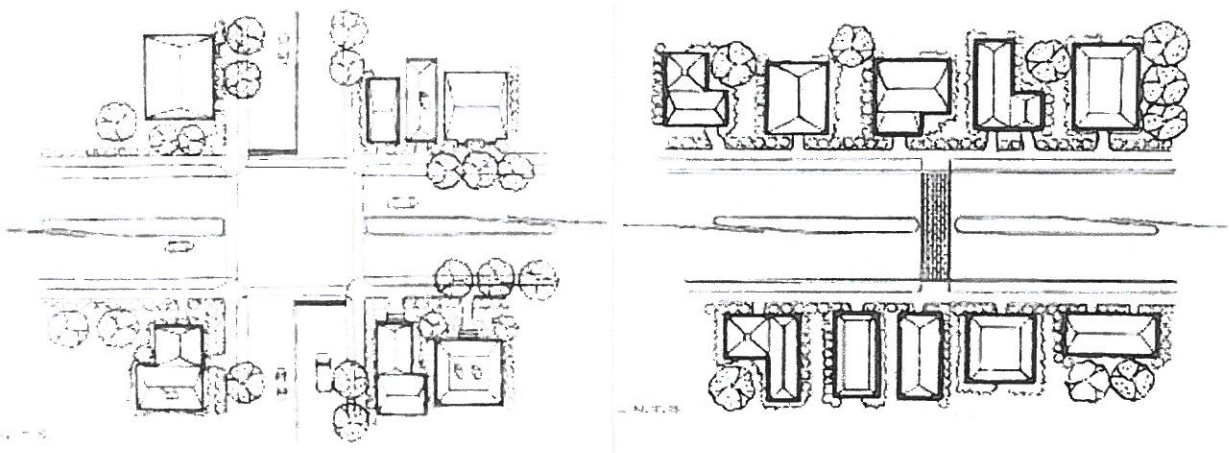
Other Considerations:

- Impact on roadway drainage must be addressed. Drainage may be provided by devices such as catch basins, concrete channels, valley gutters, inlets, and trench drains. Ponding on the sidewalk may also occur if the measure is not properly designed.
- Vertical curb is recommended, but mountable curb can be used if necessary to accommodate turning trucks and buses.
- Mid-block curb extensions should be combined with crosswalks whenever possible.
- Provisions should be made for snow and ice removal.

Advantages:	Disadvantages:
❑ Improve pedestrian safety. ❑ May reduce travel speed. ❑ May slow right-turning vehicles. ❑ Prevent illegal parking close to intersections. ❑ Facilitate pedestrian access directly to transit vehicles without entering street. ❑ Can improve neighborhood appearance with landscaping and/or textured treatments.	❑ Can result in loss of one on-street parking space on each side of the road, though at intersections this is unlikely given statutory prohibitions of parking close to intersections. ❑ May prevent right turns at intersection when another vehicle is stopped at the stop line. ❑ May make it difficult to accommodate full bicycle lanes.



RAISED MEDIAN ISLANDS / PEDESTRIAN REFUGES



Description:
Median islands are narrow islands between travel lanes that can be designed with breaks in landscaping and curbing for pedestrians.

Appropriate Locations:
- Median islands may be appropriate for all classifications of streets: local, collector, and arterial.
- They may be used on high-volume roadways and roadways posted up to 40 mph, if they do not significantly narrow the travel lane.
- Either at mid-block locations or intersections.

Typical Uses:
- Reduce the crossing distance for pedestrians by allowing them to cross half the street at a time.
- Prevent passing movements.

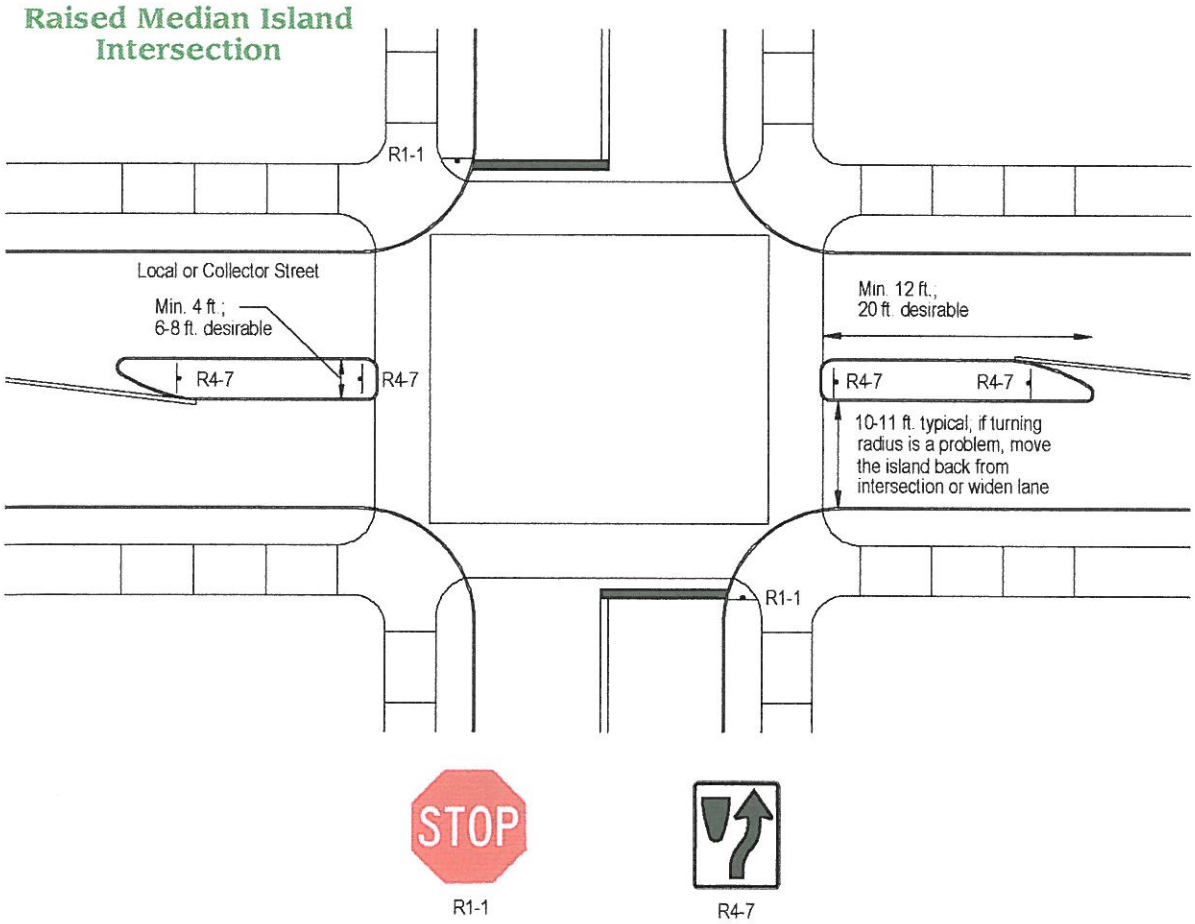
Speed/Volume Reductions:
- Vehicle speeds may decrease, particularly if the median islands result in roadway narrowing.
- Reductions in speed may range from 1 to 5 mph, with reductions of 2 to 3 mph most prevalent.

Approximate Cost:
- Approximate cost is $5,000 to $15,000 per island, depending on size, curbing, and landscape features.

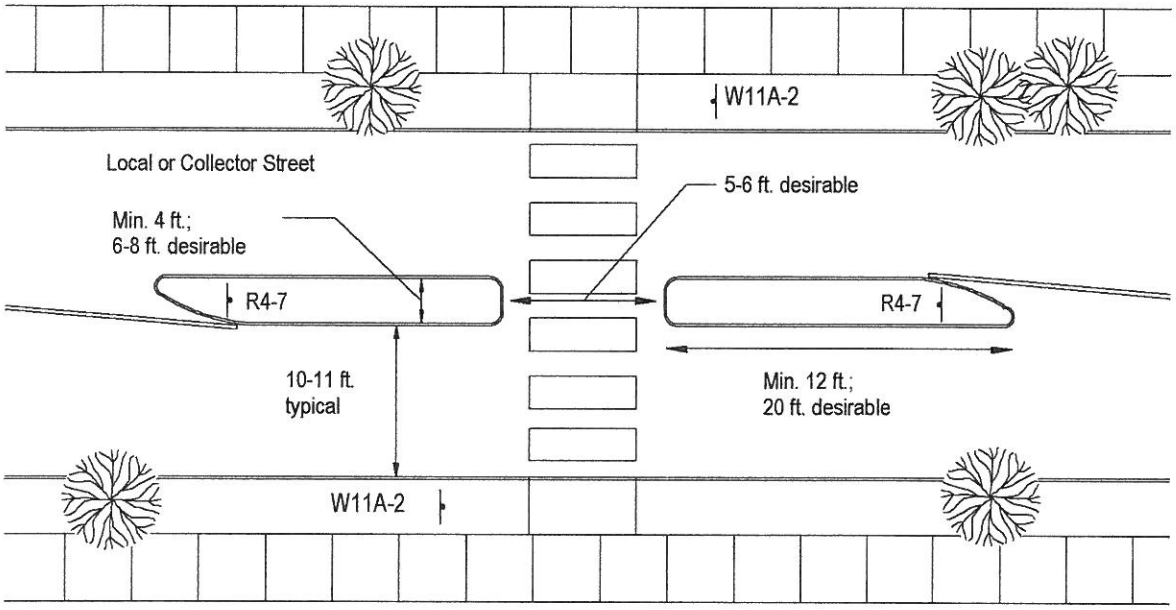
Other Considerations:
- The maximum length of median islands will be affected by driveway and intersection locations.
- Median islands should be 6 to 8 feet wide to comfortably accommodate pedestrians.
- Islands should be at least 12 feet, and preferably 20 feet, in length.
- Provisions should be made for snow and ice removal.

Advantages:	Disadvantages:
❑ Separate opposing vehicle travel lanes and prevent passing movements. ❑ Can be designed with breaks for pedestrian refuges and may reduce vehicle-pedestrian conflicts. ❑ Allow pedestrians to cross half of the street at a time. ❑ May visually enhance the street, if landscaped. ❑ Vehicle speeds may decrease. ❑ Can be used on curves to prevent vehicles from swinging wide at excessive speeds.	❑ May require removal of on-street parking to create room for median. ❑ May restrict access to driveways from one direction.

Raised Median Island Intersection



Raised Median Island
Mid-Block



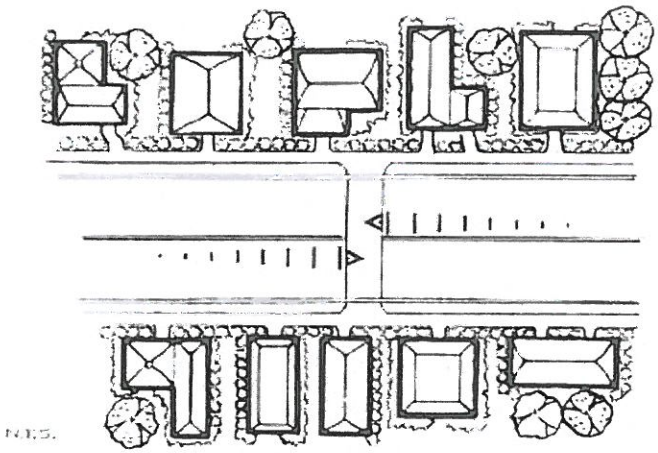
R4-7

W11A-2

SPEED HUMPS

Description:

A speed hump is a raised surface on the roadway that is typically 3 to 4 inches in height, and 12 to 20 feet in length. Speed humps are by far the most popular traffic calming measure in the United States, likely because they are effective in reducing speeds at minimal cost.



Common Designs:

- The Watts speed hump (designed by the Transport and Road Research Laboratory in Great Britain) is a parabolic hump 12 feet in length. This model was endorsed by ITE in *Guidelines for the Design and Application of Speed Humps*, June 1997.
- The Seminole County speed hump is the most popular alternative to the Watts hump. Designed by Seminole County, Florida, this hump is 22 feet in length with 6-foot ramps on either end of a 10-foot flat top. This type of speed hump design is also referred to as a "speed table".

Appropriate Locations:

- Both humps are appropriate for use on Pennsylvania roads. However, due to their different profiles, they are effectively employed in different settings.
- The Watts hump is recommended only for local streets with volumes less than 3,500 ADT and posted speeds of 30 mph or less. In addition, it is not recommended for major emergency service routes.
- The Seminole County hump can be used in a greater variety of situations. This type of hump can be used on collector roads as well as local roads. It is appropriate for streets with volumes up to 6,500 ADT. Many jurisdictions also permit the use of Seminole speed humps on emergency response routes.
- Primarily used at mid-block locations.
- Similar designs can be used as raised pedestrian crosswalks.

Typical Uses:

- Within typical residential travel speeds, humps create a gentle rocking motion encouraging motorists to slow to a safe speed at or below the speed limit.

Speed/Volume Reductions:

- The design speed is determined by the dimensions of the speed hump.
- The Watts hump is designed to slow vehicles to 15 to 20 mph at each hump and 25 to 30 mph in between properly spaced humps (see "Other Considerations"). Numerous studies have demonstrated that Watts humps can reduce speeds by about 8 mph in the vicinity of humps. Volumes are reduced, on the average, by about 18 percent.
- Because of its gentler profile, the Seminole County hump has a design speed of 25 to 30 mph at the hump, and approximately 35 mph in between humps. It has been shown to reduce speeds by about 6.5 mph, and volumes by 12 percent. Some jurisdictions have found that speed of motorists at the hump and in-between the humps are not significantly different.

Approximate Cost:

- Each speed hump installation costs about $1,500 to $3,500, depending on roadway width.

Other Speed Hump Designs:

- The Gwinnett County speed hump, like the Seminole County hump, is 22 feet in length with 6-foot ramps and a 10-foot plateau. However, the ramps of the Gwinnett speed hump are straight, not parabolic. This type of hump can be used in situations similar to the Seminole County hump.
- The 14-foot speed hump was developed by Portland, Oregon after it concluded that the 12-foot hump was too abrupt. Its effect on speeds and volumes is similar to the Watts hump and is also designed for use only on local streets.
- The Split speed hump, also designed by Portland, Oregon, is used for the benefit of emergency vehicles. Two 22-foot speed humps on opposing sides of the roadway are placed at least 50 feet apart. Small concrete medians are placed 10 to 15 feet in advance of each "hump half." Pavement striping and raised markings give the illusion that the median continues through. Emergency vehicles can avoid the speed hump by following a chicane pattern around the humps.

Split Speed Hump
Source: City of Portland, Oregon

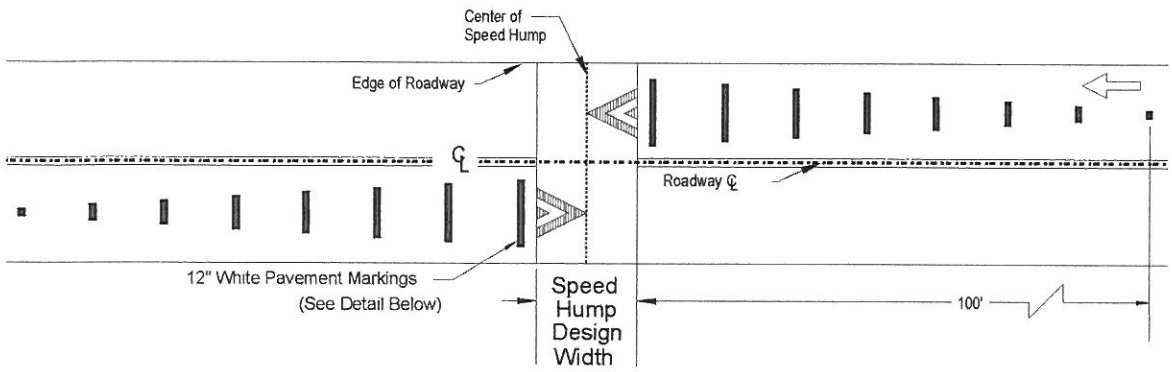
Signing and Markings:

- A Speed Hump Warning Sign (MUTCD W16-1) has been proposed for adoption in the Manual on Uniform Traffic Control Devices. This sign has also been included in PennDOT's Publication 236M (W8-17). It is recommended that this sign be installed either 100 feet in advance of speed humps, at the hump, or in both locations. Where multiple humps exist on one street, one sign before the first hump encountered, labeled "SPEED HUMPS," may be sufficient. It is also recommended that the "Speed Hump" sign be accompanied by an "Advisory Speed Plaque" (W13-1). The indicated speed depends upon the design of the individual speed hump.
- The pavement marking designs on the following pages have also been proposed for adoption in the Manual on Uniform Traffic Control Devices. It is recommended that one of these sets of markings be used with speed hump designs.

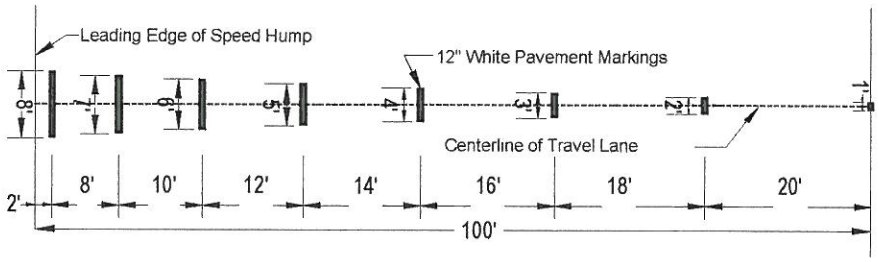
W8-17

W13-1

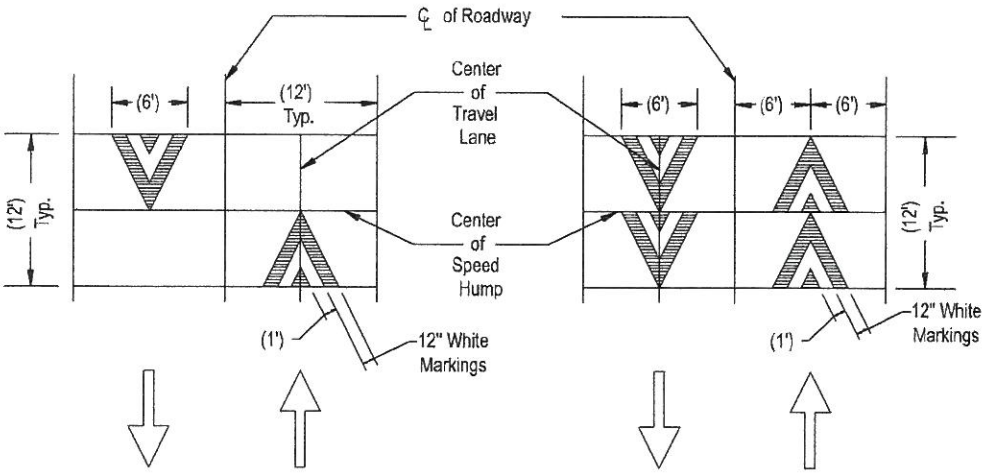
Advance Warning Markings For Speed Humps



Detail – Speed Hump Advance Warning Markings

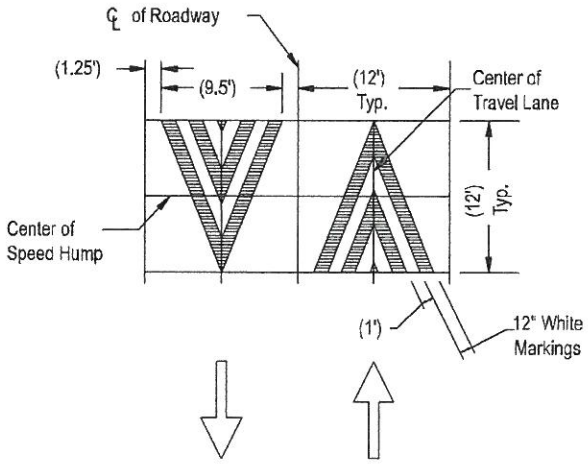


Pavement Markings for Speed Humps



Leading Edge
(a)

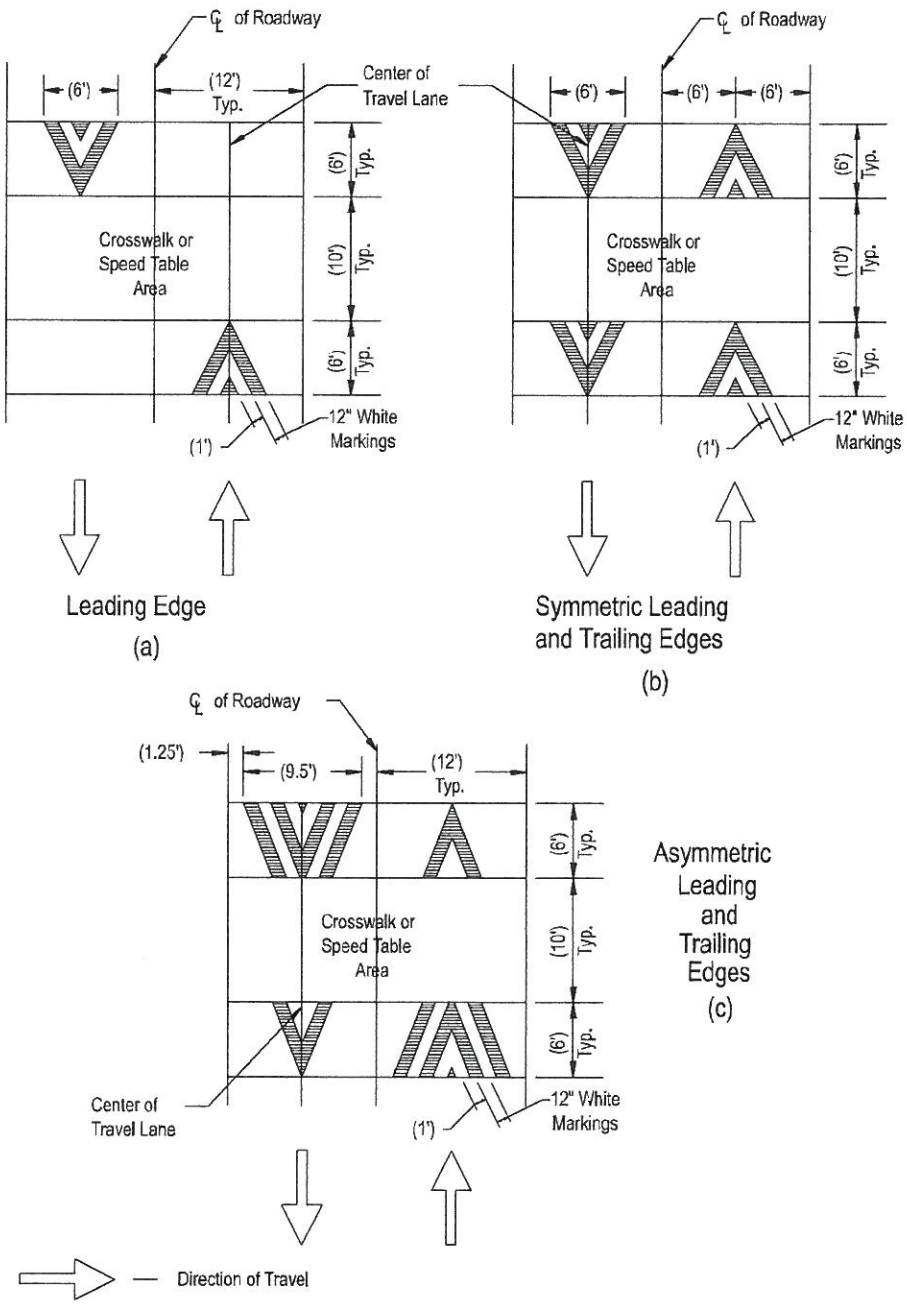
Symmetric Leading and Trailing Edges
(b)



Asymmetric Leading and Trailing Edges
(c)

Direction of Travel

Pavement Markings for Speed Humps with Crosswalks or Tables



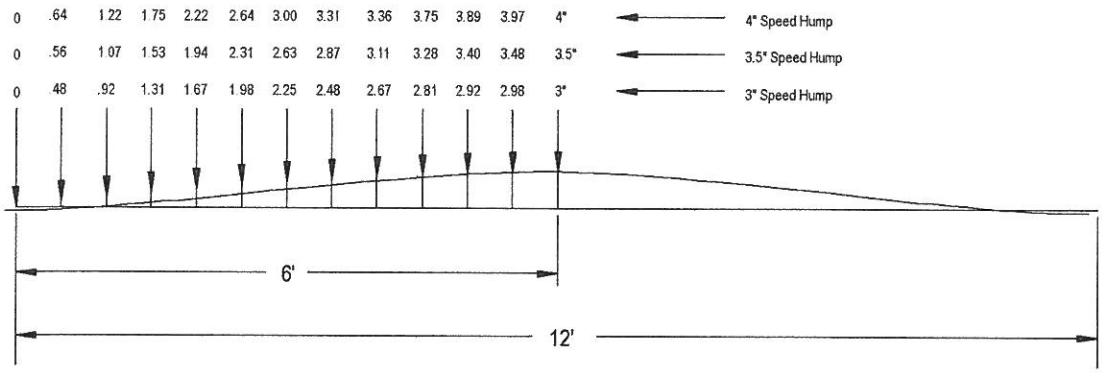
Other Considerations:

- Humps should be placed 250 to 600 feet apart. One study showed that placing Watts speed humps at intervals of 275 feet resulted in 85th percentile speeds of 25 mph; intervals of 550 feet resulted in 85th percentile speeds of 30 mph.
- Normally, no hump should be placed within 150 feet of an unsignalized intersection or 250 feet of a signalized intersection.
- Speed humps should not be used on curves unless the radius is greater than 300 feet.
- Humps should not be installed on streets with a grade exceeding 8%.
- Humps should not be installed on streets without curbing unless obstructions such as signing, flexible delineator posts, or bollards prevent drivers from driving around the hump. Rocks, boulders, and other objects of this nature should not be used for this application.
- Ideally, speed humps should extend across the roadway from curb to curb. This design is generally preferred by bicyclists, and it prevents motorists from driving with one wheel in the gutter (this may happen with tapered edges). If drainage cannot be accommodated under curb-to-curb conditions, it is recommended that humps end before bike lanes or continue across the bike lane without tapering off.
- Watts humps delay emergency vehicles anywhere from 1 to 10 seconds, with most delays in the range of 3 to 7 seconds.
- Seminole County humps appear to reduce the delay for most types of emergency vehicles by approximately 1 second. Emergency service companies greatly prefer Seminole County humps to Watts humps both because they reduce delay, and because they are less jarring to the long, stiff-bodied emergency service vehicles.
- Humps usually have a parabolic cross section. A sinusoidal cross section is harder to construct but may better facilitate snow removal.
- Although speed humps may create noise from vehicles passing over them, the overall noise levels on the street may be reduced due to lower vehicle speeds.
- Traffic may divert to other parallel streets that are not traffic calmed.
- In areas with snow removal problems, a measure such as a flexible delineator post may be needed at each hump to alert snowplow operators to lift their blades.

Speed humps should be distinguished from speed *bumps*, which may be encountered in parking lots. Speed bumps are usually about 3 to 6 inches in height, 1 to 3 feet in length, and force traffic to slow to 5 to 10 miles per hour. Speed bumps may generate severe vertical displacement at low speeds and are not to be used as traffic calming measures.

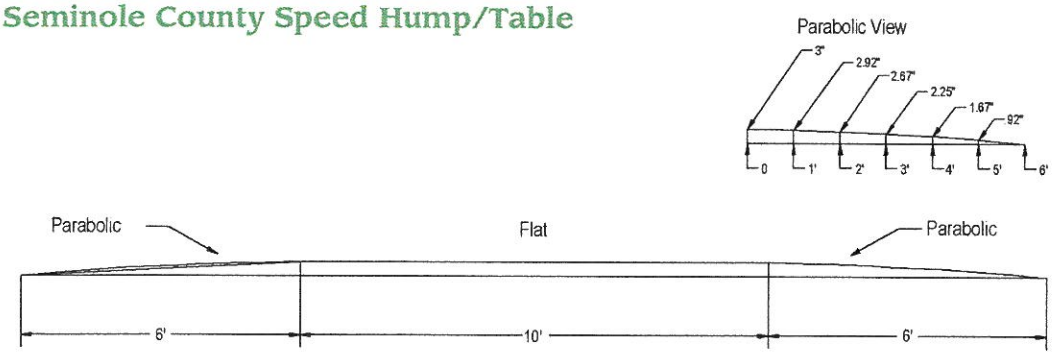
Advantages:	Disadvantages:
❑ Can be very effective in slowing traffic on residential streets. ❑ Relatively inexpensive to install and maintain. ❑ Can reduce motor vehicle conflicts. ❑ Should not pose problems for bicyclists or motorcyclists, except at high speeds.	❑ Watts speed humps are inappropriate for emergency response routes. ❑ Seminole County humps may be considered for emergency routes, but only after close coordination with emergency service providers. ❑ Should be avoided on major transit routes. ❑ Snow removal personnel may require special training in speed hump areas. However, speed humps have been used successfully in many jurisdictions with heavy snowfalls. ❑ Drainage could be a concern.

Watts (TRRL Profile) Speed Hump



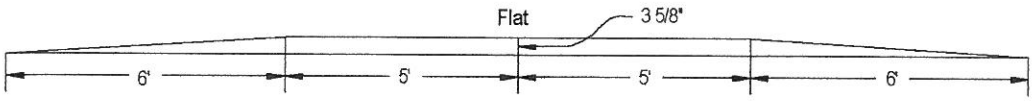
Source: ITE, Guidelines for the Design and Application of Speed Humps

Seminole County Speed Hump/Table

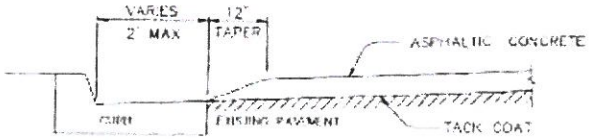


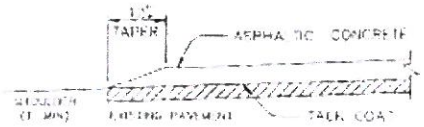
Source: Seminole County, Florida

Gwinnett County Speed Hump/Table



Gwinnett County Speed Hump/Table Shoulder Detail





Shoulder Detail For Streets Without Curbs

Source: Gwinnett County, Georgia

RAISED CROSSWALKS

Description:

Raised crosswalks are marked and elevated pedestrian areas that are an extension of the sidewalk at mid-block locations or intersections. Raised crosswalks are typically 3 to 6 inches above street level. In many jurisdictions, raised crosswalks are level with the curb, about 6 inches above the street. They often have the same profile as the Seminole County speed hump.

Appropriate Locations:

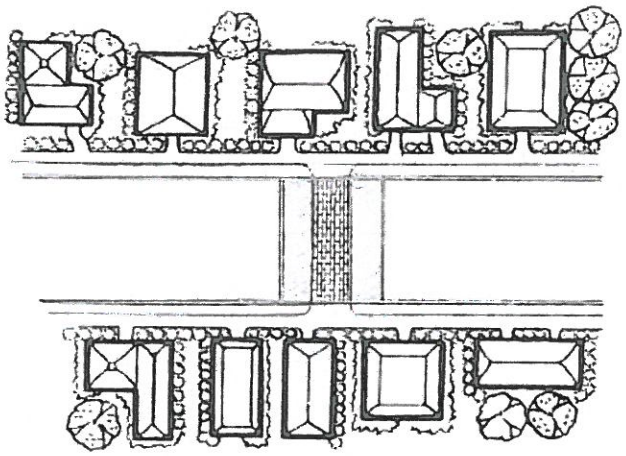
- They are appropriate on local streets and minor collectors, with volumes less than 10,000 vehicles per day.

Typical Uses:

- Reduce speeds and improve visibility of the pedestrians by defining crossings.

Speed/Volume Reductions:

- Raised crosswalks reduce speeds an average of 6 mph.
- Volumes are reduced an average of 12%.
- Due to their long flat tops and gently sloped ramps, raised crosswalks actually slow vehicles less than the Watts speed humps (12 feet in length; 3 inches in height) despite being as much as three inches higher.



NTS

Approximate Cost:

- Cost of a raised crosswalk is approximately $2,000 to $10,000 each. If drainage is an issue, costs could increase considerably.

Signing and Markings:

- It is recommended that the "Raised Pedestrian Crossing Warning Sign" (W11A-3) be used with each raised pedestrian crossing.

W11A-3

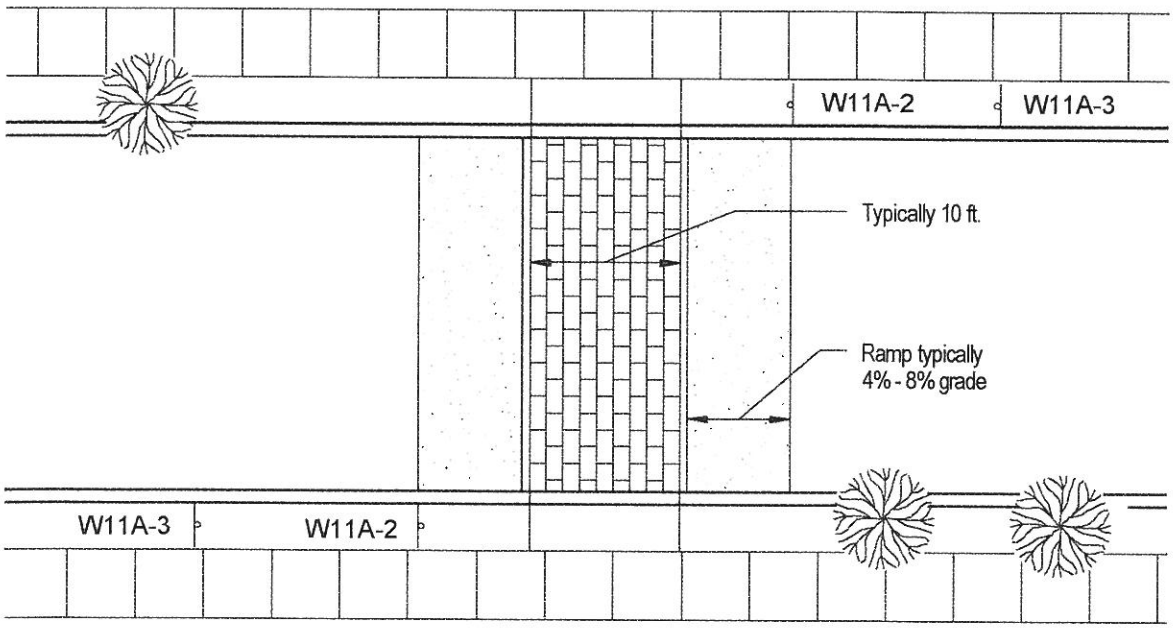
Other Considerations:

- If the raised pedestrian crossing is the same height as the curb, the edge of the raised crosswalk should be differentiated with a tactile measure to warn visually impaired people.
- Most appropriately used at areas with significant pedestrian crossing activity.
- Effectiveness of the measure is increased when used with textured crosswalks or curb extensions.
- Primary emergency access routes should be avoided, unless acceptable to emergency service providers.
- A catch basin should be installed for drainage on the uphill side of the raised crosswalk.
- All ADA requirements must be met.
- In areas with snow removal problems, a measure such as a flexible delineator post may be needed at each hump to alert snowplow operators to lift their blades.

Advantages:	Disadvantages:
❑ Reduce speeds. ❑ Improves visibility for pedestrians. ❑ Improves the visibility of pedestrians. ❑ May reduce volumes.	❑ Slows emergency vehicles by 4 to 6 seconds, on average. ❑ May generate noise and additional emissions from vehicle deceleration and acceleration. ❑ Require more maintenance than traditional crosswalks. ❑ Icing can be a problem If snow is not properly removed.

Raised Crosswalk

For typical profile, see drawings of Seminole County speed table or the Gwinnett County speed table in the "Speed Humps" section.



W11A-2 W11A-3