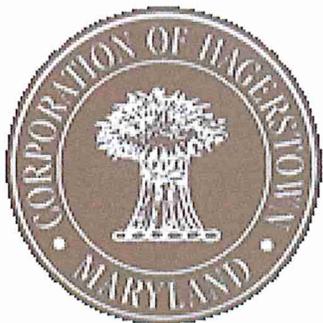
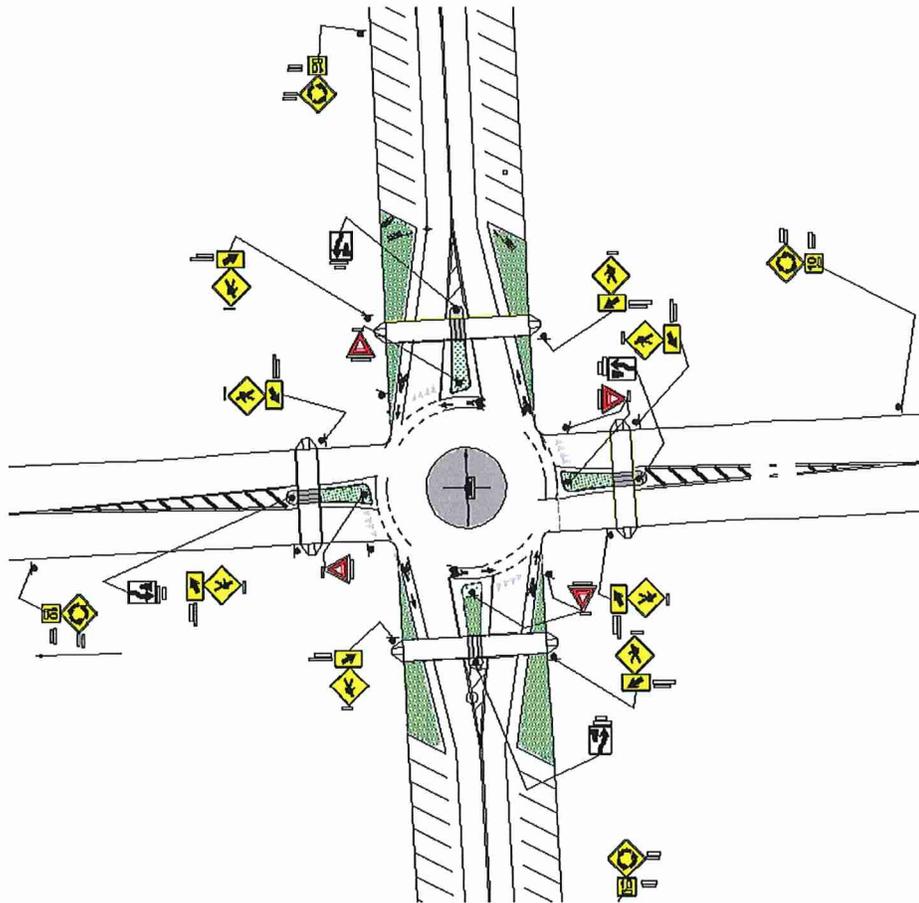


# *Residential Traffic Calming Program*



Adopted by Mayor and City Council  
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## *City of Hagerstown Residential Traffic Calming Program*

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#### **APPENDIX:**

- **Application and Checklist**
- **Point Assignment Worksheet**
- **Flow Chart of Traffic Calming Process**

**Acknowledgement:** The City of Hagerstown *Traffic Calming Program* was prepared by the Engineering Department and Sabra, Wang & Associates, Inc.



## ***City of Hagerstown Residential Traffic Calming Program***

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### **I. INTRODUCTION**

This report summarizes a policy for a Traffic Calming Program (TCP) for the City of Hagerstown. The report is in response to an increasing number of citizen inquiries to reduce speed and enhance safety on many streets, both residential and non-residential, throughout the City. As congestion along the primary roadway network grows, motorists increasingly seek bypass routes through local neighborhood streets. Aggressive driving and a diminished respect for other motorists, pedestrians, bicyclists, and traffic control devices can result. The suggested program is based on research of state-of-the-practice policies and techniques, as well as review of programs and practices of neighboring jurisdictions. The report outlines the program's goals and objectives, discusses allowable traffic calming measures, identifies policy and criteria considerations, and establishes application and implementation procedures including warrants and cost considerations.

The decision to use a particular device at a particular location should be made on the basis of an engineering study of the location. While this policy provides qualifications for allowing traffic calming devices and standards for their application, the policy is not a substitute for engineering judgment. Qualified engineers need to exercise the engineering judgment inherent in the selection of traffic calming devices, just as they are needed to locate and design the roads and streets which the devices complement. This engineering judgment shall be exercised by the City Engineer.

### **II. GOALS AND OBJECTIVES**

The goals and objectives for the TCP are as follows:

- 1) To achieve lower speeds for vehicles
- 2) To increase safety and the perception of safety for non-motorized roadway users
- 3) To promote pedestrian, bicycle and transit use
- 4) To create and maintain safe and attractive streets
- 5) To reduce the need for police enforcement
- 6) To minimize cut-through traffic
- 7) To reduce the negative effects of motor vehicles on the environment (noise, pollution, etc.)
- 8) To reduce crash frequency and severity
- 9) To encourage active citizen and neighborhood participation, and
- 10) To educate the public in the benefits and limitations of traffic calming

It should be noted that while many of these goals can have a positive impact on the quality of life in many residential neighborhoods, continued and comprehensive planning, engineering, education and enforcement is necessary over time to ensure long-term success on a city-wide level.



## City of Hagerstown Residential Traffic Calming Program

### III. GLOSSARY

Definitions for common terminology used in this report are presented below. For the purposes of this policy, every street will fall into one of four (4) roadway classifications: Arterial, Collector, Local and Alley:

**Access Restriction** – a full or part-time regulatory prohibition or physical barrier preventing full or directional entry into or through a particular street.

**Alley** – a minor public way having narrow right of way and affording secondary means of access to abutting properties

**Arterials** – A roadway that functions primarily to facilitate high volume area-wide vehicular traffic connections between the City core and outlying activity centers, collector streets and major thoroughfares such as expressways and freeways; and secondarily to provide access to abutting land uses. Examples of these roadways include Wesel Blvd, Eastern Blvd, Northern Avenue, Washington Street, and Franklin Street. In general, few traffic calming devices are permitted on arterials.

**Average (Weekday) Daily Traffic (AWDT)** – the average total number of vehicles in one or more direction of travel in a 24-hour (weekday) period passing a given point on a roadway.

**Collector** – An intermediary street that funnels vehicular traffic to and from local streets and arterials, high density development and industrial sites. Examples of these roadways include Salem Avenue and Cannon Avenue. The City classifies streets as “major” or “minor” collectors.

**Community Association** - Any incorporated or unincorporated common ownership or civic association which represents the interests of the subdivision or neighborhood in which the street being considered for traffic calming is located.

**Cut-through or Non-local traffic** – through traffic diverted from arterial and major collector streets onto minor collectors or local residential streets to avoid congestion and/or longer trips, with both an origin and destination external to the neighborhood and/ or traffic shed boundaries as documented in a license tag survey sample or other appropriate measure.

**Level-of-Service** – A qualitative measure describing operational conditions within a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. It ranges from A to F as shown in the table below:



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Level of Service	General Operating Conditions	Intersection Delay (Signal)	Intersection Delay (Stop)
A	Free flow	< 10 sec	< 10 sec
B	Reasonably free flow	10 to 20 sec	10 to 15 sec
C	Stable flow, freedom of movement but noticeable presence of other vehicles	20 to 35 sec	15 to 25 sec
D	Approaching unstable flow	35 to 55 sec	25 to 35 sec
E	Unstable flow, presence of other vehicles impedes movement	55 to 80 sec	35 to 50 sec
F	Breakdown flow	>80 sec	>50 sec

**Local Street** – a street, such as a neighborhood residential street primarily providing direct access to abutting residential or commercial land uses, not intended to provide for traffic traveling beyond or through a neighborhood.

**Manual On Uniform Traffic Control Devices** – is a publication of the Federal Highway Administration which sets national standards and guidance to ensure uniformity of traffic control devices such as signs, traffic signals and pavement markings. The use of uniform traffic controls (messages, location, size, shapes, and colors) helps ensure that devices are visible, recognizable, understandable and necessary, and reduces crashes and congestion while improving the efficiency of the surface transportation system. The information contained in the MUTCD is the result of years of practical experience and research. All public agencies and owners of private roads open to public travel are required to comply with the MUTCD.

**Neighborhood Traffic Committee** – an ad hoc group of residents formed in the absence of an active Community Association which represents the interests of the subdivision in which the street being considered for traffic calming is located. In the City of Hagerstown, the Neighborhoods 1<sup>st</sup> Group will perform this function in many neighborhoods.

**Speed Study** – A study using equipment such as a radar gun or pneumatic tubes to measure, collect and statistically analyze the speeds of vehicles.

**Study area** – The boundary of an area identified for evaluation of a traffic calming study, which may cross traditional neighborhood boundaries.

**Traffic Calming** – methods used to reduce vehicular speed and/ or volume, while encouraging sharing of streets with pedestrians, bicyclists and other users. Generally, traffic calming refers to physical measures and roadway design changes in addition to enforcement and education.

**Traffic Calming Study** – A formal study typically including 1) technical and quantitative analysis of existing traffic conditions such as speeds and traffic volumes, 2) the development of a plan for implementing one or more traffic calming devices, and 3) the assessment of potential consequences of such actions.



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**Traffic Shed** – that system of interconnected roadways within a neighborhood or portion of a residential community feeding into one or more arterials or major highways

**Warrants** – The minimum criteria necessary to require a change in the type of control, such as installation of a stop sign, traffic signal or a traffic calming device. These criteria are outlined in both federal and local engineering manuals and standards. Typically warrants are justified based on speed surveys, traffic volume studies and crash records.

**85<sup>th</sup>-Percentile Speed** – The speed at or below which 85% of the vehicles are moving, and is a common measure of the speed at which a majority of motorists consider safe and reasonable based on the prevailing geometric and traffic conditions on a particular roadway. Studies have demonstrated that drivers who travel either slower or faster than the 85<sup>th</sup>-percentile speed of the traffic stream have a higher rate of crash involvement rate than those drivers whose speed is close to the 85<sup>th</sup>-percentile speed. The measured 85<sup>th</sup>-percentile speed indicates that only 15% of drivers exceed it.

#### **IV. TYPES OF TRAFFIC CALMING MEASURES AND DEVICES EVALUATED FOR APPROVAL**

The City of Hagerstown will consider traffic calming measures and devices, as appropriate for each street, as categorized below. Educational and Enforcement Measures are typically, but not always, considered prior to Physical Measures.

##### **Educational Measures:**

In many cases, it is the residents themselves who are the primary violators of the posted speed limit. In other cases, through/ non-local traffic may not be aware of the impact caused by excessive speeds and/or volumes. The following measures may be helpful in raising drivers' awareness of their driving habits:

**Activism/ Safe Routes To School** – The goal of the Safe Routes to School (SRTS) program is to make walking and bicycling to school safer. The process involves not only education, but enforcement, engineering, encouragement and evaluation. Typically a plan includes bringing community members together such as school and City officials, listening and sharing suggestions, gathering and analyzing information on the roadway and traffic conditions surrounding a particular school, identifying solutions, creating a detailed plan, funding and implementing the plan, and monitoring the results. Typical encouragement and educational activities include:

**Safe Routes to School Events:** would be a fun event that would include both schools and local residents. Families could walk or bicycle to school on this day and signs, balloons, and banners could be located along the primary walking and bicycling routes to the school. Snacks and beverages could also be included.



Bicycle Train



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**Mileage Clubs and Contests:** mileage clubs and contests encourage children either to begin walking and bicycling to school or to increase their current amount of physical activity by making it fun and rewarding. Generally children track the amount of miles they walk or bicycle and get a small gift or a chance to win a prize after a certain mileage goal is reached or in competition with other classrooms or schools.

**Walking School Bus and Bicycle Train;** Ongoing walking and bicycling activities are activities that are held daily, weekly or several times per month throughout the school year. *Typically these events include educational materials on safe walking and bicycling tips.*



Walking School Bus

**Newsletter Articles** – The City will assist community associations in writing articles for their newsletters informing residents of the dangers of excessive speeding

**Pedestrian Paddles** (In-Street Pedestrian Crossing sign - R1-6a) are now approved by SHA and are currently included in the 2009 MUTCD and may be used to remind road users of laws regarding right-of-way at an unsignalized pedestrian crosswalk. The legend STATE LAW along with the STOP symbol should be included. If used, the sign shall be placed in the roadway at the crosswalk location on the center line, on a lane line, or on a median island.



**Radar Speed Sign** – an electronic speed limit sign with a radar device that can also display speeds of the approaching vehicles, alerting drivers if they are exceeding the legal speed limit.

**Speed Trailer** - A portable device which displays vehicle travel speeds as determined by a radar gun. The device is housed in a trailer which is typically set up in a neighborhood for four to five days at a time.



### **Enforcement Measures:**

Targeted, visible and aggressive enforcement of speed limits may be effective if it occurs consistently over a long period of time. However, this is not an efficient use of police personnel with limited budgets and resources on relatively low volume residential streets. Furthermore, with limited and spot enforcement, speeding violations tend to be only temporarily mitigated.



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**Increased Fines** – The City will consider increasing speeding fines (up to \$200) above the normal fine for speeding in designated zones, or doubling the fines for speeding in school zones signs to discourage motorists from speeding.

**Speed Cameras** – an Automated Speed Enforcement (ASE) system is an enforcement technique with one or more motor vehicle sensors producing recorded images of motor vehicles traveling at speeds above a defined threshold. Images captured by the ASE system are processed and reviewed in an office environment and violation notices are mailed to the registered owner of the identified vehicle. Often, these systems are referred to as speed cameras. Under Maryland law, speed cameras are permitted to be installed along roadways within designated school zones. However, local jurisdictions have authority to legalize the use of automated speed enforcement anywhere on their roadways. Jurisdictions must provide reasonable public notice and hold a public hearing prior to passing this local law. Similar to traffic calming, studies for speed cameras should consider traffic volumes, speed, crashes, citations, and community requests.



Both portable and permanent speed camera units are available. An educational and public outreach program should be undertaken prior to deployment, and monitoring and evaluation should be performed after deployment.

### **Physical Measures:**

By implementing physical measures which change the geometric and operational characteristics of a roadway, the speed at which drivers feel comfortable can be lowered, and in some cases the volume of traffic along a particular street can be reduced. All proposed changes must be reviewed and approved by stakeholder agencies (Board of Traffic and Parking, Fire, Police, Engineering, Public Works, and Board of Education) before implementation to assure that there is no unacceptable impact to the delivery of services. In general, physical changes should be designed to accommodate any vehicle type which was previously able to use the roadway (but at a reduced rate of speed).

### **Speed Control Measures:**

**Bicycle Lanes** – dedicated roadway space for bicycles identified with signing and pavement marking can create the perception of a narrower roadway while encouraging bicycle usage.





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**Chicanes** – a series of fixed objects, usually extensions of the curb, which alter a straight roadway into a zigzag or serpentine path to slow vehicles.



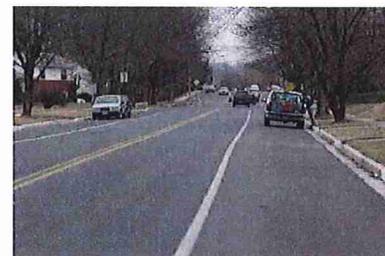
**Chokers/ Bump-outs** – Chokers are the narrowing of streets, either at an intersection or mid-block, to reduce the width of the travel way. Chokers can be designed to widen the sidewalk and appear to have the greatest effect in the area of pedestrian safety. By reducing the amount roadway width, the choker dramatically reduces the exposure time that a pedestrian is in the street. Additionally, chokers break up the appearance of the roadway and may be landscaped to increase the attractiveness of residential neighborhoods.

**Circles** – Traffic circles are different from traditional roundabouts in that they are circles placed in an intersection without modifying the outside curbs, typically less than 26 feet in diameter. Similar to roundabouts motorists must yield to traffic in the circle. A primary consideration for installing these types of devices will be the effect on emergency vehicles and school buses. Circles must be designed in a way that allows these vehicles to navigate the intersection by driving over mountable splitter or center islands.



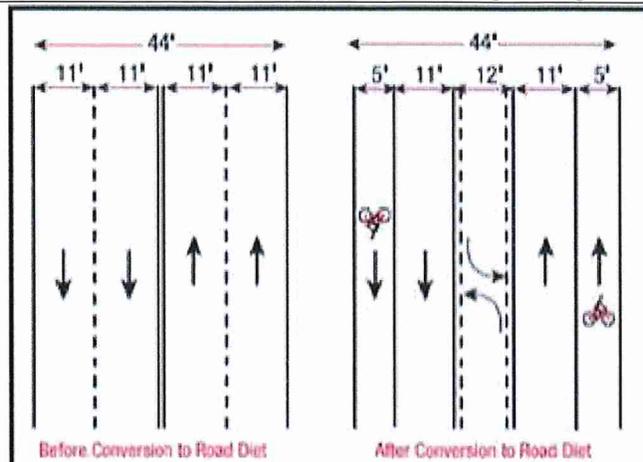
**Medians and islands** – function by narrowing the roadway with a raised center island, typically planted, dividing the existing travel lanes. They can also provide a pedestrian refuge thereby allowing pedestrians to cross one travel lane at a time

**Pavement Markings** – using paint or tape to narrow wide travel lanes can create the perception of a narrower roadway and have calming effect while also providing extra room for bicycles and parked cars. Road diets, which reduce the number of available vehicle travel lanes, are another example of pavement marking changes. This measure can be used on streets with AWDT volumes over 5,000.





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**Roundabouts** – a roundabout is a type of traffic control requiring all entering vehicles to yield to traffic in a circulating lane, and when traveling through must move in a counterclockwise direction. The resulting traffic pattern forces vehicles to slow down when traversing an intersection and reduces the number of conflict points presented to each entering driver. However, traditional roundabouts typically require diameters up to 150' to meet State and Federal roadway design standards, which may not be practical to retrofit into neighborhood streets.



**Raised Crosswalk** – a variation of a traditional pedestrian crossing area, combined with a speed cushion to purposely raise a crosswalk above the normal pavement surface level in order to give motorist and pedestrians enhanced awareness of the crossing area.

**Speed bumps (only in alleys)** – Speed bumps are narrow mountable obstructions, typically rubber or asphalt, installed on the pavement surface, across the traveled lanes, and intended to cause vehicles to slow to less than 5 mph. Speed bumps are usually less than 14 inches wide and 4 to 6 inches high. Speed bumps (or humps) are not a measure the City will consider on non-alley roadways.



**Speed cushions** – are similar to speed bumps but are wider mountable obstructions designed for slightly higher travel speeds (10 to 15 mph) and are gentler on vehicles. Speed cushions are typically parabolic in shape, or flat on top, with a height of 3", an inclined section of 6' and a length ranging from 12' to 22'.

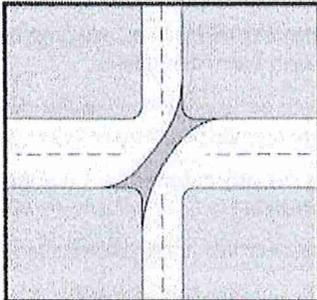




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### Volume Control Measures:

**Intersection diverter (semi or half closure)** – is a barrier, usually a landscaped island, on one side of a street at an intersection that permits traffic on the opposite direction to pass through; thereby creating a one-way street at the intersection but maintaining two-way traffic for the remainder of the block.



**Intersection diverter (diagonal)** – a partition that connects two diagonally opposite curbs, bisecting the intersection, to force motor vehicles to slow down and turn to the right only. A traversable barrier should allow emergency vehicles, as well as bicyclists and pedestrians, to cross over.

**Signing/ Traffic Pattern Changes:** The restriction of access (e.g. Do Not Enter, No Left Turn) at all times or during peak hours from, higher functional roadways into local streets, as well as conversion of local streets from two-way to one-way is a cost-effective tool for traffic volume management that can be successful when the resulting diverted traffic movements do not relocate the speed or volume problem to another adjacent roadway.



### Safety Measures:

**Multi-way stop signs** – numerous studies, as well as guidance from the MUTCD, have indicated that multi-way stops (as well as traffic signals) are not effective and should not be used in an attempt to control vehicle speeds and can oftentimes reduce a street's level of safety. When unwarranted stop signs are installed, increased non-compliance with the traffic control device often results, as motorists realize the low likelihood of encountering cross-street traffic. Therefore, stop signs (**as well as traffic signals**) are not included in the City's traffic calming program but will be considered in locations where they meet MUTCD warrants.



A summary of traffic calming measures and devices is presented below:



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Measure	Primary Control Effect	Warrant/ Criteria	Cost	Advantage	Disadvantage
Activism/ Safe Routes to School	<b>Speed and safety</b>	None	Low to moderate	<ul style="list-style-type: none"> <li>• Direct contact with drivers</li> <li>• Increases awareness</li> <li>• Can address specific concerns</li> </ul>	<ul style="list-style-type: none"> <li>• Success dependent upon resident participation</li> </ul>
Pedestrian Paddles	<b>Speed and safety</b>	Per MUTCD	low	<ul style="list-style-type: none"> <li>• Increases awareness</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enforcement</li> </ul>
Manual Enforcement/ Increased Fines	<b>Speed and safety</b>	None	Moderate	<ul style="list-style-type: none"> <li>• Quick implementation</li> <li>• Improves pedestrian and bicyclist safety</li> </ul>	<ul style="list-style-type: none"> <li>• Manpower required</li> </ul>
Automated Speed Enforcement	<b>Speed and safety</b>	Per SHA guidelines	Low	<ul style="list-style-type: none"> <li>• Strong disincentive to speeding</li> </ul>	<ul style="list-style-type: none"> <li>• Results limited to camera zone of influence</li> <li>• Negative public perception</li> </ul>
Signing/ Traffic Pattern changes (One-way, Do Not Enter, No Left Turn)	<b>Volume and safety</b>	None (Signs and marking per MUTCD)	Low	<ul style="list-style-type: none"> <li>• Inexpensive</li> <li>• Reduces vehicle conflicts and volumes</li> </ul>	<ul style="list-style-type: none"> <li>• May shift volume and conflicts to other roadways</li> <li>• May restrict access or inconvenience some land uses/ residents</li> </ul>
Roundabouts/ Traffic Circles	<b>Speed and safety</b>	Per MUTCD and FHWA guidance	Moderate to high	<ul style="list-style-type: none"> <li>• Speed reduction near circle;</li> <li>• Vehicle conflict reduction</li> <li>• Self-enforcing</li> </ul>	<ul style="list-style-type: none"> <li>• Minor constraint for emergency vehicles,</li> <li>• Large space requirement (roundabout)</li> </ul>
Intersection Diverters	<b>Volume and speed</b>	none	Moderate to high	<ul style="list-style-type: none"> <li>• Speed and volume reduction,</li> <li>• Improves safety for pedestrians and bicycles</li> <li>• May enhance aesthetics</li> </ul>	<ul style="list-style-type: none"> <li>• Impacts to pedestrian, bicycle, and emergency access</li> <li>• May shift volume to other roadways</li> <li>• Maintenance needs</li> <li>• Loss of on-street parking</li> </ul>
Chicanes	<b>Speed and safety</b>	none	Moderate	<ul style="list-style-type: none"> <li>• Speed reduction</li> <li>• Increases driver focus</li> <li>• May enhance aesthetics</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance needs</li> <li>• Loss of on-street parking</li> </ul>
Median Islands	<b>Speed and safety</b>	none	Moderate	<ul style="list-style-type: none"> <li>• Speed reduction</li> <li>• May enhance aesthetics</li> <li>• Provides pedestrian refuge</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of on-street parking,</li> <li>• maintenance needs</li> </ul>
Pavement markings/ Narrow lanes/ Bicycle lanes	<b>Speed and conflicts</b>	Per MUTCD	low	<ul style="list-style-type: none"> <li>• Speed reduction</li> <li>• Conflict reduction</li> <li>• Improves bicycle safety</li> </ul>	<ul style="list-style-type: none"> <li>• Not as effective as physical devices</li> </ul>
Speed Bumps/ Speed Cushions/ Raised X-Walk	<b>Speed and safety</b>	none	Low	<ul style="list-style-type: none"> <li>• Speed reduction</li> <li>• Self-enforcing</li> <li>• Improves pedestrian safety</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for increased noise</li> <li>• Maintenance needs</li> <li>• Impact to emergency vehicles</li> </ul>
Chokers/ Bump-outs	<b>Speed and safety</b>	none	Moderate	<ul style="list-style-type: none"> <li>• Speed reduction</li> <li>• Reduces pedestrian crossing distance</li> </ul>	<ul style="list-style-type: none"> <li>• Limited deflection of vehicles</li> <li>• Maintenance needs</li> <li>• Loss of on-street parking</li> </ul>
Warranted Multi-way STOP	<b>Safety</b>	Per MUTCD	Low	<ul style="list-style-type: none"> <li>• Improves pedestrian safety</li> </ul>	<ul style="list-style-type: none"> <li>• Requires enforcement</li> <li>• Unwarranted installation will result in non-compliance</li> <li>• May increase speeds between intersections</li> </ul>
Warranted Traffic Signal	<b>Safety</b>	Per MUTCD	High	<ul style="list-style-type: none"> <li>• Speed reduction, especially near intersection</li> <li>• Improves pedestrian safety</li> </ul>	<ul style="list-style-type: none"> <li>• Possible increase in certain types of accidents</li> <li>• Increase in driver delay</li> <li>• Maintenance and energy needs</li> </ul>



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### V. APPLICATION AND PROCESSING

In order to streamline and expedite the evaluation and implementation process, the following procedure is outlined to identify the required steps to process a traffic calming request:

- 1) Requests** should be submitted in writing to the Engineering Department through the local Neighborhoods 1<sup>st</sup> Group or elected officials, City Administrator, or Police Department. Requests should be specific about the following information:
- Location and nature of problem*
  - Critical time(s) of day, days of week*
  - Requested calming measure (i.e. speed bump, enforcement, etc.)*

If there is no Neighborhoods 1<sup>st</sup> Group, a petition by a homeowner or community association of at least 25% of the affected households on a particular street will be required to begin a study. Residents that do not respond are considered 'no' votes.

- 2) Evaluation** by the City will be performed within approximately 60 calendar days of acknowledgement of request, and if a street passes the Initial Screening the evaluation will include:
- Traffic Calming Study*
  - Point Assignment Analysis*
  - Eligibility Determination for specific measures*

- 3) Presentation** to the neighborhood to inform stakeholders and residents of recommended action and solicit feedback, followed by a presentation to the Board of Traffic and Parking.



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**4) Approval by no less than 75% of the affected residents** will be required to advance the Physical Measure project. The City will determine the exact number and location of affected residents (affected residents may be a tenant or any owner but only one vote per dwelling unit) and survey them for their vote. Should the neighborhood fail to support physical change traffic calming measures, none will be implemented.

Upon resident approval, City will budget for and determine installation schedule of the traffic calming measure.

Exemptions and qualifications:

- a. The City reserves the right to install measures on a trial basis
- b. The City reserves the right to install measures without resident support if a safety concern exists
- c. The City may install a measure even if the minimum criteria are not satisfied if 90% of the affected residents agree in writing
- d. The City reserves the right to remove measures no longer functional as traffic patterns change
- e. The City will remove a measure if 75% of the affected residents request removal

**5) Final Design and Construction** will be performed by the City once the measure is approved and funded. The designs would follow all nationally recognized standards (e.g. MUTCD, ITE, AASHTO guidelines, etc.), and other traffic engineering standards for the City of Hagerstown.

## **VI. SCREENING AND CRITERIA**

To establish an effective traffic calming program, thorough analysis and a clear, objective policy and criteria must be developed to assist in evaluating each request, as well as prioritizing resources and implementing traffic calming measures. The first step in assessing each request is to perform a detailed, quantitative traffic calming study.

### **Initial Screening**

For the purpose of this document, streets where Physical Changes will be considered are local or collector roadway with the majority (>50%) of the properties abutting both sides being



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residential in usage, and maximum average daily weekday traffic volumes do not exceed 5,000 vehicles per day.

Streets that are snow emergency or evacuation routes, have daily traffic volumes greater than 5,000 vehicles per day or peak hour volumes greater than 500 vehicles per hour, or are cul-de-sacs less than 1000 feet in length may not be eligible for physical traffic calming measures.

Given the wide variety of roadways throughout the City, some of which are constructed to non-standard designs and which have unique functions, not all streets for which measures are requested may comfortably fall into any of the above categories. However it is expected that through the use of sound engineering judgment, each street will be fitted into the category to which it is most closely related.

### **Traffic Calming Study**

A traffic engineering study shall be conducted by the Department of Parks and Engineering or a qualified consultant appointed by the City. This shall involve determining a study area, data collection needs, and performing analyses. A report summarizing findings on the following parameters should generally be submitted for review, within a 60-day period after a study has started. A study may include a combination of the following:

- Vehicular volume
- Speeds
- Cut through traffic (e.g. peak hour origin-destination data)
- Crashes
- Road alignment and grade
- Street or segment classification (as defined in Public Ways Manual “Street Classification Map”)
- School or transit bus stops and routes
- Parking regulations
- Pedestrian activities
- Bicycle activities
- Other physical conditions on roadway or segment

### **Point Assignment Analysis**

Once a study is completed, a roadway(s) will be screened against selected criteria based on multiple factors that affect roadway safety such as street functionality and classification, traffic volumes, 85<sup>th</sup>-percentile speed, crash experience, schools, sidewalks, and pedestrian and/ or bicycle traffic generators. Each factor will be assigned a weighted score, based on prevailing roadway and traffic characteristics. A sample worksheet is included.

A high score, available funding, and other factors are used to determine which roadways will proceed to the next phase which may involve community approval for the installation of traffic calming measures of devices.



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Once a requested street has been categorized, a point system using eight criteria is used to determine the street's score. A maximum score of 110 points is possible based on the following criteria:

### **1. Traffic Volume**

Points are assigned according to the street's functional classification and the desirable AWDT range for that category. The desirable AWDT range is based primarily on the roadway function, and the type of traffic which it should handle considering the overall local roadway network and roadway width. Points are assigned according to how much greater the current AWDT volume on the requested street is than the desirable AWDT range volume for the road category into which it falls. The desirable AWDT ranges are summarized on the sample point assignment worksheet.

*20 points maximum score*

### **2. Speed**

Points are assigned according to how many miles per hour the measured 85<sup>th</sup>-percentile and 95<sup>th</sup>-percentile speed on the requested street is over the posted speed limit. The 85<sup>th</sup>-percentile speed indicates that 85 percent of vehicles on a particular street are traveling at this speed or below, as measured by a spot speed study. The 85<sup>th</sup>-percentile speed is a nationally recognized standard.

*30 points maximum score*

### **3. Crash History**

Points are assigned based on the street's reported number of crashes for the three most recent years for which accident data is available. Adjustment factors of 4 and 3 are used, respectively, to weight crash history for fatal and pedestrian/ bicycle crashes.

*20 points maximum score*

### **4. School or Playground Along the Street**

Ten (10) points are assigned to a street on which an elementary, middle school or a public playground is located (i.e. with direct frontage).

*10 points maximum score*

### **5. Major Pedestrian Generators**

Ten (10) points are assigned to a street which has one or more major pedestrian generators (> 50 pedestrians in a single peak hour) abutting the street such as, but not limited to libraries, parks, playgrounds, elementary school walk route, concentrations of disabled citizens, and bus stops. Five points for each generator.

*10 points maximum score*



## ***City of Hagerstown Residential Traffic Calming Program***

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### **6. Sidewalk**

Points are assigned according to how much (by percentage) of the street does not have a sidewalk, trail or path. The points are calculated by multiplying the percentage of the street without sidewalk by 10. For example, 80% (without sidewalk) x 10 = 8 points.

*5 points maximum score*

### **7. Geometry and Sight Distance**

Five (5) points are assigned to a street with travel lanes wider than 12' and/or with uncorrectable and extensive sight distance limitations due to such conditions as vertical or horizontal curves.

*5 points score*

### **8. Cut-Through Traffic**

Points are assigned for the percentage of traffic along a particular roadway documented to be non-local as measured by an origin-destination survey. Zero to thirty-three percent is 2 points, thirty-three to sixty-six percent is 7 points, and greater than sixty-six percent is 10 points.

*10 points maximum score*

## **Eligibility Assessment and Plan Development**

Based on the results of the traffic calming study and point assessment, a roadway will be determined to be eligible or not eligible for traffic calming measures and devices. A minimum threshold score of **40 points** is required to justify an implementation of Physical Measure (Educational and Enforcement Measures may still be viable options below this threshold). If a roadway is determined to be ineligible for Physical Measures either by ADWT, functional classification or below the point assessment threshold, the neighborhood must wait a minimum period of one year before re-applying.

If a roadway is determined to be eligible for physical traffic calming measure, staff shall develop cost estimates and design one or both of the following traffic calming plans:

***Volume Management and Access Restriction Plans:*** These plans will consider primarily volume control measures such as signing/ traffic pattern changes, and intersection diverters.

***Speed control plans:*** These plans will consider primarily speed control measures such as circles, median islands, roadway diets, chokers, chicanes, speed cushions, etc. However, 85<sup>th</sup>-percentile speeds should be a minimum of 10 mph over the posted limit to consider physical measures, although the street could still employ education and enforcement applications.

In addition, these plans should consider:

- 1) Access to existing non-residential (e.g. commercial, recreational or institutional land uses) within a study area
- 2) Impact on other roadways (e.g. volumes, level of service)
- 3) Future roadway, bicycle, transit and land use plans
- 4) Approval by Police and Fire Department
- 5) Loss of on-street parking



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If a roadway is determined to be ineligible for physical traffic calming measure, staff can develop costs and programs for **Education and Enforcement Plans** such as activism, pedestrian paddles, speed trailers, speed cameras, etc.

### **VII. IMPLEMENTATION - FUNDING AND PRIORITIZATION**

The City will fund in the Capital Improvement Program projects based on priority (e.g. meeting and/ or exceeding the point threshold) and on a first come, first serve basis. However, there are several factors that can modify the project funding and/ or scheduling:

- Planned street resurfacing schedule
- Community support or lack thereof
- Private financing (e.g. community or developer)

The cost of traffic calming treatments ranges from \$1,000 to >\$100,000 depending on the devices used, street width and other environmental characteristics of a street. However, some approximate costs are as follows:

- \$3,000 to purchase each portable speed trailer,
- \$1,000 to \$2,500 for a speed bump
- \$10,000 to greater than \$20,000 for concrete design treatments such as chicanes, median islands, chokers, etc.
- \$2,500 to \$7,500 for speed cushions
- \$10,000 for a traffic circle
- \$100,000 for a roundabout (excluding right-of-way costs)

### **VIII. MONITORING AND FUTURE DEVELOPMENT**

#### **After study**

After installation, no earlier than three months or 90 days, monitoring and evaluation of a traffic calming measure is necessary and a follow-up traffic study may be conducted. This study may help in the decision-making process on similar measures to be deployed in other areas of the City. Follow-up studies may also help explain the reasons why some residents or motorists may resist a particular measure.

The 'after' study will assess resident and motorist reactions, conduct field observations, perform traffic counts, speed studies, and collect and analyze other data as needed. The analysis of the data collected should determine whether the measure or solution has met its desired objective. If the traffic calming measure does not meet the desired or intended objective based on the analyses or other factors, the City shall notify the residents about removal. Alternative solutions may be considered.



## ***City of Hagerstown Residential Traffic Calming Program***

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### **New Streets**

To avoid future requests for traffic calming in future residential neighborhoods, future subdivision plans must incorporate proactive traffic calming:

- Traffic control signage,
- Pavement marking,
- Parking regulations
- Accommodations for pedestrians and bicycles (both linear and crossings)
- Design of any traffic calming measures as allowable in this policy based on anticipated roadway functional classification and ADT, typically suggested every 300' to 500' as well as at intersections

To ensure that these elements are considered and included in the developer's roadway design plans, these items will be added to the City's development site plan review checklists.

**CITY OF HAGERSTOWN TRAFFIC CALMING PROGRAM  
POINT ASSIGNMENT WORKSHEET**

STREET NAME \_\_\_\_\_  
 FROM \_\_\_\_\_ TO \_\_\_\_\_  
 STAFF \_\_\_\_\_ DATE \_\_\_\_\_

1) **TRAFFIC VOLUME (Average Weekday Daily Traffic)** \_\_\_\_\_ POINTS  
 (Max. 20 Points)

Road Category	Desirable AWDT	Desirable PHV	Current AWDT		
		if exceeded (10 Points)	(2 Points)	(5 Points)	(10 Points)
Local Residential Street	up to 2,500 vpd	250 vph	1000-1500	1500-2500	> 2500
Collector Residential Street	up to 5,000 vpd	500 vph	2500-3500	3500-5000	>5000

2) **SPEED** 85th \_\_\_\_\_ 95th \_\_\_\_\_ POINTS  
 POSTED SPEED LIMIT \_\_\_\_\_ (Max. 30 Points)

MPH 85TH PERCENTILE OVER POSTED SPEED LIMIT

<u>&lt; 6 MPH</u>	<u>6-10 MPH</u>	<u>11-15 MPH</u>	<u>&gt; 15 MPH</u>
0	10 pts	15 pts	20 pts

MPH 95TH PERCENTILE OVER POSTED SPEED LIMIT

<u>11-15 MPH</u>	<u>&gt; 15 MPH</u>
10 pts	15 pts

3) **CRASH HISTORY** - Average annual number of police-reported crashes in past three years  
*Factor 4.0 X fatal crashes, X 3.0 for pedestrian or bicycle crashes* \_\_\_\_\_ POINTS  
 (Max. 20 Points)

4) **SCHOOL CHILDREN OR PLAYGROUND** \_\_\_\_\_ POINTS  
 Elementary, Middle School or public playground located along roadway (YES = 10 Points)

5) **MAJOR PEDESTRIAN GENERATORS** \_\_\_\_\_ POINTS  
 (e.g. libraries, parks, major bus stops) 5 points each (Max. 10 Points)

6) **SIDEWALK** \_\_\_\_\_ POINTS  
 (Max. 5 Points)  
 (% of roadway without sidewalk, trail, path, etc. on at least one side multiplied by 10. Example: 80% X 10 = 8 pts.)

7) **GEOMETRY AND SIGHT DISTANCE** \_\_\_\_\_ POINTS  
 (5 Points)  
 (Travel lanes greater than 12' and/ or uncorrectable and extensive sight distance conditions due to vertical or horizontal curves, vegetation, parked vehicles, etc.)

8) **NON-LOCAL TRAFFIC** \_\_\_\_\_ POINTS  
 as documented by an origin-destination study (Max. 10 Points)  
 0-33% 2 points  
 34 - 66% 7 points  
 67 - 100% 10 points

**TOTAL:** \_\_\_\_\_ POINTS

# City of Hagerstown Traffic Calming Process

