MEMORANDUM

To: Mayor and Members of the City Council

From: Montre' Freeman, City Manager

Date: November 23, 2022

Subj: Hold a Public Hearing – Traffic Calming Policy

BACKGROUND / ANALYSIS:

Former Community Development Director Long, Interim Police Chief Webster and Public Utilities Director Bell had several meetings on how best to modify the City's outdated traffic calming policy. Former Director Long expanded our glossary of traffic calming measures and how best to utilize those, as well as provided photos of many of the devices for future reference.

If it is the wish of the Council, this updated policy may be adopted following the scheduled public hearing.

AT THE CONCLUSION OF THE PUBLIC HEARING:

STAFF RECOMMENDATION:

By motion, adopt the updated traffic calming policy.

City of Elizabeth City
Neighborhood Traffic Calming Policy and Guidelines

I. Purpose:

The City of Elizabeth City is committed to ensure the overall safety and livability of residential neighborhoods. One way to meet this commitment is through a collaboration of City staff, residents and other agencies in an effort to minimize the impact of traffic on neighborhoods. The City of Elizabeth City Neighborhood Traffic Calming Policy and Guidelines provides a process for identifying and addressing problems related to speeding, excessive volumes, and safety on neighborhood streets. The Police Department is designated as the lead department for traffic calming issues and will coordinate the efforts of other city departments.

II. Background: Traffic Calming

Traffic calming presents a new dimension when discussing the use of public rights-of-way. The goals of traditional transportation improvements have focused on capacity, speed and safety. While these are still concerns, another dimension is often added, that being the dimension of maintaining or restoring the "livability" of a neighborhood. This new dimension is what is referred to as "traffic calming". Traffic calming has many names: traffic mitigation, neighborhood traffic management, and neighborhood traffic control to name a few. The City of Elizabeth City will use the Institute of Transportation Engineers (ITE) definition for traffic calming, which is:

"Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users."

The major difference between traffic calming measures and other forms of traffic control devices, such as stop signs and speed limit signs, which require enforcement, is that calming measures are self-enforcing. Also, traffic calming should rely on the laws of physics rather than human psychology to slow traffic.

Although certain features along the rights-of-way such as street trees and other streetscaping may be intended to aid in calming traffic, there is no evidence indicating that these features directly induce drivers to slow down.

III. Definitions

1. 85th Percentile Speed - that speed at which 85% of the free flowing vehicles are traveling at or below.
2. Arterial Street - a heavily traveled street of considerable continuity used primarily as a main traffic artery. Ideally, an arterial street would have restricted access and provide a high degree of mobility and continuity.
3. Average Daily Traffic (ADT) - The computed average of all traffic volume for a 24 hour period collected over several days.
4. Collector Street - any two or four lane street which links an arterial street with another collector street of local street.
5. Defined Neighborhood Boundaries - the boundary of the problem area, which may cross traditional neighborhood boundaries.
6. Emergency & Evacuation Routes - routes identified, usually with a classification of a collector or above, that are identified as key routes for emergency response.
7. Local Street - any two lane street with a primary purpose of providing direct access to abutting residential properties.
8. Residential Cut-Through Traffic - traffic which uses local or collector streets to travel through a residential neighborhood without having an origin or destination within the neighborhood.
9. Speed Study - a study using equipment to measure, collect, and statistically analyze the speeds of vehicles.
10. Traffic Calming Measure - an element of a traffic calming plan selected from among those devices authorized herein for use within the city.
11. Traffic Calming Study - an appraisal of traffic conditions and the development of a plan for implementing one or more traffic calming devices in a residential neighborhood.
12. Traffic Count - a manual or automated count of the number of vehicles traversing a particular street in a given time period.

IV. Objectives

These are the overall objectives of the Traffic Calming Policy and Guidelines as derived from various references:

1. Maintain and/or improve neighborhood livability by mitigating the impact of vehicular traffic on residential neighborhoods.

2. Promote safe and attractive streets that maintain and/or improve the quality of life in neighborhoods.
3. Promote conditions that provide safe neighborhoods for motorists, bicyclists, pedestrians and residents of the neighborhood while maintaining access to the neighborhood.
4. Encourage citizen involvement in all phases of neighborhood traffic calming activities.
5. Make efficient use of City resources by prioritizing traffic calming requests.
6. Support the policies contained in the Transportation Element of the Comprehensive plan.

V. Policies

The following policies are established as part of the Neighborhood Traffic Calming Policy and Guidelines:

1. Through traffic should be encouraged to use higher classification streets (i.e. collector and arterial streets), as designated in the Transportation Element of the City of Elizabeth City Comprehensive Plan.
2. Traffic may be re-routed from one street to another of equal classification as a result of a neighborhood traffic-calming project, if and only if the end result is a more equal distribution of the traffic volumes. However shifting a traffic problem from one street to another or one neighborhood to another is not an acceptable alternative.
3. Reduce the average speed of motor vehicles within neighborhoods.
4. Implement cost-effective measures for solving identified traffic problem(s).
5. Improve real and perceived safety for non-motorized users of the rights-of-way.
6. Reasonable emergency vehicle ingress/egress must be preserved.
7. Reasonable automobile access should be maintained. Calming measures implemented should encourage and enhance pedestrian and bicycle access to and throughout defined neighborhood.
8. Any local residential street can qualify to have calming measures implemented. Collector streets will be considered on a case by case basis. Arterial streets will not be considered for traffic calming measures. Only City controlled roads will be considered.
9. The City shall employ traffic calming measures to achieve the objectives identified in this document. Traffic calming measures include, but are not limited to those measures listed. The City Public Utilities Director shall direct the design and installation of all calming measures along with the traffic control devices (signs, markings, etc.) as needed to accomplish the

project, in compliance with the municipal code.

10. In processing and implementing traffic calming requests, certain procedures should be followed by the City to ensure that applicable codes and related policies are adhered to, and that projects are within the limits of available resources. At a minimum, the procedures shall provide for submittal of project proposals; project evaluation and selection; citizen participation; and communication of any findings related to the proposed project. All projects shall receive input from area residents and affected organizations, and appropriate City Council approval before installation of permanent traffic calming devices.

VI. Process

The process to be followed for a traffic calming project is as follows:

Table 1

1.	Project Petition-To-Study	When requested
2.	Preliminary Review	Within 3 months of request
3.	Priority Ranking	Within 3 months of preliminary review
4.	Funding Approved?	Yes-continue; No-wait until funding available
5.	Design and Construction	3 months

A. Project Petitions and Initiation of Traffic Calming Studies

Requests for a traffic calming study, which are usually volume and speed related, can be requested through one of the following: 1) Neighborhood/Community Crime Watch Groups 2) the Police Department, or 3) City staff.

1. Neighborhood Groups - a study may be initiated upon receipt by the City Manager of a petition from a Neighborhood Group, signed by at least one member of sixty-six percent (66%) of the households along 1,200 feet of the proposed roadway to be looked at. A typical Traffic Calming Petition shall include, at a minimum, the required signatures, a description of the street or streets which are to be included, a description of the perceived problem, and a point of contact.

Police Department or City Staff - a study may be initiated because of an identified public safety issue.

B. Phases of a Traffic Calming Study

Before any neighborhood traffic problem, whether real or perceived, can be addressed, it must be understood. The following outlines the various phases involved in a traffic calming study.

1. Citizen Meeting - All Traffic Calming Studies shall begin with an open meeting, organized by the Police Department, to which all potentially affected residents are invited. An overview of what traffic calming is, what it is intended to do and what criteria are used in selecting traffic calming devices and location(s) will be discussed, as well as an opportunity for residents to provide comments. Staff will work to define neighborhood boundaries.

2. Data Collection Phase - Once the defined neighborhood is identified, appropriate "before" data will be collected. Data collection strategies will be discussed to determine the appropriate type of data to be collected as well as length and dates of collection. Data collection before any measures are implemented also serves as a comparison to "after" data to determine the effectiveness of the traffic calming measures. Table 2 lists typical data that could be collected for each defined neighborhood. If additional data is needed for a defined neighborhood, the appropriate study will be conducted to supplement the above information.

Table 2

Traffic Studies Data Collection

DATA TYPE	PURPOSE	METHOD
Speed Counts	Determine speed	Mechanical Hose counts
Volume Counts	Determine volume	Mechanical Hose counts
Screenline Counts	Determine total vehicles traveling into and out of neighborhood	Mechanical Hose counts
Crash Reports	Determine nature of reported crashes	Review crash reports
Origin-Destination Survey	Distinguish local from non-local traffic	Two screenlines or manual recording
Pedestrian Crossing Survey	Determine frequency and location of pedestrian crossing	Manual recording of time between vehicle arrivals during given time

		period
Intersection Turning Movement Counts	Determine source and destination of drivers using streets	Manual counts
Vehicle Classification Survey	Determine percentage of vehicles that are cars, trucks, buses, etc.	Mechanical Hose counts
Parking Survey	Determine how streets and parking lots are utilized during day	Manual survey of parking inventory and utilization
Street Classification	Determine street classification	Comprehensive Plan
Posted Speed Limits	Use as basis	Taken from posted speed
Physical Street Data	Determine lane width, etc.	Field measurements
Community Facilities Inventory	Determine non-residential facilities in area	Field Survey
Emergency & Evacuation Routes	Determine if a designated Emergency or Evacuation route	Staff research
Truck Routes	Determine if a designated truck route	Staff research

C. Ranking projects

1. Speed and volume usually precipitate the request for traffic calming within a neighborhood. In order to objectively evaluate the impact of a problem and to prioritize action, the City of Elizabeth City will use two rating systems. One rating system, see Table 3, will be utilized in order to enable competing local street traffic calming projects to be ranked in relation to the anticipated benefit. Similarly another rating system, see Table 4, will be utilized in order to enable competing local collector street traffic calming projects to be ranked in relation to the anticipated benefit. If multiple projects are competing for traffic calming funds, ranking will be based on total points and project cost. Traffic calming projects must score a minimum of 30 points in order to be considered for implementation.

2. Traffic crashes are added as extra points because a crash problem usually coincides with higher volumes and speed. Residential density also affects general traffic conditions. For example, higher densities tend to generate more pedestrian and vehicle turn movements. In addition, projects on higher density streets tend to benefit more people than projects on lower density streets. The other criteria, sidewalks, school crossings, and pedestrian generators, are important considerations because they relate to pedestrian safety.

Table 3

Project Point Assignment
Local Streets

CRITERIA	POINTS	BASIS
Speed (85th %tile)	0 to 40	10 pts for every 5 mph over posted speed limit
Volume	0 to 35	ADT divided by 100
No Sidewalks	0 to 10	5 pts if no continuous sidewalk, 5 pts if signs of heavy pedestrian traffic w/out sidewalks
Traffic Crashes	0 or 5	1 pt for each crash/year at one location
School Crossing	0 or 5	5 pts if children must cross street to get to school
Pedestrian Generators	0 or 5	5 pts if pedestrian generator, includes bicycle and wheelchair users
Total Points Possible	100	

Table 4

Project Point Assignment
Collector Streets

CRITERIA	POINTS	BASIS
Speed (85^{th} %tile)	0 to 30	5 pts for every 5 mph over posted speed limit
Volume	0 to 25	5 pts for every 1,000 ADT on any one street
Traffic Crashes	0 to 15	1 pt for every 2 crash/year at one location
No Sidewalks	0 or 10	5 pts if no continuous sidewalk, 5 pts if signs of heavy pedestrian traffic w/out sidewalks
Residential Density	0 to 5	1 pt for every 100 dwelling units/mile
School Crossing	0 or 5	5 pts if children must cross street to

		get to school
Pedestrian Generators	0 or 5	5 pts if pedestrian generator
Transit Availability	0 or 5	5 pts if not on transit route
Total Points Possible	100	

VII. Project Selection and Implementation

A. Project Selection

Projects scoring a minimum of thirty (30) points will be ranked and be presented to the City Council for approval. Projects approved by the City Council will still need to compete for funding as part of the regular annual budget process. Several factors will be considered when deciding whether to fund a traffic calming project. The factors include size and complexity of calming project, timing with other infrastructure improvements, and availability of funds. As noted in Table 1, only after a calming project is funded will the design phases begin will be designed:

B. Design Criteria

As stated earlier, traffic calming measures are self-enforcing physical features in the design of the roadway which effectively change the design speed. The neighborhood will be instrumental in the development of traffic calming plans to tailor the design to area characteristics. The design of traffic calming measures must, however, be undertaken using due diligence and responsible engineering judgment of the responsible designer.

The following criteria shall be used as design guidelines for those projects meeting the criteria set in Section VI above.

1. The posted speed may not be more than thirty (30) miles per hour.
2. Limited to streets having only one lane of through traffic in each direction.
3. Streets must not be primary emergency or evacuation routes.
4. At the discretion of the City Public Utilities Director, certain traffic calming measures may not be used if they would create an unsafe condition for motorists driving at normal speeds under average driving conditions.
5. Streets must not be through truck routes unless an acceptable alternative route is identified and approved.

VIII. Project Evaluation

Approximately six (6) months after the traffic calming project is completed ~~additional data as noted in table 2 will be collected and compared to the "before" data.~~, the same data methods that were performed to collect the" before data", should be repeated to collect the "after data". The purpose of comparing "after" data to "before" data is to evaluate the effects of the project. If any unacceptable impacts are identified, corrective measures may be taken, including removal of the Traffic Calming measure.

A. Removal of Traffic Calming Measures

Traffic calming measures can be removed after the evaluation period for any of the following reasons:

1. Emergency response is significantly impacted.
2. The identified traffic problem that the calming measures were to eliminate is transferred to another adjacent street or neighborhood.
3. At least 75% of the property owners within the defined neighborhood sign a petition to remove the calming measures. (This option will result in complete removal of all measures.)

IX. ~~Glossary of~~ Traffic Calming Measures

~~**Roundabouts:**~~	~~A raised circular structure constructed in an intersection designed to deflect the flow of traffic entering the intersection in a counter-clock-wise direction around the circle. The objectives of roundabouts are to slow traffic and reduce the number and severity of crashes. Roundabouts are designed to accommodate all sizes of vehicles. These features address vehicle speeds and may discourage cut-through traffic.~~
~~**Semi-Diverter:**~~	~~Islands installed on the ingress side of the street in which entry is being prohibited. Vehicles are still allowed to exit from this street but entrance is prohibited. This feature discourages (actually prohibits) cut-through traffic.~~
~~**Mid-Block Islands:**~~	~~Islands constructed mid-block in the center of the roadway separating driving lanes and may reduce lane widths. The objectives of mid- block islands~~

	are to slow traffic and reduce the number and severity of crashes. These features address vehicle speeds and may discourage cut-through traffic.
Splitter Islands:	These are treatments that may provide landscaping and physical channelization to lanes at the entrances to the neighborhood. The objectives of splitter islands are to slow traffic and discourage cut-through traffic.
Roadway Narrowing:	These treatments reduce the width of pavement while maintaining two- way traffic. Landscaping planted in conjunction with the narrowing may further enhance the feature and impact driver behavior by reinforcing the impression that the pavement area is limited. The objectives of roadway narrowing are to slow traffic and reduce the number and severity of crashes. These features address vehicle speeds and may discourage cut-through traffic.
Forced Turn Islands:	The installation of raised islands at the approach to an intersection prohibits vehicles from making certain movements. The objectives are to slow traffic, reduce the number and severity of crashes, and prohibit certain turning movements.
Chicanes:	This feature changes the alignment of the roadway so that the street is not straight. This eliminates driver tendencies to accelerate on a straight street and may add beautification opportunities without significantly impacting emergency services. Two-way traffic and full access for larger vehicles and emergency services is maintained. The objective is to slow traffic. These features address vehicle speeds and may discourage cut-through traffic.
Neighborhood Signs:	May be included at the entrance(s) to the neighborhood to advise motorists that the area is "traffic calmed". This may eliminate or reduce the use of other warning signs within the neighborhood, at the discretion of the City Engineer. These signs discourage cut-through traffic.
Speed Cushions	A type of speed hump that utilizes smaller separate speed tables to allow emergency vehicles to transit an area without slowing them down, while still reducing the speed of regular traffic.

~~**Speed Humps:**~~ ~~Street pavement can be raised and the surface treated; the physical change in the roadway may slow vehicles. Speed humps shall not be used on roadways designated as primary access routes. The objective is to slow traffic and reduce the number and severity of crashes. These features address vehicle speeds and may discourage cut-through traffic.~~

~~**Speed Tables:**~~ ~~A type of speed hump with a flat top that may also be used as a raised pedestrian crossing area. They are generally three to four inches high, have a six-foot sloped approach, with a ten-foot top, and a six-foot sloped departure profile. The objective is to slow traffic and reduce the number and severity of crashes. These features address vehicle speeds, increase visibility for pedestrians and may discourage cut-through traffic.~~

~~**Raised Intersections:**~~ ~~A raised intersection involves the construction of the entire intersection 3" to 4" above the approaching streets. The intersection is typically constructed of a different material type or the approaches are of different material to indicate a change at the intersection. The objectives are to slow traffic and reduce the number and severity of crashes. Raised intersections are designed to accommodate all sizes of vehicles. These features address vehicle speeds and may discourage cut-through traffic.~~

Non-Intrusive Devices -Pavement Markings

Description

- The pavement marking options are used in various ways to narrow the vehicle travel lanes, which tends to make motorists drive slower. These include striping the shoulder and/or centerline to narrow the travel lanes, or adding parking and/or bicycle lanes. The addition of parking to narrow the travelway (particularly parallel parking) can have a pronounced effect on speed, particularly on a narrow two-way street with parking on both sides where parked vehicles occupy one-half or more of the block. One option when adding parking lanes is to alternate parking along opposite sides of the street which introduces a physical change in the straight vista of a roadway, similar to that of a chicane to promote reduced speeds.

Placement

- The desired features (e.g. add bike lanes and/or parking etc.) and available pavement width as well as the allowable minimum travelway widths dictates the type of pavement striping and its location.

Advantages

- Does not physically restrict driver maneuvers and thus will not impose speed reductions on emergency and transit vehicles
- Involves a standard traffic control device easily recognizable by motorists
- Can be less costly to implement than some of the other devices depending on thee type and extent of application Disadvantages Restriping the pavement involves considerably more effort where significant eradication of existing pavement markings is required. Therefore, where this is the case it is recommended that this measure is implemented in conjunction with a re-paving project.

Disadvantages

- Restriping the pavement involves considerably more effort where significant eradication of existing pavement markings is required. Therefore, where this is the case it is recommended that this measure is implemented in conjunction with a re-paving project.

Effectiveness

- FHWA suggests a reduction between 1 and 5 mph (a reduction of 2 to 3 mph being the most common) where parallel parking is added to narrow the travelway and a reduction of ½ mph where shoulder markings are used to narrow the travel lane.

Vertical Devices-Speed Bumps

Description

- A speed bump is a raised area in the roadway pavement surface extending transversely across the travel way, generally with a height of 3 to 6 inches and a length of 1 to 3 feet.

Placement

Design Considerations:

- Most effective if used in a series at 300- to 500- foot spacing.
- Typically used on private property for speed control – parking lots, apartment complexes, private streets, and driveways.
- Speed bumps are not conducive to bicycle travel, so they should be used carefully.

Effectiveness

- Designed to cause a more abrupt reduction in speed. Will slow vehicles to 5 mph or less.

Vertical Devices –Speed Hump

Description

- Street pavement can be raised and the surface treated; the physical change in the roadway may slow vehicles. Speed humps shall not be used on roadways designated as primary access routes. The objective is to slow traffic and reduce the number and severity of crashes. These features address vehicle speeds and may discourage cut-through traffic.

Placement

Design Considerations:

- If mid-block pedestrian crossings exist or are planned, they can be coordinated with speed hump installation since vehicle speeds will be lowest at the hump to negotiate ramps or curbs between the sidewalk and the street.
- The hump must be visible at night.
- Speed humps should be located to avoid conflict with underground utility access to boxes, vaults, and sewers.
- Speed humps should not be constructed at driveway locations.
- Speed humps may be constructed on streets without curbs, but steps should be taken to prevent circumnavigation around the humps in these situations.
- Adequate signing and marking of each speed hump is essential to warn roadway users of the hump's presence and guide their subsequent movements.
- Speed humps should not be installed in street sections where transit vehicles must transition between the travel lane and curbside stop. To the extent possible, speed humps should be located to ensure that transit vehicles can traverse the hump perpendicularly.
- A single hump acts as only a point speed control. To reduce speeds along an extended section of street, a series of humps is usually needed. Typically, speed humps are spaced at between 300 and 600 feet apart.

Advantages

- Speed Humps are among the most recognizable traffic calming devices, which may promote a quicker response by motorists to reduce their speed.

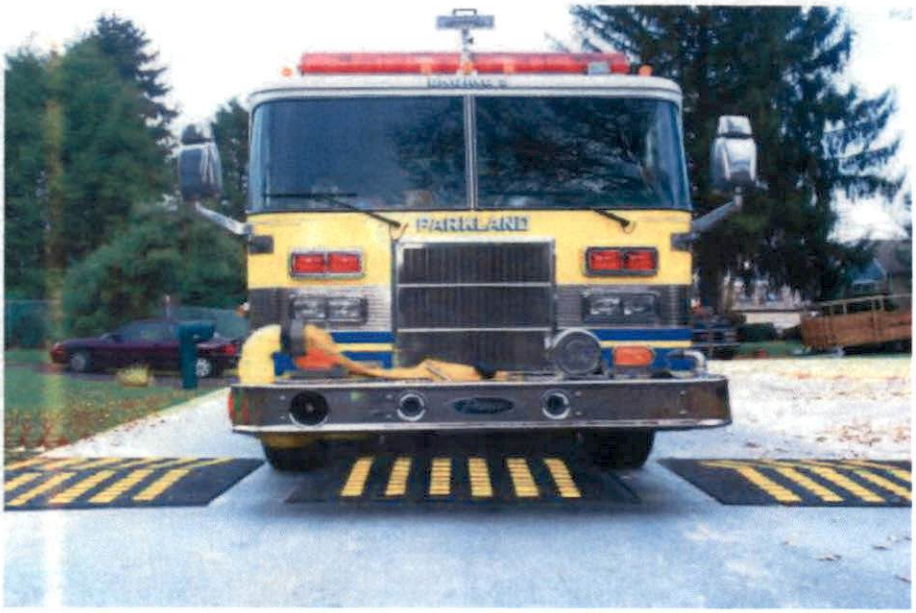
Disadvantages

- Increases noise to nearby residents as vehicles pass over the device (particularly larger trucks)
- Impedes bicyclists
- Impacts travel times of emergency vehicles and transit (buses)

Effectiveness

- FHWA & ITE (Institute of Transportation Engineers "Traffic Engineering Handbook, Sixth Edition") indicate an average reduction in operating speeds of 5 - 8 mph.

Vertical Devices –Speed Lump



Description

- A Speed Lump is a modified Speed Hump where openings are added to accommodate emergency or other large vehicles to utilize the openings without traversing over the raised portion to minimize speed reduction. However, the sizing of the lumps ensures that passenger vehicles cannot likewise avoid traveling over at least one set of lumps

Placement

- Speed lumps are placed at mid-block

Advantages

- Allows emergency vehicles and buses to traverse the device without reducing speed by utilizing the openings provided for those particular vehicles.
- Produces less noise than speed humps for emergency or other large vehicles.
- Speed lumps are more accommodating for bicyclists than speed humps, as bicyclists can utilize the openings to traverse the device.

Disadvantages

- These devices likewise increase noise to nearby residents for passenger vehicles.
- May encourage passenger vehicles to cross into the opposing lane in an attempt to straddle the humps provided for emergency vehicles. Providing a centerline stripe approaching the speed lump in each travel direction may discourage this.

Effectiveness

- ITE & FHWA data indicate an average reduction in operating speeds of 5 - 7 mph.

Vertical Devices – Speed Table

Description

- Speed Tables are similar to speed humps except they incorporate a flat "table" and thus provide an overall gentler transition than the speed hump. The top "flat area' is sized to accommodate the most typical vehicle wheelbase (usually a passenger car) entirely on the top, but can be extended to accommodate other vehicles if desired.

Placement

- Speed tables are placed at mid-block.

Advantages

- Provides a more moderate vertical transition for crossing vehicles and therefore motorists experience less discomfort than when driving over speed humps or lumps.

Disadvantages

- Disadvantages These devices likewise increase noise to nearby residents as vehicles pass over the device although to a lesser extent than speed humps.

Effectiveness

- ITE & FHWA indicate an average reduction in operating speeds of about 6 – 9 mph for tables with the dimensions used in the Guide (22 feet wide in the direction of travel). For longer tables ITE indicates a speed reduction of about 4 mph.

Vertical Devices – Raised intersections

Description

- Raised intersections incorporate a speed table concept by encompassing the entire area of the intersection and thus provide traffic calming on all connecting streets. A larger vehicle typically crosses a raised intersection at a lower speed than a passenger car. A typical delay through a raised intersection for a large commercial vehicle is 2 - 6 seconds.

Placement

- By definition, these devices are located at the intersection of two or more streets where the top, flat or "table" area covers the area of the intersection.

Advantages

- Raised intersections can be visually attractive - Cans serve as a Gateway treatment as well
- Provides traffic calming on all connecting streets at the intersection.

- The typically longer dimensions provide a smoother transition than speed tables so drivers feel less discomfort.

Disadvantages

- Raised intersections have a significantly higher cost.
- The data indicates they have less reduction on vehicle speeds - These devices likewise increase noise to nearby residents as vehicles cross over.

Effectiveness

- FHWA & ITE indicate an average reduction in operating speeds of about 0.3 - 1 mph.

Vertical Devices –Raised Crosswalk

Description

- A Raised Crosswalk is identical to a speed table, except it utilizes the top, flat surface to provide a marked pedestrian crossing.

Placement

- A raised crosswalk is located at mid-block (not recommended at intersections) where there is an existing, marked crosswalk or where one is warranted.

Advantages

- Provides improved visibility and safety for pedestrians.
- Enhances the pedestrian environment at pedestrian crossing.

- Can increase the number of motorists yielding to pedestrians crossing at the raised device

Disadvantages

- None noted.

Effectiveness

- As their design is identical to speed tables, presumably they have similar speed reductions of 6 – 9 mph.