Chapter 15

Traffic Calming

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15 Traffic Calming

15.1 Introduction

As Florida continues to grow, more and more of the major highways in its communities are becoming congested. This has caused many drivers to seek less crowded local residential streets as alternatives to get to their destinations. In many cases, this has meant the use of local residential streets as bypasses. The increase in traffic intrusion, volume, and speeds on residential streets has degraded the livability standards of various neighborhoods in Florida and as a result many residents complain about their environment (noise, air pollution), livability (quality of life, traffic intrusion, excessive volume, and speed of traffic), safety (as well as safety of their children, pets, and property) and physical characteristics (absence of sidewalks, etc.). This chapter provides some guidance to Florida roadway planners, designers, and traffic engineers on how to address concerns about maintaining or enhancing the quality of life in residential neighborhoods by balancing the need for safety for all roadway users and adjacent property owners of the street network and maintaining the integrity of the highways networks as a whole.

15.2 Planning Criteria

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.

Communities undertaking a traffic calming program shall have a procedure for planning which neighborhoods and roadways qualify for participation in the program. Specifics of these methods shall be developed by the local jurisdictions. The methods will likely vary from locality to locality. However, some issues should be addressed in all communities:

- Through the public involvement process, adjacent residents and road users who are impacted by the situation should be included in identifying the concern(s).
- The need for traffic-calming measures should be confirmed by appropriate studies (license plate survey, speed, volume, crash analyses) studied.
- Once the concerns are clearly identified and confirmed by traffic studies, and documented, it will provide the focus for possible solution, prioritizing, and development of appropriate traffic calming measures. It will also help determine the best approach to address the concerns.
- When developing traffic calming measures, in addition to the affected property owners, emergency response, transit, school, and sanitation officials and any other entities impacted by the installation of such devices should be included in the review process.

Traffic calming may not be the appropriate method in all cases to address vehicle speeds, volumes, and safety. Alternative solutions or educational tools may be considered, as well as coordinated effort with law enforcement.

The application of traffic calming measures should consider possible network and access issues. A system impact analysis should be performed as part of the development process. Vehicular and pedestrian counts, speed data, and crash history of the streets under evaluation should be reviewed. Storm water and environmental impacts also need to be addressed, as well as facility type, urban and rural design factors, and driveway densities.

Design details for each traffic calming measure may vary depending on local conditions. Factors to be considered include both horizontal and vertical deflection, ease of use, emergency vehicle accessibility, ease of maintenance, and facility type. Operational considerations and geometrics are critical factors to consider as well. A list of references and resources to consider in providing more detailed design factors and information can be found

at the end of this section. It may be desirable to begin with less restrictive measures and progress to more restrictive ones in stages.

Listed below are some "Do's" and "Don'ts" of the planning process for traffic calming which may be helpful in working through the design process.

Do's and Don’ts of the Planning Process

Do the following:

- Install temporary traffic calming features and monitor them for a period of time before installing the permanent features. Testing features on site prior to permanent installation will relieve resident anxiety about the impact on their own driving patterns and driving behaviors will adjust to the new route circumstances.
- Have an organized program including public involvement. Plans and policies should be approved and supported by the local government. Emphasize the selected treatments(s) will be initially in a “test” mode, with permanency pending the outcome measurement. Be able to describe what is being done to keep traffic off residential streets.
- Channel public resources by prioritizing traffic calming request according to documentable criteria, setting thresholds of volume, speed, etc., to merit treatment.
- Involve the local service agencies, including fire, police, and emergency medical services personnel, from the start.
- Consult with fire department and EMS personnel to develop the preferred design, particularly with speed humps and traffic circles. Set up traffic circles with cones and have fire trucks and other emergency vehicles drive around them; this will help determine what radius is best for the vehicles used in a given area. The same process can be used in the design of speed humps.
- Review traffic patterns in the neighborhood as a whole. Avoid solving the problem on one neighborhood street by just shifting the traffic to another neighborhood street.
- Consider appropriate landscape treatments as part of the traffic calming design and implementation.
- Make certain that all signing, pavement markings, and channelization is in accordance with the ***Manual on Uniform Traffic Control Devices (MUTCD)***, the ***AASHTO Policy on Geometric Design of Highways and Streets***, and ~~***NCHRP Report 672 Roundabouts: An Informational Guide***~~***NCHRP Report 1043: Guide for Roundabouts***~~***Roundabouts: An Informational Guide, Second Edition, National Cooperative Highway Research Program (NCHRP 672)***~~.

- Check sight distances for vehicles, pedestrians, and bicyclists. Sight distance should be consistent with the dimensions shown in **Chapter 3 – Geometric Design** or **Chapter 16 – Residential Street Design**.
- Become familiar with the traffic calming features used in other communities and assemble references so that residents can be directed where to see them.
- Decide on a safe design speed beforehand and in consultation with neighborhood residents.
- Check sight distances by visiting the site before and after installation. Do parked cars obstruct sight distances? Do landscaping or other features obstruct sight distance?
- Review the illumination at night. Are additional street lights needed? Does landscaping block the light? Is there a shadow on one side of a median or traffic circle that might hide pedestrians from view?
- Review the channelization during the day and night. Is it a clear approach from all directions? Can it be seen at night? Watch the traffic: Is the driving public confused by the signing and channelization? Make adjustments as needed.
- Review the site for utility conflicts. Is there a fire hydrant? Does it need to be moved? Are there existing utilities in the way?
- Check the storm water drainage. Will the storm drain system need to be moved or revised? Can the runoff flow through or around the device?
- Review on-street parking. Will parked cars block the access of emergency vehicles through or around the proposed neighborhood traffic control devices? Add additional no parking zones where needed. Additional enforcement of parking restrictions may be required to keep the traveled path clear.
- Include weekends in traffic counts, as residential streets may have unique travel patterns and high use periods.

Don't do the following:

- Install neighborhood traffic calming features without a well-engineered program supported by the local government and public.
- Install neighborhood traffic calming features on arterial streets (See Section 1.C.2 for a discussion of roadway classifications). Typically, physical devices are not installed on streets with volumes greater than 3,000 vehicles per day, or with posted or operating speeds of greater than 30 MPH.
- Install neighborhood traffic calming features on streets without curbs unless supplemental features or other design considerations are included to keep vehicles within the traveled way.

- Install neighborhood traffic calming features on street with grades of greater than 10 percent.
- Install neighborhood traffic calming features on major truck routes.
- Install neighborhood traffic calming features on primary emergency routes. Contact local fire, emergency service, and police departments to determine these routes. Secondary access routes should be considered on a case-by-case basis.
- Install neighborhood traffic calming features on curving or winding roads with limited sight distance, unless reduced speed limits and adequate warning signs are used in conjunction with the devices.
- Place neighborhood traffic calming features in front of driveways.
- Neglect to check for conflicting utilities or drainage considerations.
- Install physical features on adjacent parallel routes, unless feasible design alternatives have been agreed upon, as this prevents or hinders emergency response.

15.3 Inappropriate Traffic Calming Treatments

15.3.1 Stop Signs

Unwarranted stop signs should not be used for traffic calming for the following reasons:

- Increase midblock speeds along the street because of drivers trying to make up for lost time
- Increase noise because of quick accelerations and decelerations
- Increase pollution
- Reduce drivers' expectation of a uniform flow
- Relocate the problem
- Cause disrespect for stop signs by drivers and bicyclists

Stop signs shall be used only when warranted per the ***MUTCD***.

15.3.2 Speed Bumps

Speed bumps shall not be used on public streets. Speed bumps are severe treatments 3 to 6 inches high and 1 to 2 feet long that slow drivers to speeds of less than 10 mph. Due to their abrupt rise and required low speed they can be a hazard to motorists and bicyclists. Speed humps, as described in Section D under vertical deflection, should not be confused with speed bumps.

15.3.3 Other Inappropriate Treatments

There are some other treatments that have been shown to be ineffective at reducing the speed and volume of traffic on local roadways. While a temporary improvement may result, long-term improvement is not likely; consequently, their use is discouraged. These treatments include the following:

- Novelty signs -While signs such as CHILDREN AT PLAY, SENIORS CROSS HERE and SLOW DEAF CHILD may make an infrequent roadway user aware of a specific local population, most regular users of the roadway are unaffected by the signs.
- Odd speed limit - NEIGHBORHOOD SPEED LIMIT 23 MPH and other odd speed limit signs place a high dependence on police to monitor speeders and are not consistent with the national practice required by the ***MUTCD*** of posting speeds limits in 5 mph increments.
- Crosswalks – Standard crosswalks marked only with signs and pavement markings do not affect motorists' speeds and should not be used by themselves as traffic calming treatments.
- Bicycle lanes – Standard bicycle lanes are not traffic calming treatments. They can be used to provide space for bicyclists between the sidewalk and travel lanes but should not be used by themselves for traffic calming.
- Speed trailers – While speed trailers can be used as part of a traffic calming program for educational awareness, they have no lasting effect on motorists' behavior.
- Reduced speed limit signs – Reduced speed limits without physical traffic calming measures do not slow drivers and should not be used for traffic calming.
- Rumble strips – These applications have high maintenance requirements and can cause severe noise problems. Also, they can be an obstacle to bicyclists.

15.4 Appropriate Traffic Calming Treatments

The following sections describe some of the available traffic calming strategies. This list is not exhaustive, nor do the treatments necessarily fall exclusively into only one category.

In a typical traffic calming plan various types of treatments will be used. These plans will be based upon neighborhood preferences combined with engineering judgment.

Design details for traffic calming treatments will vary with application. Specific designs will need to be determined based upon the objective of the installations.

15.4.1 Vertical Treatments

Vertical treatments are those that depend upon a change in vertical alignment to cause drivers to slow down. When properly used, these treatments can be effective in reducing speeds and crashes. However, consideration should be given to impacts on emergency responders, buses, and, to some extent, bicyclists, and motorcyclists.

Traffic calming features that alter the vertical alignment should not be installed near fire hydrants or mailboxes.

Information on signing and pavement markings for vertical deflections can be found in the ~~*Manual on Uniform Traffic Control Devices (MUTCD)*~~***MUTCD***.

Table 15-1 Vertical Treatments

Treatment	Description	Effect	Concerns	Cost
Raised Intersection	A raised plateau where roads intersect. Plateau is generally 4 inches above surrounding street.	Slows vehicles entering intersection and improves pedestrian safety.	Increases difficulty of making a turn.	Medium to High
Raised Crosswalk	Raised pedestrian crossing used in mid-block locations. Crosswalks installed on flat-top portion of speed table. See **Figure 15 - 1**	Reduces speed and is an effective pedestrian amenity makes pedestrians more visible.	May be a problem for emergency vehicles and vehicles with trailers.	Low to Medium
Speed Humps	Speed humps are parabolic, curved, or sinusoidal in profile, 3 to 4 inches in height and to 14 feet long. Comfortable speeds limited to 15 to 20 mph. See **Figure 15 - 2**.	Reduces speed.	May cause delays for emergency vehicles and impact patient comfort. May have greater impacts on longer wheelbase cars.	Low
Speed Tables	Speed tables are flat-topped speed humps, also 3 to 4 inches high but with a sloped approach taper on each side of a flat top. They are generally 20 to 24 feet long. Comfortable speeds limited to 20 to 25 mph.	Reduces speed.	May cause delays for emergency vehicles and impact patient comfort.	Low
Speed Cushions/ Pillows	Signed speed humps as described above.	Reduces speed.	May not slow all vehicles.	Low

Figure 15-1 Raised Crosswalk

Suwannee Street, Tallahassee, Florida

Figure 15-2 Speed Hump

Inside Loop Road, Orange County, Florida

15.4.2 Horizontal Treatments

Horizontal deflection treatments are often more expensive than vertical deflection treatments. However, they have less of an impact on emergency responders and large vehicles with multiple axles. They generally do not create problems for bicyclists and motorcyclists. Because pavement area is usually reduced, additional landscaping may be possible, making horizontal deflection treatments useful as part of neighborhood beautification projects.

Information on striping and signing roundabouts can be found in the ***MUTCD***.

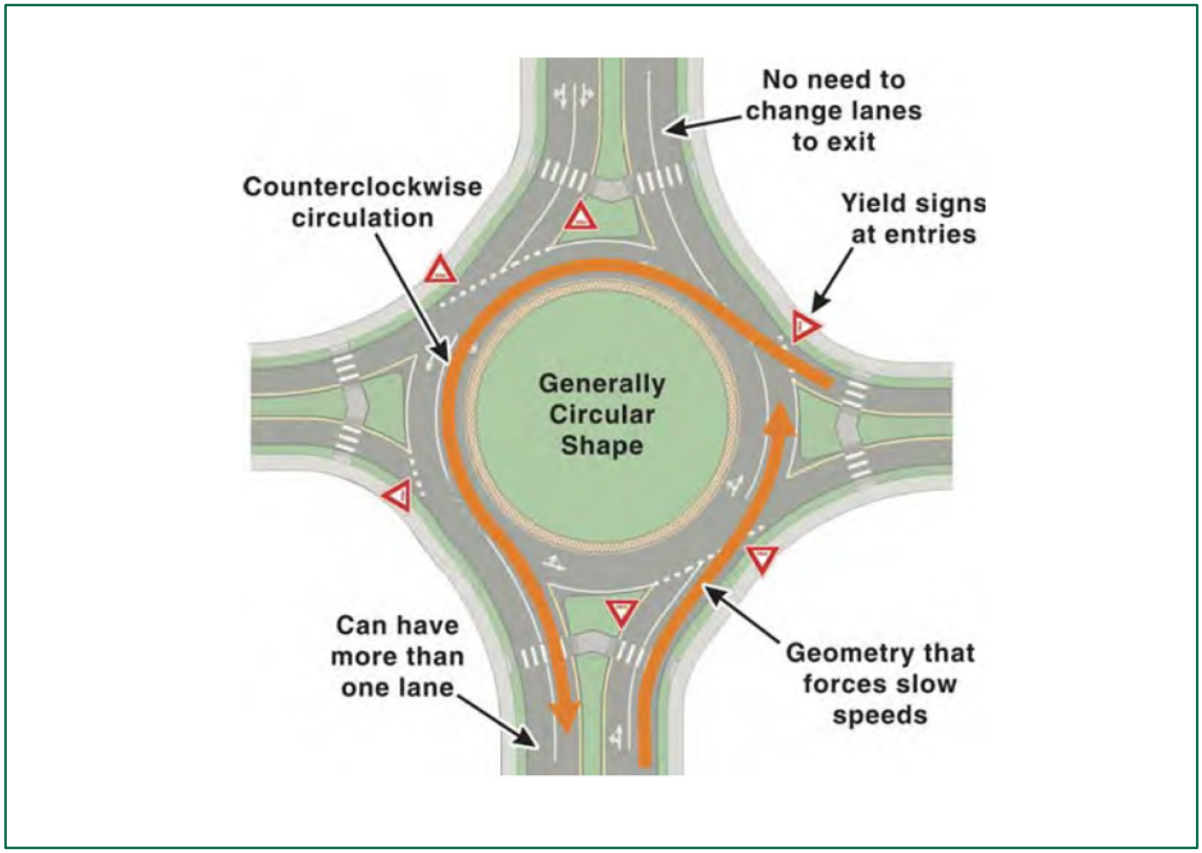
Table 15-2 Horizontal Treatments

Treatment	Description	Effect	Concerns	Cost
Angled Slow Point	Angled deviation to deter the path of travel so that the street is not a straight line	Reduces speed and pedestrian crossing distance.	Landscaping must be controlled to maintain visibility. Conflicts may occur with opposing drivers.	Medium to High
Chicanes	Mainline deviation to deter the path of travel so that the street is not a straight line. See **Figure 15 - 3**.	Reduces speed and pedestrian crossing distance.	A chicane design may warrant additional signing and striping to ensure that drivers are aware of a slight bend in the roadway. Increases the area possible for landscaping.	Medium to High
Mini-Circles	A raised circular island in the center of an existing intersection, typically 15 to 20 feet in diameter. May have mountable truck apron to accommodate large vehicles.	Reduces speed and both the number and severity of crashes.	May restrict larger vehicles. May cause some confusion when not signed properly. Some communities have documented increased crashes when mini-circles replaced all-way stop intersections.	Low to Medium
Roundabouts	A circular intersection with specific design and traffic control features, including yield control of all entering traffic, channelized approaches, geometric curvature. May be appropriate at locations as an alternative to a traffic signal. See **Figure 15 - 4**.	Reduces vehicle speeds and reinforces a change in the driving environment in transition areas.	May require more space at the intersection itself than other intersection treatments. While Roundabouts have sometimes been considered traffic calming features, they are primarily traffic control measures.	High

Figure 15-3 Chicanes

Source: NACTO Urban Street Design Guide, National Association of City Transportation Officials

Figure 15-4 Key Roundabout Characteristics



Source: NCHRP Report 1043: Guide for Roundabouts~~NCHRP Report 672: Roundabouts: An Informational Guide, Second Edition~~

15.4.3 Neighborhood Entry Control

Neighborhood entry control treatments include partial street closures and gateway type tools. They are used to reduce speeds and volume at neighborhood access points and may be used in conjunction with neighborhood beautification or enhancement projects and residential area identification.

Table 15-3 Neighborhood Entry Control

Treatment	Description	Effect	Concerns	Cost
Chokers	Midblock reduction of the street to a single travel lane for both directions.	Reduces speed and volume.	Costs increase if drainage needs to be rebuilt.	Medium to High
Gateway Treatment or Entrance Features	Treatment to a street that includes a sign, banner, landscaping, and roadway narrowing or other structure that helps to communicate a sense of neighborhood identity.	Reduces entry speed and pedestrian crossing distance. Discourages intrusion by cut through vehicles and identifies the area as residential.	Maintenance responsibility. May lose some on street parking.	Medium to High
Curb Extensions or Bulb-outs	Realignment of curb at intersection or mid-point of a block to decrease pavement width. See **Figure 15 - 5**.	Visually and physically narrows the roadway, shortens pedestrian crossing distance, increases space for plantings, street furniture.	May impact sight distance, parking, and drainage.	Medium to High
Midblock Median, Slow Point	An island or barrier in the center of a street that separate traffic.	Provides refuge for pedestrians and cyclists.	Landscaping may impede sight distance.	Varies
Lane Narrowing	Street physically narrowed to expand sidewalks and landscaping areas. Could include median, on street parking etc.	Improved pedestrian safety.	May create conflict with opposing drivers in narrow lanes.	Medium to High
One-Way In or One-Way Out Channelization	Intersection reduction of the street to single travel lane with channelization. Also called half road closure.	Reduces speed and traffic.	Costs increase if drainage must be rebuilt. Transfers additional vehicles to other ingress/egress points.	Medium to High
Textured Pavement	A change in pavement texture, and color (e.g., asphalt to brick), that helps make drivers aware of a change in driving environment.	Enhances pedestrian crossings, bike lanes, or on street parking.	Increase maintenance. May increase noise.	Low to Medium

Figure 15-5 Curb Extension or Bulb Out

First and Lee Streets, Ft. Myers, Florida

15.4.4 Diverters

A diverter consists of an island or curbed closure, which prevents certain movements at intersections, and reduces speeds and volumes. By diverting motorists within a neighborhood, they can significantly reduce cut through traffic.

Diverters must be planned with care because they will impact the people who live in the neighborhood more than anyone else. Trip lengths increase, creating inconvenience to residents. Emergency responders must also be considered when diverting traffic.

Bicyclists and pedestrians should be provided access through traffic diverters.

Table 15-4 Diverters

Treatment	Description	Effect	Concerns	Cost
Diagonal Diverters	Barrier placed diagonally across an intersection, interrupting traffic flow forcing drivers to make turns.	Eliminates through traffic.	May inhibit access by emergency vehicles and residents and increase trip lengths.	Medium
Forced Turn Barrier/Diverters	Small traffic islands installed at inter-sections to restrict specific turning movements.	Reduces cut through traffic.	Could impact emergency vehicles response time.	Low to Medium
Road Closures, Cul-de-sac	One or more legs of the intersection closed to traffic.	Eliminates through traffic improving safety for all street users.	May increase volumes on other streets in the area. Access restriction may cause concerns for emergency responders. Additional right of way for proper turnaround at dead ends may be required.	Low to Medium
Median Closures	Small median islands installed at cross streets to prevent through movements and restrict left turns.	Reduces cut through traffic.	Could impact emergency vehicle responses, inhibit access, and increase trip lengths or transfer volumes to other streets.	Low to Medium

15.4.5 Other Treatments

These treatments are most effective when used in combination with other physical traffic calming features, and should be used as supplements.

Table 15-5 Other Treatments

Treatment	Description	Effect	Concerns	Cost
Pavement Markings	Highlighting various area of road to increase driver's awareness of certain conditions such as bike lanes or crosswalks. See **Figure 15 - 6**.	Inexpensive and may reduce speed.	May not be as effective as a structure such as curb.	Low
Traversable Barriers	A barrier placed across any portion of a street that is traversable by pedestrians, bicycles, and emergency vehicles but not motor vehicles.	Eliminates cut-through traffic.	Inconvenience to some residents.	Medium
Colored Bike Lanes or Shoulders	A bike lane or shoulder painted, covered with a surface treatment, or constructed of a pigmented pavement designed to contrast with the adjacent pavement.	Visually narrows the roadway and may reduce speeds.	May not be effective on roadways with 12 foot lanes.	Low to medium

Figure 15-6 Bicycle Lane, Advance Yield Bar, and Crosswalk

Franklin Blvd, Tallahassee, Florida

15.5 References for Informational Purposes

The publications listed below are additional sources, of information related to topics presented in this chapter. Search the Internet Web for up-to-date resources using "traffic+calming" as key words.

- Speed Management Safety, FHWA

  https://safety.fhwa.dot.gov/speedmgt/
- Traffic Calming Measures - Institute of Transportation Engineers

  https://www.ite.org/technical-resources/traffic-calming/traffic-calming-measures/
- Canadian Guide to Traffic Calming - Second Edition (2018), Transportation Association of Canada

  https://www.tac-atc.ca/en/publications/ptm-trafcalm18-e
- Primer on Traffic Calming, Canadian Institute of Transportation Engineers and Transportation Association of Canada, January 2018

  https://www.tac-atc.ca/wp-content/uploads/traffic_calming_-_second_edition.pdf
- National Cooperative Highway Research Program (NCHRP) Report ~~672, Roundabouts: An Informational Guide, Second Edition, (2010)~~1043: Guide for Roundabouts

  https://nap.nationalacademies.org/catalog/27069/guide-for-roundabouts~~http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_672.pdf~~