METROPOLITAN GOVERNMENT OF NASHVILLE AND DAVIDSON COUNTY

DEPARTMENT OF PUBLIC WORKS

Neighborhood Traffic Calming

Process Manual and Toolkit

Metro Nashville Public Works
Division of Transportation

July 2020

Background

The **Metro Traffic Calming Program (MTC)** has been designed by Metro Public Works, with input from the Metro Planning Department, Metro Police Department and other Metro Agencies. The goal of this program is to create an improved street environment within neighborhoods that promotes the safety of drivers, other road users, and neighborhood residents. Two primary objectives of the program are: (1) slowing traffic to an appropriate speed and (2) providing safe accommodations to other road users such as pedestrians and cyclists.

Traffic calming in Nashville began in 1998 as a pilot program and has since operated continuously since. In May 2016, Executive Order No. 031 required that, “All Metro-owned transportation facilities in the public right-of-way including, but not limited to, streets, bridges and all other connecting pathways shall be designed, constructed, operated, and maintained to enhance environmental quality and to allow users of all ages and abilities to travel upon them safely and independently. ” This complete streets perspective drives MTC activity, affirming the idea that streets are not solely for moving cars as quickly as possible.

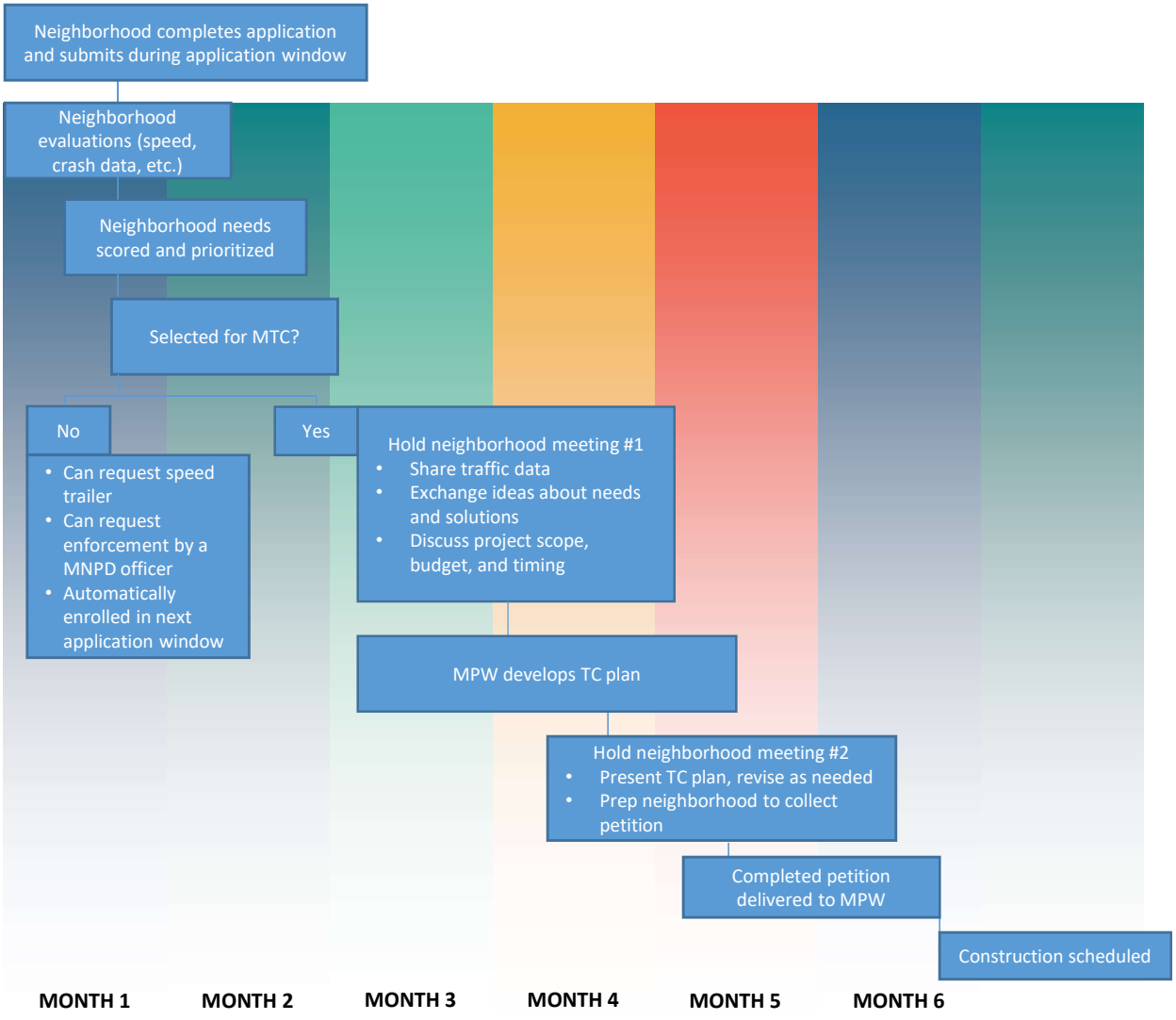
The purpose of this manual is to define the general implementation of this Metro program.

The MTC Process

We recognize that all residents deserve access to safe, efficient, and pleasant streets. Unfortunately, the demand for traffic calming treatments exceeds Public Works' resources to plan, design, and construct these. Therefore, neighborhoods must apply for MTC assistance so that neighborhood needs can be prioritized.

Applications are only accepted during certain time periods. By limiting the application period, our staff can compress data collection activities and studies to ensure efficiency and equity in neighborhood evaluations. It also allows for more accurate feedback to neighborhoods as we can better gauge our resources. Ultimately, our desire is to provide a high level of service to accepted neighborhoods and responsible communication to all applicants. The current application windows are listed on the Public Works website.

Typical MTC Project Timeline:



Program Policies

All streets accepted by Metro as part of the public street network have met basic engineering standards for safety and operations. This not withstanding, Metro recognizes that some modifications on streets can help minimize the undesirable impacts of traffic, especially with respect to speed. Traffic management seeks to modify the behavior of drivers to what is appropriate for residential streets. These modifications are used judiciously and under the oversight of Metro's licensed practicing engineering staff. The policies governing the intent and application of this program include:

- This program applies to existing residential streets that primarily serve residential neighborhoods. The neighborhood must be entirely within Metro-governed Davidson County and outside of the satellite cities. Neither very large (arterial streets) nor very small (cul-de-sac) streets are eligible. The intent is to help neighborhoods which might be affected by traffic having origins or destinations outside of the neighborhood.
- Collector streets in residential areas are essential to neighborhoods. They may be residential roadways, but they are intended to carry a greater volume of traffic. We encourage the use of these roadways to serve as thoroughfares for the rest of the neighborhood. Because of this, collector streets are typically not eligible for MTC, but these will be reviewed on a case-by-case basis. Collectors and arterials are defined by Metro Planning, see https://maps.nashville.gov/MCSP/ for further details.
- MTC works best in concert with neighborhood associations and not individual citizens to accomplish its goals. A neighborhood association can vary from a long-term established group to a loose association established to accomplish neighborhood improvements. If no neighborhood organization exists, multiple neighbors can apply for assistance jointly.
- Cut-through traffic resulting from severe congestion on larger streets is very difficult to divert out of the neighborhood. Instead, MTC hopes to create conditions for slower traffic, not necessarily lower traffic volumes. It is also not the desire of this program to relocate traffic or traffic concerns to other residential streets, although it may be desirable to balance traffic across a network of residential streets.
- Emergency vehicle access within and through neighborhoods will be carefully considered in the evaluation of traffic management and must be preserved in a reasonable fashion. It is recognized that certain traffic management techniques may result in increased emergency response times to certain streets and neighborhoods. These impacts must be understood and considered by the neighborhood when developing a traffic calming strategy.
- Metro Public Works will employ a variety of strategies and techniques to achieve the MTC objectives. Street conditions may be evaluated before and after use.
- Traffic management strategies and techniques shall be planned, designed, and developed in conformance with sound engineering practices. All plans will be reviewed, and approved, by MPW before implementation to ensure that proper engineering guidelines have been followed. MPW modify treatments as necessary to ensure sound engineering principles are followed.
- Prior to the implementation of traffic calming measures in existing travel lanes, 70% of residence owners in the affected area must sign a petition approving these changes.

Neighborhood Prioritization

Due to a limited amount of funding and staffing resources, a prioritization process is used to determine locations having the highest need for traffic calming.

Objective data is used to determine a prioritized list of neighborhoods for which to develop treatments. Prioritization is based on the follow data from applicant neighborhoods:

- **Safety Experience (40%):** Our most pressing obligation is to create safe streets. Neighborhoods already exhibiting a high number of crashes (as documented by Metro Nashville Police Department) will be prioritized. Crash history will be documented per mile to ensure a fair evaluation across neighborhoods.
- **Measurable Speeding Issues (30%):** Speed data will be collected in applicant neighborhoods to determine prevailing speeds. The degree to which existing speeds exceed posted speed limits on various streets will be used in the prioritization. Neighborhoods that see an 85th percentile speed at or below the posted speed limit will not be considered for the traffic calming program.
- **Impacts on Non-Drivers (30%):** Traffic speeds often discourage safe use of streets by pedestrians and cyclists. We evaluate the presence of likely nearby trip destinations (schools, parks, etc.) as well as non-driver accommodations (bus routes, lack of sidewalks, etc.) as prioritization data in this category.

Other relevant considerations not captured by these metrics may be considered as well and can be included in the application.

MTC Toolkit

The MTC program typically works on a fairly limited scale. In other words, countermeasures may be applied on one or two streets in a neighborhood at a time, but larger attempts to change whole neighborhoods are outside the scope of a typical MTC project. The reasons for this are, (1) a desire to aid many neighborhoods across Davidson County, and (2) to give the opportunity to reassess the impacts of the changes. MTC projects do sometimes shift traffic to a different street, but these residual changes can be very difficult to predict.

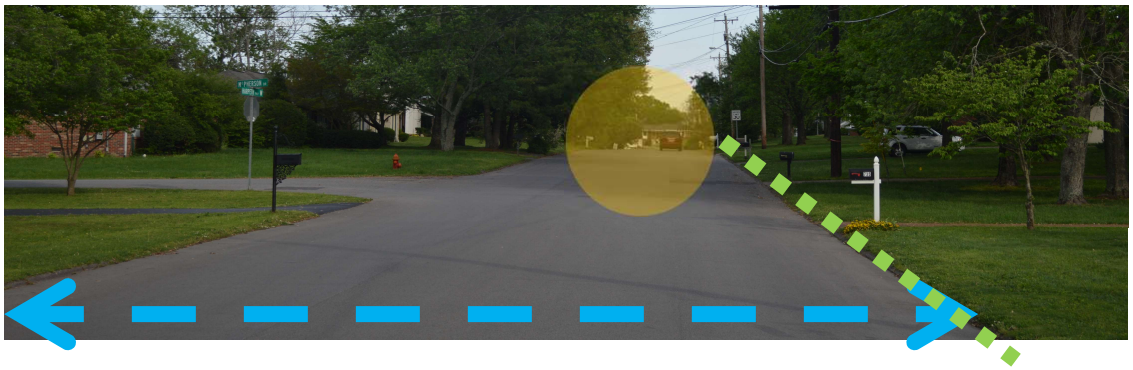
The MTC project approach is comprised of three different types of traffic calming treatments: pinch points, surface treatments, and intersections. Each of these types has a portfolio of treatments that can be appropriate for different contexts, from quiet neighborhood streets to busier roads. Each individual treatment has advantages and disadvantages for reducing speeds and impacting access for bicyclists, transit vehicles, parking, and emergency vehicles.

Drivers generally drive at a speed that feels safe. That means that streets that were designed to be straight, wide, and clear encourage drivers to drive fast, regardless of the posted speed limit. Streets and lanes must be straight enough to keep cars in the street, wide enough to allow vehicles to pass one another, and clear enough to avoid crashes. But, any extra space beyond that simply encourages people to drive fast. The tools in the MTC toolbox are generally intended to challenge existing design conditions on streets that are encouraging high speeds. These tools can be characterized as pinch points, surface, and intersection treatments.

Pinch Points
Pinch points are all treatments that narrow the street, in specific locations or for many blocks of a corridor. Making the street feel narrower makes drivers pay closer attention and drive slower.

Surface Treatments
Surface treatments refer to raising the street surface in specific locations, at regular intervals. Doing so is very effective at reducing speeds, and calls attention to things like pedestrian crossings.

Intersections
Treating intersections can reduce turning speeds, but is most effective at keeping cut-through traffic off of neighborhood streets, and improving crossings for pedestrians and bicyclists.



Clear, straight, and wide streets encourage high speeds.

Pinch Points - Narrowing

Description:

Wider streets and lanes encourage people to drive faster. An easy and cost-effective solution is to narrow lanes and the street. This can simply be done with paint, or depending on the excess space, it can be an opportunity to create space for bicyclists, pedestrians, or parking, among other activities and treatments.

Fast Facts:

Local Street Applicability	●
Collector Street Applicability	●
Speed Reduction	◕
Traffic Diversion Impact	◕
Noise Impact	○
Pedestrian Benefit	●
Bicycle Benefit	●
On-street Parking Impact	◕
Emergency Response Impact	●
Landscaping Oppurtunity	◕

● High ◔ Moderate

◕ Minimal ○ None

Advantages:

- Relatively low cost
- Quick implementation
- Safety benefit (if striping not currently present)
- Can result in shoulder, bike lane, pedestrian walkway,, parking, etc.

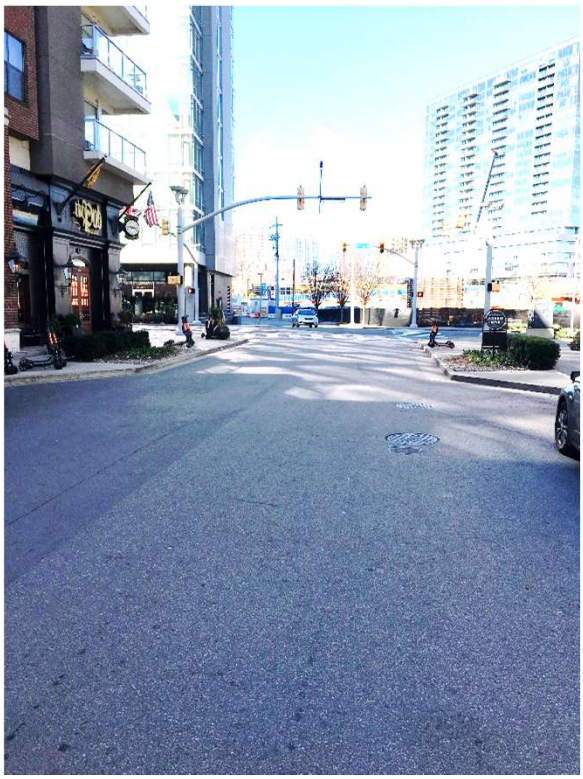
Disadvantages:

- Relatively low speed impact
- Ongoing maintenance costs

Pinch Points - Gateways

Description:

Gateways narrow the street at strategic locations--often at intersections, where there are the most conflicts. Gateways placed near pedestrian crossings can decrease the distance to cross and on local streets, gateways can be designed to reduce the width for only one car to pass at a time. With aesthetic treatments, they can identify strategic neighborhood entrance/identity points.



Fast Facts:

Local Street Applicability	●
Collector Street Applicability	●
Speed Reduction	◕
Traffic Diversion Impact	◕
Noise Impact	○
Pedestrian Benefit	◕
Bicycle Benefit	◕
On-street Parking Impact	◕
Emergency Response Impact	◕
Landscaping Oppurtunity	◕

● High ◕ Moderate

◕ Minimal ○ None

Advantages:

- Neighborhood amenity
- Cost effective (when using low-cost materials)
- Reduces crossing distance for pedestrians at intersections

Disadvantages:

- Little wider-area speed reduction
- Highly dependent on context
- May reduce parking

Pinch Points - Medians

Description:

Another method of narrowing, medians reduce the width of lanes and the street, causing drivers to slow down. Medians also remove the risk of head-on collisions. This can simply be done with paint, or depending on the excess space, it can be an opportunity to create space for greenery or art.

Fast Facts:

Local Street Applicability	●
Collector Street Applicability	●
Speed Reduction	◕
Traffic Diversion Impact	◕
Noise Impact	○
Pedestrian Benefit	◕
Bicycle Benefit	◕
On-street Parking Impact	◕
Emergency Response Impact	◕
Landscaping Oppurtunity	●

● High ◕ Moderate

◕ Minimal ○ None

Advantages:

- Effective in reducing speeds
- Opportunities for trees/green space

Disadvantages:

- Additional maintenance
- Generally reduces access/requires U-turns for driveways
- May reduce parking

Pinch Points - Chicanes

Description:

Chicanes create a meandering roadway by introducing slight curves that force drivers to pay more attention, while also narrowing lanes and the street. The narrowing can be achieved with simple paint or curbing. Chicanes are an effective solution for addressing speeding on overly straight and wide roads.

Fast Facts:

Local Street Applicability	●
Collector Street Applicability	●
Speed Reduction	◕
Traffic Diversion Impact	◕
Noise Impact	◕
Pedestrian Benefit	◕
Bicycle Benefit	◕
On-street Parking Impact	◕
Emergency Response Impact	◕
Landscaping Oppurtunity	◕

● High ◔ Moderate

◕ Minimal ○ None

Advantages:

- Effective in reducing speeds
- Very cost effective
- Opportunities for greenspace/parking

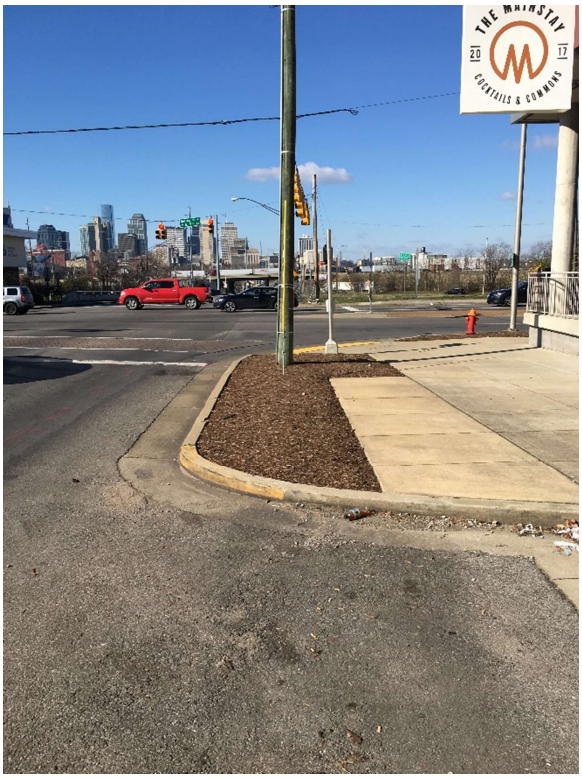
Disadvantages:

- May require additional maintenance
- Cause pedestrians/bicyclists to merge with vehicular traffic at points
- May affect street parking

Pinch Points – Bulb Outs

Description:

Wide streets often results in wide r than necessary intersections. Bulb outs are an effective way to narrow these intersections to reduce the crossing distance for pedestrians and reduce the speed of turning vehicles.



Fast Facts:

Local Street Applicability	●
Collector Street Applicability	●
Speed Reduction	◕
Traffic Diversion Impact	◕
Noise Impact	○
Pedestrian Benefit	◕
Bicycle Benefit	◕
On-street Parking Impact	◕
Emergency Response Impact	◕
Landscaping Oppurtunity	◕

● High ◔ Moderate

◕ Minimal ○ None

Advantages:

- Effective in reducing turning speeds
- Typically no impact on parking
- Reduces crossing distance for pedestrians

Disadvantages:

- May impact bicycle lanes
- May require additional maintenance

Surface Treatments– Speed Cushions

Description:

Speed cushions slow traffic by creating a vertical deflection in the roadway. Speed cushions are similar to speed bumps, with two notable exceptions. First, they are longer which reduces the jarring effect. Second, they are comprised of three separate cushions with gaps wide enough to perfectly fit the wider wheel base of emergency vehicles.

Fast Facts:

Local Street Applicability	●
Collector Street Applicability	◕
Speed Reduction	●
Traffic Diversion Impact	◕
Noise Impact	◕
Pedestrian Benefit	◕
Bicycle Benefit	◕
On-street Parking Impact	◕
Emergency Response Impact	◕
Landscaping Oppurtunity	○

● High ◕ Moderate

◕ Minimal ○ None

Advantages:

- Very effective in reducing speeds
- Minimal impact on emergency vehicles

Disadvantages:

- Only applicable to streets with a desired speed of 20 MPH or less

Surface Treatments– Speed Tables

Description:

Speed tables slow traffic by creating a vertical deflection in the roadway. Speed tables have a trapezoidal shape with a flat section in the middle and ramps on the end. The flat section is long enough for the entire wheelbase of a passenger vehicle to rest on the surface. The long flat design allows cars to pass without slowing as significantly as with speed cushions.

Fast Facts:

Local Street Applicability	High
Collector Street Applicability	Minimal
Speed Reduction	High
Traffic Diversion Impact	Moderate
Noise Impact	Minimal
Pedestrian Benefit	Minimal
Bicycle Benefit	Minimal
On-street Parking Impact	Minimal
Emergency Response Impact	Moderate
Landscaping Oppurtunity	None

High Moderate

Minimal None

Advantages:

- Very effective in reducing speeds
- Will not require vehicles obeying speed limit to slow

Disadvantages:

- May conflict with bus routes
- More expensive than the comparable speed cushion
- May impact emergency vehicles

Surface Treatments– Raised Crosswalks

Description:

Raised crosswalks are flat-topped speed humps that are aligned with a crosswalk and raise the crosswalk to the level of the sidewalk. Raised crosswalks improve the visibility of crossing pedestrians and are most appropriate in areas with heavy pedestrian traffic such as greenways and retail districts. Whenever possible raised crosswalks should be paired with pinch points.

Fast Facts:

Local Street Applicability	●
Collector Street Applicability	◕
Speed Reduction	●
Traffic Diversion Impact	◕
Noise Impact	◕
Pedestrian Benefit	◕
Bicycle Benefit	◕
On-street Parking Impact	◕
Emergency Response Impact	◕
Landscaping Oppurtunity	○

● High ◕ Moderate

◕ Minimal ○ None

Advantages:

- Very effective in reducing speeds
- Increased visibility of crossing pedestrians

Disadvantages:

- Requires additional components, traffic signals, on high speed and multiple lane roads
- May affect roadway drainage

Description:

Rumble strips are a series of raised strips across a road that produce noise and steering-wheel vibration to call attention to an upcoming street condition (speed restriction, pedestrian crossing, etc.). Rumble strips are most effective on high speed or high volume roads where speed cushions or raised crosswalks may not be appropriate.

Fast Facts:

Local Street Applicability	Moderate
Collector Street Applicability	High
Speed Reduction	Minimal
Traffic Diversion Impact	None
Noise Impact	High
Pedestrian Benefit	Minimal
Bicycle Benefit	Minimal
On-street Parking Impact	None
Emergency Response Impact	None
Landscaping Oppurtunity	None

High Moderate

Minimal None

Advantages:

- Cost effective
- Calls driver's attention to upcoming change in roadway condition

Disadvantages:

- Most effective when paired with other treatments
- Noise may be undesirable to nearest residents

Description:

Traffic circles are raised islands placed into the center of existing intersections. Circles allow drivers to yield rather than stopping, leading to a smoother traffic flow. Navigating the circle also results in slower speeds and more awareness by drivers. Traffic circles also significantly decrease the possibility for head-on and T-bone collisions.

Fast Facts:

Local Street Applicability	●
Collector Street Applicability	◕
Speed Reduction	◕
Traffic Diversion Impact	◕
Noise Impact	○
Pedestrian Benefit	◕
Bicycle Benefit	◕
On-street Parking Impact	◕
Emergency Response Impact	◕
Landscaping Oppurtunity	●

● High ◕ Moderate

◕ Minimal ○ None

Advantages:

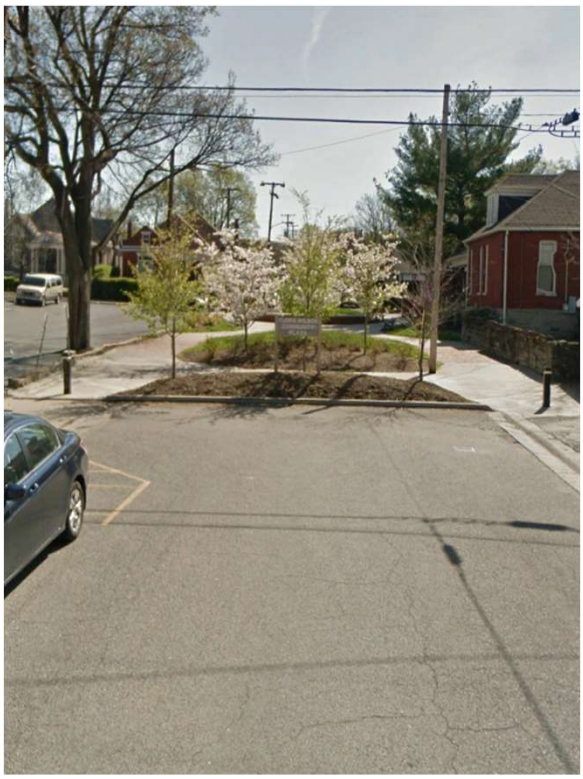
- Improved safety and efficiency
- Opportunity for greenery in the street

Disadvantages:

- May require bicyclists to merge with vehicles
- May be difficult for larger vehicles to maneuver

Description:

Bicycle/Pedestrian-Only Crossing are medians or road closures that allow bicyclists and pedestrians to cut directly through an intersection while limiting vehicle access. By limiting access this treatment reduces vehicles crossing though neighborhood streets and creates safe crossings for bicyclists and pedestrians.



Fast Facts:

Local Street Applicability	High
Collector Street Applicability	Minimal
Speed Reduction	Minimal
Traffic Diversion Impact	High
Noise Impact	None
Pedestrian Benefit	High
Bicycle Benefit	High
On-street Parking Impact	Minimal
Emergency Response Impact	High
Landscaping Oppurtunity	Moderate

High Moderate

Minimal None

Advantages:

- Safe crossing of collector streets for bicyclists and pedestrians
- Reduces vehicle traffic through neighborhood streets

Disadvantages:

- Prohibits left turns onto/out of neighborhood streets
- Limits neighborhood access points for emergency vehicles

Dynamic Signage– Speed Radar Signs

Description:

Speed radar signs provide real-time speed feedback to drivers and are capable of flashing digits and a strobe above certain speeds. Speed radar signs work best on streets where driver's naturally increase speed by calling awareness to the posted speed limit.

Fast Facts:

Local Street Applicability	●
Collector Street Applicability	●
Speed Reduction	◕
Traffic Diversion Impact	○
Noise Impact	○
Pedestrian Benefit	◕
Bicycle Benefit	◕
On-street Parking Impact	○
Emergency Response Impact	○
Landscaping Oppurtunity	○

● High ◔ Moderate

◕ Minimal ○ None

Advantages:

- Provide real time feedback to drivers
- No impact on physical street

Disadvantages:

- Drivers have the option to ignore feedback
- Signs emit flashing lights