



Neighborhood Street Traffic Calming

Process Manual and Toolkit



Background

Nashville's Neighborhood Street Traffic Calming Program (NSTC) has been designed by NDOT, 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.

The NSTC program typically works on a fairly limited scale. In other words, countermeasures may be applied on one or two NDOT selected neighborhood streets a time, but larger attempts to change whole neighborhoods are outside the scope of a typical NSTC 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. NSTC projects do sometimes shift traffic to a different street, but these residual changes can be very difficult to predict.

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 NSTC 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 NDOT program.

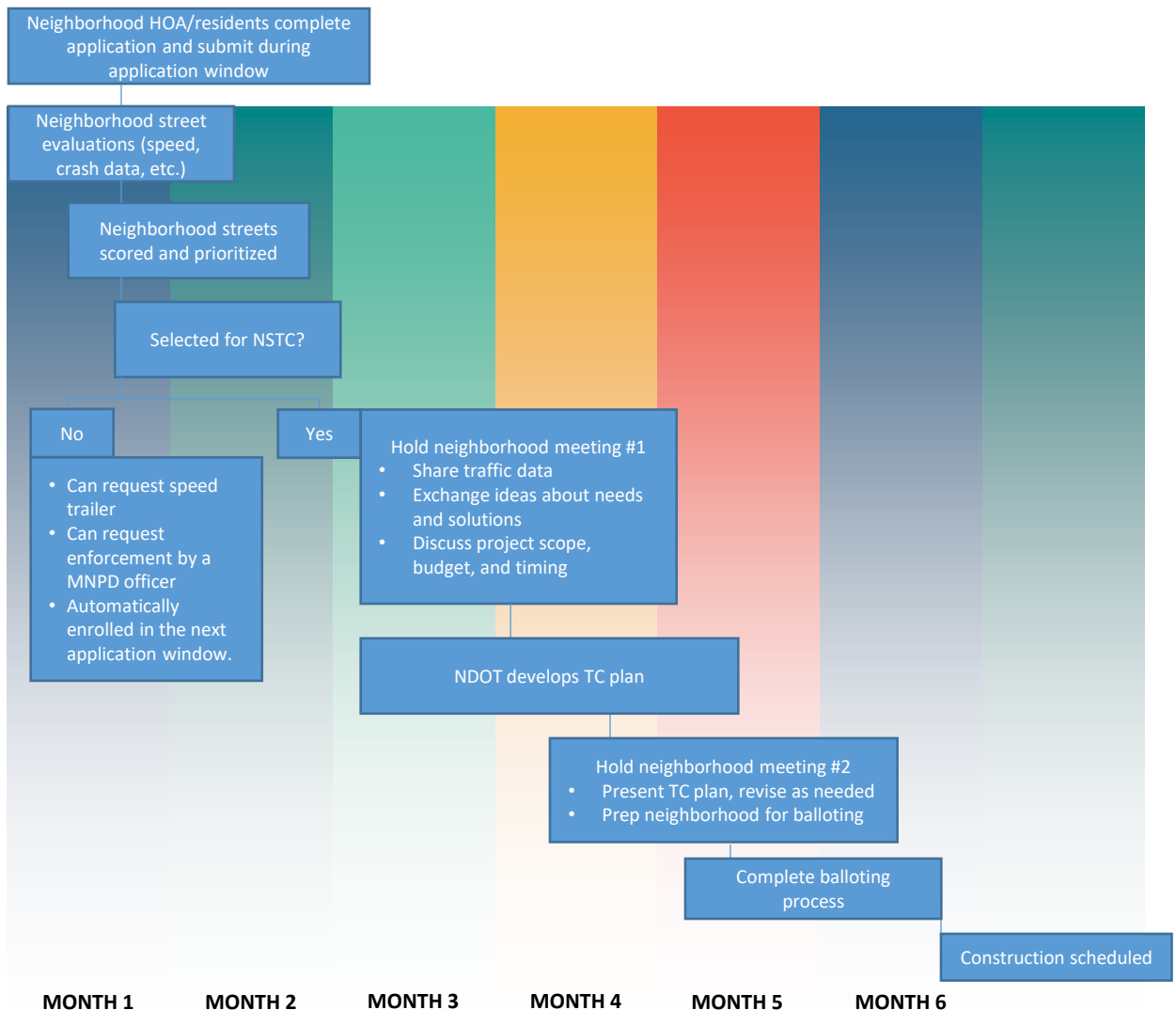


The NSTC Process

We recognize that all residents deserve access to safe, efficient, and pleasant streets. Unfortunately, the demand for traffic calming treatments exceeds NDOT's resources to plan, design, and construct these. Therefore, neighborhoods must apply for NSTC 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 NDOT traffic calming website.

Typical NSTC Project Timeline:



Program Policies

All streets accepted by NDOT as part of the public street network have met basic engineering standards for safety and operations. This notwithstanding, NDOT 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 NDOT'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 NSTC, 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.
- NSTC 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, NSTC 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.
- NDOT will employ a variety of strategies and techniques to achieve the NSTC 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 NDOT before implementation to ensure that proper engineering guidelines have been followed. NDOT may modify treatments as necessary to ensure sound engineering principles are followed.
- Prior to the implementation of traffic calming measures requiring physical changes within the existing travel lane, the online ballot process must be successful (see next page).

Ballot Policy

Prior to the implementation of traffic calming measures requiring physical changes within the existing travel lane, two-thirds of ballot respondents along the affected street or street segment must vote yes on approving the proposed changes. Nashville Department of Transportation will lead meetings, present information and provide engineering services, but completion of the online ballot will be the sole responsibility of the residence owner. The ballot requirements are as follows:

- Online ballot requires the residence owner's name, address, and unique code for proper completion. NDOT will supply ballot code and website link by US mail.
- Affected streets are defined as any street with a vertical traffic calming element bounded by the nearest intersections. Any residence with a property line along the affected street will be included in the ballot process regardless of street address. Nashville Department of Transportation will supply the list of eligible residences to the neighborhood.
- The Nashville Parcel Viewer (maps.Nashville.gov/ParcelViewer) will be the official record for both addresses and homeowners used to create mailers for all meeting/voting notices and to verify ballot respondents. Nashville Department of Transportation acknowledges that record updates to the Parcel Viewer may lag and the NDOT's Neighborhood Street Traffic Calming Program Manager is authorized to update the program's owner record if evidence of new ownership or residence is provided.
- Multi-family housing will be treated as reflected in the Nashville Parcel Viewer for the purpose of the ballot process. If the multi-family housing is listed as one parcel with one owner it will be counted as one residence.
- Each residence owner will have approximately six weeks to complete an online ballot. Once the advertised deadline has past the ballot will be closed and yes/no votes will be tallied.

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 neighborhood street(s) for which to develop treatments. Prioritization is based on the follow data from applicant neighborhoods:

- **Safety Experience (70%):** Both speed and crash history will be collected by NDOT.
- **Non-Driver Experience (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 can be included in the application and NDOT will review.

The Nashville Department of Transportation does not require re-application. However, due to Nashville's rapid growth, traffic conditions may have changed since the initial date of application. If an applicant wishes NDOT to reassess traffic conditions on their street(s), the applicant must reapply no earlier than two years after the initial date of application. The new application must include updated contact information and updated concerns related to safety and quality of life.



NSTC Toolkit

NDOT's street by street traffic calming 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 NSTC 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.



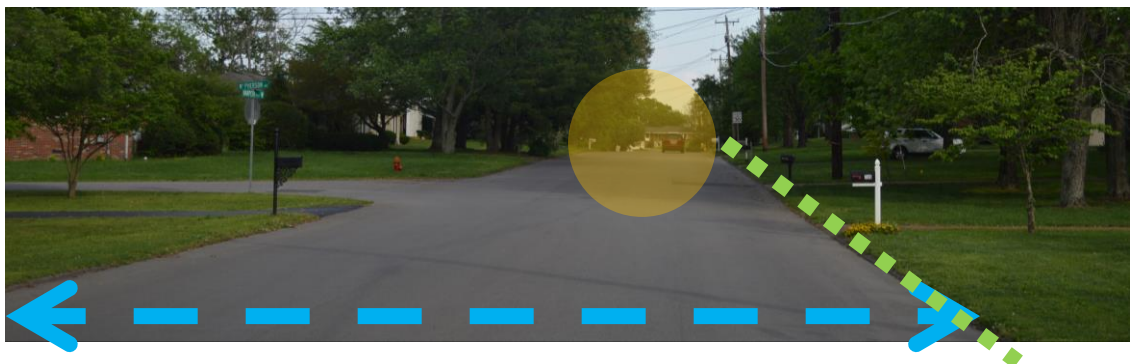
Surface Treatments

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.

Toolkit

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 Opportunity	◐



High



Moderate



Minimal



None

Pinch Points - Narrowing



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

Toolkit

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 Opportunity	◐



High



Moderate

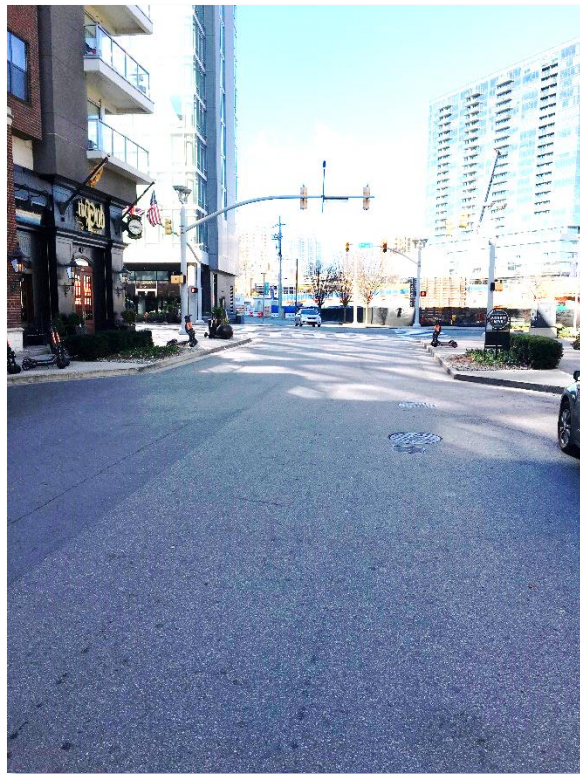


Minimal



None

Pinch Points - Gateways



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

Toolkit

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 Opportunity	●



High



Moderate



Minimal



None

Pinch Points - Medians



Advantages:

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

Disadvantages:

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

Toolkit

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 Opportunity	◐



High



Moderate



Minimal



None

Pinch Points - Chicanes



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

Toolkit

Description:

Wide streets often results in wider 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 Opportunity	◐



High



Moderate

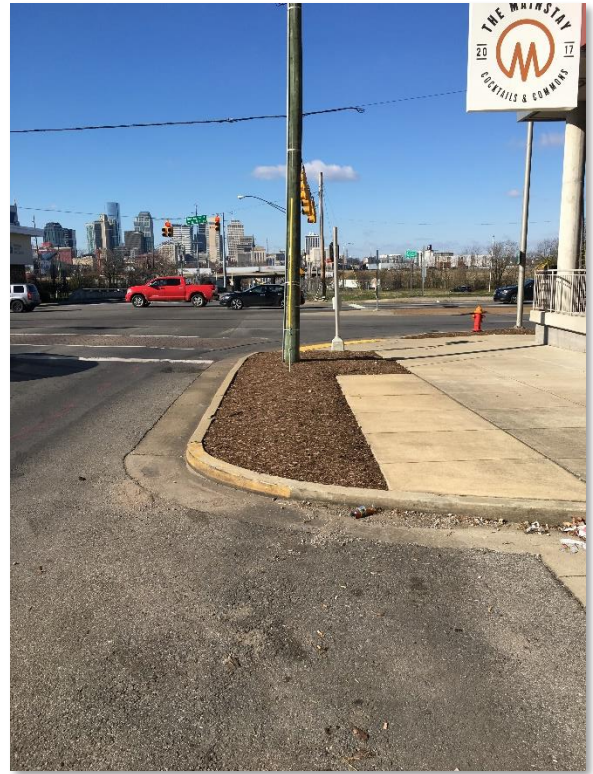


Minimal



None

Pinch Points – Bulb Outs



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

Toolkit

Description:

Speed cushions slow traffic by creating a vertical deflection in the roadway. Unlike speed humps which extend the full roadway width, speed cushions provide gaps so that larger transit/emergency vehicles with wide wheelbases can avoid max vertical deflection zones. Speed cushions are also gentle enough to provide a comfortable ride when traversed at a speed of approximately 20 to 25 MPH.

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 Opportunity	⌚



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 30 MPH or less

Toolkit

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	●
Collector Street Applicability	◐
Speed Reduction	●
Traffic Diversion Impact	◐
Noise Impact	◐
Pedestrian Benefit	◐
Bicycle Benefit	◐
On-street Parking Impact	◐
Emergency Response Impact	◐
Landscaping Opportunity	⌚



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

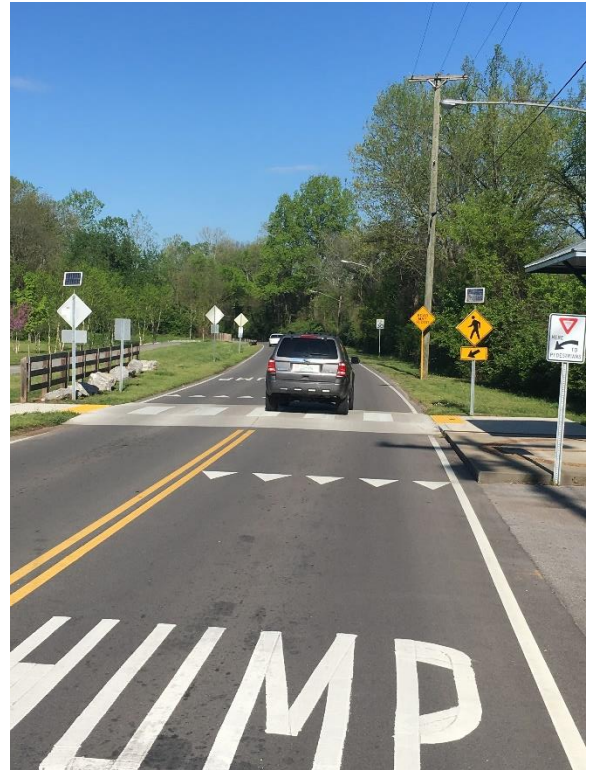
Toolkit

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 Opportunity	⌚



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

Toolkit

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 Opportunity	●



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 through neighborhood streets and creates safe crossings for bicyclists and pedestrians.

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 Opportunity	◐



High



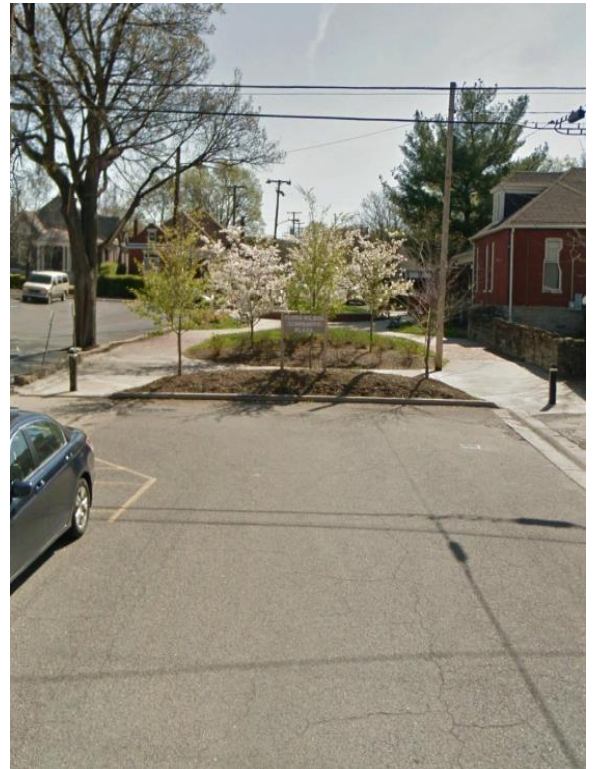
Moderate



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

Toolkit

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 Opportunity	⌚



Advantages:

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

Disadvantages:

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