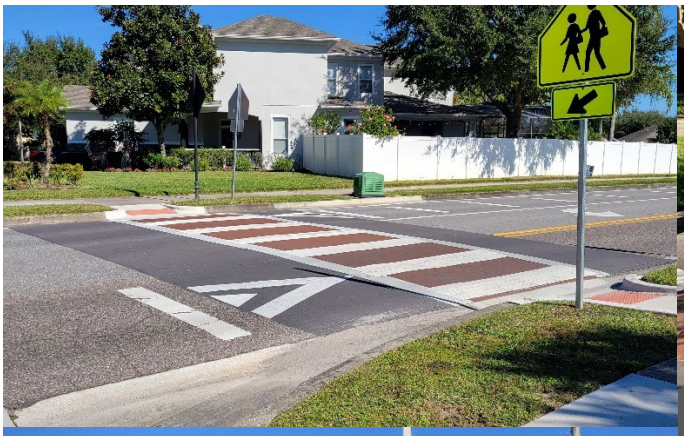

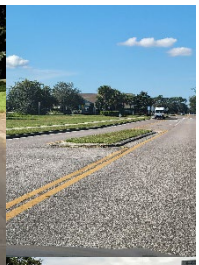
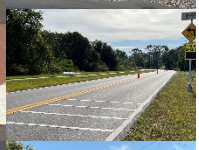




Traffic Calming & Safety Toolbox Policy

Orange County

January 20, 2026



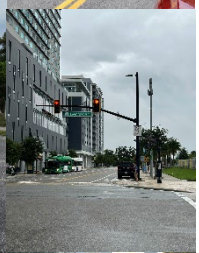
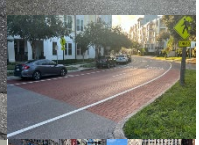

Table of Contents

1 Traffic Calming & Safety Toolbox Policy

1.1 Purpose

This Traffic Calming & Safety Toolbox Policy was created for Orange County residents and Orange County Staff through the Public Works Traffic Engineering Division, Traffic Calming Program. The Traffic Calming & Safety Toolbox (Toolbox) is a resource for helping people to understand the various transportation tools available to address neighborhood-level transportation issues at a county-wide scale. The Toolbox provides guidance and education on selecting and implementing multimodal infrastructural or operational safety improvements.

The purpose of this Toolbox is to enhance safety, livability, and mobility in residential and mixed-use neighborhoods by reducing speeding, cut-through traffic, and crash risk through context-sensitive traffic calming measures. This framework aligns with Orange County's Accelerated Transportation Safety Program (ATSP) and Vision Zero strategy.

1.2 Engineering, Education, Enforcement, and Emergency Services in Traffic Calming

Orange County, Florida, recognizes that effective traffic calming is a multifaceted approach that requires the integration of engineering, education, enforcement, and emergency services to ensure the safety and well-being of all road users.

Engineering plays a foundational role in traffic calming. Through strategic design interventions, such as raised crosswalks, speed tables, roundabouts, speed feedback signs, and additional tools outlined in this document, Orange County's Traffic Engineering Division enhances roadway safety and reduces speeding. The Toolbox exemplifies this approach, implementing state-of-the-art traffic calming measures and supporting the County's Vision Zero initiative.

Education is equally vital. Public outreach and community engagement are embedded in the planning process, ensuring that residents understand the purpose and benefits of traffic calming measures. This fosters community support and encourages safer driving behavior.

Enforcement complements engineering and education by ensuring compliance with traffic laws. The presence of law enforcement, combined with tools like speed feedback signs, reinforces speed limits and deters reckless driving.

Emergency services are integral to the planning and implementation of traffic calming strategies. Orange County ensures that all modifications to roadways maintain accessibility for emergency vehicles, preserving response times and public safety.

Together, these four pillars form a comprehensive strategy that not only mitigates traffic hazards but also promotes a safer, more livable community for all.

1.3 Common Traffic Calming Issues

Some of the common issues the traffic calming program and this toolbox policy are anticipated to address are:

- Insufficient **pedestrian crossings**:
  - At signalized intersections,
  - At unsignalized intersections or midblock crossing locations,
  - Across busy arterials, and
  - Around schools, parks, transit stations, or other pedestrian activity centers.
- **Speeding** and/or cut-through traffic on local streets
- **Difficulty seeing pedestrians, bicycles, or vehicles** approaching when driving or walking at intersections
- **Difficulty driving or bicycling across or turning** at intersections

It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.

1.4 Toolbox Information Overview

For each treatment / tool, the Toolbox provides:

- An example image, illustrating the tool
- A description of the tool
- Key factors and criteria that are considered when selecting or designing the tool
- Typical order of magnitude cost range required to design and construct/install the tool.
  - Order of magnitude costs are per unit, and projects may include multiple units.

$ ..... = $0 - $10,000
$ $ ..... = $10,000 - $100,000
$ $ $ ..... = $100,000+

- Project timeframes, which provides an order of magnitude of the time typically required to secure funding, design, and construct/install these treatments to serve a community or street.

..... = 0 - 2 Years
..... = 2 - 5 Years
... = 5+ Years

1.5 Framework/Context

The tools chosen for inclusion in this Toolbox are not exhaustive of the services or designs that the traffic calming program can provide; they were selected for their suitability for addressing transportation issues at a county-wide scale. This Traffic Calming & Safety Toolbox Policy will provide specific direction on the use and application of specific devices based on a number of factors including roadway framework/context. The framework is built around FDOT criteria, taking guidance from the context-based approach to speed management in the FDOT Design Manual (FDM)

1.6 Traffic Calming & Safety Toolbox Policy

1.6.1 Intent

This Traffic Calming & Safety Toolbox Policy is intended to provide guidance on the applicability of treatments, how to request traffic calming, and administration of the traffic calming program. Applicability of Toolbox treatments may include factors such as roadway framework/context, roadway type/classification, physical/geometric characteristics, traffic volume, and speed characteristics.

1.6.2 Applicability

The Orange County Traffic Calming Program is a county-wide program. While there are many roadways within the Orange County boundary, only those roadways maintained by Orange County are eligible. Any roadway maintained by Orange County MAY be eligible for traffic calming and/or safety improvements if they meet certain criteria. The following sections and Summary Sheets explain further.

1.6.3 How to Request Traffic Calming or Safety Treatments

Below are the steps to request traffic calming or safety treatments in your community.

1. Visit the online Toolbox, posted on the County Website.
    a. This resource is intended to help residents understand the overview and goals, purpose and audience, and Toolbox treatment types (with Summary Sheets for each).
    b. More importantly, this online Toolbox will become a new way of submitting a traffic calming request. This is an Orange County initiative to supplement the current 311 requesting system and to provide an on-line platform intended to be a customer friendly experience with a more systematic implementation approach and enhanced customer service to County residents' concerns.
2. Once in the Toolbox, users can get a more complete understanding of Traffic Calming and Safety and the actual treatments or jump directly to the "Request Traffic Calming" tab at the top right of the page.
3. Request Traffic Calming tab includes:
    a. Explanation of what roads are eligible and noneligible.
        i. Eligible: A road is considered eligible if it is owned and maintained by Orange County.

ii. Noneligible: A road is ineligible if it is owned or maintained by a different entity. i.e., Florida Department of Transportation, Florida's Turnpike Enterprise, Central Florida Expressway Authority, Cities, etc.

1.6.4 **Administration / Implementation**

Once Orange County Traffic Calming staff have received the submitted request form, County staff will begin an evaluation. Once the evaluation is completed and if a traffic calming treatment is determined to be beneficial to the community with little to no negative impact on other County services, County staff will send out ballots to the residents impacted. In order for a treatment to move forward, the County must receive support from at least 67% of returned ballots.

1.6.5 **Funding**

Along with the update to the Traffic Calming Policy, there will no longer be a requirement for communities to contribute to funding these improvements through establishing a Municipal Services Benefit Unit (MSBU) or other means.

1.6.6 **Traffic Calming & Safety Toolbox - Treatment Types**

Building on the guiding principles outlined in this Traffic Calming & Safety Toolbox Policy, the Toolbox Treatment Summary Sheets provide practical, treatment-specific details to help industry professionals, community stakeholders, and residents apply these policies effectively.

Each sheet translates policy objectives into actionable strategies, offering clear explanations of when and how individual traffic calming and safety treatments could be considered. By connecting high-level policy goals with on-the-ground implementation guidance, these resources ensure consistency, transparency, and informed decision-making throughout the planning and design process.

It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.

2 Toolbox Treatment Summary Sheets

2.1 Pedestrian Facility Treatments

2.1.1 Signs and Markings

Pedestrian Facility Treatments

Signs and Markings

2.1.1

What Is It?

- High-visibility signs and/or markings at and in advance of a pedestrian crossing to increase driver awareness and yielding compliance.

Best For:

- Intersection approaches and midblock locations to alert drivers of pedestrian crossing activity.

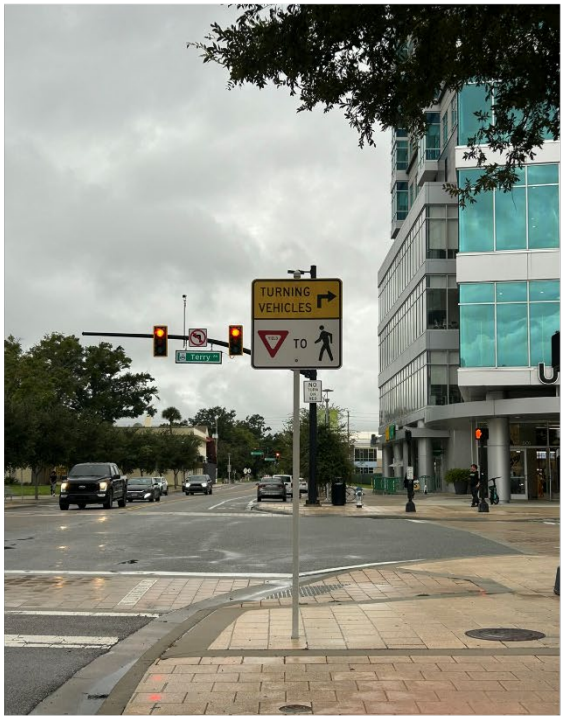

Image Source: HDR

Implementation Thresholds:	
Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Beneficial in areas where drivers might not expect a pedestrian crossing or where a higher level of driver attention is required due to potential pedestrian and bicycle conflicts. (High Injury Network).
- Consider other nearby signs to prevent sign clutter.
- Avoid blocking a pedestrian path or hindering ADA accessibility.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost: $

Timeline:

Orange County Traffic Calming Toolbox

2.1.2 Marked Crosswalk

Pedestrian Facility Treatments

Marked Crosswalk

2.1.2

What Is It?

- White striping across a pedestrian crossing typically used at signalized or unsignalized controlled intersections and midblock crossing locations to indicate pedestrian crossing locations

Best For:

- Intersection approaches and midblock crossings to alert drivers of pedestrian activity.

Image Source: HDR, Google Street View

Implementation Thresholds:	
Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	2,000+
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Only place where there is an existing/planned sidewalk and curb ramp meeting ADA standards.
- Indicates to pedestrians and drivers the preferred locations for pedestrians to cross.
- Signals a clear "channel" for pedestrian pathways to both pedestrians and drivers.
- Assists in facilitating eye contact by moving pedestrians directly into the driver's field of vision.
- Reduces pedestrian-vehicular collisions.
- Can provide a false sense of security, especially at uncontrolled crossings.
- Exceptions may be considered regarding minimum volume thresholds for crossings related to parks, schools, and trails.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

$

Timeline:

Orange County Traffic Calming Toolbox

2.1.3 In-Street Pedestrian Crossing Signs

Pedestrian Facility Treatments

In-Street Pedestrian Crossing Signs

2.1.3

What Is It?

- Regulatory signs posted on lane edge lines or road centerlines reminding drivers of the state law to yield to pedestrians entering crosswalks at unsignalized crossings
- Can be installed on raised median island along single-lane streets

Best For:

- Crossings at uncontrolled locations, especially lower speed areas near schools and parks
- 2 or 3-lane roads

Image Source: HDR, Google Street View

Implementation Thresholds:

Max Target/Posted Speed	30 MPH or Less
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	1 or 2
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Only place where there is an existing/planned marked crosswalk.
- Highly visible to motorists and has a positive impact on pedestrian safety at crosswalks.
- Good driver compliance with yielding to pedestrians; however, compliance decreases on multi-lane streets.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

$

Timeline:

Orange County Traffic Calming Toolbox

2.1.4 Rectangular Rapid Flashing Beacons (RRFB)

Pedestrian Facility Treatments

Rectangular Rapid Flashing Beacons (RRFB)

2.1.4

What Is It?

- Rapid flashing LED strobe lights mounted to pedestrian, trail, or school crossing warning signs to notify drivers of pedestrian's intention to cross

Best For:

- Midblock crossings with mild pedestrian/bicycle activity, such as at trail crossings

Image Source: HDR, Google Street View

Implementation Thresholds:	
Max Target/Posted Speed	35 MPH or Less
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	1 or 2
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Only place where there is an existing/planned sidewalk and curb ramp meeting ADA standards.
- Midblock crossings with mild pedestrian/bicycle activity, such as at trail crossings.
- Increased driver yielding compliance.
- Solar panels reduce energy costs & wireless capabilities reduce installation cost.
- It is preferred to include a median refuge island with 2 lanes per direction (and required for a 5-lane section with center turn lane).

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

$$

Timeline:

Orange County Traffic Calming Toolbox

2.1.5 In-Roadway Lighting/Internally Illuminated Raised Pavement Markers (RPMs)

Pedestrian Facility Treatments

Roadway Lighting/Internally Illuminated Raised Pavement Markers (RPMs) 2.1.5

What Is It?

- In-ground flashing strobe LED lights activated in advance of a pedestrian entering a marked crosswalk.

Best For:

- Midblock crossings, school crossings, and other uncontrolled pedestrian crossings – illuminates only when actuated

Image Source: Google Earth, Google Street View

Implementation Thresholds:	
Max Target/Posted Speed	35 MPH or Less
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	1 or 2
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Only place where there is an existing/planned marked crosswalk.
- To warn drivers that they are approaching a condition that may require the driver to slow or stop.
- Install at marked crosswalks where no overhead lighting is present.

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Cost:

$$

Timeline:

Orange County Traffic Calming Toolbox

2.1.6 Pedestrian Refuge

Pedestrian Facility Treatments

Pedestrian Refuge

2.1.6

What Is It?

- Area within the street that allows pedestrians to stand and wait, providing greater visibility and cross streets in two phases
- Used in locations on single lane or multilane streets with defined midblock crossing desire lines (worn paths leading to a specific crossing point) or at intersections

Best For:

- Uncontrolled crossings, trail crossings

Modular/Quick-Build *options are also available.*

Image Source: Minnesota Department of Transportation, Scott Batson

Implementation Thresholds:	
Max Target/Posted Speed	≤ 45 MPH, or ≤ 50 MPH (if signalized)
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Only place where there is an existing/planned marked crosswalk.
- Allows pedestrians to cross the street in two stages, focusing on each direction of traffic separately.
- The refuge provides pedestrians with a better view of oncoming traffic as well as allowing drivers to see pedestrians more easily.
- Required when crossing at a midblock location is longer than 60-feet. Should be considered for shorter crossings as well.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

Permanent	Modular/Quick-Build
$-$$	$

Timeline:

Permanent	Modular/Quick-Build
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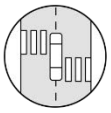
Orange County Traffic Calming Toolbox

2.1.7 Z Crossing

Pedestrian Facility Treatments

Z Crossing



2.1.7

What Is It?

- Pedestrian refuge island with the addition of an angled refuge area in the median which causes pedestrians crossing to turn slightly to face oncoming traffic before they cross the second direction of traffic
- Increases pedestrian visibility, avoid right-turn crashes with pedestrians

Best For:

- Uncontrolled crossings, directional medians, roads wider than two lanes with median

Image Source: Google Earth, Google Streetview

Implementation Thresholds:

Max Target/Posted Speed	≤ 45 MPH, or ≤ 50 MPH (if signalized)
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Divided

Key Considerations:

- Only place where there is an existing/planned marked crosswalk.
- Causes pedestrians to look more directly at oncoming traffic.
- Motorists are better able to see and make eye contact with pedestrians as they walk through the staggered refuge area.
- Can reduce vehicular delay by having separate traffic control actuations in each direction.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

$$

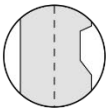
Timeline:

Orange County Traffic Calming Toolbox

2.1.8 Curb Extensions/Bulbouts

Pedestrian Facility Treatments

Curb Extensions/Bulbouts



2.1.8

What Is It?

- Consists of an extension of the sidewalk space into the street, narrowing the street at a pedestrian crossing to shorten pedestrian crossing distance and improve pedestrian visibility
- Considered at intersection and midblock locations where there is high crossing activity, no travel lane conflicts, and often in conjunction with on-street parking
- Typical in locations with on-street parking

Best For:

- Intersection and midblock locations with marked crosswalks, often in-conjunction with on-street parking

Modular/Quick-Build *options are also available.*

Image Source: HDR, City of Minneapolis

Implementation Thresholds:

Max Target/Posted Speed	35 MPH or Less
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Shortens pedestrian crossing distance, decreases pedestrian exposure time, improves pedestrian visibility, lowers vehicle turning speeds, & provides opportunity to install ADA-compliant ramps.
- Provides opportunity to store and treat stormwater runoff.
- May involve a street parking tradeoff, may also negatively impact existing parking and drainage flow.
- Can be used in conjunction with intersection daylighting.
- Must consider truck traffic and larger vehicles (emergency vehicles, waste management, transit).

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Cost:

Permanent	Modular/Quick-Build
$$	$

Timeline:

Permanent	Modular/Quick-Build
🕓🕓	🕓

Orange County Traffic Calming Toolbox

2.1.9 Raised Crosswalks

Pedestrian Facility Treatments

Raised Crosswalks

2.1.9

What Is It?

- Vertically raised crosswalk which requires vehicles to slow in approach of crosswalk
- Improves pedestrian visibility

Best For:

- Where neighborhood or commercial gateway is desired
- Locations related to parks, schools, or trails

Modular/Quick-Build *options are also available.*

Image Source: HDR, Adobe Stock Photo

Implementation Thresholds:	
Max Target/Posted Speed	30 MPH or Less
Functional Classification	Local, Collector, & possibly Minor Arterial
Typical Vehicles Per Day	Up to 10,000 per lane per direction
# of Lanes (Per Direction)	1 or 2
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Only place where there is an existing/planned sidewalk and curb ramp meeting ADA standards.
- Provides flush pedestrian crossing, and signals to approaching drivers that pedestrians are priority.
- Slows vehicles as they approach the crosswalk and improves pedestrian visibility and accessibility.
- Context Classifications of Suburban Residential and Suburban Commercial may be considered.
- In special exceptions, may be considered with posted speeds of 35 mph if a maximum slope of 1:20 is used.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

Permanent	Modular/Quick-Build
$$	$

Timeline:

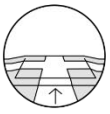
Permanent	Modular/Quick-Build
	

Orange County Traffic Calming Toolbox

2.1.10 Raised Intersections

Pedestrian Facility Treatments

Raised Intersections



2.1.10

What Is It?

- Used to slow vehicles at intersection approach from all directions
- Flat raised areas with ramps on all approaches and often textured materials.
- Provides flush crossings for pedestrians in all directions

Best For:

- In locations where neighborhood or commercial gateway is desired

Modular/Quick-Build *options are also available.*

Image Source: Orange County, nacto.org

Implementation Thresholds:	
Max Target/Posted Speed	30 MPH or Less
Functional Classification	All
Typical Vehicles Per Day	Up to 10,000 per lane per direction
# of Lanes (Per Direction)	1 or 2
Curbed or Flush Shoulder	Curbed
Divided or Undivided	Both

Key Considerations:

- Only place where there is an existing/planned sidewalk and curb ramp meeting ADA standards.
- Signals to approaching drivers that pedestrians are the priority with an enhanced crossing.
- Slows vehicles as they approach the crosswalk & improves pedestrian visibility and accessibility.
- Context Classifications of Suburban Residential and Suburban Commercial may be considered.
- Should consider drainage.
- Consider when raised crosswalks or speed cushions are not a viable option.
- In special exceptions, may be considered with posted speeds of 35 mph if a maximum slope of 1:20 is used.

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Cost:	
Permanent	Modular/Quick-Build
$$$	**$$**

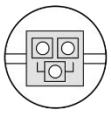
Timeline:	
Permanent	Modular/Quick-Build
🕓🕓🕓	🕓🕓

Orange County Traffic Calming Toolbox

2.1.11 Pedestrian Hybrid Beacon (PHB)

Pedestrian Facility Treatments

Pedestrian Hybrid Beacon (PHB)



2.1.11

What Is It?

- Pedestrian-actuated beacon that is a combination of flashing beacons and a traffic control signal to reduce pedestrian-vehicle conflicts and signalizes pedestrian movements, thereby requiring vehicles to stop for crosswalk users
- Applicable on higher-speed streets where a more significant pedestrian crossing device is necessary

Best For:

- Higher-speed/wider roads with high crossing activity

Image Source: HDR

Implementation Thresholds:

Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Only place where there is an existing/planned marked crosswalk.
- Most effective when combined with a raised crosswalk and "Z Crossing".
- Reduces pedestrian-vehicle conflicts and increases driver compliance with yielding to pedestrians.
- Reduces vehicle delay when compared to standard pedestrian traffic signal.

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Cost:

$$$

Timeline:

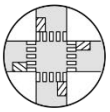
Orange County Traffic Calming Toolbox

2.2 Multimodal Operational Treatments

2.2.1 Intersection Daylighting and Visibility Improvements

Multimodal Operational Treatments

Intersection Daylighting/Visibility Improvements



2.2.1

What Is It?

- Parking is restricted 20 feet back from a crosswalk or 30 feet back from any flashing beacon or traffic control signal
- Applied in locations to improve visibility of pedestrians and bicyclists at intersections
- Can either be implemented through striping or permanent curb extensions

Best For:

- Intersections with higher pedestrian/bicyclist crossing activity

Image Source: NACTO, SFMTA

Implementation Thresholds:	
Max Target/Posted Speed	35 MPH or Less
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Improves visibility of pedestrians and bicyclists to drivers.
- Works well in conjunction with bulbouts, which help slow vehicles as they approach the intersection.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

$

Timeline:

Orange County Traffic Calming Toolbox

2.2.2 Textured Pavement

Multimodal Operational Treatments

Textured Pavement

2.2.2

What Is It?

- Permanent textured surfaces are created using materials such as stamped or colored concrete, brick or concrete pavers, and integral colored asphalt to help manage speeds through audial and vibratory cues
- Modular/Quick-Build options, while not as durable as thermoplastic or stamped treatments, are cost-effective, removable with surface grinding or re-coating, and ideal for testing design concepts.

Best For:

- Sharp curves, sudden turns, approaches to intersections

Modular/Quick-Build *options are also available.*

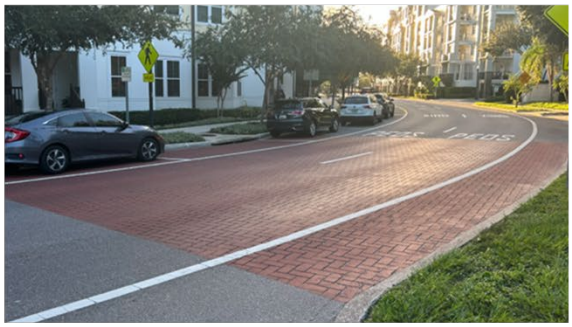


Image Source: HDR, Google Street View

Implementation Thresholds:

Max Target/Posted Speed	45 MPH or Less
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Permanent installations are typically part of major roadway redesigns and are valued for their durability and visual permanence .
- When implemented at intersections or along corridors, they provide long-term traffic calming benefits while contributing to place-making and urban design goals.
- Temporary coatings can be applied directly over existing asphalt using a specialized spray rig.
- Materials typically designed for short- to medium-term use.
- Consider using on roads with less than 10% truck traffic.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

Permanent	Modular/Quick-Build
$$	$

Timeline:

Permanent	Modular/Quick-Build
🕓🕓	🕓

Orange County Traffic Calming Toolbox

2.2.3 No Turn on Red

Multimodal Operational Treatments

No Turn On Red

2.2.3

What Is It?

- Regulatory or dynamic (blank-out) signs that restrict vehicles from turning on red signal indications
- Locations with restricted intersection sight distance

Best For:

- Typically applied at intersections with low to high crossing activity to reduce turning vehicle and pedestrians/ bicyclists crossing conflicts

Image Source: HDR, Google Street View

Implementation Thresholds:	
Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Should only be placed in conjunction with a traffic signal.
- Reduces potential conflicts between turning vehicles and pedestrians or bicyclists that might be crossing during the conflicting traffic signal phase.
- Enforcement is critical to increase effectiveness.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

$

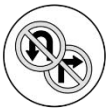
Timeline:

Orange County Traffic Calming Toolbox

2.2.4 Turn Restrictions

Multimodal Operational Treatments

Turn Restrictions



2.2.4

What Is It?

- Prohibiting certain turn movements at a signalized or unsignalized intersection

Best For:

- Intersections where turning movements can be delayed by opposing traffic, areas with pedestrian/bicycle activity
- Locations with schools for flow of school traffic during arrival/dismissal periods

Image Source: Google Street View

Implementation Thresholds:	
Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Prohibiting left turn movements can simplify intersection operations, reduce pedestrians' exposure to left-turning vehicles, and improve transit travel times.
- Prohibiting right turn movements can improve safety for bicyclists where there is a high volume of bicyclists and right-turning vehicles.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

$

Timeline:

Orange County Traffic Calming Toolbox

2.2.5 Protected Left Turns

Multimodal Operational Treatments

Protected Left Turns

2.2.5

What Is It?

- Traffic signal phasing and signal equipment that only allows turning vehicles to enter the intersection during a dedicated signal phase separate from the pedestrian and/or bicycle through phases

Best For:

- Intersections with history of left-turn conflicts, intersections with lower visibility

Image Source: Google Earth, Google Street View

Implementation Thresholds:	
Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Should only be placed in conjunction with a traffic signal.
- Eliminates conflicts between left turning vehicles and pedestrians, which is one of the most common type of crash involving pedestrians and a vehicle.
- Typically applied in locations with high pedestrian/bicyclist conflicts with left turning vehicles.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

$-$$$

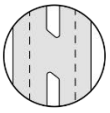
Timeline:

Orange County Traffic Calming Toolbox

2.2.6 Directional Medians

Multimodal Operational Treatments

Directional Medians



2.2.6

What Is It?

- Raised or painted center islands that restrict vehicle turning movements at intersections and midblock locations.
- Reduces conflict points.
- Function as both an access management tool and a traffic calming device, narrowing the roadway and reinforcing desired vehicle paths

Best For:

- In locations where preventing left turns or through movements across traffic is desired.

Modular/Quick-Build *options are also available.*

Image Source: Google Maps, Google Street View

Implementation Thresholds:	
Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Reduces the number of conflict points and improve safety for both motorists and pedestrians.
- Particularly effective at midblock access points, unsignalized intersections, or near high-crash driveways where side-street traffic poses a risk to mainline flow.
- Must consider upstream and downstream impacts as well as public involvement for impacting access to properties.

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Cost:

Permanent	Modular/Quick-Build
$$	$

Timeline:

Permanent	Modular/Quick-Build
	

Orange County Traffic Calming Toolbox

2.2.7 All-Way Stop

Multimodal Operational Treatments

All-Way Stop

2.2.7

What Is It?

- Installing stop signs on all four approaches to an intersection to require drivers in all directions to stop. An engineering study must be conducted to determine if it is warranted.

Best For:

- Similar volume streets, especially if a traffic signal is not warranted/feasible.

Image Source: HDR

Implementation Thresholds:	
Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	1
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Stop signs are not a traffic calming device; they do not reduce speeding.
- Most appropriate at the intersection of two similar-volume and low-volume streets where a full traffic signal may not be warranted/feasible.
- May be used where there are high volumes of pedestrians and bicycles crossing, or near schools, recreation centers, & libraries.
- If installed in an unwarranted location, new stop signs can encourage disobedience or re-routing, moving the problem but not solving it.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

$

Timeline:

Orange County Traffic Calming Toolbox

2.2.8 Pedestrian Countdown

Multimodal Operational Treatments

Pedestrian Countdown

2.2.8

What Is It?

- Pedestrian signal head that displays the amount of time remaining to cross the street
- Used at signalized intersections or at PHBs

Best For:

- Required at all signalized intersections and PHBs where the pedestrian change interval (flashing don't walk) is greater than 7 seconds in length

Image Source: HDR, Google Street View

Implementation Thresholds:

Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Should only be placed in conjunction with an existing/planned traffic signal or PHB.
- Reduces pedestrian-vehicle conflicts, especially larger intersections with longer crossing distances.
- Provides pedestrians with increased awareness of how much time they have remaining to finish crossing the street.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

$

Timeline:

Orange County Traffic Calming Toolbox

2.2.9 Leading Pedestrian Interval (LPI)

Multimodal Operational Treatments

Leading Pedestrian Interval (LPI)

2.2.9

What Is It?

- Traffic signal timing that provides pedestrians/bicyclists with a few seconds (usually 3-7 seconds) head start at crossing the street prior to vehicular movement to reduce risk of turning conflicts

Best For:

- Where there is a high volume of pedestrian and bicycle activity or a high number of potential conflicts with turning vehicles

Image Source: CUTR Research BDV25-977-22

Implementation Thresholds:

Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Could be considered at existing signals.
- Typically applied in locations with a high volume of pedestrian/bicyclist activity and multiple conflicts with turning vehicles or slower-moving pedestrians.
- Increases pedestrian/bicyclist visibility for turning vehicles and driver yielding compliance for pedestrians.
- Helps reduce conflicts between turning vehicles and pedestrians/bicyclists.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

$

Timeline:

Orange County Traffic Calming Toolbox

2.2.10 New Signal

Multimodal Operational Treatments

New Signal

2.2.10

What Is It?

- Installing a traffic signal at a multi-way intersection
- Intended to signalize movements at intersections.
- An engineering study must be completed to determine if the new signal meets applicable warrants and is feasible.

Best For:

- Intersections in need of more management beyond other forms of traffic control, due to volume, delay, etc.

Image Source: Google Street View

Implementation Thresholds:

Max Target/Posted Speed	All - (Must meet Signal Warrant)
Functional Classification	All
Typical Vehicles Per Day	All - (Must meet Signal Warrant)
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Best for intersections in need of management beyond other forms of traffic control due to volume, delay, etc.
- May be justified through high vehicular, pedestrian, or bicyclist volumes, or due to crash history, or proximity to a rail crossing (Signal Warrant Study Required by Traffic Engineer).
- If installed in an unwarranted location, new signals can encourage disobedience or rerouting, moving the problem but not solving it.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

$$$

Timeline:

Orange County Traffic Calming Toolbox

2.3 Speed Management Treatments

2.3.1 Speed Feedback Signs

Speed Management Treatments

Speed Feedback Signs

2.3.1

What Is It?

- Installation of a radar unit which measures the speed of an approaching vehicle and instantaneously shows the real-time speed of the vehicle
- Can be posted as a permanent sign, or temporarily with a trailer

Best For:

- Approaches to curves and school zones, and is most effective in conjunction with other traffic calming techniques
- Can also be used to help emphasize posted speed limits when placed in conjunction with speed limit signs

Image Source: HDR, Google Street View

Implementation Thresholds:

Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	1 or 2
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Can be implemented as a temporary or permanent solution.

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Cost:

$

Timeline:

Orange County Traffic Calming Toolbox

2.3.2 Roundabouts

Speed Management Treatments

Roundabouts

2.3.2

What Is It?

- Unsignalized circular intersections that direct traffic in a continuous counter-clockwise flow and reduce speeds at intersections
- Offer numerous benefits in safety, traffic operations, traffic calming, and aesthetics
- Federal Highway Administration (FHWA) proven countermeasure

Best For:

- Low to medium volume roadways, particularly at similar to lower volume side streets

Modular/Quick-Build *options are also available.*

Image Source: HDR, VDOT, Omni-Means, Ltd

Implementation Thresholds:	
Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	up to 30,000 single lane (entering) up to 45,000 2-lanes (entering)
# of Lanes (Per Direction)	1 or 2
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- May require more available right-of-way than other treatments.
- Dramatically reduced crash frequency and severity compared to other types of traffic control.
- Reduces speeds, with improved traffic flow over stop-controlled or signalized intersections.
- Splitter islands reduce crossing distances and allow crossing one direction at a time.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

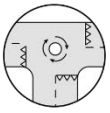
Cost:		**Timeline:**	
Permanent	Modular/Quick-Build	Permanent	Modular/Quick-Build
$$$	**$$**	🕓🕓🕓	🕓🕓

Orange County Traffic Calming Toolbox

2.3.3 Mini Roundabouts

Speed Management Treatments

Mini Roundabouts



2.3.3

What Is It?

- Unsignalized circular intersections providing continuous one-way flow of traffic and having a raised but fully mountable central island

Best For:

- Lower-volume intersections with constrained right-of-way

Modular/Quick-Build *options are also available.*

Image Source: HDR

Implementation Thresholds:	
Max Target/Posted Speed	30 MPH or Less
Functional Classification	All
Typical Vehicles Per Day	up to 15,000 (total entering)
# of Lanes (Per Direction)	1
Curbed or Flush Shoulder	Both
Divided or Undivided	Undivided

Key Considerations:

- Have all the same benefits as traditional roundabouts.
- Useful in locations where right-of-way is constrained.
- Reduces vehicular speeds.
- Frequently improve traffic flow and operations compared to stop-controlled or signalized intersections and significantly reduce delay during off-peak periods.
- Friendly for non-motorized users.

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Cost:

Permanent	Modular/Quick-Build
$$$	**$**

Timeline:

Permanent	Modular/Quick-Build
🕓🕓🕓	🕓

Orange County Traffic Calming Toolbox

2.3.4 Traffic Circles

Speed Management Treatments

Traffic Circles

2.3.4

What Is It?

- Installation of a small circulating island in the middle of residential street intersection
- To direct traffic in a continuous flow and reduce speeds at intersections
- May include stop control, but this is not required

Best For:

- Lower-volume intersections with constrained right-of-way

Modular/Quick-Build *options are also available.*

Image Source: HDR, Google Street View

Implementation Thresholds:	
Max Target/Posted Speed	25 MPH or Less
Functional Classification	Local
Typical Vehicles Per Day	up to 3,500 (total entering)
# of Lanes (Per Direction)	1
Curbed or Flush Shoulder	Both
Divided or Undivided	Undivided

Key Considerations:

- Can reduce crash frequency and severity and have positive aesthetic value.
- Can often be developed to fit within existing right-of-way constraints.
- Larger emergency vehicles and responders can turn left in front of island when no conflicting traffic, only when geometry allows.
- Can be installed as an all-way yield or as an all-way stop depending on location.
- Eliminates the need for bicyclists to fully stop, prioritizing their travel through the intersection.
- Context Classifications of Suburban Residential and Suburban Commercial may be considered.

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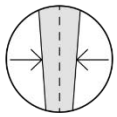
Cost:		**Timeline:**	
Permanent	Modular/Quick-Build	Permanent	Modular/Quick-Build
$$$	**$**	🕓🕓🕓	🕓

Orange County Traffic Calming Toolbox

2.3.5 Chokers

Speed Management Treatments

Chokers



2.3.5

What Is It?

- Curb extensions that narrow a street, typically applied at midblock locations
- To slow vehicular speeds at the midblock or at an intersection approach

Best For:

- Low volume neighborhood streets

Modular/Quick-Build *options are also available.*

Image Source: Dan Burden, James R. Barrera

Implementation Thresholds:	
Max Target/Posted Speed	25 MPH or Less
Functional Classification	Local
Typical Vehicles Per Day	500-2,000
# of Lanes (Per Direction)	1
Curbed or Flush Shoulder	Both
Divided or Undivided	Undivided

Key Considerations:

- Location of curbside garbage pick-up if adjacent to residential.
- Easily negotiable by large vehicles.
- Can have positive aesthetic value.
- Shortens pedestrian crossing distance when combined with pedestrian treatment.
- Slows vehicular travel speeds.
- In certain situations, Context Classifications of Suburban Residential and Suburban Commercial may be considered.

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Cost:

Permanent	Modular/Quick-Build
$$	**$**

Timeline:

Permanent	Modular/Quick-Build
🕓🕓	🕓

Orange County Traffic Calming Toolbox

2.3.6 Chicanes

Speed Management Treatments

Chicanes

2.3.6

What Is It?

- Curb extensions that alternate from one side of the street to the other, requiring drivers to slow down to navigate the slight turns by interrupting straight stretches of street and forcing vehicles to shift laterally
- Chicanes can be created by alternating on-street parking between each side of the street
- Residential or neighborhood locations where increased traffic control, reduced speeding and cut-through traffic are desired

Best For:

- Most roadways below 35 MPH posted speed

Modular/Quick-Build *options are also available.*

Image Source: New York Street Design Guide, HDR

Implementation Thresholds:

Max Target/Posted Speed	35 MPH or Less
Functional Classification	All
Typical Vehicles Per Day	up to 10,000
# of Lanes (Per Direction)	1 or 2
Curbed or Flush Shoulder	Both
Divided or Undivided	Undivided

Key Considerations:

- Can be as restrictive as necessary.
- Negotiable by large vehicles except under heavy traffic conditions.
- Provides opportunity for placemaking and green infrastructure in islands where chicaning is occurring.
- Need to consider parking and driveway access as well as drainage impacts.

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Cost:

Permanent	Modular/Quick-Build
$$$	**$**

Timeline:

Permanent	Modular/Quick-Build
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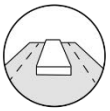
Orange County Traffic Calming Toolbox

2.3.7 Median Islands

Speed Management Treatments

Median Islands



2.3.7

What Is It?

- Raised sections installed along the roadway centerline that separate directions of travel, manage access, narrow the roadway or travel lanes, and may provide deflection and/or pedestrian refuge

Best For:

- Lower volume two-lane roadways

Modular/Quick-Build *options are also available.*

Image Source: HDR

Implementation Thresholds:	
Max Target/Posted Speed	45 MPH or Less
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	1
Curbed or Flush Shoulder	Both
Divided or Undivided	Undivided

Key Considerations:

- Must maintain minimum pavement width and axel clearance for life/safety vehicles.
- Typically measure 4–12 feet in width and may be landscaped or hardscaped.
- Often installed at mid-block locations or uncontrolled intersections.
- Context Classifications of Suburban Residential and Suburban Commercial may be considered.

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Cost:		**Timeline:**	
Permanent	Modular/Quick-Build	Permanent	Modular/Quick-Build
$-$$	**$**	🕓🕓	🕓

Orange County Traffic Calming Toolbox

2.3.8 Speed Cushions

Speed Management Treatments

Speed Cushions

2.3.8

What Is It?

- Segmented vertical deflection devices with wheel cutouts designed to slow passenger vehicles while allowing wider emergency vehicles to straddle the treatment

Best For:

- Lower-volume roadways that need emergency vehicle access

Modular/Quick-Build *options are also available.*

Image Source: HDR, FHWA: Jeff Gulden

Implementation Thresholds:	
Max Target/Posted Speed	30 MPH or Less
Functional Classification	Local and Collector
Typical Vehicles Per Day	500 – 7,500
# of Lanes (Per Direction)	1 or 2
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Must maintain minimum pavement width and axel clearance for life/safety vehicles.
- Recommended lower-volume roadways that need to maintain emergency vehicle access.
- More bicycle-friendly compared to standard speed humps.
- Proper signage and pavement markings are required to ensure visibility and compliance.

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Cost:

Permanent	Modular/Quick-Build
$-$$	$

Timeline:

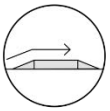
Permanent	Modular/Quick-Build
	

Orange County Traffic Calming Toolbox

2.3.9 Speed Tables

Speed Management Treatments

Speed Tables



2.3.9

What Is It?

- A raised area placed across a road to limit speeds. The flat top of the speed table is typically long enough to accommodate the wheelbase for most passenger vehicles.
- Design of these is similar to raised crosswalks, except there is no associated pedestrian crossing.

Best For:

- Midblock areas where speeding is more prevalent, as the slope/design is more forgiving when speeding

Modular/Quick-Build *options are also available.*

Image Source: HDR

Implementation Thresholds:	
Max Target/Posted Speed	30 MPH or Less
Functional Classification	Local, Collector, & possibly Minor Arterial
Typical Vehicles Per Day	Up to 10,000 per lane per direction
# of Lanes (Per Direction)	1 or 2
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Proper signage and pavement markings are required to ensure visibility and compliance.
- Generally, not appropriate for emergency routes.
- Not recommended on curves.

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Cost:

Permanent	Modular/Quick-Build
$-$$	$

Timeline:

Permanent	Modular/Quick-Build
	

Orange County Traffic Calming Toolbox

2.3.10 Reduced Curb Radii

Speed Management Treatments

Reduced Curb Radii

2.3.10

What Is It?

- Curbing or striping changes to tighten an intersection corner radius, which forces motorists to slow down to negotiate a tighter turn and shortens pedestrian crossing distances

Best For:

- Locations with non-traditional intersection geometry, larger radii, and intersections with minimal truck traffic

Modular/Quick-Build *options are also available.*

Image Source: HDR, pedsafe.org

Implementation Thresholds:

Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Reduces traffic speeds and increases driver awareness.
- Can be combined with a mountable surface to allow larger vehicles to continue to make turns, but restrict the effective radius for passenger vehicles.

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Cost:

Permanent	Modular/Quick-Build
$$	$

Timeline:

Permanent	Modular/Quick-Build
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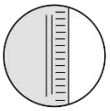
Orange County Traffic Calming Toolbox

2.3.11 Rumble Strips

Speed Management Treatments

Rumble Strips



2.3.11

What Is It?

- A low-cost pavement surface treatment intended to cause drivers to experience vehicular vibrations which alert them to slow down in advance of an area on the roadway where conditions are changing

Best For:

- Placing in advance of a stop sign or curve

Image Source: HDR, FHWA

Implementation Thresholds:	
Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	1 or 2
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Most commonly used in advance of a stop condition or a significant horizontal curvature.
- While rumble strips can be an effective device to warn drivers to slow down, they do require maintenance and can cause noise pollution, particularly if located adjacent to residences.
- Must provide a clear space for bicyclists.

* *It should be noted that these treatments are intended as illustrations of what may be appropriate in certain framework/contexts and specific locations. All treatments require review, analysis, and design decisions by County Traffic Engineering staff. Not all tools are appropriate in all situations. Implementation of devices and treatments is subject to funding availability.*

Cost:

$

Timeline:

Orange County Traffic Calming Toolbox

2.3.12 Speed Pavement Markings

Speed Management Treatments

Speed Pavement Markings

2.3.12

What Is It?

- Descriptive markings on the pavement used for the purpose of guiding, warning or regulating traffic, to supplement signage, and emphasize posted speed
- Provides more awareness to drivers when posted speed limits change

Best For:

- Areas with speeding issues and pedestrian hotspots. Best used in conjunction with other speed management strategies

Image Source: HDR

Implementation Thresholds:

Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Can be helpful to road users by supplementing signs and providing additional emphasis for important regulatory, warning, or guidance messages, because the markings do not require diversion of the road user's attention from the roadway surface.

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Cost:

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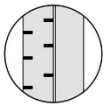
Timeline:

Orange County Traffic Calming Toolbox

2.3.13 Optical Speed Markings

Speed Management Treatments

Optical Speed Marking



2.3.13

What Is It?

- Visual pavement treatments designed to influence driver perception and behavior by creating the illusion of speed increase or lane narrowing
- These markings use painted bars, converging lines, or graduated spacing to make drivers feel they are traveling faster than they are, prompting voluntary speed reduction

Best For:

- Transitioning between context classifications, along curves, and approaches to intersections

Image Source: HDR, FHWA

Implementation Thresholds:	
Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Especially useful in transition zones (e.g., rural-to-urban), along high-speed curves, or approaches to pedestrian areas and intersections.

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Cost:

$

Timeline:

Orange County Traffic Calming Toolbox

2.4 Volume Management Treatments

2.4.1 Diverters

Volume Management Treatments

Diverters

2.4.1

What Is It?

- Landscaped islands placed diagonally across an intersection, blocking vehicle through movements, while retaining cut-through areas for bicyclists and pedestrians
- They are often staggered to create circuitous routes through the neighborhood, discouraging non-local traffic while maintaining access for local residents

Best For:

- Gridded street networks

Image Source: Paul Kruger, Jeff Gulden

Implementation Thresholds:	
Max Target/Posted Speed	25 MPH or Less
Functional Classification	Local
Typical Vehicles Per Day	up to 3,500
# of Lanes (Per Direction)	1
Curbed or Flush Shoulder	Both
Divided or Undivided	Undivided

Key Considerations:

- Do not require a full intersection closure, only a redirection of existing vehicular connections.
- Able to maintain full pedestrian, bicycle, and emergency vehicle access through cut-throughs and mountable devices.
- Best for gridded street networks; however, may result in a diversion of traffic to adjacent streets.
- Need to consider impact to drainage and emergency vehicle response times.

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Cost:

$$-$$$

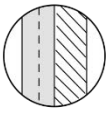
Timeline:

Orange County Traffic Calming Toolbox

2.4.2 Half Closures

Volume Management Treatments

Half Closure



2.4.2

What Is It?

- Landscaped or raised islands that block travel in one direction at the entrance of a two-way street
- Used along neighborhood bikeways or in locations where reduction in vehicular traffic is desired, while accommodating through bicycle and pedestrian traffic

Best For:

- Reducing cut-through traffic in one direction, especially from a busier roadway

Modular/Quick-Build *options are also available.*

Image Source: HDR

Implementation Thresholds:

Max Target/Posted Speed	30 MPH or Less
Functional Classification	Local
Typical Vehicles Per Day	up to 3,500
# of Lanes (Per Direction)	1
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Maintain two-way bicycle access.
- Effective in reducing traffic volumes.
- Provides opportunities for controlled crossing by pedestrians and bicyclists.
- Best for reducing cut-through traffic in one direction, especially from a busier roadway.
- May result in a diversion of traffic to adjacent streets.

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Cost:

Permanent	Modular/Quick-Build
$$-$$$	$$

Timeline:

Permanent	Modular/Quick-Build
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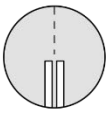
Orange County Traffic Calming Toolbox

2.5 Street Grid Management Treatments

2.5.1 Lane Striping Modification

Street Grid Management Treatments

Lane Striping Modification



2.5.1

What Is It?

- Can include reducing the width of existing wider travel lanes down to 10-11 feet, or reconfiguring pavement markings to reallocate excess street width to other purposes
- Typically used on streets with wider travel lanes and documented speeding to slow traffic while accommodating improved bicycle, pedestrian, and parking opportunities

Best For:

- Streets with travel lanes wider than needed for the street context

Before: 14' outside lane

After: 10' outside lane with 4' bike lane

Image Source: Google Street View

Implementation Thresholds:	
Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	Up to 2
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Encourages slower travel speeds and allows for the installation of medians, bicycle facilities, and other traffic calming elements.
- Best to consider as part of routine maintenance (e.g., milling and resurfacing) where planned restriping can be completed with the proposed reconfiguration on streets with travel lanes wider than needed for the street context.

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Cost:

$$

Timeline:

Orange County Traffic Calming Toolbox

2.5.2 Lane Redesignation

Street Grid Management Treatments

Lane Redesignation

2.5.2

What Is It?

- Repurposing or eliminating one or more travel lanes with the excess space used to widen sidewalks, add bicycle lanes, and/or add or convert space for on-street parking or other multimodal facilities

Best For:

- Multilane roads that meet traffic count thresholds for reducing number of lanes

Before: 4-Lane Undivided

After: 2-Lane with continuous left turn lane

Image Source: HDR, Google Maps

Implementation Thresholds:	
Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	Up to 20,000 (4-lane to 2-lane)
# of Lanes (Per Direction)	Up to 3
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Most commonly applied to convert four-lane undivided streets to three lanes.
- Provides opportunity to provide on-street bicycle facilities.
- Improves pedestrian conditions on multilane streets by allowing for the installation of bulbouts (with parking) and/or refuge islands.
- Reduces vehicular travel speeds and can improve overall corridor safety.
- Can be considered as part of routine maintenance (e.g., milling and resurfacing) where planned restriping can be completed with the proposed reconfiguration.

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Cost:

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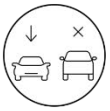
Timeline:

Orange County Traffic Calming Toolbox

2.5.3 One-Way Conversion

Street Grid Management Treatments

Two-Way to One-Way



2.5.3

What Is It?

- Involves converting a two-way roadway into a single-direction facility to reduce vehicle conflicts, simplify operations, and moderate speeds where bicycle and pedestrian activities make dual direction traffic unsafe
- Conversions can also free up roadway space for other uses such as widened sidewalks, protected bike lanes, or curb extensions
- FHWA recognizes street reconfigurations as a context-sensitive speed management strategy, particularly when used to reduce exposure to conflicts and better align roadway design with surrounding land use and mobility needs

Best For:

- Narrower roadways where more bike/pedestrian facilities are desired

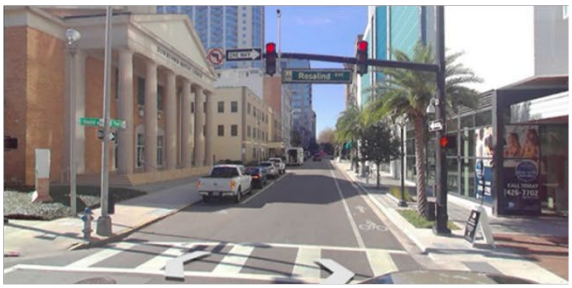


Image Source: maps.google.com, Google Earth

Implementation Thresholds:

Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	Up to 15,000
# of Lanes (Per Direction)	Any
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- By removing opposing flows, they reduce conflict points at intersections and improve signal coordination, particularly in constrained or high-pedestrian urban corridors .
- Most effective when paired with additional traffic calming elements like curb extensions, raised crossings, or mini roundabouts.
- Conversions that result in two or more lanes in a single direction can have the unintended consequence of speeding traffic up by permitting lane changing and weaving.
- May consider speed threshold when paired with other traffic calming treatments.
- Consider coordination for emergency rescue, solid waste, transit, and school bus routes.

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Cost:

$$$

Timeline:

Orange County Traffic Calming Toolbox

2.5.4 Two-Way Conversion

Street Grid Management Treatments

One-Way to Two-Way

2.5.4

What Is It?

- Converting a one-way street to a two-way street due to character or street-use changes
- Introduces opposing traffic flows, which helps to shorten travel distances and reduce circulation, as well as reduce traffic speeds.

Best For:

- Improving transportation efficiency, safety, and/or economic development potential of under-performing one-way streets

Blake St – 1-Way (2015) – Denver

Blake St – 2-Way Denver (2016-Present)

Image Source: Google Earth

Implementation Thresholds:

Max Target/Posted Speed	All
Functional Classification	All
Typical Vehicles Per Day	All
# of Lanes (Per Direction)	1 or 2
Curbed or Flush Shoulder	Both
Divided or Undivided	Both

Key Considerations:

- Simplifies turning and business access by reducing the number of turns necessary to reach a destination.
- Reduces peak directional carrying capacity of the street.
- Can slow transit times; however, can also create a more walkable street, and improve walking access to transit stops.
- Requires the addition of traffic control devices in the new direction of travel.
- May consider speed threshold when paired with other traffic calming treatments.
- Consider coordination for emergency rescue, solid waste, transit, and school bus routes.

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Cost:

$$$

Timeline:

Orange County Traffic Calming Toolbox