Safer Streets

Design Guidelines

Indian Wells | August 2024

Bicycle Boulevards and Sharrows

Bicycle boulevards (Class III Bikeways) are streets with low motorized traffic volumes and speeds and are designed to give bicycle travel the priority. Bicycle boulevards use signs, pavement markings, and speed and volume management to discourage speeding.

Typical Use

- Bicycle boulevards should not be used on roadways that have a posted speed greater than 25 mph.
- Bicycle boulevards are typically used on neighborhood streets or streets with low traffic and speeds.

Design Features

- Sharrow markings are typically placed in the center of the travel lane.
- If sharrows are placed next to parking, markings should be 3-4 feet from the parking lane, outside of the door zone.
- Markings should be placed after intersections and spaced at 250-foot intervals.

Further Considerations

- May need to consider modifying signal timing to induce a bicycle friendly travel speed.
- A “Bikes May Use Full Lane” should be installed to further educate all roadways users.
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Materials & Maintenance

- Shared lane markings should be inspected annually and maintained accordingly.

Bicycle Lanes

On-street bike lanes (Class II Bikeways) designate an exclusive space for cyclists through the use of pavement markings and signs. The bike lane is located directly adjacent to motor vehicle travel lanes and is used in the same direction as motor vehicle traffic.

Typical Use

- Bike lanes are typically used and most effective on any street with adequate space and moderate traffic volumes (<6,000 ADT).
- Bike lanes are most appropriate on streets with lower to moderate speeds of about 25 mph.

Design Features

- Bicycle lane markings are typically used at the beginning of block and at regular intervals.
- Bike lane widths range from 5-8 feet.
- Class II bikeways can be buffered to further separate bicycles from the adjacent vehicle traffic. .

Further Considerations

Advantages

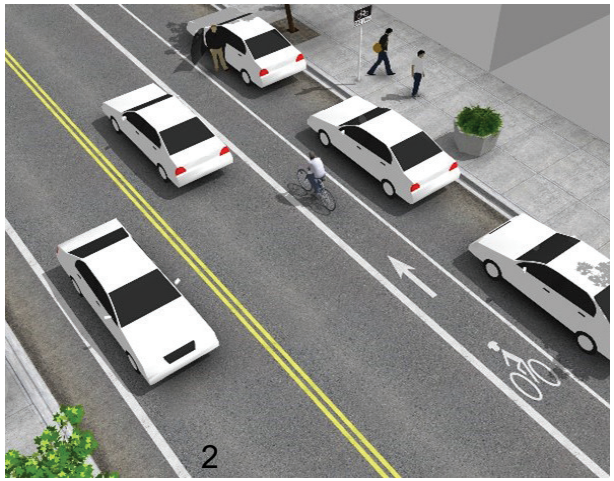
- May be an opportunity to narrow travel lane widths in order to widen the bicycle lane.
- On multi-lane streets a buffered bike lane may be most appropriate if feasible.

Disadvantages

- No vertical protection for cyclists.

Materials & Maintenance

- Bike lane striping will require maintenance especially at intersections. Bike lanes will also need to be maintained to ensure there is no debris, cracks, or potholes in the bike lane.



Typical Use

- Bioswales have flexible siting requirements and can be integrated with medians, cul-de-sacs, bulb outs, and other public space or traffic calming measure.

Design Features

- Bioswales require appropriate media composition for soil construction. The soil mixture should consist of 5% maximum clay content.
- 5-foot minimum clearance is required from the bottom of the bioswale to high groundwater table.

Further Considerations

Advantages

- Increases green vegetation throughout complete streets.
- Prevents drainage issues and flooding.

Disadvantages

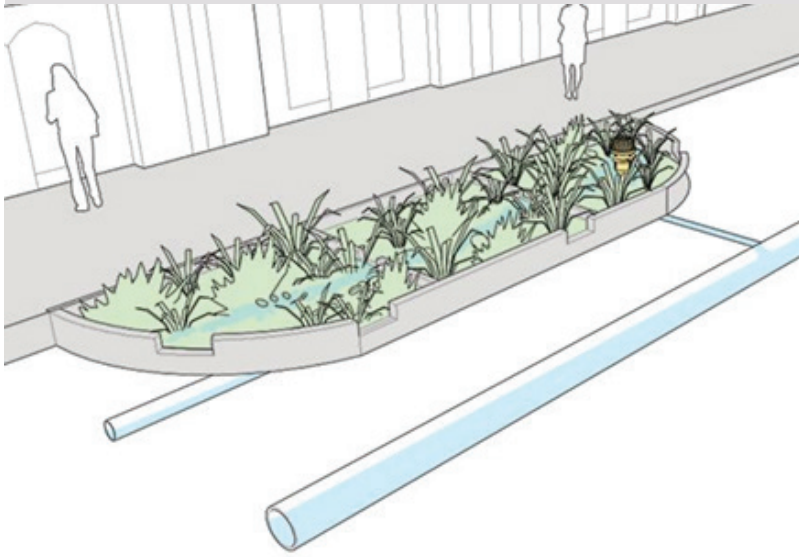
- Needs to be maintained.

Materials & Maintenance

Bioswales should be composed of diverse, native vegetation and irrigation requirements.

Bioswales

Bioswales are vegetated, shallow, landscaped depressions designed to capture, treat, and infiltrate stormwater runoff as it moves downstream. Bioswales are the most effective type of green infrastructure facility in slowing runoff velocity and cleansing water while recharging the underlying groundwater table.



Chicanes

A chicane is a series of alternating curves or lane shifts that are positioned to guide a motorist to steer back and forth out of a straight travel path. The curvilinear path is intended to reduce the speed at which a motorist is comfortable travelling through the feature. The lower speed could in turn result in a traffic volume reduction

Typical Use

• Chicanes have a traffic slowing effect which may be more suitable for streets with low traffic and with a typical speed limit of 35 mph.

• Chicanes are most effective of slowing traffic by encouraging motorists to moderate vehicle speeds through a series of horizontal deflections.

Design Features

• A chicane design may warrant additional signing and striping to ensure that drivers are aware of a slight bend in the roadway.

• A curb extension or edge island that forms a chicane should have vertical elements (e.g. signs, landscaping) to draw attention to it.

• Chicanes may be designed using a return angle of 45 degrees, or more gradual taper and transition, resulting in an S-shaped roadway.

Materials & Maintenance

Chicanes require few additional maintenance requirements to local roadways. Signage, landscaping, and other design features should be inspected and maintained according to local standards.

Further Considerations

Advantages

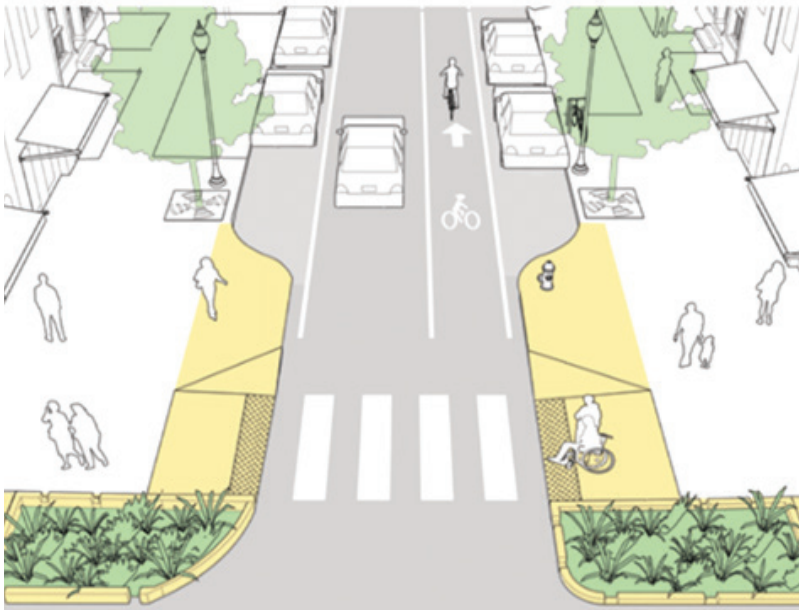
- Reduces vehicle speeds.
- Reduces straight line of sight and enhances visual breaks in the streetscape.
- Provides landscaping opportunity.
- Can accommodate emergency vehicles.

Disadvantages

- Removes on-street parking.
- Landscaping must be designed so as not to obstruct sight lines.
- Inattentive drivers may not abide by the new centerline.May disrupt ability of service/delivery vehicles to find parking.

Curb Extension/ Bulb Outs

Curb extensions visually and physically narrow the roadway, creating safer and shorter crossings for pedestrians while increasing the available space for landscaping and street trees.



Typical Use

- Curb extensions can be used as a gateway to minor streets known as neckdowns.
- Curb extensions can be used at bus stops known as bus bulbs.
- They are usually implemented at intersections with long crosswalks in order to shorten the crossing distance for pedestrians.
- Curb extensions can be used on roadways with any common urban speed limit.

Design Features

- Where the application of a curb extension impacts drainage, curb extensions may be designed with a 1-2 foot gap from the curb to trench drain.
- A corner curb extension is usually constructed to a width of between 6-8 feet. It should be offset from the through traffic lane by 1.5 feet.

Further Considerations

Advantages

- Decreases the overall width of the roadways and can serve as a visual cue to drivers.
- Increase overall visibility of pedestrians.
- The change in curb radii encourages slower turning speeds.

Disadvantages

- May require relocation of drainage features such as catch basins and trench drains.
- Hydraulic impacts may need to be evaluated.
- May require moving fire hydrants.

Materials & Maintenance

Curb extensions can be constructed using concrete. Additional maintenance may be required if landscaping on the curb extension is chosen.

Cycle Tracks

Cycle tracks (Class IV Bikeways) are exclusive bike facilities that include a horizontal and vertical separation from vehicle traffic. Cycle tracks may be one-way or two-way. The vertical separation may be in the form of raising the bicycle facility to sidewalk level or providing protection in the form of bollards, parked cars, planters, or raised curb.

Typical Use

- Cycle tracks are recommended on streets with multiple lanes, high traffic volumes, or high speed to provide additional protection for cyclists.
- Roads with high bicycle volumes could benefit from installing a dedicated and protected space for bicyclists.
- Cycle tracks should be installed on roadways with few conflicts (e.g. driveways, and cross streets) to maximize the protection for cyclists.

Design Features

- The minimum width of a one-way cycle track is 5 feet and the preferred width is 7 feet.
- The minimum width of a two-way cycle track is 8 feet with a preferred width of 12 feet.
- The minimum buffer width is 2 feet, and the preferred buffer width is 3 feet.
- Parking should be prohibited near intersections to allow for adequate sight lines.

Further Considerations

Advantages

- Provides a dedicated and protected space for cyclists which improves safety and comfort.

Disadvantages

- Impacts to drainage should be considered when using a raised curb for cycle tracks.
- Special consideration should be made for roadways with transit routes.

Materials & Maintenance

- Cycle tracks require regular street sweeping and maintenance to ensure the path for cyclists is keep clean and free of debris.

Diverter

A diverter is a physical barrier placed diagonally across an intersection to prevent vehicles from travelling straight through. Typically, through movements are still allowed for bicycles in this design.

Typical Use

- Diverters can be used on local and collector streets and can be used on streets with or without bicycle facilities.
- Typical maximum design roadway speeds for diverters is 25 mph.

Design Features

- A cut out can be provided to allow for through bicycle movements.
- Breakaway or lockable bollards can be used for the diverter to allow for emergency vehicles to travel through the intersection.

Further Considerations

Advantages

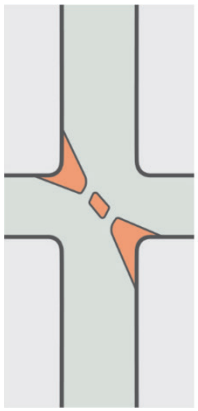
- Reduces vehicle speeds and cut through traffic.
- Removes conflict points within intersection.

Disadvantages

- A traffic study may be required to analyze the effects of vehicle rerouting.
- Diverters are not recommended for transit routes.

Materials & Maintenance

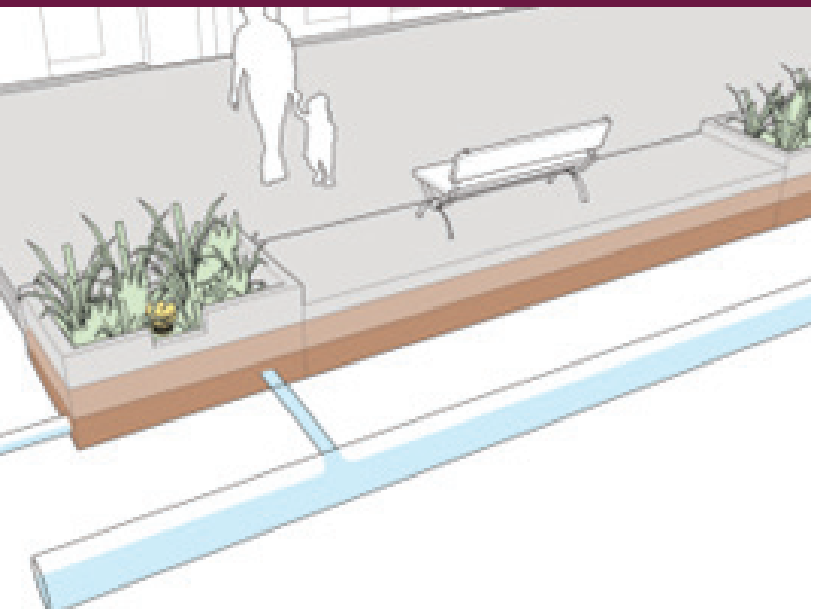
- Signage and pavement markings shall be designed per local standards.
- Landscaping may need to be maintained if landscaping is provided on diverters



Streetscaping and Green Infrastructure

Flow-Through Planters

Flow-through planters are hard-edged stormwater management facilities with an impermeable base.



Typical Use

- Appropriate for infiltration-preclusive or high-density urban areas.
- Are commonly designed next to building, poorly draining soils, steep slopes, or areas with contaminated soils.

Design Features

- Flow-through planters usually have a maximum 6-inch ponding depth.
- Planters are designed to drain within 24 hours.

Further Considerations

Advantages

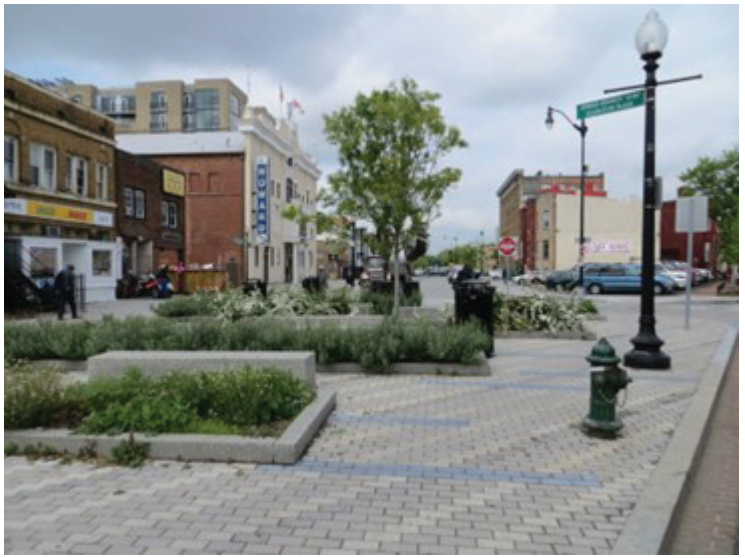
- Increases green vegetation throughout complete streets.
- Prevents drainage issues and flooding.

Disadvantages

- Needs to be maintained.

Materials & Maintenance

Planters should be composed of diverse, native vegetation and irrigation requirements.



Full Street Closure

A full street closure design includes a physical barrier that prohibits vehicular movement through a section of the street.

Typical Use

- Full street closures can be made mid-block or at intersections on local streets with relatively low vehicular volumes.
- Full street closures can be used on roadways with any common urban speed limit provided that there is adequate advance warning.

Design Features

- The street closure may be constructed using a landscaped island, bollards, or wall.

Further Considerations

Pedestrian crosswalks may need to be further set back from intersections in order to make room for two-stage queueing boxes.

Advantages

- Eliminates cut-through traffic.
- Improved pedestrian and bicycle safety at the closure point by removing vehicular conflicts.

Disadvantages

- A traffic study may be required to analyze the effects of vehicle rerouting.
- Full street closures are not recommended for primary emergency vehicle or transit routes.

Materials & Maintenance

- Signage and pavement markings shall be designed per local standards.

Lane Width Reduction

Wider travel lanes (11 to 13 feet) allow for more space for drivers which can lead to increase speeds as drivers a more forgiving buffer area. Narrower lanes may result in slower speeds and can also allow for reallocation of the right of way for other modes of travel.

Typical Use

- Reduction of lane widths can be used in urban and suburban areas to slow traffic speeds.
- Lane width reductions can reallocate the right of way for other roadway users.
- Lane width reductions can be used on roadways with any common urban speed limit.

Design Features

- 10-foot travel lanes are typically used in urban areas.
- 11-foot travel lanes can be used on roadways with heavy truck or transit traffic.
- Additional right of way can be reallocated to other modes of transportation such as cyclists and pedestrians.

Further Considerations

Advantages

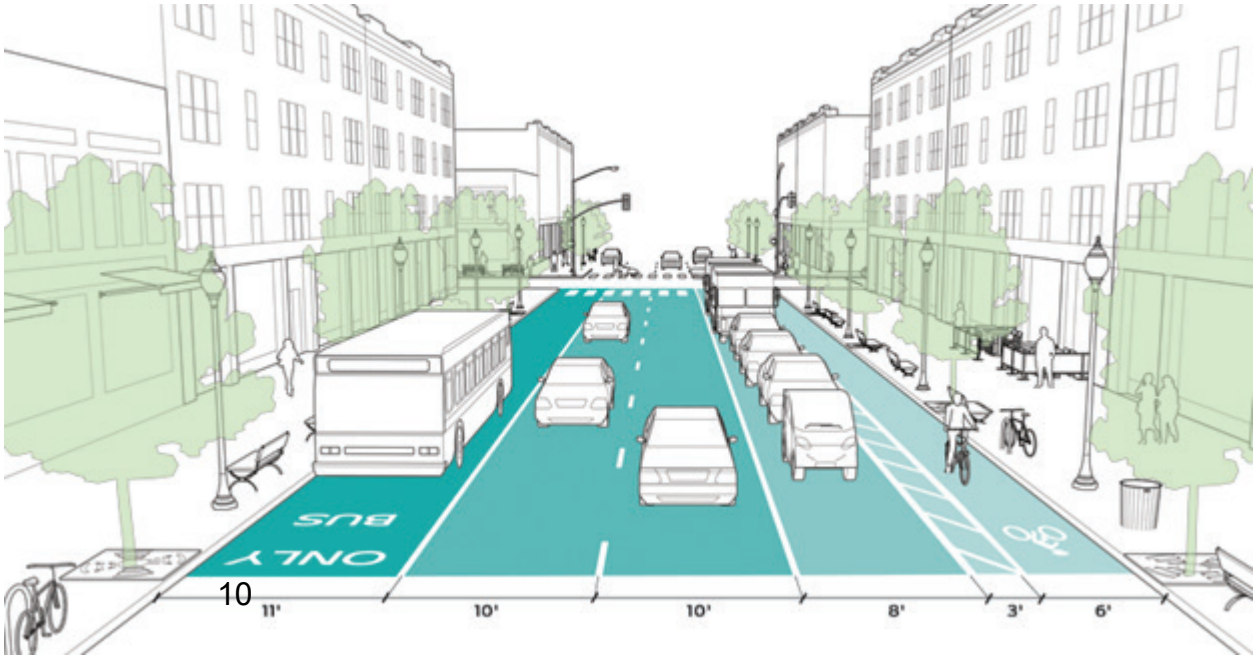
- Reduces vehicle speeds.

Disadvantages

- May not be suitable for roads with heavy truck traffic.

Materials & Maintenance

All designs shall be in accordance with local standards.



Lateral Shift

A lateral shift is a realignment of an otherwise straight street that causes the travel lanes to shift in one direction. Opposing traffic is separated by using a raised median island. The horizontal deflection a reduction in vehicle speeds.

Typical Use

- Lateral shifts can be used on local and collector roads and is sometimes advisable for arterial roadways.
- Lateral shifts are used at midblock locations on two-way roadways.
- The typical maximum speed limit is 35 mph.

Design Features

- A raised median island is used to separate opposing traffic and is combined with raised islands on the approaches of the lateral shift.

Further Considerations

Advantages

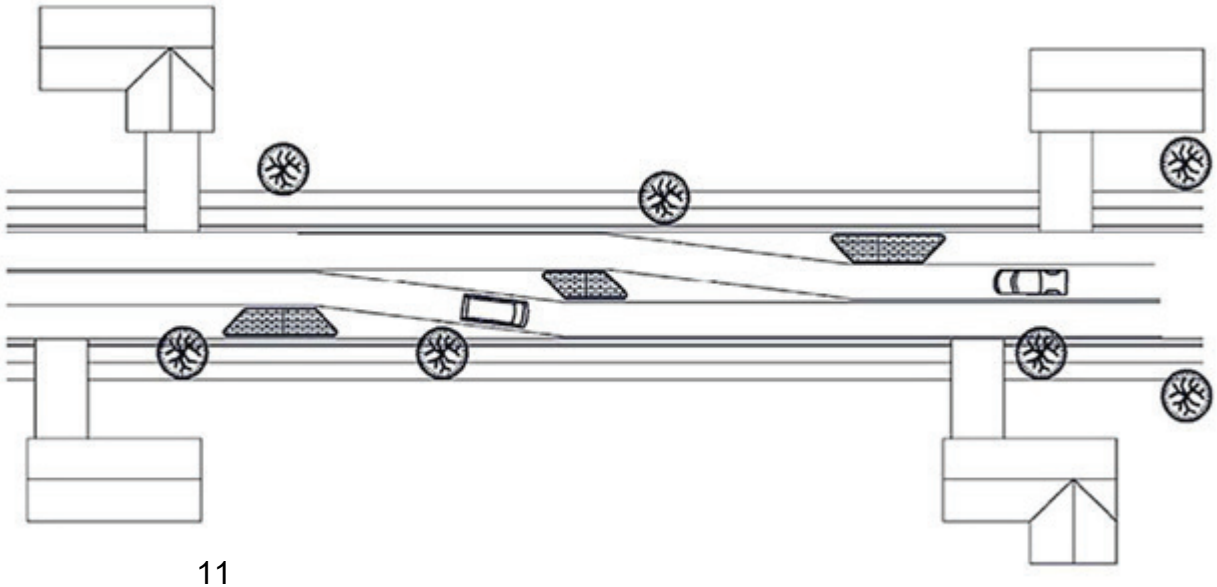
- Reduces vehicle speeds.
- The median island reduces the potential for a head on collision during the lateral shift.
- Can be used in combination with on-street parking.

Disadvantages

- May require the removal of on-street parking.

Materials & Maintenance

Landscaping within the medians may require landscape maintenance if provided.



Mini Roundabout

A mini roundabout features a central raised island installed at an uncontrolled intersection around which traffic circulates. Roundabouts reduce the number of head on and turning collisions and serve as a traffic calming measure as drivers must slow down as they enter the intersection.

Typical Use

Mini roundabouts can be used at the intersection of local and collector roads.

Design Features

- Splitter islands can be added to further reduce traffic speeds.
- A mountable apron may be used to accommodate larger vehicles traversing the intersection.
- Mini roundabouts should be designed for a maximum entry design speed of 15 mph.

Further Considerations

Advantages

- Mini roundabouts have fewer conflict points compared to traditional 4-way intersections.
- Require less space and right-of-way compared to a regular roundabout.

Disadvantages

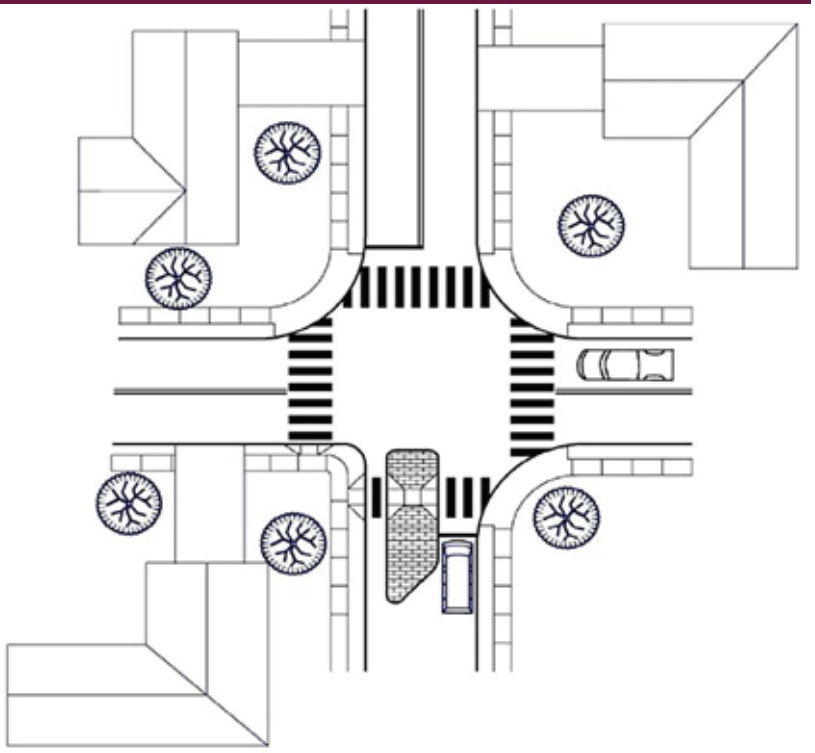
- Cyclists would need to share the lane with vehicles around the mini roundabout.
- Additional right of way may be required compared to a traditional 4-way intersection.

Materials & Maintenance

Mini roundabouts can be constructed with a combination of asphalt, concrete, and pavers. Signage and pavement markings shall be designed per local standards. Mini roundabouts may require landscape maintenance if landscaping is provided.

Partial Street Closure

A partial street closure requires a barrier to block vehicular movements for one direction of the intersection, essentially creating a one-way street on one of the approaches. The closure can be for traffic entering or exiting the intersection.



Typical Use

- Partial street closures should only be used on local roads and at intersections.
- Partial street closures can be used on streets with any common urban speed limit, provided that there is adequate advanced warning.

Design Features

- The partial street closure may be constructed using a landscaped island, bollards, or wall.

Further Considerations

Advantages

- Reduces cut through traffic.
- Reduces vehicle speeds by narrowing the pavement width.
- Emergency vehicle access is not restricted as they can maneuver around the partial street closure.

Disadvantages

- A traffic study may be required to analyze the effects of vehicle rerouting.

Materials & Maintenance

Signage and pavement markings shall be designed per local standards.

Pedestrian Refuge Islands

Pedestrian refuge islands provide a safe area for pedestrians to wait while crossing multiple lanes of traffic. Refuge islands may be provided at intersections or at mid-block crossings. Pedestrian refuge islands reduce pedestrian exposure and reduce the crossing distance.

Typical Use

- Pedestrian refuge islands should be considered along major pedestrian routes and in areas with high pedestrian activity.
- Pedestrian refuge islands can be used at signalized and unsignalized intersection.
- Pedestrian refuge islands can be used on roadways with any common urban speed limit.

Design Features

- The minimum refuge island width is 6 feet, and the preferred width is 10 feet.

Further Considerations

Advantages

- Landscaping opportunities exist within the curbed median refuge island.
- Provides a protected space for pedestrians and cyclists crossing the street.
- Narrows the roadway and may reduce vehicular speeds.

Disadvantages

- Refuge islands require additional space that may not exist within the existing curb to curb width.

Materials & Maintenance

Signage and pavement markings shall be designed per local standards.

Pinch Point

A mid-block curb extension, also known as a pinch point or choker, can aid in slowing traffic speeds. Pinch points can also serve as a mid-block crossing for pedestrians.

Typical Use

- Pinch points are typically used on roadways with existing parking.
- Pinch points can be used to facilitate a pedestrian mid-block crossing.
- Pinch points can be used on roadways with any common urban speed limit.

Design Features

- Road diets can be constructed by simply using striping or physically narrowing the roadway by narrowing the curb to curb width.

Further Considerations

Advantages

- Reduces vehicle speeds.
- Reduces pedestrian crossing distance.
- Potential for planting strip and/or street trees on curb extension.

Disadvantages

- Potential reduction in number of parking spaces.
- May force cyclists to share the lane with vehicles.
- Hydraulic impacts may need to be evaluated to ensure stormwater can flow around the curb extension.

Materials & Maintenance

Signage and pavement markings shall be designed per local standards. Landscaping within the curb extension may require landscape maintenance.

Protected Intersections

Protected Intersections give bikeways a set back from the parallel motor vehicle traffic. Unlike at conventional intersections, people biking are not forced to merge into mixed traffic. Instead, they are given a dedicated path through the intersection, and have the right of way over turning motor vehicles.

Typical Use

- Protected intersections are usually provided to create shorter, simpler crossings, more predictable movements, and better visibility between people on bikes and people driving.

Design Features

- Setback bicycle crossing of 15-20 feet allows for to queue while yielding.
- Corner islands with a 15-20 corner radius slows motor vehicle speeds.

Further Considerations

Pedestrian crosswalks may need to be further set back from intersections in order to make room for two-stage queueing boxes.

Advantages

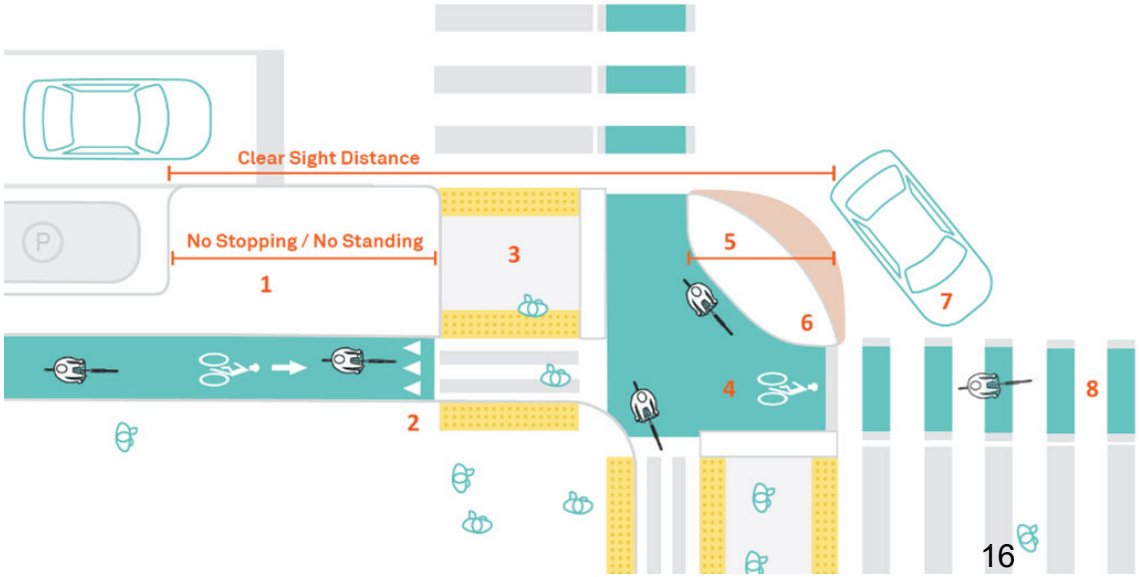
- Helps reduce conflict between right turning motorists and cyclists by reducing turning speeds.

Disadvantages

- • Bicycle and pedestrian confusion at the beginning of implementation.

Materials & Maintenance

- Wayfinding and directional signage should be provided to help cyclists navigate through the intersection.
- Bikeways with protected concrete can be swept by street sweeper vehicles with narrow widths.



Raised Intersection

A raised intersection elevates the entire intersection to sidewalk level and essentially functions as a speed table as vehicular speeds are slowed through the intersection.

Typical Use

- Raised intersections are typically flush with the sidewalk to ensure that drivers traverse the crossing slowly.
- Raised intersections should be used on roadways with a maximum design speed of 30 mph.

Design Features

- Bollards can be placed on the corner radii to prevent vehicles from entering the sidewalks and pedestrian space.
- Detectable warning tiles should be used to delineate the sidewalk from the street.

Further Considerations

Advantages

- Reduces vehicle speed.
- Increases probability of a driver yielding to a pedestrian wanting to cross the street.

Disadvantages

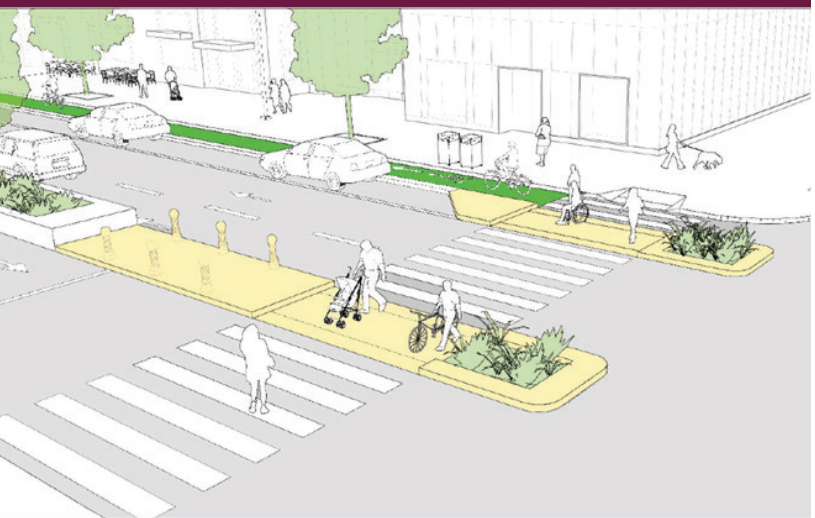
- Hydraulic impacts may need to be evaluated..

Materials & Maintenance

- Different colored pavers can be used to distinguish the crosswalk areas from the center of the intersection.

Raised Median

A raised median is a raised area separating different lanes, traffic directions, or roadways within a street. The raised median can either be curb height of 12-24 inches high, where appropriate. Raised median widths can vary and can range from narrow raised concrete islands to intensively landscaped raised medians. Medians have a traffic calming effect by reducing the open feel of a street.



Typical Use

- A raised median is typically used to separate traffic directions and calms traffic by narrowing the roadway and limiting left turn movements.
- Raised medians are typically used urban streets with speed limits up to 45 mph.

Design Features

- Raised medians should be a minimum of 7 feet wide to provide detectable warnings and refuge to pedestrians at crossings.
- Raised medians usually extend beyond the crosswalk at intersections.
- Raised medians can have a walkable path across the raised median crossing to provide a pedestrian refuge.

Further Considerations

Advantages

- Reduces risk of left-turn collisions
- Discourages mid-block crossing when used with fencing or planting.
- Can improve pedestrian crossing safety by implementing a pedestrian refuge in the middle of the intersection.

Disadvantages

- Design must account for emergency vehicle access.

Materials & Maintenance

Raised medians can be constructed with a combination of asphalt, concrete, pavers, and landscaping. Signage may be needed on the median as well as maintain landscaping.

Realigned Intersection

A realigned intersection is the reconfiguration of an intersection with perpendicular angles to have skewed approaches or travel paths through the intersection. The expectation is that these physical features will remove or discourage fast vehicle movement through the intersection.

Typical Use

The most common application is the conversion of a T-intersection with a straight approach into a curving street meeting at right angles.

Design Features

- The typical maximum speed through a realigned intersection is 25 mph.
- Cyclists and motorists may have separate lanes or may share lanes at the intersections.

Further Considerations

Advantages

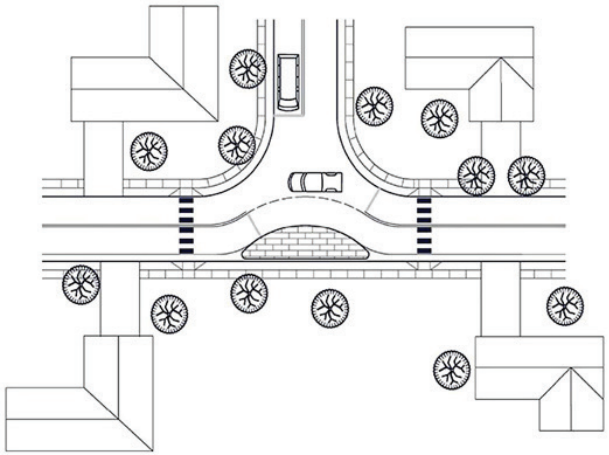
- Provides opportunity for landscaping.
- Adds additional safety for pedestrians with more of a buffer between the sidewalk and roadway.

Disadvantages

- May cause line of sight issues.

Materials & Maintenance

Realigned intersections can be constructed with a combination of asphalt, concrete, and pavers. Signage and pavement markings shall be designed per local standards.



Road Diet

A road diet is the conversion of a roadway to fewer travel lanes.

Typical Use

The most common application of a road diet is the conversion of an undivided 4-lane roadway to a three-lane roadway consisting of two travel lanes and a center two-way left-turn lane. Road diets can be applied to roadways with any common urban speed limit.

Design Features

- Road diets can be constructed by simply using striping or physically narrowing the roadway by narrowing the curb to curb width.

Further Considerations

Advantages

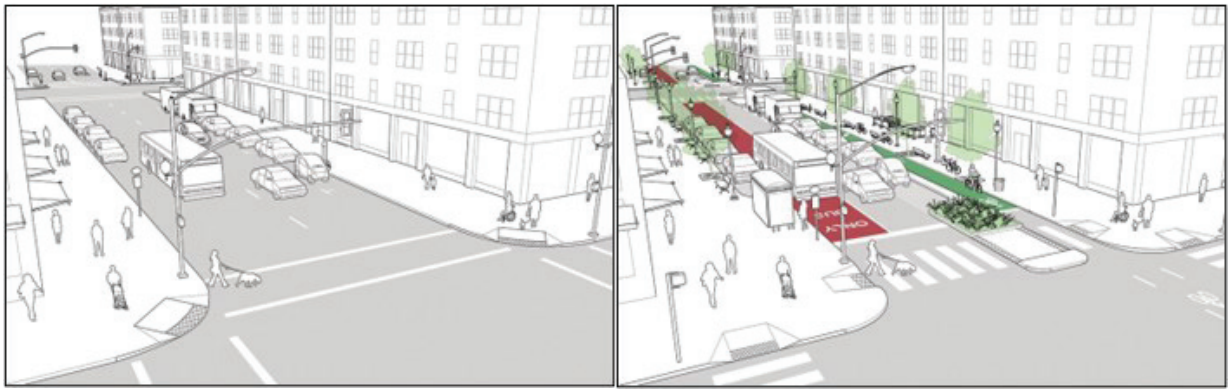
- The reduction or narrowing of travel lanes permits the inclusion of other facilities such as bicycle lanes, sidewalks, pedestrian refuge islands, transit uses, and on-street parking.

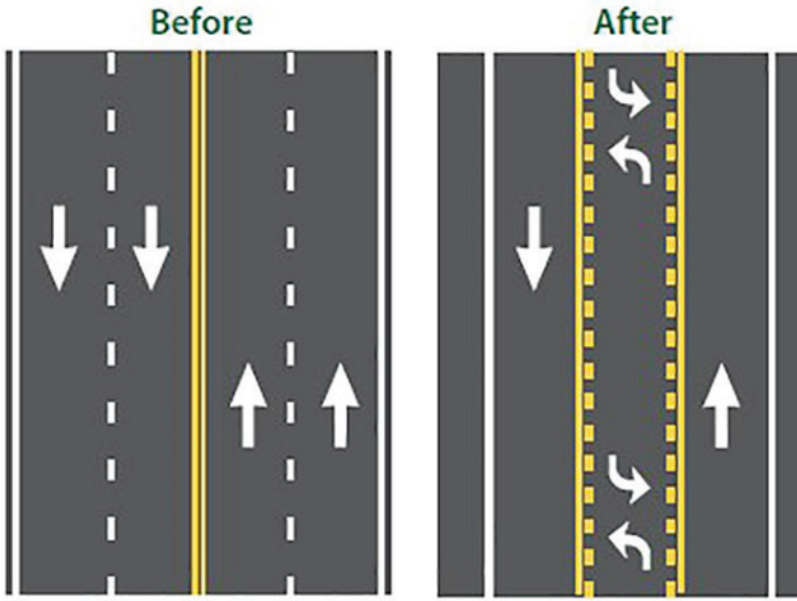
Disadvantages

- Large vehicles or trucks may double park and block the travel lane

Materials & Maintenance

Signage and pavement markings shall be designed per local standards.





Roundabout

Roundabouts are a form of intersection control designed to eliminate left turns by requiring traffic to exit to the right of the circle. Roundabouts are installed to reduce vehicle speed, improve safety at intersections by eliminating broadside collisions, and help traffic flow more efficiently and reduction in operational costs that come with a signalized intersection.

Typical Use

Roundabouts can be used at intersections experiencing high-crashes, traffic delays, or intersection with a complex geometry and frequent left turns. A roundabout is often used as a replacement for a signalized intersection along arterial street.

Design Features

- Roundabouts should be designed for a maximum entry design speed of 20 mph for a single lane roundabout.
- If bike lanes are used in the roundabout, additional right-of way may be necessary.
- Typical mountable diameter for a single-lane roundabout is 90-180 feet and 150-300 feet for a multilane roundabout.

Further Considerations

Advantages

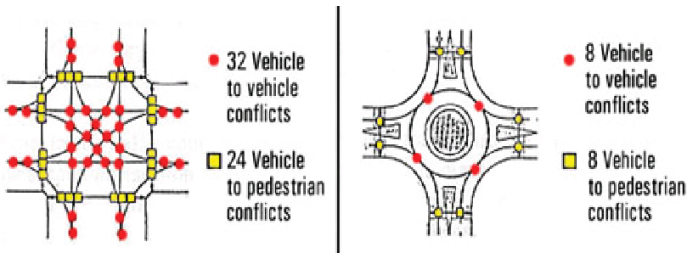
- Roundabouts can reduce crash severity for all users, allow for safer merges into circulating traffic, and provide more time for all users to detect and correct their mistakes or mistakes of others due to the lower vehicle speeds.
- Fewer conflict points and eliminates left-turn conflicts.
- May have lower delays and queues than other forms of intersection control.

Disadvantages

- Can create confusion and present additional challenges for bicycle and pedestrian safety and overall comfort.
- Driveways closely spaced near the roundabout may have left turn restrictions (right in/right out access only) due to location of splitter islands.
- Equal priority for all approaches can reduce the progression for high volume approaches.
- Expensive to construct.

Materials & Maintenance

Roundabouts typically require less maintenance and less cost over their lifespan when compared to traffic signals. Signage and pavement markings shall be designed per local standards. Roundabouts may require landscape maintenance if landscaping is provided.



Shared Streets

In a shared street design, physical distinctions between vehicle, pedestrian, and bicycle space is removed, forcing all roadway users to share the street. In this environment, pedestrians, the most vulnerable roadway users have the right of way and are prioritized as such.

Typical Use

- In areas where pedestrian activity is very high and vehicle activity is relatively low.

Design Features

- Curbs are removed and the sidewalk and vehicle/bicycle travel lanes are all at the same level.
- Different pavers, bollards, planters, and benches can be used to define spaces for each roadway user.
- Low speed limits are used (typically 10 to 15 mph).

Further Considerations

Pedestrian crosswalks may need to be further set back from intersections in order to make room for two-stage queueing boxes.

Advantages

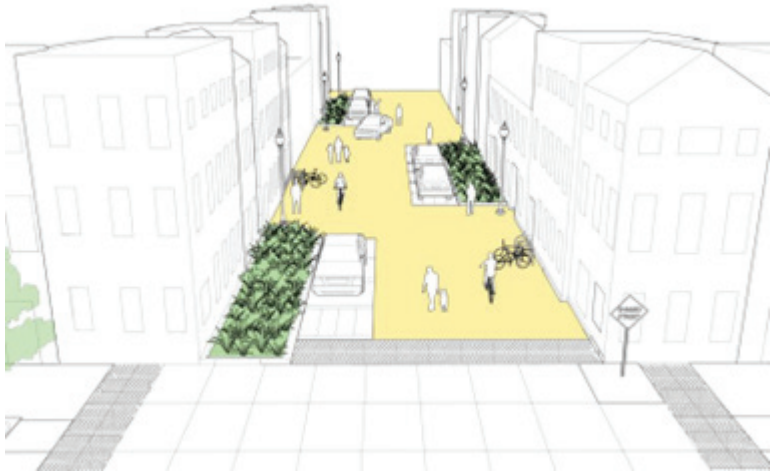
- There is an opportunity to add in parklets or landscaping spaces and add to the public realm.
- Provides a comfortable walking environment for pedestrians.
- Slows vehicular speeds.

Disadvantages

- Shared streets are no suitable for all roadways, including primary emergency vehicle routes.

Materials & Maintenance

- Typically, pavers are used to create the shared space at one level for all roadway users.



Traffic Circle

Traffic circles are very similar to mini roundabouts in that they are used on local and collector streets, however, they do not have splitter islands

Typical Use

Traffic circles or neighborhood traffic circles are typically built at the intersections of local streets for traffic calming and/or aesthetics.

Design Features

- A typical traffic circle has a horizontal clearance that is too small for a left-turning truck, emergency vehicle, or bus to circulate counterclockwise even with a partially mountable center island.
- Traffic circles should be designed for a maximum entry design speed of 15 mph or less.

Further Considerations

Advantages

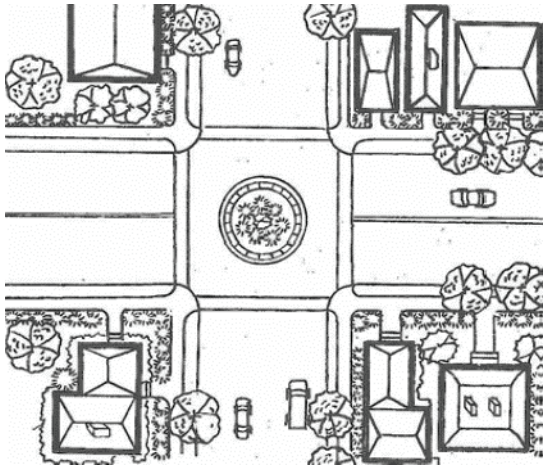
- Traffic circles have fewer conflict points compared to traditional 4-way intersections.
- Require less space and right-of-way compared to roundabouts and mini roundabouts.

Disadvantages

- Cyclists would need to share the lane with vehicles around the traffic circle.
- Additional right of way may be required compared to a traditional 4-way intersection.

Materials & Maintenance

Traffic circles can be constructed with a combination of asphalt, concrete, and pavers. Signage and pavement markings shall be designed per local standards. Traffic circles may require landscape maintenance if landscaping is provided.



Typical Use

- **Speed Humps** - Speed humps are parabolic vertical speed control elements to be used on low volume, low speed roads with targets design speeds of 15 to 30 mph. A series of speed humps can be used to achieve a targeted speed reduction for the corridor

- **Speed Tables/Raised Crosswalks** - Speed tables are longer than speed humps and are typically used on roads with desired speeds between 25 and 45 mph. Speed tables can also be used as a raised midblock crossing.

- **Speed Cusions** - Speed cushions have a similar application to speed humps and speed tables, however, they allow large vehicles to pass unimpeded by providing wheel cutouts. These can be used on roads with bus routes and major emergency access routes. Speed cushions typically are used for targeted design speeds of 30 mph or less.

Design Features

- **Speed Humps** - Speed humps are typically 3 to 4 inches high and 12 to 14 feet wide with ramp lengths of 3 to 6 feet. Ramp slopes should be 4% and 10%.

- **Speed Tables/Raised Crosswalks** - Speed tables are typically 3 to 4 inches high and 22 feet wide, including 6-foot approaches on each side and a 10-foot plateau. Speed tables can be marked with a crosswalk creating a raised crosswalk. Ramp slopes should be 4% and 10%.

- **Speed Cusions** - Speed cushions consist of two or more raised areas. Ramp slopes should be 4% and 10%.

Further Considerations

Advantages
- Reduces vehicle speeds.
- Speed cushions can accommodate emergency vehicles.
- Speed tables can be combined with curb bulb-outs to create a raised crosswalk.
- Cyclists are not typically affected by vertical speed control elements and are able to traverse speed humps/tables/cushions with minimal delay or discomfort

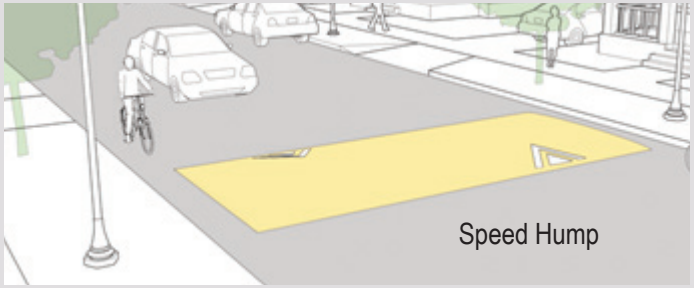
Disadvantages
- Limited reduction in cut-through traffic.
- Speed humps are generally not advised for major emergency vehicle routes.
- Potential for increased noise.
- Hydraulic impacts may need to be evaluated for speed humps/tables/cushions that extend from curb to curb.

Materials & Maintenance

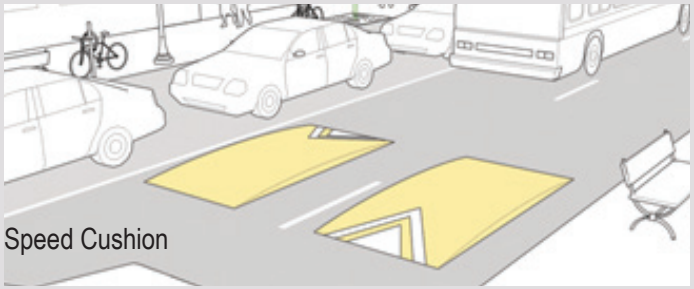
Speed humps and cushions are typically constructed with asphalt. Speed tables and raised crosswalks can be constructed with pavers. Signage and pavement markings shall be designed per local standards.

Vertical Speed Control Elements

Vertical speed control elements help to manage vehicular speeds by changing the height of the roadway surface. Speed humps, speed cushions, and speed tables are all examples of vertical deflection used to slow traffic speeds. These elements are designed to be traversed at the posted speed limit.


Speed Hump


Speed Table/Raised Crosswalk


Speed Cushion