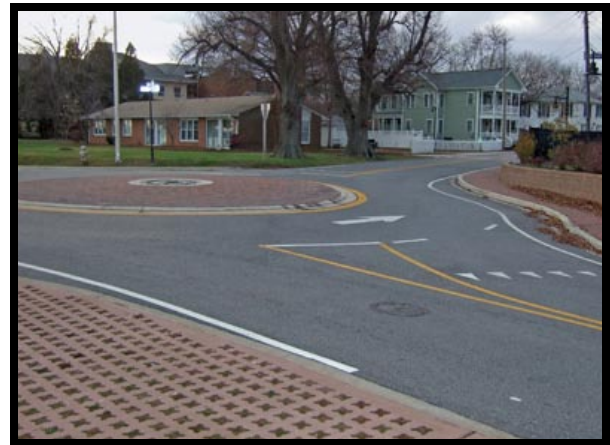


In the world of traffic calming, options to reduce speeding drivers, to increase pedestrian and motorist safety, and to improve the quality of life within a community are constantly evolving. This document is the second in a series of 21st Century Traffic Calming guides that analyze engineered traffic-calming solutions.

Part II: Horizontal Alterations

Chicanes, Roundabouts and Traffic Circles



Horizontal deflections include any device or roadway deviation designed to change driver behavior through a change of path, often to discourage cut-through traffic. In recent years, traffic planners have focused less on vertical deflection devices, like speed bumps, to reduce traffic speed, in favor of many of these horizontal devices. Still, horizontal alterations are not without controversy (see below).

CHICANES

Chicanes are best suited for installation on streets that offer flexible use of the width of the road. Chicanes, which have multiple forms, shift the travel pathway of motor vehicles in a serpentine manner, forcing drivers to reduce their speed. Most chicanes are created by building curb extensions or bulb-outs that alternate from one side of the street to the other. The distance between the curb extensions impact the ease and speed which motorists can maneuver through the street.

Design:

- Application is appropriate for straight streets with long blocks.
- Single-lane chicanes restrict two-way traffic by requiring requiring traffic from one direction to give way to opposing traffic.
- Two-way chicanes allow vehicles to pass one another while traveling in opposite directions.
- Space for parking can be included on alternate sides of the street
- Can be formed using landscaping to enhance the community's appearance.
- Best used on narrow roads so that motorists do not straddle the roadway to avoid negotiating the chicanes.

Known Concerns:

- Can slow travel and response times—although not as much as speed humps—so they should not be installed on roads used by mass transit or emergency response vehicles. It is worthy to note that emergency/first responders often prefer chicanes to speed humps.
- Parking and driveway access can be affected.
- Driver visibility can be obstructed by planted vegetation.
- Must be well-designed to prevent drivers cutting straight through center line to maintain unsafe speeds.
- Bicyclist safety is jeopardized by chicane-alterations on steep, uphill streets; avoid development on this terrain.
- May require manual street cleaning due to their irregular shape.

Costs:

- Initial installation (for a set of three): \$15,000-\$30,000 ([concrete](#)) or \$10,000 ([asphalt](#))
- \$10,000-\$20,000 for a set of 3 ([Alameda, CA](#))
- Additional cost factors vary based on whether the street is asphalt or concrete, drainage concerns, road width and the presence of vegetation.
- Long-term expenses include maintenance on both construction and landscaping.

Federal Compliance Guidelines for Chicanes

There are no federal guidelines for roundabouts, although some local and state municipalities may require compliance with certain codes. MUTCD guidelines provide only two recommendation for chicane markings:

1. Utilize “Road Narrows” word message signs to alert drivers to changes in road width with any narrowing of the road, such as the presence of curb extensions, bulb-outs or chicanes
2. Utilize painted lines to identify street edges with on narrowed roadways

ROUNDABOUTS and TRAFFIC CIRCLES

Roundabouts are one-way circular intersections in which traffic flows around a raised island in the center. Roundabouts are often confused with traffic circles. Traffic circles, which were introduced to the U.S. more than a century ago, were designed for vehicles to enter, merge, circulate and exit at relatively high speeds. As traffic increased and cars became faster, a higher incidence of crashes occurred at traffic circles, and these types of intersections fell out of favor. Modern [roundabouts](#), which are smaller than traffic circles, require motorists entering the circle to yield to circulating traffic. Roundabouts can handle a [high volume of traffic](#) and have been proven to safely decrease traffic delays and congestion. Traffic circles have been successful worldwide by reducing car crashes and are appropriate for both residential and nonresidential areas.

Design:

- Yield control on all entries.
- Typically circular in shape, though not always.
- Center island may be paved with no vegetation or can be landscaped with low-growing bushes,

flowers or grass.

- Pedestrian access is only allowed across the legs of the roundabout, well behind the yield point.
- May include a raised, traversable truck apron which acts as an extra lane, allowing large vehicles to pass through. Aprons are usually constructed of a material other than asphalt and should be textured to discourage other other motorist from using them.

Known Concerns:

- Without traffic signals, enabling emergency vehicles cannot preempt other traffic.
- Fire trucks can maneuver around traffic circles at slow speeds (provided vehicles are not parked near the circle).
- Unsafe if high volumes of large vehicles need to turn left in front of the circle.
- All landscaping must be designed to allow adequate sight distance.
- Avoid routing vehicles through unmarked crosswalks on side-street approach.
- Large vehicles maneuverability potentially obstructed by radii of turns.

Cost:

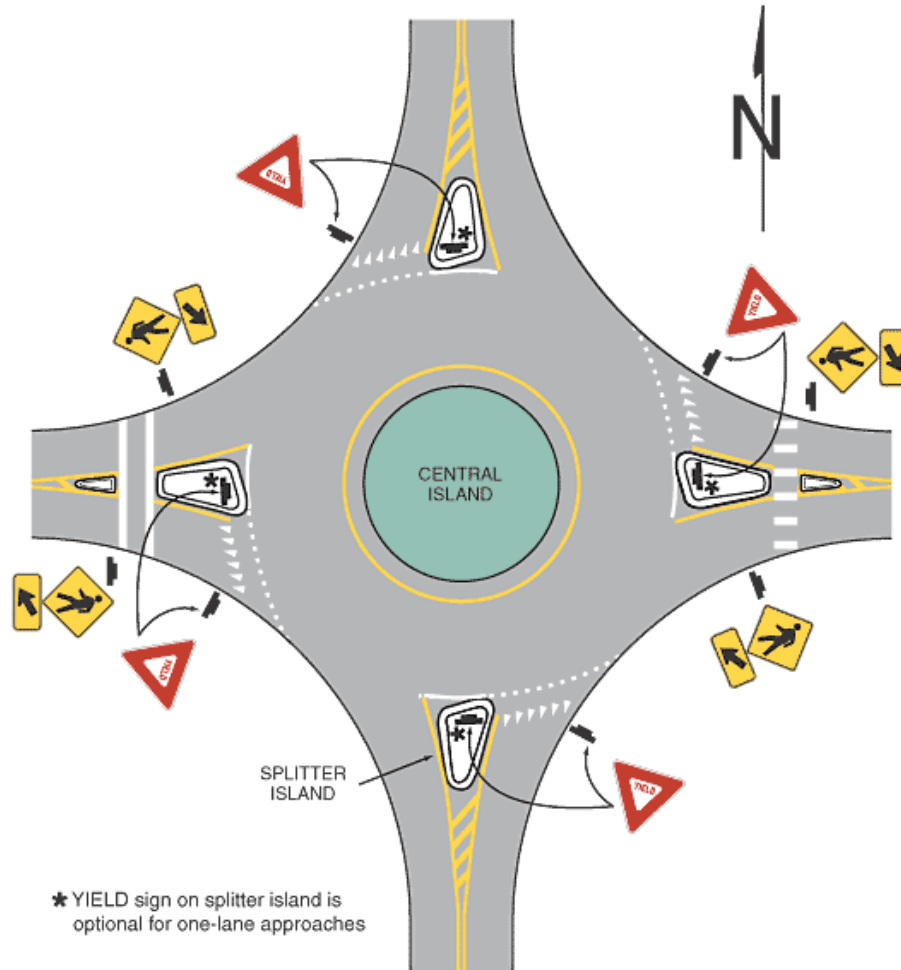
- Initial installation: \$200,000 - \$500,000. ([Maryland](#))
- Installation costs are \$150,000 less than signalized intersections. ([Carmel, IN](#))
- The annual maintenance costs of roundabouts are lower than signalized intersections: \$2000 per year versus \$5,000. ([Shawnee, KS](#))
- Additional cost factors vary based primarily on street width, drainage needs and landscaping.

Federal Compliance Guidelines for Roundabout Intersections

There are no federal guidelines for roundabouts, although some local and state municipalities may require compliance with certain codes. MUTCD guidelines provide recommendations for markings and signage affiliated with roundabout intersections, which can be found in Section [3B.24](#), Markings for Roundabout Intersections.

[Figure 3B-27](#), below, illustrates MUTCD markings for Roundabout Intersections with **One-Lane Approaches**

Figure 3B-27. Examples of Markings for Roundabout Intersections with One-Lane Approaches



Here a central island is surrounded by a circular roadway, which is created with four streets that enter/exit the roundabout. Triangular splitter islands separate oppositional traffic directions. Markings include:

- A solid yellow line to identify the inner edge of the roadway.
- Outer edges of the roadway is designated with 1) a solid white line at the wide end/outer edge of the splitter islands which is connected with 2) a white dotted line across the lane of in-bound traffic. Edge line extensions should not be placed across the exit lanes.
- Yield is designated with a line of white triangles AND a yield sign for entering traffic. The white triangles appear on the pavement in advance of—and parallel to—the dotted white line (the outer edge of the roadway). Optional: add yield signs to each splitter island for one-lane approaches. More on yield markings can be found [here](#).
- Opposing directions of traffic on all roadways entering/exiting the roundabout are separated by a solid, double yellow lines. These diverge to go around the sides of the splitter islands. Diagonal yellow lines

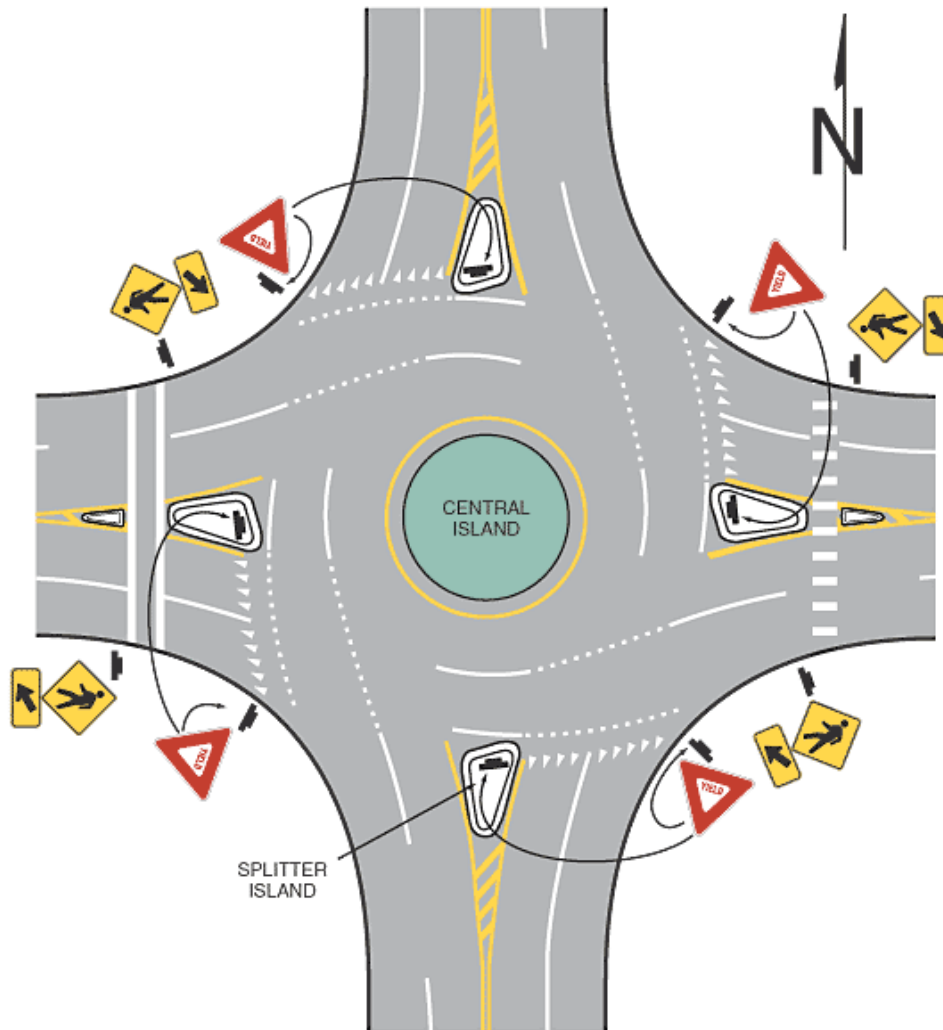
identify the beginning/end of the splitter island.

- Crosswalks are designated in three ways:
 1. Two parallel white lines (solid yellow lines and yellow diagonal lines associated with the splitter islands are omitted within the crosswalk)
 2. A row of closely spaced white lines parallel to the flow of traffic (solid yellow lines and yellow diagonal lines associated with the splitter islands are omitted within the crosswalk).
 3. Crosswalk/pedestrian signage (diamond-shaped person walking sign) placed over a downward, diagonal-arrow sign, installed just in advance of the crosswalk.

Note: crosswalk markings should be located a minimum of 7.6 m (25 ft) upstream from the yield line, or, if none, from the dotted white line.

Figure 3B-28 below, illustrates MUTCD markings for Roundabout Intersections with **Two-Lane Approaches**

Figure 3B-28. Examples of Markings for Roundabout Intersections with Two-Lane Approaches



Markings for the two-lane entry roundabout are the same as those for the one-lane entry with one addition:

- Lane lines may be used if there is more than one lane.

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About Radarsign

In 2004, Atlanta-based Radarsign™ established new industry standards for traffic-calming solutions with the debut of the world's first armored radar speed signs, which are vandal, weather and bullet-resistant. The industry's most durable radar speed signs are also the most ecological and energy efficient. Engineered and manufactured in the USA, Radarsign products are MUTCD-compliant and utilize recycled aluminum, innovative LED reflector technology, minimal battery power and solar panels to deliver bright, easy-to-read feedback to drivers. Radarsign products are scientifically proven to reduce drivers' speeds and have been entrusted to provide safe and effective traffic-calming solutions for: municipalities, treasured national parks, schools, neighborhoods, military bases, and private and public development projects across the U.S., Canada and overseas. www.Radarsign.com.