

N. Curbs

1. **Curb Offset:** The curb offset is measured from the back of curb to the edge of the lane. The curb offset increases driver comfort and roadway safety. The presence of the curb, and potential vehicle damage and loss of control resulting from striking the curb, causes drivers to move away from the curb, reducing the effective width of the through lane. Due to this driver reaction, and to accommodate the flow of drainage and intake structures, an offset between the curb and the edge of the traveled way is provided.

The curb offset widths specified in [Section 5C-1](#), [Tables 5C-1.01](#) and [5C-1.02](#) do not necessarily indicate the width of the curb and gutter or the location of a longitudinal joint; however, the width of the curb and gutter can affect the required width of the curb offset. The presence of a longitudinal joint near the curb (gutterline jointing) can be a limiting factor for usable lane width as some drivers are uncomfortable driving on or near the joint line. This is especially true for HMA roadways with PCC curb and gutter. For pavements with a longitudinal joint line near the gutter, the curb offset should be equal to or greater than the width of the curb and gutter section. In addition, grates and special shaping for curb intakes and depressions for open-throat intakes should be located within the curb offset width and should not encroach into the lane.

2. **Curb and Gutter:** Typically, a curb should be 6 inches high, 6 inches wide. Where curb and gutter is used, the standard gutter width is 2 feet, 6 inches. When a gutter is used, it should not be included in the travel lane width. If the design speed is 40 mph or below, an 8 inch curb may be used for certain arterial and collector streets. For design speeds greater than 40 mph, a 1 foot wide, 6 inch high sloped curb with up to a 2 foot offset may be used. Where a gutter is used, its width is considered part of the curb offset width.

O. Parking Lane

Where curbed sections are used, the curb offset width may be included as part of the parking lane.

1. Parking lanes are not allowed on arterial streets.
2. Although on-street parking may impede traffic flow, parallel parking may be allowed by the Jurisdiction on urban collectors where sufficient street width is available to provide parking lanes.
3. Parking lane width determinations should include consideration for the potential use of the lane as a through or turn lane for moving traffic either during peak hours or continuously. If this potential exists, additional parking width should be provided.

P. Cul-de-sacs

A local street open at one end only should have a cul-de-sac constructed at the closed-end. The 2018 International Fire Code stipulates a minimum cul-de-sac radius of 48 feet however some jurisdictions allow lesser radii due to the size of their fire apparatus. The minimum radius for cul-de-sacs is 45 feet, which may be increased in commercial areas or if significant truck traffic is anticipated. The border area around the cul-de-sac should be the same as the approach street. The transition radius with the approach street will be 50 feet for residential streets and 75 feet for commercial and industrial streets.

The length of a cul-de-sac determines how many people are impacted by maintenance operations, traffic accidents, and other incidences that may stop traffic flow. Many Iowa cities limit the length of a cul-de-sac to 500 to 600 feet. Studies indicate the longer the cul-de-sac, the higher the vehicular

speeds along it. The 2018 edition of the International Fire Code recommends the length of the cul-de-sac be less than 750 feet unless additional steps such as intermediate turnarounds are implemented. ITE, the Urban Land Institute, and ASCE indicate cul-de-sacs should be less than 1,000 feet long or the length that generates less than 200 trips per day according to the adjacent land use. For single family dwellings that generate 8 to 10 trips per day, the 200 trips per day would be produced by about 20 parcels.

Consider building cut through sidewalks or shared use paths at the closed end of the cul-de-sac to improve pedestrian and bicyclist connections to surrounding neighborhood or land uses. The cut through sidewalk or shared use paths is likely to reduce vehicular trips by encouraging walking and bicycling.

Q. Shoulder Width

Shoulders accommodate stopped vehicles, emergency use, and provide lateral support of the subbase and pavement. In some cases, the shoulder can accommodate pedestrians when no sidewalks are present and bicyclists. Where no curb and gutter is constructed a soil, granular, or paved shoulder will be provided. When pedestrians and/or bicyclists are expected to use the shoulder, the shoulder should be paved. Refer to [Section 12B-3](#) for guidance on paved shoulder widths. The *AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities* presents appropriate methods for accommodating pedestrians on paved shoulders. Where shoulders are designated as the pedestrian access route, shoulder must also meet accessibility requirements.

Desirably, a vehicle stopped on the shoulder should clear the pavement edge by 2 feet. This preference has led to the adoption of 10 feet as the desirable shoulder width that should be provided along high volume facilities. In difficult terrain and on low volume highways, usable shoulders of this width may not be practical.

Where roadside barriers, walls, or other vertical elements are used, the graded shoulder should be wide enough that these vertical elements can be offset a minimum of 2 feet from the outer edge of the usable shoulder. It may be necessary to provide a graded shoulder wider than used elsewhere on the curved section of a roadway or to provide lateral support for guardrail posts and/or clear space for lateral dynamic deflection required by the particular barrier in use. On low volume roads, roadside barriers may be placed at the outer edge of the shoulder; however, a minimum of 4 feet should be provided from the traveled way to the barrier.

R. Intersection Radii and Right Turning Vehicle Speeds

Vehicle turning movements affect operations and safety at an intersection and driveways – especially the safety of pedestrians and bicyclists. It is important to consider the size of vehicles that will reasonably be expected to move through the intersection, the frequency of these movements, and any local jurisdictional policies for lane encroachment. For roadways where the most common vehicle is a passenger car, delivery vehicle, or single unit truck, designing intersections to easily accommodate larger vehicles with large turning radii can negatively affect crossing distances, exposure to conflicts, the speed of turning vehicles, the severity of crashes, and amount of right-of-way needed for the intersection. Similarly, using a smaller design vehicle at intersections that are regularly used by larger vehicles should also be avoided because frequent operational challenges may occur, may lead to encroachment beyond the edge of pavement or curb line, and can lead to damage to infrastructure such as curb ramps, signs, or poles. The following sections describe the process for selecting the appropriate design vehicle and intersection turning radii.