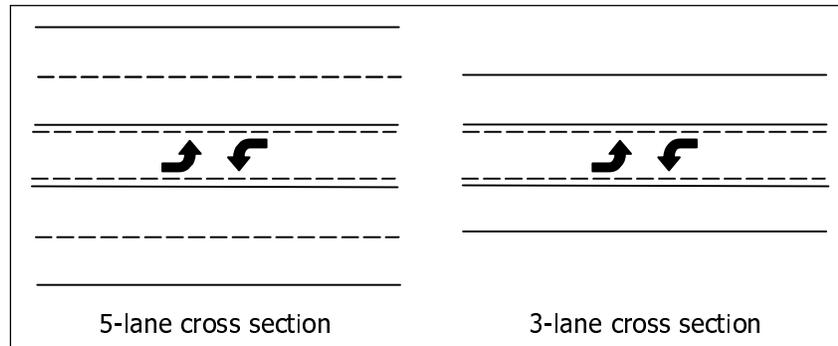


Continuous Two-Way Left-Turn Lanes

Continuous two-way-left-turn lanes (TWLTL) are a common access management treatment when combined with driveway consolidation and corner clearance. TWLTLs simultaneously provide a separate lane for left turning vehicles and property access. Typically, they are used as the center lane of a five-lane roadway. A less common design involves three lanes, a TWLTL in the center for left turns and one lane in each direction for through traffic. Figures below demonstrate.



Why is there a need for TWLTLs?

From the 1950s through the 1970s, many arterial and collector roads and streets were constructed with either two lanes or four lanes and no turn lanes or medians. Since all lanes served both through traffic and turning traffic, these roads began to operate less efficiently and safely as the volume of turning traffic grew. In many cases, this may have been caused by unmanaged development and access along the roadway. When such roads experience a considerable amount of left-turning traffic, congestion delays and crashes increase. Types of crashes most associated with turning vehicles include rear-end and broadside collisions.

Because TWLTLs separate left-turning traffic from through traffic, they can help solve some of these problems. A detailed accident study conducted in Minnesota between 1991 and 1993 of arterials in urban areas indicates that three-lane roadways are about 27 percent safer than four-lane undivided roadways and five-lane roadways are about 41 percent safer than four-lane undivided roadways (see table below).

Roadway Type (All Urban Arterials)	Crash Rate (Crashes per Million Vehicle Miles)
4-lane undivided	6.75
3-lane with center turn lane	4.96
4-lane with median	4.02
5-lane with center turn lane	4.01

Source: BRW, Inc., study for the Minnesota Department of Transportation, August 1998.

When should continuous TWLTLs be considered?

In general, TWLTL projects function well when traffic levels are moderate, the percentage of turning volumes is high, and the density of commercial driveways is low to

moderate. TWLTLs will function very well on most arterials where traffic volumes average from 10,000 to 28,000 vehicles per day.

TWLTLs can also work very well in places where the number of driveways per block or mile is high but the land use does not produce many turning movements per hour. An example would be an arterial through a predominantly residential area.



South Duff Avenue in Ames, Iowa, after retrofit in 1994 with a continuous TWLTL (five lanes) and a driveway management and consolidation program. After completion of the project, the crash rate fell by about 70 percent and traffic operations improved one full level of service even though traffic volumes increased seven percent.



State Street (US 67) in Bettendorf, Iowa, after retrofit in 1996 with a continuous TWLTL (five lanes). After completion of the project, the crash rate fell by more than one-half and traffic operations improved one full level of service even though traffic volumes increased eight percent.

When should continuous TWLTLs be avoided?

TWLTLs begin to lose their effectiveness when traffic volumes on a roadway are high. A Georgia Tech University study indicates operating degradation occurs between an average annual daily traffic (AADT) of 24,000 to 28,000 vehicles per day. This would be a relatively high level of traffic level in Iowa. TWLTLs are also much less effective in situations where commercial driveway densities are high and these driveways are closely spaced. In such a situation, the number of conflict points is high and this will be reflected in crash rates. If TWLTLs are considered, driveway density and driveway spacing *must* be managed aggressively.

TWLTLs are not recommended in situations where there are more than four through traffic lanes (e.g., two through lanes in each direction). Several states in the southeastern United States have constructed seven lane urban arterials where one lane is a TWLTL. These roadways have accident rates as high as 11 accidents per hundred million vehicle miles. This is similar to an undivided roadway with a high number of access points per mile. Many of the accidents on these roads occur because drivers may have to cross as many six or seven lanes (with traffic moving in several directions) to enter or exit a business. This represents too complex a situation for drivers to manage. When there are six or more through traffic lanes, a raised median is essential.