

Median Crossovers

Design Manual
Chapter 3
Cross Sections

Originally Issued: 01-04-02
 Revised: 08-17-16

Median crossovers are used for a variety of reasons, including diverting traffic around work areas and diverting traffic in areas where two lane highways are being converted to four lane divided highways. Unlike other types of median crossings they are designed for high speed operation. Two types of median crossovers exist: one directional (Figure 1) and two directional (Figure 2). The [PV-500 Series](#) Standard Road Plans and Road Design Detail [531-2](#) provide construction details for two and one directional median crossovers with standard median widths.

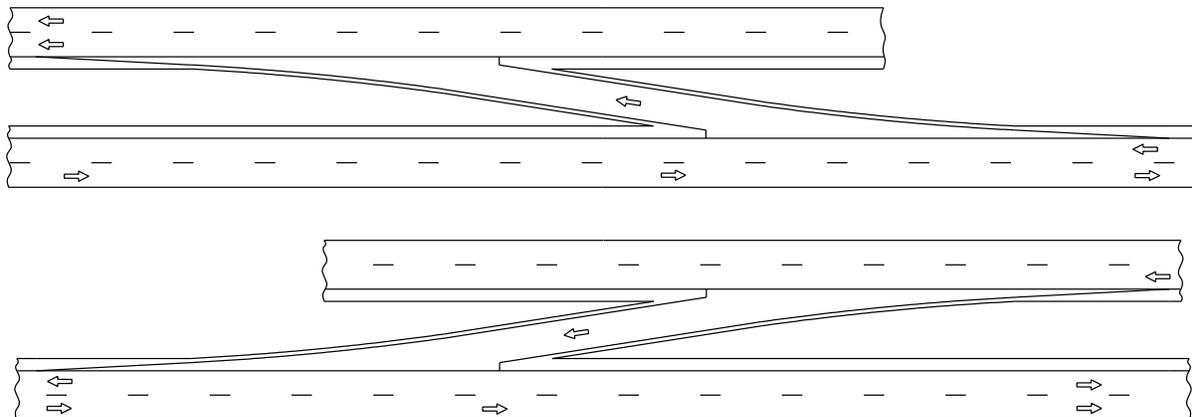


Figure 1: Two directional median crossovers.

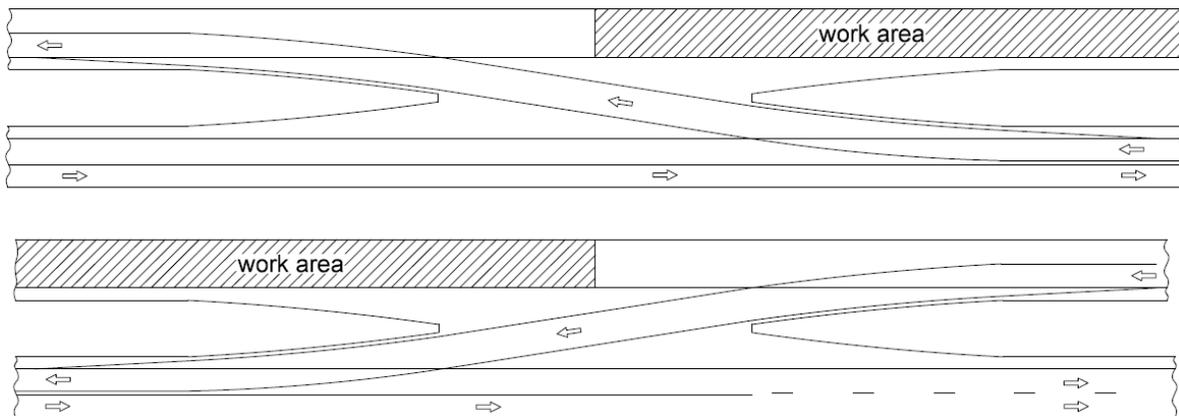


Figure 2: One directional median crossovers.

Design Considerations

Several considerations are involved with the design of a median crossover:

- The desirable design speed for median crossovers should be the posted speed prior to the construction area. In constrained areas, the minimum design speed may be reduced to no less than 10 mph below the posted speed limit.

Note: The [PV-500s](#) use 3500 foot radii and a cross slope (e_{max}) of 2 percent. This combination of radii and cross slope provides a sufficient side friction factor (f_{max}) for high speed roadways. For two way median crossovers, the inverted crown break in the median is limited to 4% with 2% cross slopes.

- Median crossovers should be located to provide the maximum advance warning to the driver based on the vertical and horizontal alignment at the site. The driver should be able to see the entire crossover area well in advance of the median crossover.
- Desirably median crossovers should not be located within horizontal curves or in locations where the elevations of the inside edges of pavement are not equal.
- Advance signing and proper pavement markings are also necessities for the safe operation of a median crossover. Standard Road Plans [TC-61](#) and [TC-62](#), provide traffic control and pavement marking details for median crossovers.
- Access points should be avoided within or near a crossover.

Standard Road Plan [DR-502](#) applies to two directional crossovers. Road Design Detail [500-19](#) applies to one directional crossovers. In certain situations, a cross roadway culvert may be used in place of Road Design Detail [500-19](#).

Example using COGO

A single lane, one directional, median crossover is required to redirect traffic around a work area. The road is a rural expressway with a 50 foot median and has a posted speed of 65 mph. The width of a crossover (W) should equal the approach lane width plus 2 feet on each side, see Figure 3. For a single lane crossover, the width should be $W = 12' + 2' + 2' = 16'$. To simplify construction, the radii for the crossover and all offsets and drops are measured to the edge of the 16 foot lane. The 12 foot lane lines are for pavement markings only.

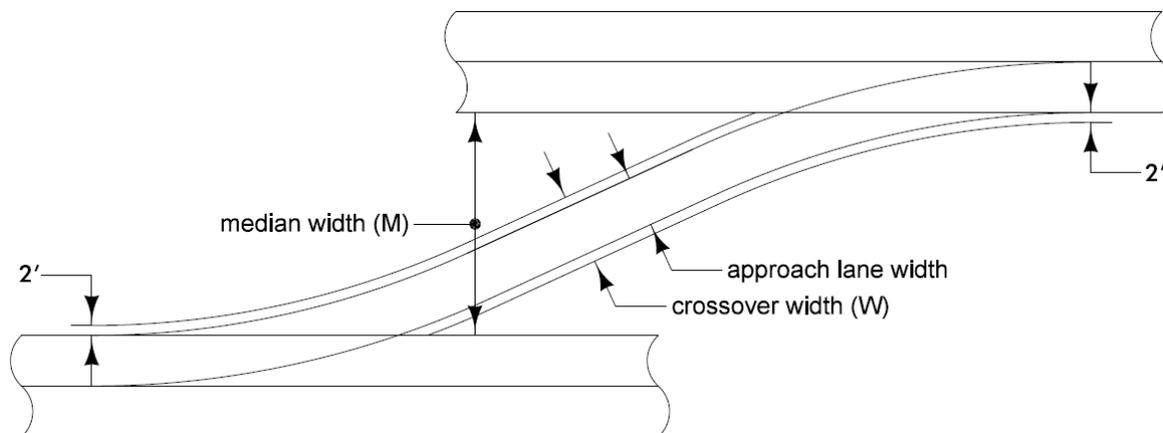


Figure 3: Establishing crossover pavement width.

1. For median crossovers, the radius is set at 3500 feet and the superelevation rate is set at 2%.
2. Curves R_1 and R_2 are normally the same to permit use of the crossover in either direction of travel.
3. A transition length, L , is provided between the reverse curves to permit change in cross slope. The length L is twice the “ x ” value found in the superelevation tables in Section [2A-3](#). This length will accommodate reversal of the 2% normal crown slope at the selected design speed, which will be 65mph (the posted speed before the construction area). Although the width of the pavement is actually 16 feet, it is striped as a 12 foot lane. Therefore, Table 2 in Section [2A-3](#) is used to determine “ x ” for a single lane crossover. For a design speed of 65 mph, $x = 56$ feet, thus $L = 2 \times 56' = 112$ feet.
4. The median width for calculation purposes is 46 feet ($50' - 2' - 2' = 46'$) because the 3500 foot radius curves are located at the edge of the 16 foot lane, which ties into a 2 foot parallel offset from the inside edge of slab, see Figure 3.

5. Using Table 2 in Section 2A-3, the distance to 2% (x) for 65 mph is 56 feet. The incomplete algorithm with Geopak cogo can be used for the calculation of the median crossover geometry. The commands below, included as a portion of an input file, produce the illustration in Figure 4.

Note: The geometry for a median crossover is tied 2 feet inside edge of pavement.

```
LOCATE 10000 CHA ML080 STA 250+00 OFF -23
LOCATE 10001 CHA ML080 STA 260+00 OFF -23
LOCATE 10002 CHA ML080 STA 250+00 OFF 23
LOCATE 10003 CHA ML080 STA 260+00 OFF 23
ALI DET3 INC
POT 10000 TD 10000 TO 10001
CUR 10010 TL 0 RAD 3500 P DEF ?
POT 10011 TL 56
POT 10012 M DEF 90 TL 16
POT 10013 P DEF 90 TL 56
CUR 10014 TL 0 RAD 3500 M DEF ?
POT 10003 TL ? TD 10002 TO 10003
END ALI
STO CHA DET3 CUR 10010 10011 10012 10013 CUR 10014 STA 3+00
```

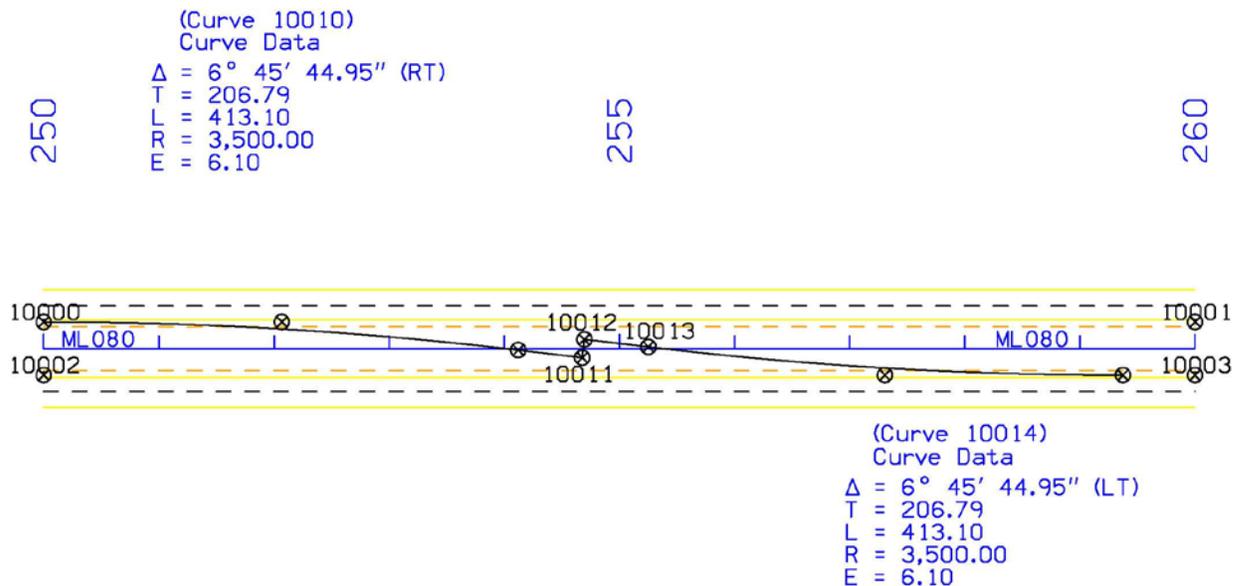


Figure 4: Median crossover geometry for example problem using COGO.

Chronology of Changes to Design Manual Section:

003E-003 Median Crossovers

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| 8/17/2016 | Revised
Changed reference to outdated standard. Changed reference to table in Section Section 2A-3. |
| 12/19/2012 | Revised
Updated hyperlinks to current Standard Road Plans and Details. Replaced 'temporary' and 'permanent' language with one and two directional as appropriate. Updated reference from Table 7 of Section 2A-3 to Table 4.
Replaced example problem with COGO example. |
| 5/23/2007 | Previously Updated. |