

## INTERSECTING CROSS ROAD GRADES

The grade of a connecting facility must be carefully studied when approaching an intersection where the mainline is superelevated.

A smooth grade tie-in is desirable, with sufficient area on a relatively flat grade for a vehicle to stop before entering the main roadway. Also, when a connection is on the outside of a superelevated curve, the grade must be designed so that the connection is visible to a driver on the main roadway desiring to turn onto the connection.

Every attempt must be made to provide an adequate area for this vehicular stoppage, giving full consideration to the horizontal and vertical sight distances.

The desirable tie-in is one that is no steeper than the pavement cross slope whether this is superelevated or the normal crown. The maximum difference between the pavement cross slope and the approach road grade shall not exceed 8% at stop intersections, or 4% at continuous-movement intersections. The stoppage area should be a minimum of 15 m before beginning the steeper grade. (See AASHTO's A Policy on Geometric Design of Highways and Streets)

## LEFT-TURN LANES

As a general policy, left-turn lanes are to be provided for traffic in both directions in the design of all median crossovers on non-access controlled divided highways using controls as shown in Figure C-1-1M. Left-turn lanes should also be established on two-lane highways where needed for storage of left-turn vehicles and/or prevention of thru-traffic delay.

In general, when left-turn volumes are higher than 100 vph, an exclusive left-turn lane shall be considered.\*

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\*Rev. 1/08

## LEFT AND RIGHT TURN STORAGE AND TAPER LENGTHS

<u>LENGTH OF STORAGE</u>		<u>TAPER - Rural and Urban</u>	
Rural - For Design Speeds 80 km/h or Higher	*L – 60m min. (For 240 or fewer vehicles during peak hour, <u>making turn</u> )	- For Design Speeds 55 km/h or Higher	**T – 60 m Min.
- For Design Speeds Less than 80 km/h	*L – 30 m min. (For 60 or fewer vehicles during peak hour, <u>making turn</u> )  *Distance L to be adjusted upward as determined by capacity analysis for Left and Right Turn Storage.	- For Design Speeds 55 km/h or Less	**T – 30 m Min.  **Tapers are to be straight-line unless local policy requires reverse curves. In congested areas the taper length may be reduced to increase storage length.
Urban - Length determined by capacity analysis for Left and Right Turn Storage			

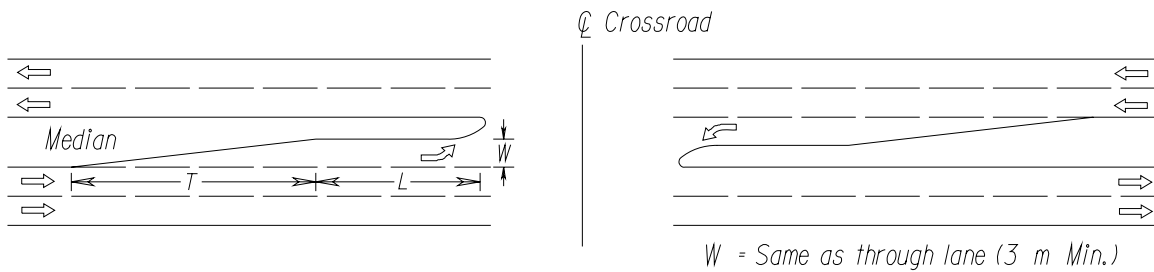
Taper rates: 8:1 for design speeds up to 50 km/h\* and 15:1 for design speeds between 55 and 80 km/h. (Source: 2004 AASHTO Green Book , Page 716 and Exhibit 9-74).

Note: Figures shown above were compiled using these formulas and were rounded up.

**FIGURE C-1-1M**

Dimension "L" to be adjusted upward as determined by Figure C-1-1.1M or by capacity analysis for left-turn storage.

A capacity analysis is defined as a detailed analysis of the location in accordance with the guidelines contained in the current issue of the Highway Capacity Manual for intersection capacity and signalization requirements.



\* Rev. 1/08