Figures 3-5 through 3-22 provide warrants for left-turn storage lanes on two-lane highways based on 5 to 30 percent left-turn volumes and design speeds of 40, 50, and 60 MPH. Additional storage length is required for 10 to 50 percent truck volumes.

NOTE: There are circumstances where a turn lane may be needed even if the warrants are not met. *

For example, intersections with poor visibility and/or a bad accident record may require the Engineer to use engineering judgment when volume conditions alone do not warrant a storage lane.

Additionally, the functional classification of the highway shall be considered so that the impact of turning movements on highways intended to serve through traffic is minimized.

LANE/TRANSITIONS, MERGING TAPERS AND SPEED CHANGE LENGTHS

Lane/transitions typically occur where new or reconstructed roadways tie-in to existing roadways. Lane transitions, merging tapers and speed change lengths shall meet the minimum length provided by the following equations:

Less than 45 mph	45 mph and greater
$L = S^2W \div 60$	$L = W \times S$

L = length of transition
S = Design Speed
W = Width of offset on each side

Transition length area shall include all roadside safety apparatus, if required.