TRAFFIC AND SAFETY NOTE 605A

SUBJECT: **Traffic Volume Guidelines for Left-Turn Lanes and Passing Flares at Unsignalized Intersections**

PURPOSE: **To Promote a Uniform System of Determining When Left-Turn Lanes or Passing Flares Should be Constructed**

COORDINATING UNIT: Geometric Design Unit

INFORMATION: The addition of left-turn lanes or passing flares should be considered in order to enhance the movement of traffic through intersections. The MDOT has established such guidelines on page 2.

The charts on page 3, 4, and 5 display the relationship between advancing and opposing volumes with respect to left-turns on two-lane, two-way highways. For each of the three charts, if the intersection of advancing and opposing volumes falls to the right of the curve representing the percentage of left-turns in the advancing volume, a left-turn lane is recommended. If the intersection falls to the left of the curve, a left-turn lane is not recommended. If a left-turn lane is not recommended, see the bottom of page 2 to consider the installation of a passing flare. For flare and intersection design details, see the Geometric Design Guide VII-650 series.

The chart on page 6 displays the relation between the left-turning volumes and opposing volumes on four-lane undivided highways. A left-turn lane normally is not warranted if the intersection opposing and left-turning volume falls in the shaded areas.

Charts are taken from NCHRP Report 279, Intersection Design Guide.

Guidelines for Left-Turn Lanes on Two-Lane, Two-Way Highways And Four-Lane Undivided Highways

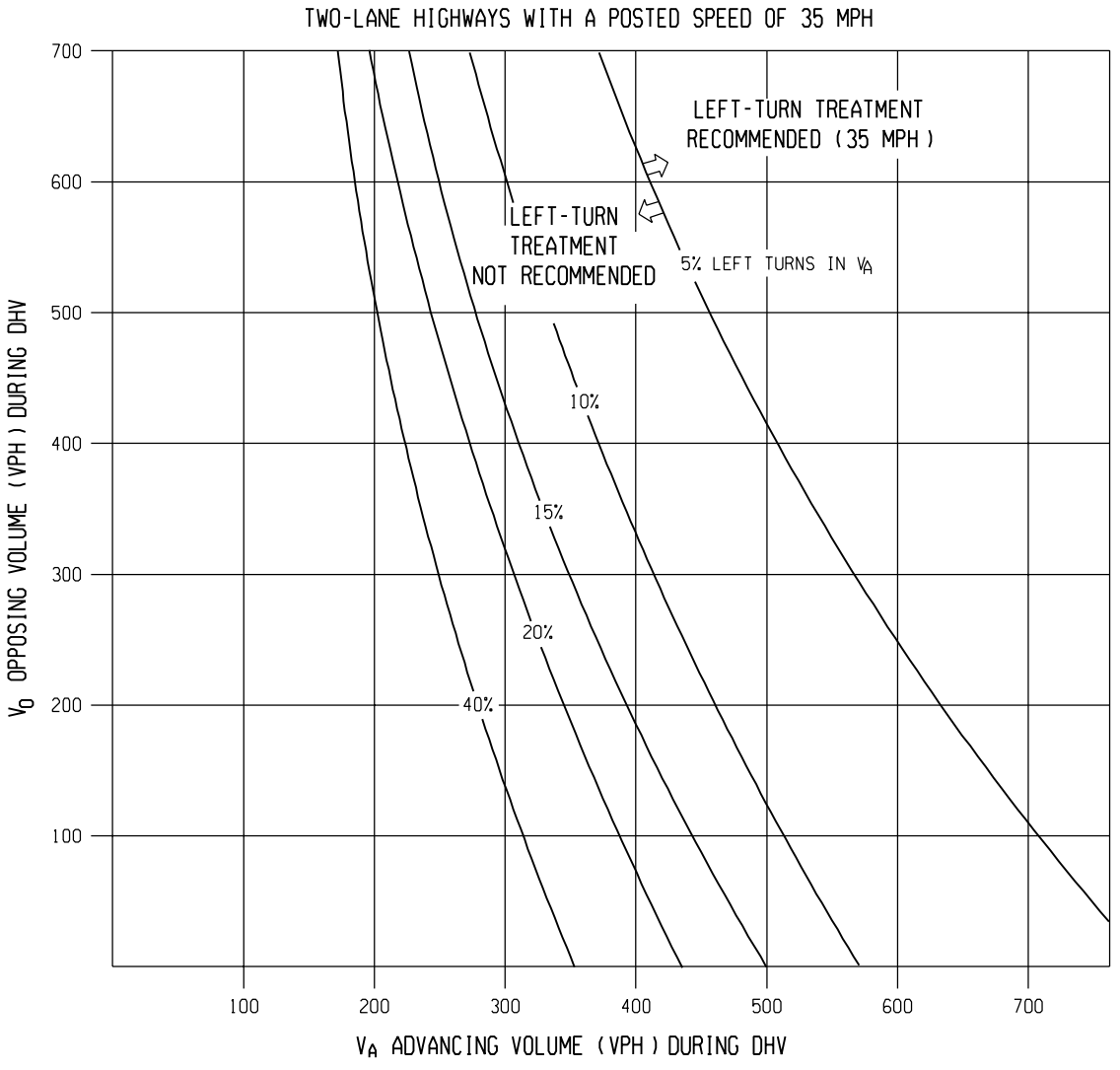
The accommodation of left turns is often the critical factor in proper intersection design. Left-turn lanes and passing flares can significantly improve safety and the level of service at an intersection. Exclusive left-turn lanes should be considered under the following conditions:

1. At any unsignalized intersection on a two-lane urban or rural highway which satisfies the criteria on pages 3, 4 or 5.

2. At any unsignalized intersections on a four-lane urban or rural highway which satisfies the criteria on page 6.

3. At any intersection where the crash experience, traffic operations, sight distance restrictions (e.g., intersection beyond a crest vertical curve), or engineering judgment indicates that a left-turn lane will significantly improve operations.

However, if a left-turn lane is not recommended, a passing flare should be considered. Passing flares are discussed in Traffic and Safety Note 603A (7.3) Traffic Volume Guidelines for Driveway Passing Flares.



Instructions:

1. The family of curves represent the percentage of left turns in the advancing volume (V_A). The designer should locate the curve for the actual percentage of left turns. When this is not an even increment of 5, the designer should estimate where the curve lies.

2. Read V_A and V_O into the chart and locate the intersection of the two volumes.

3. Note the location of the point in #2 relative to the line in #1. If the point is to the right of the line, then a left-turn lane is recommended. If the point is to the left of the line, then a left-turn is not recommended based on traffic volumes.

Example: Speed = 35mph
Advancing volume during DHV = 400 vph
Opposing volume during DHV = 400 vph
Percentage of left-turns in advancing volume = 7%

Problem: Determine if left-turn lane is recommended.

Solution: Figure indicates that the intersection of 400 vph and 400 vph is located to the left of the 7% curve (estimated); thus a left-turn lane is not recommended based on volumes.

MDOT Michigan Department of Transportation

TRAFFIC AND SAFETY NOTE

TRAFFIC VOLUME GUIDELINES FOR LEFT-TURN LANES AT UNSIGNALIZED INTERSECTIONS

DRAWN BY: MTS	08/05/2004	605A	SHEET 3 OF 6
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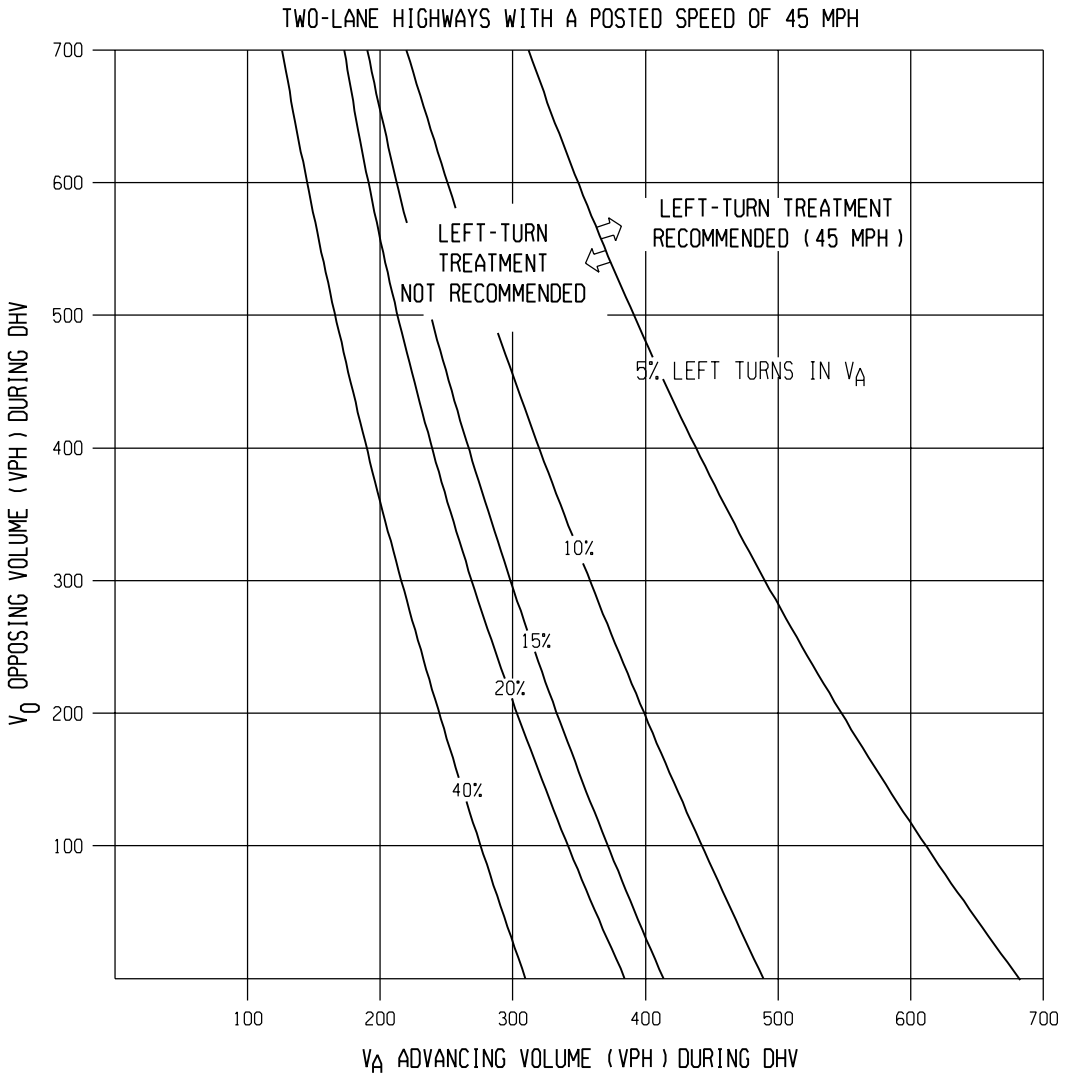

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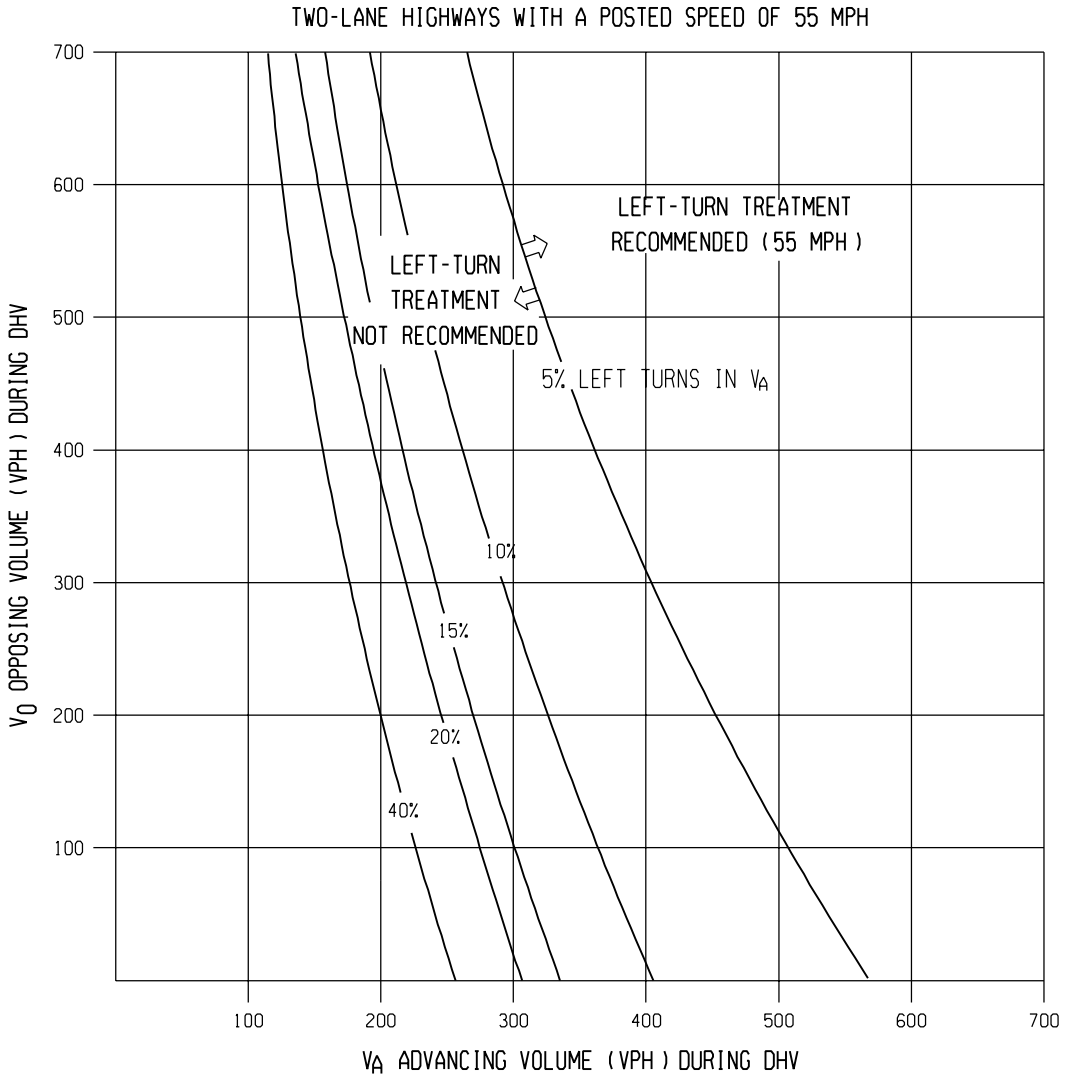

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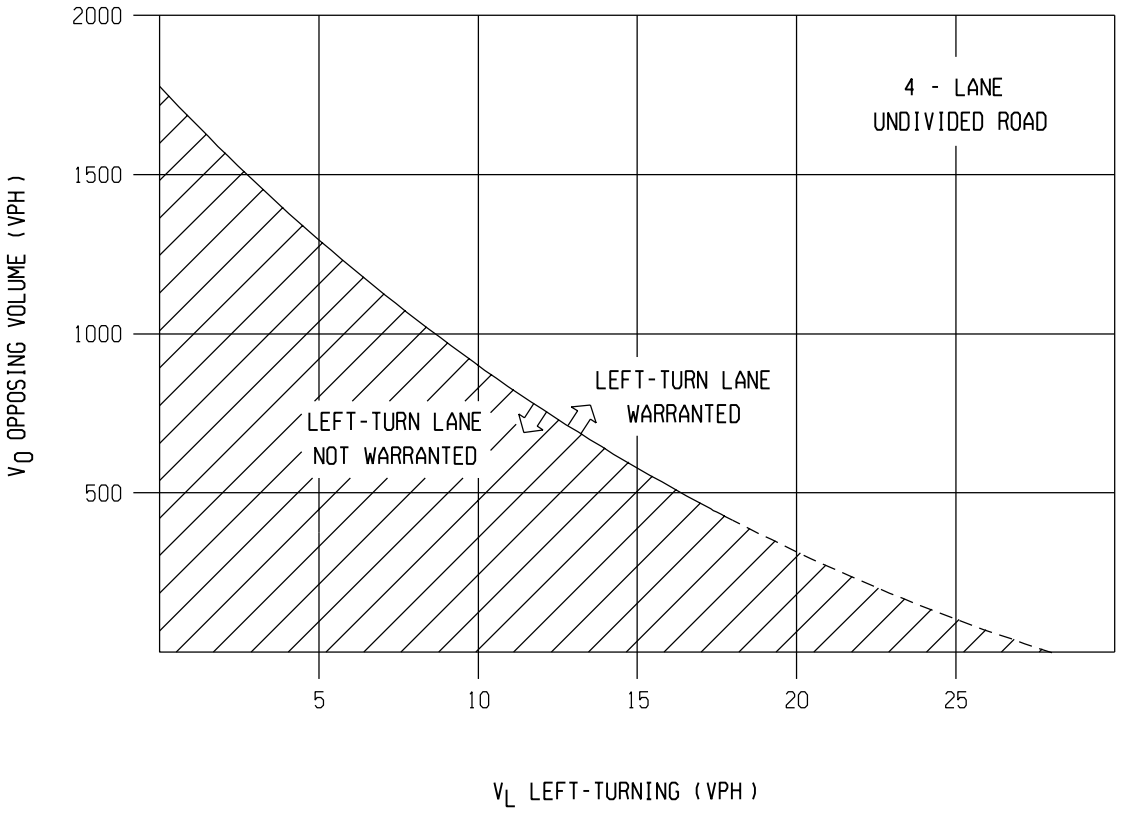
FOUR-LANE HIGHWAYS



NOTE: When V_O < 400 vph (dashed line), a Left-Turn Lane is Not Normally Warranted Unless The Advancing Volume (V_A) in The Same Direction as the Left-Turning Traffic Exceeds 400 vph (V_A > 400 vph).

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