
MEMORANDUM

DATE: January 1, 2021
TO: City of El Mirage Engineering Department
SUBJECT: Auxiliary Lane Criteria

1. **Intersection Lane Requirements:**

A traffic analysis is required to determine the number of lanes and the lane configuration for intersections. The desired level of service is dependent on roadway classifications; the minimum desired Level of Service (LOS) is D.

Developments are to construct auxiliary lanes when the following criteria or thresholds are expected to be met due to the addition of the projected development traffic.

- A. Right Turn Lane is to be provided when:
 - 1. At all signalized intersections
 - 2. At all street intersections of Parkways and Major Arterials. Right turn lanes may be required on Minor Arterial and Collector streets, when determined by the City Engineer.
 - 3. On any roadway where a Traffic Impact Study indicates the LOS would be increased to a LOS of D or better with the addition of a right-turn lane.
 - 4. In rural and developing urban areas with higher speeds, a separate right turn lane may be required for lower right turn volumes.

- B. Left Turn Lane is to be provided:
 - 1. At all signalized intersections and on Parkways, Arterials and Major Collector streets.
 - 2. When the left turn movement into another roadway results in a LOS less than the minimum LOS of D during any peak hour.

- C. Dual Left-Turn Lanes are to be provided when:
 - 1. The peak hour left-turn volume exceeds 200 vph.
 - 2. The peak hour conflicting through movement volume exceeds 1,000 vph.
 - 3. The delay to left turning vehicles exceeds 45 seconds.
 - 4. A Traffic Impact Study indicates the LOS would be increased to a LOS of D or better with the addition of dual left turns.

The criteria used to determine the need for turn lanes are based on a normal mix of design vehicle types, the volume limits may be adjusted at the discretion of the Engineering Division.

2. Driveway Lane Requirements:

- A. Right turn deceleration lanes are required at all driveways on Parkways and Major Arterial streets. Deceleration lanes for driveways may be required on Minor Arterial and Collector streets, which may require additional right-of-way. To determine the need for a deceleration lane on streets classified as Minor Arterial or Collector, the site Traffic Engineer shall analyze the site, for City of El Mirage review and approval, to see if the proposed site conditions meet a **minimum of three** of the following criteria(s):
1. At least 5,000 vehicles per day are using or are expected to be using the adjacent street.
 2. The posted speed limit is 35 mph or greater.
 3. At least 1,000 vehicles per day are using or are expected to use the driveway for the development or adjacent development(s) (existing or future).
 4. At least 30 vehicles are expected to make right-turns into the driveway for a one-hour period for the development or adjacent developments (existing or future).
- B. **Commercial and Industrial sites:** Through the approved Traffic Impact Study, if it was determined that such a deceleration lane is not warranted (per criteria 2A above), a minimum of one driveway shall be designated as truck delivery access drives and shall meet the minimum turning path for a WB-67 design vehicle, without requiring maneuvering into more than one traffic lane within the public roadway. Additional driveways may be required to meet the criteria (as determined by the City Engineer based on local conditions).
- C. **Storage facilities:** Through the approved Traffic Analysis, if it was determined that such a deceleration lane is not warranted (per criteria 2A above), the main access driveway shall meet the minimum turning path for a MH/B design vehicle.
- D. Left turn lanes are required at all driveways on Parkways and Major Arterial streets. Deceleration lanes for driveways may be required on Minor Arterial and Collector streets. To determine the need for a deceleration lane on streets classified as Minor Arterial or Collector, the site Traffic Engineer shall analyze the site, for City of El Mirage review and approval, to see if the proposed site conditions meet the volume warrants shown in Table 7.6 of the *MCDOT Roadway Design Manual* shown on the next page.

TABLE 7.6: VOLUME WARRANTS FOR LEFT-TURN LANES				
Peak Hour Traffic Volume on the Roadway in the Advancing Direction	Minimum Peak Hour Left-turn Traffic Volume			
	# of through lanes per direction			
	1		2	
	< 45 MPH Posted Speed	≥ 45 MPH Posted Speed	< 45 MPH Posted Speed	≥ 45 MPH Posted Speed
≤ 200	30	15	-	-
201-300	12	12	40	30
301-400	12	12	30	25
401-500	12	12	25	18
501-600	12	12	15	12
601-1000	12	12	10	8
1001+	12	8	10	8

- E. At the discretion of the City Engineer or their designee, a right turn deceleration lane or left turn lane may be required regardless of the minimum criteria, if site specific conditions warrant the addition of a lane such as sites with a larger than average number of heavy vehicles.
- F. In no event shall adjacent driveways be located within the area of the deceleration storage lane or the required taper lengths unless specifically approved by the City Engineer.

3. Auxiliary Lane Lengths:

- A. **Left Turn Lane Storage:** For arterials and collector roads, the minimum storage length is 160 feet. This will apply to both signalized and unsignalized intersections.
- B. **Right Turn Lane Storage:** For arterials and collector roads, the minimum storage length is 160 feet. This will apply to both signalized and unsignalized intersections.
- C. **Taper Lengths:** The lengths of auxiliary lane tapers should be approximately 8-foot to 15-foot longitudinally per 1-foot transversely (8:1 to 15:1) with a minimum taper of 100 feet. These taper lengths are only applicable to auxiliary lanes. Tapers associated with changing of pavement widths shall be in accordance with City of El Mirage requirements.
- D. The auxiliary lane lengths must be determined by the site Traffic Engineer on a case-by-case basis and must be approved by the City Engineer or their designee. The Traffic Impact Study should recommend minimum storage lengths based on a queuing analysis. The queuing analysis should be performed using accepted formulas as specified in the AASHTO *A Policy on Geometric Design of Highways and Streets* and with proper documentation. 95th percentile queue lengths from the LOS analysis should also be referenced when determining the recommended storage lengths.

- E. If site constraints will not allow the minimum lengths outlined in 3A, 3B and 3C above, the storage and/or taper lengths may be reduced if the Traffic Impact Study confirms the proposed lengths are acceptable and with approval from the City Engineer.
- E. Auxiliary lane length for driveways serving school sites may be required to be increased based on recommendation of the City Engineer after review of the onsite traffic circulation plan.
- F. The City Engineer may require certain lengths of storage lanes or tapers based on specific site conditions.