

ENGINEERING DIRECTIVES AND STANDARDS

Volume	Chapter	Section	Directive Number	Effective Date
IV	2	1	4	6/2/2014

SUBJECT: MEDIAN OPENINGS ON DIVIDED MULTI-LANE ROADWAYS

- 1. PURPOSE:** This directive sets forth the Department of Transportation and Development's (DOTD) policy for planning, design, maintenance, permitting, and operation of medians and median openings on multi-lane roadways. Controlling the spacing and type of median openings is a technique of Access Management which promotes safe and efficient use of the transportation network. Limiting the number of median openings will reduce the number of conflict points, hence reducing the potential for crashes.

The spacing of median openings is critical because median opening spacing determines future traffic signal spacing on a corridor. As traffic volumes increase with time, traffic signals can become justified at full access median openings. Reasonably spaced traffic signals on major arterials improve traffic flow, reduce congestion, improve safety, and improve air quality. Poorly spaced traffic signals lead to a degradation of the efficiency of the roadway and an increase in maintenance costs. Studies have shown that signals spaced on a four lane divided roadway at ½ mile intervals have the same capacity as a six lane roadway with signals spaced at ¼ mile intervals. (TRB Access Management Manual 2003 p144) Increasing the distance between median openings helps to manage the spacing between future traffic signals. This policy assists DOTD in managing the number of conflict points and the efficiency of the roadway.

This policy gives alternatives to full access median openings, such as median U-turns and partial median openings with restricted movements. These types of managed median openings assist in reducing conflict points and improving the efficiency of the roadway for all users.

- 2. SCOPE:** This policy applies to all multi-lane, divided, state-maintained, non-controlled access highways.
- 3. LEGISLATIVE AUTHORITY:** Louisiana Revised Statutes 32:82 allows drivers on divided highways to use median openings, crossovers, and intersections which have been established by DOTD. **Louisiana R.S. 32:82 (Driving on divided highways)** states:

"A. Whenever any highway has been divided into two roadways by a median, physical barrier, or clearly indicated dividing section so constructed as to impede vehicular traffic, every vehicle shall be driven only upon the right hand roadway and no vehicle shall be driven over, across or within the median, barrier or section, except through an improved opening or at a cross over or intersection established under authority of this Chapter..."

Acts 1962, No. 310, §J; Acts 1997, No. 186, §1."

4. DEFINITIONS:

- A. **Corridor Study:** A study of a series of adjacent intersections which include a travel time and level of service analysis of all signalized intersections. The limits of the study shall be approved by the District Traffic Operations Engineer (DTOE). The study shall present results of the before and after travel time, level of service and approach delay for each intersection of concern and the roadway as a whole.
- B. **Directional U-turn Opening** is defined as a median opening that serves one direction of U-turn. When a pair of U-turn median openings is provided, they shall be physically separated by a minimum of 100 ft. and shall be designed to allow for adequate sight distances. U-turn openings shall be designed with a turn lane of adequate length for queue storage. The sight distance and storage length shall be verified and approved by the DTOE.

- C. **Full Access Median Opening** is defined as a median opening that allows all directions of movement, including all turning movements (left turns, right turns, and through movements). It may also allow U-turns when they are needed and can be safely provided. This median opening may be signalized or un-signalized. This definition does not apply to roundabout intersections due to the reduced number of conflict points.
- D. **Median** is defined as a raised or depressed area separating opposing directions of the traveled way.
- E. **Median Opening** is defined as any opening in the median. This may include, but is not limited to, signalized intersections, un-signalized intersections, directional U-turns, or partial median openings. All median openings shall be designed with turn lanes and the storage lengths provided for those turn lanes are verified by the DTOE.
- F. **Median U-Turn (MUT) Intersection** is defined as the use of two or four directional U-turn openings, placed on each side of an intersection, combined with the prohibition of all left turns at the intersection. This type of intersection is typically the crossing of two major arterials where the through move is heavier than the left turns. All through movements and right turns at the intersection are permitted. The openings must be appropriately spaced with one directional median opening on each side of the partial median opening. The distance between two of these treatments is also critical. The main intersection is typically signalized and the U-turns may be un-signalized or signalized, depending on volumes.
- G. **Multi-Lane Roadway** is defined as a roadway having two (2) or more through lanes in at least one direction.
- H. **Partial Median Opening** is defined as a median opening that allows for left turns from the mainline and right-in/right-out from the minor roadway (or access connection). This type of opening prohibits left turns or through movements from the minor roadway (or access connection). The Restricted Crossing U-Turn Intersection and the Median U-Turn Intersection are examples of uses of partial median openings.
- I. **Restricted Crossing U-Turn (RCUT) Intersection** is defined as a non-traditional intersection system that utilizes a combination of one partial median opening and two directional median openings. This type of intersection is typically the crossing of major and minor arterials where the left turn moves are relatively high. The openings must be appropriately spaced with one directional U-turn opening or one partial median opening on each side of the partial median opening. The distance between two of these systems is also critical. The intersection and U-turns may be un-signalized or signalized, depending on volumes.
- J. **Turn Lane** is defined as the roadway widening required to store vehicles waiting to make the associated move.

5. POLICY.

- A. Design of multi-lane roadway projects
 - 1) All multi-lane roadways independent of their roadway classification shall be designed with a median as defined herein.
 - 2) Refer to the DOTD Design Guidelines for Roadways.
 - 3) A corridor study shall be performed prior to design or redesign of a median roadway. Preservation only projects are exempt from performing a corridor study.
- B. Design of median openings on roadways where a median did not exist prior to the current project (i.e., 2-lane to 4-lane divided or 4-lane undivided to 4-lane divided)
 - 1) Median U-turn openings for passenger cars shall be spaced at mile distances. This minimizes the distance for a vehicle to turn right, make a U-turn and get back to where they started to no more than ½ mile.
 - 2) Signalized Restricted Crossing U-Turn Intersection should be designed only for public roadways that meet MUTCD Traffic Signal Warrant 1A (100%). Turn lanes with adequate queue storage (verified and approved by the DTOE) shall be provided.

- 3) Full access median openings will only be allowed if the provisions of EDSM VI.3.1.6 (Installation of a New Traffic Signal) are met, and full analysis utilizing the following alternatives predicts that the Full Access Median Opening will be safer and more efficient.
 - i. Full Median Opening
 - ii. Restricted Crossing U-Turn Intersection
 - iii. Median U-Turn Intersection
 - iv. Roundabouts
 - 4) A Full Access Median Opening must be recommended by the DTOE and the Traffic Engineering Division Administrator and approved by the Chief Engineer.
- C. Design of median openings on roadways where a median exists (i.e., 4-lane to 6-lane, addition of turn lanes or changes in access). The median openings shall be redesigned based on the following requirements. In order to meet these requirements, it may be necessary to relocate or close existing median openings.
- 1) Median U-turn openings for passenger cars desirable spacing is at mile distances. This minimizes the distance for a vehicle to turn right, make a U-turn and get back to where they started to no more than ½ mile.
 - 2) Partial median openings will be permitted. The partial median openings desirable spacing is 1/2 mile but would depend upon the corridor study and existing traffic generators. The DTOE shall verify that the queue from adjacent signals do not interfere with the opening.
 - 3) Full access median openings will only be allowed if the provisions of EDSM VI.3.1.6 (Installation of a New Traffic Signal) are met, and full analysis utilizing the following alternatives predicts that the Full Access Median Opening will be safer and more efficient.
 - i. Full Median Opening
 - ii. Restricted Crossing U-Turn Intersection
 - iii. Median U-Turn Intersection
 - iv. Roundabouts
 - 4) A Full Access Median Opening must be recommended by the DTOE and the Traffic Engineering Division Administrator, and approved by the Chief Engineer. All other median openings shall be approved by the DTOE.
- D. This policy does not apply to the design of median openings on roadways where a median exists but the projects are limited to preservation (i.e. overlay only),
- E. Permits for median openings and access connections (driveways) on roadways where a median exists shall follow this EDSM and the DOTD Access Connection Policy.
- F. Design vehicles shall be approved by the DTOE based on the following guidance:

Access Type and Spacing	Truck Percentage	
	< 5%	≥ 5%
Minor Median U-turn Openings (Typical 1/4 mile spacing)	P	SU
Major Median U-turn Openings (Typical 2 mile spacing)	SU	WB-67
Signalized Intersections and Roundabouts	WB-67	WB-67

It is not necessary to design each opening for a WB-67 but openings along the route should allow WB-67's to make U-turns within reasonable distances. Engineering judgment should be used in determining u turns and bulb outs.

6. **WAIVER:** A waiver on median and median openings may be granted but must be recommended by the District Administrator, the Traffic Engineering Administrator and approved by the Chief Engineer.

7. **APPLICATION OF STANDARDS:** This policy shall apply immediately to all design projects in Stage 0, Stage 1 and all permits that have not been approved.
8. **OTHER ISSUANCES AFFECTED:** All standards, directives, memoranda or instructions issued heretofore in conflict with this directive are hereby rescinded.
9. **IMPLEMENTATION:** This directive will become effective immediately upon issuance.

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