City of Fort Worth, Texas

# Access Management Policy

Adopted June 5, 2018

Effective August 1, 2018

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# Introduction

I

## Acknowledgments

This document draws on the prior work of a number of other communities, consultants, and researchers. In some cases this prior work was used as a reference; however, in other cases it was determined to be directly applicable to Fort Worth. In those situations, the standards and/or policies have been incorporated into this document. The references section at the end of this document includes these publications.

## Purpose

Access management is the coordinated planning, regulation, and design of access between roadways and land development. An effective access management program can reduce crashes by 50%, increase roadway capacity by 23% to 45%, and reduce travel time and delay by 40% to 60% (TRB Access Management Manual 2nd Edition (2014)). Access management also has an overall positive economic impact on businesses in access-controlled corridors.

The purpose, therefore, of this Access Management Manual is to provide for and manage access to land development, while preserving the regional flow of traffic in terms of safety, capacity, and speed. The guidelines recognize both the right of reasonable access to private property and the right of the citizens of Fort Worth to safe and efficient travel. To achieve this policy intent, the Manual draws on existing regional and national access management guidelines to set policies and standards.

## Applicability

This Manual applies to all roadways and roadway rights-of-way (public and private) within the City of Fort Worth, as well as to all properties within the City that abut these roadways. The requirements of this Manual are in addition to other state or local standards and requirements that may be in force on these roadways (such as the 2011 TxDOT Access Management Manual).

## Conformance with Plans and Policies

The guidelines are intended as a complement to the plans and policies set forth in the City of Fort Worth's Master Thoroughfare Plan (MTP). In addition, they are intended to conform to, support, and supplement policies and plans of TxDOT and the North Central Texas Council of Governments (NCTCOG).

## Conflicts and Revisions

While efforts have been made to ensure that these guidelines do not conflict with any city codes, subdivision regulations, zoning ordinance, roadway design standards, or other city, state and county planning and design regulations or documents, there may be occasions where discrepancies between these policies arise. Upon such an occasion, the most recently adopted policy should apply.

# Street Types

II

## Thoroughfares

Rather than categorizing thoroughfares solely on the basis of traffic volumes and speeds, the MTP categorizations are designed to reflect streets' respective land-use contexts, and a balanced approach to the various transportation modes needing to use each Street Type. The Street Type concept covers all thoroughfares in the City (with certain exceptions noted in the MTP), including those that have already been built. The MTP includes five thoroughfare Street Types:

- System Link
- Commercial Connector
- Neighborhood Connector
- Commerce/Mixed Use Street
- Activity Street

Each of these Street Types is accompanied by a suite of cross-sections, and the MTP provides a selection process resulting in a cross-section assignment for every thoroughfare segment in the City and ETJ.

## Collectors

Although collector streets are not mapped in the MTP, cross-sections are provided in that document. Collectors provide extremely important supporting connections to the City's overall transportation system, moving traffic from local streets and developments to thoroughfares. They support access management at the network level: specifically, a well-designed collector network can reduce overall traffic pressure by allowing shorter, more local trips to be made off the thoroughfare network. Thus, the spacing or "density" of collectors throughout the roadway network is an important component of an efficient and successful transportation system.

## Local Streets

Local streets are also not mapped in the MTP, but cross-sections are provided in that document. Local streets play a role in access management, and are thus addressed in relevant sections of this manual.

# Access Guidelines

III

## Roadway and Access Connection Spacing Requirements

Recent research has verified that adequate spacing between access points significantly benefits traffic safety as well as traffic flow and operations on the local street system. This includes implementing appropriate and uniform spacing for driveways, cross-streets, and signalized intersections.

According to the 2014 TRB Access Management Manual, urban and suburban streets with 20 access points per mile (every 260 feet) typically have crash rates that are 30 to 40 percent lower than streets with 40 access points per mile (every 130 feet). The increase is more pronounced on streets without medians or two-way left-turn lanes. In addition, closely spaced or irregularly spaced traffic signals on arterial roadways result in frequent stops, unnecessary delay, increased fuel consumption, excessive vehicular emissions, and high crash rates (NCHRP 420, 1999). The most efficient and safe signalized corridors typically have long and uniform signal spacing.

Key factors to consider in regards to connection spacing include:

- Establishing appropriate and uniform spacing to promote consistent and suitable traffic flows and speeds
- Reducing the overall frequency of access points to limit conflicts and improve safety
- Maintaining safe distances between access points to provide appropriate stopping, intersection, and decision sight distances.
- Avoiding interchange and intersection functional areas (as defined later in this section) to the extent practical to limit conflicts and maintain capacity

All new or modified street and access connections to Thoroughfares (as designated by the MTP) in the City of Fort Worth must meet or exceed the allowable minimum connection spacing requirements shown in **Figure 3.1** except as noted below. Connection spacing distances shown in the table must be measured between the endpoints shown in the figure. Distances D and I are measured along the edge of the traveled way from the closest edge of pavement of the first access connection to the closest edge of pavement of the second access connection. The remaining distances are measured center to center.

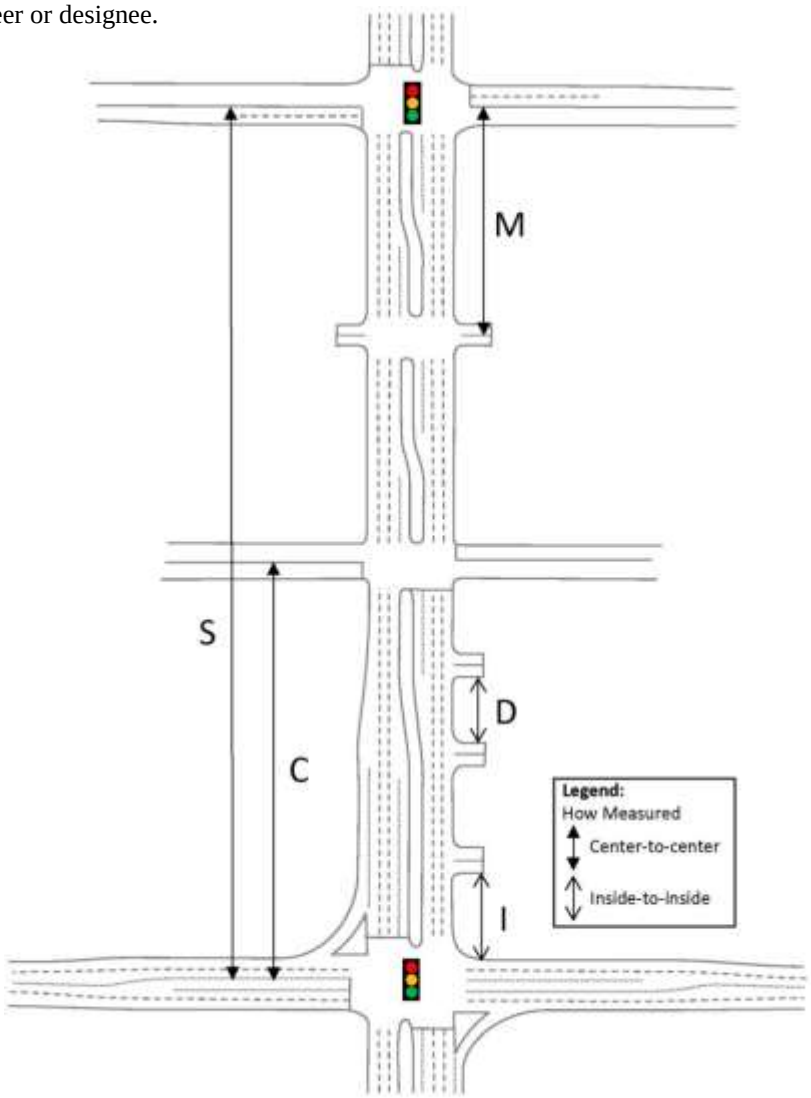
Section V discusses joint-access driveways, cross-access connections, and public access easements as one set of techniques that can be used to avoid violating these minimum spacing requirements. It should also be noted that these minimum spacing distances are not intended to set the number of access points for a given property frontage. The number of access points is a function of land-use (type and intensity) and need (See Section V).

The street type for a specific Thoroughfare segment must be determined using the most recent approved version of the Master Thoroughfare Plan. The guidelines from several large and/or developing cities in Texas were considered in the development of the values shown in **Figure 3.1**.

**Figure 3.1: Minimum Street and Access Connection Spacing**

| Street Type | *MTP Target Speed (mph)†* | *MTP Range of Through Lanes* | **D** Driveway – Driveway Spacing (ft) | **I** Intersection – Driveway Spacing (ft) | **S** Signalized Intersection Spacing (ft) | **C** Street Spacing (ft) | **M** Median Opening Spacing (ft) |
|---|---|---|---|---|---|---|---|
| System Link | *35 to 45* | *4 to 6* | 300 | 300 | 1,320 | 1,000-1,320* | 500 - 800 |
| Commercial Connector | *30 to 35* | *2 to 6* | 250 | 250 | 1,000 | 660-1,000* | 500 - 800 |
| Neighborhood Connector | *30 to 35* | *2 to 6* | 200 | 250 | 1,000 | 660-1,000* | 500 - 800 |
| Commerce / Mixed-Use St | *25* | *2 to 4* | 150 | 150 | 600-1,320* | 300-660* | NA |
| Activity Street | *25* | *2 to 4* | 100** | 100** | 400-800* | 300-660* | NA*** |
| Collector Streets**** | *25 to 30* | *2* | 100‡ | 100 | NA | 250 | NA |
| Local Streets**** | *25* | *2* | 75‡ | 75 | NA | 250 | NA |

† Target speed is defined in the MTP as the recommended design speed
* Refer to text discussion regarding allowable minimums and desirable maximums
‡ This does not apply to residential driveways
** New driveways on Activity Streets are only allowed if there is not access from a lower class roadway
*** Median treatments and openings for Activity Streets must be examined on a project- and context-specific basis
****Collector/Local Streets: Values shown are for guidance only; closer access spacing may be permitted at the discretion of the City Traffic Engineer or designee.



The spacing requirements are not intended to constrain infill or small site developments or redevelopments. The City Traffic Engineer or designee has the authority to reduce the requirements by up to 10 percent based on existing site and street constraints and an engineering analysis demonstrating that the connection will function adequately and safely. (See Section VIII)

As shown on **Figure 3.1**, the distance between two driveways (D) ranges from 100 feet to 300 feet depending on the street type. The distance between an intersection and a driveway (I) also ranges from 100 feet to 300 feet, with the only difference being a 50 foot increase on Commercial Connectors to provide additional intersection clearance in commercial areas. These are minimum allowable distances; longer distances are preferred to avoid driveway and intersection functional areas, which can extend much further depending on the target speed as discussed later in this section.

Low volume streets intersecting thoroughfares, except System Links, can be treated as driveways if the following three criteria are met:

- Projected ADT on the street is 500 or less;
- Main street volume is 20,000 or less; and
- Main street has fewer than 6 lanes.

**Figure 3.1** indicates the distance criteria between signals (S), including expected future signals, on System Links, Commercial Connectors, and Neighborhood Connectors. These distances are necessary to maintain acceptable traffic flow and signal progression. For Commerce / Mixed-Use Streets and Activity Streets, a range is indicated. The lower value is the minimum allowable distance between signals on these street types. These distances reflect the desire for increased density along these streets and the need to balance traffic flow with a denser street grid and pedestrian crossing opportunities. The upper value is the desirable maximum distance between signals along these types of streets for the same reasons. The potential to adjust the signal spacing for a specific project is discussed below.

The installation of a traffic signal in the City of Fort Worth must meet one or more of the signal warrants in the Manual on Uniform Traffic Control Devices (MUTCD). As stated in the MUTCD, use of the peak hour warrant is limited only to "unusual cases". Warrants must be based on existing traffic volumes or existing plus proposed development volumes with the approval of the City Traffic Engineer or designee. The preferred spacing must be pursued in all new street and access point construction. However, if the signal spacing guidelines cannot be achieved, an engineering study will be required to be submitted to the City Traffic Engineer or designee, who will make a determination as to whether the requirement may be adjusted. The engineering study must be provided to demonstrate the need for, and acceptability of, the lower value. This will include documenting that the traffic signal will not degrade traffic conditions (current or future operations and safety) below acceptable levels. The installation of a traffic signal (and any study of a potential signal location) must take into account possible future signals in the vicinity of the intersection, such that the build-out land-use and traffic condition will not require signals spaced more closely than the minimum allowable distances specified in **Figure 3.1** (unless adjusted as described in this paragraph).

The street spacing distances (C) shown in **Figure 3.1** indicate the minimum allowable street spacing and a desirable maximum for each street type. The minimum spacing is to promote the safe and efficient movement of traffic on the different street types, while the desirable maximums are to promote appropriately dense street grids which provide access and promote pedestrian and bicycle connectivity.

Street and access connection spacing on collector streets in the City of Fort Worth must also follow the general guidance provided by **Figure 3.1**. For each collector street, the target speed, number of lanes, and land-uses must be considered to determine an appropriate desirable minimum (or maximum) spacing. For collector and local streets, the values in **Figure 3.1** are for guidance only and closer access spacing can be permitted at the discretion of the City Traffic Engineer or designee.

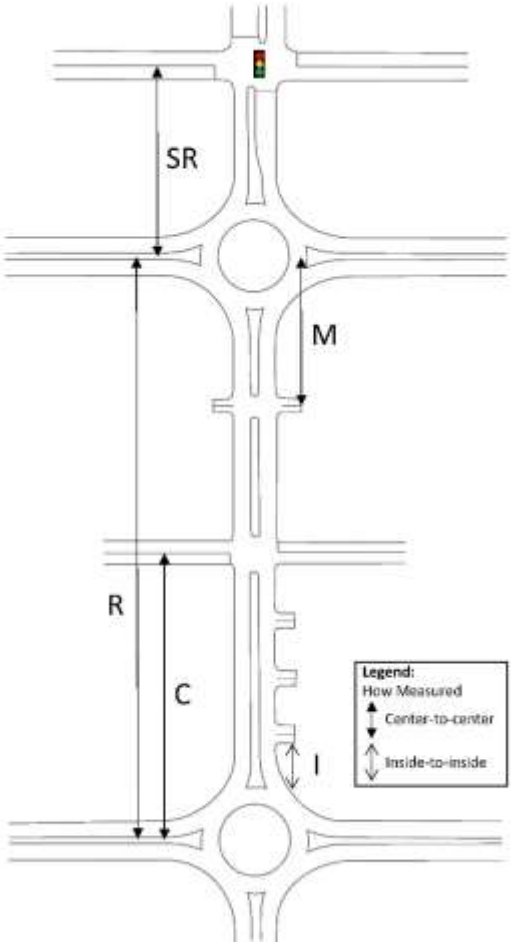
The City of Fort Worth views roundabouts as a viable, and sometimes even a preferred, alternative to the use of traffic signals in locations where an engineering study indicates that they are physically feasible (e.g. available right-of-way and acceptable topography) and would operate acceptably (e.g. sufficient traffic capacity, and safe operating conditions). Where roundabouts are used, the spacing distances shown in **Figure 3.2** would apply as the initial guidelines rather than the values in **Figure 3.1**. It may be possible to decrease the values shown in Figure 3.2, though it is important to take into account the typical need for increased spacing downstream from a roundabout compared to upstream from a roundabout. For all situations where a roundabout is to be constructed, where a driveway (I) is to be constructed within 300 feet of a roundabout, or where a non-driveway access connection (R, C, M, SR) is to be constructed within 1,000 feet of a roundabout, a traffic study must be completed to show that the proposed roundabout, driveway, and/or access connection will function acceptably after full-build out plus five years.

It is worth noting that roundabouts can also be used to resolve spacing conflicts with nearby driveways or streets by incorporating these access points as additional legs into the roundabout. This type of configuration may at times be a viable option for access to a “hard corner” lot – allowing the lot to access the fifth leg of a roundabout. As in the discussion above, a traffic study must be completed in these cases to demonstrate that the proposed configuration will function acceptably in the time horizon discussed above.

**Figure 3.2: Minimum Street and Access Connection Spacing with Roundabouts**

| Street Type | *MTP Target Speed (mph)†* | *MTP Range of Through Lanes* | **I** Roundabout – Driveway Spacing (ft) | **R** Roundabout-Roundabout Spacing (ft) | **C** Street Spacing (ft) | **M** Median Opening Spacing (ft) | **SR** Signal – Roundabout Spacing (ft) |
|---|---|---|---|---|---|---|---|
| System Link | *35 to 45* | *4 to 6* | 300 | 660-1,320* | 1,000-1,320* | 500 - 800 | 1,000-1,320* |
| Commercial Connector | *30 to 35* | *2 to 6* | 250 | 660-1,000* | 660-1,000* | ↓ | 660-1,000* |
| Neighborhood Connector | *30 to 35* | *2 to 6* | 250 | 660-1,000* | 660-1,000* | | 660-1,000* |
| Commerce / Mixed-Use St | *25* | *2 to 4* | 150 | 300-660* | 300-660* | 300-800 | 300-660* |
| Activity Street | *25* | *2 to 4* | 100** | 300-660* | 300-660* | 300-800 | 300-660* |
| Collector Streets | *25 to 30* | *2* | 100 | 250 | 250 | NA | 250 |
| Local Streets | *25* | *2* | 75 | 250 | 250 | NA | 250 |

† Target speed is defined in the MTP as the recommended design speed
* Refer to text discussion regarding allowable minimums and desirable maximums
** New driveways on Activity Streets are only allowed if there is not access from a lower class roadway
***Note:*** *The distances in this table are initial guidelines. Lower values may be acceptable. For all proposed roundabouts, where a driveway (I) is to be constructed within 300 ft or where a connection (R, C, M, SR) is to be constructed within 1,000 feet, a traffic study must be completed to show that the roundabout, driveway, and/or access connection will function acceptably after full-build out plus five years.*

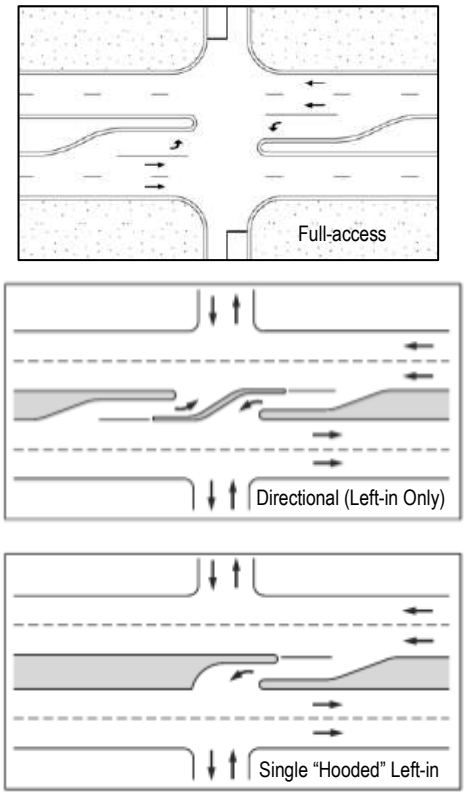


### *Restrictive Medians – Installation and Standards*

Restrictive (or non-traversable) medians improve roadway safety by physically separating vehicles traveling in opposite directions, greatly reducing the chance of head-on collisions. They can also improve roadway operations by controlling where a vehicle can make a left turn onto and off of the roadway, and providing left turn lanes separate from the through lanes. Median types for each section of thoroughfare in Fort Worth are defined by the MTP. In cases where a restrictive median is desired to be included on a thoroughfare in conflict with the MTP (for example, in a high-crash location or other area in which it is desirable to limit left turns to improve safety), the appropriate MTP amendment or waiver process must be followed.

### *Median Openings Types and Installation Requirements*

**Figure 3.3: Example Median Openings**
(Not All-Inclusive)




Median openings are designed to allow one or more left-turn movements across a restrictive median. They can be full-access openings or directional openings as shown in **Figure 3.3**. Left-turn lanes are required at all new or modified median openings with the exception of roundabout intersections, or along "Aesthetic Corridors" as defined by the MTP.

Regardless of street type and median opening type, the minimum spacing between median openings must be 500 to 800 feet. In addition, median openings must conform to the connection spacing and traffic signal spacing requirements outlined previously. The spacing must take into account expected future connections and traffic signals.

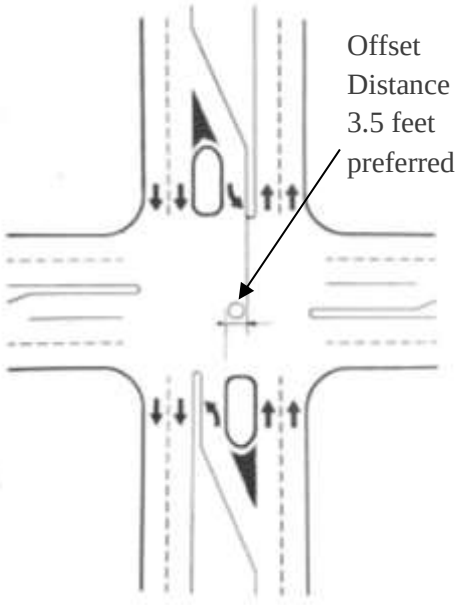
Median openings must only be allowed where they meet the minimum connection spacing requirements, provide adequate sight distance, provide adequate left-turn storage and deceleration length, and meet any other necessary design requirements or guidelines. An engineering study must be provided to support the location of a new or modified median opening.

Additional guidance on appropriate use of directional median openings, including "hooded" left turns, can be found in TRB's Access Management Manual, 2nd Edition (2014)

If the median spacing guidelines cannot be achieved, the engineering study must justify the proposed spacing. Refer to Section VII for the waiver and exception process. The engineering study must demonstrate the need for, and acceptability of, the lower value. This will include documenting that the median opening will not degrade traffic conditions (current or future operations and safety) below acceptable levels. The primary metric for this evaluation must be a comparison of 95$^{th}$ percentile peak hour queue length and the available queue storage, demonstrating that the median opening will not impact upstream and downstream intersections or signals.

New left-turn lanes that are built in wide medians (as defined by the MTP) must be designed to provide offset left turns. Offset left-turn lanes have proven to reduce crash rates by improving the mutual visibility of opposing vehicles. **Figure 3.4** depicts the offset left turn lane with a preferred 3.5-foot offset distance.

**Figure 3.4: Offset Left-turn Lanes**




### *Continuous Two-Way Left-Turn Lanes – Installation and Standards*

The use of continuous two-way left-turn (TWLT) lanes is guided by the typical section selection process in the MTP. From an access management standpoint, the number of driveways on a road with a TWLTL must be minimized to the extent possible (see the Unified Access description in Section V.)

### *U-Turns*

A restrictive median will often prevent left turns out of driveways and other roadways along a corridor, in particular when a directional median opening is used. U-turns provide a way for vehicles to first turn right onto the corridor and then turn around at a downstream median opening. Roadways with medians must be designed such that U-turns can be completed at full and directional median openings when there are no operational or safety restrictions that would limit such movements. Providing for U-turns sometimes includes widening the receiving side of the street and/or median itself such that a U-turn can be made by an appropriate design vehicle.

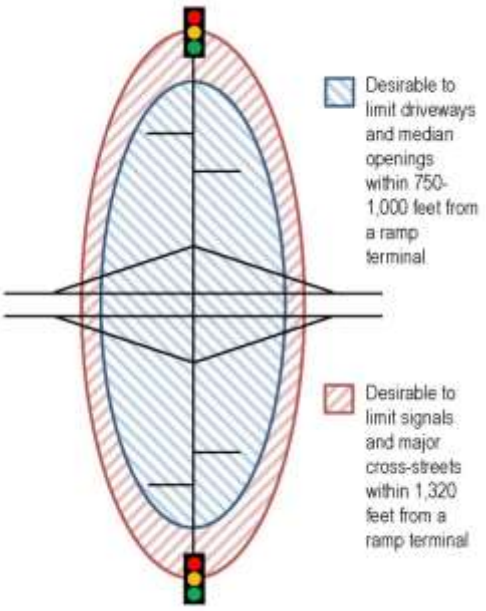
## Access Near Interchanges and Intersections

It is important in access and roadway design to keep the areas near interchanges and intersections clear of street and driveway connections. Research has demonstrated that the presence of connections within the functional area of an interchange or intersection can negatively impact safety and obstruct the efficient flow of traffic. (Rakha et al, 2008. Zhou, Williams & Farah, 2008.)

### *Interchange Functional Areas*

While the access requirements discussed previously provide the guidelines for all new access connections to thoroughfares and collector streets in the City of Fort Worth, it is important to consider access connections near a freeway interchange, freeway ramp, or freeway frontage road in more detail. For these types of facilities, it is useful to consider the concept of an influence area. It is beneficial for traffic flow to limit new connections within the freeway influence area.

**Figure 3.5: Functional Areas near Interchanges**




For an interchange where there are direct ramp connections to a cross-street (such as a diamond interchange), the influence area for driveways and median openings in a current or future urban/suburban area often extends 750 feet to 1,000 feet from the ramp terminal (see **Figure 3.5**). Thus, new driveways and median openings would not be desirable within this area. In addition, major cross-streets and traffic signals are often spaced at least 1,320 feet from the ramp terminal at such an interchange. These distances are to facilitate safe and efficient traffic operations including merging, weaving, and storage. The suggested distances may be shortened for roundabouts based on the results of an operational analysis. The operational analysis must address queues and capacity and the potential effects on adjacent intersections.

For the more common frontage road condition, TxDOT provides access connection guidance; the connection spacing guidance provided earlier in this document would apply to the cross-street. However, even in these cases, longer spacing distances on the cross-street near the frontage road can provide for improved traffic operations and safety in that critical area.

Where possible, direct property access within an interchange area must be provided by side-streets (typically collector or local roadways) and not the main interchange crossroad. This could include using joint-access serving multiple properties as described later in this document (see Section V).

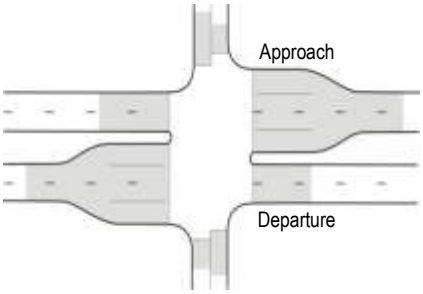
While these interchange area recommendations and values are not required by this guidance, it is the goal of this document to promote good street design and access spacing in the vicinity of freeway connection points. This is especially true for areas where substantial development has not yet occurred.

### *Access near Stop-Controlled Intersections, Signalized Intersection, and Roundabouts*

According to AASHTO's A Policy on Geometric Design of Highways and Streets, "The design and operation of intersections have a significant effect on the operational quality of an arterial." (AASHTO, 2011, p. 7-42) Access points located within this functional area can have a significant negative impact on both traffic flow and safety. In order to decrease the probability of crashes and to maintain efficient traffic flow, for new or modified access points (streets, driveways, and median openings), designers are encouraged to consider intersection functional areas when locating new access point and street connections.

The functional area of an intersection is the area both upstream and downstream from an intersection that is influenced by slowing, stopped, turning, merging, or accelerating vehicles. **Figure 3.6** illustrates the intersection functional area.

**Figure 3.6: Intersection Functional Areas**




The key elements of the upstream functional intersection area include the 1) perception-reaction distance, 2) deceleration and lane change distance, and 3) queue storage.

The downstream influence area includes the distance needed for acceleration (including any taper). Conflicts and unexpected operations should be avoided in this area. Decision sight distance is recommended for determining the downstream functional area.

The TRB Access Management Manual 2nd Edition (TRB 2014) provides guidance on methods for calculating both the upstream and downstream functional areas. Designers are encouraged to use the latest version of this document (or another similar reference) to determine these distances and to take them into account in locating new driveways and other access points. Influence zones must be identified in the access request. City staff has the authority to limit or minimize access in the intersection functional area.

# Auxiliary Lanes

IV

The provision of auxiliary turn lanes at intersections and driveways is essential to the safe and efficient flow of traffic on the local roadway system. Left- and right-turn lanes allow vehicles to slow and queue without undue disruption to the through vehicles in the traffic stream. In particular, this helps reduce the speed differential between through and turning vehicles until the turning vehicles are safely in the turn lane. Turn lanes also increase intersection capacity and facilitate safe turning movements, even at large heavily traveled intersections.

## Left-Turn Lane Requirements

At non-roundabout intersections, left-turn lanes must be provided in the following locations and conditions:

1. **Along a Thoroughfare:** Left-turn lanes must be provided along thoroughfares at all driveways or street intersections where left turns are allowed, with one potential exception: engineering judgment may be used along Activity Streets at such new connections.
2. **Along a Thoroughfare or Connecting Street/Driveway:** Left-turn lanes must be provided on all approaches to signalized (or possible future signalized) intersections, unless the design restricts left-turns.
3. **Along a Connecting Street/Driveway:** Left-turn lanes must be provided on all approaches along new connections (street and driveway approaches) with System Links, Commercial Connectors, or Neighborhood Connectors where left-turns onto the thoroughfare are permitted. This requirement applies to approaches with two-way average daily traffic (ADT) values exceeding 1,000 vehicles per day (under a buildout scenario), unless a traffic study, approved by the City Traffic Engineer, demonstrates that a left-turn lane is not needed.
4. **Along Streets with Medians:** Left-turn lanes must be provided at all median openings that allow left turns on streets with medians. This applies to the street with the median, not the side-street or driveway unless it meets other criteria in this section.
5. **Along Collector Streets:** Left-turn lanes must be provided on collector streets at intersections serving non-residential or high-density residential development (for example streets or driveways serving commercial or industrial uses).

Possible future dual left-turn lane configurations must be studied for at all System Link, Commercial Connector, and Neighborhood Connector intersections.

In addition, left-turn lanes (including dual left-turn lanes) must be provided where an engineering study indicates that they are needed for safety, access, or traffic operations. If a left-turn lane required above is to be omitted, an engineering study must show that its elimination will not negatively impact traffic safety and operations.

To facilitate left turns, the length of a turn bay must cover an average vehicle's deceleration distance as well as the queue storage length and taper length. To determine the design requirements and measurements for left turn bays consult the Fort Worth Traffic Engineering Design Standards and Policy Guidelines. The most recent versions of the TxDOT Roadway Design Manual and TRB Access Management Manual can

also be referred to for design guidance. Continuous two-way left turn lanes may be used in lieu of individual left-turn lanes where permitted.

## Right-Turn Lane Requirements

Right-turn lanes are used to improve safety and reduce delay for through vehicles, by providing a safe area for vehicles to decelerate and even stop before making a right turn. (TRB, 2016) The safety benefits of right-turn lanes, while less than for left-turn lanes, are documented in the *Highway Safety Manual* (AASHTO, 2010) and in research provided in the Crash Modification Factor (CMF) Clearinghouse. Operationally, right-turn lanes most strongly benefit intersections with high right-turn volumes.

On a TxDOT roadway with a speed equal to or less than 45 mph, a right-turn lane into a property is warranted if the right turn volume is greater than 60 vehicles per hour (vph). This applies to both divided and undivided roadways. There are however, some additional considerations including safety, trucks, limited right-of-way, queues, and several other factors. (TxDOT, 2011) For Fort Worth streets, this single-value approach does not recognize that different street types have different traffic needs, nor is it reflective of the slower design speeds expected on most of the Fort Worth street types.

Unsignalized Intersections and Driveways

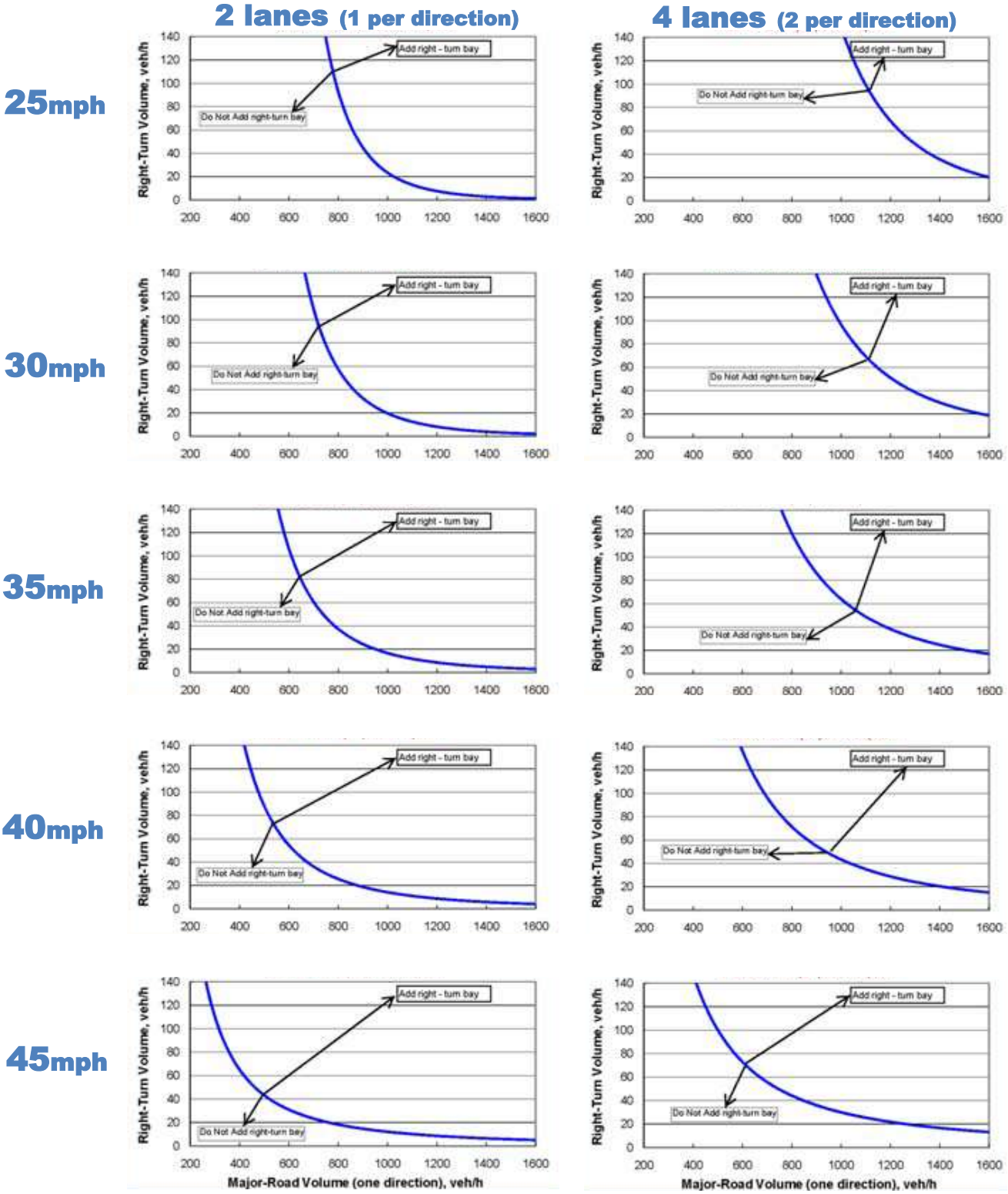
For unsignalized (stop controlled) intersections, the graphs shown in **Figure 4.1** should be used as the initial step in determining if right-turn lanes are required. This applies to both street and driveway intersections with and without medians. The volumes used for the evaluation should be future design year volumes, typically project build-out plus 5 years or 10 years from opening day for City street projects. This guidance provides thresholds for 2-lane and 4-lane facilities and for the following posted speed limits: 25 mph, 30 mph, 35 mph, 40 mph, and 45 mph. Thus, it addresses all of the target speeds for the different MTP thoroughfares. If the right-turn volume used to meet the warrant is below the TxDOT 60 vph threshold, then additional analysis may be appropriate to confirm that a right-turn lane is necessary.

In addition to the volume thresholds, consideration should be given to other factors before a final determination is made. These factors should be documented in a traffic study if the volume thresholds are exceeded, but a right-turn lane is not proposed. The other factors to be considered include:

- Traffic operational needs and issues
- Safety and crash history
- Truck and bus volumes
- Land-Use and Street Type
- Pedestrian and bicycle needs
- Right-of-way constraints
- Design considerations

If the street has six through lanes, the evaluation must consider whether the outside lanes can serve the right-turn lane function, eliminating the need for dedicated right-turn lanes. Traffic safety and the presence of left-turn movements crossing the outside lane must be considered in the evaluation.

**Figure 4.1: Guidelines for Right-turn Lanes at Unsignalized Intersections and Driveways**
*(Speeds = posted)*




*Source: Facilities Development Manual, Chapter 11, Section 25: Intersections at Grade, Wisconsin Department of Transportation, 2017. http://wisconsindot.gov/rdwy/fdm/fd-11-25.pdf The graphs used in the Wisconsin report were developed based on NCHRP Report 457. http://onlinepubs.trb.org/onlinepubs/nchrp/esg/esg.pdf*

Signalized Intersections

The volume thresholds discussed for unsignalized intersections must be used as an initial screening to identify signalized intersections that may not need right turn lanes. For all new signalized intersections an operational analysis must be conducted to identify whether a right-turn lane is necessary to achieve desirable traffic operations. A quantitative safety analysis must also be conducted to compare the predicted crash frequency with and without right turn lanes.

In addition to the volume thresholds, operational analysis, and quantitative safety analysis, consideration must be given to other factors before a final determination is made. The other factors to be considered could include:

- Other traffic issues
- Crash history
- Truck and bus volumes
- Land-Use and Street Type
- Pedestrian and bicycle needs
- Right-of-way constraints
- Design considerations

Right turn-lanes follow the same turn-bay length guidelines as those for left turn lanes, as shown in **Figure 4.1**.

The final decision regarding providing right-turn lanes for both unsignalized and signalized intersections will rest with the City Traffic Engineer or designee.

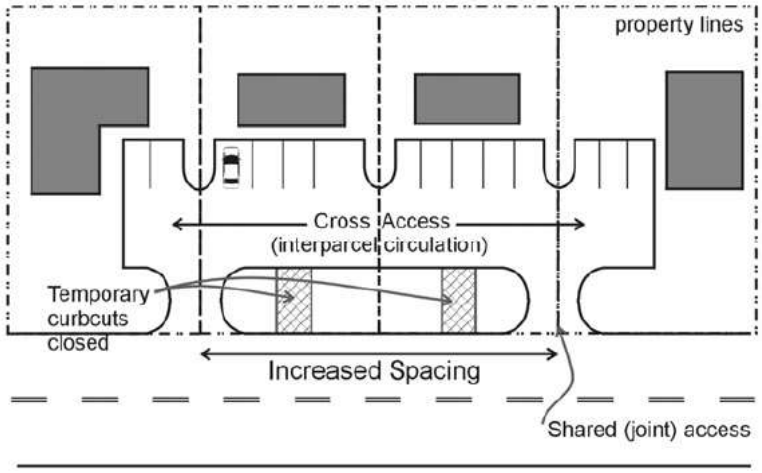
# Unified Access and Circulation

V

Internal connections between neighboring properties and shared driveways allow vehicles to circulate from one business or development to the next without having to reenter a major roadway. Unified access and circulation improves the overall ease of access to development and reduces the need for individual driveways. The purpose of this section is to describe and facilitate unified access and circulation systems, especially for commercial development.

In order to limit the number of access points and short trips along a thoroughfare, joint-access and cross-access serving adjoining parcels must be considered (see **Figure 5.1**). Developments must have proper site designs that allow for movement between different trip destinations without forcing the traveler on to the main roadway network. Individual "strip" development(s) are discouraged if a supporting road network is absent. Developments with multiple destinations must have internal access to one another. Neighboring parcels with driveways that could reasonably be shared (as determined by the City Traffic Engineer or designee) must share access points.

**Figure 5.1: Joint-Access and Cross-Access between Adjacent Parcels**




Note: Joint-access and cross-access can be at the front, side, or rear of a property, depending on the design of the sites involved and the location of the parking, drive aisles, and the public streets.

## Developments with More than One Building Site

Unified access and circulation plans must be prepared for all development sites that consist of more than one building site. This applies to sites with one owner as well as sites with multiple owners that are consolidated for the purposes of development. In addition, the following apply:

- The number of connections must be the minimum number necessary to provide reasonable and adequate access to the overall development, as informed by a traffic study, and not the maximum available for the development's frontage. The traffic study must address the following topics if relevant:
    - Total entering and exiting traffic

- Site circulation patterns
- Emergency access and safety
- Short-term and long-term traffic demand and operational needs
- Pedestrian and bicycle considerations

Note that the minimum spacing distances in Section III are not intended to set the number of access points for a given property frontage.

- Direct outparcel access must be provided from the development's interior roadways and aisles and not from the development's external frontage.
- All necessary easements and agreements must be recorded in an instrument that runs with the deed to the property.
- Unified access for abutting properties under different ownership and not part of an overall development plan must be addressed through the Joint and Cross Access provisions below.

## Joint and Cross Access

Joint and cross access policies promote connections between major developments, as well as between smaller businesses along a corridor. These policies help to achieve unified access and circulation systems for individual developments under separate ownership that could not otherwise meet access spacing standards or that would benefit from interconnection, e.g., adjacent shopping centers or office parks that abut shopping centers and restaurants. Thus, the intent of the joint-access and cross-access provisions is to limit access connections to thoroughfares and collectors and to help meet the spacing guidelines in Section III. **Figure 5.1** shows an example of joint-access between four sites. Regarding joint and cross access, the following apply:

- Adjoining parcels with driveways that could reasonably be shared (as determined by the City Traffic Engineer or designee) must share access points. This does not apply to single-family residential development.

- Adjoining commercial or office properties and major traffic generators, e.g. shopping plazas, must provide a cross-access drive and accessible pedestrian connection (not necessarily in the same place) to allow circulation between adjoining properties. These connections must be accompanied by supporting public access easements. This requirement also applies to a building site that abuts an existing developed property unless the City Traffic Engineer or designee finds that this would be impractical.

- For smaller development sites, to promote efficient circulation and to meet the spacing requirements of this guide, the City Traffic Engineer or designee may require dedication of a public access easement consistent with the most recent Subdivision Ordinance, extending to the edges of the property lines of the development site under consideration to provide for the development of a public access easements system. If the easement is required, the physical connection must be built to said property lines. It must be visually obvious that abutting properties may tie in to the easement and connection in the future. Abutting properties must be required to continue the public access easement and connection as they develop or redevelop in

accordance with the requirements of this policy. The easement and connection may be provided to the front, side, or rear of the site or across the site where it connects to a public roadway.

- For multi-development sites, public access easements and associated connections must be in place prior to issuance of a building permit in accordance with Section 31-150 of the Subdivision Ordinance. Where properties are under the same ownership or consolidated for the purposes of development, the establishment of the public access easement(s) and construction of the connection(s) are the responsibility of the developer. Where the easement(s) will serve properties under separate ownership, easement and connection costs must be apportioned in accordance with adopted City policies.

- Property owners must record all necessary easements and agreements, including any easement allowing joint-access serving more than one property, any easement allowing cross-access to and from the adjacent properties, any agreement to close driveways provided for access in the interim after construction of the joint access driveway(s) or public access easements system, and any joint maintenance agreement defining maintenance responsibilities of property owners that share the joint-access driveway and cross-access system. The property owner must also agree to close any pre-existing curb cuts after the construction of both sides of a joint-access driveway.

- The requirement to build a public access easement to city street standards from Section 31-106 (i) of the Subdivision Ordinance does not apply in the case of a public access easement dedicated for the sole purpose of complying with the driveway and access spacing requirements of this policy. The design criteria in Section 31-106 (i) (b) should be used if the public access easement is intended solely to provide cross-access as a driveway. If the public access easement is intended to function as a city street and not a driveway, it must be constructed to city street standards.

- Joint and cross access requirements may be waived when, in the City Traffic Engineer's or designee's judgment, such a waiver is warranted. Instances in which a waiver may be warranted include, but are not limited to, incompatible uses (e.g., a gas station next to a childcare center), or major physical constraints (e.g., significant change in grade between properties).

- Public access easements are the preferred method of dedication because it the best way for the City to ensure perpetually available cross-access. However, private access easements may be allowed in certain conditions at the discretion of the Director of Transportation and Public Works. The agreement must include: a provision that states that dissolution of the agreement will not be considered as sole justification for new or modified access; and all developments that take access must be a party to the agreement.

# Redevelopment Application

VI

The access management requirements of this code do not affect existing access along existing roadways. Existing access connections that do not meet the requirements of this policy are considered non-conforming access. These connections are allowed to remain based on the requirements in place when they were constructed. This protects the existing property owners' rights and recognizes the expense of bringing non-conforming properties into conformity. However, the goal of this document is to bring the roadway system into compliance over time.

Properties with non-conforming access connections should be brought in to compliance with the Access Management Manual provisions to the maximum extent possible when one or more of the following conditions occur.

- When the roadway with the access connections is modified
- When a new or modified access connection is requested or required
- When a plat or re-plat is required
- When a new development involving a change in use or occupancy of any existing structure, which requires a new permit with the exception of shell structures never previously occupied, that has the effect of increasing vehicular traffic to/from the site such that it is 10 times (or more) the traffic attributable to the immediately preceding use, and which may include but is not limited to the reconstruction, redevelopment, conversion, structural alteration, or enlargement of any structure.
- When the City Traffic Engineer or designee has documented a safety concern related to the site access, including but not limited to high-volume driveways in close proximity to intersections or railroad crossings, offset intersections, high crash locations, limited sight distance, or pedestrian and/or bicycle conflicts.

An engineering study may be required to support continuation of the existing access conditions. In all other cases, the existing access connection should be allowed to continue.

# Driveway Connection Geometry VII

The design of driveways is important in access management in that it affects the speed of traffic turning into and out of driveways. This in turn affects the speed differential between through traffic and turning traffic where auxiliary turning lanes are not provided. Large speed differentials are created where driveways are inadequately designed, and these higher speed differentials are associated with higher crash rates and diminished traffic operations. (Generally, this section is not relevant to single-family residences and duplexes.)

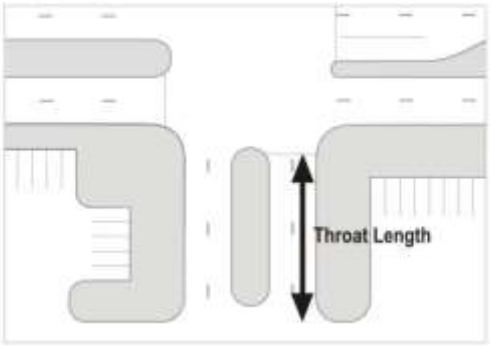
Another critical aspect of the driveway or connection design is the potential for traffic operations on private property to become congested and spill or queue back onto the public street. Adequate separation of internal conflict points from the public street is necessary to eliminate or diminish this potential. Driveway designs must always be based on the results of a study of the traffic likely to use them, and must be developed based on the guidelines provided in the 2014 TxDOT *Roadway Design Manual*, Appendix C.

## Driveway/Connection Standards

### *Driveway Throat Length*

The throat length must minimize or eliminate the condition where inbound traffic queues back onto a public street (see **Figure 7.1**). The throat length also provides a place for exiting vehicles to queue, better definition of the driving lanes, and separation between the parking area and the adjacent street. Driveway throat lengths must meet the following requirements and must be based on the ultimate public street section anticipated:

**Figure 7.1: Driveway Throat Length***




**Note: The Fort Worth Traffic Engineering Design Standards and Policy Guidelines document is the source for design details on driveways including widths, radii, angles, slopes, etc.*

- All driveways must provide at least 50 feet of throat length adjacent to local streets and 100 feet adjacent to thoroughfares and collectors.
- For driveways serving between 100 and 400 vehicles in the peak hour (two-way traffic volumes) the driveways must provide at least 150 feet of throat length.
- For driveways serving over 400 vehicles per hour (two-way traffic volume) and for all driveways controlled by a traffic signal, adequate throat length must be determined by a transportation impact study.
- For driveways serving extremely low volumes (10 vehicles or fewer in the peak hours) on streets with low volumes (fewer than 100 vehicles existing or projected in any hour) and low speeds (25 miles per hour speed limit), a throat depth of 30 feet may be permitted at the City Traffic Engineer's or designee's discretion.
- On Activity Streets and Commerce Mixed-Use Streets the required throat length can be modified by the City Traffic Engineer or designee based on the results of an engineering analysis.

# Review / Exceptions Process

VIII

Flexibility is essential when administering access spacing requirements to balance access management objectives with the needs and constraints of a development site. The following administrative procedures are intended to provide flexibility, while maintaining a fair, equitable, and consistent process for access management decisions. The exception/waiver process described below applies to all of the guidelines in this Manual.

## Approval Required

No person may construct or modify any access connection to a roadway within the City of Fort Worth without approval from the City. Approval is typically granted through the preliminary and final development plan processes and/or engineering approval of construction plans for roadways. All requests for connections to a roadway within the City after the date of adoption of this Access Management Manual must be reviewed for conformance with this Access Management Manual, except as noted below.

Access connections that do not conform to this policy and were constructed before the effective date of this Manual are considered legal nonconforming connections and may continue until a change in use occurs as described in Section VI.

Any access connection constructed without approval after the adoption of this Manual is considered an illegal nonconforming connection and may be issued a violation notice and may be closed or removed.

## Requests for Modification

Access connections deemed in conformance with this policy will be authorized by the City Traffic Engineer or designee. The City Traffic Engineer or designee may reduce the connection, median opening, signal, and roadway spacing requirements by up to 10 percent or 100 feet (whichever is less) where it is impractical to meet the standards, except where prohibited by this Manual. Any requests for modification greater than 10 percent require approval by the Transportation and Public Works Director based on the results of a traffic study with appeals to the City Manager.

Modifications greater than 10% or 100 feet require documentation justifying the need for the modification and an access management plan for the site. The study area for the access management plan must include the site frontage plus the distance to the nearest thoroughfare or collector in either direction.

The analysis must address existing and future access for study area properties, evaluate impacts of the proposed plan versus impacts of adherence to standards, and include improvements and recommendations necessary to implement the proposed plan. The impact analysis must conform to the City's *Transportation Impact Study Guidelines* and the thresholds in those guidelines.

## Variances

Based on an engineering study, the standards outlined in this Manual may be altered or waived by the City Traffic Engineer or designee to accommodate existing street or property limitations or extraordinary conditions.

## Waiver for Nonconforming Situations

Where the existing configuration of properties and driveways in the vicinity of the subject site precludes spacing of a connection in accordance with the spacing standards of this Manual, the Transportation and Public Works Director or designee, in consultation with appropriate City departments, will be authorized to waive the spacing requirement if all of the following conditions have been met:

- No other reasonable access to the property is available.
- The connection does not create a potential safety or operational problem as determined by the City Traffic Engineer or designee based on a review of a transportation impact study prepared by the applicant's professional engineer.

An access connection along the property line farthest from the intersection may be allowed. The construction of a median may be required on the street to restrict movements to right-in/right-out, and only one drive will be permitted along the roadway having the "higher" Street Type. For the access connection, joint-access must be considered with the property adjacent to the farthest property line, and if implemented it must follow the provisions of Section V.

# Glossary

**AASHTO:** American Association of State Highway and Transportation Officials

**Access Point:** See definition for connection.

**AADT:** Average Annual Daily Traffic. The average number of vehicle trips generated in one day over the time frame of one year.

**ADT:** Average Daily Traffic. The average number of daily vehicle trips generated over a specific time period.

**Connection:** Any street or driveway intersection with a public street. It also includes median openings on public streets.

**City Traffic Engineer:** The City Traffic Engineer can authorize a designee to make decisions where the text authorizes the City Traffic Engineer or designee to make decisions.

**Driveway throat:** The portion of the driveway extending back from the public street, uninterrupted by any internal site access points (through physical prohibition by raised islands).

**FHWA**: Federal Highway Administration

**Flag lots:** Lots created such that each parcel has access to the main roadway instead of the preferred method where the parcels would connect on a private drive or local roadway.

**LOS:** Level of service. A measure of effectiveness that determines the quality of service on transportation infrastructure.

**MTP:** Master Thoroughfare Plan

**NCTCOG**: North Central Texas Council of Governments

**Outparcels:** Lots on the perimeter of a larger parcel that break its frontage along a roadway. They are often created along arterial street frontage of shopping center sites, and leased or sold separately to businesses that desire the visibility of major street locations.

**Queue:** A line of vehicles.

**Trip Generation:** Prediction of the amount of traffic originating from a particular location.

**TxDOT:** Texas Department of Transportation **V/C:** The ratio of demand flow rates to capacity for a given type of transportation facility.

**VPD:** Vehicles per day

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