

STREET ACCESS MANAGEMENT*

***Editor's note:** Printed herein are the street access management regulations as enacted in Ordinance Number 4510, adopted on Oct. 15, 2007. All amending ordinances adopted subsequent to Oct. 15, 2007, are indicated by the presence of history notes in parentheses (), following the section amended. The absence of such a note indicates that a section has remained unchanged since Oct. 15, 2007. The original arrangement, catchlines and subcatchlines of Ordinance Number 4510 have been retained. Material which has been added by the editor for clarity is indicated by brackets []. Obvious errors in spelling and punctuation have been corrected without notation.

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SECTION 1.0 PURPOSE

A. Title and List of Guidelines.

These regulations may be referred as the "Access Management Ordinance" of the City of Lebanon.

LIST OF GUIDELINES

The following table provides a listing and rationale for the guidelines included in this document.

TABLE INSET:

Access Management Guidelines	What It Means	Why It Is Important
Distance between major at-grade intersections.	The minimum distance or spacing between types of roadways (e.g. between two major streets.	Preserves traffic flow and ensures that a functional hierarchy of roads is maintained:
Distance between traffic signals.	The minimum and desirable spacing between signals.	Ensures efficient traffic flow on signalized arterials. Too many signals placed too close together will disrupt traffic flow.
Auxiliary lanes (dedicated left and right turning lane guidelines.	The traffic conditions under which turning lanes should be provided to serve a commercial or industrial driveway or street.	Some high volume driveways should have dedicated left or right turn lanes to reduce conflicts with through traffic.
Guideline on using two-way left-turn lane (TWLTL).	When TWLTL's should be used and when raised medians should be used instead.	TWLTL's are far less controversial than raised medians; however TWLTL's do not function well once a certain traffic volume range has been reached.
Guidelines for using three lane TWLTL crossing-section.	The three lane road may perform better than a four lane undivided roadway under the right circumstances.	Three lane roads are a relatively new concept that may be an economical solution to some access problems.
Driveway spacing and density.	The amount of distance between driveways and the number of driveways per unit of frontage. These guidelines should vary with the roadway classification, the expected land use, and the speed limit for the road.	Short spacing between driveways and high driveway densities generate conflict points that in turn lead to higher crash rates and more traffic congestion.
Corner clearance	The minimum distance allowed	Insufficient corner clearance is a

and clearance of the functional areas of intersections.	between an intersection and the first driveway.	major cause of access-related crashes.
Sight distance standards.	The sight distance conditions under which a driveway should not be allowed.	A driveway opening where there is insufficient sight distance is inherently dangerous.
Driveway geometric guidelines.	The width, turning radius, throat length, approach angle, grade and surfacing requirements for driveways. These can vary by the expected land use served by the driveway and the roadway classifications	Insufficient driveway geometrics lead to slow driveway entrance and exit speeds. This leads to conflicts between turning and through traffic. Driveway geometric design can help or hinder pedestrians and bicyclists.
Parking on Streets.	Vehicle parking on street right-of-way.	Street parking increases congestion and crashes on city streets as drivers pull on and off the roadway often with limited visibility.

B. Purpose and Policy.

To define policy and procedure to improve traffic flow and safety on existing city streets.

As development occurs and vehicle traffic increases, many roadways deteriorate into highly congested routes that experience unacceptable delays and crashes. This deterioration can be due in part to improperly spaced and designed intersections and driveways. These intersections and driveways cause crashes and conflicts to through traffic. Roadways serve a dual purpose of providing a means of transport between one place and another and providing access to adjacent property. Access management is intended to balance the roadways' role of serving through traffic with the role of providing access to property.

Once the safety and efficient operation of a roadway is lost, it is difficult and expensive to restore. Adding lanes to an existing route does not completely solve the problem.

The goals established for the development of access management guidelines for the City of Lebanon include the following:

- Improve roadway safety
- Improve traffic operations
- Protect taxpayers' investment in roadways
- Co-ordinate all City Planning efforts to maximize resource utilization.

Access management involves the proper planning and design of points of access to the public roadway system. These points of access include public roadway intersections and driveways. Sound access management can have a positive impact on roadway safety and the ability of roadways to carry traffic efficiently and safely. Failure to properly manage access can result in safety and operational problems, negatively

impact adjacent property owners, and cause a loss of the public's investment in the roadway system.

Access management on existing streets with existing driveways will only be considered at the time of a major change to traffic flows or street configuration.

New roadways intersecting existing roadways will be subject to these guidelines after adoption by the City Council.

All new driveways, intersections or access to City streets must be approved by the City of Lebanon Planning and Zoning Administrator and shall be granted an access permit.

Driveway and intersection guidelines include the following:

- Spacing for public road intersections
- Spacing of traffic signals
- Driveway spacing and density
- Corner clearance and clearance of functional areas of public road intersections
- Sight distance minimums
- Driveway geometric design
- Angle of intersection and approach radii
- Driveway width, throat length and grade
- Guidelines for surfacing and curbs

SECTION 2.0 STREET CLASSIFICATION SYSTEM AND ACCESS PERMITS

A. Street Classification Map.

1. The City Council shall adopt a street classification map consistent with the Comprehensive Plan and according to the classifications as set out below. This map shall be amended from time to time and shall be used to guide the decision-making process regarding access to public street system.

a. *Principal Arterial.* A street primarily intended to provide for high-volume, moderate-speed traffic and moderate to extended trip length traffic movement between major activity centers. Access to abutting property to major traffic movement and is subject to the necessary control of entrances and exits. (E.g. Elm, Hwy 5, Hwy 32, Morgan, etc.)

b. *Major Arterial.* A street which interconnects with and augments and feeds the primary arterial system and is intended for moderate volume, moderate speed traffic and short to moderate trip lengths. Access to abutting property is partially controlled. (E.g. Beck, Tower, etc.)

c. *Major Collector.* A street which collects and distributes traffic to and from local and arterial street systems and is primarily intended to provide for low-to-moderate volume, low-speed and short length trips while also providing access to abutting property. (E.g. Adams, Clark, Madison)

d. *Residential Collector.* A street which collects and distributes residential traffic between local streets and collector and arterial streets and is primarily intended for low-to-moderate volume, low-speed and short length trips while also providing access to abutting properties. (E.g. Fowler, Deadra, Raef, Brook, etc.)

B. Residential/Commercial Subdivisions Access Permits.

1. Plat approved permits. Approval process through plat and access permit numbers assigned with building permit.

2. New construction initiated accesses not approved via sub division plat (i.e. new construction initiated after November 1, 2007). The turnaround guidelines for approval is 5 days once application has been submitted.

SECTION 3.0 AT-GRADE INTERSECTIONS SPACING

A. What This Guideline Means.

The guideline governs the minimum distance or spacing between types of public roadways and their intersections. This guideline provides for a hierarchy of roads and maintains adequate spacing between roads that are intended to serve through traffic. Collectors provide some service to through traffic but also provide direct access to property; therefore, they can be placed closer together.

B. Minimum Guideline.

TABLE INSET:

Roadway Classification	Minimum Spacing
Principal Arterial	1 mile (5,280 feet)
Major Arterial	1/2 mile (2,640 feet)
Collector	1/4 mile (1,320 feet)
Residential Collector	1/4 mile min. to 1/2 mile max.

SECTION 4.0 TRAFFIC SIGNALS SPACING

A. What This Guideline Means.

This guideline governs the distance between signalized at-grade intersections on public roadways. Minimum spacing is mainly intended to preserve efficient traffic flow and progression on urban arterial roadways; for instance, a quarter-or half-mile spacing allows traffic signals to be effectively interconnected and synchronized. Adequate spacing will also tend to reduce rear-end collisions and "stop and go" driving that increases congestion, delay, and air pollution. In urban areas, these guidelines were developed to allow for smooth operations given a 90-second total traffic signal cycle length.

B. Minimum Guideline.

TABLE INSET:

Roadway Classification	In Current and Projected Urban Areas
Principal Arterial	* 1/2 mile (2,640 feet)

*Only advisable when traffic count warrants or special circumstances exist.

SECTION 5.0 AUXILIARY TURNING LANES

A. What This Guideline Means.

Dedicated left and right-turn lanes should be provided in situations where traffic volumes and speeds are relatively high and conflicts are likely to develop at public road intersections and private driveways between through and turning traffic. Auxiliary lanes are an asset in promoting safety and improved traffic flow in such situations. The use and design of any auxiliary lanes shall always be guided by a traffic study. Some major applications for and considerations for the design of auxiliary lanes are as follows:

B. Installing Auxiliary Left-Turn Lanes.

Such lanes, installed in the roadway center, are intended to remove turning vehicles from the through traffic flow. This should reduce the frequency of rear-end collisions at locations where there is considerable left-turn ingress activity, such as major driveways and minor public road intersections. Suggested application for left-turn lanes in the median are shown in the table below. A turn lane shall be considered when the left-turning volume meets or exceeds the value in the table for a posted speed.

TABLE INSET:

Posted Speed Limit (mph)	Left-turn Volume (at Peak Hour)
35	20
45	15

The use and design of auxiliary left-turn lanes shall be guided by a traffic study. In general, auxiliary left-turn lanes must be long enough to accommodate a safe deceleration distance and to provide adequate storage of a queue for expected peak hour turning traffic.

C. Installing Auxiliary Right-Turn Lanes.

The use of dedicated right-turn lanes shall also always be guided by a traffic study. In general, dedicated right-turn lanes shall be provided on two lane routes as shown in the table below when the right-turn volumes at peak hour are met or exceeded.

TABLE INSET:

Posted Speed Limit (mph)	Right-turn Volume (at Peak Hour)
35	20
45	15

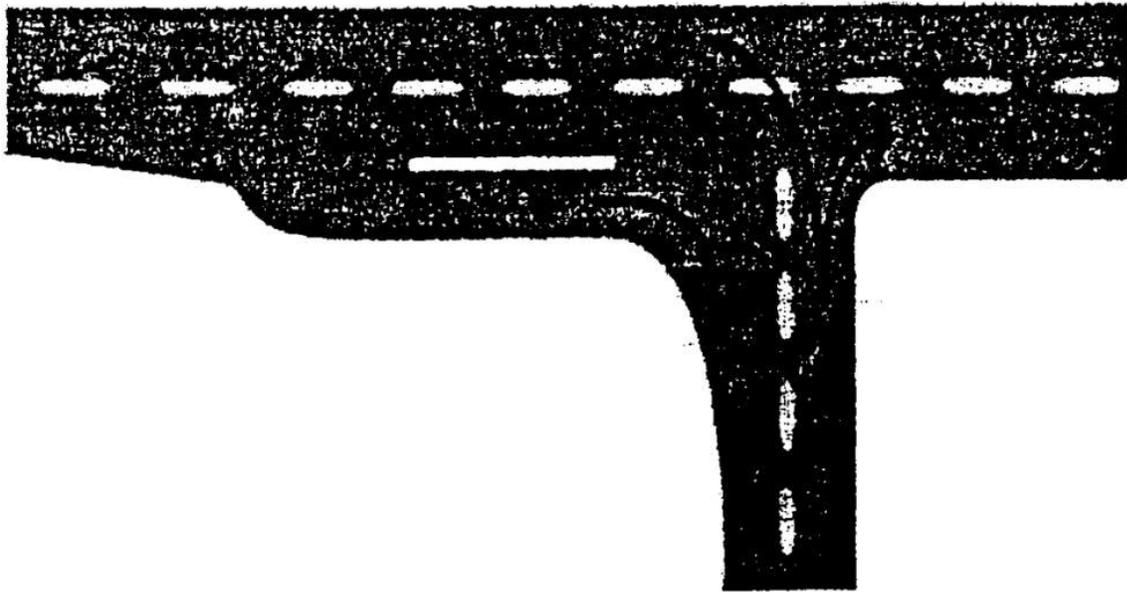
D. Dedicated right turn lanes shall be considered in situations where:

- Poor internal site design and circulation leads to backups on the mainline. Auto-oriented businesses with short drive-through lanes or poorly-designed parking lots would be prime examples of this situation.
- The peak hour turning traffic activity is unusually high (e.g. greater than 10 percent of the daily total.)
- The driveway or minor public road intersection is difficult for drivers to see.
- The driveway entrance is gated or otherwise must be entered very slowly.

- Right turning traffic consists of an unusually high number of trailers or other large vehicles.
- The intersection or driveway angle is highly skewed.
- Rear end collision experience is unusually high at a location.

As with any auxiliary turning lane, dedicated right-turn lanes shall be designed based on the results of a traffic study.

FULL RIGHT TURN LANE



E. Width of Auxiliary Acceleration and Turn Lanes.

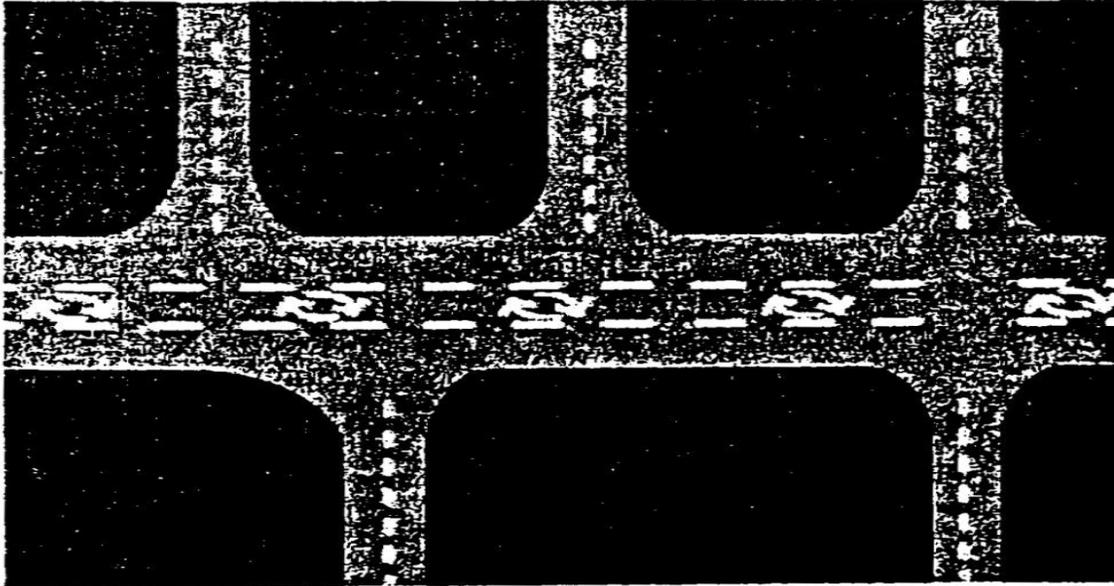
Any auxiliary turning lanes such as dedicated right and left turns shall be at least 11 feet wide. Twelve feet is a desirable width, not including the gutter.

SECTION 6.0 THREE-LANE CROSS SECTIONS

A. What This Guideline Means.

Three-lane cross sections (two through lanes with a TWLTL in the center) are a possible access management tool in certain situations. Such roadways are about 25 percent safer than an undivided four-lane road and can provide comparable capacity provided that intersections are well designed. They work best in situations where traffic volumes are moderate and where the proportion of vehicles turning left is high. TWLTL's are best used in situations where driveway density is low to moderate (e.g., below 24 commercial driveways per mile, which equates to a spacing of about 440 feet between driveways). They shall be strongly considered in multifamily residential areas or mixed land use areas, especially on minor arterials and collectors. This guideline does not refer to third lanes used as passing, turning, or climbing lanes in rural areas.

Three-Lane Cross Sections



B.Guidelines.

TABLE INSET:

Roadway Classification	In Current and Projected Urban Areas
Principal Arterial	Not Available
Major Arterial	May be used when appropriate and/or where AADT in design year is less than 15,000
Collector	May be used when appropriate and/or where AADT in design year is less than 15,000
Residential Collector	Not Available

SECTION 7.0 DRIVEWAY SPACING

A. What This Guideline Means.

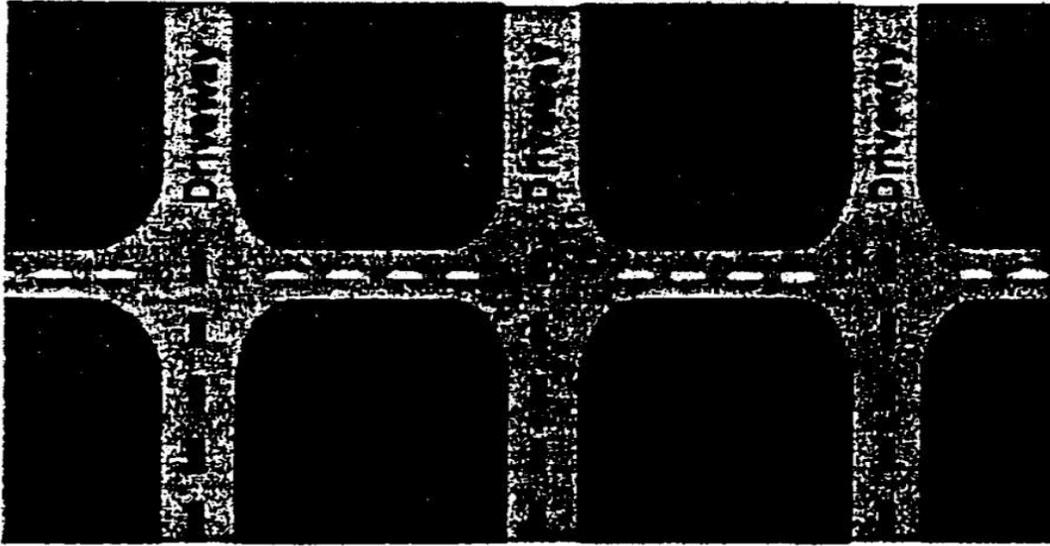
This guideline governs the minimum recommended spacing between private driveways necessary to preserve both safety and traffic flow. Spacing between driveways must be longer on higher speed routes in rural areas than in urban areas. In urban areas, these guidelines allow for about one driveway per city block face on principal arterials, minor arterials, and two driveways per block face on collectors.

In order to preserve spacing, direct access should be moved to local streets (not arterials) or shared driveways where possible. In particular, access for corner lots should be moved to a lower traffic side street whenever possible. Access can often be better accomplished on major streets through such means as frontage and backage roads, joint access, cross access, and shared driveways. This guideline only applies where sight distance allows. Driveways shall not be allowed where sight distance is inadequate even if the driveway spacing guideline would allow them.

Driveway accesses shall be provided on local and collector streets ("side streets") rather than arterials wherever possible. Driveways shall also be lined up across the public roadway from each other whenever possible. When driveways are not lined up, the minimum spacing shall be measured from the closest driveway on either side of the road, except where a non-traversable (e.g., raised) median exists.

On urban routes where non-traversable medians exist, shorter driveway spacing may be acceptable for right-in, right-out driveways only.

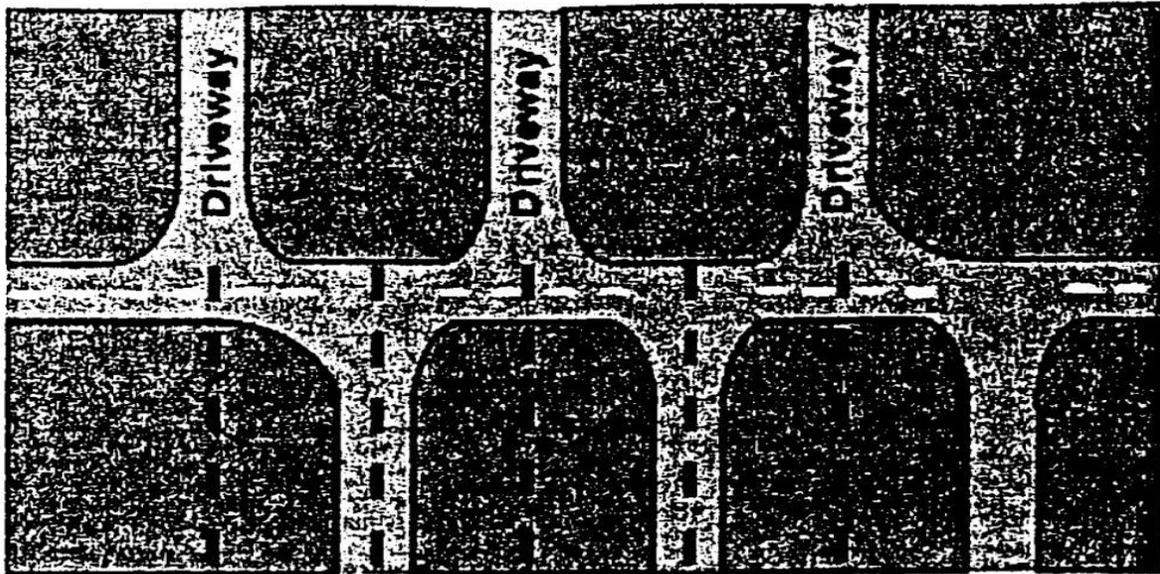
Driveway Spacing



Minimum Spacing Between Driveways

(Centerline to Centerline)

Driveway spacing (*Off-set Drives*)



Minimum Spacing Between

Driveways (Centerline to

Centerline)

B. Minimum Guideline.

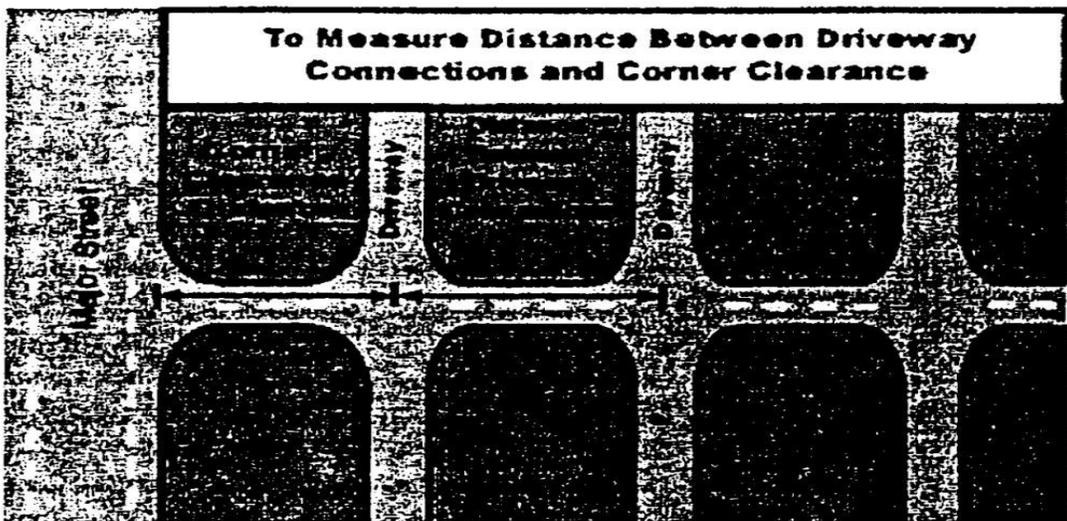
TABLE INSET:

Roadway Classification	Driveway Spacing
Principal Arterial	440 ft.
Major Arterial	220 ft.
Collectors	220 ft. (desirable)
Residential Collector	N/A

SECTION 8.0 DRIVEWAY CORNER CLEARANCE

A. What This Guideline Means.

Corner clearance represents the distance between the corner of the intersection of two public roadways and the next private driveway. It is important to provide enough distance between the corner and the first driveway to effectively separate conflict points and to allow drivers enough time to make safe maneuvers. When corners are not adequately cleared, high crash rates tend to occur. Delays and traffic congestion also result when corners are not adequately cleared. These guidelines correspond to the minimum driveway spacing guidelines for the same roadway classification. This *guideline only applies where the minimum sight distance guideline allows.*



B. Minimum Guideline.

TABLE INSET:

Roadway Classification	Corner Clearance
Principal Arterial	220 feet
Major Arterial	220 feet
Collector	100 feet (desirable)
Residential Collector	100 feet (desirable) or as far as practically possible

SECTION 9.0 DRIVEWAY SIGHT DISTANCE

A. What This Standard Means.

Sight distance for driveway construction shall be considered essential in the design and issuance of permits for all classes of driveways. If there is a request to construct a driveway at a questionable location, a traffic study must include an on-site inspection to evaluate the sight distance. *Sight distance is always the most important consideration in allowing, not allowing, or placing driveways.*

There are two basic concerns of responsibility when considering the sight distance requirements for any driveway. The first concern is to provide maximum safety for the motoring public. The second concern is to provide for access to the adjacent property owners. Both vertical and horizontal alignment can limit sight distance.

1. *How to Measure Vertical Sight Distance.* To measure actual sight distance limited by vertical alignment in the field, place a sighting target 4.25 feet above and 20 feet from the edge of pavement at the proposed driveway location (approximate location of a driver approaching the roadway). On minor arterial and collector routes, the target may be placed at a point 14.4 feet from edge of pavement. Sighting from a height of 3.5 feet, move along the roadway away from the proposed driveway site to a point just beyond where the target disappears. Then move back toward the target until it can first be seen. Place a mark on the pavement and then measure the distance along the roadway between the mark and the target. This measured distance is the vertical sight distance. Measurement may also be made with an accurate measuring device mounted on an automobile.

2. *How to Measure Horizontal Sight Distance.* To measure horizontal sight distance, place a sighting target 4.25 feet above and 20 feet from the edge of pavement at the proposed driveway location. On minor arterial and collector routes, the target may be placed at a point 14.4 feet from edge of pavement. Move away from the target along the roadway until the target is just out of sight or the line of sight is beyond the right-of-way limits. *The line of sight must stay within the limits of the right-of-way.* Consideration should also be given to vegetation both on the right-of-way and adjacent to the right-of-way as it may impede vision more during certain times of the year. Sighting from a height of 3.5 feet, move along the roadway toward the target until it can first be seen and place a mark on the pavement. Measure the distance between the mark and the target along the roadway. This measured distance is the sight distance.

The three sight distance categories are; design sight distance, minimum sight distance and minimum stopping sight distance.

TABLE 9.1

TABLE INSET:

Design Sight Distance (Feet)						
SPEED*	30	35	40	45	50	55
DISTANCE	370	470	570	700	830	980

*Speed is the greater of the following; the design speed of the roadway or the posted speed. In cases where the design speed is unknown, posted speed will apply.

Basis: Based on Figure IX - 41 (situations B-2b and Cob) of the AASHTO Green Book, 1990 edition, and Table 14 of NCHRP Report 383.

B. Application.

Preparation for issuing a driveway permit must include a prior inspection of the driveway site to ensure that vehicles can enter and exit from the proposed driveway with a minimum disruption of traffic along the roadway. Sight distance should be considered the essential element in the location of all driveways with particular emphasis placed upon public street approaches, high-volume commercial and industrial driveways, and all driveways on principal arterial routes. Field measurements shall be based on a 3.5 feet height of eye and a 4.25 feet height of object. The *sight distance for the proposed driveway is measured for each direction of travel and the smaller distance is then located in the sight distance chart for the speed* of the roadway to determine which sight distance criterion is met, if any.*

1. *Design Sight Distance.* If the driveway location meets or exceeds the requirements for the design sight distance for the speed* of the roadway as established by Table 9.1, a permit may be written, providing the other appropriate requirements are met.

TABLE 9.2

TABLE INSET:

Minimum Sight Distance (Feet)						
SPEED*	30	35	40	45	50	55
DISTANCE	310	360	410	460	510	560

*Speed is the greater of the following; the design speed of the roadway or the posted speed. In cases where the design speed is unknown, posted speed will apply.

Basis: Based on Figure IX - 41 (situations B-1) of the AASHTO Green Book, 1990 edition, and Table 14 of NCHRP Report 383.

2. *Minimum Sight Distance.* If no location on the applicant's frontage meets or exceeds design sight distance but a location does meet or exceed the distances shown in Table 9.2, a permit may be issued in accordance with the following criteria:

1. The proposed driveway location has the maximum sight distance available on the entire property frontage.
2. The access management classification category for the route is minor arterial or collector.
3. The proposed location is not for a public street approach or a high-volume commercial driveway.

4. The following applicant's responsibility clause is added to the permit: "Applicant understands the presence of this driveway creates a potential sight distance problem and has been so informed in writing by the department."
 In this instance, it is imperative that property owners be on the site to be certain they understand the conditions of this driveway construction.

TABLE 9.3

TABLE INSET:

Minimum Stopping Sight Distance (feet)						
SPEED *	30	35	40	45	50	55
DISTANCE	200	225	275	325	400	450

*Speed is the greater of the following; the design speed of the roadway or the posted speed. In cases where the design speed is unknown, posted speed will apply.

Basis: Based on Table III-1 of the AASHTO Green Book, 1990 edition, and Table 14 of NCHRP Report 383.

3. *Minimum Stop Distance.* If no location on the applicant's frontage meets or exceeds minimum sight distance but a location does meet or exceed the distances shown in Table 9.3, a permit may be issued in accordance with the following criteria:

1. The proposed driveway location has the maximum sight distance available on the entire property frontage.
2. The access management classification category for the route is minor arterial or collector.
3. The proposed location is not for a public street approach or a high-volume commercial driveway.
4. There is no other available access having equal or greater sight distance.
5. The applicant's responsibility clause is added to the permit: "Applicant understands the presence of this driveway creates a potential sight distance problem and has been so informed in writing by the City of Lebanon."
6. The following clause is added to the permit in addition to the applicant's responsibility clause: "Applicant is aware that the sight distance of this driveway is severely restricted. The sight distance is the minimum necessary for a vehicle traveling at the posted speed to come to a complete stop prior to the driveway."

If these conditions are not met the permit shall not be issued for the driveway. If an appeal for the access is made, it should be sent to the City Engineer for additional review.

The applicant should be advised of work that could improve sight distance for the location, such as minor grading or brush removal.

The City may allow the widening of a driveway with limited sight distance or may allow the relocation of a driveway with limited sight distance to a location on the property frontage with better sight distance. This will be allowed on routes with normal right-of-way, provided there is no change in driveway usage. The following responsibility clause must be added to the permit:

Applicant understands that the existing sight distance for this driveway is less than current design standards and the driveway modification, while beneficial to the property owner, will not remedy the sight distance limitation.

C. Adjustment for Steep Grades.

The sight distance standards here assume a level (flat) roadway. On many roadways in Missouri, there are significant upgrades or downgrades along the road

profile. The AASHTO Green Book indicates that for upgrades or downgrades of up to and including three percent, there is little effect of grade on stopping site distance. However, when an upgrade equals or exceeds four percent, stopping sight distances need to be adjusted to account for the fact that vehicles entering the traffic stream will take longer to accelerate to the posted speed limit. The impact of grade will be most profound for combination trucks (e.g., the AASHTO WB-50 design vehicle) and other heavy vehicles.

When there is a significant upgrade (e.g., over 4 percent) that must be negotiated by an entering vehicle, the adjustment factors in Table 9.4 should be applied to the stopping sight distance tables noted above by multiplying the adjustment factor to the appropriate stopping sight distance figure. When a driveway is used significant number of combination vehicles, the higher of the two adjustment factors should be used.

TABLE 9.4
ADJUSTMENT FACTORS FOR STEEP GRADES

TABLE INSET:

Typical Entering Vehicle	Flat to 4% Grade	Grades Between 4% to 6%	Grades 6% or More
Passenger Vehicles (P) and Single-Unit Trucks (SU)	No adjustment needed	1.3	1.5
Combination Trucks (WB-50)	No adjustment needed	1.7	2.2

Basis: Adapted from the AASHTO Policy on Geometric Design of Highways and Streets. If at all possible, public road intersections or high-volume private driveways should not be placed along roadway segments where the grade of the roadway exceeds six percent.

SECTION 10.0 DRIVEWAY GEOMETRICS ON CLASSIFIED STREETS

The design of driveways is critical 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. Large speed differentials are created when driveways are inadequately designed. Large speed differentials are associated with higher crash rates and diminished traffic operations.

Driveway designs should always be based on the results of a study of the traffic likely to use them; these guidelines are presented to illustrate good practices for driveway designs.

A. Lining Up Driveways Across Roadways.

Driveways should be as closely lined up with driveways across roadways without non-traversable medians to the maximum extent possible even if less spacing between driveways is the result.

B. Angle of Intersection to the Public Roadway.

1. Driveways that serve two-way traffic should have angles of intersection with the public road of 90 degrees or very near 90 degrees. The minimum acceptable angle for driveways that serve two-way traffic is 70 degrees.

2. Driveways that serve one-way traffic may have an acute angular placement of from 60 to 90 degrees.

C. Right-Turn (Approach) Radius.

Approach radii shall be large enough to allow entering vehicles to do so at a reasonable rate of speed. The following are suggested as minimum approach radii and are measured from the edge of the driving surface of the roadway. Any maximum approach radius is allowable for driveways.

TABLE INSET:

Driveways Types	Minimum Right Turn Radius
Principal & Major	20 feet
Commercial Driveways	20 feet
Collector	15 feet

Inside radii should be determined on a case by case basis given driveway angle, traffic volume, and other relevant factors. Sites that generate substantial large truck traffic need inside larger radii to accommodate the wheel path of the turning trucks.

D. Driveway Width.

No driveways shall have widths less than 12 feet. Driveways of greater than 54 feet should be strongly discouraged unless they contain a raised median to separate traffic lanes. Driveways that serve one-way traffic shall be from 20 to 30 feet wide. Driveway widths shall be measured from the face of curb to the face of curb at the point of tangency. Any medians contained in the driveway are above and beyond the minimum widths in the table. Minimum acceptable and maximum acceptable widths for various levels of traffic and directions of access are shown in the table below:

TABLE INSET:

Driveway Traffic Category	Average Daily Traffic Using Driveway	Average Daily Traffic Using Driveway	With Two-Way Access		With One-Way Access	
			Minimum Width	Maximum Width	Minimum Width	Maximum Width
Residential	0-100	0-10	12 feet	N/A	N/A	N/A
Low Volume Commercial/industrial	28 feet**	42 feet***	20 feet*	20 feet*		
Medium Volume Commercial/industrial	150--400	40 feet***	54 feet****	20 feet*	30 feet**	

High Volume Commercial/industrial	>4000	>400	40 feet***	To be determined through a traffic study	Generally not applicable	Generally not applicable
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*One-lane driveways.

**Driveway striped for two lanes.

***Driveway striped for three lanes.

****Driveway striped for four lanes.

All commercial and industrial driveways should be curbed on approach.

E. Driveways and Accommodation of Pedestrians.

Where driveways cross pedestrian sidewalks all Americans with Disabilities Act regulations shall be followed.

F. Vertical Geometrics--Driveway Grade Change (Commercial Driveways Only).

Access driveways on arterial roadways shall always be designed to allow vehicles to proceed into or out of the driveway at a speed that will prevent large speed differentials between turning and through traffic. Required apron lengths, desirable grade changes and maximum allowable grade changes are shown in the table below. The apron is a relatively flat area where the driveway meets the public roadway. These guidelines apply to all types of driveways, including for residential, commercial and industrial uses. Driveways shall always have a minimum grade change between 1/2 to 1 percent to provide for adequate drainage. Either an upgrade or downgrade is permissible.

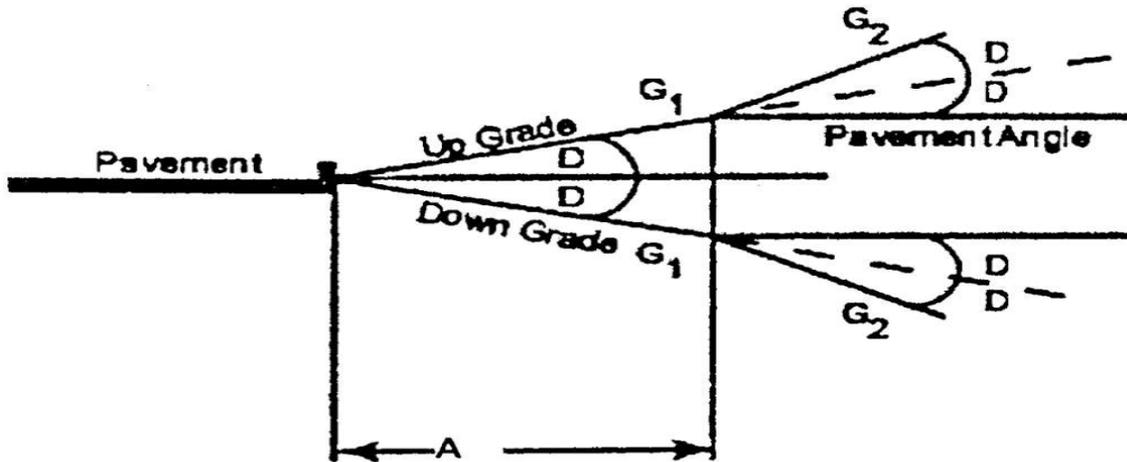
Desirable grades and maximum allowable grades are shown in the following table. Driveways should have a minimum grade of 1% for drainage.

TABLE INSET:

Roadway Classification	Required Minimum Apron Length ("A" in the Diagram)	Desirable Grade Change	Maximum Grade Change Allowed
Principal Arterial	25-30 feet	[2%-3%]	[3%-4%]
Minor Arterial	20 feet	[4%]	[5%]
Collector	15 feet I	[5%]	[6%]

Notes: NA: No driveways are allowed on this classification. The Apron Length is shown as "A" and grade change as "D" on the diagram below. The grade may change along the course of the driveway, as indicated by G1 and G2. In such cases, it is very important to ensure that the minimum apron length is maintained.

Desirable Driveway Grades From Curbed Roadways



SECTION 11.0 PARKING ON STREETS

A. What This Guideline Means.

This guideline suggests when parking may be allowed on facilities. In general, parking shall not be allowed on street facilities that are primarily intended to serve through traffic movement. On facilities such as collectors, parking may be allowed if an engineering study indicates that it is safe to do so and that the parking will not unduly hinder traffic operations.

Only parallel parking shall be allowed. No angle parking shall be permitted on any of the types of facilities listed in the table below. Angle parking may, however, be appropriate if the goal is to provide something other than smooth traffic flow or safety.

B. Recommended Guideline.

TABLE INSET:

Roadway Classification	Parking Guidelines
Principal Arterial	No parking
Major Arterial	Parking should be studied but may be allowed when the street can provide unrestricted traffic flow
Collectors	Parking should be studied but may be allowed when the street can provide unrestricted traffic flow

SECTION 12.0 VARIANCE PROCEDURE

Affected individuals can request a variance from the requirements of this in accordance with the provisions of section 23-6 of the Code of Ordinance