Saint Louis COUNTY
HIGHWAYS & TRAFFIC
PUBLIC WORKS

ACCESS MANAGEMENT GUIDELINES

St. Louis County
Department of Highways and Traffic
Division of Planning
Transportation Planning Studies Section

June 2008

TABLE OF CONTENTS:

INTRODUCTION

Access management involves the thoughtful planning and design of points of access to the public roadway system, including both public roads and private driveways. Sound access management can have a profound impact on roadway safety and the ability of roads to successfully carry traffic. Failure to properly manage access can result in congestion, excessive delay, safety concerns and diminish the public's investment in the roadway system.

The standards presented herein are intended to establish *guidelines* for access management as it relates to the St. Louis County Road System. The standards assume jurisdictional uniformity in the design and provision of access to roadway facilities operated by the St. Louis County Department of Highways and Traffic (SLCDHT). The standards apply to a variety of situations, including long-range planning, project planning and design, right-of-way acquisition, redesign of existing arterial corridors, and driveway permitting. Uniform standards are intended to improve the safety, effectiveness, and efficiency of the St. Louis County Road System.

Within the context of this plan, the word "shall" implies a mandatory standard, the word "should" represents an advisory recommendation, and the word "may" suggests a permissive condition. It should be noted that several other access management plans and resources were used in the development of this plan (as cited in the "Resources" section). Where appropriate, the information gathered from these references was adapted to better reflect the needs and characteristics of the St. Louis County Road System.

1.0 ANALYSIS OF RETROFIT AND PERMIT APPLICATIONS

Where access is being managed on an existing roadway (a retrofit or permit project), it is often not possible to incorporate and attain all of the access management principles contained herein due to economic, physical or other constraints. Care must be taken to balance economic interests with transportation needs. Economic impacts to business must be carefully considered and efforts must be made to mitigate those impacts. Collaboration with property owners and other stakeholders is the most effective method to achieve improvements that satisfy both operational and economic needs.

The collaboration process should begin in the early stages of project development. Department staff should discuss the fundamentals and benefits of managed access with the stakeholders. Emphasis should be placed on safety and operational benefits and how those benefits can have a positive impact on property values and the business climate. The requirements of potential traffic analyses shall be discussed at this point. The goal of the process should be to

produce acceptable operational and safety impacts, while gaining consent of the stakeholders.

In cases where the access management criteria cannot be met, a detailed analysis should be performed to determine the optimum solution. This solution should strive to improve safety and operations along the roadway, and maintain optimal flow on the transportation system and insure adequate access to the adjoining properties. In all cases, St. Louis County sight distance requirements supersede access management allowances.

2.0 SPACING BETWEEN INTERCHANGES

While interchanges are not typically a part of St.Louis County's Roadway system, the following information is provided for integration with the Missouri Department of Transportation's (MoDOT) roadway system and any possible future County road projects that may incorporate interchanges.

Adequate spacing is needed between grade-separated interchanges on parkways to allow for safe and efficient weaving or changing of lanes for traffic that is entering and exiting. Interchange spacing decisions should be supported by an operational and level of service (LOS) analysis. Connectivity, speed, and safety should also be considered. In dense urban areas, the configuration of the local street system may require a closer interchange spacing to maintain connections and mobility.

Figure 2.0.1. Interchange Clearance (Indicated as Distance A)

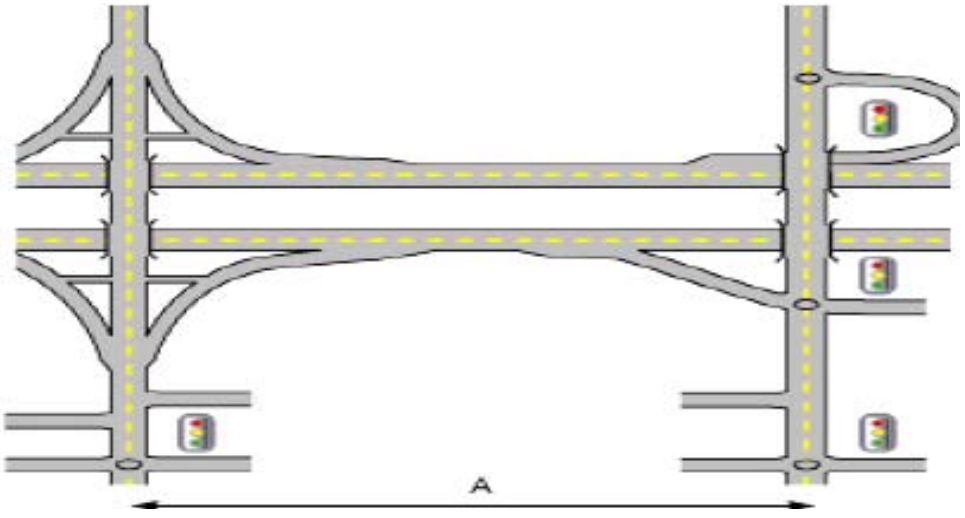


Table 2.0.1. Minimum Interchange Spacing

Roadway Classification	In Current and Projected Urban Areas	In Rural Areas
Major: MoDOT, Interstate	2-3* Miles	2-5 miles
Minor: St. Louis County Principal Arterials and Parkways	1* Mile	

* Spacing less than minimum in urban areas may be considered, when analysis indicates the lesser spacing is acceptable. However, all other options should be considered, before spacing is reduced.

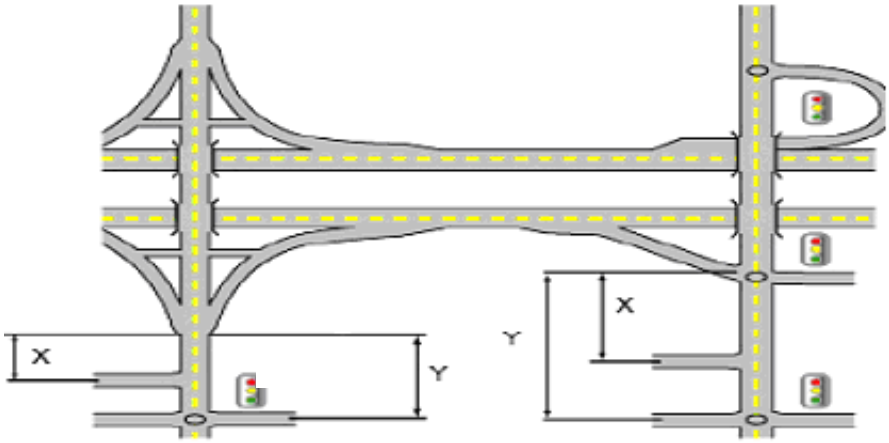
Spacing greater than the distances shown is advantageous for safety and operations. Distances shown are between the centers of interchanges.

3.0 CLEARANCE OF FUNCTIONAL AREAS OF INTERCHANGES

Adequate space is needed for traffic to make the transition from a road with interchanges to a road with at-grade access points. The functional area of the interchange is the area in which merging and diverging of traffic takes place. Drivers must travel along an exit ramp, find acceptable gaps, change lanes (weave), and merge within this distance.

A safe distance for this activity to occur should be provided from the end of the off ramp to the first driveway, median opening, or intersection with a public road. (This is measured from the point of intersection of the ramp baseline and roadway centerline.) When only right turns into or out of driveways or public roads are involved, a shorter clearance area may be used.

Figure 3.01. Parkway Interchange Clearance



X = Distance from baseline on- or off-ramp to the nearest right-in, right-out driveway/public road intersection.

Y = Distance from baseline off-ramp to first major public road intersection, full median opening, or left-turn opportunity.

Table 3.0.1. Interchange Area Clearance

Type of Area	Distance from Ramp to Right-In, Right-Out Driveway (X)	Distance to First Major Public Road Intersection, Full Median Opening, Or Left-Turn Opportunity (Y)*
Major: MoDOT, Interstate	750 feet – 1,320 feet	1,320 feet – 2,640 feet
Minor: St. Louis County Principal Arterials and Parkways	600 feet	1,320 feet

*Left turns should not be allowed in this section of roadway. The public road intersection is likely to become a signalized intersection as the interchange area develops. Right –in, right –out driveways configuration should include a non-traversable median.

Note: All ramp measurements are taken to or from baseline ramp.

Any clearance of less than the range contained in the above table should be supported by a study of alternatives to ensure safety and traffic flow. All reasonable alternatives, including relocating the interchange to a different location should be considered.

4.0 AT-GRADE INTERSECTIONS SPACING

The proper spacing between public roadway and their intersections (both signalized and unsignalized) is an important access management issue. As the number of intersections per mile increases, the opportunity for crashes and the potential obstruction of through traffic increases. Conversely, an adequately dense street network is necessary to prevent adverse travel and to avoid oversaturation of collector roads.

The minimum spacing of signalized intersections is mainly intended to preserve efficient traffic flow and progression on urban arterial roadways. Adequate spacing allows traffic signals to be effectively interconnected and synchronized, which will tend to reduce rear-end collisions and "stop and go" driving that increases congestion, delay and air pollution. When the spacing between signals is too close, the ability of the arterial to carry through traffic will decrease, travel speeds may decrease, and delays and excessive queues may develop at intersections.

This guideline provides for adequate spacing between street intersections. St. Louis County Principal Arterials are intended to serve through traffic and should have street intersections that are spaced the farthest apart. St. Louis County Minor Arterials and Collector Streets provide some service to through traffic but also collect and distribute traffic from adjacent land uses. Local Roads provide direct access to properties, therefore, they can be placed closer together.

Table 4.0.1 demonstrates minimum spacing requirements for various road classifications. For instance a driver traveling on a principal arterial should not encounter a signalized intersection more often than every 1320 feet. While traveling on that same road an intersection of any kind should not be encountered more often than 660 feet.

Table 4.0.1. Intersection Spacing

Roadway Classification	**Signalized**	**Un-signalized***	**Roundabout****
Principal Arterial	1320	660	(intentionally left blank)
Minor Arterials and Collectors	660	460	(intentionally left blank)
Local Roadways	Generally Not Permitted	360	(intentionally left blank)

***Un-signalized locations shall be examined closely for a potential need for a signal in the future.

**St. Louis County standards are under development.

All potential signalized intersections shall satisfy the traffic signal warrants specified by the Manual on Uniform Traffic Control Devices (MUTCD), current edition, preferably Warrant 1 (Condition A or B): Eight-Hour Vehicular Volume. Also, the installation of a traffic signal should be supported by an engineering study that demonstrates that progression along the arterial would not be compromised. Installations should generally serve both sides of the street and should preferably provide connections to public streets and/or multiple users.

5.0 RAISED MEDIANS

Raised medians are the most effective access management strategy on high-volume urban routes. Roadways with raised medians are at least 25 percent safer than multilane undivided sections and 15 percent safer than two-way left-turn lane cross-sections in such high traffic situations.

In general, use of raised medians should be considered where current and projected traffic volume is greater than 28,000 Average Weekday Traffic (AWT). Raised medians are especially recommended in corridors where the traffic volume is high, the density of commercial driveways is high, and other access management strategies such as driveway consolidation and corner clearance are not practical. Raised medians should be incorporated on arterial facilities with three or more through traffic lanes in each direction.

6.0 MEDIAN OPENING SPACING

Openings in raised medians should only be provided to accommodate turning traffic in locations where this can be safely done.

A full opening allows turns to be made in both directions and generally should not be permitted; a directional opening allows left turns in only one direction. Where openings are approved, an adequate spacing between them is necessary to allow for weaving of traffic, to preserve traffic flow, and to provide for safe lane changes and turns. Any consideration for a median opening will require turn pockets of sufficient length to satisfy the predictable left turn demand. An example of a directional median would be one that allows left turns into a driveway but does not allow left turns to be made out. See Figure 6.0.1.

Median openings should not be allowed under the following circumstances:

- On Parkways, except for approved signalized intersections
- Within the functional area of an interchange
- Within the functional area of an intersection between two public roads
- At locations that have a history of high accident rates

Under conditions of inadequate sight distance, median openings *shall not* be allowed.

Traffic analyses should support the required length of queue storage for major traffic generators such as a shopping mall or industrial plant.

Accommodating Safe U-Turns

In cases where left turns are restricted by lack of median openings, care must be taken to allow for U-turns to be made in a safe manner at select downstream locations. U-turns can be safely accommodated through a variety of means, including signal phasing and timing, pavement widening, and including physical design features such as turning lanes and “jug handles” type configuration. Where U-turns cannot be made safely, they should be explicitly prohibited. U-turn opportunities should be designed with an appropriate typical design vehicle based on facility type. The minimum design vehicle should be WB-40 (Local articulated vehicle).

Figure 6.0.1 Directional Median Openings

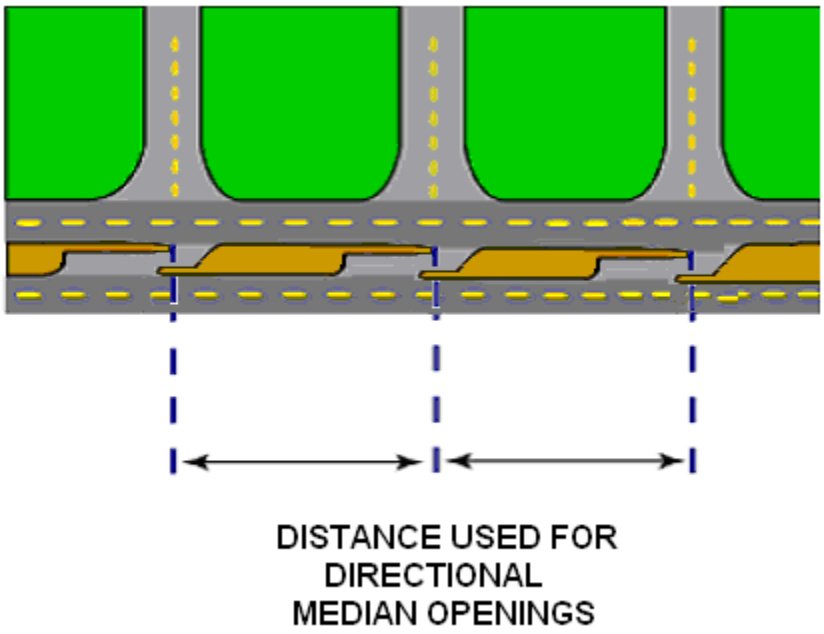


Table 6.0.1 Directional Median Openings

Roadway Classification	Median Break Spacing
Principal Arterial	660
Minor Arterials and Collectors	460
Local Roadways	360

7.0 AUXILIARY ACCELERATION AND TURNING LANES

The installation of right-turn acceleration lanes is generally not considered on the St. Louis County roadway system. 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 driveways between through and turning traffic. Auxiliary lanes are an asset in promoting safety and improved traffic flow in such situations. Some major applications of and considerations for the design of auxiliary lanes are as follows:

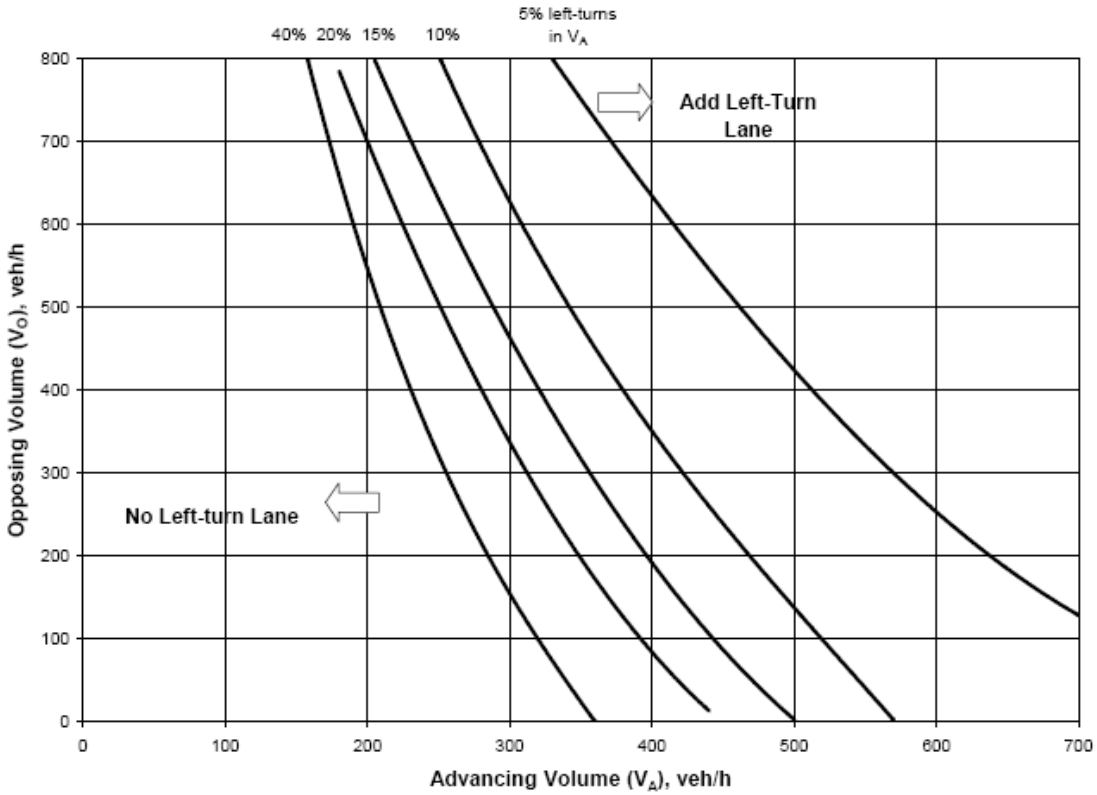
- Installing auxiliary left-turn lanes. Such lanes, installed in the roadway center, are intended to remove turning vehicles from the through traffic flow. This should reduce the frequency of rear-end collisions at locations where there is considerable left-turn ingress activity, such as major driveways and minor public road intersections. Left turn lane warrants are shown in Figures 7.1.1 thru 7.1.3. To use the figures, peak hour traffic counts, including directional splits, will be required.

- The application of auxiliary left-turn lanes should be guided by a traffic analysis. 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.

Note: There may be situations where a left turn lane must be considered irrespective of these guidelines, such as locations with high accident rates, insufficient sight distance, unusual geometric conditions, etc.

7.1 Left Turn Lanes

Figure 7.1.1. Left Turn Lane Guideline for Two-Lane Road <= 40 mph (60 km/h)



The following data are required:

1. Opposing Volume (veh/hr) - VO - The opposing volume should include only the right-turn and through movements in the opposite direction of the left turning vehicle.

2. Advancing Volume (veh/hr) - VA - The advancing volume should include the right-turn, left-turn and through movements in the same direction as the left turning vehicle.

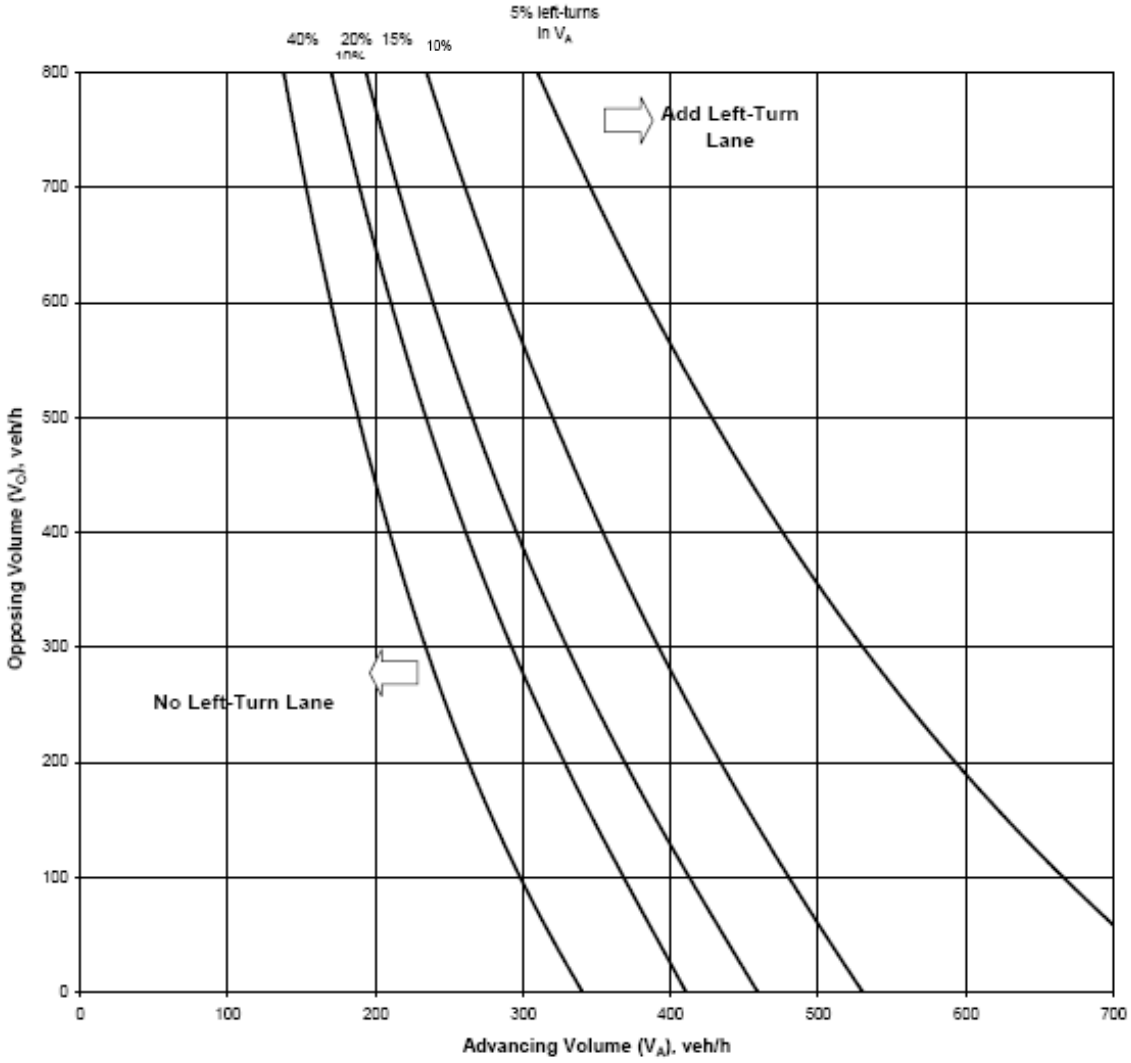
3. Speed (mph) – The design speed.

4. Percentage of left turns in VA.

A Left turn lane is not typically needed for left turn volume less than 10 vph. However, criteria other than volume, such as crash experience, may justify a left turn lane.

The appropriate trend line is identified on the basis of the percentage of left-turns in the advancing volume, rounded up to the nearest percentage trend line. If the advancing and opposing volume combination intersects above or to the right of this trend line, a left-turn lane is appropriate.

Figure 7.1.2. Left Turn Lane Guideline for Two-Lane Road - 45 mph (70 km/h)



From Missouri Department of Transportation Access Management Guidelines

The following data are required:

1. Opposing Volume (veh/hr) - VO - The opposing volume should include only the right-turn and through movements in the opposite direction of the left turning vehicle.

2. Advancing Volume (veh/hr) - VA - The advancing volume should include the right-turn, left-turn and through movements in the same direction as the left turning vehicle.

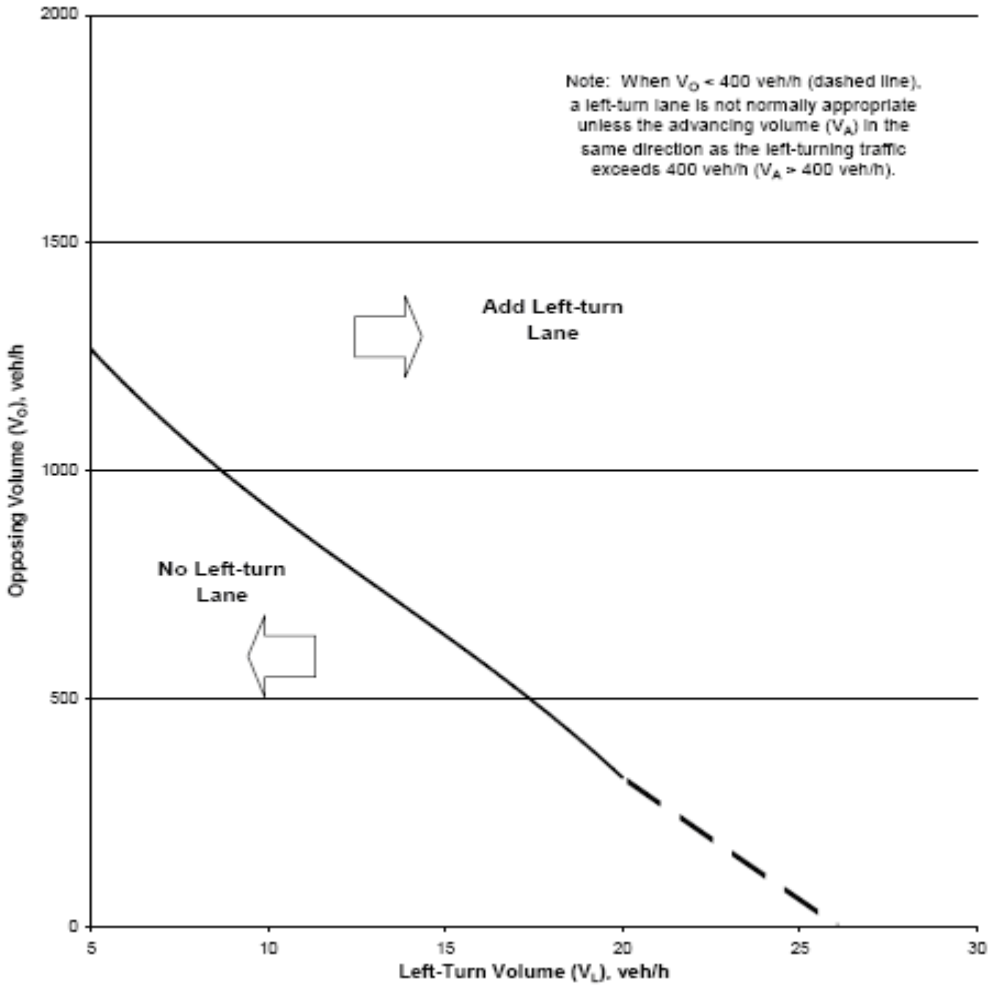
3. Speed (mph) – The design speed.

4. Percentage of left turns in VA

A Left turn lane is not typically needed for an average left turn volume less than 10 vph. However, criteria other than volume, such as crash experience, may justify a left turn lane.

The appropriate trend line is identified on the basis of the percentage of left-turns in the advancing volume, rounded up to the nearest percentage trend line. If the advancing and opposing volume combination intersects above or to the right of this trend line, a left-turn lane is appropriate.

Figure 7.1.3. Left Turn Lane Guideline for Four-Lane Undivided Roadway



From Missouri Department of Transportation Access Management Guidelines

The following data are required:

1. Opposing Volume (veh/hr) - VO - The opposing volume should include only the right-turn and through movements in the opposite direction of the left turning vehicle.

2. Left-Turn Volume – VL
3. Advancing Volume (veh/hr) - VA - The advancing volume should include the left-turn and through movements in the same direction as the left turning vehicle.

If the opposing and left-turn volume combination intersects above or to the right of the trend line, a left-turn lane is appropriate.

7.2 Right Turn Lanes

- Installing auxiliary right-turn lanes. The use of dedicated right-turn lanes should be guided by a traffic analysis. In general, dedicated right-turn lanes should be provided as shown in the Figures 7.2.1. To use the figures, peak hour traffic counts, including directional splits will be required.

Dedicated right turn lanes should also be strongly considered in situations where:

- Poor internal site design and circulation leads to backups on the mainline. 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.
- The intersection or driveway angle is highly skewed.
- Rear end collision experience is unusually high.

Figure 7.2.1. Full Right Turn Lane

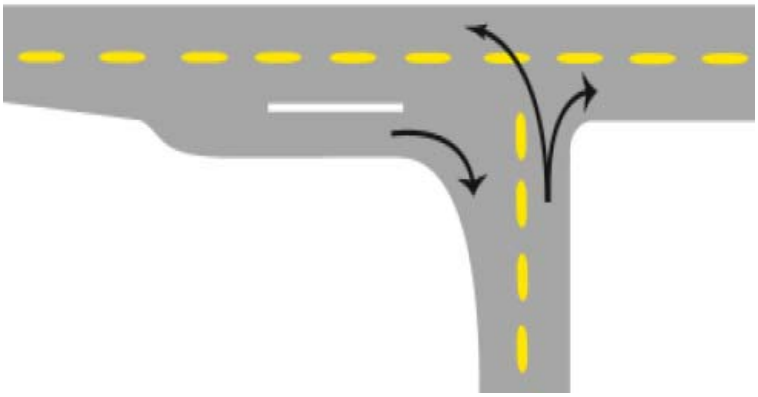
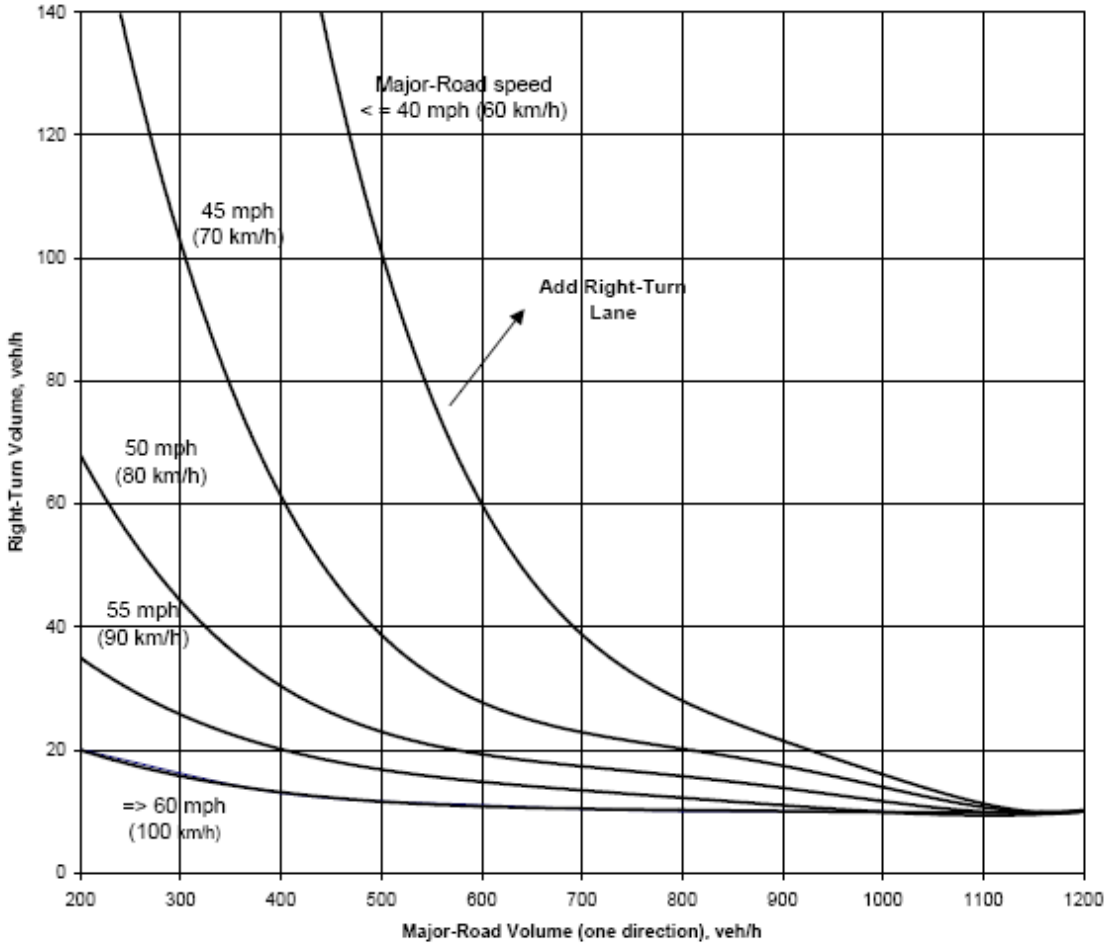


Figure 7.2.2. Right Turn Lane Guideline for Two-Lane Roadway



From Missouri Department of Transportation Access Management Guidelines

The following data are required:

1. Advancing Volume (veh/hr) - The advancing volume should include the right-turn, left-turn and through movements in the same direction as the right turning vehicle.

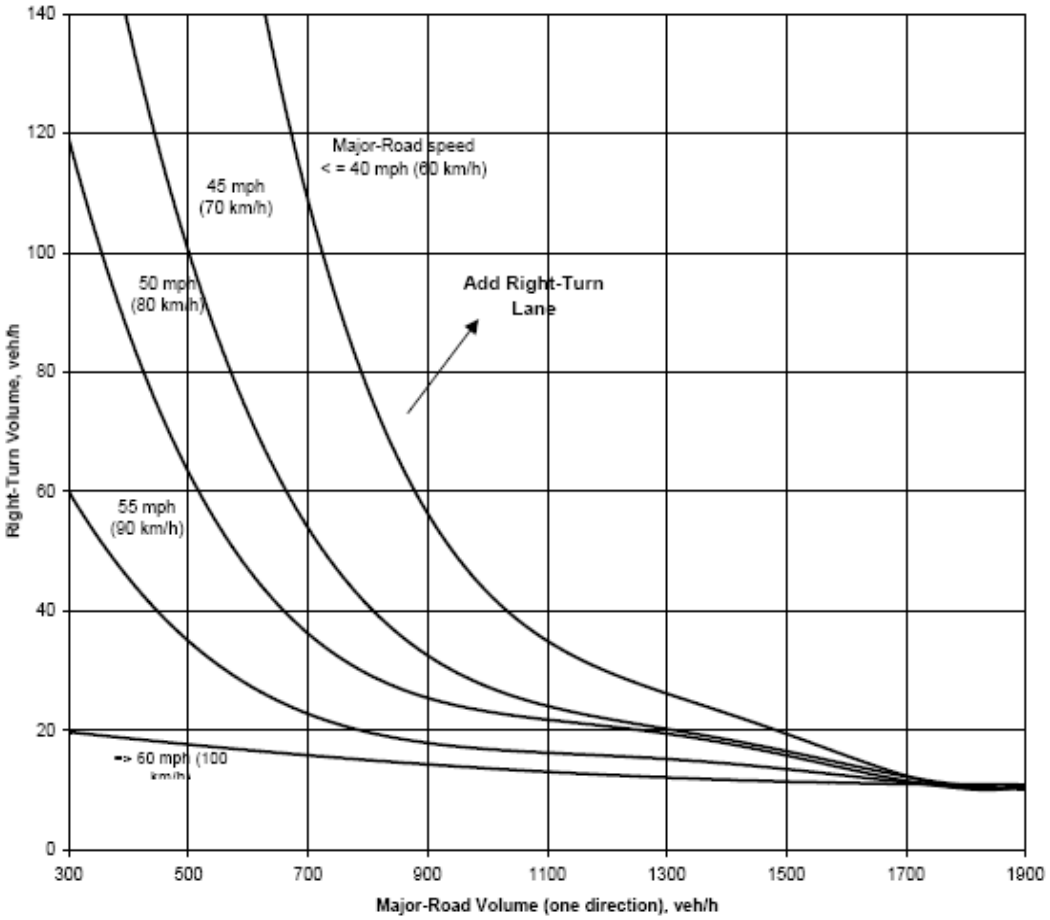
2. Right Turning Volume (veh/hr) - The right turning volume is the number of advancing vehicles turning right.

3. Speed (mph) - The design speed.

A Right turn lane is not typically needed for right turn volumes less than 10 vph. However, criteria other than volume, e.g. crash experience, may justify a right turn lane.

If the combination of major-road approach volume and right-turn volume intersects above or to the right of the speed trend line corresponding to the major road design speed, then a right-turn lane is appropriate.

Figure 7.2.3. Right Turn Lane Guideline for Four-Lane Roadway



From Missouri Department of Transportation Access Management Guidelines

The following data are required:

1. Advancing Volume (veh/hr) - The advancing volume should include the right-turn, left-turn and through movements in the same direction as the right turning vehicle.

2. Right Turning Volume (veh/hr) - The right turning volume is the number of advancing vehicles turning right.

3. Speed (mph) - The design speed.

A Right turn lane is not typically needed for right turn volumes less than 10 vph. However, criteria other than volume, e.g. crash experience, may justify a right turn lane.

If the combination of major-road approach volume and right-turn volume intersects above or to the right of the speed trend line corresponding to the major road design speed, then a right-turn lane is appropriate.

7.3 Offset Right- and Left- Turn Lanes

Vehicles in the right-turn lane tend to obstruct the vision of drivers waiting at the stop bar of the minor roadway. One way to reduce the obstruction of the minor roadway drivers' view is to offset the right-hand turning bay to the right. Similarly, vehicles in the opposing left-turn lane block the views of left-turning vehicles from the opposite direction. These conditions are shown in the Figure 7.3.1 below. An example intersection with offset right- and left-turn lanes is shown in Figure 7.3.2. Offsetting left-turn lanes to the left as far as practical improve the visibility of opposing traffic. By improving the visibility of opposing traffic, drivers can more effectively use available gaps. Offsetting right-turn lanes to the right permits drivers on the minor approach (at the stop bar) to observe oncoming traffic in the near lanes, which allows for more effective use of gaps.

Figure 7.3.1. Cone of Obstructed Visibility

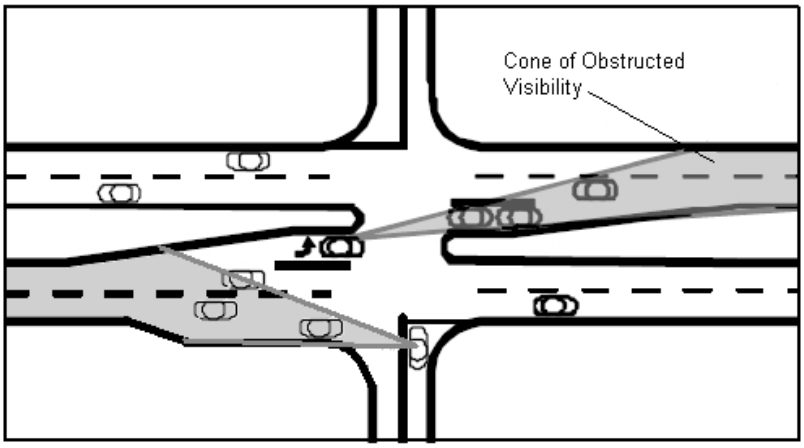
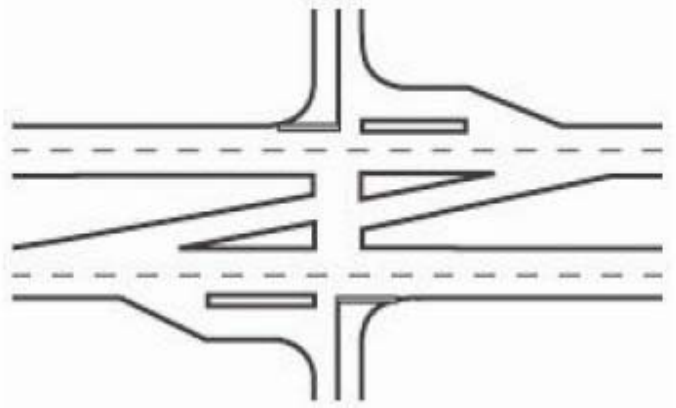


Figure 7.3.2. Offset Right Turn Lanes



Consideration should be given to offset right- and left-turn lanes in locations with high mainline operating speeds, large percentage of turning trucks, unique sight distance issues, or crash experience where investigation of crash diagrams indicates a safety benefit may be obtained from an offset turn lane. Care should be taken when implementing offset auxiliary turn lanes to insure the horizontal geometry of the roadway does not negate the line-of-sight improvement.

8.0 TWO-WAY LEFT-TURN LANES

Two-way left-turn lanes (TWLTL) may be effective as an access management tool when used in conjunction with other techniques such as driveway consolidation and corner clearance. TWLTL cross sections work best in situations where traffic volume and the density of driveways is relatively low, and the proportion of left-turning vehicles is relatively high. TWLTL's are recommended in places where commercial driveways make up a substantial portion of total driveways and where the percentage of vehicles turning left in peak hour is significant.

TWLTL's may be inappropriate where the commercial driveway density is above the driveway spacing guideline. Research indicates that when commercial driveway density is high, crash rates increase significantly.

TWLTL configurations are not recommended along high traffic volume (over 28,000 AWT) urban routes; in such situations raised medians are at least 25 percent safer than multilane undivided sections and 15 percent safer than TWLTL cross sections. TWLTL configurations generally should not be used on facilities with more than four through-traffic lanes, e.g., to create a "seven lane" facility.

Figure 8.0.1. Center Two Way Left Turn Lanes

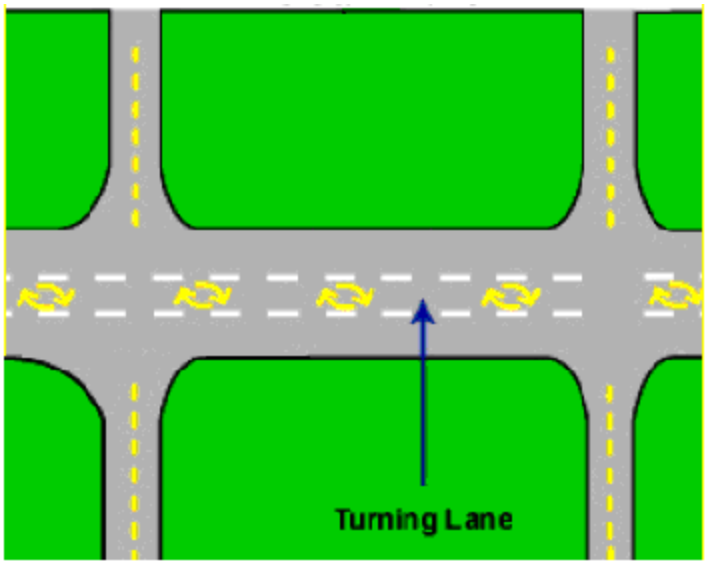


Table 8.0.1. TWLTL Requirements

Roadway Classification	TWLTL
Principal Arterial	May be used when appropriate if the design hour volume of opposing direction is between 750 and 1,000 vphpl
Minor Arterials and Collectors	May be used when appropriate if the design hour volume of opposing direction is between 750 and 1,200 vphpl
Local Roadways	Generally Not Recommended

9.0 FRONTAGE AND BACKAGE ROADS

Frontage and backage roads provide alternative access to property and help remove turning traffic from the through traffic on a mainline route. A frontage road provides alternative access at the front of properties while a backage road provides alternative access at the rear of properties. These access management techniques are more appropriate for applications serving properties fronting on principal arterials, although there maybe conditions on minor arterial that warrant consideration as well.

Frontage and backage roads can dramatically improve safety and operations. However, a common mistake involves placing frontage or backage roads in close proximity to the mainline. Placing frontage roads very close to mainline roads can create additional delay, congestion, and crashes because insufficient storage (“throat length”) is provided for entering and exiting vehicles at their terminals.

Frontage and Backage roads should be spaced approximately 360 feet or more from the mainline route at their terminals. Measurements should be taken from pavement edge to pavement edge depending on roadway classification, traffic control type, etc.

The parallel section of frontage roads should be located a minimum of 50 feet from the arterial to minimize interference with operating conditions on the arterial.

10.0 DRIVEWAY SPACING

This guideline describes the recommended spacing between private driveways necessary to preserve both safety and traffic flow. Spacing between driveways must be longer in commercial areas than in residential areas.

In order to preserve traffic flow, direct access should be moved to local streets (not arterials) 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 should *not* be allowed where sight distance is inadequate even if the driveway spacing guideline would allow them.

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

Where non-traversable medians exist, shorter driveway spacing may be acceptable for right-in, right-out driveways only. (See Section 12.0)

Figure 10.0.1. Aligned Driveways

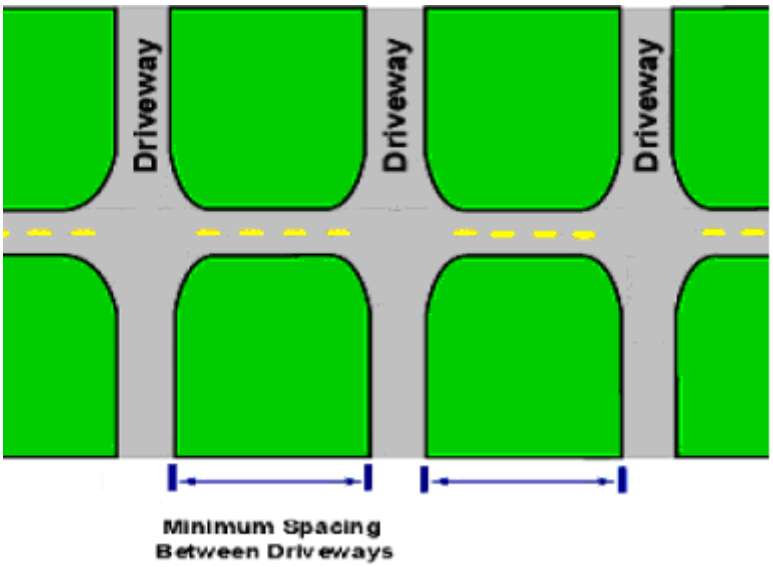


Table 10.0.1. Minimum Driveway Spacing

Roadway Classification	**Non-Residential**	**Residential**
Principal Arterial	660 feet	Generally Not Permitted
Minor Arterials and Collectors	460 feet	100*
Local Roadways	360 feet	Generally Not Restricted

***** Local land use planning should be developed to generally preclude residential access to minor arterials or collectors for individual residential lots.

11.0 DRIVEWAY CORNER CLEARANCE

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, crash rates and delay increase. These guidelines correspond to the driveway spacing guidelines for the same roadway classification. However, maintaining adequate corner clearance is more critical for safety and operations than mid block driveway spacing. *This guideline only applies where the sight distance guideline allows.*

Figure 11.0.1. Corner Clearance Distance

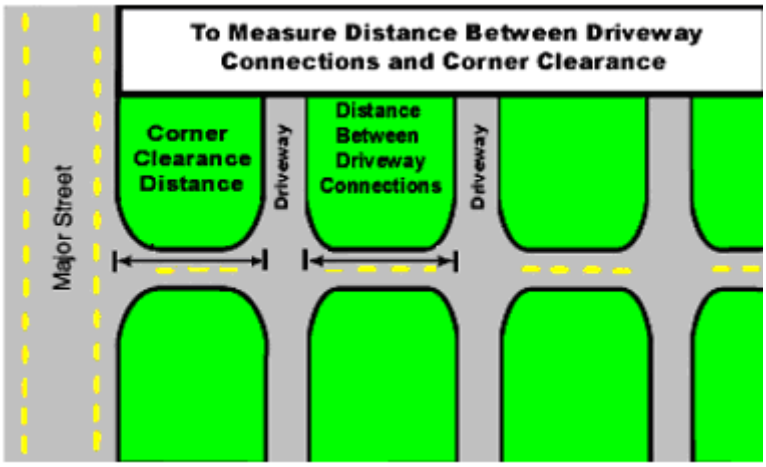


Table 11.0.1. Minimum Corner Clearance

Roadway Classification Distance From	Non-Residential Driveways	Residential Driveways
Principal Arterial	660 feet	Generally Not Permitted
Minor Arterials and Collectors	510 feet	200* feet
Local Roadways	410 feet	100 feet

*Local land use planning should be developed to generally preclude residential access to minor arterials or collectors for individual residential lots.

12.0 SPACING / CLEARANCE FOR RIGHT-IN, RIGHT-OUT DRIVEWAYS

This guideline describes the recommended spacing and corner clearance for driveways along roadways in urban areas that have a non-traversable median and speed limits at or below 45 miles per hour. A non-traversable median restricts left-turn movements into and out of driveways. Adequate spacing between driveways and corner clearance are both important to maintain safety and traffic flow. Spacing between driveways should be greater on higher speed routes.

Research and experience in other states indicates that on urban routes *where nontraversable medians exist*, shorter driveway spacing is acceptable for right-in, right-out driveways. However, corner clearance upstream from an intersection or a full access driveway should meet the minimum spacing required for a full access driveway (see table 12.0.1). This guideline provides for double the number of right-in, right-out driveway access points compared to situations where left turns into and out of driveways are permitted. It also provides for a shorter clearance distance from corners to the last driveway upstream from the corner. For safety reasons, the downstream corner clearance is similar to situations where no nontraversable median is present. This shorter guideline for right-in right-out driveways *should not* be used where a non-traversable median does not exist (e.g., where there is a continuous left-turn lane.)

Experience has shown that a shorter guideline for right-in, right-out drives is appropriate where there is a physical barrier that prevents left turns (e.g., a non-traversable median). Regulatory restrictions on left turns (e.g., “No Left Turn” signs) and small traffic islands do not effectively prevent left and should not be considered as substitutes for nontraversable medians.

Direct access should be moved to local streets (not arterials and collectors) where possible. Access can be better accomplished on major roadways through techniques such as frontage and backage roads, joint access, cross access, and shared driveways. These guidelines only apply where sight distance allows. *Driveways should not be allowed where sight distance is inadequate even if the spacing guideline would allow them.*

Figure 12.0.1. Driveway Spacing Where Nontraversable Median Exists

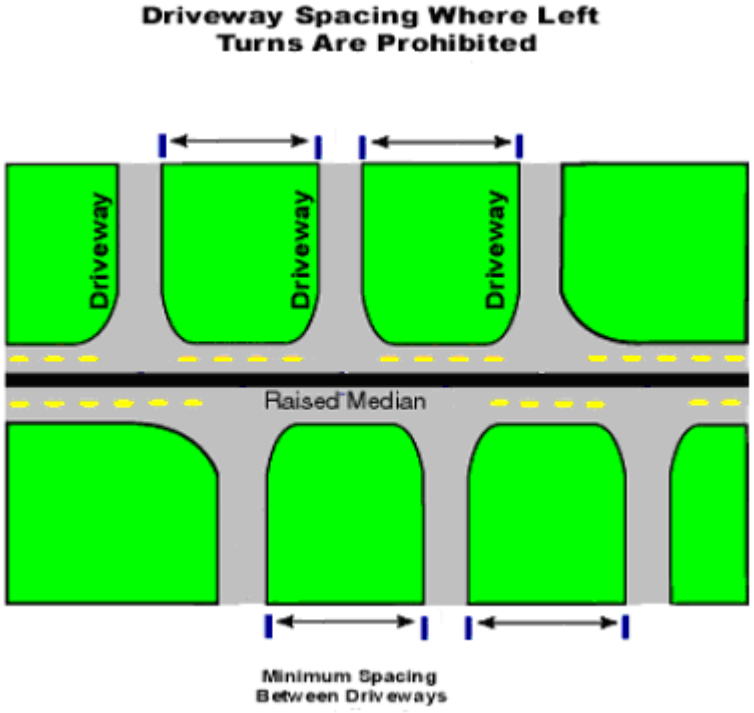


Table 12.0.1. Minimum Right-In, Right-Out Driveway Spacing

Roadway Classification	Spacing between Right- In, Right-Out Driveways on Roadway with a Restrictive Median
Principal Arterial	330 feet
Arterials and Collectors	230 feet
Local Roadways	180 feet

13.0 DRIVEWAY GEOMETRICS

The design of driveways affects the speed of traffic entering and exiting driveways and thus the speed differential between through traffic and turning traffic. Large speed differentials are associated with higher crash rates and diminished traffic operations. Driveway should always be designed based on the results of an analysis of the traffic likely to use them; these guidelines are presented to illustrate good practices for driveway design.

13.1 Aligning Driveways Across Roadways

Driveways should be as closely aligned with driveways across roadways without nontraversable medians to the maximum extent possible.

13.2 Angle of Intersection to the Public Roadway

Driveways that serve two-way traffic should have angles of intersection with the public road of 90 degrees or very near 90 degrees. Two-way traffic driveways with skews greater than 20 degrees from perpendicular are not permitted.

13.3 Right-Turn (Entering and Exiting) Radius

Approach radii should be large enough to allow entering vehicles to do so at a reasonable rate of speed. The following are suggested as acceptable approach radii and are measured from the edge of the driving surface of the roadway. No maximum approach radius is specified.

Table 13.3.1. Minimum Right Turn Radius

Roadway Classification	Right-Turn Radius Residential Driveways	Right-Turn Radius Commercial Driveways*	Right-Turn Radius Industrial Driveways*
Principal Arterial	Generally Not Applicable	40 feet	50 feet
Minor Arterials and Collectors	15** feet	30 feet	40 feet
Local Roadways	10 feet	30 feet	Generally Not Applicable

*This table only covers minimum radii, all radii should satisfy requirements for the turn radius of the design vehicle appropriate to the land use.

** Local land use planning should be developed to generally preclude residential access to minor arterials or collectors for individual residential lots

13.4 Driveway Width

All commercial and industrial drives shall accommodate the design vehicle applicable to the particular land use and shall satisfy St. Louis County Design Standards. All commercial and industrial driveways shall be clearly defined and unobstructed.

13.5 Driveways and Accommodation of Pedestrians and Bicycles

All Driveways shall accommodate pedestrian and bicycle access and be in accordance with St. Louis County and ADA standards.

13.6 Driveway Throat Length

The throat length is the distance between the street and any parking facilities served by a driveway. An adequate throat length is necessary to keep traffic conflicts within a parking lot to an acceptable level and to provide space on the driveway for incoming and outbound traffic. The following throat-length guidelines should be followed:

- For low traffic volume commercial and driveways, the shortest allowable driveway throat length is 40 feet (about two 20-foot car lengths).

- For medium traffic volume commercial and industrial driveways, the shortest allowable driveway throat length is 80 feet (about four 20-foot car lengths).

- For high-volume driveways such as a shopping center entrance, the adequate throat length should be determined by the results of a traffic analysis.

14.0 PARKING ON FACILITIES

Parking should not be allowed on roadways that are primarily intended to serve through-traffic movement (principal arterials). Parking should generally not be allowed on minor arterials and collectors unless there are designated parking areas outside of the travel lanes. Parking may be allowed on local roadways.

Generally, only parallel parking is allowed on St. Louis County roadways.

Local governments have the ability to prohibit or restrict parking within their jurisdiction, subject to concurrent legislation in St. Louis County.

GLOSSARY

Acceleration Lane – A speed change lane that enables a vehicle entering a roadway to increase its speed to a rate at which it can safely merge with through traffic.

Access – The ability to enter or leave a public street from or at an adjacent driveway or another public street.

Access Management – The control of access to and from the roadway system for the purpose of maintaining safety and optimal flow of traffic.

Auxiliary Lane – A portion of the roadway separate from the thru lanes on the approach to a turning movement that is reserved for storage of vehicles waiting to make the turn.

Average Weekday Traffic (AWT) – The total volume of traffic using the roadway Monday thru Friday of an average sample week divided by 5.

Backage Road – A local street or road running parallel to an arterial for service to abutting properties and for controlling access to the arterials and which provides land access to the rear lot line of the property.

Conflict Point– Any point where the paths of two through or turning vehicles diverge, merge, or cross.

Congestion – See traffic congestion.

Corner Clearance – The minimum dimension, measured along a travel lane between the edge of pavement of an intersecting roadway and the nearest edge of a driveway.

Cross Access – A connection providing vehicular access between two or more contiguous properties so that the motorist need not re-enter the public roadway system in order to visit multiple sites on a single trip.

Driveway – Paved access to a private property.

Design Hour Volume – The hourly traffic volume used to evaluate or design a highway or driveway.

Easement – A grant of one or more property rights by a property owner to or for use by the public, or another person or entity.

Frontage Road – A public or private drive that generally parallels a public road between the right-of-way and the front building setback line. The frontage road provides access to private properties while separating them from the arterial street.

Functional Area (Intersection) – That area beyond the physical intersection of two classified roadways that comprises decision and maneuver distance, plus any required vehicle storage length, and is typically protected through corner-clearance standards and/or driveway connection spacing standards.

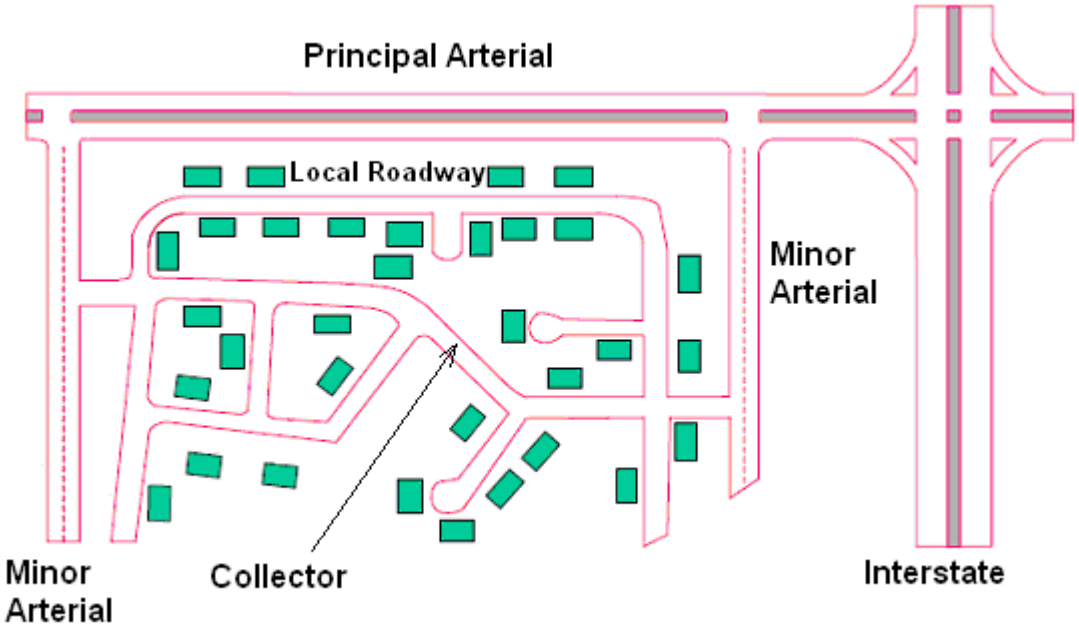
Functional Area (Interchange) – The functional area of the interchange is the area in which merging and diverging of traffic takes place.

Functional Classification – A system used to group public roadways into classes according to their purpose in traffic operation relating to mobility, connectivity and access.

Highway Capacity – The maximum number of vehicles that a highway can handle during a specific amount of time at a given level of service.

Highway System – All public highways and roads maintained by St. Louis County. These include parkways, arterials, collector streets and local roads (Figure 1).

Figure 1—The highway system



Joint Access (or Shared Access) – A single driveway serving multiple properties.

Level of Service (LOS) – The description of traffic conditions along a given roadway or at a particular intersection. The level of service ranges from "A," which is the best, to "F," which is the worst. It reflects factors such as speed, travel time, freedom to maneuver, traffic interruptions, and delay.

Local Street – A roadway intended to provide direct access to abutting properties and to roads of higher functional classification.

Minor Arterial and Collector – A roadway intended to distribute traffic between a principal arterial and a local roadway where function is balanced between access and thru put. Typically characterized by a significant volume of peak hour traffic.

Peak Hour Traffic – The highest number of vehicles passing over a section of a lane or roadway during any 60 consecutive minutes. Typically, there is a peak hour condition in the a.m. and a peak hour condition in the p.m. for which a roadway or intersection is analyzed for capacity and level of service at which time it becomes the design hour.

Principal Arterial – A roadway intended primarily for thru traffic and regional distribution where access is carefully controlled. Typically characterized by substantial volumes of peak hour traffic.

Right-of-Way – Land reserved, used, or slated for use for a highway, street, alley, walkway, drainage facility, or other public purpose.

Side Friction – Driver delays and conflicts caused by vehicles entering and exiting the roadway.

Traffic Analysis – A professional assessment of traffic conditions relating to change of access or development.

Traffic Congestion – A persistent or frequent condition resulting from more vehicles trying to use a given road during a specific period of time than the road can handle with what are considered acceptable levels of delay or inconvenience.

Traffic Impact Study – A report initiated in response to a proposed development that compares the anticipated roadway conditions with and without the development. The report may include an analysis of mitigation measures.

Trip Generation – Based upon national averages or local experience, the estimated volume of traffic going to and from a particular land use.

Turn Radius – The radius of an arc that represents the turning path of a vehicle.

Vehicle Trip – The vehicle moving from an origin point to a destination point.

Volume Warrants – The conditions under which traffic management techniques, such as a left-turn or a right-turn lane, are justified. For example, the need for a left-turn lane will vary according to the volumes of advancing and opposing traffic, and the percentages of traffic turning left.

RESOURCES:

1. Iowa State University Center for Transportation Research and Education, *Iowa Access Management Handbook, October 2000*

2. Missouri Department of Transportation, *Missouri Department of Transportation Access Management Manual, November 2006 Edition*

3. Transportation Research Board, *Highway Capacity Manual, 2000 Edition*

4. Iowa State University Center for Transportation Research and Education, *Access Management Frequently Asked Questions Toolkit, October 2000*

5. Minnesota Department of Transportation, *Access Category System and Spacing Guidelines, March 2002*

6. Transportation Research Board, *Access Management Manual, 2003*

7. American Association of State Highway and Transportation Officials, *A policy on Geometric Design of Highways and Streets, 5th Edition, 2004*

8. Federal Highway Administration, *Access Management for Streets and Highways, June 1982*

9. Papayannolulis, Gluck, and Feeney, *Access Spacing and Traffic Safety*

10. McHenry County, Illinois, *McHenry County Access Management Ordinances, March 1997*

11. Crawford, Bunte, Brammeier, *Access Management Plan for the St. Louis County Arterial Road System, December 2001*