

ACCESS MANAGEMENT STANDARD



December 6, 2005
Version 1.2

TABLE OF CONTENTS

<u>SUBJECT</u>	<u>PAGE</u>
Introduction	1
Application Process	2
Appeals	3
Standards Summary	4
Establishing Spacing & Number of Driveways	6
Site Circulation Planning	7
Signalized Intersection Spacing	8
Functional Intersection Area	9
Right-Turn Downstream Clearance Distances	9
Turn Lanes	10
Cross Access	11
Local Streets	12
Access Width & Design	13
Plan-View Lane Use Configurations	14
Turning Radii	16
Driveway Grades	17
Temporary Access	19
Access Maintenance & Construction	20
Functional Classification System	21
Principal Arterials	21
Minor Arterials.....	21
Collector Streets.....	21
Local Streets.....	21
Functional Classification Maps	22
Traffic Studies	26
Qualifications to Perform Study	26
When a Study is Required.....	26
Traffic Study Details (Expanded)	28
Construction Standards	32
Other Access Management Standards	33
Access Permit Application	34

INTRODUCTION

Access management provides a systematic means of balancing the access and mobility requirement of streets and roads. Simply stated, access management is the process that administers access to land development while simultaneously preserving the flow of traffic on the surrounding public road system in terms of **safety**, capacity, and speed.

A permit shall be required for the construction of any new point of access or the modification of any existing driveway within roadway right-of-way when the work is being done by any person, entity, or agency. A permit shall be required when new activity centers are planned or where major expansion or change of use of existing activity centers is envisioned, even though modification to existing access may be not required as a component of the enterprise itself. The access permit shall cover each access point between a site and the surrounding public road system.

The spacing of access for driveways and streets is an important element in the planning, design, and operation of roadways. Access points are the main source of accidents (both pedestrian and vehicular) and congestion. Their location and spacing directly affect the safety and functional integrity of streets and highway. Too many closely spaced street and driveway intersections, for example, increase accident potential and delays and preclude effective traffic signal coordination. Too few inhibit property access and over-concentrate traffic.

The actual operational impact of access is determined by the configuration of the accesses themselves. For example, accesses that provide for bi-directional movements in excess of two lanes may have a negative impact upon the roadway it is located upon, or adjacent accesses, depending upon the physical parameters of each. The careful management of both access travel lanes, in terms of number and width, as well as the standards that apply to the actual construction of the same, represent key elements in the ability of a roadway to operate safely and efficiently.

Despite the importance of access spacing for driveways and streets, it is often overlooked in current roadway and site planning efforts. Part of the problem stems from the constraints posed by existing streets and developments. However, the subject of sound spacing standards and guidelines is an equal, if not more important, constraint.

This standard on driveway and street intersection spacing has been developed in response to the need for a clear and consistent standard to guide the development of sound spacing practices.

The specific techniques for managing access to developments involve the application of established traffic engineering, traffic planning, and roadway design principles that:

- Limit the number of conflicts;
- Separate basic conflict areas;
- Reduce interference with through traffic due to turns into or out of a site;
- Provide sufficient spacing between at-grade intersections;
- Maintain progressive speeds along arterials and collectors; and
- Provide adequate on-site storage areas.

APPLICATION PROCESS

The application form on page 34 shall be completed for all valid applications. Incomplete applications shall not be accepted and are invalid. Applications for building permits, development plans, or subdivision plats shall not be processed until an application for an access is made and approved.

Access requested on Missouri Department of Transportation (MoDot) routes requires the permission of both the City of St. Joseph AND MoDot. Applicants shall initiate the permit process with the City of St. Joseph and, if approved, also obtain a permit from MoDot. No access construction or alteration shall occur without an approved access permit from BOTH MoDot and the City of St. Joseph along MoDot routes. For commercial projects, the coordination of this effort may occur at the City's Development Review meetings, but is the applicant's responsibility.

Upon receiving an access permit from both agencies, the applicant shall comply with MoDot construction standards for accesses located on a MoDot route. Applications on City routes shall conform to the construction standards of the City of St. Joseph.

The City of St. Joseph and MoDot utilize a coordinated permitting process for roadway access and have their own access management standards. Under this standard, the applicant (on a MoDot route) shall comply with the City of St. Joseph access management standards unless in conflict with a more stringent MoDot requirement. In that case, the more stringent of the two standards shall apply.

APPEALS

Applications that are denied may be appealed under the provisions of City Code, Section 25-93. However, all reviews requested through this process shall be restricted to a determination specifically limited to conformance with the Access Management Standards and potential impacts upon traffic safety, traffic operations, and public safety.

No finding in support of the applicant shall be granted unless it is found that the following relevant requirements and conditions are satisfied:

1. The granting of the variation is in harmony with the general purpose and intent of the regulations and will not result in undue delay or congestion or be detrimental to the safety of the motoring or pedestrian public using the roadway.
2. There must be proof of unique or existing special circumstances or conditions where the strict application of the provisions would deprive the developer/owner of reasonable access. Circumstances that would allow reasonable access by a road or street other than a primary roadway, circumstances where indirect or restricted access can be obtained, or circumstances where engineering or construction solutions can be applied to mitigate the conditions shall not be considered unique or special.
3. There must be proof of the need for the access and a clear documentation of the practical difficulty or unnecessary hardship. It is not sufficient to show that greater profit or economic gain would result if the variation would be granted. Furthermore, the hardship or difficulty cannot be self-created or self-imposed; nor can it be established on this basis by the owner who purchases with or without knowledge of the applicable provisions. The difficulty or hardship must result from the strict application of the provision, and it must be suffered directly and solely by the owner or developer of the property in question.

Upon receipt of relevant information, facts and necessary data, a review of the information shall be conducted and a decision rendered in writing to the applicant. Materials documenting the final decision shall be maintained in the Department's permit files.

STANDARDS SUMMARY

The following table summarizes the unsignalized access spacing guidelines for the various criteria that are described within this document. Spacing standards within the ranges shown shall be selected whenever possible to ensure safe traffic operations. However, their application may require adjustments in developed areas, where land subdivision has often limited property frontage and the desired spacing may not always be achievable. To address such instances, the standard applied shall utilize the greatest distance of any guideline listed where not constrained by aforementioned land subdivision, but shall never constitute a distance less than the shortest distance indicated in the same.

Unsignalized Intersection (Driveway) Summary*

Criteria	Posted Speed (mph)								
	20	25	30	35	40	45	50	55	60
1. Stopping Sight Distance	120	165	220	275	340	410	485	565	655
2. Length of Turn Lane: Turning Traffic to Leave Through Lane with a Speed Differential of:									
a) ≤10 mph					490	590	700	820	950
b) ≤15 mph				390	390	390	590	700	820
c) ≤20 mph			320	320	320	320	490	590	700
3. Minimum Right-turn Conflict Overlap			100	150	200	300			
4. Intersection Sight Distance	230	300	375	460	575	700	850	1,000	1,150
5. Maximum Egress Capacity	120	190	320	450	620	860	1,125	1,500	1,875
6. Crossing Sight Distance			<i>See Table</i>						

*Applicable to all roadways except listed arterials: Riverside Road (all), Belt Highway (Cook Road north) and all roadways classified as “local”. Arterial roadways are restricted to 1/4 mile access only as the land area served represent zones of new development. Future sections will include/do utilize medians. NO new access will be approved on any part of the Parkway System, including Noyes Blvd., and Ashland Avenue.

Sight Distances for Passenger Vehicle Crossing 2-Lane Roadway

Crossing Sight Distance			
Calculated ^{(1) (2)}			
Speed (mph)	2-Lane undivided	4-Lane undivided	6-Lane undivided
20	205	235	260
25	255	295	325
30	310	350	390
35	360	410	450
40	410	470	515
45	465	530	580
50	515	590	645
55	565	645	710
60	615	705	775
65	670	765	840
70	720	825	905

All accesses shall conform to the minimum stopping sight distance, intersection sight distance, and functional area of the intersection standards set forth with respect to functional class, typical section, and speed limit.

However, the other instances often require a retrofit approach that may comply with the minimum of a particular standard, but is not fully compliant with another. This is acceptable only if no other reasonable options exist in the Director's opinion, documented in a signed variance enumerating the same.

ESTABLISHING SPACING AND NUMBER OF DRIVEWAYS

Spacing provisions apply to highway connections involving private driveways, private streets, and public streets. All must be properly located and designed to ensure safe and efficient highway operations. Provisions concerning the number and spacing of driveways and streets shall reflect the following general considerations:

1. Spacing is keyed to the roadway functional classification (incorporating operating speed, development density, and operation needs). Spacing shall be more restrictive along higher-type roads, such as arterials.
2. Spacing provisions apply to new developments and to significant changes (defined as additional structures, change in use, or land use change) in existing developments. Existing accesses may be ordered altered, moved, or removed at the sole discretion of the City of St. Joseph in the event of a change of use or re-development involving the issuance of a new building permit or requested modification of an access.
3. The spacing provisions do not have to be consistent with pre-existing access practices.
4. The provisions cover the following: interchanges, streets, and driveways, median openings, and corner clearances.
5. The provisions shall minimize the need for variances, while simultaneously protecting traffic flow. Access to land parcels that does not conform to spacing criteria may be needed where there is no reasonable alternative access resultant from pre-existing lot size or structure construction, at the discretion of the Director.
6. Allowable clearances for deviations from the spacing provisions are specified for each class of road. They are greater for collectors and minor arterials than for principal arterials, based upon speed and other considerations.
7. Access driveways for major activity centers shall be considered as intersecting, high-volume roads, rather than as curb cuts. Different levels of traffic studies may be required to determine the impact of a related access upon the level of service of the adjacent public roadway.
8. Traffic signal spacing shall be related to the vehicle operating speed. Signal spacing criteria shall take precedence over unsignalized spacing standards in situations where future signalization is likely. This also applies to openings in medians.
9. Grade separation may be needed where major roads intersect, or as a means of providing direct access to major generators.
10. One (1) reasonable access to property shall be available. However, this may, at the discretion of the Director, involve side-street access where direct access is denied to an arterial, as well as cross-access agreement and/or shared driveways.
11. Residential applications for a new or expanded access must be justified by comprising an integral component involved in the use or access to structures such as a garage or carport. Applications for an access supporting only the provision of parking a vehicle in the public right-of-way, yard, or parking area shall not be permitted. Other applicant types (commercial, industrial, etc.---) must be justified via the section in this standard regarding traffic studies.

SITE CIRCULATION PLANNING

Provisions concerning the spacing and number of driveways shall reflect the following general considerations from a site perspective:

1. Encourage direct access to roadways of lower functional class.
2. The number of driveways shall be based upon need. For small developments where access to a lower functional class roadway is not available, site access shall be limited to one (1) driveway. For large developments, it may be necessary to provide additional access points from a specific, high-volume approach direction, based upon data derived from an appropriate traffic study. This may in turn require improvements (funded by the applicant) to the roadway to accommodate the privately generated impacts identified by the traffic study.
3. Site access designs that simplify signal phasing by separating left-turns in and left-turns out for large developments shall be considered.
4. Design features of a driveway or intersection, including lane width, median treatment, turning radius, sight distance, etc.--- shall reflect the functional class of the highway on which it will be located.
5. On-site circulation shall be designed with sufficient storage space to preclude any spill-back of traffic from site connectors onto the roadway system.

SIGNALIZED INTERSECTION SPACING

Most traffic delays along roadways result from stops at traffic signals. Various studies have shown that the number of traffic signals per mile has a greater influence on travel speeds than the traffic volume per lane or the volume-to-capacity ratio. Therefore, selecting a long and uniform signalized intersection spacing is the first essential element in establishing access spacing standards.

Minimum Traffic Signal Spacing

<i>Roadway Class</i>	<i>Rural</i>	<i>Suburban</i>	<i>Urban</i>
Interstate	2 miles	1 mile	1 mile
Expressway	1 mile	1 mile	1 mile
Major Arterial	½ mile (2,640')	½ mile (2,640')	½ mile (2,640')
Minor Arterial	¼ mile (1,320')	¼ mile (1,320')	¼ mile (1,320')
Collectors	1/8 mile* (660')	1/8 mile* (660')	1/8 mile* (660')

*Traffic signal spacing of 660' may be considered in retrofit applications where there is an opportunity to combine and reduce the number of existing connections when a traffic indicates that the queues will not extend between signals and signal progression can be maintained.

FUNCTIONAL INTERSECTION AREA

The functional area of an intersection shall govern corner clearances upstream and downstream of an intersection.

Functional Intersection Area – Excluding Storage *Minimum Maneuver Distance*

Speed	Desirable Conditions		Limiting Conditions	
	Deceleration	Total	Deceleration	Total
30	225	325	170	215
35	295	425	220	270
40	375	525	275	335
45	465	630	340	405
50	565	750	410	480
55	675	875	495	565
60	785	1005	565	655

1. All values rounded to nearest 5 feet.
2. 2.5 second perception-reaction time. 3.5 fps² average deceleration while moving laterally into turn bay and an average 6 fps² deceleration thereafter, 10 MPH speed differential.
3. 1.0 second perception-reaction time. 4.5 fps² deceleration while moving laterally into turn bay and an average 9.0 fps² deceleration thereafter, 10 MPH speed differential.
4. Distance to decelerate from speed to a stop while maneuvering laterally into a left or right-turn bay.
5. Deceleration distances plus distance traveled in perception-reaction time.

Right-Turn Downstream Clearance Distances

Minimum corner clearance from a major, unchannelized intersection, is 120 feet. Where a right-turn deceleration lane of sufficient length is provided downstream from a major intersection, a distance of 35 to 40 feet between the end of the curb return and the beginning of the right-turn lane bay taper is required.

For channelized intersections (providing for protected right-turns at signalized intersections), the following shall apply:

<u>Radius</u>	<u>Clearance</u>
(feet)	(feet)
50	200
75	230
100	275

TURN LANES

Right-Turn Lanes

The requirement for right-turn turn lanes shall be considered for every intersecting street or driveway at an arterial street. The warrants to guide this consideration are as follows:

<i>Roadway Class</i>	<i>Rural</i>	<i>Suburban</i>	<i>Urban</i>
Expressway	>10 VPH	>10 VPH	>10 VPH
Major Arterial	>25 VPH	>25 VPH	>25 VPH
Minor Arterial	>25 VPH (45 MPH+) >50 VPH (<45 MPH)	>25 VPH (45 MPH+) >50 VPH (<45 MPH)	>25 VPH (45 MPH+) >100 VPH (<45 MPH)
All Others	>50 VPH (45 MPH+) >100 VPH (<45 MPH)	>50 VPH (45 MPH+) >100 VPH (<45 MPH)	>50 VPH (45 MPH+) >100 VPH (<45 MPH)

*VPH= Vehicles Per Hour

CROSS ACCESS

Development along collector and arterial roadways is a natural outcome of the construction and maintenance of a roadway. However, the purpose of both types of functional classes is not to serve property access, but to efficiently and safely move traffic from one area of the community to another. Excessive accesses detract from the purpose the roadway was designed and constructed for within these functional classes.

When opportunities arise, whether via a reconstruction project, re-development, or new development, a cross access agreement shall be required of the applicant when requested. This provision shall grant adjacent properties the opportunity to share an access point onto a roadway to in turn access a property. In this manner, property may be subdivided along collectors or arterials without having a detrimental impact upon the roadway, via combining multiple property access to a single conflict point.

LOCAL STREETS

The following standards shall apply to local streets:

- Minimum distance for a driveway from such an intersection shall be forty (40') feet, as measured from the nearest driveway edge to the curb of the street intersection.
- **Standards concerning obstructions in the sight triangle and sight distance shall apply.** A field person will check this in the field previous to application approval. An access may have to be disapproved or moved depending upon the results of this safety review.
- On local roadways serving single family, residential purposes, access widths may be granted in increments of 10' (instead of the 12' standard), but shall be no greater than 24' in total width per street frontage (i.e. two 12' accesses for a circular drive or a single, 24' drive).
 - This limitation is based upon the fact that a full travel lane on a public street is 12', meaning that a local access may have an access equal in width to that of the travel lanes of the street being accessed (24'), but no greater. It also places fewer pavement in the right-of-way (ROW) to disrupt utility and other work.
 - This limitation is placed only upon the portion of the driveway placed in the ROW. A drive may be whatever width is desired outside of the ROW, subject to paving limitations of the Planning Division.
- Lots facing two streets (corner lots) may have a maximum of a 24' wide access per frontage, if the access requested leads to a garage, carport, storage shed, or related structure justifying the request.
- Access applications for in-yard parking only shall not be permitted.
- No access shall be approved if it is not justified by leading to a garage, carport, storage shed, or related structure, but may be approved on streets where on-street parking is prohibited by ordinance on the applicant's side of the street.
- Radii are not required and may simply intersect the local street at ninety degrees.
- All construction shall be in compliance with American with Disabilities Act and City Construction Standards.

ACCESS WIDTH AND DESIGN

In some driveway permit regulations, the term “curb cut” is used. Under this standard, the term “access” shall be used because the word “curb cut” has little relation to the practical function of a driveway and may be confusing to the public when applied to roadways without curbs. Access width is measured at the “throat” (the point at which the access crosses the right-of-way line) of the access, not the edge of the radii.

Major Access Design Factors

AASHTO recognizes that a full-width travel lane is twelve feet for non-interstate roadways. Given that dimension, access widths shall be granted in increments of twelve feet. The lane number shall correspond to the number of properties served by a single access, the roadway type (functional class and lane number), and associated land-use served by the access.

Accesses to a public roadway operate as an intersection. Vehicle safety in the operation of the access and the safety of motorists using the roadway itself are both important factors considered in the design of a driveway. However, the primary consideration is to preserve the safety and operational capacity of the roadway and motorists using the roadway itself and intersecting roadways that access it. Of secondary concern is the property access requirement.

On local roadways serving single family, residential purposes, access widths may be granted in increments of ten feet (instead of the twelve foot standard), as generally the purpose served is for driveways leading to a garage, but shall be no greater than twenty-four feet in total width. As such are traditionally low-volume generators, full lane widths are not as vital as with other accesses. Radii for such are not required and may simply intersect the local street at ninety degrees.

Multi-family to commercial uses, are granted access widths of twenty-four (24) feet (two (2) lanes), when granted an approval to access a roadway, although heavy reliance upon shared access shall govern before an individual property access is approved. Single family shall be limited to 12' (with a turning radii), subject to the same shared access provisions. New single family residential development shall be required to utilize shared access when access to a collector or arterial is planned.

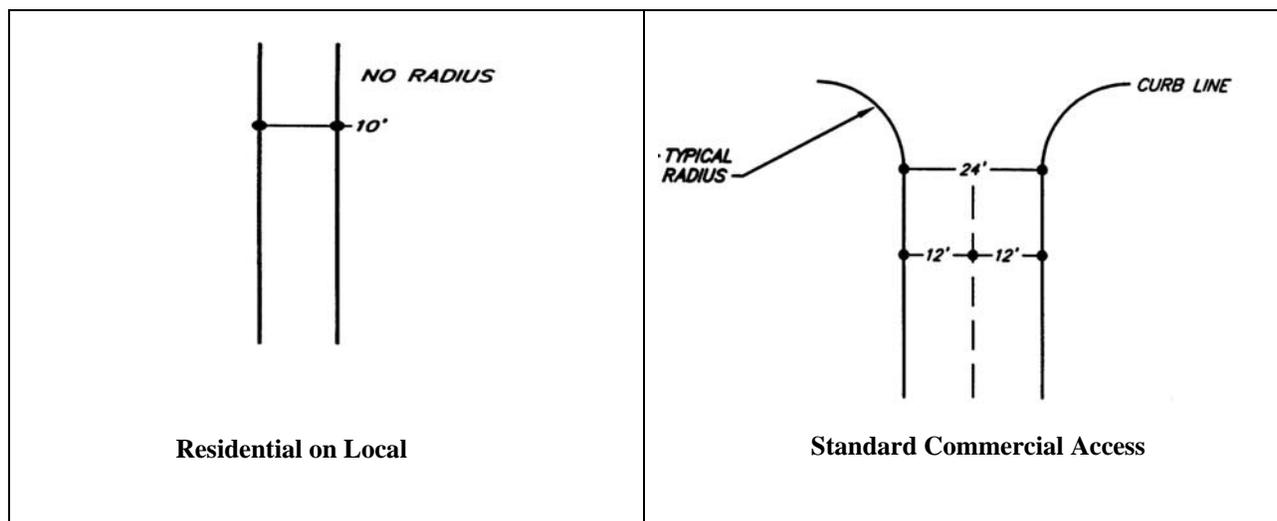
Additional travel lanes will be considered upon justification by the applicant that the supplementary travel lanes are appropriate to the situation, will not have an adverse effect upon motorist safety, and will not adversely impact operational capacity. This justification shall be based upon traffic volume, associated with the land use proposed, illustrated in the most recent publication of the Institute of Transportation Engineer’s “Trip Generation Manual”. The following lane configurations shall be considered illustrations for permitting purposes, intending only to show lane widths, relationship of lane number to median treatments, and general layout data. Full construction details are contained within the City’s construction standards.

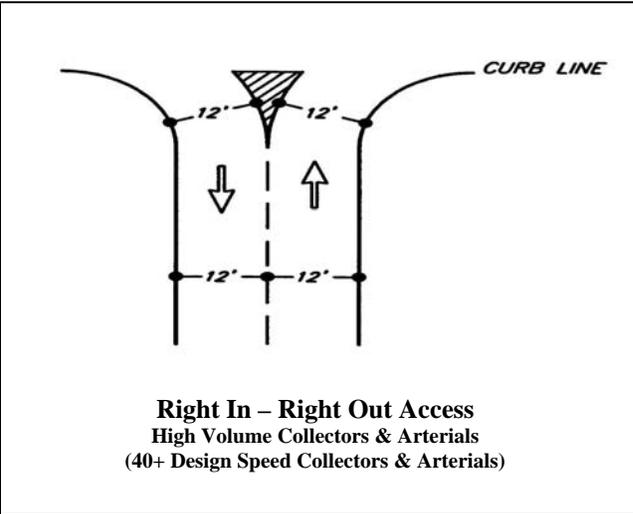
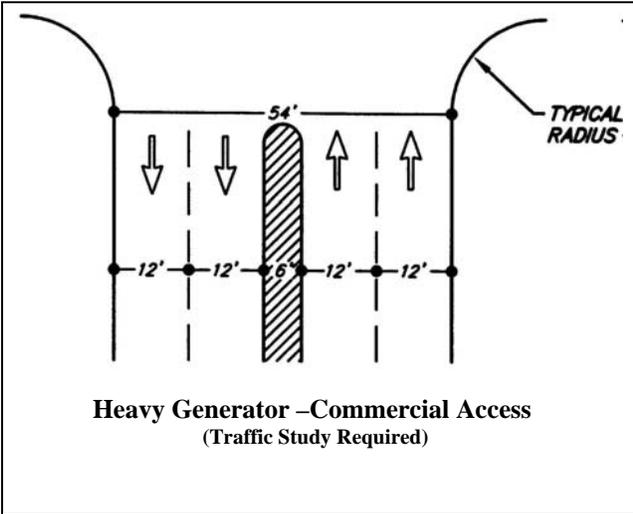
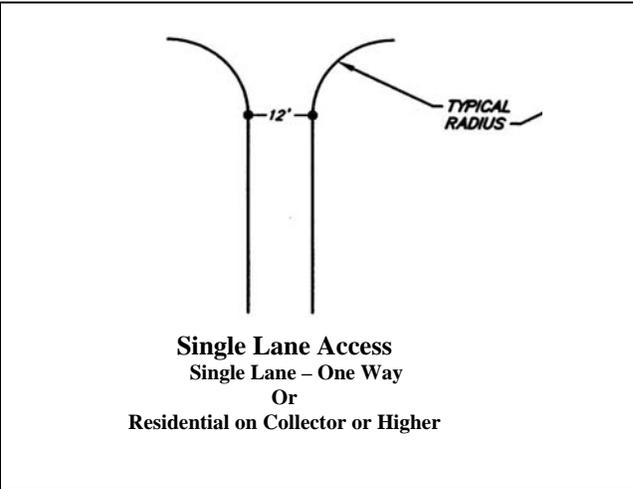
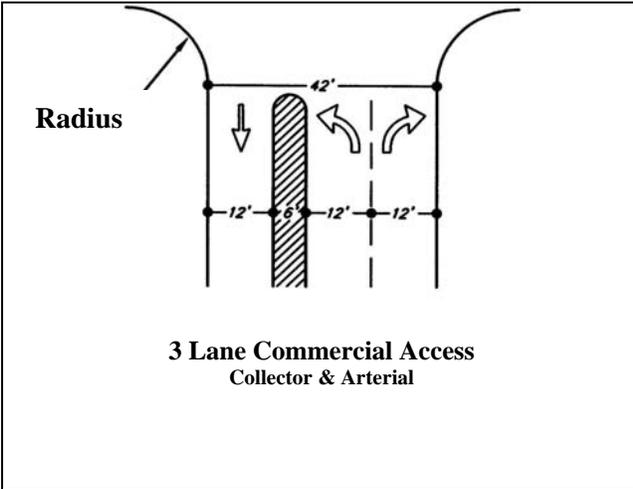
No driveways shall have widths less than 10 feet. Driveways of greater than 24 feet shall be strongly discouraged unless they contain a raised median to separate traffic lanes, and even in that event must be justified per the guidance contained within the “traffic study” section of this standard. Driveway widths shall be measured at the “throat” of the access where it crosses the right of way (ROW) line. Existing accesses may be altered, moved, or removed at the sole discretion of the City of St. Joseph in the event of a change of use or re-development involving the issuance of a new building permit. 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:

Driveway Traffic Category	Average Daily Traffic Using Driveway	Peak Hour Traffic Using Driveway	With Two-Way Access		With One-Way Access	
			Minimum Width	Maximum Width	Minimum Width	Maximum Width
Residential	0 – 100	0 – 10	10 feet*	24 feet*	NA	NA
Low Volume Commercial/Industrial	< 1500	< 150	24 feet**	36 feet***	12 feet*	24 feet*
Medium Volume Commercial/Industrial	1,500 – 4,000	150 – 400	24 feet**	48 feet****	12 feet*	24 feet**
High Volume Commercial/Industrial	> 4000	> 400	24 feet**	To be determined through a traffic study	Generally not applicable	Generally not applicable

- * One-lane driveways.
- ** Driveway striped for two lanes.
- *** Driveway with median for three lanes.
- **** Driveway with median for four lanes.

All commercial and industrial driveways shall be curbed on approach.





TURNING RADII

The inclusion of turning radii in access decision-making is crucial in allowing the turning vehicle to quickly enter and leave the roadway without impeding traffic. However, planning for an inappropriate design vehicle accommodation is often more detrimental than beneficial. Additionally, the over-designed access radius exposes the pedestrian and bicyclist to increased exposure to the motorist, which supports the requirement for a justified and documented radius as designed for, not simply as requested.

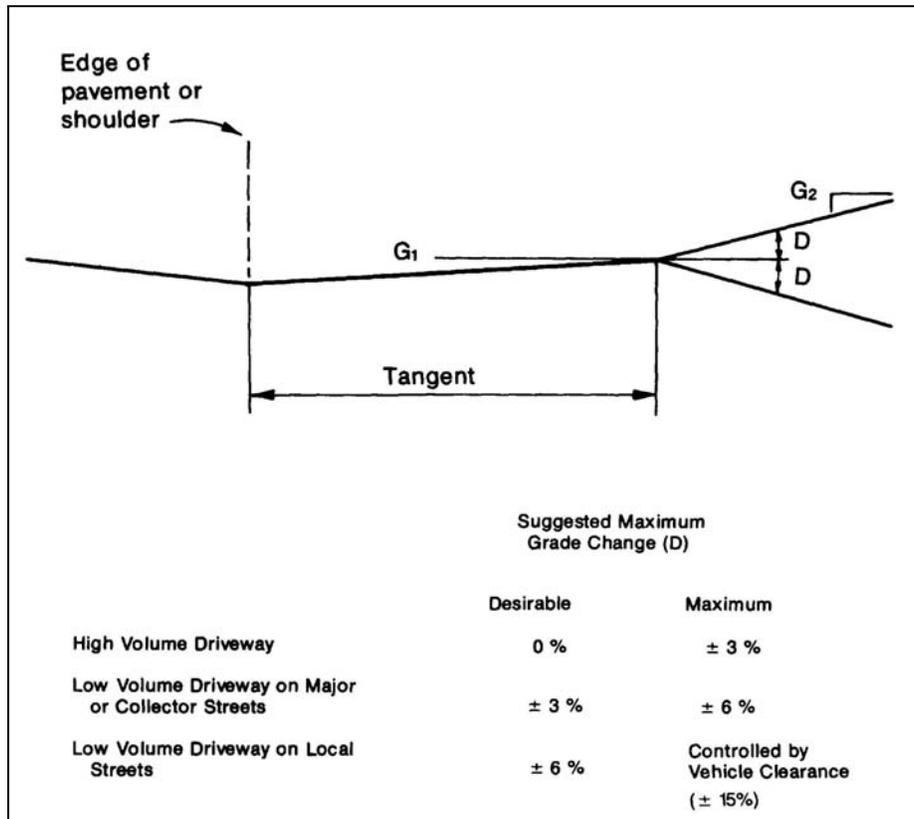
Applicants are required to identify the AASHTO design vehicle and apply the associated turning templates that support the use of the designed access for the designated design vehicle. For large properties that front two public streets, design preference for truck traffic will be granted from the lower functional class street of the two. This statement shall in no way be interpreted as suggesting that properties fronting on two roadways have an automatic access opportunity for multiple streets – one does not.

As a minimum, the following use groups shall utilize the listed right-turn radius:

- Residential – 5'
- Commercial – 15'
- Industrial – 20'

DRIVEWAY GRADES

The following graphic shows the desirable (the standard requirement) and maximum (the minimum acceptable) grade changes for three classes of driveways. For the values shown, no vertical curve connecting the tangents is necessary. The value of G_1 is limited by shoulder slope or by the presence of a sidewalk within the right-of-way, but desirably should not exceed ten percent.



For grade changes more abrupt than those shown, vertical curves at least ten feet long shall be used to connect tangents.

Maximum grades, G_2 , shall be limited to fifteen percent for residential driveways and to five to eight percent for commercial and industrial driveways. If possible, driveways that must be steeper than the minimum standards shall have longer tangent sections (at G_1 grade) than those discussed below, but a variance to the standard is required by the Director in any event.

Within ten feet of the roadway edge, the driveway grade shall be limited to six percent when possible. The maximum difference between the downward cross slope of the traveled way (usually two percent or less) and the upward slope of the driveway to the sidewalk shall not exceed eight percent. The driveway crossing of the sidewalk shall be made with little or no change in the sidewalk grade or cross-section. If the provision of adequate curb return radii precludes meeting this objective, the sidewalk shall be warped into the driveway grade. The

driveway slope upward from the gutter line on a straight slope (no vertical curve) shall be at least ten feet long for residential driveways and forty feet long for commercial and industrial driveways. This relatively flat area permits vehicles to turn off a roadway without immediately climbing or descending, and exiting vehicles have a waiting area at approximately roadway level.

Mountable curbs are used along local streets in many areas, and often the curb is not modified when a driveway is installed. Such a design has the obvious disadvantage of costing the developer less to construct. However, they result in considerable bounce for occupants in vehicles riding over the curb. Due to this discomfort, the accident hazard when such driveways are entered at relatively high speeds, and the proliferation of unapproved “wedges” constructed in the gutter to overcome this bounce, new or modified driveways may have the curb lowered to approximately the elevation of the gutter for residential access points, at the option of the applicant. It is mandatory that curbs be removed to the elevation of the gutter line for commercial and industrial access points. Of course, curb removal assumes that the driveway elevation from the gutter to the driveway is such that storm water will not flow onto a property. If such is the case, other design approaches may be required and will be made on a case by case basis.

The same physical limitations apply to roadways with shoulders except that the driveway grade across the shoulder shall be that of the shoulder. The grade between the outer edge of the shoulder and the property line shall be appropriate for the type of drainage provided. If the roadway is in a cut, a driveway sloped to the low point of the ditch line would often result in a break-over angle that would be too sharp for satisfactory driveway speed, especially on an uncurbed, high-speed rural highway. As an alternative, a flat driveway with a culvert under it is recommended. If the roadway is in a hilly area, the driveway may require sufficient rise above shoulder level to prevent stormwater run-off onto adjacent property.

TEMPORARY ACCESS

Temporary access may be granted to underdeveloped/undeveloped property prior to development of a final development plan if access is needed for construction or preliminary site access. Temporary accesses are subject to removal, relocation, or re-design preceding or after the final development plan is approved.

Unimproved accesses and access modifications made without a permit shall be considered “temporary” and subject to the provisions of this section.

ACCESS MAINTENANCE & CONSTRUCTION

Unless a driveway is paved and well-maintained, potholes and other surface imperfections are likely to develop. This may cause vehicles using the driveway to come almost to a stop before entering or leaving the traffic stream, causing excessive interference with through traffic. Further, if the pavement becomes badly deteriorated, circulation paths in any adjoining parking area may be adversely affected. Other undesirable characteristics of non-permanent driveway surfacing include the difficulty of maintaining the desired surface profile, higher maintenance expenses, reduced skid resistance, tracking of loose material onto sidewalks, streets, and highways, possible damage to the pavement if potholes develop at the edge of the pavement, and problems of snow removal.

Permanent types of paving include surfacing with Portland cement concrete, asphaltic concrete and bituminous surface treatment. Gravel and other materials without a permanent surface are not considered satisfactory except for low volume driveways in rural areas or for temporary accesses.

Driveways shall be well maintained to ensure that the original profile is retained, that operational speeds are not reduced by rough surfaces, and that damage to or deterioration of the public pavement is not caused by the condition of a driveway. The quality of maintenance shall also be adequate to ensure that drivers will not deviate from logical circulation patterns to avoid driveways in poor condition.

Permanent pavement, for new construction and for maintenance, shall extend at least to the end of the driveway curb radii, to the sidewalk, or to any other portion of the driveway within the public right-of-way. In the case of commercial and industrial driveways, permanent pavement is required for at least 50 feet (15m) from the edge of the highway pavement.

If a driveway connects with an unpaved street or road, stabilized material of at least as high a standard as the roadway shall be required to the right-of-way line. The stabilized material shall be carried well back into private property.

When separate turn lanes and/or tapers are built along a paved street or road to serve a driveway, the permanent paving shall be of the same type as that used on the public roadway or of contrasting surface material. The pavement within the right of way shall be designed to have at least the same structural strength as the public road. Separate turn lanes and tapers along unpaved streets and roads are not permitted.

The area between approximately 3 feet to 8 feet above sidewalk and roadway elevation shall be maintained as a clear open zone for exiting driver visibility. This range covers the eye height from the lowest passenger car through the truck driver.

FUNCTIONAL CLASSIFICATION SYSTEM

A functional classification system is a hierarchy of streets that describe the operational characteristics and role of streets in the circulation system. The system is divided into classification types including arterial, collector and local streets. In addition to these classical categories, St. Joseph also uses the designations of parkway and boulevard system.

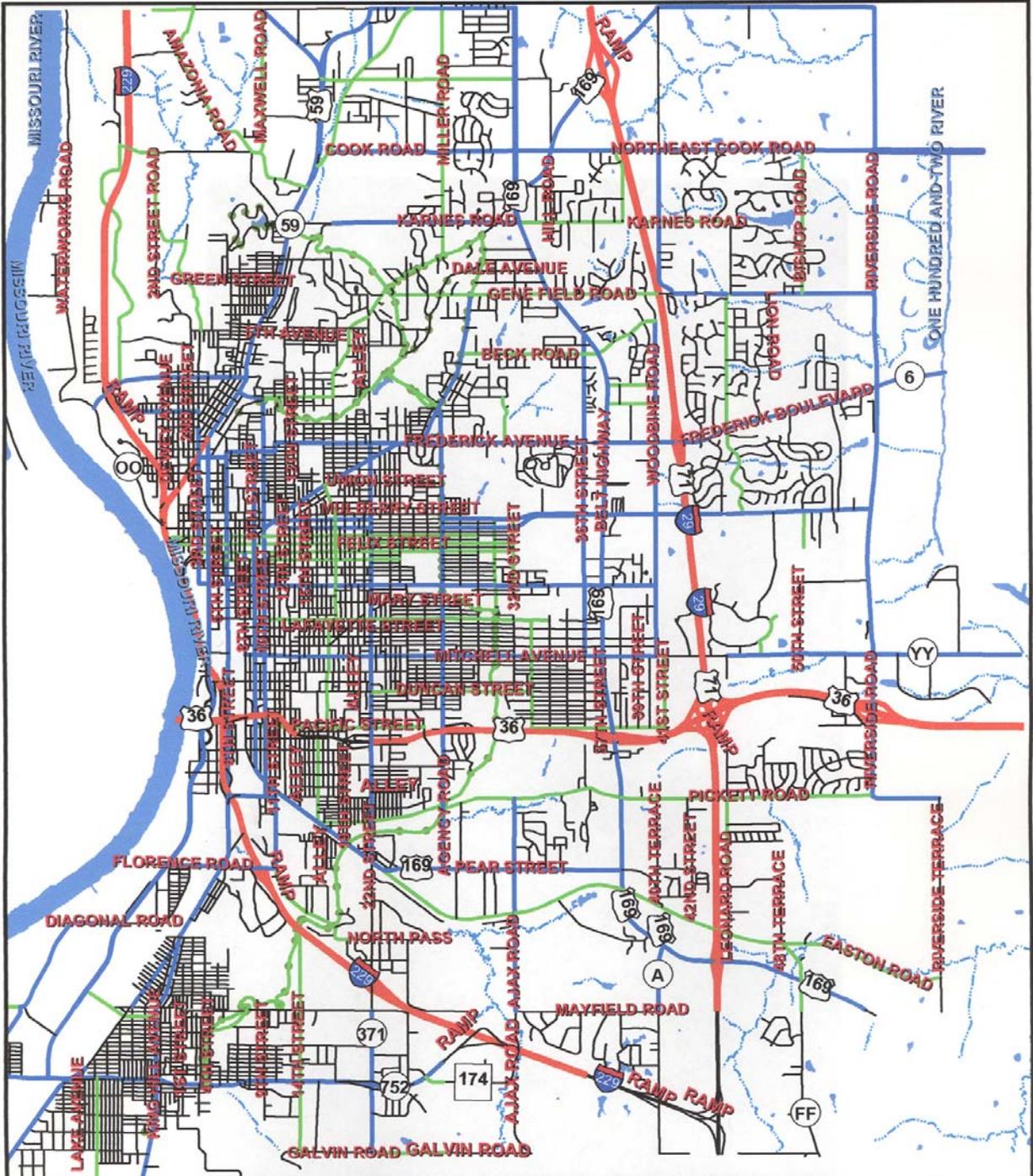
Arterial-

Principal arterials are roadways designed to carry large volumes of traffic at high rates of speed. Examples of roadways in this category would include interstates, United States highways, and expressways. The function of a principal is to carry traffic from point to point at a high rate of speed. Direct property access is often limited access or restricted to grade separation access via interchanges. Posted speed limits vary from 55 MPH to 70 MPH.

Arterial roadways are designed to carry large volumes of traffic, but a lower rates of speed within an urban area, typically with posted speeds no greater than 55 MPH. The function of an arterial is to carry traffic from point to point at a higher rate of speed than local streets or collector streets. Direct property access is often limited access or shared access to separate points of access as far apart as possible. Posted speed limits vary from 35 MPH to 55 MPH. Some expressways may be classified in this category, in industrial or commercial areas.

Collector roadways are a split purpose classification. The roadways function at a lower rate of speed than an arterial and serve as a means of access to private property. A collector often carries a volume of traffic comparable to that of some arterials, but at a lower rate of speed. As a result of additional access, a collector operates allows a greater number of turning movements which results in a corresponding decrease in posted travel speeds from 30 MPH to 45 MPH. Roadway management relies heavily upon shared access and access spacing to retain the operational capacity and safety of this class while maintaining safety and capacity.

Local streets are designed to provide direct access to property, at lower speeds. Local streets typically have a low volume of traffic and often allow on-street parking. Posted speed limits on a local street are posted at 25 MPH or less. Aside from corner clearance, access spacing is not a critical issue on local streets.



Functional Classification Map
CITY OF ST. JOSEPH
BUCHANAN COUNTY,
MISSOURI
 Nov. 30, 2005

GEOGRAPHIC INFORMATION SYSTEM BY
MIDLAND GIS SOLUTIONS, LLC.
 601 N. MARKET
 MARYVILLE, MO 64489
 VOICE: 660-562-0050
 FAX: 660-562-7173
 WWW.MIDLANDGIS.COM

GIS METADATA OVERVIEW
 GRID COORDINATE SYSTEM: MISSOURI STATE PLANE
 SPCS ZONE CENTER/ARK. MISSOURI WEST
 DATUM: NAD83
 UNITS: US SURVEY FEET
 PHOTOGRAPHY CURRENCY: 2005

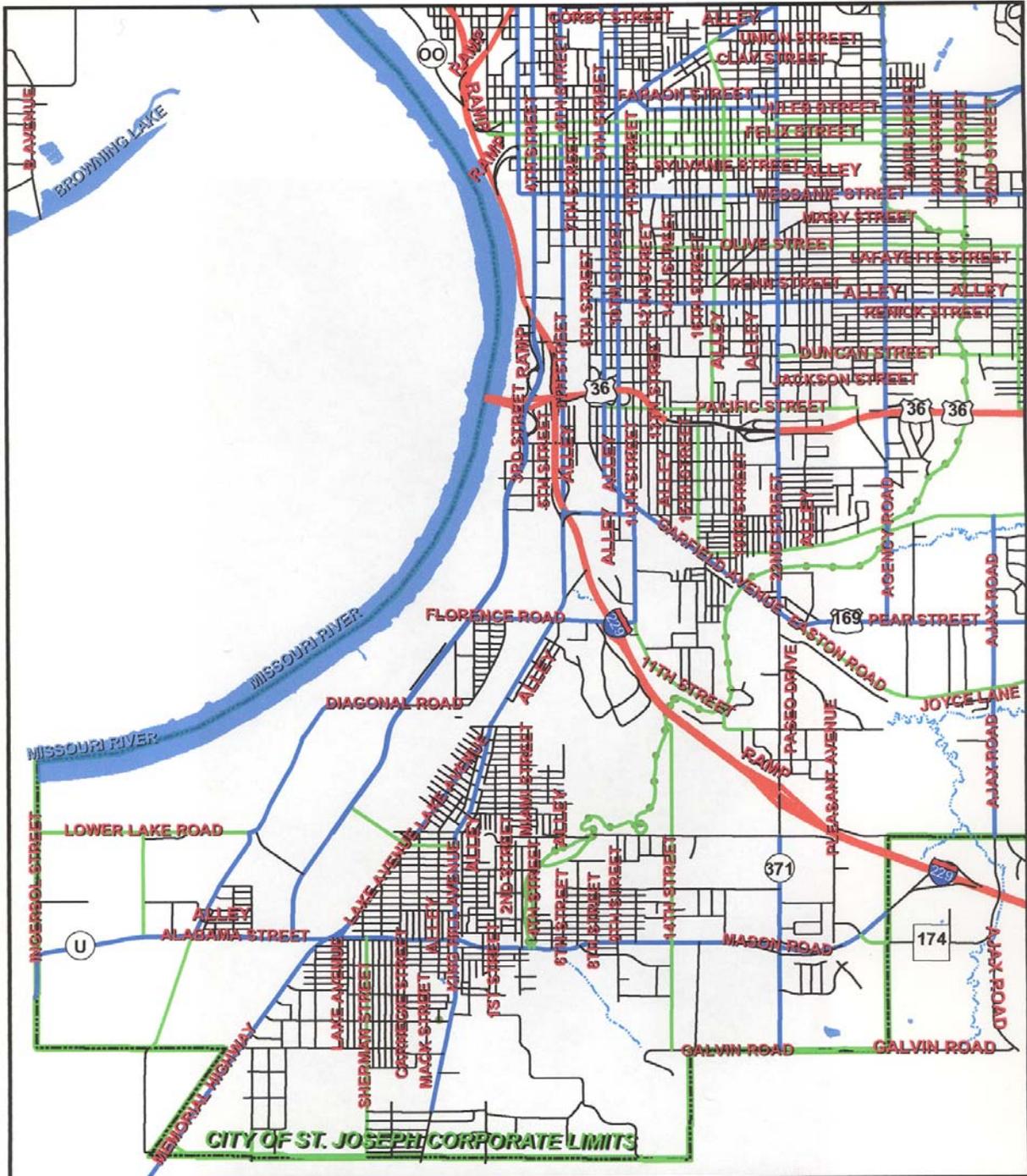
THIS PROPERTY OWNERSHIP MAP IS FOR TAX PURPOSES ONLY. IT IS NOT INTENDED FOR CONVEYANCE, NOR IS IT A LEGAL SURVEY.

LEGEND

SECTION LINE	CORPORATION LINE	Major Arterial	INTERSTATE HIGHWAY
TWP & RND	COUNTY LINE	Arterial	U.S. HIGHWAY
QUARTER SECTION	STATE LINE	Collector	STATE HIGHWAY
TRACTS	RAILROAD CENTERLINE	MAP BLOCK	COUNTY HIGHWAY
MAP INDEX	LAND HOODS	STREAMS	BUSINESS LOOP
PARCELS	PARCEL NUMBER	1:50' ORIGINAL BLOCKS	
ORIGINAL LOTS	DIMENSION	160' EASEMENT	

1 inch equals 4,776 feet





Functional Classification Map
CITY OF ST. JOSEPH
BUCHANAN COUNTY,
MISSOURI
 Nov. 30, 2005

GEOGRAPHIC INFORMATION SYSTEM BY
MIDLAND GIS SOLUTIONS, LLC.
 101 N. MARKET
 MARYVILLE, MO 64468
 VOICE: 660-582-0050
 FAX: 660-582-7173
 WWW.MIDLANDGIS.COM

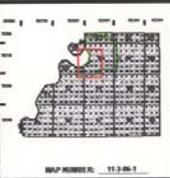
GIS METADATA OVERVIEW

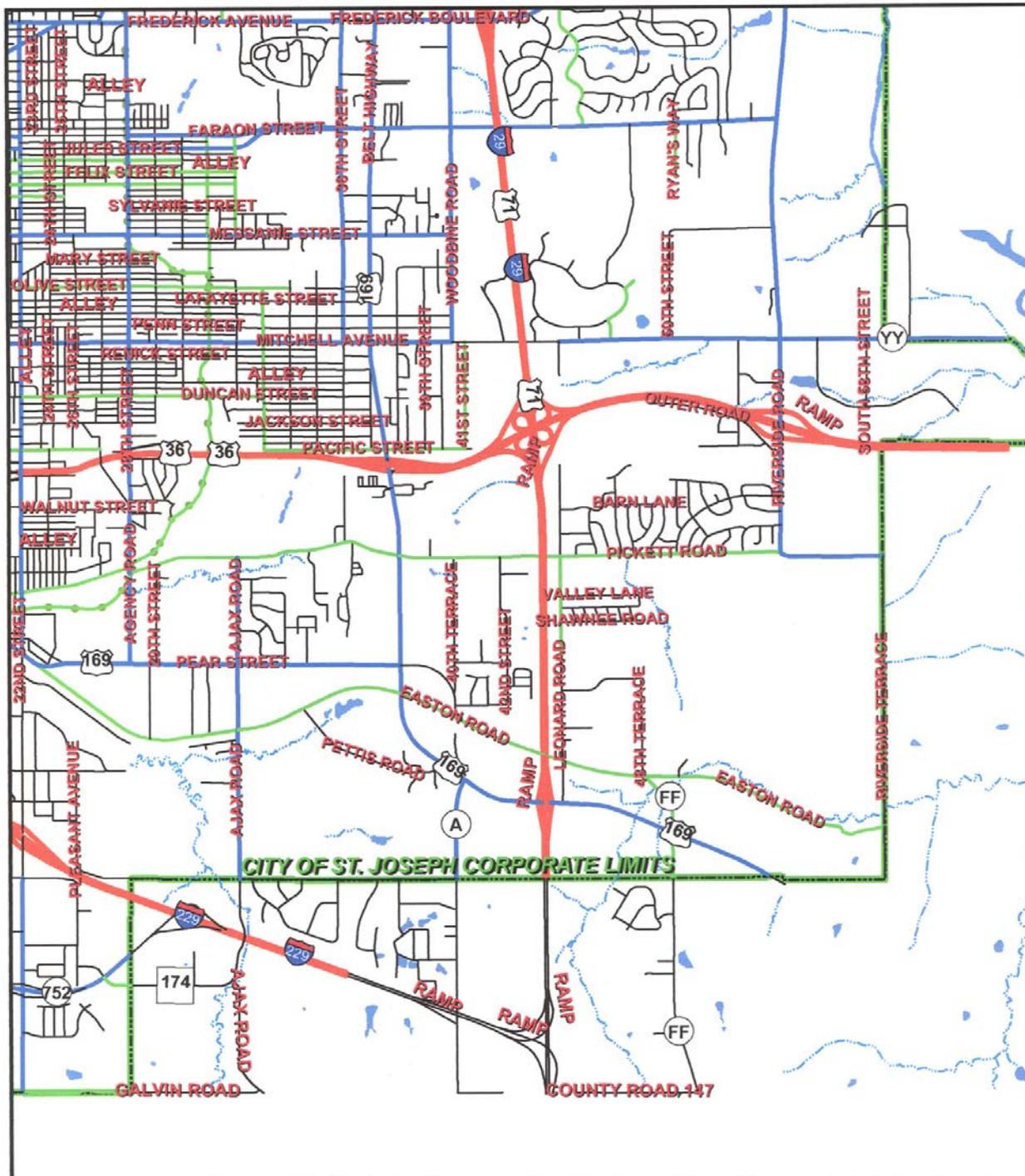
GRID COORDINATE SYSTEM: MISSOURI STATE PLANE
 SP43 ZONE IDENTIFIER: MISSOURI, WEST
 DATUM: NAD83
 UNITS: US SURVEY FEET
 PHOTOGRAPHY CURRENCY: 2003

THIS PROPERTY OWNERSHIP MAP IS FOR TAX PURPOSES ONLY. IT IS NOT INTENDED FOR CONVEYANCES, FOR EIT A LEGAL SURVEY.

LEGEND

SECTION LINE	CORPORATION LINE	Major Arterial	INTERSTATE HIGHWAY
TWP & RING	COUNTY LINE	Arterial	U.S. HIGHWAY
QUARTER SECTION	STATE LINE	Collector	STATE HIGHWAY
TRACTS	RAILROAD CENTERLINE	MAP BLOCK	COUNTY HIGHWAY
MAP INDEX	LAND HOODS	STREAMS	BUSINESS LOOP
PARCELS	PARCEL NUMBERS	ORIGINAL BLOCKS	
ORIGINAL LOTS	DIMENSION	EASEMENT	





Functional Classification Map
CITY OF ST. JOSEPH
BUCHANAN COUNTY,
MISSOURI
 Nov. 30, 2005

GEOGRAPHIC INFORMATION SYSTEM BY
MIDLAND GIS SOLUTIONS, LLC.

501 N. MARKET
 MARYVILLE, MO 64488
 VOICE: 660-562-0050
 FAX: 660-562-7173
 WWW.MIDLANDGIS.COM

GIS METADATA OVERVIEW

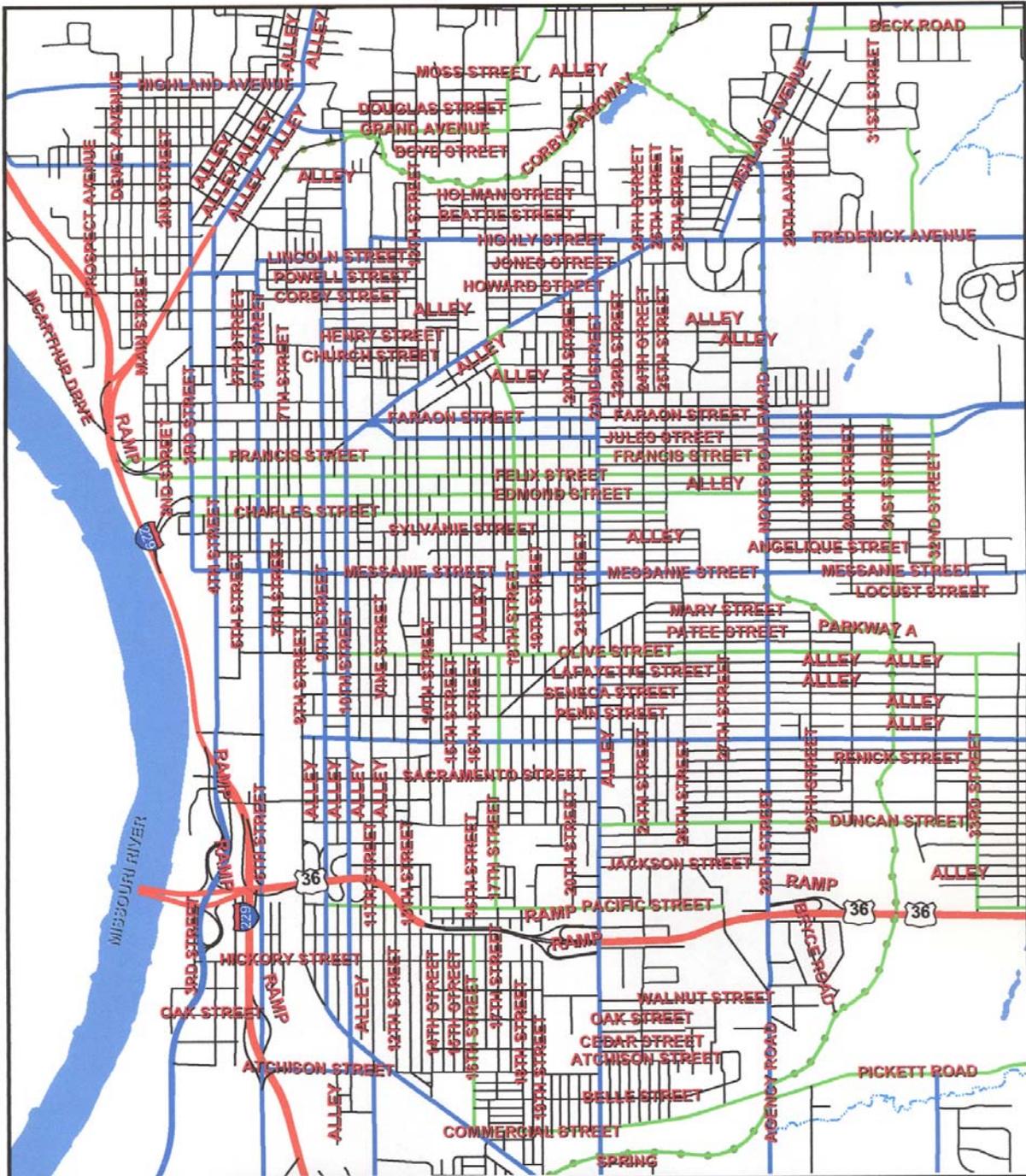
GRID COORDINATE SYSTEM: MISSOURI STATE PLANE
 SPHERICAL IDENTIFIER: MISSOURI, WEST
 DATUM: NAD83
 UNITS: US SURVEY FEET
 PHOTOGRAPHY CURRENCY: 2003

THIS PROPERTY OWNERSHIP MAP IS FOR TAX PURPOSES ONLY. IT IS NOT INTENDED FOR CONVEYANCES, NOR IS IT A LEGAL SURVEY.

LEGEND

SECTION LINE	CORPORATION LINE	Map Arterial	INTERSTATE HIGHWAY
TWP & RNG	COUNTY LINE	Arterial	U.S. HIGHWAY
QUARTER SECTION	STATE LINE	Collector	STATE HIGHWAY
TRACTS	RAILROAD CENTERLINE	MAP BLOCK	COUNTY HIGHWAY
MAP INDEX	LAND HOOPS	STREAMS	BUSINESS LOOP
PARCELS	PARCEL NUMBER	ORIGINAL BLOCKS	
ORIGINAL LOTS	DIMENSION	EASEMENT	





Functional Classification Map
CITY OF ST JOSEPH
BUCHANAN COUNTY,
MISSOURI
 Nov. 30, 2005

GEOGRAPHIC INFORMATION SYSTEM BY
MIDLAND GIS SOLUTIONS, LLC.
 501 N. MARKET
 MARYVILLE, MO 64488
 VOICE: 660-562-0050
 FAX: 660-562-7173
 WWW.MIDLANDGIS.COM

GIS METADATA OVERVIEW
 GRID COORDINATE SYSTEM: MISSOURI STATE PLANE
 SPCS ZONE IDENTIFIER: MISSOURI WEST
 DATUM: NAD83
 UNITS: US SURVEY FEET
 PHOTOGRAPHY CURRENCY: 2003

THIS PROPERTY OWNERSHIP MAP IS
 FOR TAX PURPOSES ONLY. IT IS NOT
 INTENDED FOR CONVEYANCES, NOR
 IS IT A LEGAL SURVEY.

LEGEND

SECTION LINE	CORPORATION LINE	Map Arterial	INTERSTATE HIGHWAY
TRIP & RING	COUNTY LINE	Arterial	U.S. HIGHWAY
QUARTER SECTION	STATE LINE	Collector	STATE HIGHWAY
TRACTS	RAILROAD CENTERLINE	MAP BLOCK	COUNTY HIGHWAY
MAP INDEX	LAND HOOKS	STREAMS	BUSINESS LOOP
PARCELS	PARCEL NUMBER	ORIGINAL BLOCKS	
ORIGINAL LOTS	EMBISSION	EASEMENT	



TRAFFIC STUDIES

Process

The City of St. Joseph, responsible for a roadway to be accessed, has the discretion to grant or deny an access permit based upon the material submitted in comparison to its adopted standards. The request may be granted as submitted, require design modifications, or denied. A variance may be requested in an instance where the requested access does not meet desirable standards, but still falls within safety minimums. The safety minimums that must be met at all times shall be stopping sight distance, intersections sight distance, and functional intersection area clearance.

All modeling shall be coordinated through the City of St. Joseph and will be performed via the St. Joseph Area Transportation Study Organization (the St. Joseph MPO) for inclusion in the study at the macro level to generate gross volumes necessary for the traffic study. The applicant shall perform micro modeling necessary for the project. Fundamentally, a study is aimed at determining the impact a proposed access may have upon the public road's level of service (LOS) and safety. Private property access is secondary to these concerns. It shall be the responsibility of the applicant to mitigate impacts identified in the traffic study, as they may relate to existing or future traffic projections.

Qualifications to Perform Study

A professional transportation planner (AICP) or professional engineer (PE) shall be required to perform an "expanded" study as described below. The staff must demonstrate experience in the preparation of transportation impact studies for land development. The City of St. Joseph shall determine whether an individual is qualified to conduct said work *before* the applicant begins/authorizes work on the study.

When a Study is Required

The following table provides an objective measure to determine what level of data is required to support the access permit request. The study details are contained in this standard in full, but three basic types of analysis are possible and one of the three must be provided for all valid access applications (the third being a variation on item two listed below):

1. Basic Study-
 - a) Site Plan
 - b) Conceptual layout depicting land use types and intensities and the arrangement of buildings, parking, and access.
 - c) Identify land uses and arrangement on property abutting the proposed site, including property across public streets.
 - d) Identify other approved development.
 - e) Compare access locations and driveway design to Access Management Standard.
 - f) Estimate trips generated per ITE guidelines for proposed development.
2. Expanded Study-
 - a) All Basic Study Elements
 - b) Include all modes (i.e. truck, pedestrians, bicyclists, and public transit)
 - c) Document existing peak hour traffic volumes.

- d) Estimate future peak hour traffic volumes using traffic model.
- e) Distribute and assign traffic.
- f) Conduct volume/capacity analyses using *Highway Capacity Manual* methodologies.
- g) Identify geometric and/or traffic control improvements necessary to mitigate deficiencies.
- h) Prepare report, document all work, and identify/justify deviations from current guidelines/policies.

Development Triggers	Minimum Study Requirements
All Applications	Conduct Basic Study
100 to 499 trips in Peak Hour	Conduct Expanded Study. Review all drives and adjacent intersections.
500 or More Trips in Peak Hour	Conduct Expanded Study, plus review adjacent streets to next major cross street.

TRAFFIC STUDY DETAILS

Expanded traffic studies, for large projects, (as per the preceding table) may be required by the City of St. Joseph to provide an objective analysis of the impacts a proposed access may have upon the safety and level of service (LOS) upon the public roadway system, and to determine development off-site improvements necessary to support the traffic it generates on the adjacent and or surrounding public roadways. The study shall analyze the impact upon the existing roadway and the forecast horizon of twenty years.

Steps

The permit application process for larger projects shall go through the following separate phases:

1. **Initial Request or Inquiry.** Prior to the initial request for site plan approval or a building permit, the developer shall obtain a copy of the access requirements of the City and/or MoDot relative to the adjacent roadway. It is suggested that the developer or his representative contact the City, or go through the Development Review Process to inform them of development plans that call for roadway access.
2. **Initial or Preliminary Proposal.** The initial submittal by a developer shall include, but not be limited to, a letter of explanation and request for consideration, a Preliminary Survey Plat, a Preliminary Site Plan, and a Preliminary Traffic Impact Analysis. This procedure allows the City to guide the applicant in the preferred direction. This step may be waived at staff discretion where a proposal is very minor, is previously approved in an access management plan, or a complete application can be prepared by an experienced consultant.
3. **Final Submittal.** Upon review and further detailing of the Site Plan and its revisions to the initial submittal, the developer shall submit the final site plan and supporting documentation, if required. This documentation may include engineering plans, traffic impact analyses, and other supplemental studies and, when required, a cost estimate for the proposed access and associated improvements to the adjacent roadways. If the traffic study determines that a decrease to a roadway's LOS is directly linked to the development or use of a property, whether based upon an analysis of the existing system or forecast horizon, the City may require the project to incorporate the cost of design and construction on designated roadways to support said impacts. The scope of work shall comply with the recommendations of the City approved traffic study. Phased work, corresponding to development phases, shall be acceptable when requested.

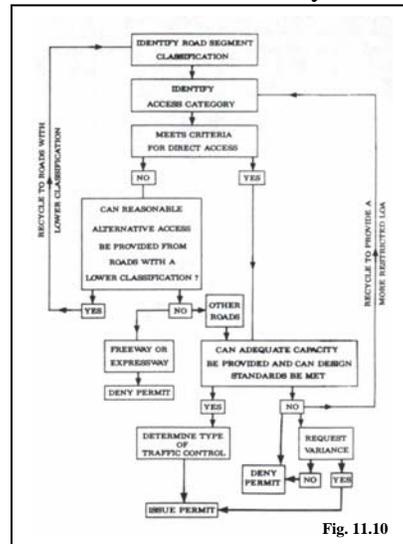


Fig. 11.10

Submittal Requirements

Preliminary Plan Requirements. The preliminary plan shall be submitted with the initial request for an access. The following information shall be included on the plan:

- a. Scale: 1 inch = 100 feet;

- b. Name, address, and telephone number of the owner(s) and that of the applicant where the applicant is an agent of the owner (contractor, tenant, consultant);
- c. The name of the property or development;
- d. The location of the property in relation to municipal boundaries and all roads within one and one-half miles of the property – a location map with an appropriate scale should indicate the location of the property with respect to the area;
- e. A description of the current and proposed land use and all access within 300 feet of the property – at a minimum, proposal developments that have been approved, but not yet constructed, should be indicated;
- f. A description of existing conditions;
- g. Estimated trip volume generated by the development and design hour volume for the combined driveway(s) or access point(s) – based on accepted standards such as those designated by the Institute for Transportation Engineers.
- h. Trip distribution and traffic assignment
- i. Existing versus projected traffic volumes.
- j. Capacity analysis for the adjacent roadway facilities and for any proposed driveways.
- k. Traffic crash analysis for the adjacent roadway facilities.
- l. Proposed traffic improvements and driveways/access points.
- m. Analysis of internal circulation and its impact upon external access points.
- n. Main findings from the traffic study;
- o. The identification of any legal rights-of-way or easements affecting the property as it relates to the roadway and proposed right-of-way acquisitions and alternate access, if appropriate (i.e. , an access easement across neighboring property to a secondary road);
- p. The existing and proposed dimensions of the roadway including through and turning lanes, shoulders, curbs, medians, etc.;
- q. The number, location, and dimensions of proposed accesses (driveways and new public intersections); and
- r. All site characteristics, such as existing structures, utilities, natural drainage, floodplains, and wetlands within 300 feet of the roadway.
- s. Identify design vehicle and apply corresponding turning template to proposed access location.
- t. Apply access standards and note pertinent information such as, but not limited to, crossing sight distance, stopping sight distance, etc.---
- u. The electronic data files, and the calibrated network, developed for micro-modeling in *Synchro* shall be provided as a supplement to all hard-copy submittals.

Engineering, Plans, Specifications, and Estimates of Cost. Engineering plans, specifications and estimates of costs may be requested by the City of St. Joseph concerning roadways impacted by the proposed development.

Traffic Study Data Sources

At a minimum, contents of a traffic study should include the following major sections, taken from the Institute of Transportation Engineers (ITE) 2000 (as amended or updated) publication entitled “Transportation and Land Development”.

Variances – Traffic Studies

Where the City of St. Joseph finds that extraordinary hardship or practical difficulties may result from strict compliance with approved requirements, the City may approve variations to the requirements, provided that at least the minimum safety standards are met (stopping sight distance, intersection sight distance, and functional intersection area clearance), so that the public interest is served. The Department may require that a Traffic Impact Analysis or other information or studies be submitted when reviewing a request for a variance.

Economic development factors may be considered for development projects that will bring new job opportunities into the area. However, safety standards shall not be comprised for purely economic reasons. In some cases, the City of St. Joseph may elect to fund some or part of the mitigating costs due to the traffic impacts.

A petition for any variation shall be submitted in writing to the Public Works and Transportation Department. The applicant must prove that the variation will not be contrary to the public interest and that unavoidable practical difficulty or unnecessary hardship will result if it is not granted. The developer shall establish and substantiate that the variation conforms to the City’s basic requirements and standards.

No variation shall be granted unless it is found that the following relevant requirements and conditions are satisfied. The Department may grant variations whenever it is determined that all of the following have been met:

1. The granting of the variation is in harmony with the general purpose and intent of the regulations and will not result in undue delay or congestion or be detrimental to the safety of the motoring public using the roadway.
2. There must be proof of unique or existing special circumstances or conditions where the strict application of the provisions would deprive the developer of reasonable access. Circumstances that would allow reasonable access by a road or street other than a primary roadway, circumstances where indirect or restricted access can be obtained, or circumstances where engineering or construction solutions can be applied to mitigate the conditions shall not be considered unique or special.
3. There must be proof of the need for the access and a clear documentation of the practical difficulty or unnecessary hardship. It is not sufficient to show that greater profit or economic gain would result if the variation would be granted. Furthermore, the hardship or difficulty cannot be self-created or self-imposed; nor can it be established on this basis by the owner who purchases with or without knowledge of the applicable provisions. The difficulty or

hardship must result from the strict application of the provision, and it must be suffered directly and solely by the owner or developer of the property in question.

Upon receipt of relevant information, facts and necessary data, the Department shall review the information and render a decision in writing to the developer/owner. Materials documenting the variance shall be maintained in the Department's permit files.

CONSTRUCTION STANDARDS

This standard addresses issues of safety, appropriate lane widths, and related matters relative to the safe operation of the public roadway system – both onto and from private and public roadways. The actual construction standards (curb, median, and related facility construction details) for improvements discussed herein assume the use of the latest version of the Kansas City Metropolitan Chapter of the American Public Works Association’s *Standard Specifications and Design Criteria*.

OTHER ACCESS MANAGEMENT STANDARDS

Various units of government within the St. Joseph Metropolitan Area have jurisdiction over roadways. Within the City of St. Joseph, both the City and the Missouri Department of Transportation have authority over the regulation and management of individual, distinct roadways.

In cases where roadways enjoy oversight by more than a single unit of government, and both have access management policies in place, the standard having the greater requirement in the area of study shall apply. Joint (or individual permits from both governments) access permits shall be required in such cases.



ACCESS APPLICATION FORM

Name: _____ Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ e-mail: _____

All applications must provide traffic study information as listed on page 26- TRAFFIC STUDIES. This application is invalid if it does not accompany a building application, subdivision application, or development plan for new or additional accesses.

PERMIT TYPE: New Development Addition Modification
 Re-Development Change of Use

Site Location: _____ Land Use/Purpose: _____

Location of Requested Access (from property line(s)): _____

Functional Class of Street(s) Accessed: _____

Access Width: _____ Existing Access Width: _____ Radius: _____

*Design Vehicle (type): _____ MoDot Route? Yes/No

*Distance from: Opposing Access(es): _____ *Adjacent Access(es): _____

Distance from Street Intersection: _____ Signalized? Yes/No

*Intersection Sight Distance: _____ Functional Intersection Clearance? Yes/No

Horizontal Sight Distance: _____ Vertical Sight Distance: _____

*Estimated Daily Traffic Volume: _____ *Cross-Access Granted to Other Sites? Yes/No

Materials Attached:

Site Map Project/Development/Building Plan Traffic Study Information (pg.26-7)

Site Plan (Showing access points, internal site circulation plans, and site traffic control)

*Questions may be not be applicable if the access is for a residential purpose on a local street only.