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	<i>March 2006</i>	<i>Appendix 6F</i>	<i>Transit Design Manual</i>	<i>6F-1</i>

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## Chapter 6 Part 1 Access Management

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### 6.1.1 Intent

The intent of this section is to manage vehicular access to land development, while preserving traffic flow in terms of safety, capacity, and speed and to promote green management practices (GMP) within the context of stormwater management techniques and reduction of impervious materials. The site access approval procedures established herein are intended to balance the right of reasonable access to private property with the right of the citizens of Louisville Metro to safe and efficient travel. These regulations are intended to implement the Mobility Goals and Objectives of Cornerstone 2020, and Guideline 7 of the Plan Elements.

### 6.1.2 Approval Required

Construction of curb cuts or access to a public right-of-way serving any new development shall occur only after review of plans and receipt of the necessary permits from the Director of Works or the Kentucky Transportation Cabinet. All new development shall be reviewed for compliance with the Access Management Design Manual. The Director of Works may approve deviations from the Design Manual when site conditions prevent adherence to the manual, or if GMPs are proposed, based on a determination that the deviation is in accordance with AASHTO standards and will not create a public safety hazard. Deviations from portions of the Design Manual relating to joint access and connections between adjacent uses may be approved if the Director of Works and the Planning Director jointly determine such deviations are consistent with public safety, the form district standards and the intent of the Comprehensive Plan. Proposed GMPs within the public right-of-wall are subject to approval of the Department of Public Works, MSD and Kentucky Transportation Cabinet, as required.

In addition to new development, the following changes to existing development are subject to this Part:

- A. existing structure is replaced by new structure or improvements; or
- B. existing structure or parking lot is expanded by 20% or more beyond the size existing at the effective date of this regulation (incremental changes that cumulatively increase the size by 20% fall within the regulated activities of this paragraph); or
- C. an existing use is changed to a use for which Chapter 9 of the Land Development Code specifies a higher parking ratio.

### 6.1.3 Residential Developments

When a residential subdivision is proposed that abuts an arterial or collector roadway, it shall be designed to provide lots abutting the roadway with access only from an alley, frontage road or interior local road. (See also Section 5.4.2.B.1.a)

Direct driveway access to individual one and two family dwellings from arterial and collector roadways are prohibited unless the Planning Commission determines, in consultation with the Director of Works, that there is no acceptable access alternative.

Developments with an aggregate of 200 or more dwellings (single family or multi-family) shall have at least two separate access roadways connecting directly to existing roadway(s). Developments created prior to the effective date of this paragraph and not in compliance with it may be modified, including construction of ancillary facilities and improvements to existing structures, provided that the modifications do not increase the number of dwelling units.

**NOTE:** Refer to the Access Management Design Manual (Appendix 6A) for specific design guidance.

#### 6.1.4 Corridor Access Management Overlay Zones

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Segments of a roadway corridor may be designated as corridor access management zones for the purpose of applying special access management controls that exceed the requirements and standards in this part. The purpose of this designation is to avoid significant traffic congestion problems, reduce vehicular and pedestrian conflict areas, and to ensure appropriate development within the designated area in accordance with the Comprehensive Plan.

The controls in such districts are not intended to be substitute for other Land Development Code provisions but can be superimposed over such provisions and should be considered additional requirements.

Corridor access management zones shall be created in accordance with the public involvement and public hearing requirements applicable to the creation of any form district.

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**Chapter 6 Part 2 Streets and Rights-of-Way**

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**6.2.1 Applicability and General Standards**

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- A. All new streets located in or adjoining any subdivision of land hereafter proposed shall conform to the standards of design established in this Part. In any subdivision of land hereafter proposed, the subdivider shall agree to make all dedications and complete all physical improvements as required in Table 6.2.1 before the Commission may approve the preliminary plan or minor plat. In no case shall any new lots be created or new street constructed that does not meet a pavement width of at least 18 feet, except that a five lot, five acre per lot subdivision may be accessed by a 12 foot gravel road with 3 foot earthen shoulders.
- B. All new development meeting one of the criteria listed in 1 through 6 below and having frontage on a public right-of-way shall dedicate land necessary to meet the minimum right -of-way width established in Table 6.2.1, unless exempted by the Planning Director and the Director of Works.
1. Category 3 Review (includes Major Subdivisions)
  2. Rezoning/Plan Certain Development
  3. Conditional Use Permit
  4. Developments adjacent to legislatively adopted roadway improvement projects.
  5. Developments with road improvements as required by Metro Public Works and/or the LDC.
  6. Minor Subdivision Plats creating lots.
- C. Developments meeting one of the criteria listed above that contain land that is depicted for future roadways shown in the comprehensive plan, legislatively adopted roadway plans , or an approved road alignment study shall dedicate right-of-way as outlined within the applicable plan or study.
- D. All single family residential developments or detached unit condominium developments shall not create private streets unless written approval is obtained from the Directors of Works and Planning.
- E. All new development and subdivisions having frontage on roadways proposed for bicycle facilities in the Comprehensive Plan shall provide right-of-way necessary to accommodate such facilities. The applicant shall construct the bicycle facilities, unless the Planning Director and the Director of Works determine, based on roadway conditions or the status of adjacent segments of the bicycle facility, that construction would not be appropriate.

**6.2.2 Relationship of Streets to Topography**

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New streets shall be so related to the topography and to existing streets as to promote the public convenience and safety and to facilitate the proper use of the land they are constructed to serve. In particular, streets shall be designed to facilitate the drainage and storm water runoff objectives set forth in Appendix 4H (Erosion Prevention Sediment Control). Street Grades shall conform, as closely as practicable to the original topography.

**6.2.3 Grade**

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No street grade shall be less than one per cent nor more than ten percent, unless a different grade is expressly approved by the Director of Works because of special topographical conditions.

The maximum grade at any point on a street constructed without curb and gutter shall be 6 percent, unless approved by Director of Works.

### 6.2.4 Street Intersections

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- A. Number of Approaches - Intersections involving more than four basic street legs or approaches shall be prohibited. Merging lanes, deceleration lanes, "Y" intersections and traffic circles are not included in this prohibition, but are considered as being parts of one street leg or approach.
- B. Angle of Intersection - For a tangent distance of at least one hundred feet measured from the intersection of right-of-way lines, all streets shall intersect at an angle of ninety degrees, where practical, but in no case shall the angle be less than seventy five degrees.
- C. Intersection Offset - Streets entering opposite sides of another street shall be laid out either directly opposite one another or with a minimum offset of one hundred feet between their centerlines.
- D. Intersection Spacing - All local and cul-de-sac streets intersecting with and entering the same side of other collector, local or cul-de-sac streets shall be located at least two hundred feet apart measured from centerline to centerline. When the intersected street is an arterial, the distance between intersecting streets shall be at least 1,000 feet. All other streets intersecting with and entering the same side of any other street shall be located at least five hundred feet apart, measured from centerline to centerline, unless a closer spacing is expressly approved by the Director of Works, to promote the public convenience and safety and to facilitate the proper use of the surrounding land.
- E. Grades at Intersections - Where the grade of any street at the approach to an intersection exceeds three percent, a leveling area shall be provided, having not greater than a three per cent grade for a distance of fifty feet from the intersection of the street centerline. A sag immediately adjacent to the intersecting street and a vertical curve shall be used to connect the intersection grades.

### 6.2.5 General Layout of Streets

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- A. Coordination with Surrounding Streets - A proposed street shall recognize and extend the plan and profile of off-site existing streets, and shall make possible the future extension of streets into adjacent undeveloped land. Collector streets shall intersect with surrounding collector or arterial streets at safe and convenient locations.
- B. Ingress and Egress - Access from new lots or a new street connecting an existing street shall not be approved unless the existing street has adequate pavement width to provide for ingress and egress to the proposed development.
- C. Alignment - The alignment of all streets shall be related to the centerline and shall be as follows, unless a different alignment is required by the Director of Works because of special topographical considerations or sound engineering practices:
  - 1. Major and Minor Arterials and Collectors - the radius of all horizontal curves shall be at least 573 feet and horizontal curves shall have a desired stopping site distance of 325 feet with the minimum stopping sight distance of 275 feet. All vertical crest and sag curves shall conform to the formula  $L = KA$ . The desired K value shall be 80 with a minimum K value of 55. The design of the horizontal and vertical curves may vary based on the design speed of the roadway as determined by the Director of Works.
  - 2. Local and Cul-de-sac Streets - All local and cul-de-sac streets shall be related to the topography of the subdivision and shall generally tend to discourage fast or through traffic.
- D. Corner Radii - The minimum radii at the pavement edge, or the back of the curb where required, shall be twenty-five feet for all street intersections, unless a different figure is expressly approved by the commission because of special topographical considerations or sound engineering practices. The minimum

radii at the property line shall be fifteen feet for all street intersections, unless a different figure is expressly approved by the Director of Works because of special topographical considerations or sound engineering practices.

- E. Continuation of Existing Streets – Subdivisions shall be designed to ensure that existing public and private streets, which stub into the subject property must be extended through the subject property. For subdivisions creating any lot that abuts or has access to any proposed stub street extension, right-of-way shall be dedicated sufficient to accommodate the extension of the street, and the street shall be constructed in accordance with the requirements of this Land Development Code for constructing public or private roads.
- F. Cul-de-sac or Dead End Streets – Proposed closure of a section of cul-de-sac or dead end streets shall require installation of a turn-around or cul-de-sac unless waived by the Directors of Public Works and Planning or their designees. Signs shall be installed meeting the Manual on Uniform Transportation Control Devices (MUTCD).

### 6.2.6 Requirements for Specific Types of Streets and Alleys

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- A. Minimum Requirements - New streets shall provide right-of-way and improvements specified in Tables 6.2.1 and 6.2.2, according to the functional class of the street and the form district in which it is located, subject to the following exception:
- B. Development activity that meets the thresholds in the form district for Street and Roadside Design and new streets shall provide sidewalks in accordance with Tables 6.2.1 and 6.2.2 subject to the following exceptions:
  - Sidewalks shall not be required on lots that are five acres or greater in area and developed for single family residential uses unless they connect with existing sidewalks on both sides of the property.
  - Lots within approved major subdivisions in which the sidewalk(s) were waived as part of the subdivision approval for the applicable street frontage shall not be required to provide sidewalks.
  - 1. Fee in Lieu Option - The Director of Works and the Director of Planning or designees may allow the payment in lieu of sidewalk construction upon a finding that construction of a sidewalk is not appropriate due to one of the following applicability requirements:
    - Sidewalks construction is impracticable due to topographical conditions or site constraints; or
    - A determination by the Director of Works and the Director of Planning or designees that sidewalks do not exist in the area and there is not a likelihood for sidewalks to be constructed in the future, except for areas where sidewalks are recommended within a Planning Commission or legislatively adopted plan recommending sidewalk construction.
  - a. Amount of fee shall be set by Metro Public Works based on average sidewalk construction. The fee in lieu amount for single family residential property that is not part of a major subdivision plan shall be calculated based on the minimum lot frontage of the applicable zoning district or actual lot width, whichever is less. All fees paid shall be used for sidewalk construction within the same Metro Council District. It should be noted that payment of a fee in lieu of sidewalk construction is an option available to developers that must be approved by the Director of Works and the Director of Planning or designees. Applicants retain the right to request a sidewalk waiver (see B.2 below); in no case shall the Planning Commission or Director of Works require the payment of a fee in lieu of sidewalk construction. The fee in lieu option shall not be approved and the sidewalk shall be constructed when one of the following situations apply:

- Where an existing sidewalk network can be completed or extended, except in locations where site constraints cause construction difficulties as determined by the Director of Works and the Director of Planning or designees.
  - The required sidewalk would provide a direct means of access to a lot that contains a pedestrian generator such as a school, church, library, community center or park.
- b. A new fee in lieu or sidewalk shall not be required in the future for a street frontage in which a fee in lieu has already been approved and paid.
2. Sidewalk Waiver
- a. Applicability:
- Any development site required to provide a sidewalk in accordance with applicable form district threshold tables of Chapter 5 of this code may submit an application for a sidewalk waiver in accordance with the submittal requirements of paragraph 2b below.
- b. Submittal Requirements:
- i. A plan (e.g. development plan (plan certain or category review), minor plat, preliminary subdivision plan or conditional use permit plan.)
  - ii. A justification document, which addresses as applicable the following items:
    - (a) How the proposed waiver conforms to the Comprehensive Plan and the intent of this Land Development Code;
    - (b) Why compliance with the regulations is not appropriate and granting of the waiver will result in a development more in keeping with the Comprehensive Plan and the overall intent of this Land Development Code;
    - (c) What impacts granting of the waiver may have on adjacent property owners;
    - (d) Why strict application of the provision of the regulations would deprive the applicant of the reasonable use of the land or would create an unnecessary hardship on the applicant.
- c. Review Process:
- i. Notice shall be given in accordance with the provisions of LDC waivers as listed in Chapter 11 of this code.
  - ii. The Planning Commission or designee or BOZA (only in conjunction with a review of a variance or conditional use permit request) shall review the waiver request in order to hear comments from concerned citizens and to review comments from Planning and Design Services staff and other agencies.
  - iii. The Planning Commission or designee or BOZA (only in conjunction with a review of a variance or conditional use permit request) may approve waivers or modifications of standards upon a finding that:
    - (a) The waiver will not adversely affect adjacent property owners; and
    - (b) The waiver will not violate the Comprehensive Plan; and
    - (c) The extent of waiver of the regulation is the minimum necessary to afford relief to the applicant.
  - iv. The Planning Commission or designee or BOZA (only in conjunction with a review of a variance or conditional use permit request) may grant a waiver to allow a reduced sidewalk requirement where less than 50% of the street frontage is being developed. A reduction

waiver shall not exempt future development on the parcel from the construction of the remainder of the sidewalk.

General Standard	Major Arterial	Minor Arterial	Collector	Local	Cul-de- sac	Alley
R.O.W Width	130 feet	120 feet	80 feet	60 feet/50 feet if curb & gutter	50 feet	25 feet
Pavement Width	As determined by the Director of Works; refer to Street Cross Sections for general guidance on pavement widths					
Sidewalk	Required <sup>1</sup>	Required <sup>1</sup>	Required <sup>1</sup>	Required	See Table 6.2.2	N.A.
Bicycle Lane	Bike Plan <sup>2</sup>	Bike Plan <sup>2</sup>	Bike Plan <sup>2</sup>	Bike Plan <sup>2</sup>		N.A.
Verge <sup>3</sup> (Planting Strip)	Width to be determined by Director of Works; refer to form district standards for recommended width (if adequate right-of-way)					N.A.
<p>1 Sidewalk is required on both sides of all streets. Minimum sidewalk width is 5 feet unless different width specified in Form Districts. With approval of the Director of Works, meandering sidewalks are specifically allowed.</p> <p>2 Bicycle facilities will be required along selected streets based on the adopted Bicycle and Pedestrian Plan.</p> <p>3 Verge width will be determined by the Director of Works, depending on right-of-way width and site specific</p>						

Form District Standards	The following standards are specific to the form district in which a roadway is located					
	Major Arterial	Minor Arterial	Collector	Local	Cul-de- sac	Alley
Neighborhood	Sidewalk: 5 feet; Verge: 15 feet	Sidewalk: 5 feet; Verge: 15 feet	Sidewalk: 5 feet; Verge: 10 feet	If <20 lots, cul- de- sac standards <sup>4</sup> ; Sidewalk: 4 feet	Sidewalk (4 feet) if more than 20 dwellings	15 feet pavement w. 5 feet utility easements
Traditional Neighborhood	Sidewalk: 5 feet Verge: 5 feet	Sidewalk: 5 feet Verge: 5 feet	Sidewalk: 5 feet Verge: 5 feet	Sidewalk: 5 feet Verge: 5 feet	Sidewalk: 5 feet	15 feet pavement w. 5 feet utility easements
Village	Sidewalk: 6 feet in Center Verge: 6 feet	Sidewalk: 6 feet in Center Verge: 6 feet	Sidewalk: 6 feet in Center Verge: 4 feet	Sidewalk: 6 feet in Center; 4 feet in Outlying Areas Verge: 6 feet	Sidewalk (5 feet) if more than 20 dwellings	15 feet pavement w. 5 feet utility easements
Town Center	Sidewalk: 5 feet; Verge: 5 feet	Sidewalk: 5 feet; Verge: 5 feet	Sidewalk: 5 feet; Verge: 5 feet	Sidewalk: 5 feet; Verge: 5 feet	Sidewalk: 5 feet; Verge: 5 feet	Same as above
Traditional Marketplace	Sidewalk: 6 feet; Verge: 5 feet	Sidewalk: 6 feet; Verge: 5 feet	Sidewalk: 6 feet; Verge: 5 feet	Sidewalk: 6 feet; Verge: 5 feet	Sidewalk: 6 feet; Verge: 5 feet	Same as above

Table 6.2.2						
Form District Standards	The following standards are specific to the form district in which a roadway is located					
	Major Arterial	Minor Arterial	Collector	Local	Cul-de- sac	Alley
Suburban Marketplace	Sidewalk: 5 feet; Verge: 6 feet	Sidewalk: 5 feet; Verge: 6 feet	Sidewalk: 5 feet; Verge: 6 feet	Sidewalk: 5 feet; Verge: 4 feet	Sidewalk: 5 feet; Verge: 4 feet	Same as Above
Traditional Workplace	Sidewalk: 5 feet, Verge: 5 feet	Sidewalk: 5 feet; Verge: 5 feet	Sidewalk: 5 feet; Verge: 5 feet	Sidewalk: 5 feet; Verge: 5 feet	Sidewalk 5 feet; Sidewalk required unless < 5 lots	Same as above
Suburban Workplace	Sidewalk: 5 feet; Verge: 15 feet	Sidewalk: 5 feet; Verge: 15 feet	Sidewalk: 5 feet; Verge: 10 feet	Sidewalk: 5 feet; Verge: 6 feet	Sidewalk required unless < 5 lots	Same as above
Regional Center	Sidewalk: 5 feet; Verge: 10 feet	Sidewalk: 5 feet; Verge: 10 feet	Sidewalk: 5 feet; Verge: 10 feet	Sidewalk: 5 feet; Verge: 6 feet	Sidewalk: 5 feet; Verge: 6 feet	Same as above
Campus	Sidewalk: 5 feet; Verge: 10	Sidewalk: 5 feet; Verge: 10	Sidewalk: 5 feet; Verge: 10	Sidewalk: 5 feet; Verge: 6 feet	Sidewalk required unless < 5 lots	Same as above
Downtown*	Sidewalk: 7 feet	Sidewalk: 7 feet	Sidewalk: 7 feet	Sidewalk: 7 feet		Same as above
<p>4 Local level through streets that have no more than 20 single family lots when fully developed may be built to cul-de-sac right-of-way and pavement width standards, with a finding from the Director of Works that through traffic is adequately accommodated.</p>						
<p>* 5 ft. sidewalk width is acceptable in some situations</p>						

- C. Exceptions – The Director of Works may approve exceptions from the standards of Tables 6.2.1 and 6.2.2 where new development extends an established pattern of roadway design that has been shown to adequately serve the area’s transportation needs. The Planning Commission, with comments from the Director of Works, may approve deviations from the standards (reductions and exceedances) of Table 6.2.1 and Table 6.2.2.

### 6.2.7 Construction Standards

Construction plan showing materials, methods of construction and detailed specifications for all required physical improvements, for public and private roadways, shall be submitted to and approved by the Director of Works before construction is begun.

- A. **Materials** - The engineer shall be guided by sound engineering practices in the selection of materials for street construction and other physical improvements. Wearing surfaces shall be limited to high-type asphalt or Portland cement concrete. Base courses may be of, but not limited to, the following: Portland cement concrete, hot mixed asphalt concrete, crushed limestone, stabilization of acceptable soils with soil-cement, asphalt, lime or other recognized materials or combinations thereof. Sub-base stabilization with recognized materials may also be used. If a pervious pavement System is proposed, the materials are to be approved by the Department of Public of Works and MSD.
- B. **Design Standards** - The engineer designing the subdivision and the approving agency shall be guided by recognized procedures for determining adequacy of the various structures. Examples and guidelines are as follows:
1. **Drainage** - MSD Design Criteria or the Kentucky Department of Highways Drainage Manual will be acceptable for determining hydraulic adequacy of drainage facilities.
  2. **Structures** - Design shall be by acceptable methods using AASHTO design loading as follows:
    - a. Local and Cul-de-sac H - 15
    - b. Collector H - 20
    - c. Arterial and All Industrial and Commercial Zoning Districts As required by Director of Works
  3. **Street Pavement and Base** - Design methods suggested by, but not limited to, trade associations, such as Asphalt Institute, Portland Cement Association, National Limestone Institute, and others shall be used. The following basic elements shall be considered: soil characteristics, design life, traffic usage, material strengths and provisions for maintenance.
  4. **Pavement Design Criteria** - Pavement design for all street classifications shall conform to the current pavement design standards established by the Director of Works.
  5. **Road Shoulder Design** - The design of new roadway shoulders must comply with the most recent AASHTO publication.
  6. **Construction Sequencing**- The construction phasing of all sections within an approved preliminary plan shall be contiguous to completed subdivision sections. Any deviation from this scheduling must be approved by the Director of Works prior to beginning of construction.
  7. **Construction Specifications** - The construction plans shall include complete specifications to guide construction and fully explain the intent of the drawings. Because of general familiarity by contractors, the current edition of MSD or Kentucky Transportation Cabinet Standard Specifications for Road and Bridge Construction or other adopted standards may be incorporated by reference to the extent applicable, or separate detail specifications may be written to satisfy the conditions. In any event, complete specifications shall be provided which include, but are not limited to the following:
    - a. Materials and requirements for acceptance
    - b. Methods of construction, and
    - c. Basis for acceptance or rejection of the project
  8. **Private Roadways** – All private roadways shall meet the right-of- way width and construction standards of sections 6.2.6 and 6.2.7, unless the Planning Director, with concurrence of the Director of Works,

approves in writing a waiver of said standards, or unless eligible for the standards contained in section 6.2.8. Private streets/access easements located in the OR, OR-1, OR-2, OR-3, OTF, CN, CR, C-1, C-2, C-3, CM, EZ-1, M-1, M-2, M-3, PD, PRO and PEC zones shall make all dedications and complete all physical improvements or provide a financial instrument adequate to ensure completion of the improvements as required under these regulations before the Commission may approve the subdivision plat.

9. Sidewalks shall maintain an unobstructed passage way (clear of fire hydrants, street trees, utility poles, other obstructions) at least 4 feet wide, or other dimension as approved by the Director of Works.

### 6.2.8 Private Roadways

- A. Standards – Private roadways serving no more than five lots restricted for single family residential use may be constructed in accordance with the following standards:

Minimum Physical Improvements for Private Roadways	
Number of Lots	Private Street
1 - 2 lots	P 18/R30
3 - 5 lots	P 18/R50
P = Pavement width	
R = Right-of-way or easement width	

- B. Grade - No private access easement grade shall be less than one percent nor more than ten percent, unless a different grade is expressly approved by the Commission and the Director of Works because of special topographical conditions.
- C. Minimum Pavement Standards - The Pavement/roadway design shall conform to the minimum physical improvements for private access easements issued by the Director of Works and to the requirements of the Louisville Metro Code of Ordinances, Chapter 94.80 - 94.82.
- D. Lots - All applicable zoning regulations, as pertaining to minimum yard requirements, shall be interpreted as being measured from the nearest boundary of the private access easement.

### Right-of-Way Illustrations

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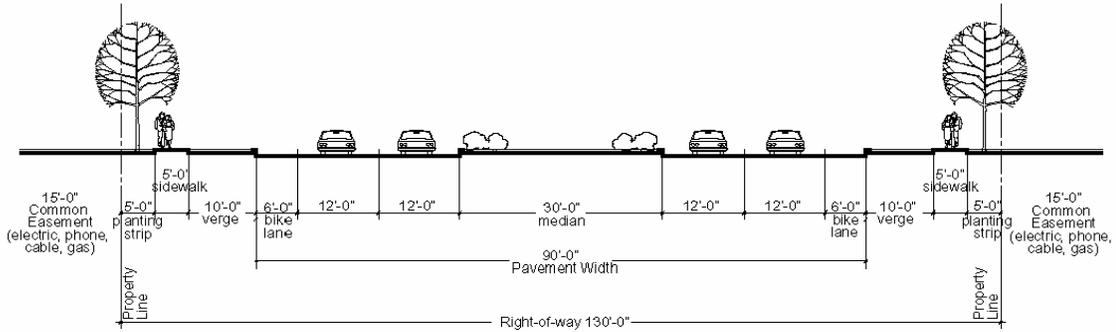
The following illustrations depict right-of-way configurations based on the standards contained in Tables 6.2.1 and 6.2.2. Streets developed prior to adoption of these standards may diverge significantly from the illustrations. Subdivisions and new developments along pre-existing routes may be required to dedicate right-of-way or make improvements in accordance with the Tables 6.2.1 and 6.2.2 standards and the following illustrations.

Notes: (applicable to all roadway types)

1. Greater or lesser right-of-way widths may be needed, depending on topography and other circumstances.
2. Shared use paths and bicycle lanes will be provided in selected locations based on the Bicycle and Pedestrian Plan. These facilities will not be constructed along every roadway. A wide curb lane may substitute for a bike lane, if the standards of the “Kentucky Transportation Cabinet Pedestrian and Bicycle Task Force Policy Recommendations” are met. Bike lanes and shared use paths are shown with various street types and configurations for purposes of illustration; these renderings are not intended to limit the type of bicycle facility provided with a certain road configuration.
3. Type, size and location of landscaping within the right-of-way must be in accordance with the requirements of the entity responsible for the right-of-way. Street trees shall be placed in accordance with requirements of the agency having jurisdiction over the roadway and applicable form district standards. Ground cover and low growing vegetation (two feet maximum height) compatible with utility line maintenance are recommended for the verge. If a green street design is proposed, refer to Chapter 13: Native Revegetation from the MSD Design Manual (a link to document found in Appendix 10A) for required plantings and exemptions from street trees.
4. Sidewalk widths and setbacks vary according to form district; refer to the applicable form district regulation. A minimum five feet width is required in all form districts other than local level roadways in the Neighborhood Form District. Meandering alignment of walkways is permitted.
5. All vegetated verges, median and swales shown in the illustrations may be depressed, with slopes no greater than 4:1 and planted in such a fashion that promotes the infiltration of stormwater as set forth in Chapter 10 of the LDC and Chapter 18 of the MSD Design Manual, allowable plantings can be found in Chapter 13: Native Revegetation of the MSD Design Manual (a link to the document found in Appendix 10A). In no case shall the plantings impair the vision of automobile traffic causing an unsafe condition.

### Major Arterial

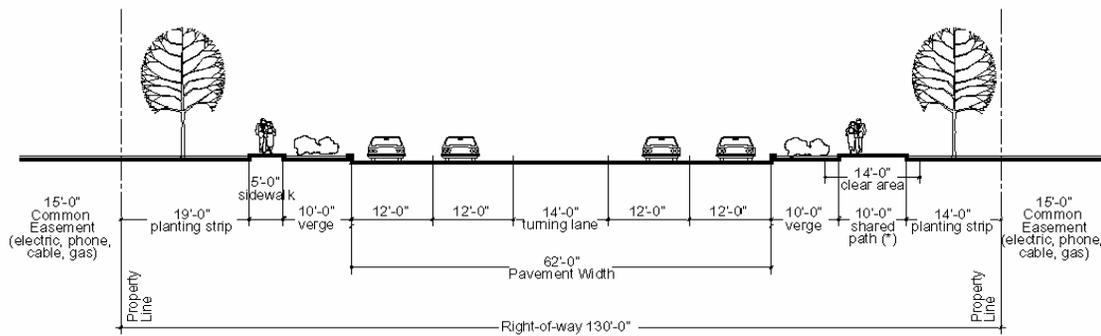
Urban Type A: Two-way, four-lane with median and bike lane / No parking



### Major Arterial

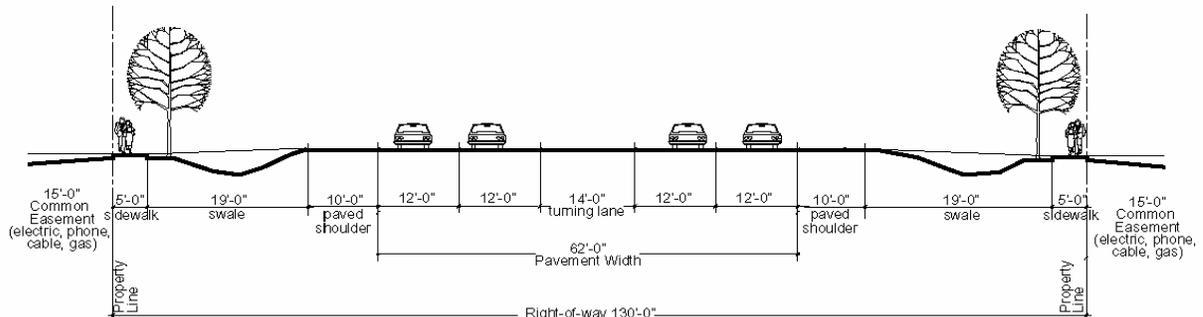
Urban Type B: Two-way, four-lane and turning lane / Shared use path / No Parking

(\*) Shared use path (serving pedestrians and bicycles) may be located within the arterial right-of-way or on separate alignment, depending on factors such as frequency of street intersections and curb cuts.



### Major Arterial

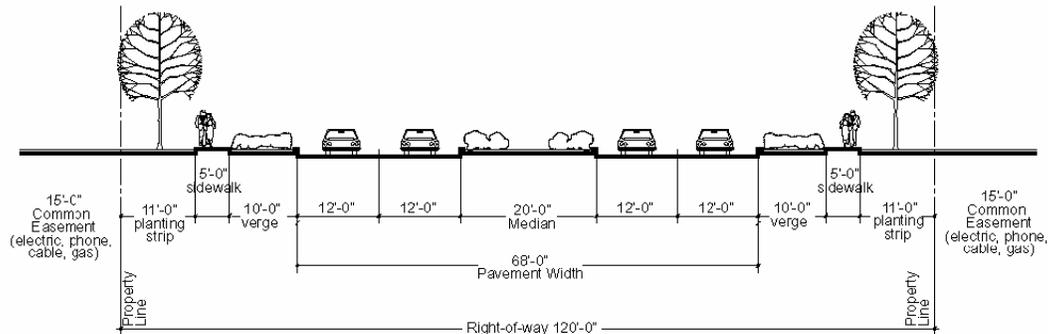
Rural: Two-way, four-lane + turning lane / paved shoulder / no parking



### Minor Arterial

#### Type A: Two-way, four-lane and median

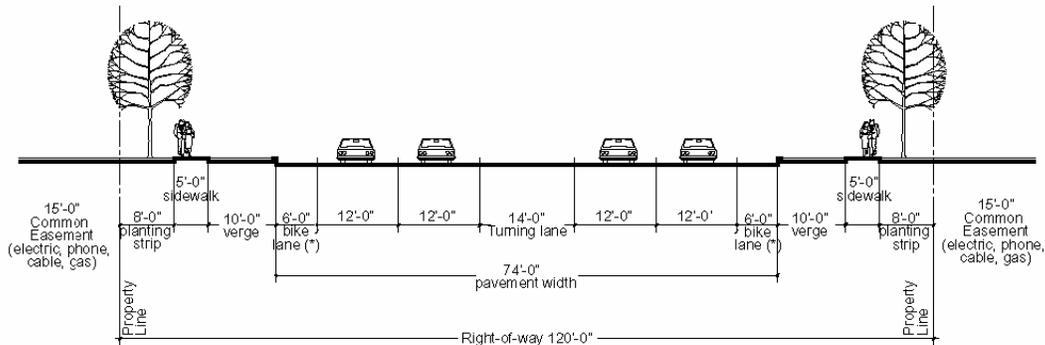
Note: Bike lanes or shared use path may be accommodated, per Bike Plan



### Minor Arterial

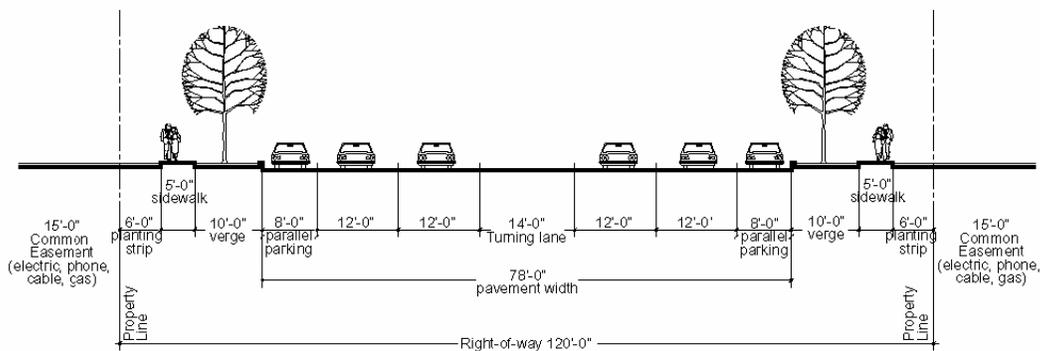
#### Type B: Two-way, four-lane and turning lane / No parking / Bike lanes (\*)

(\*) A shared use path may substitute for bike lanes if circumstances warrant



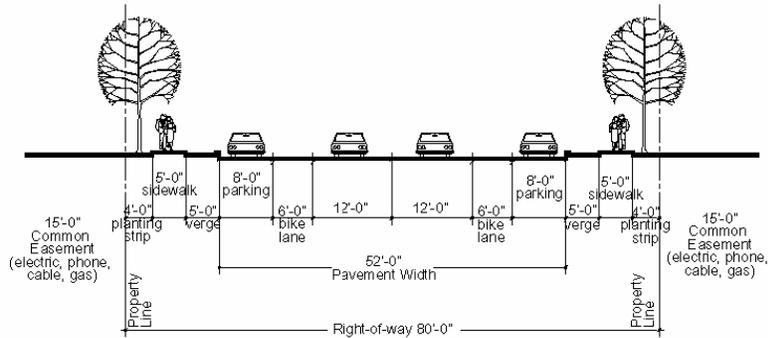
### Minor Arterial

#### Type C: Two-way, four-lane and turning lane / Parallel parking



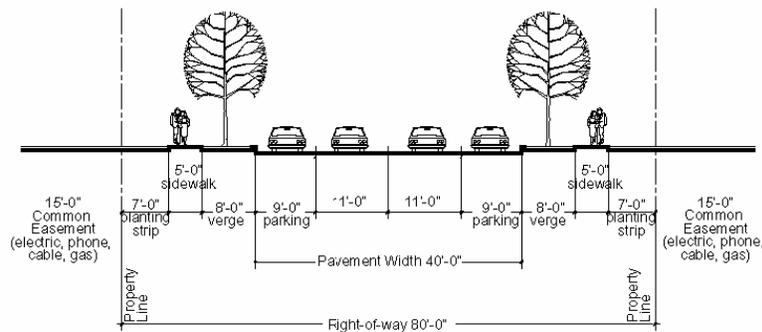
### Collector Street (Primary and Secondary)

Urban Type A: Two-way, two-lane / Bike lanes / Parallel



### Collector Street

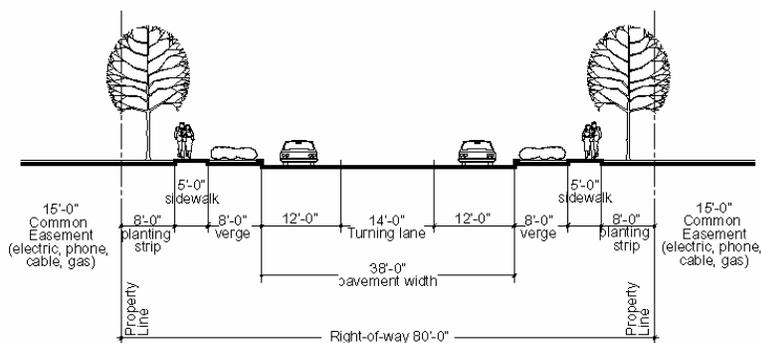
Urban Type B: Two-way, two-lane / Parallel parking



### Collector Street

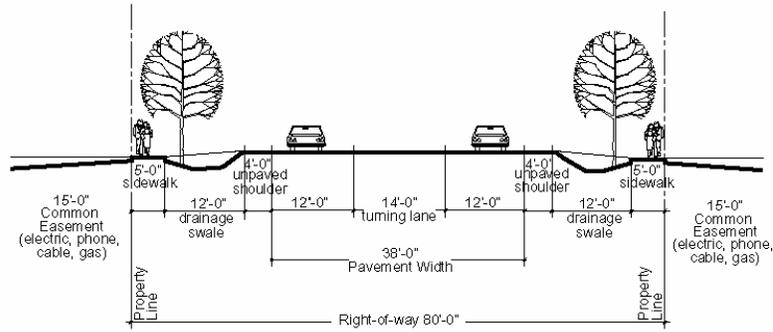
Urban Type C: Two-way, two-lane and turning lane / No parking

Note: Bike lane (6') or wide curb lane (15') on collectors without on-street parking may be appropriate if recommended in the Bicycle and Pedestrian Plan



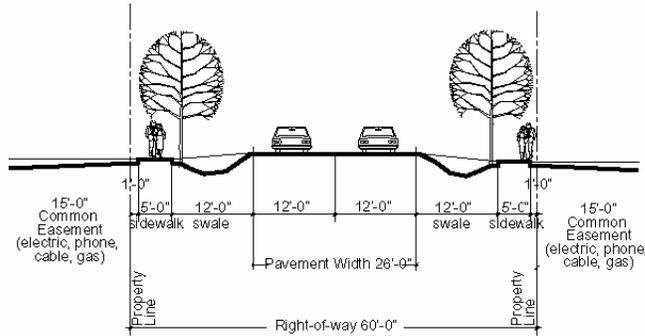
### Collector Street

Rural: Two-way, two-lane + turning lane / no curb / no parking



### Local Street

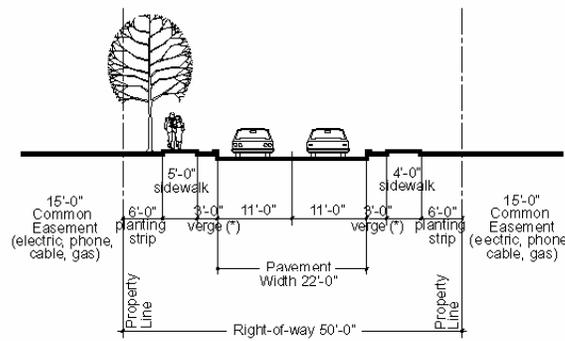
Rural: Two-way, two-lane no curb and gutter



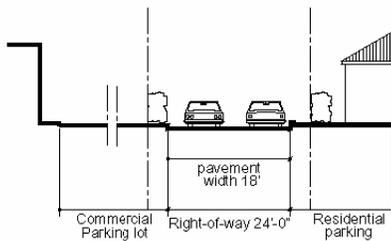
### Local Street

Urban: Two-way, two-lane street with curb and gutter

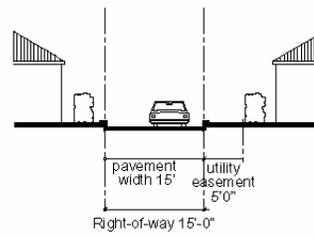
\* (Trees may be planted in verge, depending upon established planting pattern)



### Alley Neighborhood Form



### Alley Traditional Neighborhood



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## Chapter 6 Part 3 Street Name Change, Street Closing, Street Naming and Site Addressing

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### 6.3.1 General Provision

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#### A. Purpose

These standards and procedures are established to promote and protect the public health, safety and welfare within Jefferson County by providing common and effective methods for assigning and changing street names and site addresses, and permanent closure of public rights-of-way and access easements. Such methods ensure the efficient delivery of emergency services to individual homes and businesses, and appropriate determination of the continued use of lands dedicated for public purpose.

#### B. Effect

No application for a building permit or subdivision plat shall be approved that contains street names or site addresses that do not comply with the requirements and procedures provided herein.

**NOTE:** *The following terms relating to Street Names are included in the Definitions (Chapter 1 Part 2):  
Commission, Planning Director, Fire Protection District, Louisville and Jefferson County Information Consortium (LOJIC), Person, Street Index File*

### 6.3.2 Street Name Change

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#### A. Authorization and Procedure

Street and alley names may be changed in accordance with this section.

#### B. Who May Initiate a Street or Alley Name Change

Applications for changing a street or alley name may be initiated by the Planning Commission, any governmental unit having jurisdiction over any part of the street or alley, property owners representing fifty-one percent of all parcels adjacent to the public right-of-way to be renamed, or by property owners whose property includes more than fifty-one percent of the linear front feet of the portion of the street or alley to be renamed.

#### C. Application Requirements

The following information items are required for acceptance of a formal application to the Louisville and Jefferson County Planning Commission to change the name of any public or private street or alley.

1. The formal application shall contain the following items:

- a. The existing street or alley name.
- b. The proposed street or alley name.
- c. Justification for request.
- d. The application shall be signed by the applicant or a person authorized by the applicant.
- e. Signed, notarized, consent and address of each adjoining property owner who has requested the name change, or an affidavit authorizing an agent to act on behalf of said adjoining property owner(s).
- f. Statement of the availability of the proposed street name, in accordance with Section 6.3.5.

- g. Additional information as required.
2. Ten copies of a scaled 8 1/2 x 14 inch drawing showing the entire street or alley involved and including names, sources of title, and addresses of all adjacent property owners along the street as reflected by information and maps maintained by the Property Valuation Administrator. Vacant lots shall be designated as such in the scaled drawing. A location/vicinity map showing the distance of the street proposed for re-naming to the nearest arterial street shall be on the drawing.
3. The appropriate application fee as defined in the Schedule of Application Fees.
4. Fee to record the final documents in the Office of the County Clerk.

#### D. Review and Action for Applications

Complete applications for a street name change shall be reviewed and action taken in accordance with the following procedures.

1. The Planning Commission or its designee shall determine the technical accuracy of the request and establish the Planning Commission public hearing date.
2. A notice of the proposal to change the street or alley name and the opportunity to request a public hearing shall be sent to all property owners adjacent to the affected portion of the street or alley and all governmental units having geographical jurisdiction. Notice shall be sent no less than 14 days prior to the Planning Commission's consideration of any proposed street name change.
3. If requested to do so by any interested party, the Planning Commission shall hold a public hearing on any proposed street or alley names changes. The Planning Commission may waive the public hearing if no such request is received, and affected governmental units having geographical jurisdiction agree to the proposed name change.
4. Notice of public hearing shall be published in accordance with the provisions of Kentucky Revised Statutes, Chapter 424 (minimum 14 calendar day notice).
5. Following a public hearing or business session at which the proposed street or alley name change was considered, the Planning Commission shall:
  - a. If the street or alley is entirely within one jurisdiction with zoning authority, the Planning Commission shall make a recommendation to the legislative body of that jurisdiction for final action; or,
  - b. If the street or alley is located in more than one jurisdiction with zoning authority, the Planning Commission shall make a recommendation to Fiscal Court, or, after January 1, 2003, the council of the consolidated local government.
6. Upon receipt of an ordinance from the legislative body approving a name change, a copy of the ordinance and the approved map shall be recorded in the Office of the County Clerk.

### 6.3.3 Permanent Street Closing

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#### A. Authorization and Procedure

Publicly dedicated right-of-way may be permanently closed in accordance with this section. Temporary street closures may be authorized by the Director of Works; such closures are not subject to this regulation.

This regulation is not applicable to any streets or alleys located entirely within 5th or 6th class cities.

#### B. Who May Initiate an Application for Permanent Closing or Abandonment of a Public Right-of-Way or Easement.

Applications for permanently closing a public right-of-way may be initiated as follows:

1. By the Planning Commission;
2. Any governmental unit having geographical jurisdiction over the public right-of-way;
3. Property owners representing a minimum of fifty-one percent of all parcels adjacent to the public right-of-way or section of right-of-way proposed to be closed, from intersection to intersection;
4. Property owners representing a minimum of fifty-one percent of the linear street frontage feet of the public right-of-way or section of public right-of-way proposed for closure from intersection to intersection;
5. Property owners representing a minimum of fifty-one percent of the adjoining parcels or adjoining linear frontage feet of a cul-de-sac or dead end street and alleyways or other rights of way adjacent to the section of right-of-way proposed for closure. See section 6.2.5 General Layout of Streets, for additional requirements.

### C. Application Requirements

The following information items are required for acceptance of a formal application to the Louisville and Jefferson County Planning Commission to permanently close a public right-of-way.

1. Pre-Application Conference - The staff of the Division of Planning and Development Services will meet with applicants prior to formal submittal of the request to discuss the requirements, procedures and standards of the street closure process.
2. Formal Application – A complete application form available through the Division of Planning and Development Services including the following information and attachments:
  - a. A metes and bounds description of the public right-of-way proposed for closure signed and sealed by a registered Land Surveyor in the Commonwealth of Kentucky.
  - b. Justification for the request.
  - c. The application shall be signed by the applicant or a person authorized by the applicant.
3. Plat of Survey - A recent plat of survey that describes the area proposed for permanent closure with the street or alley name(s) clearly labeled where appropriate. The plat shall show how the area proposed for closure is to be divided. The plat shall be signed and sealed by a land surveyor registered in the Commonwealth of Kentucky. Multiple copies of the plat shall be submitted, as determined by the Planning Director.
4. Site Plan - Closures related to any proposed development shall submit a site plan as part of the application. Where transportation or utility facilities are to be relocated, the site plan shall indicate specific locations for the relocation of these facilities and label as existing or relocated.
5. Notification List - The applicant shall provide a list of the names and mailing addresses of all property owners adjacent to the proposed street or alley closing extending to the nearest intersecting streets. This list may be prepared from maps and records maintained by the Jefferson County Property Valuation Administrator. A map shall be submitted illustrating the location of each of the property owners identified above. Vacant lots shall be designated in the map.
6. Notarized Consent - The applicant shall provide an original and one (1) copy of notarized consent to the closing from property owners of the adjoining properties along the proposed area of closure who have requested the closure, or an affidavit authorizing an agent to act on behalf of the said property owners.

7. Additional Information – The Planning Commission may request the applicant to provide other information based upon consultation with other local agencies (i.e., Air Pollution Control District, Department of Public Works), including but not limited to traffic impact analyses and utility relocation data.
8. Fees – The application and recording fees as defined in the Schedule of Application Fees.

**Editor's Note:** Refer to KRS 82.405 for street closing procedures in 5<sup>th</sup> and 6<sup>th</sup> class cities.

#### D. Considerations for Approval of a Street or Alley Closing

In determining whether a proposed street closing should be approved, the Planning Commission shall consider the following:

1. Adequate Public Facilities - Whether and the extent to which the request would result in demand on public facilities and services (both on-site and off-site), exceeding the capacity or interfering with the function of such facilities and services, existing or programmed, including transportation, utilities, drainage, recreation, education, emergency services, and similar necessary facilities and services. No closure of any public right-of-way shall be approved where an identified current or future need for the facility exists. Where existing or proposed utilities are located within the right-of-way to be closed, it shall be retained as an easement or alternative locations shall be provided for the utilities.
2. Cost for Improvement - The cost for a street or alley closing, or abandonment of any easement or land dedicated to the use of the public shall be paid by the applicant or developer of a proposed project, including cost of improvements to adjacent rights-of-way or relocation of utilities within an existing easement.
3. Comprehensive Plan – The extent to which the proposed closure is in compliance with the Goals, Objectives and Plan Elements of the Comprehensive Plan.
4. Other Matters - Any other matters which the Planning Commission may deem relevant and appropriate.

#### E. Findings for Street Closings

The Planning Commission shall make a recommendation on the proposed street or alley closing based on its findings relating to the various considerations listed in section D, above or its designee shall review the application for compliance with Cornerstone 2020 (comprehensive plan).

#### F. Review and Action for Applications

Complete applications for a street closing shall be reviewed and action taken under the following procedures.

1. The Planning Commission or its designee shall determine the Planning Commission public hearing date.
2. The Planning Commission shall hold a public hearing on all proposed street or alley closings, unless waived in accordance with paragraph 4, below.
3. Notice of public hearing shall be published in accordance with the provisions of Kentucky Revised Statutes, Chapter 424. In addition, signs giving notice of the public hearing shall be placed in the area so as to be conspicuous for passing motorists or pedestrians using the affected street or alley and at or near the closest street intersections. Signs shall be posted at least 14 days prior to the public hearing. A notice of the proposal to close the street or alley shall be sent to all property owners adjacent to the street or alley segment defined by the nearest intersecting streets, and all governmental units having geographical jurisdiction. This Notice shall be mailed to property owners at least 30 days prior to any

public hearing.

4. The Planning Commission may waive the public hearing if all owners of property adjacent to the street or alley, and affected governmental units having geographical jurisdiction, agree to the proposed closure.
5. Following a public hearing concerning a proposed street or alley closure, the Planning Commission shall make a recommendation to the affected legislative body for final action. If the street or alley is entirely within more than one jurisdiction with zoning authority, the Planning Commission shall make a recommendation to all of the affected legislative bodies for final action.
6. Upon receipt of an ordinance from the legislative body approving a street closure, a copy of the ordinance, approved plat and the metes and bounds description shall be recorded in the Office of the County Clerk.

### 6.3.4 Release or Modification of Private Access Easement

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#### A. Authorization and Procedure

Private access easements created by documents or plats approved by the Planning Commission may be modified or released in accordance with this section. Applications for closing a private access easement shall be made in accordance with the procedures established in Chapter 11.

#### B. Non-Utility Access Easements

If an easement was established for private access only (and does not include an easement for sewer, drainage, or utilities), the Planning Director or designee may approve the release or modification of a private access easement if all of the following conditions are satisfied:

1. The applicant has submitted the notarized consents of 100% of the property owners adjoining the easement to be modified or released, extending in either direction to the nearest intersecting streets (three or four way intersection).
2. The easement is not necessary for access, or alternate appropriate access is provided.
3. If the easement was created by a minor plat, the applicant must obtain approval of a revised minor plat in accordance with the Subdivision Regulations. If the easement was created by a recorded major subdivision plat, the applicant must obtain approval of an amendment to the record plat in accordance with the Subdivision Regulations.

#### C. Joint Use Easements

If the easement is for private access, as well as sewer, drainage, or utilities, the Planning Director or designee may approve the release or modification of the easement if all of the following conditions are satisfied:

1. The applicant has submitted the notarized consents of 100% of the property owners adjoining the easement to be modified or closed, extending in either direction to the nearest intersecting streets (three or four way intersection).
2. Written approval of the closure or modification is received from MSD, Public Works, Louisville Water Company and Louisville Gas & Electric (or successor organization).
3. Thirty (30) days advance written notice of the proposed closure or modification is given to the following agencies/utilities (or their successors) and no objections are received within that time period:
  - a. BellSouth;

- b. Louisville & Jefferson County Board of Health;
  - c. Planning and Design Services (E-911);
  - d. Agency responsible for police and fire services
  - e. Clerk of the legislative body having jurisdiction;
4. All necessary utility easements are preserved or provided in alternate locations.
  5. The easement is not necessary for access or alternate appropriate access is provided.
  6. Easements created by minor plat must obtain approval of a revised minor plat in accordance with the Subdivision Regulations. Easements created by a recorded major subdivision plat, must obtain approval of an amendment to the record plat in accordance with the Subdivision Regulations.

#### D. Limitation of Commission Authority

The above conditions may not be waived by the Planning Commission. If all of the above conditions are not satisfied, neither Planning and Design Services staff nor the Planning Commission may approve the closure or modification.

#### E. Recording

Documentation of the release or modification shall be recorded in the office of the Jefferson County Clerk.

### 6.3.5 Street Names

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#### A. Requirement for Naming

All public streets shall be named in accordance with the provisions of this section. All private streets, frontage roads and ingress/egress easements providing the principal means of access to residential, commercial, industrial, or other properties or buildings shall be named.

**Exceptions:** Private streets and easements that provide secondary means of access to parcels that are accessible from and qualify for an address on a named public or private street are not required to be named. Easements through a parking lot that link parcels in shopping centers or other multiple lot developments with the public street system shall be named if the Planning Director in consultation with the appropriate Fire Department determines that naming is required for emergency services purposes. The Planning Director, with comments from the appropriate Fire Department, may waive the requirement to name private streets based on a finding that naming would not benefit emergency service providers.

**Street Signs:** All street signs, for public and private streets shall conform to the requirements of the Manual on Uniform Traffic Control Devices. Permanent signs shall be installed no later than the date on which the road(s) are open to public use. Temporary signs may be required if the Director of Public Works determines they are necessary. The Director may determine the installation schedule and acceptable design (size, height, materials) of temporary signs. The party(ies) responsible for maintenance of private roads and access easements required to be named by this section shall provide, install and maintain street signs adequate to identify the private roads.

#### B. Agency Responsible for Assignment and Change of Street Names

The assignment or change of all public and private street names shall be approved by the Louisville and Jefferson County Planning Commission or its designated representative for approval of street names. Street names that have been approved by the Commission are considered official street names and are to be included in the Louisville and Jefferson County Street Index File (SIF).

#### C. Responsibility for Coordination of Street Name Assignments

The Division of Planning and Design Services (DPDS) shall be responsible for coordination with fire and police departments, public agencies, utility providers and others for the assignment or change of street names. This coordination will occur during the street name approval processes defined in this Chapter. DPDS will also be responsible for notification of all appropriate agencies of approved street names that have been entered into the Street Index File.

#### D. How Street Name Assignments May be Initiated

The approval process for new street names may be initiated as part of any of the following development approval procedures. Applicants for preliminary subdivision plan review are encouraged to seek street name approval as part of the preliminary plan application.

1. Preliminary Plan for Major Subdivision: Street names may be submitted for approval with a Preliminary Plan for Major Subdivision. Approval of the preliminary plan with street names may be given by the Planning Commission, the Technical Review Committee or the Planning Director. A street name review fee is not required for street name assignments that are part of an application for preliminary subdivision plan review.
2. Record Plat for Major Subdivision: Approved street names shall be shown on all major subdivision record plats. A street name review fee is not required for street name assignments that are part of an application for major subdivision record plat review.
3. Minor Subdivision: Street names must be submitted for approval with a Minor Subdivision Plat. Approval of the plat with street names may be given by the Planning Commission or the Planning Director. A street name review fee is not required for street name assignments that are part of an application for minor subdivision plat.
4. Condominium Property Regime Plan: Street names may be submitted for approval with a Condominium Property Regime Plan. Approval of the plan with street names may be given by the Planning Commission or the Planning Director. A street name review fee is required for street name assignments within condominium property regime plans.
5. Development Plan Review: Street names may be submitted for approval with a General Development or Detailed District Development Plan associated with a zoning district change. Approval of street names may be given by the Planning Commission or the Planning Director. A street name review fee is not required for street name assignments that are part of an application for general or detailed district development plan approval.
6. Street Name Change: Street name assignment requests that cannot be submitted as part of one of the development approvals listed above may utilize the street name change application process. Approval of these types of requests shall be given in accordance with Section 6.3.2 of this Land Development Code. A street name review fee is required for street name assignments.

#### E. Time Limits for Street Name Approvals

Street name approvals are limited to the effective period of the associated development approval as listed in this Code. For example, a street name approval contained with a preliminary subdivision plan approval is effective for one year. At the end of the one year period, the preliminary subdivision plan and street name approvals would expire if the applicant has not filed a record plat for the property or requested an extension of the preliminary approval as provided in this Code.

#### F. Reservation of Street Names

Property owners and registered agents may apply to the Division of Planning and Design Services for a street name reservation. Street name reservations have a maximum effective period of six months and may

not be extended except through a new application process. A street name review fee is required.

**G. Duplication of Existing Street Names Not Permitted**

To eliminate potential confusion and delay of emergency response, duplication of street names shall not be permitted. Streets with the same name but different street type designations shall be considered duplicate street names (e.g., Chesterfield Drive and Chesterfield Road are duplicates). Proposed street names and name changes shall be compared with street names listed in the Street Index File (SIF) to determine if the proposal would create a duplicate name.

**H. Similar or Confusing Spelling of Street Names Not Permitted**

To eliminate confusion resulting from diction problems when individuals are reporting street names under stress, similar (text or phonetic) or confusing spelling of street names shall not be approved. The following are examples of the issues described in this section.

Example	Problem
Stonehenge vs. Stonehedge	Similar Spelling
Rumplestiltskin	Difficult to spell
Jotunheimen	Obscure
Phunny	Phonetically confusing spelling

**I. Length of Street Names**

Street names of 12 or fewer characters are encouraged to maximize visibility of street signs. New street names shall not contain more than 16 characters, which does not include either the direction (north, east, etc.) or the street type (lane, drive, etc.). Names shall not contain hyphens, apostrophes, or other non-letter characters. New street names shall not contain more than two words, exclusive of direction or street type.

**J. Permanent Voids (Use of Same Name For Interrupted Streets)**

To preserve the continuity of street names, and accommodate permanent interruptions to streets including limited access freeways, streams or railroad facilities, the same street name shall not be continued on both sides of a permanent physical interruption to the road.

**K. Continuation of Street Names**

Streets continuing through an intersection shall keep the same name. For commercial, multi-family, or townhouse developments that have an entrance or access through a publicly maintained cul-de-sac, a separate street name will be required for the entrance or access road in the event that it serves or is intended to serve two or more address numbers.

Street names shall not be changed due to a change in direction of the street, nor shall a new prefix be used for those streets that meet the criteria for using a directional indicator in the street name.

**L. Use of Directional Indicators in Street Names**

Directional indicators, such as north and west, shall not be included in street name proposals as a prefix or suffix to a street name. When streets cross the east/west or north/south zero baseline the appropriate directional indicator may be assigned by DPDS as part of the street name approval process.

**M. Street Type Designations**

Street type designations shall be assigned by the Planning Commission or its designee. Street names submitted for review will be evaluated for conformance with the criteria provided below. Street type

designations that appear on approved subdivision, development and condominium plans shall be consistent with approved designations. Abbreviations of street type designations shall be consistent with NENA (National Emergency Number Association) standards as depicted in Appendix 6B. See table below for the categories which comprise the range of street types that may be approved.

Category	Criteria	Possible Street Type Designations
Limited Access Roadway	Four or more lanes, divided, limited access	Pike, Freeway, or Expressway
Major Arterials	Multi-lane, high volume, through movement of traffic	Thoroughfare, Avenue, Road, Boulevard, Parkway (County Designated), Highway
Minor Arterials and Collectors	Two or more lanes, moderate traffic volumes and trip lengths	Avenue, Street, Road, Drive, Trace
Local Residential or Commercial	Two or more lanes, provide access to individual residences or businesses	Lane, Drive, Way, Circle, Trail, Loop
Residential or Commercial Cul-de-sacs	Typically two travel lanes, providing access to fewer than twenty sites	Court, Place, Terrace
Shopping Center ingress/egress	Typically two travel lanes, providing access to business sites within a larger planned development	Square, Arcade, Center, Plaza
Service Facilities	One or more travel lanes providing service access to residences and businesses	Alley, Walk, Court, Terrace

Street type designations that are proposed that do not meet the criteria listed above will not be approved.

### 6.3.6 Street Address Assignment

#### A. Street Address Assignment

Street addresses shall be assigned to all residential and commercial lots, each home site within mobile home parks, condominium and apartment units, individual business, office and commercial uses and sites, and accessory structures and uses that represent separate living or business units. Addresses shall be assigned based on the Jefferson County Addressing Manual (see Appendix 6C).

#### B. Administrative Procedures

##### 1. Authority, Duties and Responsibilities of Planning Director

- a. The Planning Director shall be responsible for the updating, interpretation, administration, and enforcement of all aspects of the addressing manual which are not the specifically reserved authority of the Louisville and Jefferson County Planning Commission, and shall have the necessary authority to ensure compliance herewith, including the issuance of violation notices and any other appropriate action.

- b. The Planning Director shall maintain records of all addresses for each property and building on the parcel identification maps that are maintained by LOJIC. Such records and maps shall be made available to all public safety, law enforcement and emergency agencies for their use in the performance of their respective duties.
- c. When street address numbers are noted by the Planning Director as either incorrect or otherwise in need of reassignment, the Planning Director is authorized to change the address in accordance with the provisions contained herein.

### 2. Cooperation with Fire Protection Districts

The Planning Director shall cooperate with the Fire Protection Districts prior to the assignment and change of addresses and street names.

### 3. Enforcement of Numbering System

- a. Whenever there is reason to believe that any person is in violation of any provision of this ordinance, the Planning Director or any Fire Protection District acting through one of its regular firefighters may give notice of such violation to the person failing to comply with any such provision and order said person to take such corrective measures as are necessary within 30 days from the date of notification. Said notice shall also advise that the recipient may, within 14 days from the date of notification, submit written evidence to the Planning Director or the Fire Protection District, as the case may be, of why there is no violation of this ordinance. Copies of all violation notices and any response thereto shall be provided to both the Planning Director and Fire Protection District having jurisdiction regardless of the source that issued the original violation notice.
- b. Such notice and order shall be sent via certified mail, with return receipt requested, to the property owner. The date shown on the return receipt shall be the date from which the 30- day period shall commence for compliance or submission of written evidence of non-violation.
- c. If such person fails to comply with the order issued pursuant to this section, the Planning Director may initiate such actions as are necessary to terminate the violation, including criminal citations and applying to courts of competent jurisdiction for injunctive relief, or any other appropriate action. If the original violation notice was issued by a regular firefighter, such firefighter may pursue and prosecute a criminal citation or complaint.

### 4. Preparation of Street Name and Address Maps, Address Files, and Emergency Service Numeration (ESN) District Boundary Maps

The Planning Director shall have prepared and shall maintain a series of maps of the entire county and such maps, to the extent possible, shall depict each street property address as well as the boundaries of all emergency service numeration districts. Due to the limitations of mapping to effectively portray each address for each building or building sub-unit, the Planning Director shall also cause to be prepared a listing of each address for each parcel and building and/or sub-units within buildings. The official street name, address maps are available through LOJIC and other related computer files.

### 5. Display of Address Number

Address numbers shall be displayed in accordance with Louisville Metro Code of Ordinances 97.10 through 97.14. (See Appendix 6D)

### 6. Building and Occupancy Permits – Duty of Owner

- a. No building permit shall be issued for any structure until the owner or developer has procured the official address number of the premises from the Planning Director or designee. An occupancy

permit for any structure erected or repaired shall be withheld until permanent and proper address numbers have been affixed to such structure in accordance with the requirements of this regulation.

**NOTE:** *Louisville Metro Ordinance 224 2003, effective 12 152003*

- b. In the event that a structure is modified in use or design so that either a change in address or the assignment of additional addresses is required for continued compliance with this ordinance, the changed address or additional addresses must be acquired from the Planning Director in accordance with the provisions of this article. No building permit or occupancy permit shall be issued until the proper street address number(s) for a modified structure has been assigned.
7. Penalty

Any person, firm or corporation failing to comply with the provisions of this regulation after written notice by the Planning Director issued under the provisions shall be guilty of a violation and fined in accordance with Chapter 97.16 of the Jefferson County Code of Ordinances.

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**Chapter 6 Part 4 Design Standards for Transit**

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**Chapter 6 Part 4 Design Standards for Transit**

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## A. Relationship to the Comprehensive Plan

These regulations are intended to implement the Mobility Goals A2, A3 and I6 of Cornerstone 2020, and Guidelines 7 and 9 of the Plan Elements.

## B. Adoption of Design Manual

The Planning Commission is authorized to approve and revise as necessary the “Transit Design Standards Manual” or successor document, based on guidance from the Director of Works and of the Executive Director of the Transit Authority of River City, or successor agencies. The manual shall specify the type and design of transit- related amenities and transit-related site design features to be provided, as well as thresholds for provision of various types of transit-related features.

***NOTE: The Transit Design Standards Manual is located in Appendix 6F.***

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**Chapter 6 Part 5 Traffic and Air Quality Assessment**

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**6.5.1 Traffic and Air Quality Assessment**

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**A. Intent**

These regulations are intended to implement the Mobility Goals and Objectives of Cornerstone 2020, and Guidelines 7 and 12 of the Plan Elements.

**B. Analysis Required**

The applicant shall be required to file a traffic impact study or air quality analysis or both, if the Director of Works or the Director of the Air Pollution Control District determines that the development meets the conditions and thresholds established in the current version of the “Guidelines for Traffic Impact Studies and Air Quality Analysis in Jefferson County, Kentucky” or successor document as approved by the Planning Commission (See Appendix 6E). The content and methodology of the traffic impact study and air quality analysis shall be in accordance with the Guidelines or successor document.

**C. Planning Commission Approval**

1. The Planning Commission may approve or deny a development plan, based on recommendations concerning the air quality or traffic study provided by the Air Pollution Control Board, Director of Works or the Director of APCD.
2. The Planning Commission is authorized to approve, revise and replace the “Guidelines for Traffic Impact Studies and Air Quality Analysis in Jefferson County, Kentucky” document, based on guidance from the Directors of Public Works and of the Air Pollution Control District, or successor agencies.

**NOTE:** Part II A of the “Guidelines” establishes the conditions currently used to determine need for a traffic/air quality study:

1. 200 or more peak hour trips
2. location near heavily congested roadways
3. location near roadway needing to be improved
4. project entails installation or modification of traffic signal
5. project affects air quality “hot spot” or area of special concern

### Appendix 6A Access Management Design Standards

#### Part 1 Access Management

##### 1.1 Intent and Applicability

This manual presents design guidelines for managing vehicular access to land development, while preserving traffic flow in terms of safety, capacity, and speed. Major thoroughfares and collectors serve as the primary network for moving people and goods. These corridors also provide access to businesses and homes and have served as the focus for commercial and residential development. The design principles described herein are intended to balance the right of reasonable access to private property with the right of the citizens of Louisville and Jefferson County to safe and efficient travel.

##### 1.2 Relationship to the Comprehensive Plan

This manual is intended to assist in implementing the Goals, Objectives and Plan Elements of Cornerstone 2020.

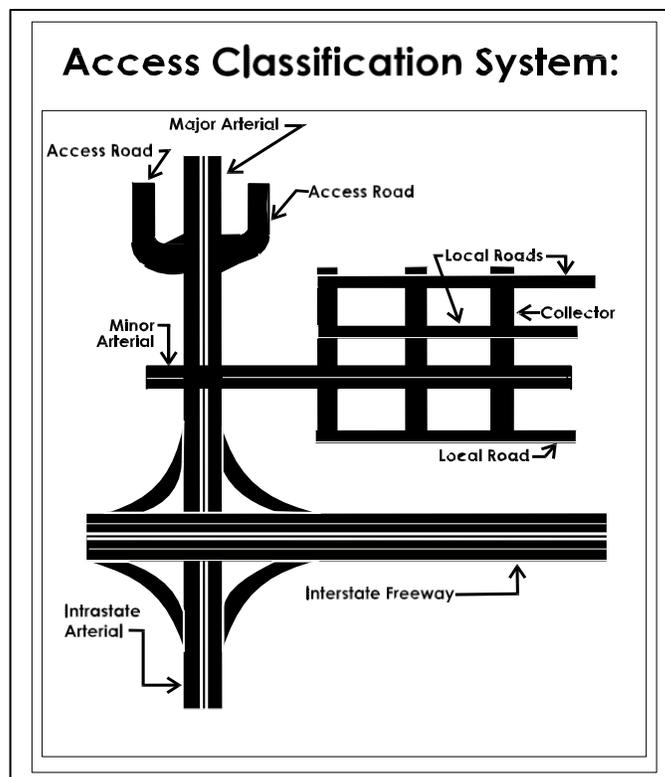
##### 1.3 Access Classification System and Standards

- A. The Director of Works (City or County depending upon location) is responsible for approving the number and location of curb cuts. The Director issues permits in accordance with the design principles presented in this manual, AASHTO standards and good engineering practice.
- B. Roadways within Jefferson County are classified for the purposes of access management as shown in Core Graphic 10, “Roadway Classification and Projected Corridors.”
- C. Separation between access points on all City and County maintained roadways should meet or exceed the following minimum standards for that classification.

Table 4: Jefferson County Access Classification System & Standards: <sup>1</sup>

Functional Classification	Driveway Spacing	Spacing of Median Openings or Major Intersections <sup>2</sup>	Signal Spacing
Major Arterial with a Median	600 ft. <sup>3</sup> , 400 ft. <sup>4</sup>	1200 ft. <sup>3</sup> , 800 ft. <sup>4</sup>	1/4 - 1/2 mile
Minor Arterial	600 ft.	600 ft	1/4 mile
Collector	300 ft.	300 ft. to 600 ft.	1/4 mile
(1) It is recognized that some locations, due to existing development characteristics, may not meet the standards provided in this section. Access to such properties is allowed to continue.			
(2) Applies to full median openings on roadways with medians. Directional median opening spacing shall be 1/4 mile on all major arterials.			
(3) Applies to facilities with a speed of 45 mph or greater. Speed refers to posted speed or 85 <sup>th</sup> percentile speed, whichever is lower.			
(4) Applies to facilities with a speed of less than 45 mph. Speed refers to posted speed or 85 <sup>th</sup> percentile speed, whichever is lower.			

1. To provide reasonable flexibility in administration, some deviation from access spacing standards may be permitted, if the Director of Works finds that a property is otherwise unable to meet minimum driveway spacing standards and allowing such a deviation would not create a safety hazard on the public road.
2. The Director of Works may establish some or all of the following conditions as the basis for approving deviation from the driveway spacing standards:
  - a) A traffic impact study, prepared at the expense of the applicant, demonstrates that the deviation will not create a public safety hazard;
  - b) A joint-use driveway will be established wherever feasible, to serve two abutting building sites, with cross-access easements provided in accordance with Section);



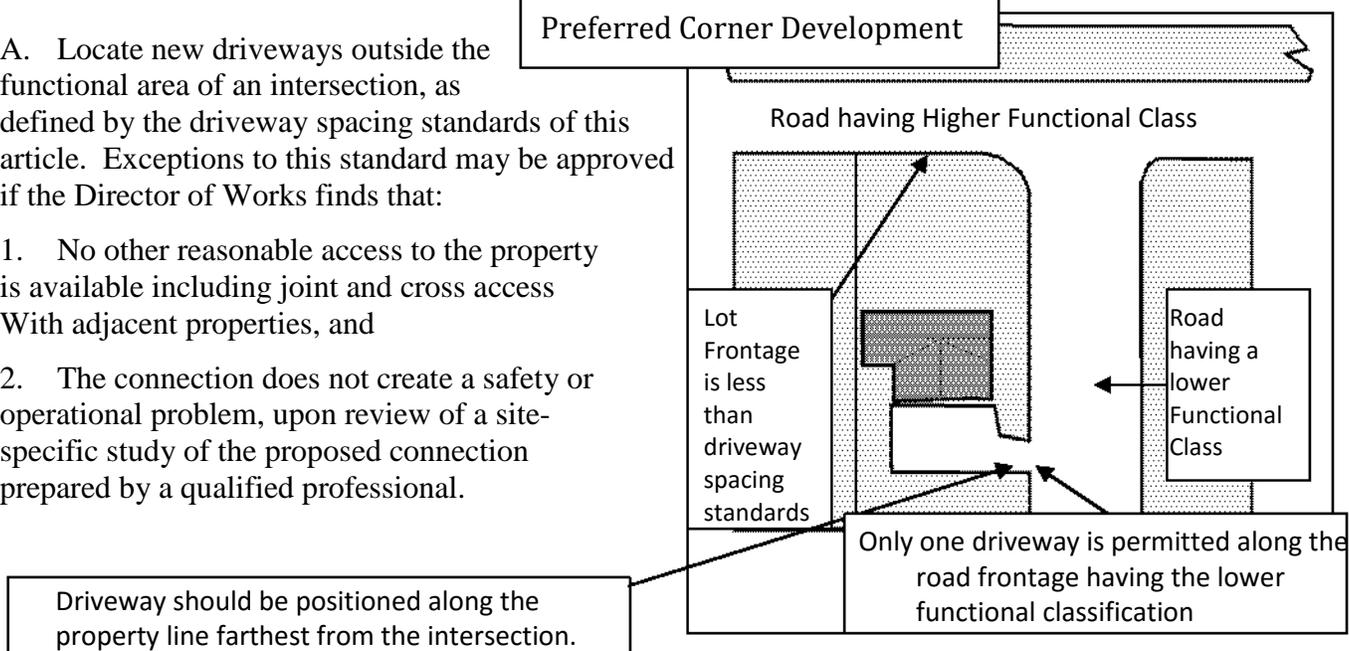
- c) The building site is designed to provide cross access and unified circulation with abutting sites;
- d) The property owner shall agree to close any pre-existing curb-cuts that are nonconforming on the building site, after the construction of both sides of the joint-use driveway

#### 1.4 Corner Clearance

A. Locate new driveways outside the functional area of an intersection, as defined by the driveway spacing standards of this article. Exceptions to this standard may be approved if the Director of Works finds that:

1. No other reasonable access to the property is available including joint and cross access With adjacent properties, and
2. The connection does not create a safety or operational problem, upon review of a site-specific study of the proposed connection prepared by a qualified professional.

#### Preferred Corner Development



- B. If the Director finds that no other alternatives exist and provided appropriate sight distance standards are met, a driveway within the functional area of the intersection may be constructed. It shall be located as close to the property line and as far from the intersection as site conditions allow. Only one driveway will be permitted and it shall access the road frontage of the street having the lower functional classification, unless the Director determines that this would create a safety or operational problem on the public street system.

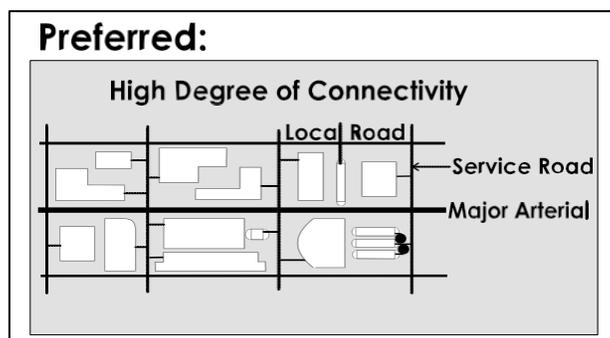
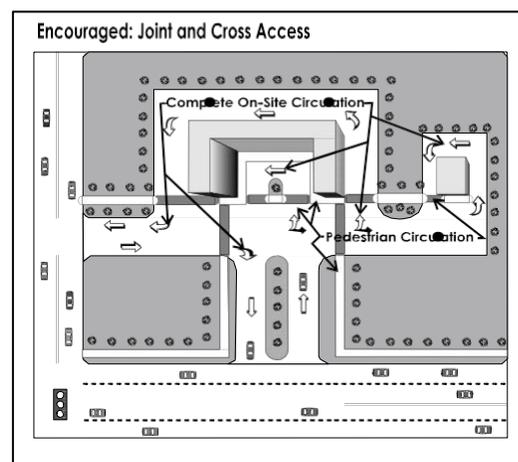
### 1.5 Joint and Cross Access

- A. Properties located on arterial or collector roadways should provide a cross access drive and pedestrian access to allow circulation between adjacent sites as required by the Director of Works. Such connection is generally required in the following circumstances:

1. Retail commercial use adjacent to other commercial, office, industrial or multi-family development.
2. Other connections as required in the form district regulations.

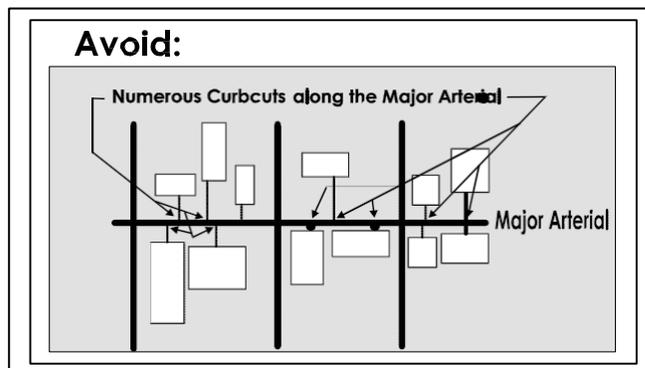
- B. Required cross-access corridors shall be shown on any subdivision or site plan. A system of joint use driveways and cross access easements shall be required to provide unified access and circulation among parcels and assist in local traffic movement. In such cases, the building site shall incorporate the following:

1. A continuous cross-access or service drive with sufficient width to accommodate two-way travel aisles for automobiles, service vehicles, and loading vehicles.
2. Stub-outs and other design features to make it visually obvious that abutting vacant properties should be tied in to provide cross access at the time they are developed.
3. Building sites shall be designed to ensure parking, access and circulation may be easily tied in to future adjacent development.



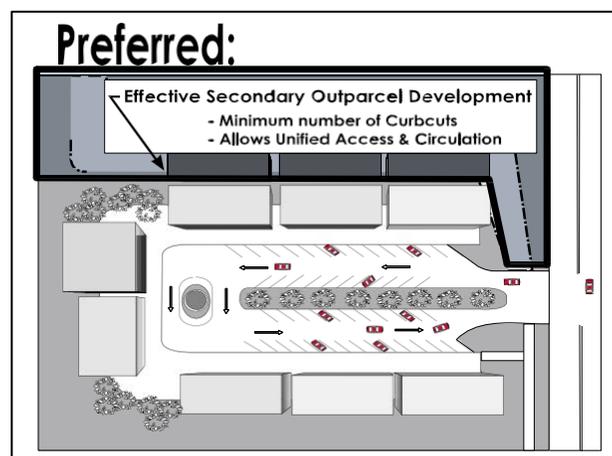
C. Where joint- and cross-access is provided pursuant to this section, property owners shall:

1. Record an easement in the office of the Clerk of Jefferson County Kentucky, allowing cross-access to and from other properties served by the joint use driveways or service drive, which shall be a covenant running with the land;
2. Record an agreement in the office of the Clerk of Jefferson County Kentucky that any pre-existing curb cuts providing for access in the interim shall be closed and eliminated after construction of the joint-use driveway, which shall be a covenant running with the land; and
3. Record a joint maintenance agreement in the office of the Clerk of Jefferson County Kentucky, defining maintenance responsibilities of property owners that share the joint use driveway and cross access system, which shall be a covenant running with the land.
4. Items described in paragraphs 1 –3, above, shall be recorded prior to requesting a building permit; if no new construction, the items shall be recorded before requesting a certificate of occupancy.



### 1.6 Requirements for Unified Access and Circulation

- A. In the interest of promoting unified access and circulation systems, integrated development sites comprised of more than one building or more than one lot are not considered separate properties in relation to the access management standards of this code. This will also apply to phased development plans. In addition, the following standards apply:
1. The number of curb cuts permitted shall be the minimum number necessary to provide reasonable access to the overall site and not the maximum available for that frontage. Reasonable access shall be determined by the Director of Works.
  2. All necessary easements, agreements, and stipulations required under Section 1.5 (C) shall be met. Subsequent owners and lessees within the affected area are responsible for compliance with these requirements.
  3. Outparcels should be accessed via the shared circulation system of the principal development or retail center. Access to outparcels should be designed to avoid excessive movement across parking aisles and queuing across surrounding parking and driving aisles.



- B. Where abutting properties are in different ownership and not part of an overall development plan, cooperation between the various owners to create a unified access and circulation system is encouraged. Abutting properties shall provide unified access and circulation at the time that they are developed, or are redeveloped as provided in Section 1.8.

### 1.7 Driveway Location and Design

- A. Sight distance at driveway approaches must be located and designed in conformance with appropriate AASHTO, ITE or other applicable standards.

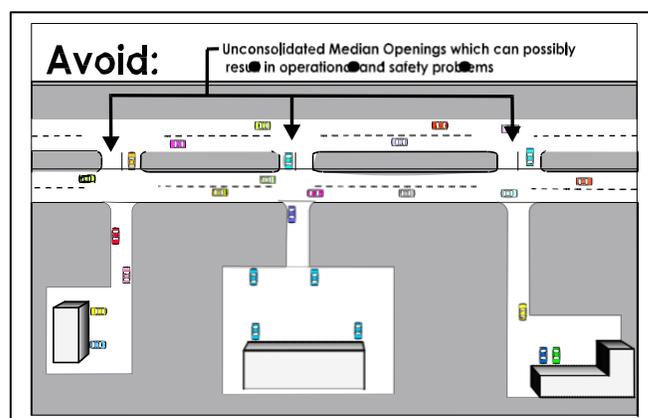
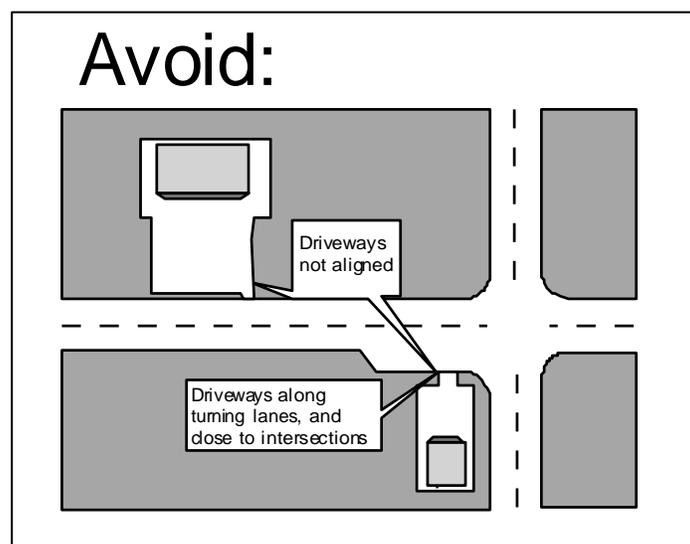
- B. The Director of Works may require deceleration or storage lanes where deemed necessary due to traffic volumes, speed limits, or where there may be a safety or operational problem. The design of left-turn and right-turn deceleration/storage lanes shall conform to appropriate agency standards.

- C. Due to the potential for vehicular weaving conflicts and crashes, construction of driveways along acceleration or deceleration lanes, left turn storage lanes and tapers is to be avoided, unless no other access to the property is available.

- D. Driveways across from median openings should be consolidated wherever feasible, to coordinate access at the median opening.

- E. Driveways on undivided roadways should be aligned directly opposite driveways on the opposite side of the road, or offset from each other in accordance with applicable County or State Highway Standards, due to the potential for conflicting left turns or jog maneuvers and resulting safety or operational problems.

- F. Driveway width and return radius or flare shall be adequate to serve the volume of traffic and provide for efficient movement of vehicles onto and off of the major thoroughfare. However, the width of driveways shall not be so excessive as to pose safety hazards for pedestrians and bicycles.



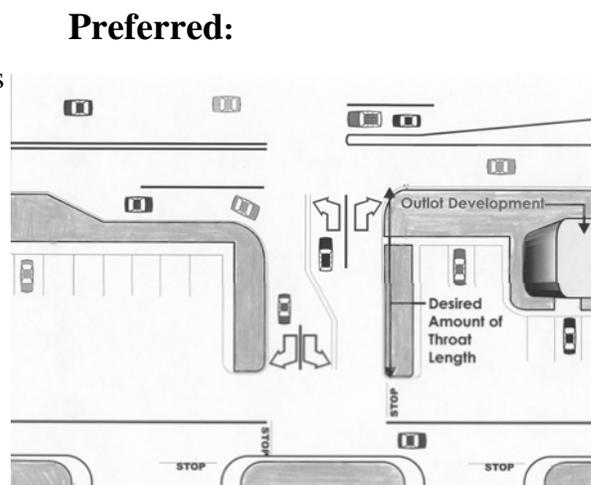
The Director of Works may require longer radii and/or wider throats where deemed necessary to accommodate trucks.

- G. Driveways with more than two lanes should incorporate channelization features. Double-yellow lines may be considered instead of medians where truck off-tracking is a problem.
- H. Driveways shall be designed with adequate on-site storage for entering and exiting vehicles to reduce unsafe conflicts with through or on-site traffic and to avoid congestion at the entrance. These guidelines are intended for the principal access to the property and are not intended for minor driveways.

### 1.8 Redevelopment

Access connections to roadways in place as of the date of adoption of this article that do not conform with the standards herein are considered nonconforming. Properties with nonconforming connections should be brought into compliance with this article as changes to the roadway design allow or when an existing development is changed in any of the following ways:

- a) existing structure is replaced by new structure or improvements; or
- b) existing structure or parking lot is expanded by 20% or more beyond the size existing at the effective date of this regulation (incremental changes that cumulatively increase the size by 20% fall within the regulated activities of this paragraph); or
- c) an existing use is changed to a use for which Chapter 9 of the Land Development Code specifies a higher parking ratio.

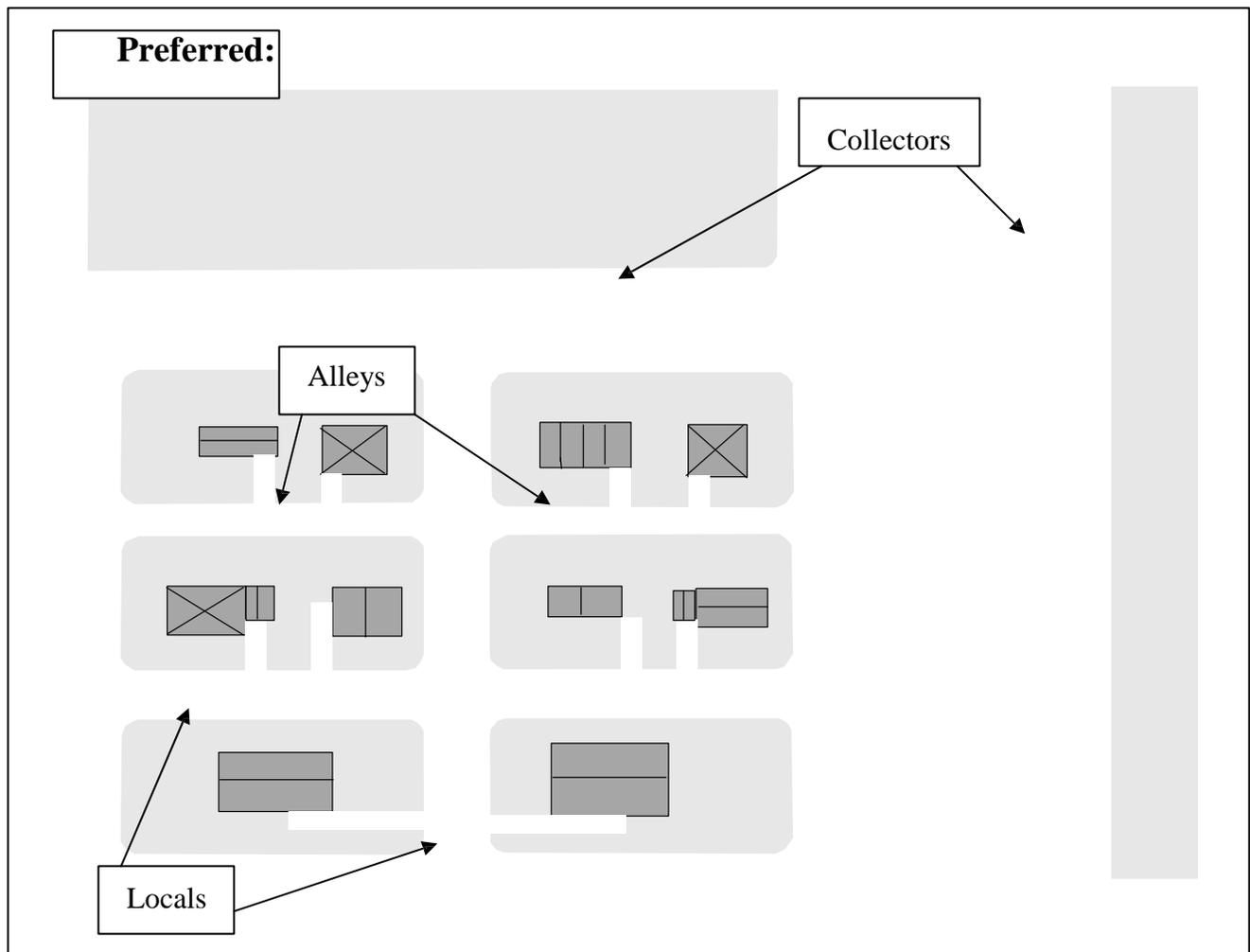


### 1.9 Corridor Access Management Overlay Zones

- A. Segments of a roadway corridor may be designated as corridor access management zones for the purpose of applying special access management controls that exceed the requirements and standards in this article. The purpose of this designation is to avoid significant traffic congestion problems, reduce vehicular and pedestrian conflict areas, and to ensure appropriate development within the designated area in accordance with the Jefferson County Comprehensive Plan.
- B. The controls in such districts are not intended to be substituted for other general zoning district provisions but can be superimposed over such district provisions and should be considered additional requirements.
- C. Corridor access management zones shall be designated and approved in accordance with the public involvement and public hearing requirements of Jefferson County that govern the creation of all land use designations and zoning districts.

#### 1.10 Access to Homes and Subdivisions

- A. When a residential subdivision is proposed that abuts an arterial or major collector roadway, it shall be designed to provide lots abutting the roadway with access only from an interior local road or frontage road.
- B. Direct Driveway access to individual one and two family dwellings on arterial and collector roadways are prohibited unless the Planning Commission determines that there is no acceptable access alternative.



## Abbreviations for Streets and Thoroughfares

## APPENDIX 6B NENA\* RECOMMENDED ABBREVIATIONS FOR STREETS AND THOROUGHFARES

STREET TYPE	ABBREVIATION		STREET TYPE	ABBREVIATION
Alley	Aly		Parkway	Pky
Arcade	Arc		Pass	Pass
Avenue	Ave		Path	Path
Boulevard	Blvd		Pike	Pike
Bypass	Byp		Place	Pl
Center	Ctr		Plaza	Plz
Circle	Cir		Point	Pt
Court	Ct		Ridge	Rdg
Cove	Cv		Road	Rd
Drive	Dr		Row	Row
Expressway	Epy		Run	Run
Fork	Frk		Square	Sq
Freeway	Fwy		Street	St
Harbor	Hbr		Terrace	Ter
Highway	Hwy		Trace	Trce
Hill	Hl		Trail	Trl
Hollow	Holw		Turnpike	Tpke
Landing	Lndg		Village	Vlg
Lane	Ln		Walk	Walk
Loop	Loop		Way	Way
Park	Park		-	-

\*National Emergency Number Association

## Abbreviations for Streets and Thoroughfares

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### APPENDIX 6C JEFFERSON COUNTY ADDRESSING MANUAL

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#### A. Authority of the Planning Director

The Planning Director or designee shall assign addresses in accordance with the following procedures. When circumstances dictate, the Planning Director may authorize address assignments that diverge from the standards in this section.

#### B. Address Grid System

Each new subdivision parcel, each pad in a mobile home park, commercial unit, apartment, condominium, or townhouse shall be assigned an address on the street providing access to the parcel. Addresses will be assigned based on a countywide grid system.

The grid system allows a series of numbers to be assigned for approximately every 500 feet. The address grid includes the NW, NE, SW, and SE quadrants of Jefferson County and uses primary routes within the County as zero baselines.

#### C. Address Grid Baselines

Jefferson County's address numbering system shall be on a grid system that divides Jefferson County into quadrants establishing zero baselines from which numbers are assigned. The grid system, as shown on the property numbering map on file in the office of the Commission, indicates the point at which block numbers will change in increments of 100.

Assigned address numbers under the grid system will ascend numerically from 100 to the north and to the south based on Main Street/Shelbyville Road as the boundary or zero baseline for streets that are aligned basically North and South. Streets that are aligned basically east and west shall be assigned address numbers ascending numerically from 100 to the east and to the west based on First Street as extended to the county boundary representing the boundary or zero baseline. The directional orientation of a number street shall be determined by the Planning Director or the Commission. Numbers on the north side of the east-west streets shall be odd and numbers on the south side of the east-west streets shall be even. Numbers on the west side of the north-south streets shall be even and numbers on the east side of the north-south streets shall be odd.

#### D. Application of Address Grid

Application of the address grid will vary, as few streets run directly north, south, east or west. Most streets run at angles to the cardinal directions and often change direction. The primary consideration for assigning addresses on streets that diverge from the cardinal directions is the even distribution of address numbers. The grid shall be used to assist in assigning numbers by orienting the grid parallel to the direction of the street. In this manner, an appropriate distance between address numbers can be maintained.

#### E. Addressing Single Family Dwelling Lots

Addresses for single family dwelling lots shall be assigned consecutively on the odd and even sides of the street.

#### F. Addressing Mobile Home Parks

Addresses for home sites in mobile home parks are assigned consecutively on the odd and even sides of the street. A separate street address number shall be assigned for each mobile home pad. No unit numbers shall be assigned to mobile home park developments.

#### G. Addressing Townhouse Developments

Addresses for townhouse units are to be assigned consecutively on the odd and even sides of the street. A separate street address number shall be assigned for each townhouse lot. No unit numbers, such as apartment numbers, shall be assigned to townhouse developments.

#### H. Addressing Commercial, Office, and Warehouse Developments

Staff shall evaluate commercial, office and warehouse developments for address assignment based on the maximum potential number of units. Large stores, offices and warehouses may be divided into smaller spaces many years after the center is constructed. Staff will take into account the potential for readdressing the potential must be taken into account to avoid potential readdressing.

## Abbreviations for Streets and Thoroughfares

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### I. Addressing Commercial Shopping Centers

Commercial shopping centers shall generally be addressed in a manner similar to townhouses. Because the frontage dimension for each store may change as the use changes, site development plans for shopping centers shall include the maximum number of potential use units within the center in order to provide the maximum number of addresses. The location of the door to an individual use unit providing primary access is the critical factor in determining which available address applies.

In the event that a shopping center may allow more street addresses than are available with the segment of street, the Planning Director may assign one street address to the shopping center as a whole, and assign unit numbers for each of the potential use units within the center. Unit numbers for the stores shall run as consecutive whole numbers in the same direction as the addresses on the street. Unit numbers shall begin with 101 and progress until all use units have been addressed. No lower numbers, including 100, shall be used. The same procedure and information shall be used in assigning addresses and unit numbers for office and warehouse developments.

In shopping centers with multiple stories, each story shall be assigned four digit addresses beginning with 2100 on the second story and increasing by 1000 for each additional story. For example, stores on the first floor of a shopping center may run from 100 to 122, while stores on a second level of the shopping center may run from 2100 to 2122, and stores on a third level of the shopping center may run from 3100 to 3122. In this manner, it will be easier to locate a store in an emergency by providing a logical separation between levels in the shopping center.

### J. Addressing Commercial Shopping Malls

Malls shall be addressed with one street address number assigned to the street intersecting with the main vehicular entrance. Separate address numbers shall not be assigned to each entrance of shopping malls. The maximum number of stores is to be included on the site development plans as well as the minimum potential store frontage. Based on this information, unit numbers shall be assigned using an odd and even distribution on either side of the mall corridor(s). Unit numbers shall begin with 101 on the odd (north and east) side and 100 on the even (south and west) side.

In malls with multiple corridors, each corridor shall be assigned numbers in higher hundred divisions. For example, stores in one corridor may run from 100 to 147, and stores in an adjoining corridor would run from 200 to 238. In this manner, it will be easier to locate a store in an emergency by providing a logical separation between corridors in the mall.

In malls with multiple stories, each story shall be assigned four digit addresses beginning with 2100 on the second story and increasing by 1000 for each additional story. For example, stores on the first floor of a commercial shopping mall may run from 100 to 147, while stores on a second level of the shopping mall may run from 2100 to 2147, and stores on a third level of the shopping mall may run from 3100 to 3147. In this manner, it will be easier to locate a store in an emergency by providing a logical separation between levels in the mall.

### K. Addressing Offices and Multi-Family Dwellings

These procedures include residential and office buildings of the same construction design as apartment buildings. Multi-family housing units, such as apartments and condominiums, will have a separate whole number street address assigned to each door/entrance providing access to units within an individual building(s). Street addresses shall be assigned based on the normal criteria for assignment, skipping numbers in accordance with the grid and using the appropriate odd and even numbering scheme for building entrances.

Within structures having dwelling units placed one above another, a consecutive whole unit number (referred to as apartment, suite, or unit number) shall be assigned for each separate dwelling unit. The numbers shall be

## Abbreviations for Streets and Thoroughfares

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assigned in the same direction as the street numbers. The lowest floor shall begin with 101, progressing with 102, 103, etc., until all units have been assigned unit numbers. Successively higher floors shall begin with successively higher increments of hundreds. The complete official street address for each unit will consist of the street address, street name, and unit number.

When a single story multi-family structure has frontage along two streets, and has doors/entrances to individual dwelling units from each street, a separate street address will be assigned to each dwelling unit.

### L. Addressing Marinas

This procedure includes all water-based facilities for the long term (more than six months) docking and storage of boats that may be used as dwelling units. Marinas shall be addressed in the following manner. The marina will be assigned a street address, and each dock providing access to individual boat slips shall be designated by a letter of the alphabet, beginning with "A" for the dock closest to the street entrance to the marina.

A whole unit number (1,2, etc.) shall be assigned for each separate boat storage slip beginning on the right side of the dock and continuing around the dock to the slip closest to the beginning of the dock on the left side. The complete official street address for each unit will consist of the street address, street name, dock indicator (alpha) and slip indicator (numeric).

### M. Assignment of Addresses to Corner Lots

Residential and commercial lots which have frontage on two streets that are required to be named (See 06-03-05A), regardless of whether the streets are private or public, shall be assigned an address for each frontage street which the lot abuts. After the building is established, the Fire Protection District with jurisdiction shall determine which address will be used for the lot and report their decision to the Planning Commission.

## Abbreviations for Streets and Thoroughfares

### APPENDIX 6D POSTING OF ADDRESS NUMBERS

#### POSTING OF ADDRESS NUMBERS

*Editor's Note: This subchapter is based on Ord. 21-1982, adopted 5-19-82.*

#### 97.010 DEFINITIONS.

(A) For the purposes of this ordinance, the following terms shall have their assigned meanings:

**COMMERCIAL** or **INDUSTRIAL STRUCTURE.** Any building, structure, premises, or establishment used for commercial, industrial, or business enterprises as opposed to residential purposes.

**COMMISSION** The Louisville/Jefferson County Planning Commission.

**FAMILY.** One or more persons occupying residential premises and living as one housekeeping unit.

**FIRE PROTECTION DISTRICT.** Any lawfully created agency established for the ostensible purpose of fire suppression and enforcement of laws and regulations related to fire prevention, protection, and suppression.

**MULTIPLE-FAMILY DWELLING** A building or portion thereof designed for or occupied by two or more families living independently of each other, and doing their own cooking in separate kitchens. It shall also include residential dwellings which are grouped or clustered on a single parcel of land such as a townhouse, row house, or condominium development. The term multiple-family dwelling shall include but not be limited to apartments, apartment buildings, condominiums, duplexes and patio homes.

**REGULAR FIRE FIGHTER** The regular members of a fire department in a Fire Protection District, except volunteer fire fighters, who have the same powers of arrest as now given by law to sheriffs of the Commonwealth in the manner prescribed in KRS 75.160.

**SINGLE-FAMILY DWELLING.** A detached building designed for or occupied exclusively by one family.

(1994 Jeff. Code, § 97.10) (Jeff. Ord. 41-1996, adopted and effective 11-12-1996)

#### 97.011 DISPLAY OF STREET ADDRESS NUMBER.

All residential, commercial, and industrial property located in Jefferson County, shall conspicuously display the appropriate street address approved or assigned by the Louisville/Jefferson County Planning Commission in accordance with §§ 97.030 through 97.042.

(1994 Jeff. Code, § 97.11) (Jeff. Ord. 41-1996, adopted and effective 11-12-1996)

#### 97.012 SINGLE-FAMILY DWELLINGS.

(A) All street address numbers for new single-family dwellings shall comply with the following requirements, except as explicitly set forth herein. Numbers always must be clearly visible to vehicles traveling in either direction on the nearest fronting road, in addition to all of the following:

(1) *Form.*

(a) Standard Arabic numerals (numbers shall not be written out); (b)

In a color distinguishable from its background;

(c) At least four inches in height, unless:

## Abbreviations for Streets and Thoroughfares

1. Street numbers posted prior to the effective date of §§ 97.012 and 97.013 that were in compliance with previous ordinance requirements as to numeral height will be considered to remain in compliance, until they are removed for any reason, including routine maintenance or replacement;

2. Street numbers that are constructed of laser-cut masonry may be allowed at the height of the cut brick, with a minimum height of three inches.

(2) *Placement.*

(a) Free and clear of any obstructions hindering clear visibility;

(b) Placed at, on, or about the front of the dwelling; however, numbers which are painted only on the road curb do not comply with this requirement; and

1. Placed on the back of such buildings, garages, fences, or other structures on the property, if the back of the property abuts an unnamed alley;

2. If dwelling sits back 100 feet or more from the nearest fronting road, the numbers may be a minimum of three inches in height and permanently affixed to the mailbox, or, if there is no mailbox available on the fronting road, to a freestanding sign that is:

a. Located no closer than 6 feet, and no more than 12 feet from the driveway; and b.

At least 18 inches in height.

(1994 Jeff. Code, § 97.12) (Jeff. Ord. 41-1996, adopted and effective 11-12-1996; Lou. Metro Am. Ord. No. 224-2003, approved 12-15-2003)

### 97.013 MULTIPLE-FAMILY DWELLINGS.

(A) All street address numbers for new multiple-family dwellings shall comply with the following requirements, except as explicitly set forth herein. Numbers always must be clearly visible to vehicles traveling in either direction on the nearest fronting road, in addition to all of the following:

(1) *Form.*

(a) Standard Arabic numeral form;

(b) In a color distinguishable from its background;

(c) At least six inches in height with regard to street address/building numbers, and four inches in height with regard to individual unit numbers in buildings with street address/building numbers also posted, unless:

1. Street numbers posted prior to the effective date of §§ 97.012 and 97.013 that were in compliance with previous ordinance requirements as to numeral height will be considered to remain in compliance, until they are removed for any reason, including routine maintenance or replacement;

(2) *Placement.*

(a) Free and clear of any obstructions hindering clear visibility;

(b) Placed at, on, or about the front of the dwelling; however, numbers which are painted only on the road curb do not comply with this requirement; and

1. Placed on the back of such buildings, garages, fences, or other structures on the property, if the back of the property abuts an unnamed alley;

2. If dwelling sits back 100 feet or more from the nearest fronting road, or is not clearly visible to vehicles traveling in either direction on the nearest fronting road, the numbers shall be permanently affixed to a freestanding sign, or the owner of any such building

## Abbreviations for Streets and Thoroughfares

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may submit an alternate form of placement of street address/building numbers to the Fire Department or Fire District having jurisdiction, that is reasonably calculated to readily identify such buildings to emergency and public safety personnel. The parties shall work together to insure proper identification without undue expense to the owner. The written proposal shall be signed off by the Fire Department or Fire District once approved, and submitted to the Commission as proof of compliance with §§ 97.012 and 97.013.

(1994 Jeff. Code, § 97.13) (Jeff. Ord. 41-1996, adopted and effective 11-12-1996; Lou. Metro Am. Ord. No. 224-2003, approved 12-15-2003)

### 97.014 COMMERCIAL OR INDUSTRIAL STRUCTURES.

- (A) The street address number shall be placed at, on, or about the front of each individual commercial or industrial structure so it is clearly visible to vehicles traveling in either direction on the nearest fronting road or parking area and in order to insure prompt identification of the location of each separate building. The address shall be kept free and clear of any obstructions hindering clear visibility to vehicles traveling in either direction on the nearest fronting road or parking area.
- (B) (1) After the effective date of this ordinance, the street address numbers for all new commercial or industrial structures shall be in standard Arabic form of a size at least six inches in height or larger so as to be clearly visible to vehicles traveling in either direction on the nearest fronting road or parking area, and the street address number shall be in a color distinguishable from its background.
- (2) All commercial or industrial structures in existence upon the effective date of this ordinance which have existing posted street address numbers in standard Arabic form of a size at least five inches in height shall be deemed in compliance with this ordinance unless:
- (a) The street address number for such commercial or industrial structure is determined to be in violation of §§ 97.030 through 97.042; or
- (b) The street address number is replaced as a result of routine maintenance, replacement, or for any other reason.
- (3) In either event set forth in divisions (B)(2)(a) and (b) of this section, such commercial or industrial structure will be required to have at least six-inch Arabic numerals for its posted street address.
- (C) In the event that a commercial or industrial structure is more than 100 feet from the nearest fronting road or is otherwise not clearly visible from the nearest fronting road, the owner of such structure shall use a system of street address identification, approved by the Fire Protection District having jurisdiction, that is reasonably calculated to readily identify the structure to emergency and public safety personnel. The owner shall propose any such identification system in writing to the Fire Protection District having jurisdiction, and the Fire Protection District shall work with such owner to insure proper identification without undue expense to the owner. The Fire Protection District shall give written approval for any qualifying identification system, with a copy to the Commission, and such written approval shall be prima facie evidence of compliance with this ordinance.

(1994 Jeff. Code, § 97.14) (Jeff. Ord. 41-1996, adopted and effective 11-12-1996)

**Abbreviations for Streets and Thoroughfares**

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**97.015 ENFORCEMENT PERSONNEL.**

- (A) The Code Enforcement Officer, or his authorized representatives, and all regular fire fighters are hereby designated as enforcement personnel for this ordinance, which shall be enforced with the intent to insure that each residential, commercial, and industrial structure in Jefferson County is clearly identified by its assigned street address in order to enable emergency and other public service personnel to promptly identify same at all times.
- (B) Prior to the issuance of any citations for violation of this ordinance, an enforcement officer shall deliver a written warning, either in person or by first class mail, which shall describe the violation and direct the correction of such violation within ten business days of the written notice. Thereafter, if subsequent inspection reveals the violation has not been corrected, then the enforcement officer shall issue a citation for the violation.

(1994 Jeff. Code, § 97.15) (Jeff. Ord. 41-1996, adopted and effective 11-12-1996)

GUIDELINES  
FOR  
TRAFFIC IMPACT STUDIES  
AND  
AIR QUALITY ANALYSIS IN  
JEFFERSON COUNTY, KENTUCKY

Prepared by:

Public Works and Transportation Division and  
Air Pollution Control District

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**GUIDELINES FOR  
TRAFFIC IMPACT STUDIES AND AIR QUALITY ANALYSIS IN  
JEFFERSON COUNTY, KENTUCKY**

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### Traffic Impact Studies & Air Quality Analysis

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## I. INTRODUCTION

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The Louisville and Jefferson County Planning Commission requires that all traffic data and/or analysis either by a project proponent or opponent must be first reviewed by the Jefferson County Public Works and Transportation Division. This is to insure compliance with these guidelines and the comprehensive plan.

The purpose of this document is to provide guidance to developers and consultants regarding traffic impact studies and air quality analysis submitted as attachments to proposed development plans in Jefferson County, Kentucky. These studies can be useful decision making tools and, when warranted, are an important component of a development petition. These guidelines are intended to provide consistency in the preparation of impact studies. They are provided as a reference only. The analysis required for a traffic impact study should be conducted only under the supervision of a transportation engineer with specific training in traffic engineering. The air quality analysis should be conducted only by a professional certified by the Air Pollution Control District.

Notes which provide definitions for the technical terms discussed herein and those that should be addressed in an impact study are included in Appendix A. Elements of a recommended impact study are presented in Appendix B and sample traffic analysis forms are shown in Appendix D. The emission data required for air quality analysis generated by the Air Pollution Control District is presented in Appendix E. The major acceptable sources of information and reference are presented in Appendix F.

## II. WARRANTS FOR REQUIRING AN IMPACT STUDY

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The Jefferson County Public Works and Transportation Division (PW&T), as the initial step in the review process of a proposed development plan, will evaluate the need for a traffic impact study. The need for a traffic impact study will be determined on a case-by-case basis. The criteria described below will be used by the PW&T staff in its recommendations of need for a traffic impact study. The final decision to require a traffic impact study will be determined by the Director of Public Works, based on staff recommendations. If a traffic impact study is determined to be necessary, a report of the study's findings must be transmitted to and reviewed by PW&T staff before a recommendation on the proposed development plan will be made to the Planning Commission. For air quality concerns the APCD shall determine when an analysis performed by or for the developer is required. In most instances a traffic and air quality impact study would be jointly performed, however, either or both may be waived when conditions warrant.

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The normal maximum time required for review and comment is two weeks. Should action be required of the APCD's Board this time would be extended to be compatible with the Board's regular monthly meeting every third Wednesday. An impact study may be requested if any of the following conditions are present:

- A. Significantly Sized Project: The proposed development is of sufficient size to have a substantial impact on a particular local area. The proposed development is considered to meet this criteria if it generates two hundred (200) or more peak hour trips according to the current editions of Trip Generation, published by the Institute of Transportation Engineers, locally generated data or other acceptable source.
- B. Nearby Congestion: The proposed development, of any size, is located near roadways, intersections or set of intersections which have been identified by the Director of Public Works as being already heavily congested.
- C. Modification to Roadway: When the proposed development is located near a roadway segment identified by the Director of Public Works as within a problem area, needing to be widened or improved. This criteria will also be satisfied if the proposed development plan includes modifications to the State or County roadway system.
- D. Traffic Control Signal: This warrant will be satisfied if the proposed development plan includes the installation of a new or the modification of an existing traffic control signal.
- E. Air Quality: The proposed development is located in or will affect potential "Hot Spot" area, as identified in the Core Graphics of the Comprehensive Plan or an area of special air quality concern.

### III. RECOMMENDED CONTENTS OF AN IMPACT STUDY

The developer shall be responsible for all data collection, analysis, and reporting associated with the traffic and air quality studies. The results of the developer's efforts will be reviewed by PW&T and APCD for content, results and acceptability. A single report documenting the traffic and air quality studies should be prepared. Traffic should be presented first since air quality analysis is dependent on traffic data.

#### A. Traffic Impact

Generally a traffic impact study will provide operating capacity and level of service analysis for critical roadway segments and/or intersections within a predetermined impact area. Upon determination that a traffic impact study is required, the PW&T staff, with the petitioner, will identify the area of impact, the critical intersections to be analyzed and the scope of the study. Capacity and level of service analysis will be conducted for the following conditions:

1. Existing traffic, to establish the current conditions as a point of reference;
2. Existing plus expected natural traffic growth, and approved development projects not yet completed, if any, to establish the short term future traffic conditions without the proposed development;
3. Full development traffic condition (including existing traffic, expected natural growth, approved development projects, and expected site generated traffic), to estimate future traffic conditions once the project is completed.

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[NOTE: If the proposed development is expected to be constructed in phases, over a period of years, analysis for each phase of development must be provided for each of the above conditions and should include a predetermined rate for natural growth of through traffic.]

If the proposed development includes a request for rezoning, the study should also include an analysis comparing the traffic generated by the proposed development with the traffic generated by the existing zoning or land use/zoning recommendations in Corridor Plans or Neighborhood Plans. This analysis should be very brief, possibly consisting only of a table comparing the expected number of new trips generated by the recommended zoning and the proposed development plan. In addition, a short narrative should be present comparing the percentage or basic differences between the two scenarios.

The individual parameters of the traffic impact study will be agreed upon during an initial review meeting between the petitioner and PW&T staff. These parameters may include, but not be limited to, the following:

1. Boundary of the traffic impact area;
2. Roadway segments and critical intersections to be included in the traffic impact study;
3. Adequacy of available turning movement counts and need for additional data;
4. Period of analysis (A.M. and/or P.M. peak hour weekday and/or weekend, depending on the development);
5. Trip generation rates or acceptable sources to be used;
6. Reductions to driveway trips due to internal circulation (if applicable);
7. Percentage of trip reassignment to account for pass-by and diverted traffic.
8. Directional distribution of site-generated traffic;
9. Mode split assumptions (if applicable);
10. Programmed projects in KIPDA's Transportation Improvement Program, the Comprehensive Plan's Core Graphics, along with travel demand estimating procedures for any assumptions relating to traffic diversion to new programmed facilities;
11. Roadway capacity and trends in traffic growth;
12. Acceptable methodologies to be used;
13. The range of feasible traffic engineering and operational improvements associated with the development;
14. Feasibility of including measures in the development proposal to promote transit ridership. This would require coordination with TARC *and* may include such provisions as transit stops and shelters with adequate pedestrian access, park-n-ride lots.
15. Possibility of implementing other transportation system management strategies such as flex-time and variable work hour programs to redistribute peak hour traffic, employer ridesharing programs, preferential parking for ridesharers, etc.;
16. Possibility of implementing provisions for alternative modes of transportation, such as bikeways, pedestrian walkways, including the provision of sidewalks along State Highways and along the County through roads system.

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17. The identification of high accident locations; and
18. A formal cost estimate of mitigation measures, (including construction, design, right-of-way and utility relocation cost). Approval of the above parameters must be given by the PW&T at this initial meeting. It is recommended that the developer, or his representative, document the discussions at this meeting and submit a letter of conformation to PW & T for approval. This confirmation should be obtained prior to the beginning of analysis. Failure to obtain approval for the methodologies, parameters or assumptions used, in the traffic impact study, may result in rejection of the entire study by PW&T.

Proposed site plans should be submitted to AP CD and P W&T as soon as possible. The Public Works and Transportation Division will then coordinate, for APCD , the collection and analysis of all traffic data, by the developer. A representative from APCD will be asked to attend the initial meeting discussed above and will be informed of all meetings, which may affect air quality, throughout the review Process.

No traffic data, however, will be submitted to APCD by the developer. All existing and expected traffic data will be submitted to and review by PW&T. The Public Works and Transportation Division will forward, to APCD, only traffic data required for air quality analysis. Any discussions between the Developer and APCD, concerning site or general traffic related issues, must be coordinated through the Public Works and Transportation Division.

Should any of the proposed development's ingress/egress points be located on a roadway controlled by the Commonwealth of Kentucky, the petitioner is recommended to contact the Kentucky Department of Highway's district office, (District 5). A copy of the proposed development site plan should be submitted to the District Permit Engineer. The District Permit Engineer will be informed of all meetings concerning traffic issues and asked to attend. A copy of the traffic impact study, (both draft and final), report should be submitted to the District Permit Engineer for their review and comment. Proposed mitigation measures, if any, on roadways controlled by the State must be approved by the District Permit Engineer before approval by PW&T will be granted and recommendations to the Planning Commission will be made.

### B. Air Quality Analysis

The traffic impact study will generate a substantial amount of data required for the air quality analysis. The traffic data used for the air quality analysis must be identical to that used for traffic analysis. Coordination of all traffic studies shall be the responsibility of PW&T, even in those cases when only an air quality analysis is performed. Upon determination an air quality analysis is required the APCD staff will identify the intersections to be analyzed. These may or may not be the same intersections identified by PW&T for traffic analysis.

Prior to beginning any air quality analysis the petitioner will attend the initial review meeting where APCD staff will be available to discuss the petitioner's air quality analysis plan. At that meeting data collection, analysis techniques, assumptions, and products shall be discussed. The following study elements relative to air quality will be covered:

- 1) APCD's certification process for air quality analyst;
- 2) Relationship between traffic studies and air quality studies;
- 3) Critical intersections included for air quality analysis;
- 4) Criteria for locating receptors;
- 5) Acceptable air quality model;

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- 6) Intersection drawing requirements;
- 7) Emission rates from MOBILE 5 a;
- 8) Traffic counts needed for persistence factor;
- 9) Assumptions for meteorological condition;
- 10) Background emission levels;
- 11) Mitigation of air quality impacts; and
- 12) National Ambient Air Quality Standards;

The guidelines set forth in this document and those discussed at the initial review meeting shall be followed. Any proposed deviation from the guidelines shall be well documented and thoroughly justified in writing prior to their use. Mitigation measures should be developed with consideration given to their effects on traffic and air quality. Although most mitigation measures that improves traffic flow also improves air quality, this is not true for all mitigation measures.

Mitigation measures should be clearly identified and should be implementable. Before a mitigation measure can be accepted there must be a formal enforceable agreement with the party responsible for implementation.

#### IV. HOW THE IMPACT STUDY WILL BE USED

The Jefferson County Public Works and Transportation Division staff will relate the findings from the traffic impact study to the following:

- A. Changes in operating delays, levels of service and volume-to-capacity ratios;
- B. Cost of making any necessary improvements to the transportation system;
- C. Comparing the impacts of a proposed rezoning with those which would occur by adherence to the Comprehensive Plan;
- D. Assessing the necessary capacity of the transportation system in the context of a fully developed impact area; and
- E. Improvements proposed by the petitioner to mitigate traffic impacts.

The Air Pollution Control District staff has one major concern: Whether the air quality model predicts an exceedance of the National Ambient Air Quality Standards. Also of concern is the impact on the identified potential "Hot Spots".

Major conclusions reached by the PW&T and APCD will be discussed with the petitioner and incorporated into the staffs' comments and reported to the Louisville and Jefferson County Planning Commission. Three (3) copies of the final study report shall be submitted, by the petitioner, to the Jefferson County Public Works and Transportation Division, two (2) copies to the Air Pollution Control District of Jefferson County, and one (1) copy to the Planning Commission at a minimum of two (2) weeks prior to its Land Development and Transportation (LD&T) Committee, which is held on alternating Thursdays. Where applicable one (1) copy should be submitted to the District permit Engineer at the Kentucky Department of Highways' District 5 Office. Information presented within the final report, backup supporting data and staff comments from PW&T and APCD, will be made available to concerned citizens of Jefferson County

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requesting this information. A detailed description of the information to be included and a typical outline for the final report is presented in Appendix C. In addition, the study may be used by the PW&T staff to identify needed transportation improvements, right-of-way requirements and the potential for developer contributions to needed improvements. Written commitments regarding these issues may be incorporated, for plan approval, in the form of binding elements by the developer.

Based on this analysis the APCD will make recommendations to the Planning Commission, in regards to the proposed development's impact on air quality. Any negative recommendation must have official approval of the APCD Board. Traffic improvements required to reduce the developments impact on air quality may be identified, with the assistance of PW&T. If these mitigation measure represent sound traffic engineering practices, they may be incorporated in to proposed binding elements for the approved plans.

#### APPENDIX A TECHNICAL NOTES

- A. Trip Generation:** Average trip generation rates or regression equations for the peak hour of the adjacent street will be obtained from the current edition of the Institute of Transportation Engineer's *Trip Generation Manual* or *Local Trip Generation Study* published in October 1993. Other local data may be acceptable provided it was collected using recommended methodology and can be properly documented.
- B. Peak Hour Percent:** A peak hour percentage of 10 percent of the daily trips will be assumed for existing traffic unless hourly counts are available.
- C. Peak Hour:** The petitioner shall use the peak one hour period which occurs during either 7-9 A.M. or 4-6 P.M. periods or both, as agreed to by the staff and petitioner. In some cases, however, the PW&T staff may require additional hours, for example, Friday nights or Saturday afternoon, to also be analyzed.
- D. Directional Split:** The directional split of the entering and exiting traffic associated with the development will be derived from the ITE Trip Generation manual unless other acceptable locally generated data is available.
- E. Pass-by Trips:** The percent of pass-by-trips shall be applied to the trips generated by the proposed development and assigned to the adjacent street network. This rate does not affect the proposed project's driveway volumes but rather reassigns existing trips to movements entering and exiting the proposed development. The pass-by trip rates will be agreed upon during the preliminary meeting. The following pass-by trip rates have been determined for some land uses in Jefferson County:

Retail	30-35%	Quality and Sit Down Restaurants
25% Fast-Food Restaurants	30-50%	Banks 55% Convenience/Gas
Stations	55-60%	

These rates were determined as part of a Local Trip Generation Study. The use of these rates are recommended, however, the developer may supply additional information for review and consideration.

- F. Diverted Linked Trips:** A reassignment for diverted trips will generally occur outside the impacted study area; therefore, for the purpose of these traffic impact studies, diverted trips would be considered "new trips" within the study area and can be ignored in most cases. This factor, if applicable, will be decided during the preliminary meeting.

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- G. Internal Circulation Trips:** Reductions for internal circulation trips are applicable for projects such as shopping centers with out-lots and represents a reduction in projected driveway trips. The internal circulation trip rate will be agreed upon during the preliminary meeting and shall not exceed 10 percent.
- H. Trip Distribution:** The directional distribution of the generated trips entering and exiting the proposed development via all access points must be justified by the relative locations of other traffic generators (e.g., employment centers, transportation terminals, etc.) and/or trip table information. These factors, or other factors agreed upon by the staff, shall be applied to the traffic generated by the proposed development as well as the traffic generated by nearby approved projects.
- I. Trip Assignment:** The distribution factors shall be applied to the trips generated by the proposed development and nearby approved projects and assigned to the existing traffic on the road network providing access to the proposed development.
- J. Capacity Analysis:** At the identified critical intersection(s), the existing and generated traffic is to be related to the adequacy of the intersection by using the techniques described in Chapters 9 and 10 of the *1985 Highway Capacity Manual*, Special Report 209. The PW&T staff has the necessary computer program to review and verify this analysis. Link volume analysis shall also be related to the *Highway Capacity Manual* standards. The analysis should be carried out for the A.M. and/or P.M. peaks, as agreed to by the staff and petitioner. This analysis should use traffic data for non-holiday weekdays, unless specifically requested by PW&T staff to analyze other periods. It is also recommended that the operational methodology be used in the analysis of signalized intersections. If so desired, alternative capacity and level of service analysis techniques may be used, provided data is presented in such a form that the results may be duplicated using the latest version of the Highway Capacity Software and Signal Software sponsored by FHWA and McTrans, respectively.
- K. Traffic Data:**
1. Traffic volume data IS NOT available from PW&T at this time. Average Daily Traffic volumes, turning movement counts and traffic control signals data on roadways maintained by the Commonwealth of Kentucky MAYBE available from the Department of Highways or KIPDA. The above sources should be contacted concerning the availability of traffic data. If, however, acceptable data is not available, the petitioner is responsible for obtaining such data.
  2. Traffic count data should be adjusted to the current year, or new counts should be made by the applicant if, in the opinion of the PW&T staff, traffic volumes have significantly increased due to some change(s) in the traffic pattern, such as the completion of a development project after the count was made.
  3. If turning movement data is outdated or if there are locations for which data is non-existent, data must be acquired at the applicant's expense.
  4. Intersection traffic counts conducted by the petitioner should be comprised of manual turning movement counts covering the period of 7-9 A.M. and 4-6 P.M. in order to allow for the selection of the peak hour within the nearest fifteen minutes (e.g., 4:00-5:00, 4:15-5:15, etc.). The inclusion of all 7-9 A.M. and 4-6 P.M. turning movement data is requested as part of the petitioner traffic impact analysis., Summaries of each fifteen minute period should be submitted, under separate cover, to PW&T. (A typical turning movement count summary form is present in Appendix D.)
  5. Ideally the traffic analysis should be performed for the design hour which represents the 30th highest hourly traffic volume on an annual basis. However most peak hour traffic volumes counts in urban areas closely approximate the 30th highest hour. Exception to this generalization are when special

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events occur, holidays (and holiday periods), and the month of December. Although these periods should be avoided for traffic counting, on occasions because of scheduling considerations counts are made. Such counts should be adjusted to approximate the 30th highest hourly traffic volumes. Historical counts and staff knowledge of the area will be used to judge the adequacy of counts used by the applicant.

6. If the proposed development includes plans for the installation of a new traffic control signal, the petitioner must conduct a Traffic Signal Warrant Analysis. This analysis would produce documentation that indicates the conditions at the proposed location warrant a traffic signal by meeting the recommended minimum warrants presented in the *Manual for Uniform Traffic Control Devices*. (MUTCD). Documentation of this analysis should be included in the appendix of the final report and should include, but not be limited to, the methodology used, daily traffic count data used in the analysis, and the resulting capacity analysis results at this location. A simple analysis form is presented in Appendix D.

- L. Adequate Accommodation of Traffic:** The ability of a highway system to carry traffic is expressed in terms of volume-to-capacity (V/C) ratios and level of service at the critical locations, usually intersections. The V/C ratios clearly define the degree of saturation at an intersection. A V/C ratio of 1.0 indicates that the intersection is operating at its theoretical capacity, that is, the traffic volume demand equals the estimated number of vehicle that may pass through the intersection in a given period of time. A value of over 1.0 depicts a situation where the demand exceeds the intersection's capacity and operational problems exist, either in geometries or signalization. As the V/C ratio approaches 0.9, breakdowns in the operational efficiency of the intersection tend to develop. When the V/C increases above 0.9, operational breakdowns also increase in frequency and may result in a high level of delay to motorists.

In considering mitigation measures, the change in V/C ratio and level of service must be taken into account as well as the actual V/C values for individual approaches and the overall intersection. If no mitigation exists or if the improvements required are beyond what could reasonably be expected from the petitioner, then negotiations between the petitioner and PW&T staff members will be conducted to determine the level of petitioner responsibility for improvements at the intersection.

Level of service for signalized intersections is defined by the Transportation Research Board's Special Report 209, *1985 Highway Capacity Manual*, in terms of delay. Generally, delay is considered a measure of driver discomfort, frustration, lost time and fuel consumption. Delay at signalized intersections is a result of a number of factors, including the signal's cycle length, phasing, progression in relation to other signals, traffic volumes and the intersection's lane configuration and geometries. Although they are an important consideration in intersection analysis, delay and level of service results should not be used in determining mitigation measures. The PW&T staff will rely primarily on the V/C ratio in determining the effectiveness of proposed mitigation measures.

"Levels of service" as defined by the *1985 Highway Capacity Manual* are presented in Table A-1.

- M. Air Quality Analysis Model:** The recommended model for roadway and signalized intersections is CAL3QHC. A copy of the computer program and user's guide prepared by the U.S. Environmental Protection Agency may be purchased from Pollution Control District. CAL3QHC is a microcomputer-based modeling methodology developed to predict the level of carbon monoxide (CO) emitted from motor vehicles traveling near roadway intersections.

- N. Mapping:** The application of the CAL3QHC model requires a scale drawing of each critical intersection. It is recommended that the scale be 1" = 50'. Alternative scales may be considered at the initial review meeting. When a grid system is placed on the scale drawing the spatial relationship between the driving lanes and

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receptors may be replicated within the computer model. A transparent grid has been successfully used on recent projects. The drawings should provide existing lane configuration, lane widths, and location of all-rights-of-way. Contour lines and spot elevations also must be presented on each drawing. Separate drawings showing existing and proposed conditions should be provided. Copies of these drawing should be submitted along with the impact analysis report.

- O. Receptor Location:** The receptors should be located where the maximum total projected concentration is likely to occur (not on the roadway itself). As a rule a receptor should be located outside the "mixing zone" of the travel lanes. The distance from the travel lanes should be 10 feet (3 meters) or at the right-of-way line (if no people generating activity occurs within the right-of-way), whichever is the greatest distance.

All space outside the right-of-way is considered to be available to the general public whether or not it is presently used. A dedicated buffer zone boundary legally identified for landscaping purposes on which routine public access is not intended may be used to locate receptor locations rather than the right-of-way line.

- P. Free Flow Speeds:** At an intersection, vehicles are considered to be idling when the traffic signal is red, all other times the vehicles are considered to be in a free flow mode. The speed for a free flow link represents the speed experienced by drivers traveling along the link during the time the traffic signal is not red. A free flow speed must be assigned to each link.

Based on the posted speed limit the following speeds should be used as default values:

<u>PostedSpeed(mph)</u>	<u>FreeFlowSpeed(mph)</u>
55	40
45	35
40	30
35	25
25	20

Actual free flow speeds may be substituted for the above default values based on an acceptable documented study. The techniques in Chapter 9 of the Highway Capacity Manual (TRB 1985) to estimate adjusted vehicle speed may be used.

- Q. Emissions - MOBILE 5 a:** Separate emission rates are used as input data to CA L3QHC for each free flow and queue link. The U.S. EPA mobile source emission factor model (MOBILE 5 a) has been applied by APCD to generate both free flow and idling emission rates. Appendix E contains approved emission rates for the years 1991 through 2000. No other emission rates may be used without prior approval, in writing, of APCD.
- R. National Ambient Air Quality Standards:** The ambient air quality standards for carbon monoxide applicable in Jefferson County are the following Federal Standards.

One Hour - 35 ppm or 40 mg/m<sup>3</sup>

Eight Hour - 9 ppm or 10 mg/m<sup>3</sup>

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These values may not be exceeded more than once per year. Any modeled concentrations above 35 ppm or 9 ppm is considered a violation.

- S. Persistence Factor:** The CAL3QH C model is to be used to predict the one-hour worst-case concentrations. A persistence factor is used to convert the one-hour worst-case modeling results to a predicted 8-hour average concentration. The persistence factor **primarily** accounts for the variation in traffic over the eight hour period and can be estimated by using traffic counts made over the eight hour period on each leg of the intersection. These counts may be made with an automatic traffic counting machine, manual counts are not necessary. The persistence factor is determined by dividing the average of the eight highest hours by the peak hour. The calculated factor shall be used if it is greater than 0.60 or less than 0.80. If lower than 0.60 use 0.60 and if greater than 0.80 use 0.80. The eight highest hours must be continuous and must contain the peak hour.

The counts on the legs of the intersection should be summed for this calculation to determine one overall persistence factor for each intersection. The calculations used to determine the persistence factor shall be documented in the impact study report.

- T. Background Concentrations:** All concentrations of carbon monoxide that are not emitted by the sources being modeled are background concentrations. They can be windblown from far away or from nearby sources such as parking lots and adjacent intersections. The following background concentrations (one hour) should be used for the conditions described:

Condition		Background Concentration (ppm)
1)	CBD or intersection with congested adjacent intersection(s) and nearby parking facilities.	3.0
2)	Intersection with nearby parking facilities	2.0
3)	Isolated intersection (no nearby congested intersection or nearby parking facilities).	1.5
The use of background concentrations other than the above must receive prior approval, in writing, of the APCD.		

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**U. Meteorological Conditions:** The CAL3QHC User's Guide discusses various meteorological parameters that are input to the model. The following values or responses shall be used for air quality analysis in Jefferson County.

Wind Speed	1 Meter/Second
Wind Angle	0°
Multiple Wind Angles	Yes
Increment Angle	10°
First Increment Multiplier	0
Last Increment Multiplier	36
Mixing Height	1000M
Stability Class	D
Surface Roughness	
CBD	321 cm
Office Area	175 cm
Suburban Area	108 cm

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<b>TABLE A-1</b>	
<b>LEVEL OF SERVICE</b>	<b>LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS</b>
	<b>DESCRIPTION</b>
<b>A</b>	Describes operations with very low delay, i.e., less than 5.0 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
<b>B</b>	Describes operations with delay in the range of 5.1 to 15.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
<b>C</b>	Describes operations with delay in the range of 15.1 to 25.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
<b>D</b>	Describes operations with delay in the range of 25.1 to 40.0 seconds per vehicle. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
<b>E</b>	Describes operations with delay in the range of 40.1 to 60.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.
<b>F</b>	Describes operations with delay in excess of 60.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high V/C ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.
<b>SOURCE:</b> <i>Highway Capacity Manual</i> . Special Report 209, Transportation Research Board, Washington, D.C., 1985.	

#### APPENDIX B STUDY ELEMENTS

The following items should be included in the impact studies submitted to the Jefferson County Public Works and Transportation Division and the Air Pollution Control District of Jefferson County.

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### A. Text

The text should be brief and to the point. It should be presented in numbered sections which contain the information as outlined below:

#### **Part One: Traffic Impact Studies**

**Section 1:** Introduction — this section should identify clearly the developer of the proposed development and the consultant performing the analysis. It should also provide a description of the site's location, using a location map to depict its location in Jefferson County. In addition, this section should detail the site's current zoning, any proposed zoning changes, zoning of the surrounding area and the total acreage to be developed. The Comprehensive Plan recommendations for the proposed site should also be described in this section. In addition, this section should briefly describe the proposed project in terms of total square footage, by land use, or the number of dwelling units to be constructed. This description also should include the proposed construction schedule and the number of units, by land uses, to be constructed in each development phase.

**Section 2:** - Section two of the report should describe the data collection process, that is, the type of data collected and when, if necessary, traffic counts were taken. This section should also include a description of the relationship between the site and the existing transportation system. This should include driveway locations, existing geometry, average daily traffic, lane configurations, traffic control devices at critical intersections, and existing and expected future functional classifications, as presented in the Comprehensive Plan Core Graphics. If applicable, the availability of public transit to the site should also be discussed.

**Section 3:** This section should indicate the procedures used in the analysis, street segment(s)/intersection(s) to be analyzed, trip generation rates used and their source, time period(s) to be analyzed, and the range of trip reassignments for pass-by, diverted, and trip reductions for internal circulation, identifying the source of the rates used, expected traffic entering and exiting the site, and the assignment of those trips to the street system, expressed as a percentage of total new trips generated.

**Section 4:** - Discussion of the results for each condition analyzed should be submitted in section 4. A subsection should address committed roadway and intersection improvements in the area and their effect on the proposed development. If the street segment(s)/intersection(s) are scheduled for improvement, a description of these improvements and the expected completion date should be included. Planned roadway or intersection improvements may also be identified in this section. However, planned improvements may not be considered in the analysis of the proposed development. Only projects committed to by the state, county or local jurisdiction should be considered. In addition to committed improvements additional mitigation measures should be identified, if necessary. Analysis should be conducted and compared with results without these measures. Tables comparing the analysis results; should be presented within this section, and detailed result should be presented in the appendices of the report.

It should be the goal of any proposed mitigation measure to maintain an acceptable V/C ratio and level of service at all critical intersections. Whenever feasible, mitigation measures should be developed to ensure that resulting conditions at the critical intersections are no worse than currently exist or are expected to exist with committed improvements without the proposed development. It is realized that this is not always possible or desirable; therefore, the main objective is to maintain an acceptable V/C ratio for the intersection. Detailed supporting data and analysis results used in the determination of mitigation measures should be submitted to PW&T under separate cover.

## Traffic Impact Studies & Air Quality Analysis

**Section 5:** The final section should briefly describe the roadway system's ability to handle the traffic generated for each condition analyzed. Identify needed street improvements over and above those currently programmed and a reasonable cost estimate for making the improvements. This section should also be used to document reasons for those street improvements above those currently programmed.

### **Part Two: Air Quality Analysis**

The air quality analysis should be well documented, however, the text should be brief. The CAL3QHC modeling printouts provide most of the details needed for review and verification by the APCD. A diskette containing the data used for the CAL3QHC model runs should be provided. The text of the impact report should summarize the analysis. The certified air quality analyst should be identified in the report.

**Section 1:** Briefly described the process and in making the air quality analysis. If the procedure in the guideline were followed, a statement to that effect is all that is needed for this Section. Tables or maps describing the input or output of the model should be referenced. Should a value not recommended in the guide lines be used, the full documentation justifying the deviation should be presented here. (Caution: Although the documentation is presented in this report the approval to deviate from the guidelines must be obtained prior to the analysis.)

**Section 2:** The conclusions and findings relative to air quality are presented here. Mitigation measures proposed by the developer to reduce air quality impacts should be described. If the mitigation measure is to be implemented by someone or agency other than the developer an official statement must be included (letter of commitment) from the other party.

### **B. Maps**

The following maps, as a minimum, should be provided for reference with the impact study report submitted for review and acceptance.

1. An area or location map which locates the proposed development in the context of the existing area wide street system.
2. A site plan of the proposed development which identifies the proposed land uses, access to the site from the existing roadway system, the proposed internal circulation system, parking layout and parking breakdown, (number of spaces required and number of spaces provided), as defined in **Article 10** of the **Louisville/Jefferson County Zoning Regulations**.
3. A map of the traffic impact area which identifies existing roads in the area, the proposed development, critical intersections and other approved projects in the area using the following status categories:
  - a. **under construction**
  - b. **zoning and/or construction approval**
  - c. **proposed, but not yet approved.**
4. A map which identifies committed roadway improvements, if any, that are included in the Regional Transportation Improvement Program, the Commonwealth of Kentucky's Six Year Plan or identified by the Director of Public Works, which may affect traffic at the critical intersection(s) being studied.
5. A map which identifies existing A.M. and/or P.M. peak hour traffic volumes assigned to the affected street system. (**NOTE:** Both volumes, if needed, may be presented on the same map).

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6. A map which identifies the trip distribution pattern, as a percent of total traffic generated, for the proposed development during the time period(s) agreed upon.
7. A map which identifies the trip distribution pattern, as a percent of total traffic generated, for approved projects in the impact area during the time period(s) agreed upon.
8. A map which identifies the actual traffic volumes generated by the proposed site and other approved projects within the impact area assigned to the affected street system for the time period agreed upon. The map should distinguish between the two sources of traffic and identify the sum of the two.
9. Scaled drawings (1" = 50') of critical intersections with a grid overlay showing the location of the receptors, distance to adjacent intersections, length of storage lanes, and location of stop bar.

**C. Tables and Figures**

The following is a minimum list of tables and figures which should be included in a traffic impact study within Jefferson County.

1. A table which provides the following information about the land uses/trip generation characteristics of the traffic impact area identified in Map 3.
  - a. ITE land use code used in the study;
  - b. Units to be developed (sq. ft., D.U., etc.);
  - c. Trip generation rate/trip ends generated (for the adjacent street peak hour, entering/exiting the facility for the period(s) analyzed);
  - d. Reassignment rates for pass-by, and diverted trips and reduction rates for internal circulation;
  - e. Total new Trip ends added to the new existing (and/or committed) street system.
2. A table which summarizes the volume-to-capacity ratios delay and level of service for each of the critical intersections, by approach and movement, for each of the conditions analyzed.
3. Diagrams of the existing geometry and lane utilization for the road segment(s) and/or critical intersection(s) being analyzed.
4. Diagram of the improved geometry and lane utilization for the road segment(s) and/or intersection(s) being analyzed. Diagrams identifying both planned improvements and mitigation measures should also be provided.
5. A receptor location description table (including coordinates).
6. Tables showing maximum 1-hour and 8-hour concentrations (including background) at each receptor point.
7. Modeling printouts with input listing and output files showing maximum concentration calculated.

Should be submitted as a separate document.

**Traffic Impact Studies & Air Quality Analysis**

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**D. Appendix**

The appendix should include the output summary from the Highway Capacity software, or, if other procedures are used, equivalent documentation which would permit PW&T staff to easily replicate the procedures. Documentation should be provided for each condition analyzed. (Detailed results from the Highway Capacity Software should be provided under separate cover to PW&T).

All relevant data necessary to conduct an analysis using the Highway Capacity software should be provided within the appendix. This data includes assumptions or actual counts of truck and transit traffic, right turns on red, pedestrian traffic and parking maneuvers. This data should also include a diagram showing the assumed phasing and timing for each signalized intersection analyzed. (If actual signal phasing and timings are used, phasing diagrams and time charts should be provide under separate cover to PW&T).

If the intersection level of analysis is being performed, existing intersection turning movement counts for the time period(s) analyzed should be included for each intersection. The counts should be presented in such a fashion that the PW&T staff may determine the peak traffic hour for the time period(s) analyzed. In addition expected peak hour turning movement counts should also be provided for each critical intersection for the total build condition. If the project is to be constructed in phases, expected peak hour turning movements should be provided for each phase. A sample turning movement summary sheet is provided in Appendix D, Figure 2. This example provides a summary of all data required to determine the expected peak hour turning movements.

It is also requested that copies of the original turning movement field sheets be provided, under separated cover, to the PW&T staff. It is requested that these counts be summarized in 15 minute intervals. The purpose of this request is to develop a historical turning movement count file throughout Jefferson County. This data will be useful in more accurately determining the impacts of future development in the area and provide Jefferson County and developers with an accessible traffic count database. The recommendation for the installation of a traffic control signal and the estimated cost for installation should be presented within the text of the report, with other recommended improvements.

If the petitioner or the consultant feels that the installation of a new traffic control signal is warranted, documentation supporting this recommendation should be provided in the appendix. This documentation should include a discussion of the signal warrant expected to be satisfied and the methodology used in that determination. This narrative should be supported with tables and figures that clearly present any assumptions, calculations and results used in the analysis. Reference material used for this analysis should also be noted

In addition, possibilities of providing an interconnect signal system or to provide optimum signal progression should be discussed. Figure 3 of Appendix D provides an example of the type of table that should be present in this analysis to support the justification of signal installation.

### APPENDIX C TYPICAL TRAFFIC IMPACT STUDY FINAL REPORT OUTLINE

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#### **PART ONE: TRAFFIC IMPACT STUDY**

##### **I. INTRODUCTION**

##### **II. TRAFFIC DATA COLLECTION AND INVENTORY**

- A. Critical roadway segments/intersections
- B. Existing traffic volumes
- C. Traffic control devices
- D. Functional classifications

##### **III. PROJECT GENERATED TRAFFIC**

- A. Trip generation
- B. Pass By/Diverted Traffic and internal circulation
- C. Trip distribution and assignment

##### **IV. TRAFFIC ANALYSIS**

- A. Methodology
  - B. Existing level of service
  - C. Future level of service
  - D. Mitigation Measures
- E. Traffic signal warrant analysis (if required)

##### **V. TRAFFIC IMPACT CONCLUSIONS**

#### **PART TWO ; AIR QUALITY ANALYSIS**

##### **I. AIR QUALITY PROCEDURES**

##### **II. FINDINGS AND RECOMMENDATIONS**

#### **PART THREE ; APPENDICES**

- A. Existing traffic count data
- B. Expected traffic count data

### Traffic Impact Studies & Air Quality Analysis

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1. Future without proposed development
2. Future with proposed development

C. Existing capacity analysis results

D. Expected capacity analysis results

1. Future without proposed development
2. Future with proposed development
3. Future with proposed development and mitigation measures.

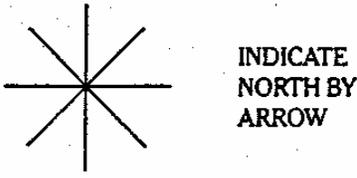
E. Traffic signal warrant analysis (if necessary)

F. Air Quality modeling printouts with input

### APPENDIX D SAMPLE FORMS

# TRAFFIC COUNT

## GRAPHIC SUMMARY SHEET



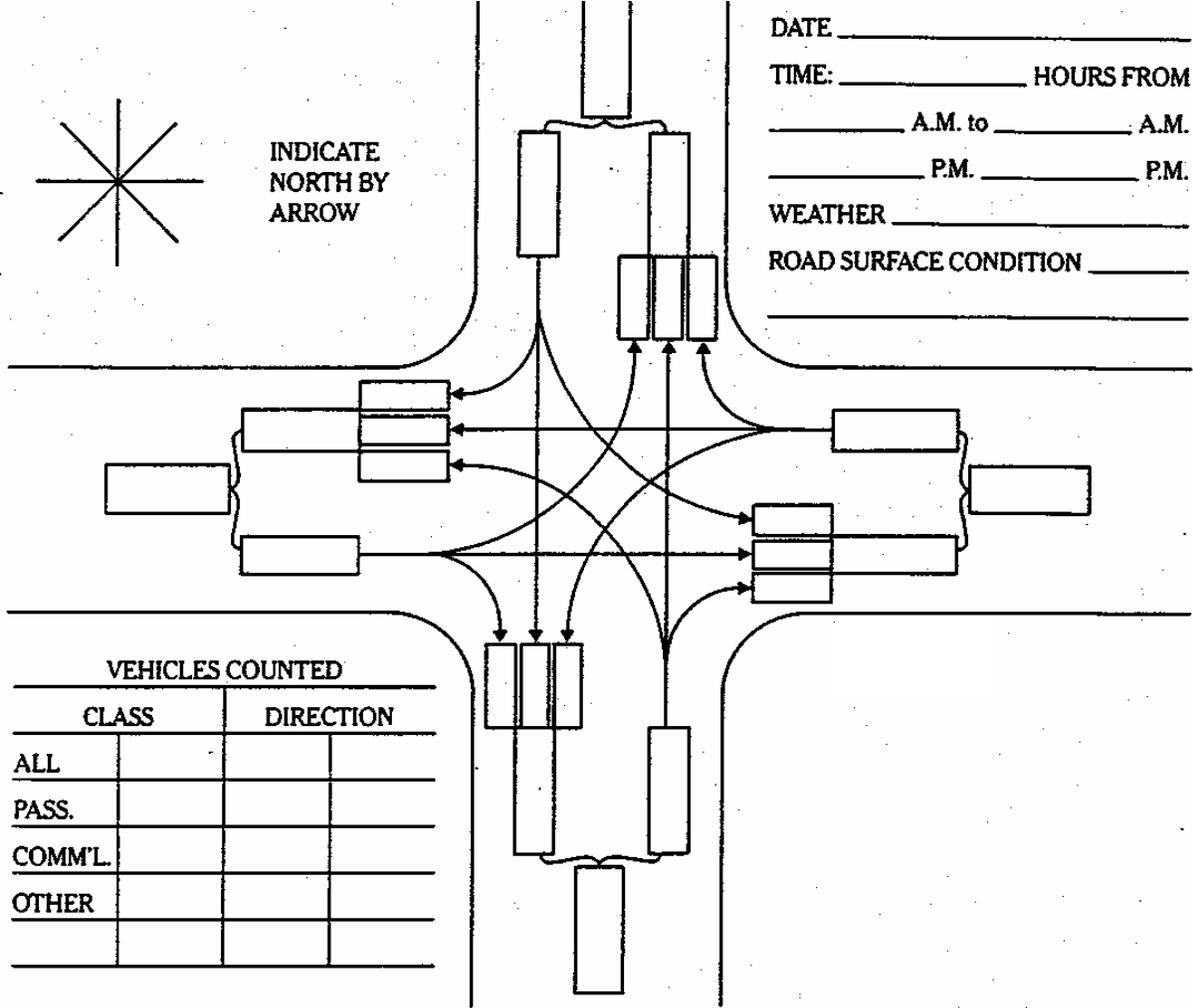
INDICATE  
NORTH BY  
ARROW

DATE \_\_\_\_\_

TIME: \_\_\_\_\_ HOURS FROM  
\_\_\_\_\_ A.M. to \_\_\_\_\_ A.M.  
\_\_\_\_\_ P.M. \_\_\_\_\_ P.M.

WEATHER \_\_\_\_\_

ROAD SURFACE CONDITION \_\_\_\_\_



VEHICLES COUNTED			
CLASS	DIRECTION		
ALL			
PASS.			
COMM'L.			
OTHER			

REMARKS: \_\_\_\_\_

FIGURE 1

## Traffic Impact Studies & Air Quality Analysis

### VEHICLE TURNING MOVEMENTS

PROJECT \_\_\_\_\_  
INTERSECTION \_\_\_\_\_  
COMPLETION YEAR \_\_\_\_\_ TIME \_\_\_\_\_

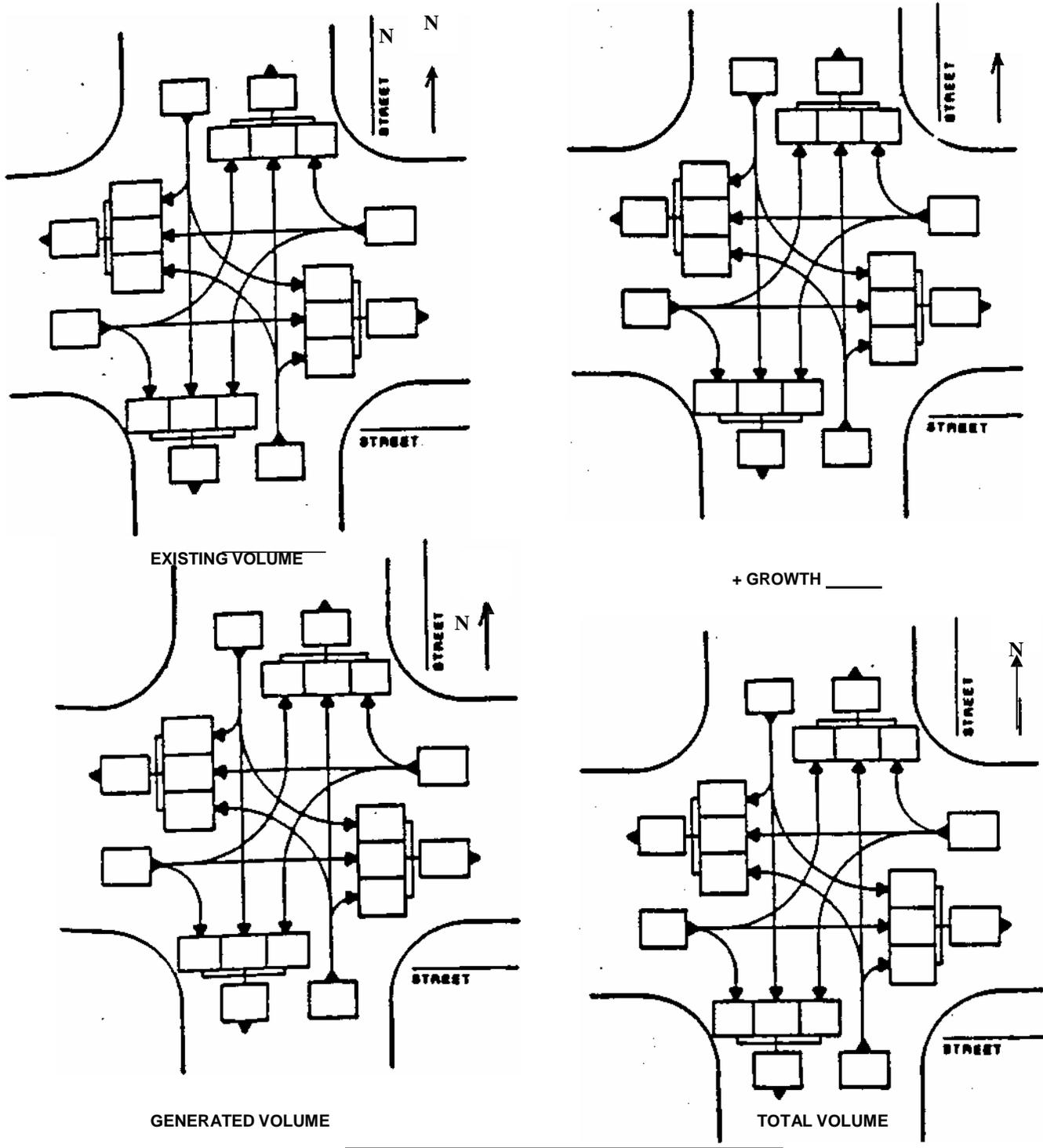


FIGURE 2

JEFFERSON COUNTY PUBLIC WORKS AND TRANSPORTATION DIVISION  
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## Traffic Impact Studies & Air Quality Analysis

### TRAFFIC SIGNAL WARRANTS ANALYSIS FORM

Major Street \_\_\_\_\_ Critical Approach Speed \_\_\_\_\_ mph Lanes \_\_\_\_\_

Minor Street \_\_\_\_\_ Critical Approach Speed \_\_\_\_\_ mph Lanes \_\_\_\_\_

Critical speed of major street traffic > 40 mph

70% VOL. YES      100% VOL. NO

In built up area of isolated community of < 10,000 pop.

YES      NO

Applicable Minimum Volume Requirements:

70%      100%

#### WARRANT 1 — Minimum Vehicular Volume

Approach Lanes	Minimum Requirements (80% Shown in Brackets)				YES NO 100% SATISFIED 80% SATISFIED							
	1		2 or more									
	100%	70%	100%	70%	1	2	3	4	5	6	7	8
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)								
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)								

TIME PERIOD FROM \_\_\_\_\_ M TO \_\_\_\_\_ M

#### WARRANT 2 — Interruption of Continuous Traffic

Approach Lanes	Minimum Requirements (80% Shown in Brackets)				YES NO 100% SATISFIED 80% SATISFIED							
	1		2 or more									
	100%	70%	100%	70%	1	2	3	4	5	6	7	8
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)								
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)								

TIME PERIOD FROM \_\_\_\_\_ M TO \_\_\_\_\_ M

FIGURE 3

## Traffic Impact Studies & Air Quality Analysis

### APPENDIX E AIR POLLUTION CONTROL DISTRICT EMISSION FACTORS

Emission factors for air quality analysis in Jefferson County are presented in the following tables. Table E -1 contains the carbon monoxide emission factor during the operating mode (when vehicle is in motion) and Table E-2 shows the emission factors to vising when the vehicles are in the idling mode of operation. The factors are provided by the Air Pollution Control District and may not be changed without prior approval. The factors were generated using MOBILE 5a and MOBILE 4. Ic.

**TABLE E-1 CO EMISSION FACTORS (GRAMS PER MILE)  
1990- 2000**

MOBILE 5a (Version 26 Mar 93) Emission Factors -Carbon Monoxide (CO) SIP  
93 Method 07-27-93 Composite Emission Factors  
WINTER Jefferson County

GM/MI @ MPH	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
3	233.533	217.272	199.029	177.538	166.651	138.000	131.331	124.476	117.334	110.642	105.354
4	179.842	167.317	153.561	137.290	129.070	107.053	101.968	96.792	91.472	86.494	82.555
5	146.370	136.359	125.478	112.528	106.016	88.125	84.056	79.936	75.747	71.830	68.725
6	123.499	115.274	106.388	95.732	90.403	75.326	71.964	68.570	65.151	61.958	59.420
8	94.368	88.461	82.136	74.410	70.602	59.100	56.652	54.192	51.753	49.480	47.660
10	76.715	72.201	67.426	61.470	58.583	49.241	47.351	45.460	43.619	41.903	40.519
12	64.943	61.336	57.586	52.801	50.523	42.615	41.100	39.591	38.150	36.808	35.713
14	56.555	53.577	50.552	46.592	44.745	37.857	36.610	35.374	34.219	33.144	32.256
16	50.267	47.753	45.267	41.922	40.396	34.272	33.225	32.195	31.255	30.381	29.649
18	45.357	43.207	41.139	38.274	36.998	31.470	30.580	29.711	28.939	28.222	27.613
20	41.495	39.618	37.846	35.309	34.197	29.110	28.310	27.529	26.852	26.233	25.695
25	34.687	33.026	31.443	29.186	28.147	23.823	23.059	22.297	21.587	20.905	20.312
30	29.951	28.492	27.064	25.025	24.052	20.262	19.531	18.788	18.059	17.342	16.720
35	26.565	25.259	23.945	22.065	21.141	17.734	17.026	16.296	15.552	14.809	14.165
40	24.198	22.971	21.719	19.936	19.033	15.894	15.195	14.467	13.707	12.938	12.274
45	22.612	21.386	20.150	18.407	17.502	14.540	13.834	13.099	12.319	11.522	10.833
50	21.955	20.702	19.458	17.718	16.801	13.912	13.196	12.450	11.655	10.840	10.136
55	22.087	20.821	19.564	17.811	16.886	13.983	13.259	12.506	11.705	10.885	10.176
60	41.464	38.352	35.354	31.501	29.316	23.726	22.099	20.438	18.782	17.144	15.764
65	61.001	56.028	51.273	45.307	41.852	33.557	31.017	28441	25.921	23.460	21.405
I/HR IDLE	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
	695.282	647.185	593.062	529.524	497.456	411.267	391.261	370.839	349.449	329.468	313.411

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## Traffic Impact Studies & Air Quality Analysis

**TABLE E-1 (CONTINUED)**

**CO EMISSION FACTORS  
(GRAMS PER MILE)  
2000-2010**

MOBILE 5a (Version 26 Mar 93) Emission Factors -Carbon Monoxide (CO)  
SIP 93 Method 07-27-93 Composite Emission Factors  
WINTER Jefferson County

GM/MI @ MPH	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020
3	105.354	99.169	95.120	92.714	91.138	90.018	88.161	88.051	87.977	87.914	87.88
4	82.555	77.929	74.926	73.145	71.972	71.149	69.851	69.764	69.705	69.657	69.62
5	68.725	65.065	62.703	61.298	60.370	59.726	58.731	58.660	58.611	58.569	58.54
6	59.420	56.417	54.489	53.338	52.573	52.049	51.236	51.174	51.131	51.096	51.07
8	47.660	45.495	44.118	43.287	42.730	42.356	41.735	41.684	41.649	41.620	41.60
10	40.519	38.862	37.822	37.187	36.755	36.472	35.937	35.894	35.864	35.839	35.82
12	35.713	34.397	33.585	33.084	32735	32.515	32.022	31.983	31.957	31.934	31.92
14	32.256	31.185	30.538	30.132	29.844	29.667	29.197	29.162	29.138	29.117	29.10
16	29.649	28.763	28.240	27.906	27.664	27.520	27.063	27.030	27.008	26.988	26.97
18	27.613	26.871	26.445	26.168	25.962	25.843	25.395	25.365	25.343	25.325	25.31
20	25.695	25.028	24.646	24.395	24.205	24.099	23.665	23.634	23.614	23.596	23.58
25	20.312	19.562	19.120	18.836	18.631	18.504	18.151	18.121	18.105	18.091	18.08
30	16.720	15.921	15.440	15.133	14.918	14.776	14.483	14.454	14.440	14.430	14.42
35	14.165	13.330	12.821	12.498	12.275	12.123	11.879	11.851	11.838	11.830	11.82
40	12.274	11.406	10.872	10.536	10.307	10.147	9.9948	9.920	9.910	9.902	9.89
45	10.833	9.931	9.375	9.029	8.794	8.628	8.472	8.445	8.435	8.429	8.42
50	10.136	9.211	8.642	8.289	8.053	7.883	7.762	7.734	7.725	7.720	7.71
55	10.176	9.245	8.672	8.318	8.081	7.910	7.816	7.789	7.779	7.774	7.77
60	15.764	13.954	12.820	12.127	11.672	11.351	11.141	11.098	11.085	11.077	11.07
65	21.405	18.707	17.007	15.975	15.302	14.828	14.530	14.471	14.454	14.444	14.43
I/HR IDLE	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020
	313.411	294.734	282.911	275.633	270.664	267.293	258.158	257.826	257.607	257.425	257.33

All Rates are subject to future modification by the Air Pollution Control District as new information becomes available.

TABLE E-2

(Derivation of above values is described below under Table E-2)

**Traffic Impact Studies & Air Quality Analysis**

**CO IDLE EMISSION FACTORS (GRAMS PER MINUTE)**

**1990-2010**

**24 Feb 1992 MOBILE version 4.1c (4 Nov 91)**

<u>YEAR</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>
<b>IDLE</b>	<b>9.019</b>	<b>8.111</b>	<b>7.354</b>	<b>6.735</b>	<b>6.214</b>	<b>5.708</b>	<b>5.191</b>	<b>4.734</b>	<b>4.349</b>	<b>4.050</b>	<b>3.781</b>

<u>YEAR</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>
<b>IDLE</b>	<b>3.781</b>	<b>3.558</b>	<b>3.380</b>	<b>3.245</b>	<b>3.068</b>	<b>2.994</b>	<b>2.929</b>	<b>2.867</b>	<b>2.836</b>	<b>2.794</b>	<b>2.773</b>

**All Rates are subject to future modification by the Air Pollution Control District as new information becomes available.**

**Derivation of Tables E-1. and E-2;**

Vehicle emissions per mile and idle emissions per minute from results of MOBILE 5a and MOBILE 4.1c (version of 4 Nov 91) model runs as prepared by AP CDJC personnel to reflect reasonable predictions of future emissions rates. MOBILE 5a model default registration distribution is used. RVP of local gasoline is set to 15.0 as a realistic winter supply condition. The temperature used by the model was 28.5 degrees Fahrenheit, determined to be the average minimum daily temperature for January 1992, and reflects reasonable expectations of real-world low temperatures (CO emissions go up when temperature goes down).

The model assumed that an inspection/maintenance program equivalent to the EPA minimum performance-based standard is implemented for all vehicles in the area for all years. This specification does not take into account local improvements over title minimum I/M program but is realistic and meaningful, since the Clean Air Act mandates the minimum specification or better in all covered areas, and thus emission rates should be NO HIGHER than those shown. Using the minimum standard allows for more stable predictions of the future, since as-yet-undetermined program variations are ignored.

These assumptions should be adequate for the intended purpose of evaluating individual land-use or transportation projects. Only changes in the MOBILE model version should bring about a need to revise these rate tables.

APPENDIX F TECHNICAL REFERENCE

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**Manual of Traffic Engineering Studies.** Box, Paul C. and Joseph C. Oppenlander, Institute of Transportation Engineers, Washington, D.C., 1976

**Quick Response Urban Travel Estimation Techniques and Transferable Parameters: User** Guide. NCHRP Report 187, Sosslau A.B., et al., National Cooperative Highway Research Program, Transportation Research Board, 1978.

**Trip Generation.** 5th edition, Institute of Transportation Engineers, Washington, D.C., 1991

**Local Trip Generation Study.** Barton Aschman Associates, Inc., October 1993,

**Development and Application of Trip Generation Rates.** Mehra, Joe and C. Richard Keller, Federal Highway Administration, Washington, D.C. 1985.

**Highway Capacity Manual.** Special Report 209, Transportation Research Board, Washington, D.C., 1985.

**Manual on Uniform Traffic Control Devices.** National Committee on Uniform Traffic Control Devices, U.S. Department of Transportation, Federal Highway Administration, 1978.

**Transportation and Traffic Engineering Handbook.** 2nd. Edition, Institute of Transportation Engineers, Washington, D.C., 1982.

**User's Guide to CAL3OHC.** U.S. Environmental Protection Agency, Technical Support Division, Research Triangle Park, N.C. July, 1990.

**Traffic Engineering Handbook.** 4th edition, Institute of Transportation Engineers, Washington, D.C. 1992

**Transportation Planning Handbook.** 1st edition Institute of Transportation Engineers, Washington, D.C., 1992

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## Appendix 6F Transit Design Standards Manual

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### Purpose & Intent

The location and type of transit amenities to be provided with various developments depends primarily on three factors: the planned use of the development, the scope of the development and the presence of transit service in the area. Other contributing factors include surrounding land uses, character of the neighborhood, environmental, and / or topographic factors. This appendix is not intended to dictate where transit facilities are to be installed. Rather, it is designed to ensure that all developments are accessible by any means of transport and that all developments provide a physical place for transit passengers to access the transit vehicle and their final destination. These needs are especially crucial for young people, the elderly, and people with disabilities. In addition to the surrounding environment, transit amenities need to be sited based on service demands and transit agency policies. All of these factors are to be considered when locating a transit amenity.

### Transit Amenities

Transit amenities are defined as physical design features that assist in the provision of transit service. They are to be considered part of the property as a parking lot or sidewalk in front of the building would be and maintenance should be provided as it is for those areas. The amenities are provided to ensure that transit patrons and other pedestrians have a safe, accessible, and pleasant place to board a transit vehicle and travel to and from the boarding area to the building. Larger developments or developments of a certain use may warrant the provision of additional amenities at the boarding area, including, but not limited to, seats, shelters, park-n-ride spaces, bicycle storage, trash cans, and increased lighting. Some developments, based on size, scale, or use, may require on-site transit access to be determined by transit agency and Planning and Design Services. For this appendix, specific transit amenities are defined:

**Boarding Area** – a safe, accessible, thirty-two (32) square foot minimum concrete pad (or pavers) that has a well-marked link from the main entrance of the building to the street that is free from physical obstructions and has minimal conflicts with vehicular traffic. Transit agency and Public Works will determine when and specifically where the transit sign will be located. In all cases, the transit agency will work with the developer and Public Works as needed to best configure the necessary details and specifications of the boarding area.

**Boarding Area with seats and shelter** – Boarding Area features and a place for seating and a covered waiting area to protect from the elements. Shelters or awnings and benches are the most common elements, but a more creative design concept may be allowed based on approval by the Planning Director and Executive Director of transit agency (or designees).

**Additional Review Needed** - Certain developments based on size, scale, or particular use may warrant additional review by the Planning Director and Executive Director of the transit agency (or designees.) The additional review will be used to determine the number of park and ride spaces from the size of parking lot, to determine if on-site transit access is necessary, to determine if there are any special needs for transit service for that site, to determine whether pull-off lanes are needed, or to decrease the requirement. Additional review shall take into account the existing character of the roadway in which an amenity may be located.

**Transit Amenities to be provided (or verification of adequate existing facilities for a new development) based on Use** Any development should provide at minimum a boarding area to provide access for employees, or any persons with disabilities that may need to access the site. Additional requirements are outlined below.

	Boarding Area	Boarding Area + seats & shelter	Additional Review Needed
<b>Single Family Residential</b>			
Between 25 to 100			X
Over 100 lots		X *could be part of signature entrance	X
<b>Multi Family Residential</b>			
Between 25 to 100			X
Over 100 units		X	X
<b>Other Residential</b>			
Any	X		X
<b>General / Professional / Medical Office</b>			
under 50,000 SF			X
50,000 to 100,000square feet	X		X
Over 100,000 square feet		X	X
<b>Industrial &amp; Manufacturing</b>			
under 250 employees			X
250 to 500 employees	X		X
500 to 1,000employees		X	X
Over 1,000 employees			
<b>Retail / Commercial / Grocery &amp; Drug Stores / Pharmacies / Convenience Stores / Gas Stations / Department &amp; Discount Stores / Shopping Centers &amp; Malls / Other similar uses</b>			
under 50000 SF			X
50,000 to 100,000 square feet	X		X
<b>Non-retail Commercial / Recreational</b>			
Coliseums, Stadiums, and Similar facilities	X		X
Movie Theaters and Cinemas (more than five screens)	X		X
Any use generating an average of more than 200 trips per day (only applies in TMC,TC, TW, SMC, RC, and SW form districts)	X		X

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	<b>Boarding Area</b>	<b>Boarding Area + seats &amp; shelter</b>	<b>Additional Review Needed</b>
<b>Institutional</b>			
Any institutional use			X
Churches	X		X
Any school, college, or university	X		X
Hospitals, Asylums, Institutions, Penal / Correctional Facilities		X	X
Libraries, Museums, Art Galleries, and similar uses	X		X
Airport / Bus / Train or other transportation facility		X	X
<b>Any other use not specifically listed above (at minimum)</b>			X

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