

II. Neighborhood Development Regulations

1. General Requirements.
 - A. General Requirements.
 - B. Neighborhood Types Map.
 - C. General Zoning District Requirements.
 - D. General Open Space Categories & Requirements.
 - E. General Block, Lot, and Street Design.
 - F. Traffic Impact Analysis.
 - G. Community Facilities Impact Analysis.
2. Neighborhood Type I Requirements.
 - A. General Requirements.
 - B. Zoning Districts and Requirements.
 - C. Open Space Requirements.
 - D. Block Design and Street Layout.
3. Neighborhood Type II Requirements.
 - A. General Requirements.
 - B. Zoning Districts and Requirements.
 - C. Open Space Requirements.
 - D. Block Design and Street Layout.
4. Neighborhood Type III Requirements.
 - A. General Requirements.
 - B. Zoning Districts and Requirements.
 - C. Open Space Requirements.
 - D. Block Design and Street Layout.
5. Neighborhood Type IV Requirements.
 - A. General Requirements.
 - B. Zoning Districts and Requirements.
 - C. Open Space Requirements.
 - D. Block Design and Street Layout.
6. Neighborhood Type V Requirements.
 - A. General Requirements.
 - B. Zoning Districts and Requirements.
 - C. Open Space Requirements.
 - D. Block Design and Street Layout.
7. Campus Neighborhood Requirements.
 - A. General Requirements.
 - B. Zoning Districts and Requirements.
8. Open Space Requirements.
 - A. General Requirements.
 - B. Map of Street Types.
 - C. General Street Type Standards.
 - D. General Street Layout Requirements.
 - E. Intersection Design.
 - F. Street Design Standards.
 - G. Alley.
 - H. Rural Neighborhood Street.
 - I. Urban Neighborhood Street.
 - J. Rural Connector.
 - K. Urban Connector.
 - L. Rural Avenue.
 - M. Urban Avenue.
 - N. Boulevard.
 - O. Scenic Corridor.
 - P. Conservation Street Overlay.
 - Q. Cul-de-Sac & Eyebrows.
9. Utility Standards.
 - A. General Requirements.
 - B. Water Supply System.
 - C. Sanitary Sewer System.
 - D. Storm Sewer System.
 - E. Sewer Lift Systems & Sewer Force Mains.
10. Stormwater Management Requirements
 - A. General Requirements.
 - B. General Design Principles
 - C. Release Rate, Runoff Volume, and Water Quality Standards.
 - D. Drainage and Discharge Standards
 - E. Retention Methods.
11. Conservation Area Requirements
 - A. General Requirements
 - B. Qualifying Features Delineation.
 - C. Restoration and Management Plan
 - D. Plat Requirements

- E. General Design Requirements
- F. Specific Requirements for Very High Priority Areas and Conservation Area A
- G. Specific Requirements for High Priority Areas and Conservation Area B
- H. Specific Requirements for Medium Priority Areas and Conservation Area C

12. Site Disturbance and Grading

- A. General Requirements
- B. Site Disturbance and Grading
- C. Grading & Slope Preservation
- D. Existing Vegetation and Soil Protection
- E. Retaining Walls

13. Soil Erosion and Sediment Control During Construction

- A. General Requirements
- B. Soil Erosion and Sediment Control Plan.
- C. Soil Erosion and Sediment Control Techniques
- D. Post-Construction Restoration

II. Neighborhood Development Regulations: Sections 1 through 7: Neighborhood Types

II. Neighborhood Development Regulations Section 1 - General Requirements

A. General Requirements.

1. Intent. The purpose is to regulate the Subdivision, Zoning, and development of land in order to meet the standards of these Land Development Regulations and to promote and protect the public health, safety, morals, comfort, convenience, and general welfare of the people and their environment. Additionally, the Neighborhood Development regulations are intended to:
 - a. Provide for the harmonious development of the City as a whole.
 - b. Secure the coordination of streets within Subdivisions and with other existing or planned streets, to secure a coordinated layout and adequate provision for traffic.
 - c. Secure adequate provision of light, air, recreation, transportation, water, drainage, sewer, and other sanitary facilities and to provide for a distribution of population and traffic which will tend to create conditions favorable to health, safety, convenience and prosperity.
 - d. Ensure new development considers adjacent Parcels in the design and provides continuity along all street frontages.
 2. Applicability.
 - a. The regulations in this Article shall apply to Parcels being subdivided according to the processes outlined in I.4 Administration: Process Criteria and Application.
 - b. When multiple existing Parcels are being utilized to develop one Subdivision, the entire Subdivision shall be treated as one (1) development and is referred to herein as Applicant's Property.
 - c. The entirety of any Parcel shall be included in the application; portions of Parcels are not permitted.
 3. Authority. This Article includes provisions that fall under both Zoning and Subdivision authority, as defined by the Tennessee Code Annotated (TCA). The division of authority is as follows, with blue text being applicable to subdivision requirements, black text being applicable to zoning requirements, and red text applicable to both. Where there is red text, that text is considered duplicated and incorporated into both regulations.
 - a. Zoning. All references to required land Uses and permitted Zoning Districts are part of the Zoning Regulations and shall be utilized in the review of the Rezoning application (refer to I.4.L). These specifically include the following:
 - (1) The general neighborhood requirements defined by II.1.C General Zoning District Requirements.
 - (2) The Neighborhood Types Map per II.1.B.
 - (3) The Neighborhood Type requirements detailed in subsection B, Zoning District and Requirements, of Sections 2-7 of this Article, specifically:
 - (a) Permitted districts.
 - (b) Commercial and office district minimum and maximum requirements.
 - (c) Minimum residential mix requirements.
 - b. Subdivision. All references to Blocks and streets, open space, and utilities are part of the Subdivision Regulations and shall be utilized in the review of the Plat application (I.4.C-E). These specifically include, the following:
 - (1) The general neighborhood requirements as defined by II.1.D General Open Space Categories and Requirements; II.1.E General Block, Lot, and Street Design; II.1.F Traffic Impact Analysis; and II.1.G Community Facilities Impact Analysis.
 - (2) The Neighborhood Type requirements detailed in subsections C, Open Space Requirements, and subsections D, Block Design and Street Layout of Sections 2 through 7 of this Article, specifically:
 - (a) Open Space Requirements.
 - (b) Street Configuration.
 - (c) Permitted Street Types.
 - (3) The general neighborhood standards included in this Article:
 - (a) II.8 Street Type Standards.
 - (b) II.9 Utility Standards.
 4. Zoning Authority. The rezoning of any Parcel shall be a legislative decision within the sole discretion of the Board of Commissioners (BOC). Refer to I.4.L Rezoning. The designation of permitted Zoning Districts for a Neighborhood Type shall not be deemed to confer any entitlement to a rezoning approval by the BOC.
 5. Approvals. All developments utilizing the Neighborhood Development Regulations are approved through concurrent Preliminary Plat (I.4.C) and Rezoning (I.4.L) process, followed by Construction Plans (I.4.D) and Final Plat (I.4.E) approvals. Each new building or Lots developed based on the approved Preliminary Plat and Rezoning shall be approved by the Minor Site Plan Review (I.4.J) or Site Plan Review (I.4.K), based on the submittal requirements of those processes.
- B. Neighborhood Types Map.
- The Neighborhood Types Map designates the location of the permitted Neighborhood Types (refer to Figure 1.B-1).
1. Permitted Neighborhood Type. A Parcel shall be

II. Neighborhood Development Regulations

Section 1 - General Requirements

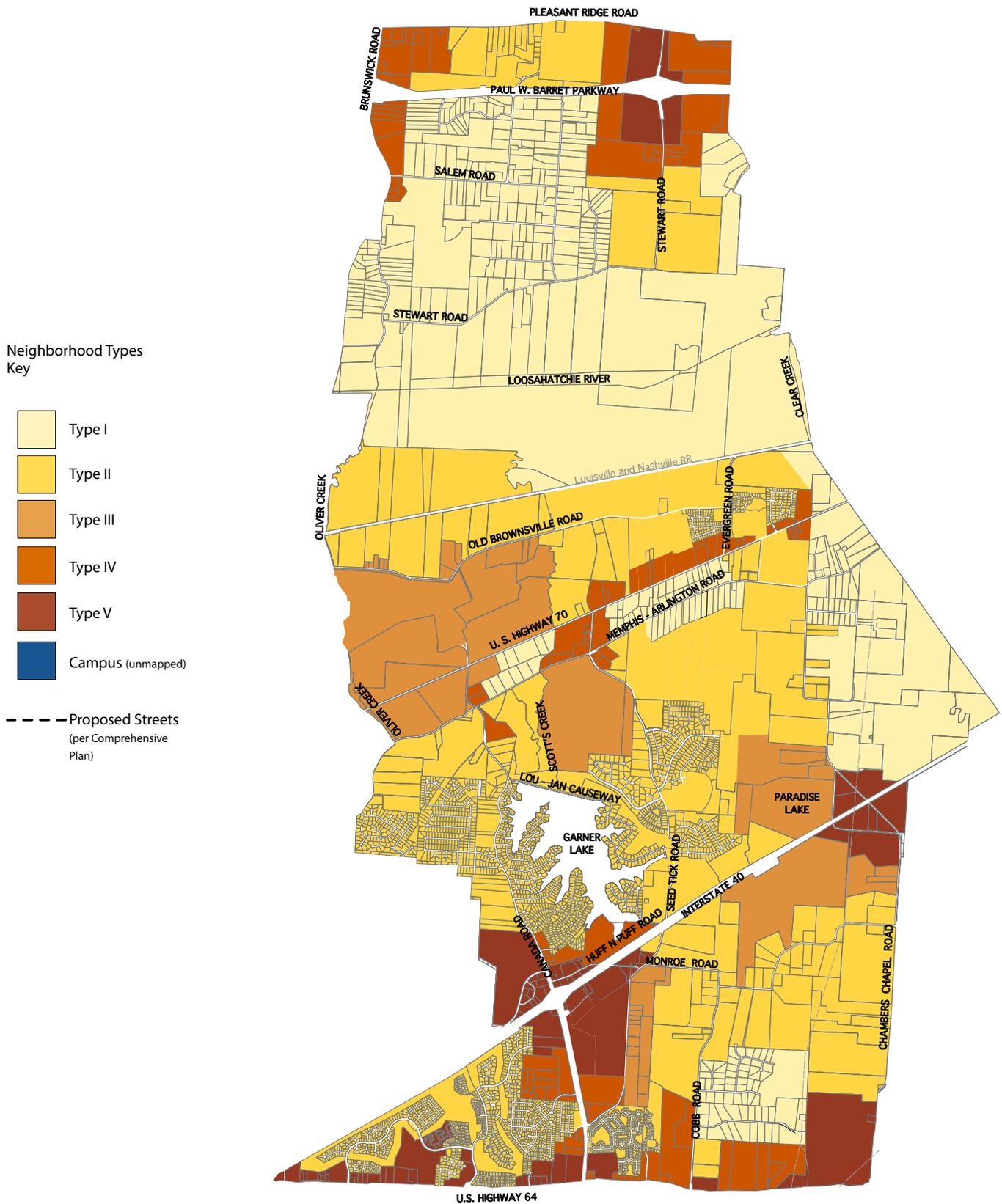


Figure 1.B-1. Neighborhoods Types Map.

II. Neighborhood Development Regulations Section 1 - General Requirements

subdivided utilizing the standards associated with the Neighborhood Type defined for that Parcel on the Neighborhood Types Map.

during the Preliminary Plat Process (I.4.C) and approval of the BOC through Rezoning (I.4.L). Refer to II.7 for limitations on location of a Campus Type.

2. Campus Type. The Campus Type is not mapped, but may be utilized through recommendation of the MPC

C. General Zoning District Requirements.

The following requirements apply to the layout and design of all Neighborhood Types, unless otherwise exempted in this Article.

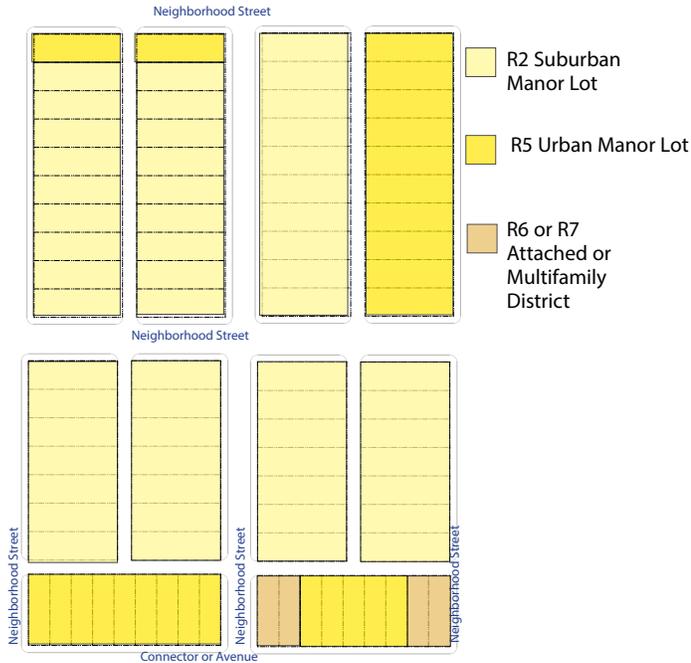


Figure 1.C-1. Example of Residential District Relationships.

1. Permitted Districts. Permitted Zoning Districts are defined for each Neighborhood Type.
2. Required Mix of Residential Districts. A mix of permitted residential Zoning Districts, with a minimum number of units of each, is required for each Neighborhood Type (refer to II.2 through 7), unless otherwise stated in this Article.
3. Required Minimum & Maximum Amounts of Commercially Zoned Space.
 - a. A minimum and maximum amount of commercial and office district Gross Building Area is required for each Neighborhood Type, unless otherwise stated in this Article.
 - b. Office district Gross Building Area shall not exceed fifty (50) percent of the total supplied commercial and office district Gross Building Area.
4. Relationship between Districts within the Development. The following outlines general relationships between Districts (refer to Figures 1.C-1 and 1.C-2). For more specific information, refer to the appropriate Neighborhood Type.
 - a. All Districts. The following apply to all Zoning Districts.
 - (1) Districts of the same category (refer to III.1.A(1 through 7)) should face each other across the street, with the exception of the Institutional District (P) and Open Space Districts (OS1 through OS5).
 - (2) More intense districts, that share Blocks with less intense, lower numbered districts, should be located on Block Ends. For example, a Blockface mainly of R5 Urban Manor District Lots may have an R6 Attached District Lot on the Block End.
 - (3) Landscape Buffers and Screens. Refer to III.5.J-M for landscape buffers and screens that may be required between different districts.
 - b. Residential Districts.
 - (1) Blocks may contain multiple residential Zoning Districts, changing at Rear Property Lines, Alleys, or Corner Lots.
 - (2) Changes in Zoning Districts occurring at Alleys should not change by more than two (2) districts (for example, R5 to R7).

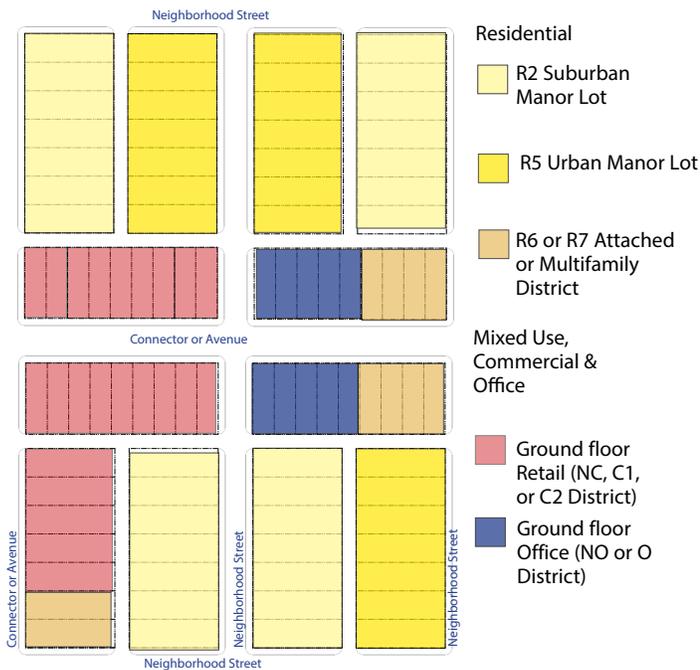


Figure 1.C-2. Example of Mixed Use, Commercial, Office, and Residential District Relationships.

II. Neighborhood Development Regulations

Section 1 - General Requirements

- (3) Changes in Zoning Districts occurring at Rear Property lines should not change by more than one (1) district (for example, R2 to R3).
 - (4) Corner Lots may also contain different Zoning Districts from the rest of the Block Face and should not change by more than one (1) district (for example, R2 to R3).
 - (5) Multiple Family districts, R7 Attached and R8 Multifamily, shall be located either on an Avenue or Connector, or on a Neighborhood Street perpendicular to an Avenue or Collector, beginning less than one (1) Block away. These districts shall be located towards the front of the Neighborhood Type.
- c. Mixed Use, Commercial, and Office Districts.
- (1) Mixed Use and commercial districts should be clustered into Nodes of at least 7,500 square feet of Gross Building Area with the exception of a Corner Store.
 - (2) Nodes of Mixed Use and commercial districts should be uninterrupted and continuous. Office districts may be located between Mixed Use/ commercial districts and residential districts.
 - (3) Mixed use, commercial, and office district Nodes shall be located on a Connector Street or Avenue within the Neighborhood Type. The edge of the Node shall be located beginning less than one (1) Block from an Avenue, Boulevard, or Scenic Corridor, typically on the perimeter of the Neighborhood Type.
5. Relationship to Adjacent Parcels. The requirements for transition of districts within the development (refer to the above) apply to the districts of adjacent Parcels not located within the same development, with the following additional requirements.
- a. Transition between a Proposed Development and Adjacent Existing or Proposed Type I Neighborhoods. One of the following shall be provided:
- (1) Proposed Lots abutting the Rear or Side Property Line of any Lot currently zoned RE or any Parcel designated for a Neighborhood Type I (refer to II.1.B for the Neighborhood Types Map) shall be designated as either an A or RE District, per III.1, or
 - (2) A buffer shall be provided in the form of one of the permitted Open Space Types (refer to III.4) or a Conservation Area (refer to II.11) adjacent to the Rear or Side Property Line, minimum seventy-five (75) feet in width from that Property Line and zoned as one of the Open Space districts (refer to III.1.A(5)).
- b. Transition between a Proposed Development across the street from an Existing or Proposed Type I Neighborhood.
- (1) If separated by a Boulevard Street Type, Scenic Corridor, or an existing Highway or railroad, Lots designated with an A, RE, R1, or R2 District are permitted.
 - (2) If separated by any other Street Type,
 - (a) Lots designated with an A, RE, or R1 District are permitted.
 - (b) R2 Districts are permitted with the provision of a buffer in the form of one of the permitted Open Space Types (refer to III.4) or a Conservation Area (refer to II.11) adjacent to the street along the Type I Neighborhood, minimum fifty (50) feet in width from the street Right-of-Way and zoned as one of the Open Space districts (refer to III.1.A.).
- c. Proximity of a Proposed Development to an Existing or Proposed Type I Neighborhood. C1, C2, O, M1, M2, or P Districts are not permitted within six hundred and sixty (660) feet of an existing or proposed Type I neighborhood, unless separated from the Type I neighborhood by a Boulevard with a median (refer to II.8.N), a Scenic Corridor (refer to II.8.O), a Highway, a railroad, a City Waterway, an Open Space Type (refer to III.4) or a Conservation Area (refer to II.11).
- d. New R3, R4, and R5 Zoned Lots.
- (1) Proposed Lots designated R3, R4, or R5 shall not be located adjacent to the Rear or Side Property Line of an existing Lot currently designated A, RE, or R1.
 - (2) Proposed Lots designated R4 or R5 shall not be located adjacent to the Rear or Side Property Line of an existing Lot currently designated R2.
- e. New R6 or R7 Zoned Lots.
- (1) Proposed Lots designated R6 or R7 shall be located beginning within one (1) Block of a Boulevard, Avenue, Connector Street, or Highway.
 - (2) Proposed Lots designated R6 or R7 shall not abut an existing or proposed Type I or Type II neighborhood unless one of the following is provided:
 - (a) The R6 or R7 area separated from the existing, proposed, or mapped Type I or II neighborhood by a Boulevard with a median (refer to II.8.N), a Scenic Corridor (refer to II.8.O), a railroad, or a City Waterway.
 - (b) A buffer shall be provided in the form of one of the permitted Open Space Types (refer to III.4) or a Conservation Area (refer to II.11) adjacent to the Rear or Side Property Line, minimum seventy-five (75) feet in width from

II. Neighborhood Development Regulations Section 1 - General Requirements

that Property Line and zoned as one of the Open Space districts (refer to III.1.A(5)).

D. General Open Space Categories & Requirements.

The following requirements apply to all Neighborhood Types.

1. Intent. The following defines the basis for intent to require an adequate amount and mix of Open Space for new Subdivision development.
 - a. TN Code Title 13, Chapters 4 and 7, and Title 6, Chapter 19, enable requirements for adequate open spaces, parks, greenways, public grounds, green spaces, stormwater facilities, landscaping, and planting of shade trees, whether publicly or privately owned.
 - b. The natural resources assessment component of the Comprehensive Plan places particular value on open spaces with forest cover, mature native trees, lakes, streams, wetlands, wildlife habitat, rolling terrain, and their environmental, scenic, and community character, as well as the quality of life benefits of the conservation and connection of such open spaces.
 - c. The recreation, greenways, and bicycle-pedestrian components of the Comprehensive Plan impact quality of life by providing for anticipated demand for recreation, fostering activity, fostering a family-friendly atmosphere, providing opportunities for relaxation, social interaction, and entertainment, protecting natural areas, connecting facilities to natural areas, and by increasing property values.
2. Categories of Open Space. The following is a list of open space categories that may be required.
 - a. Neighborhood Scale Open Space. Refer to II.1 through 7 for specific requirements for each Neighborhood Type and III.4 for Open Space Types.
 - b. City-Wide Parks and Greenways. Refer to the current Comprehensive Plan and Recreation Master Plan for definitions of and requirements for city-wide parks and greenways, including off-street paths and trails.
 - c. Conservation Areas. Refer to II.11 for requirements for Conservation Areas, applicable to all Neighborhood Types.
 - d. Streamside Management Buffers. Refer to the III.12 Streamside Management Buffers for requirements for stream buffers.
 - e. Scenic Corridor Buffers. Refer to Street Types, II.8, for Scenic Corridor Buffers required adjacent to all Scenic Corridors.
3. Designation for Categories of Open Space. To count towards open space requirements, each open space category shall be designated as follows on the Preliminary and Final Plat.
 - a. Neighborhood Scale Open Space. Designate as District OS1, OS2, OS3, or OS4 per III.2.J, Open Space and Recreation Uses and III.4 Open Space Types.
 - b. City-Wide Parks and Greenways. Designate as District OS3 or OS4 per III.2.J, Open Space and Recreation Uses.
 - c. Conservation Areas. Designate as District OS5 per II.11 Conservation Areas.
 - d. Streamside Management Buffers. Designate as District OS5.
 - e. Scenic Corridor Buffer. For Scenic Corridor zone OS5.
4. Requirements for each Open Space Category. The following specific requirements shall be met in addition to the general requirements.
 - a. Neighborhood Scale Open Space Requirements. Refer to the specific requirements of each Neighborhood Type for required quantities and distribution (II.2 through II.7) and permitted open space districts (III.1.D).
 - (1) Streamside Management Buffers, Conservation Areas and Scenic Corridor Buffers shall be not utilized to meet these requirements.
 - (2) Parcels less than Fourteen (14) acres. Parcels less than fourteen (14) acres with Conservation Area A or B totaling greater than ten (10) percent of the Parcel, have no Neighborhood Scale Open Space Requirements.
 - (3) Mix of Types. A mixture of Open Space Types shall be used to meet the Neighborhood Scale Open Space Requirements. When more than three (3) Neighborhood Scale Open Spaces are required, no Type shall be used more than twice.
 - b. City-Wide Parks Requirement. Refer to the current Recreation Master Plan (part of the Comprehensive Plan) for city-wide parks requirements.
 - (1) Each development that includes residential Zoning Districts shall utilize the following:
 - (a) Parkland dedication formula. Each residential subdivision shall utilize the formula in Article IV.3 (Appendix) for a parkland dedication requirement to determine whether a dedication of park land or payment-in-lieu of park land is required.
 - (b) Small Park Land Result. In no case shall land be accepted which results in a dedicated park that comprises less than 5 acres. If calculations are for a land amount less than this size, payment-in-lieu is required for the

II. Neighborhood Development Regulations

Section 1 - General Requirements

- entire amount, unless adjacent lands can be considered below.
- (c) **Public Parks.** If a Subdivision is located in the immediate vicinity of a proposed neighborhood or community park, as defined and located in the Recreation Master Plan component of the Comprehensive Plan, where such park(s) in the vicinity have not already been located and approved, the Applicant shall coordinate with the City to locate such park(s) within the Subdivision, if the parkland calculation noted above yields a suitable amount of land, so long as the MPC (with PRB review and recommendation) determines that location in the subdivision is appropriate for such public park(s). Adjoining land already dedicated for recreation can be considered toward meeting the size requirements for such public park(s). Lands for dedication shall be indicated in applicable plat and construction documents for dedication.
 - (d) **Fee in lieu.** If MPC (with PRB review and recommendation) determines that land in the subdivision is inappropriate or not needed for a public park, the Applicant shall provide a fee in-lieu-of parkland as indicated in IV.3.
 - (e) **Combination of Park Land and Fee in-Lieu.** If such park lands are recommended, but the land calculation substantially exceeds applicable recommended sizes for neighborhood and community parks, the Applicant shall provide a fee in-lieu-of park land for the portion that exceeds what can be appropriately located in the subdivision, and what is appropriate for sizing such parks.
- (2) For parkland dedication or payment in lieu, a recommendation from the PRB shall be required prior to consideration by the MPC. The recommendation shall be based on suitability. Suitability for parkland should be based on, but is not limited to, such factors as size, shape, development potential, topography, subsoils, bodies of water, accessibility, location, utility, compatibility with the Recreation Master Park Plan and Comprehensive Plan, and neighboring land uses, and nearby improvements.
- c. **Conservation Areas.** Conservation Areas may be required per II.11 Conservation Area.
 - d. **Streamside Management Buffers.** Streamside management buffers may be required per the III.12 Streamside Management Buffer.
 - e. **Scenic Corridor Buffers.** Scenic Corridor Buffers may be required (refer to II.8.C(9)).
5. **Total Amount of Designated Open Space.** The following total amounts of designated open space apply to all Subdivisions fourteen (14) acres or greater.
- a. **Minimum Total Amount of Open Space.** Upon meeting the requirements for each category, a minimum of twenty-five (25) percent of the gross Subdivision area shall be designated as open space per II.1.D(2).
 - b. **Permitted Reductions in Open Space Requirements.** Should the total of the open space category requirements result in more than fifty (50) percent of the gross Subdivision area for all Types with the exception of Type V, some of the open space areas shall be reduced as follows.
 - (1) The resulting total open space area shall constitute a minimum of fifty (50) percent of the gross Subdivision area.
 - (2) The following permitted reductions shall be taken in the following order to reach the minimum amount open space.
 - (a) **Conservation Area C.** Conservation Area C, as defined by II.11.H, may be reduced.
 - (b) **City-Wide Greenways.** City-wide greenways for off-street paths and trails may be reduced or eliminated unless no other connection opportunity exists.
 - (c) **City-Wide Parks.** The fee-in-lieu of Dedication of land may be utilized for city-wide parks.
 - (d) **Conservation Area Connections.** Required connections between Conservation Areas may be reduced.
 - (e) **Neighborhood Scale Open Space Requirement.** Conservation Areas and Streamside Management Buffers may be utilized to meet the requirements of the Neighborhood Scale Open Space Requirement as long as the Conservation Area or Streamside Management Buffer meets the distance requirement.
 - (f) **Conservation Area B.** Conservation Area B may be reduced. If the resulting area is less than two (2) acres, Area B may be eliminated.
 - (g) **Conservation Area A.** Conservation Area A may be reduced with the approval of the MPC, with a recommendation by the NRB. If the resulting area is less than two (2) acres, Area A may be eliminated without approvals.
 - (h) **Scenic Corridor Buffers.** Scenic Corridor Buffers may be reduced to no less than thirty

II. Neighborhood Development Regulations Section 1 - General Requirements

five (35) feet in depth for no more than two hundred (200) feet along the Scenic Corridor.

- (i) Streamside Management Buffer. As a final effort, the streamside management buffers may be reduced with the approval of the MPC, with a recommendation by the NRB
- c. Documentation. In the Preliminary Plat application, the Applicant shall include a table of required open space with the following information.
 - (1) Total gross acreage of Subdivision Plat.
 - (2) Total acreage of open space required and percentage of total gross acreage of the Subdivision.
 - (3) Each category of open space required and the acreage of each category provided.
 - (4) Any acreage reductions proposed per II.1.D(5) (b).

E. General Block, Lot, and Street Design.

The following are general requirements for all Subdivisions. Specific requirements are outlined for each Neighborhood Type.

1. Required Block Configuration. Refer to Figure 1.E-1 for an illustration of Typical Block Elements.
 - a. The shape of a Block shall be generally rectangular, but may vary due to natural features or site constraints.
 - b. Blocks shall typically be two (2) Lots deep with the exception of Blocks containing Conservation Areas or Open Space. Blocks may also include an Alley.
 - c. Blocks shall typically be fronted with Lots on at least

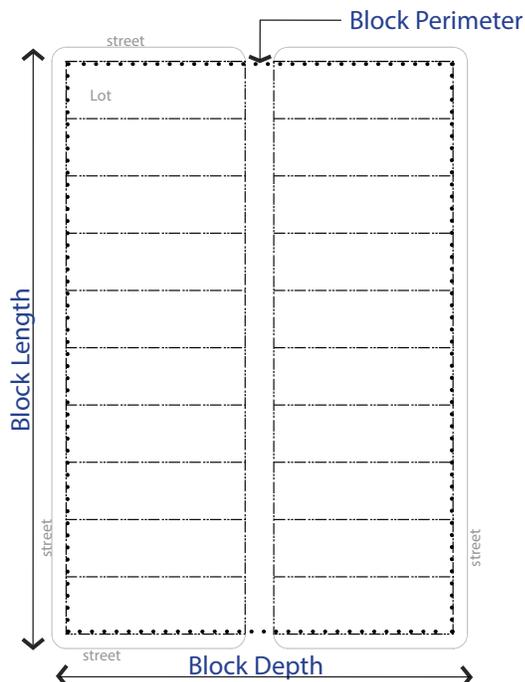


Figure 1.E-1. Typical Block Elements.

two (2) faces, preferably on the longest Street Faces, with the exception of Blocks along Scenic Corridors.

- d. Maximum Block sizes (length and depth) are defined in the specific requirements for each Neighborhood Type.
- e. Block configurations may vary when they include Conservation Areas and Open Space.
- 2. Minimum Number of Intersections per Square Mile of Developable Area.
 - a. Intent. The intent for this measurement is to ensure a minimum number of directional choices for all modes of transportation within a neighborhood on a scale small enough to accommodate a pedestrian.
 - b. Measurement. All Subdivisions are required to include a minimum number of intersections, defined in the specific requirements for each Neighborhood Type, measured as follows. (Refer to Figure 1.E-2).
 - (1) Number of Intersections. Intersections include all locations where a minimum of two (2) street centerlines intersect, including all Street Types except Alleys. Street centerlines shall intersect at a three-way or greater intersection to count towards this requirement.
 - (2) Square Mile of Developable Area. The number of intersections in a neighborhood is divided by the number of square miles of Developable Area in the Subdivision. The term Developable Area is defined in I.2.B; it excludes all area zoned OS5 (Conservation Areas, Streamside Buffer Zones, and Scenic Corridor Buffers).
 - (3) Open Space Exemption. Any area with an OS 3: General Open Space or OS4: Outdoor Recreation District larger than five (5) acres may be removed from the intersection calculation.

3. Minimum Miles of Street Centerlines per Square Mile of Developable Area.
 - a. Intent. This measurement is intended to accompany minimum Block size and the minimum number of intersections to ensure that Blocks are scaled comfortably to the pedestrian and provide access to the entire Subdivision.
 - b. Measurement. All Subdivisions are required to include a minimum number of Street Centerlines per square mile of Developable Area, measured as follows. Refer to Figure 1.E-3.
 - (1) Number of Miles of Street Centerlines. The Street Centerlines are measured in miles, continuous through all intersections and ending at the Parcel boundary, another centerline at a T intersection, or the center of a cul-de-sac.
 - (2) Square Mile of Developable Area. The number of miles of Street Centerlines in a Subdivision is divided by the number of square miles of

II. Neighborhood Development Regulations

Section 1 - General Requirements

Developable Area in the Subdivision. The term Developable Area is defined in I.2.B; it excludes all area zoned OS5 (Conservation Areas, Streamside Buffer Zones, and Scenic Corridor Buffers).

- (3) Open Space Exemption. Any OS 3: General Open Space and OS4: Outdoor Recreation larger than five (5) acres may be removed from the Street Centerlines calculation.

4. Minimum Number of Access Points.
 - a. Intent. This requirement is intended to provide a minimum level of connectivity between adjacent Subdivisions.
 - b. Measurement. A minimum number of Access Points is required of each Neighborhood Type, measured per a designated distance in linear feet along the outside Property Line of each Open Boundary.
 - (1) Conservation Area Exception. Where Conservation Area is adjacent to any boundary, the minimum number of Access Points may be reduced to match the street crossing requirement of the Conservation Area (refer to II.11.E(4)(c)).
 - (2) Stream Buffer Exception. Where Streamside Management Buffers are adjacent to the Subdivision boundary, the minimum number of Access Points required by this Section may be reduced to match the maximum street crossing requirements of III.12 Streamside Management Buffer.
5. Street Types. Refer to II.8 for regulations regarding Street Types. Permitted Street Types are outlined within each Neighborhood Type Section.
6. Alleys. Blocks may include or be required to contain Alleys, depending on the Building Type. Alleys shall be designed with the following configurations. Refer to Figure 1.E-4.
 - a. Mid-Block Alley. This configuration includes an Alley running through the center of the Block. This type of Alley is appropriate for all types of development.
 - b. "T" Alley. This configuration includes two (2) Alleys within a Block that are perpendicular to each other, forming a "T."
 - (1) This configuration is appropriate for both residential and commercial development.
 - (2) It is ideal for Blocks on the Neighborhood Street Type that are directly adjacent to larger streets such as Avenues or Connectors.
 - (3) The "T" allows development to front on both the local and larger Street Types. It also allows for a transition between different districts, such as residential facing one street and commercial

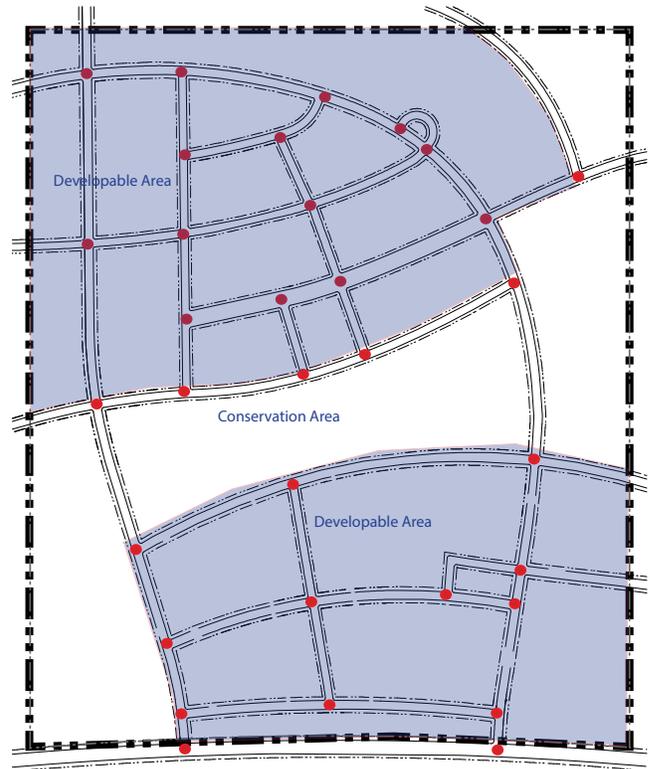


Figure 1.E-2. Measuring Minimum Number of Intersections per Square Mile of Developable Area.

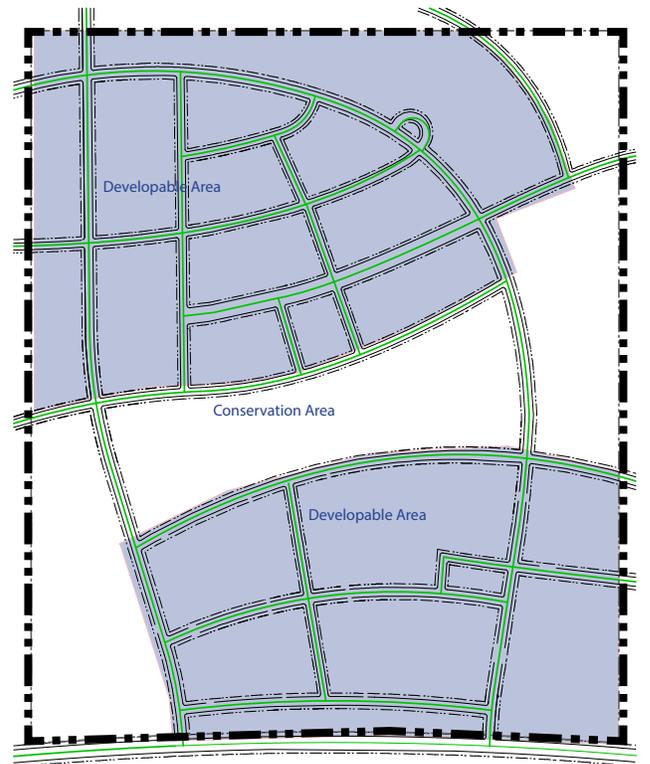


Figure 1.E-3. Measuring Minimum Miles of Street Centerlines per Square Mile of Developable Area.

II. Neighborhood Development Regulations Section 1 - General Requirements

Zoning Districts along the shorter Block Face of the perpendicular street.

- c. "H" Alley. This is similar to the "T" configuration except that it adds an additional Alley within the Block. It has similar applications to the "T" configuration and allows Lots to front on all four (4) Block Faces.
7. Mid-Block Pedestrianways.
 - a. Residential Blocks. Mid-Block Pedestrianways are required through all residential Blocks more than two hundred (200) feet longer than the maximum Block size defined by the Neighborhood Type.
 - b. Commercial Blocks. Mid-Block Pedestrianways are required through all commercial Blocks as defined by the Neighborhood Type.
 - c. When combined with mid-Block street crossings, these pathways shall align to facilitate easy pedestrian movements.
 - d. Mid-Block Pedestrianways shall be located in the middle third of a Block Face.
 - e. Residential Block Pedestrianways shall be zoned OS 3 General Open Space and utilize the Linear Park Open Space Type (refer to III.4.I).
 8. Lot Dimensions. All Lots of record shall be developed to meet the requirements outlined in III.3 Building Type Standards.
 9. Lot Configuration. Lots shall meet the following requirements.
 - a. Frontage. All Lots shall have frontage along a Neighborhood Street, Connector Street, Avenue, or Boulevard, unless otherwise specified in III.3 Building Type Standards.
- (1) With the exception of Lots in A or RE Districts, Alleys are required for vehicular access to residential Lots fronting on an Avenue, Boulevard, or Scenic Corridor. Alleys and garage access shall be in the rear of the building with the front of the building facing the Avenue, Boulevard, or Scenic Corridor.
 - (2) Scenic Corridor Buffer. Minimum Setbacks or Build-to Zones for all residential Lots fronting on a Scenic Corridor shall occur outside the Scenic Corridor Buffer. Refer to II.C.9. Refer to Figure
 - b. Lot Shape. To create regular, rectangular Lots, Side Property Lines shall be perpendicular to the vehicular Right-of-Way to the extent practical.
 - c. Through Lots. Through Lots are not permitted with the following exceptions.
 - (1) The Lot covers fifty (50) percent or more of a Block and the two (2) longest parallel Street Faces are treated as Front Property Lines per Building Type requirements (III.3).
 - (2) When no other alternative exists, a series of Lots in a neighborhood may back up to a Boulevard or Avenue with a minimum fifty (50) foot wide landscape Easement adjacent to the major road Right-of-Way. Fences shall be constructed on the Lot outside of the Easement, per III.5.P Fences and Walls. Refer to III.5 for landscape requirements.
 - d. Corner Lots. The Front Lot Line of a Corner Lot shall be aligned with at least one (1) Front Lot Line of an adjacent Parcel.
 - (1) Lots directly adjacent to Pedestrianways shall be considered Corner Lots.
 - (2) The Rear Yard of a Corner Lot is typically the Yard against an Alley or another Lot's Rear Yard.
 - (3) The Side Yard of a Corner Lot is adjacent to another Lot.
 - e. Flag Lots. Flag Lots are prohibited.
 - f. Buildable Lots. Refer to III.3 for Building Types and

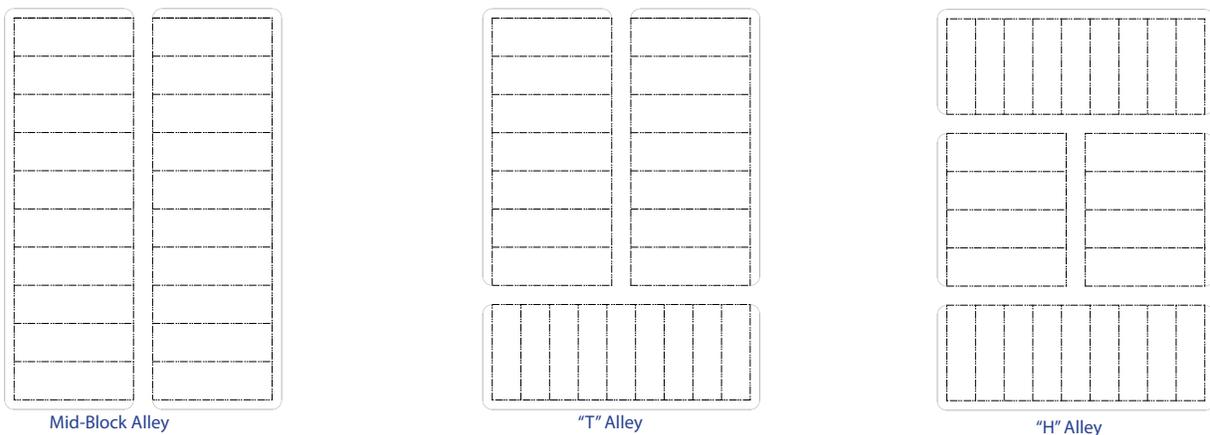


Figure 1.E-4. Typical Alley Configurations.

II. Neighborhood Development Regulations

Section 1 - General Requirements

requirements for Lots. Refer to I.8.F. Nonconforming Lots.

F. Traffic Impact Analysis.

A traffic impact analysis with the following requirements may be required. Refer to IV.2 Traffic Impact Study for all triggers and analysis details.

1. The analysis shall demonstrate that existing and proposed infrastructure will meet the additional traffic demand of the proposed development.
2. Should additional facilities be required, the analysis shall illustrate how and when that additional infrastructure will be developed.
3. The MPC may reject the Subdivision application if the analysis does not demonstrate that the development and any additional infrastructure improvements will meet additional traffic demand.

G. Community Facilities Impact Analysis.

All Subdivisions resulting in more than twenty (20) residential Lots or units, or ten thousand (10,000) square feet of non-residential Gross Building Area, require a Community Facilities Impact Analysis with the following requirements:

1. The analysis shall demonstrate that existing facilities shall meet the additional demand of the proposed development.
2. The analysis shall include at a minimum the services of the County Fire agency, Police agency, and the

3. Governing Board of Education. Should additional facilities be required, the analysis shall illustrate how and when that additional demand will be met.
4. The BOC may reject the rezoning of the development if the analysis is not sufficient.

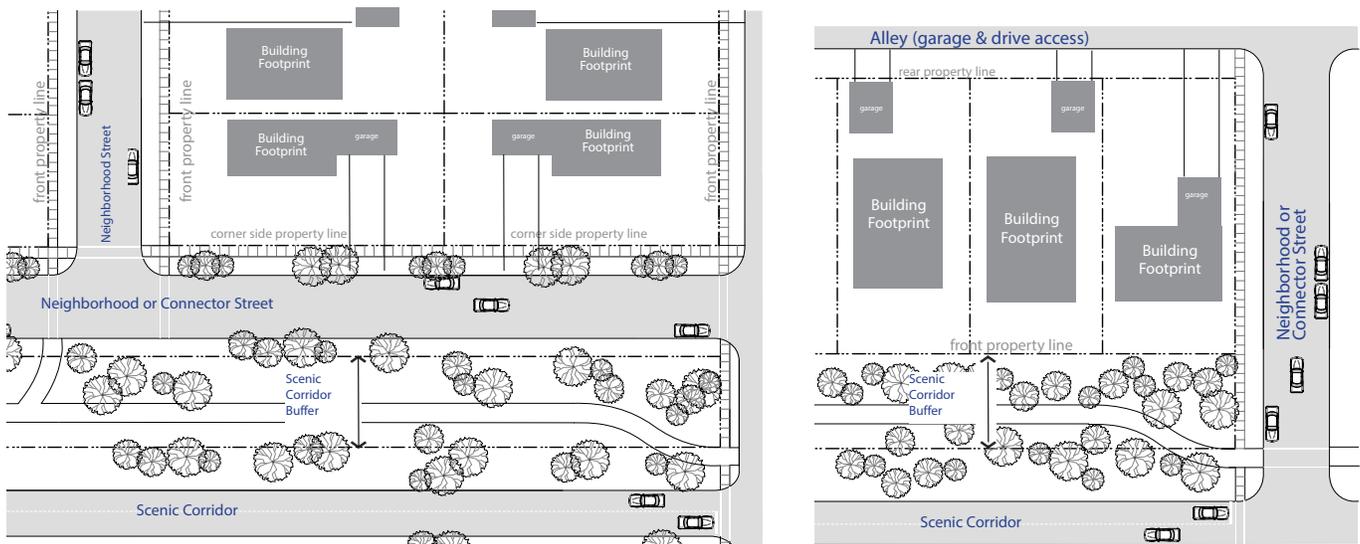


Figure 1.E-5. Examples of the Relationship of Preferred Lots and Street Orientation to Scenic Corridor Buffers.

II. Neighborhood Development Regulations

Section 2 - Neighborhood Type I Requirements

A. General Requirements.

1. **Intent.** Neighborhood Type I is primarily intended to preserve the rural character, and feel of applicable areas. Commercial development is not permitted. Very low density housing, including both agricultural and large Lot single family development, is permitted.
2. **Applicability.** These standards apply to land designated as Neighborhood Type I on the Neighborhood Types Map, with standards in blue text being applicable to subdivision requirements, and black text being applicable to zoning requirements. Refer to Figure 1.B-1.
3. **Neighborhood Type Illustration.** Figure 2.A-1 conceptually illustrates one example that graphically represents one combination of the requirements of a Type I Neighborhood (map not to scale)

B. Zoning Districts and Requirements.

1. **Zoning District Requirements.** Refer to II.1.C for General Zoning District Requirements.
2. **Permitted Zoning Districts** are designated on Table 2.A-1. Refer to III.1 Zoning Districts for more information.

C. Open Space Requirements.

1. Refer to II.1.D for General Open Space Requirements.
2. Refer to Table 2.A-1 for permitted open space districts and Neighborhood Scale Open Space Requirements.

D. Block Design and Street Layout.

1. **Street Configuration.** Refer to Table 2.A-1 for specific Block and street layout requirements, including maximum Block size, minimum number of intersections per square mile of Developable Area, minimum miles of Street Centerlines per square mile of Developable Area, and minimum number of Access

Points per Open Boundary. Refer to II.1.E for General Block, Lot, and Street Design Requirements.

2. **Street Types.** Permitted Street Types and their requirements are designated on Table 2.A-1. Refer to II.8 Street Type Standards for more information.
 - a. **Connectors.** Connectors shall not constitute more than ten (10) percent of the linear miles of Street Centerline.
 - b. **Boulevards and Avenues.** Boulevards and Avenues may be used only for streets designated as future streets on the Comprehensive Plan.

Illustration Key

	NC: Neighborhood Commercial		RE: Ex-Urban
	C1: Community Commercial		R1: Suburban Estate
	C2: Regional Commercial		R2: Suburban Manor
	NO: Neighborhood Office		R3: Suburban Cottage
	OS1: Neighborhood Civic Space		R4: Urban Estate
	OS2: Neighborhood Open Space		R5: Urban Manor
	OS3: General Open Space		R6: Attached
	OS4: Outdoor Recreation		R7: Multifamily
	OS5: Conservation Area		

II. Neighborhood Development Regulations Section 2 - Neighborhood Type I Requirements

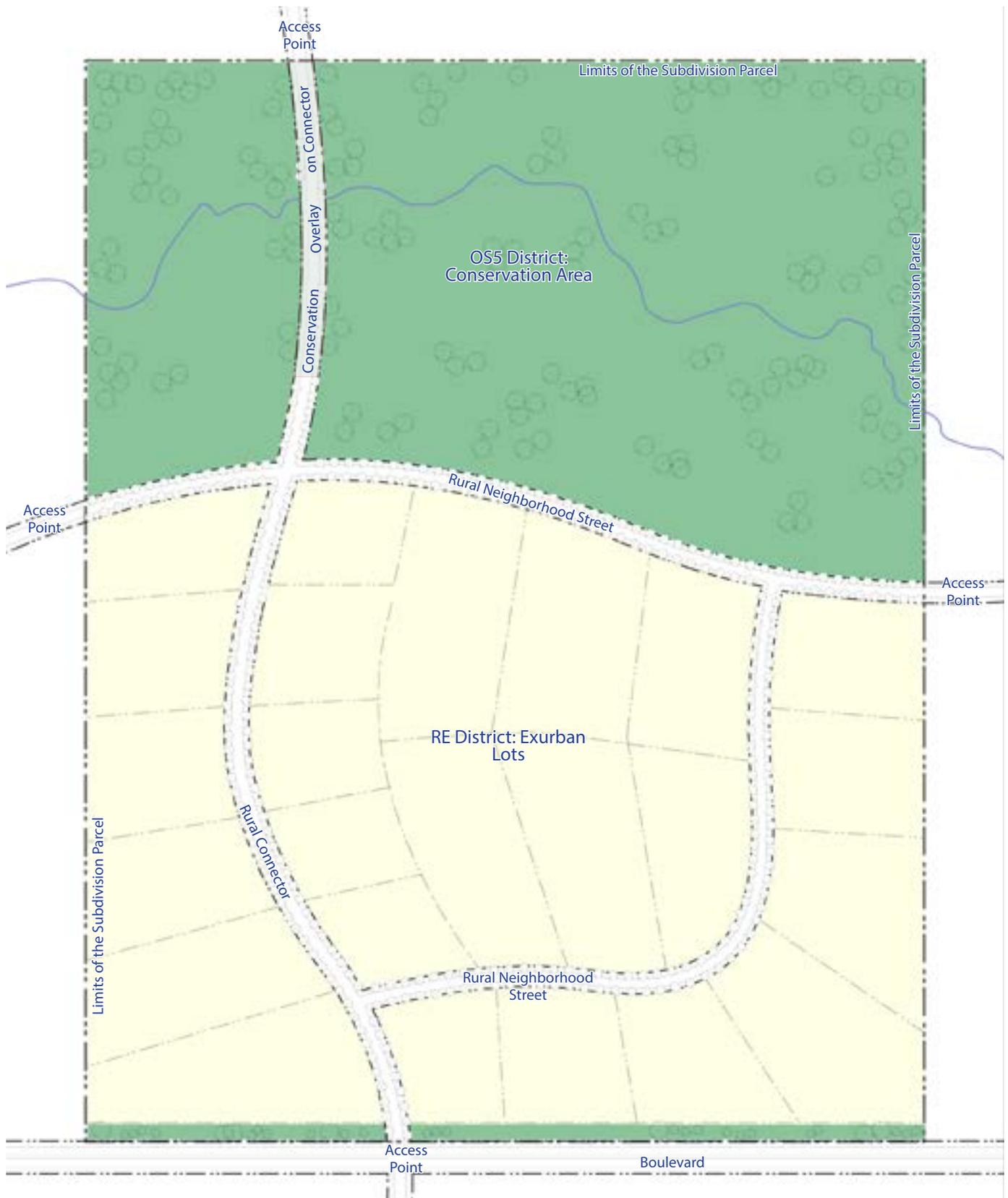


Figure 2.A-1. Neighborhood Type I Illustration (not to scale).

II. Neighborhood Development Regulations Section 2 - Neighborhood Type I Requirements

		Type I
		All Sizes
	Commercial Minimum Requirements minimum Gross Building Area (in sf) of permitted commercial and office districts	none permitted
	Commercial Maximum Limitations maximum Gross Building Area (in sf) of permitted commercial and office districts	none permitted
	Minimum Residential Mix Requirements minimum 10 Dwelling Units of minimum number of different permitted residential districts	none required
Mixed Use/Commercial, Office & Institutional Districts	NC District: Neighborhood Mixed Use/Commercial	
	C1 District: Community Mixed Use/Commercial	
	C2 District: Regional Mixed Use/Commercial	
	NO District: Neighborhood Office NO & O Districts maximum 50% of total commercial space	
	O District: General Office NO & O Districts maximum 50% of total commercial space	
	P District: Institutional	
Residential Districts	R7 District: Multifamily Building	
	R6 District: Attached House	
	R5 District: Urban Manor	
	R4 District: Urban Estate	
	R3 District: Suburban Cottage	
	R2 District: Suburban Manor	
	R1 District: Suburban Estate	
	RE District: Ex-Urban	●
AG District: Rural Single Family, Agriculture	●	

Table Key

● Permitted

Table 2.A-1. Neighborhood Type I Requirements.

II. Neighborhood Development Regulations

Section 2 - Neighborhood Type I Requirements

		Type I
		All Sizes
Neighborhood Scale Open Space Requirements	Residential: Neighborhood Scale Open Space Requirement	no requirement
	Non-Residential: Neighborhood Scale Open Space Requirement	not applicable
Permitted Open Space Districts	OS5 District: Conservation	● (Required for Conservation Areas, Streamside Management Buffers, and Scenic Corridor Buffers only. Refer to III.1.D)
	OS4 District: Outdoor Recreation	●
	OS3 District: General Open Space	●
	OS2 District: Neighborhood Open Space	
	OS1 District: Neighborhood Civic Space	
Street Configuration	Cul-de-sacs (refer to II.8.Q)	maximum 10 per Developable Square Mile
	Intersections Minimum Number per Developable Square Mile	no requirement
	Street Centerlines (miles) Minimum Number per Developable Square Mile	no requirement
	Access Points Minimum Number per Open Boundary	minimum 2 total and 1 per every 1800' of Open Boundary
	Commercial Maximum Block Size (in feet)	not applicable
	Commercial Through Block Pedestrianway Requirement	not applicable
	Residential Maximum Block Area size (in feet) (no maximum Block size for R-1 or AG District Blocks)	not applicable
Street Types	Street Type: Alley	
	Street Type: Boulevard	
	Street Type: Urban Avenue	
	Street Type: Rural Avenue	
	Street Type: Urban Connector	
	Street Type: Rural Connector	●
	Street Type: Urban Neighborhood Street	
	Street Type: Rural Neighborhood Street	●
	Conservation Street Overlay	permitted on all Street Types (refer to II.8)

Table Key

● Permitted

Table 2.A-1. (continued) Neighborhood Type I Requirements.

II. Neighborhood Development Regulations

Section 3 - Neighborhood Type II Requirements

A. General Requirements.

1. **Intent.** Neighborhood Type II is intended to result in a traditional suburban built environment. Only single family detached residential Building Types are permitted for the residential component.
2. **Applicability.** These standards apply to the Subdivision of all land designated as Neighborhood Type II on the Neighborhood Types Map, with standards in blue text being applicable to subdivision requirements, and black text being applicable to zoning requirements. Refer to Figure 1.B-1.
3. **Neighborhood Type II Illustration.** Figure 3.A-1 conceptually illustrates one example that graphically represents one combination of the requirements of a Type II Neighborhood (map not to scale).

B. Zoning Districts and Requirements.

1. **Zoning District Requirements.** Refer to II.1.C for General Zoning District Requirements.
 - a. A minimum mix of permitted residential districts is defined per Table 3.A-1.
2. **Permitted Districts.** Permitted districts are defined in Table 3.A-1. Refer to III.1 Zoning Districts for more information.
 - a. R1: Suburban Estate. An R1-primary option is provided, which permits all R1 lots for a Type II Neighborhood.
 - b. R1: Suburban Estate. When the R1-primary option is not utilized, at least twenty (20) percent of all residential Lots shall be zoned R1.
 - c. R3: Suburban Cottage. For developments fifteen (15) acres or more, no more than fifty (50) percent of all residential Lots may be zoned R3, with the following exception:
 - (1) If fifty (50) percent or more of the gross Subdivision area is designated as open space per II.1.D, up to eighty (80) percent of all residential Lots may be zoned R3.
 - d. RE: Ex-Urban District Restriction. When permitted, no more than ten (10) percent of all residential Lots may be Ex-Urban, with the following exception:
 - (1) RE zoned Lots providing a transition to existing adjacent RE zoned Lots are exempt from this limitation.

C. Open Space Requirements.

1. Refer to II.1.D for General Open Space Requirements.
2. Refer to Table 3.A-1 for permitted open space districts, and Neighborhood Scale Open Space Requirements.

D. Block Design and Street Layout.

1. **Street Configuration.** Refer to II.1.E for General Block, Lot, and Street Design Requirements.
 - a. Refer to Table 3.A-1 for specific Block and street layout requirements, including maximum Block size, minimum number of intersections per square mile of Developable Area, minimum miles of Street Centerlines per square mile of Developable Area, and minimum number of Access Points per Open Boundary.
 - b. **Residential Districts Block Size Exception.** If a mid-Block Pedestrianway is provided, Block Length may be increased to fourteen hundred (1,400) feet.
2. **Street Types.** Permitted Street Types and their requirements are designated on Table 3.A-1. Refer to II.8 Street Type Standards for more information.
 - a. **Connectors.** Connectors shall not constitute more than ten (10) percent of the linear miles of Street Centerlines.
 - b. **Boulevards and Avenues.** Boulevards and Avenues may be used only for streets designated as future streets on the Street Type Map in this section.

Illustration Key

 NC: Neighborhood Commercial	 RE: Ex-Urban
 C1: Community Commercial	 R1: Suburban Estate
 C2: Regional Commercial	 R2: Suburban Manor
 NO: Neighborhood Office	 R3: Suburban Cottage
 O: Community Office	 R4: Urban Estate
 OS1: Neighborhood Civic Space	 R5: Urban Manor
 OS2: Neighborhood Open Space	 R6: Attached
 OS3: General Open Space	 R7: Multifamily
 OS4: Outdoor Recreation	
 OS5: Conservation Area	

II. Neighborhood Development Regulations Section 3 - Neighborhood Type II Requirements

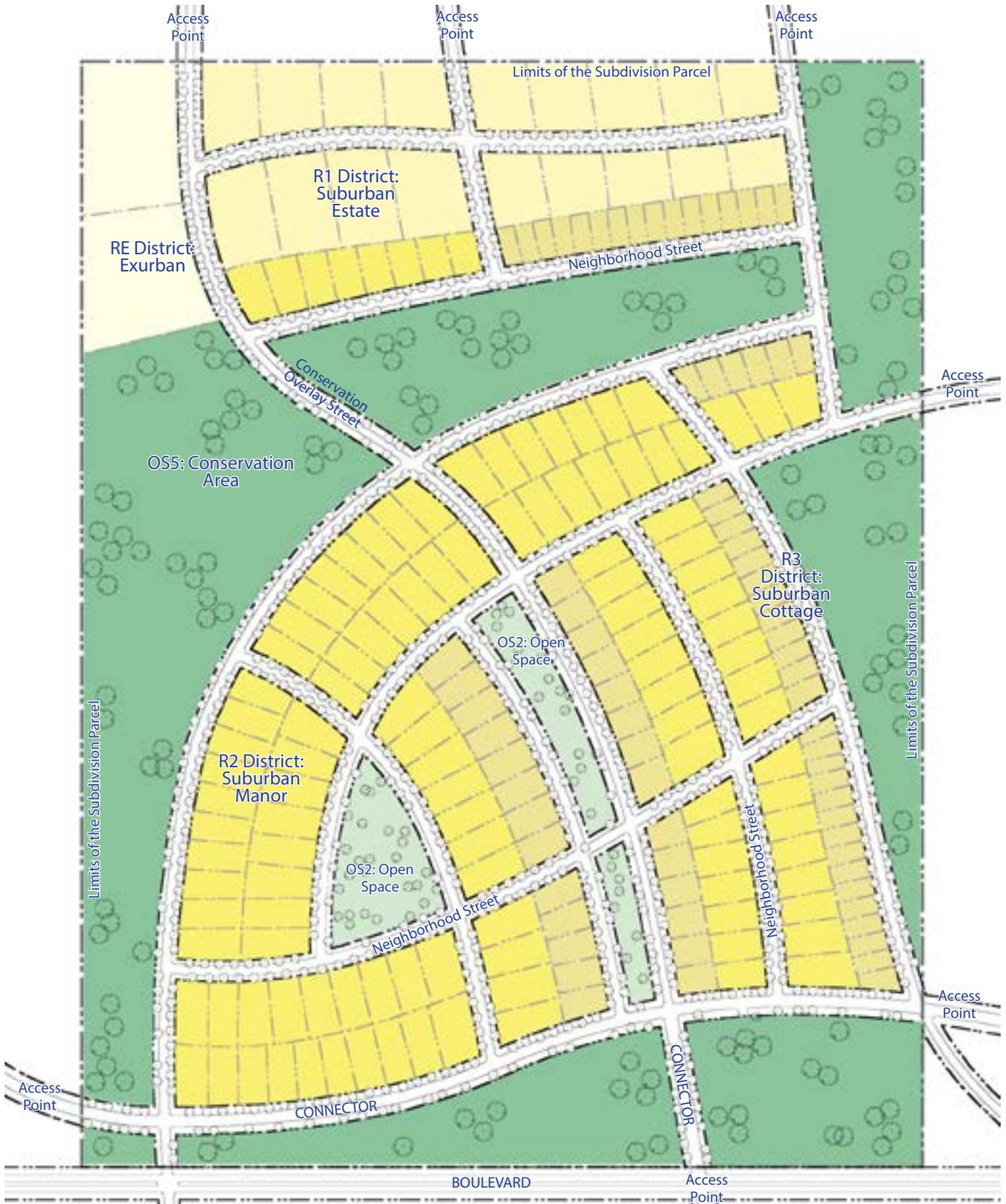


Figure 3.A-1. Neighborhood Type II Illustration (not to scale).

II. Neighborhood Development Regulations Section 3 - Neighborhood Type II Requirements

		Type II		
		less than 15 Acres of Developable Area	15 Acres or more of Developable Area	R1-primary option any sized Developable Area
	Commercial Minimum Requirements minimum Gross Building Area (in sf) of permitted commercial and office districts	none permitted	none permitted	none permitted
	Commercial Maximum Limitations maximum Gross Building Area (in sf) of permitted commercial and office districts	none permitted	none permitted	none permitted
	Minimum Residential Mix Requirements minimum 10 Dwelling Units of minimum number of different permitted residential districts	no minimum	at least 2 Districts	no minimum
Mixed Use/Commercial, Office & Institutional Districts	NC District: Neighborhood Mixed Use/Commercial			
	C1 District: Community Mixed Use/Commercial			
	C2 District: Regional Mixed Use/Commercial			
	NO District: Neighborhood Office NO & O Districts maximum 50% of total commercial space			
	O District: General Office NO & O Districts maximum 50% of total commercial space			
	P District: Institutional			
Residential Districts	R7 District: Multifamily Building			
	R6 District: Attached House			
	R5 District: Urban Manor			
	R4 District: Urban Estate			
	R3 District: Suburban Cottage	●	● no more than 50% of all residential Lots, with exception per II.3.B	
	R2 District: Suburban Manor	●	●	
	R1 District: Suburban Estate	● at least 20% of all residential Lots must be this district	● at least 20% of all residential Lots must be this district	●
	RE District: Ex-Urban		● (no more than 10% of all residential Lots)	● (no more than 10% of all residential Lots)
AG District: Rural Single Family, Agriculture				

Table Key

● Permitted

Table 3.A-1. Neighborhood Type II Requirements.

II. Neighborhood Development Regulations

Section 3 - Neighborhood Type II Requirements

		Type II	
		Less than 15 Acres of Developable Area	15 Acres or more of Developable Area
Neighborhood Scale Open Space Requirements	Residential: Neighborhood Scale Open Space Requirement	One permitted Open Space District (OS) required within 1/6 mile of each residential unit.	
	Non-Residential: Neighborhood Scale Open Space Requirement	not applicable	
Permitted Open Space Districts	OS5 District: Conservation	● (Required for Conservation Areas, Streamside Management Buffers, and Scenic Corridor Buffers only. Refer to III.1.D(5)(e))	
	OS4 District: Outdoor Recreation	●	●
	OS3 District: General Open Space	●	●
	OS2 District: Neighborhood Open Space	●	●
	OS1 District: Neighborhood Civic Space		
Street Configuration	Cul-de-sacs (refer to II.8.Q)	maximum 10 per Developable Square Mile	
	Intersections Minimum Number per Developable Square Mile	130; minimum 100 if R-1 Districts utilized	
	Street Centerlines (miles) Minimum Number per Developable Square Mile	20	
	Access Points Minimum Number per Open Boundary	minimum 2 total and 1 per every 1500' of Open Boundary	
	Commercial Maximum Block Size (in feet)	not applicable	
	Commercial Through-Block Pedestrianway Requirement	not applicable	
	Residential Maximum Block Area size (in feet) (no maximum Block size for R-1 or AG District Blocks)	350' deep by 900' long (see exception II.3.E)	
Street Types	Street Type: Alley	permitted per Building Type (refer to III.3)	
	Street Type: Boulevard		
	Street Type: Urban Avenue		
	Street Type: Rural Avenue		
	Street Type: Urban Connector	●	
	Street Type: Rural Connector	●	
	Street Type: Urban Neighborhood Street	●	
	Street Type: Rural Neighborhood Street	●	
	Conservation Street Overlay	permitted on all Street Types (refer to II.8)	

Table Key

● Permitted

Table 3.A-1. (continued) Neighborhood Type II Requirements.

II. Neighborhood Development Regulations

Section 4 - Neighborhood Type III Requirements

A. General Requirements.

1. **Intent.** Neighborhood Type III shall be primarily residential and shall be developed generally according to the principles of Traditional Neighborhood Design. Medium sized commercial Nodes shall occur on more intense Street Types and most Scales of residential development, except Multifamily, are permitted.
2. **Applicability.** These standards apply to Subdivision of all land designated as Neighborhood Type III on the Neighborhood Types Map, Figure 1.B-1.
3. **Neighborhood Type III illustration.** Figure 4.A-1 conceptually illustrates one example that graphically represents one combination of the requirements of a Type III Neighborhood (not to scale)

B. Zoning Districts and Requirements.

1. **Zoning District Requirements.** Refer to II.1.C for General Zoning District Requirements.
 - a. Commercial and office district minimum and maximum requirements are defined in Table 4.A-1.
 - (1) **Location.** Commercial and office districts shall be located in Subdivisions at least partially abutting a Highway or Boulevard. The commercial and office districts shall be located on an Avenue or Connector Street Type within the Applicant's Property. The edge of the commercial Node shall be located less than one (1) Block from an Avenue, Boulevard, or Scenic Corridor.
 - (2) **Exceptions.**
 - (a) For neighborhoods fifty (50) acres or less, commercial and office districts are not permitted if all residences are located within one-half (1/2) mile of an existing Mixed Use or commercial district.
 - (b) For Parcels with Developable Area smaller than five (5) acres, no minimum commercial area is required.
 - (3) **Larger Commercial Node.** For Subdivisions over one hundred (100) acres, a maximum of 200,000 square feet of commercial and office district Gross Building Area may be permitted for one (1) commercial Node.
 - (4) **Larger Office Node.** For Subdivisions over thirty (30) acres, a maximum of 100,000 square feet of office Gross Building Area may be permitted.
 - b. A minimum mix of permitted residential districts is defined per Table 4.A-1.
 - (1) The minimum residential mix requirement applies to every quarter (1/4) mile radius segment of the development.
 - (2) For Parcels with Developable Area smaller than five (5) acres, no minimum residential mix is

required.

2. **Permitted Districts.** Permitted districts are defined in Table 4.A-1. Refer to III.1 Zoning Districts for more information.
 - a. **C1: Community Commercial District Restriction.** Community Commercial is permitted with Uses in each tenant space of no more than 20,000 square feet each. For Parcels one hundred (100) acres or more in size and a minimum of 100,000 square feet in tenant space, one tenant space up to 30,000 square feet is permitted. .
 - b. **NO: Office District Restriction.** No more than fifty (50) percent of the total commercial space and no more than twenty thousand (20,000) square feet may be office districts.
 - c. **R6: Attached District Restriction.** No more than ten (10) percent of all Dwelling Units may be Attached.
 - d. **R4, R5, R6: Urban Estate, Urban Manor, Attached District Restriction.** For neighborhoods thirty (30) acres or more, a total of no more than sixty (60) percent of all residential Lots may be zoned with any combination of R4, R5, and R6. ,
 - (1) **Exception:** If fifty (50) percent or more of the gross Subdivision area is designated as open space per II.1.D, a total of no more than eighty (80) percent of all residential Lots may be zoned with any combination of R4, R5, and R6.
 - d. **RE: Ex-Urban District Restriction.** No more than ten (10) percent of all Dwelling Units may be Ex-Urban.

C. Open Space Requirements.

1. Refer to II.1.D for General Open Space.
2. Refer to Table 4.A-1 for permitted open space districts and Neighborhood Scale Open Space Requirements.

Illustration Key

	NC: Neighborhood Commercial		RE: Ex-Urban
	C1: Community Commercial		R1: Suburban Estate
	C2: Regional Commercial		R2: Suburban Manor
	NO: Neighborhood Office		R3: Suburban Cottage
	O: Community Office		R4: Urban Estate
	OS1: Neighborhood Civic Space		R5: Urban Manor
	OS2: Neighborhood Open Space		R6: Attached
	OS3: General Open Space		R7: Multifamily
	OS4: Outdoor Recreation		
	OS5: Conservation Area		

II. Neighborhood Development Regulations Section 4 - Neighborhood Type III Requirements



Figure 4.A-1. Neighborhood Type III Illustration (not to scale).

II. Neighborhood Development Regulations Section 4 - Neighborhood Type III Requirements

		Type III		
		less than 30 Acres of Developable Area	30-50 Acres of Developable Area	more than 50 Acres of Developable Area
Commercial Minimum Requirements minimum Gross Building Area (in sf) of permitted commercial and office districts		minimum 10,000 sf per II.4.B); none required if all residences within 1/2 mile of existing district	minimum 20,000 sf per II.4.B; none required if all residences within 1/2 mile of existing district	minimum 20,000 sf per II.4.B
Commercial Maximum Limitations maximum Gross Building Area (in sf) of permitted commercial and office districts		maximum 50,000 sf	maximum 100,000 sf	maximum 100,000; Parcels over 100 acres, maximum 200,000
Minimum Residential Mix Requirements minimum 10 Dwelling Units of minimum number of different permitted residential districts		at least 3 different Districts	at least 3 different Districts	at least 3 different Districts per each contiguous 125 acre area
Mixed Use/Commercial, Office & Institutional Districts	NC District: Neighborhood Mixed Use/Commercial	●	●	●
	C1 District: Community Mixed Use/Commercial			● Refer to II.4.B(2)(a) for restrictions.
	C2 District: Regional Mixed Use/Commercial			
	NO District: Neighborhood Office NO & O Districts maximum 50% of total commercial space	● (maximum 20,000 sf)	● (maximum 50,000 sf)	● (maximum 50,000 sf)
	O District: General Office NO & O Districts maximum 50% of total commercial space			
	P District: Institutional			
Residential Districts	R7 District: Multifamily Building			
	R6 District: Attached House	● (no more than 10% of all Dwelling Units) and refer to II.4.B for cap on number of Dwelling Units	● (no more than 10% of all Dwelling Units and refer to II.4.B for cap on number of Dwelling Units)	● (no more than 10% of all Dwelling Units and refer to II.4.B for cap on number of Dwelling Units)
	R5 District: Urban Manor	●	● (refer to II.4.B for cap on number of Dwelling Units)	● (refer to II.4.B for cap on number of Dwelling Units)
	R4 District: Urban Estate	●	● (refer to II.4.B for cap on number of Dwelling Units)	● (refer to II.4.B for cap on number of Dwelling Units)
	R3 District: Suburban Cottage			
	R2 District: Suburban Manor		●	●
	R1 District: Suburban Estate		●	●
	RE District: Ex-Urban			● (no more than 10% of all Dwelling Units)
	AG District: Rural Single Family, Agriculture			

Table 4.A-1. Neighborhood Type III Requirements.

- D. Block Design and Street Layout.
1. Street Configuration. Refer to II.1.E for General Block, Lot, and Street Design Requirements.
 - a. Refer to Table 4.A-1 for specific Block and street layout requirements, including maximum Block size, minimum number of intersections per square mile of Developable Area, minimum miles of Street Centerlines per square mile of Developable Area, and minimum number of Access Points per Open Boundary.
 - b. Mixed Use, Commercial and Office Districts Blocks.
 - (1) Pedestrianways shall be provided through the Block for every four hundred (400) feet of Block Face.
 - (2) Mixed Use and commercial districts should be located on Block Ends.
 - c. Residential Districts Block Size Exception. If a mid-Block Pedestrianway is provided, Block Length may be increased to twelve hundred (1,200) feet.

II. Neighborhood Development Regulations

Section 4 - Neighborhood Type III Requirements

		Type III		
		less than 30 Acres of Developable Area	30-50 Acres of Developable Area	more than 50 Acres of Developable Area
Neighborhood Scale Open Space Requirements	Residential: Neighborhood Scale Open Space Requirement	One permitted Open Space District (OS) required within 1/6 mile of each residential unit.		
	Non-Residential: Neighborhood Scale Open Space Requirement	One permitted Open Space District (OS) within 1/8 mile of the front door of each non-residential unit.		
Permitted Open Space Districts	OS5 District: Conservation	● (Required for Conservation Areas, Streamside Management Buffers, and Scenic Corridor Buffers only. Refer to III.1.D(5)(e))		
	OS4 District: Outdoor Recreation	●	●	●
	OS3 District: General Open Space	●	●	●
	OS2 District: Neighborhood Open Space	●	●	●
	OS1 District: Neighborhood Civic Space	●	●	●
Street Configuration	Cul-de-sacs (refer to II.8.Q)	not permitted	not permitted	maximum 10 per Developable Square Mile, R-1 and R-2 Districts only
	Intersections Minimum Number per Developable Square Mile	130		
	Street Centerlines (miles) Minimum Number per Developable Square Mile	22		
	Access Points Minimum Number per Open Boundary	minimum 2 total and 1 per every 1000' of Open Boundary		
	Commercial Maximum Block Size (in feet)	400' deep by 800' long		
	Commercial Through-Block Pedestrianway Requirement	every 400' of Block Face		
	Residential Maximum Block Area size (in feet) (no maximum Block size for R-1 or AG District Blocks)	350' deep by 700' long (see exception II.4.D(1)(c))		
Street Types	Street Type: Alley	permitted per Building Type (refer to III.3)		
	Street Type: Boulevard			
	Street Type: Urban Avenue	●		
	Street Type: Rural Avenue	●		
	Street Type: Urban Connector	●		
	Street Type: Rural Connector	●		
	Street Type: Urban Neighborhood Street	●		
	Street Type: Rural Neighborhood Street	●		
	Conservation Street Overlay	permitted on all Street Types (refer to II.8)		

Table 4.A-1. (continued) Neighborhood Type III Requirements.

Table Key ● Permitted

2. Street Types. Permitted Street Types and their requirements are designated on Table 4.A-1. Refer to II.8 Street Type Standards for more information.
 - a. Connectors. Connectors shall not constitute more than ten (10) percent of the linear miles of Street Centerline.
 - b. Boulevards and Avenues. Boulevards and Avenues may be used only for streets designated as future streets on the Comprehensive Plan.

II. Neighborhood Development Regulations

Section 5 - Neighborhood Type IV Requirements

A. General Requirements.

1. **Intent.** Neighborhood Type IV is primarily intended to be developed as a residential neighborhood with smaller-Scale Nodes of commercial development than Neighborhood Type V, which occur along more intensive Street Types. Single family detached homes are predominant, but single family attached housing is also permitted.
2. **Applicability.** These standards apply to the Subdivision of all land designated as Neighborhood Type IV on the Neighborhood Types Map, with standards in blue text being applicable to subdivision requirements, and black text being applicable to zoning requirements. Refer to Figure 1.B-1.
3. **Neighborhood Type Illustration.** Figure 5.A-1 conceptually illustrates one example that graphically represents one combination of the requirements of a Type IV Neighborhood (not to scale).

B. Zoning Districts and Requirements.

1. **Zoning District Requirements.** Refer to II.1.C for General Zoning District Requirements.
 - a. Commercial and office district minimum and maximum requirements are defined in Table 5.A-1.
 - (1) **Location.** Commercial and office districts shall be located on an Avenue or Connector Street Type within the Subdivision. The edge of the commercial Node shall be located less than one (1) Block from an Avenue, Boulevard, or Scenic Corridor.
 - (2) **Exception.** For all neighborhoods, commercial, and office districts are not required if all residences are located within one-quarter (1/4) mile of an existing Mixed Use or commercial district.
 - b. A minimum mix of permitted residential districts is defined per Table 5.A-1.
2. **Permitted Districts.** Permitted districts are defined in Table 5.A-1. Refer to III.1 Zoning Districts for more information.
 - a. **NO: Office Districts Restriction.** No more than fifty (50) percent of the total commercial space and no more than 20,000 square feet may be office districts.
 - b. **R6: Attached District Restriction.** No more than ten (10) percent of all Dwelling Units may be Attached.
 - c. **RE: Ex-Urban District Restriction.** No more than ten (10) percent of all Dwelling Units may be Ex-Urban, with the following exception:
 - (1) RE zoned Lots providing a transition to existing adjacent RE zoned Lots are exempt from this limitation.

C. Open Space Requirements.

1. Refer to II.1.D for General Open Space Requirements.
2. Refer to Table 5.A-1 for permitted open space districts, and Neighborhood Scale Open Space Requirements.

D. Block Design and Street Layout.

1. **Street Configuration.** Refer to II.1.E for General Block, Lot, and Street Design Requirements.
 - a. Refer to Table 5.A-1 for specific Block and street layout requirements, including maximum Block size, minimum number of intersections per square mile of Developable Area, minimum miles of Street Centerlines per square mile of Developable Area, and minimum number of Access Points per Open Boundary.
 - b. **Mixed Use, Commercial and Office Districts Blocks.** Pedestrianways shall be provided through the Block for every four hundred (400) feet of Block Face.
 - c. **Residential Districts Block Size Exceptions.** If a mid-Block Pedestrianway is provided, Block Length may be increased to twelve hundred (1,200) feet.
2. **Street Types.** Permitted Street Types and their requirements are designated on Table 5.A-1. Refer to II.8 Street Type Standards for more information.
 - a. **Connectors.** Connectors shall not constitute more than ten (10) percent of the linear miles of Street Centerline.
 - b. **Boulevards and Avenues.** Boulevards and Avenues may be used only for streets designated as future streets on the Comprehensive Plan.

Illustration Key

	NC: Neighborhood Commercial		RE: Ex-Urban
	C1: Community Commercial		R1: Suburban Estate
	C2: Regional Commercial		R2: Suburban Manor
	NO: Neighborhood Office		R3: Suburban Cottage
	O: Community Office		R4: Urban Estate
	OS1: Neighborhood Civic Space		R5: Urban Manor
	OS2: Neighborhood Open Space		R6: Attached
	OS3: General Open Space		R7: Multifamily
	OS4: Outdoor Recreation		
	OS5: Conservation Area		

II. Neighborhood Development Regulations Section 5 - Neighborhood Type IV Requirements

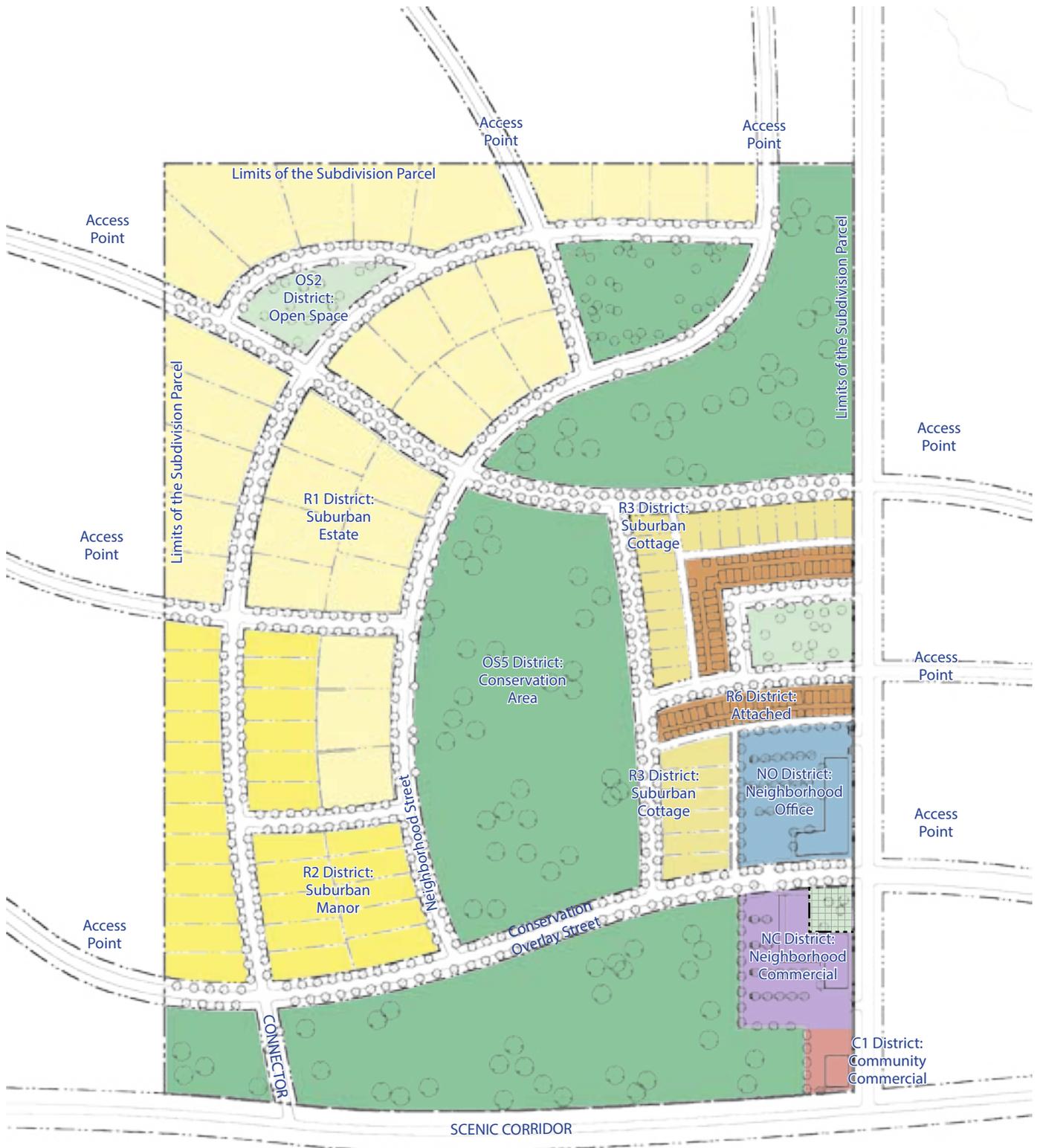


Figure 5.A-1. Neighborhood Type IV Illustration (not to scale).

II. Neighborhood Development Regulations Section 5 - Neighborhood Type IV Requirements

		Type IV		
		less than 15 Acres of Developable Area	15-30 Acres of Developable Area	more than 30 Acres of Developable Area
	Commercial Minimum Requirements minimum Gross Building Area (in sf) of permitted commercial and office districts	no minimum	minimum 20,000 sf; none if all residences within 1/4 mile of existing district	minimum 20,000 sf; none if all residences within 1/4 mile of existing district
	Commercial Maximum Limitations maximum Gross Building Area (in sf) of permitted commercial and office districts	maximum 50,000 sf	maximum 50,000 sf	maximum 50,000 sf
	Minimum Residential Mix Requirements minimum 10 Dwelling Units of minimum number of different permitted residential districts	no minimum	at least 1 District	at least 3 different Districts
Mixed Use/ Commercial, Office & Institutional Districts	NC District: Neighborhood Mixed Use/Commercial	●	●	●
	C1 District: Community Mixed Use/Commercial	●	●	●
	C2 District: Regional Mixed Use/Commercial			
	NO District: Neighborhood Office NO & O Districts maximum 50% of total commercial space	● (maximum 20,000 sf)	● (maximum 20,000 sf)	● (maximum 20,000 sf)
	O District: General Office NO & O Districts maximum 50% of total commercial space			
	P District: Institutional			
Residential Districts	R7 District: Multifamily Building			
	R6 District: Attached House	● (no more than 10% of all Dwelling Units)	● (no more than 10% of all Dwelling Units)	● (no more than 10% of all Dwelling Units)
	R5 District: Urban Manor			
	R4 District: Urban Estate			
	R3 District: Suburban Cottage	●	●	●
	R2 District: Suburban Manor	●	●	●
	R1 District: Suburban Estate	●	●	●
	RE District: Ex-Urban		● (no more than 10% of all Dwelling Units)	● (no more than 10% of all Dwelling Units)
	AG District: Rural Single Family, Agriculture			

Table Key

● Permitted

Table 5.A-1. Neighborhood Type IV Requirements.

II. Neighborhood Development Regulations

Section 5 - Neighborhood Type IV Requirements

		Type IV		
		less than 15 Acres of Developable Area	15-30 Acres of Developable Area	more than 30 Acres of Developable Area
Neighborhood Scale Open Space Requirements	Residential: Neighborhood Scale Open Space Requirement	One permitted Open Space District (OS) required within 1/6 mile of each residential unit.		
	Non-Residential: Neighborhood Scale Open Space Requirement	Minimum one OS District permitted Open Space District (OS) within 1/8 mile of the front door of each non-residential unit.		
Permitted Open Space Districts	OS5 District: Conservation	● (Required for Conservation Areas, Streamside Management Buffers, and Scenic Corridor Buffers only. Refer to III.1.D(5)(e))		
	OS4 District: Outdoor Recreation			
	OS3 District: General Open Space	●	●	●
	OS2 District: Neighborhood Open Space	●	●	●
	OS1 District: Neighborhood Civic Space	●	●	●
Street Configuration	Cul-de-sacs (refer to II.8.Q)	not permitted	not permitted	maximum 10 per Developable Square Mile
	Intersections Minimum Number per Developable Square Mile	130		
	Street Centerlines (miles) Minimum Number per Developable Square Mile	20		
	Access Points Minimum Number per Open Boundary	minimum 2 total and 1 per every 1500' of Open Boundary		
	Commercial Maximum Block Size (in feet)	600' deep by 1000' long		
	Commercial Through-Block Pedestrianway Requirement	every 400' of Block Face		
	Residential Maximum Block Area size (in feet) (no maximum Block size for R-1 or AG District Blocks)	350' deep by 700' long (see exception II.5D(1)(c))		
Street Types	Street Type: Alley	permitted per Building Type (refer to III.3)		
	Street Type: Boulevard			
	Street Type: Urban Avenue			
	Street Type: Rural Avenue			
	Street Type: Urban Connector	●		
	Street Type: Rural Connector	●		
	Street Type: Urban Neighborhood Street	●		
	Street Type: Rural Neighborhood Street	●		
	Conservation Street Overlay	permitted on all Street Types (refer to II.8)		

Table Key

● Permitted

Table 5.A-1. (continued) Neighborhood Type IV Requirements.

II. Neighborhood Development Regulations

Section 6 - Neighborhood Type V Requirements

- A. General Requirements.**
1. **Intent.** Neighborhood Type V is primarily intended for more intense commercial Uses, occurring at Nodes along higher capacity streets. Multifamily residential may be integrated with commercial development, while single-family detached and attached housing may occur beyond commercial Uses in larger Subdivisions.
 2. **Applicability.** These standards apply to the Subdivision of all land designated as Neighborhood Type V on the Neighborhood Types Map, with standards in blue text being applicable to subdivision requirements, and black text being applicable to zoning requirements. Refer to Figure 1.B-1.
 3. **Neighborhood Type Illustration.** Figure 6.A-1 conceptually illustrates one example that graphically represents one combination of the requirements of a Type V Neighborhood (not to scale).
- B. Zoning Districts and Requirements.**
1. **Zoning District Requirements.** Refer to II.1.C for General Zoning District Requirements.
 - a. Commercial and office district minimum and maximum requirements are defined in Table 6.A-1.
 - (1) **Location.** Commercial and office districts shall be located on an Avenue or Connector Street Type within the Applicant's Property. The edge of the commercial Node shall be located less than one (1) Block from an Avenue, Boulevard, or Scenic Corridor.
 - (2) **Exception.** For Parcels with less than two (2) acres of Developable Area, commercial or office Gross Building Area is required at a minimum rate of eight thousand (8,000) square feet per one (1) acre.
 - b. A minimum mix of permitted residential districts is defined per Table 6.A-1.
 2. **Permitted Districts.** Permitted districts are defined in Table 6.A-1. Refer to III.1 Zoning Districts for more information.
 - a. **NO and O: Office Districts Restriction.** No more than fifty (50) percent of the total commercial space may be office districts
 - b. **R7: Multifamily District Restriction.** No more than twenty (20) percent of all Dwelling Units may be Multifamily.
 - c. **R6: Attached District Restriction.** No more than ten (10) percent of all Dwelling Units may be Attached.
 - d. **RE: Ex-Urban District Restriction.** No more than ten (10) percent of all Dwelling Units may be Ex-Urban.
- C. Open Space Requirements.**
1. Refer to II.1.D for General Open Space Requirements.
 2. Refer to Table 6.A-1 for permitted open space districts, and Neighborhood Scale Open Space Requirements.
- D. Block Design and Street Layout.**
1. **Street Configuration.** Refer to II.1.E for General Block, Lot, and Street Design Requirements.
 - a. Refer to Table 6.A-1 for specific Block and street layout requirements, including maximum Block size, minimum number of intersections per square mile of Developable Area, minimum miles of Street Centerlines per square mile of Developable Area, and minimum number of Access Points per Open Boundary.
 - b. **Mixed Use, Commercial and Office Districts Blocks.** Pedestrianways shall be provided through the Block for every four hundred (400) feet of Block Face.
 - c. **Residential Districts Block Size Exception.** If a mid-Block Pedestrianway is provided, Block Length may be increased to twelve hundred (1,200) feet.
 2. **Street Types.** Permitted Street Types and their requirements are designated on Table 6.A-1. Refer to II.8 Street Type Standards for more information.
 - a. **Connectors.** Connectors shall not constitute more than ten (10) percent of the linear miles of Street Centerline.
 - b. **Boulevards and Avenues.** Boulevards and Avenues may be used only for streets designated as future streets on the Comprehensive Plan.

Illustration Key

	NC: Neighborhood Commercial		RE: Ex-Urban
	C1: Community Commercial		R1: Suburban Estate
	C2: Regional Commercial		R2: Suburban Manor
	NO: Neighborhood Office		R3: Suburban Cottage
	O: Community Office		R4: Urban Estate
	OS1: Neighborhood Civic Space		R5: Urban Manor
	OS2: Neighborhood Open Space		R6: Attached
	OS3: General Open Space		R7: Multifamily
	OS4: Outdoor Recreation		
	OS5: Conservation Area		

II. Neighborhood Development Regulations Section 6 - Neighborhood Type V Requirements

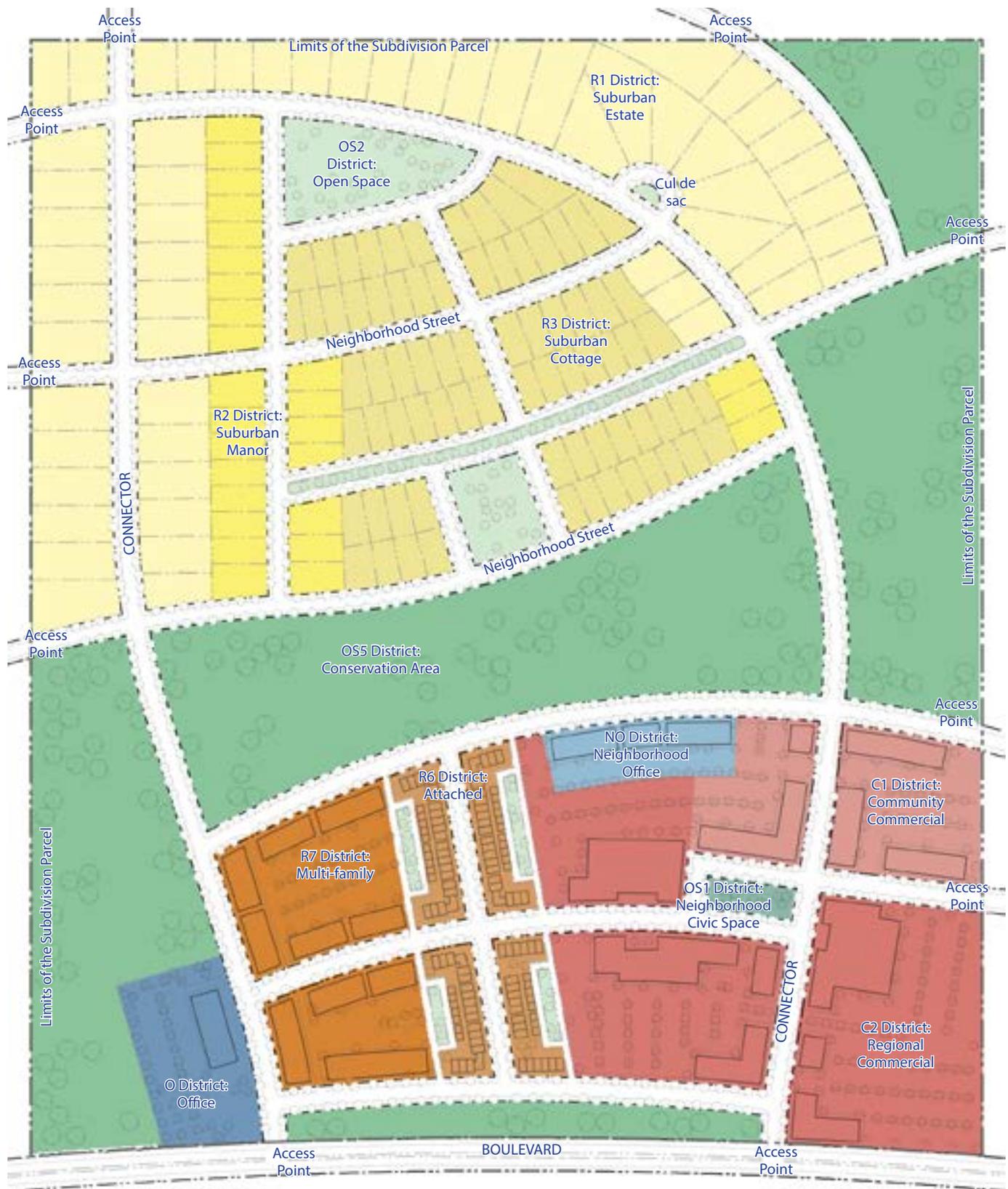


Figure 6.A-1. Neighborhood Type V Illustration (not to scale).

II. Neighborhood Development Regulations Section 6 - Neighborhood Type V Requirements

		Type V			
		less than 15 Acres of Developable Area	15-30 Acres of Developable Area	30-50 Acres of Developable Area	more than 50 Acres of Developable Area
Commercial Minimum Requirements minimum Gross Building Area (in sf) of permitted commercial and office districts		minimum 20,000 sf	minimum 20,000 sf	minimum 40,000 sf	minimum 50,000 sf
Commercial Maximum Limitations maximum Gross Building Area (in sf) of permitted commercial and office districts		no maximum	no maximum	no maximum	no maximum
Minimum Residential Mix Requirements minimum 10 Dwelling Units of minimum number of different permitted residential districts		no minimum	at least 1 District	at least 3 different Districts	at least 3 different Districts
Mixed Use/ Commercial, Office & Institutional Districts	NC District: Neighborhood Mixed Use/Commercial	●	●	●	●
	C1 District: Community Mixed Use/Commercial	●	●	●	●
	C2 District: Regional Mixed Use/Commercial	●	●	●	●
	NO District: Neighborhood Office NO & O Districts maximum 50% of total commercial space	●	●	●	●
	O District: General Office NO & O Districts maximum 50% of total commercial space	●	●	●	●
	P District: Institutional				
Residential Districts	R7 District: Multifamily Building	● (no more than 20% of all Dwelling Units)	● (no more than 20% of all Dwelling Units)	● (no more than 20% of all Dwelling Units)	● (no more than 40% of all Dwelling Units)
	R6 District: Attached House	● (no more than 10% of all Dwelling Units)	● (no more than 10% of all Dwelling Units)	● (no more than 10%-of all Dwelling Units)	● (no more than 10% of all Dwelling Units)
	R5 District: Urban Manor		●	●	●
	R4 District: Urban Estate		●	●	●
	R3 District: Suburban Cottage			●	●
	R2 District: Suburban Manor			●	●
	R1 District: Suburban Estate			●	●
	RE District: Ex-Urban				
	AG District: Rural Single Family, Agriculture				

Table Key
● Permitted

Table 6.A-1. Neighborhood Type V Requirements.

II. Neighborhood Development Regulations

Section 6 - Neighborhood Type V Requirements

		Type V		
		less than 15 Acres of Developable Area	15-30 Acres of Developable Area	more than 30 Acres of Developable Area
Neighborhood Scale Open Space Requirements	Residential: Neighborhood Scale Open Space Requirement	One permitted Open Space District (OS) required within 1/6 mile of each residential unit.		
	Non-Residential: Neighborhood Scale Open Space Requirement	Minimum one OS District permitted Open Space District (OS) within 1/8 mile of the front door of each non-residential unit.		
Permitted Open Space Districts	OS5 District: Conservation	● (Required for Conservation Areas, Streamside Management Buffers, and Scenic Corridor Buffers only. Refer to III.1.D(5)(e))		
	OS4 District: Outdoor Recreation	●	●	●
	OS3 District: General Open Space	●	●	●
	OS2 District: Neighborhood Open Space	●	●	●
	OS1 District: Neighborhood Civic Space	●	●	●
Street Configuration	Cul-de-sacs (refer to II.8.Q)	not permitted		maximum 10 per Developable Square Mile
	Intersections Minimum Number per Developable Square Mile	100		
	Street Centerlines (miles) Minimum Number per Developable Square Mile	18		
	Access Points Minimum Number per Open Boundary	minimum 2 total and 1 per every 1200' of Open Boundary		
	Commercial Maximum Block Size (in feet)	600' deep by 1000' long		
	Commercial Block Pedestrianway Requirement	every 400' of Block Face		
	Residential Maximum Block Area size (in feet) (no maximum Block size for R-1 or AG District Blocks)	350' deep by 700' long (see exception II.6D(1)(c))		
Street Types	Street Type: Alley	permitted per Building Type (refer to III.3)		
	Street Type: Boulevard	●		
	Street Type: Urban Avenue	●		
	Street Type: Rural Avenue			
	Street Type: Urban Connector	●		
	Street Type: Rural Connector			
	Street Type: Urban Neighborhood Street	●		
	Street Type: Rural Neighborhood Street	●		
	Conservation Street Overlay	permitted on all Street Types (refer to II.8)		

Table Key

● Permitted

Table 6.A-1. (continued) Neighborhood Type V Requirements.

II. Neighborhood Development Regulations

Section 7 - Campus Neighborhood Requirements

- A. General Requirements.**
1. **Intent.** Campus Neighborhood Type is intended to provide a single-use purpose, such as a recreational park, hospital, school, or office park. Residential development is not permitted.
 2. **Applicability.** The Campus Type is not mapped, but may be utilized through recommendation of the MPC during the Preliminary Plat Process (I.4.C) and approval of the BOC through Rezoning (I.4.L) in any location, meeting the following conditions:
 - a. The Campus shall not be developed directly adjacent to residential Uses, but shall be separated from those Uses by a major road (Boulevard, Avenue, or Scenic Corridor per II.8; or a Highway), railroad, or City Waterway.
 - b. The Campus shall have at least one (1) connection to one of the following Highways or their frontage road: Paul Barrett Parkway/State Route 385, U.S. Highway 70, Interstate 40, and U.S. Highway 64.
 - c. Standards in blue text are applicable to subdivision requirements, and black text is applicable to zoning requirements.
 3. **Neighborhood Type Illustration.** Figure 7.A-1 conceptually illustrates one hypothetical example that graphically represents a combination of the requirements of a Campus Neighborhood. (map not to scale).
- B. Zoning Districts and Requirements.**
1. **Minimum Size.** The minimum size of a Parcel for development as a Campus Neighborhood Type is ten (10) acres.
 2. **Zoning District Requirements.** Refer to II.1.C for General Zoning District Requirements.
 - a. Commercial and office district minimum and maximum requirements are defined in Table 7.A-1.
 - (1) **Location.** Mixed Use and commercial districts shall be located on an Avenue or Connector Street Type within the Applicant's Property. The edge of the commercial Node shall be located less than one (1) Block from the an Avenue, Boulevard, Scenic Corridor, or Highway.
 2. **Permitted Districts.** Permitted districts are defined in Table 7.A-1. Refer to III.1 for more information on each Zoning District.
 - a. **C1 and C2: Commercial Districts Restriction.** No more than fifty (50) percent of the total space may be commercial districts.
 - b. **C2 District.** C2 District is permitted and may have Warehouse Retail Uses with greater than 75,000 square feet in Gross Building Area.

- C. **Open Space Requirements.**
 1. Refer to II.1.D for General Open Space Requirements.
 2. Refer to Table 7.A-1 for permitted open space districts, and Neighborhood Scale Open Space Requirements.
 3. **Office Open Space Requirement.**
 - a. A minimum of one (1) OS1 District is required for every lot zoned office that is 5 acres or more.
 - b. A minimum of one (1) permitted open space district shall be located within one-sixth (1/6) mile of the Front Lot Line of every office district.
- D. **Block Design and Layout.**
 1. **Street Configuration.** Refer to II.1.E for General Block, Lot, and Street Design Requirements.
 - a. Refer to Table 7.A-1 for specific Block and street layout requirements, including maximum Block size, minimum number of intersections per square mile of Developable Area, minimum miles of Street Centerlines per square mile of Developable Area, and minimum number of Access Points per Open Boundary.
 - b. Pedestrianways shall be provided through the Block for every four hundred (400) feet of Block Face.
 2. **Street Types.** Permitted Street Types and their requirements are designated on Table 7.A-1. Refer to II.8 Street Type Standards for more information.
 - a. **Boulevards and Avenues.** Boulevards and Avenues may be used only for streets designated as future streets on the Comprehensive Plan.

Illustration Key

 NC: Neighborhood Commercial	 RE: Ex-Urban
 C1: Community Commercial	 R1: Suburban Estate
 C2: Regional Commercial	 R2: Suburban Manor
 NO: Neighborhood Office	 R3: Suburban Cottage
 O: Community Office	 R4: Urban Estate
 OS1: Neighborhood Civic Space	 R5: Urban Manor
 OS2: Neighborhood Open Space	 R6: Attached
 OS3: General Open Space	 R7: Multifamily
 OS4: Outdoor Recreation	
 OS5: Conservation Area	

II. Neighborhood Development Regulations Section 7 - Campus Neighborhood Requirements

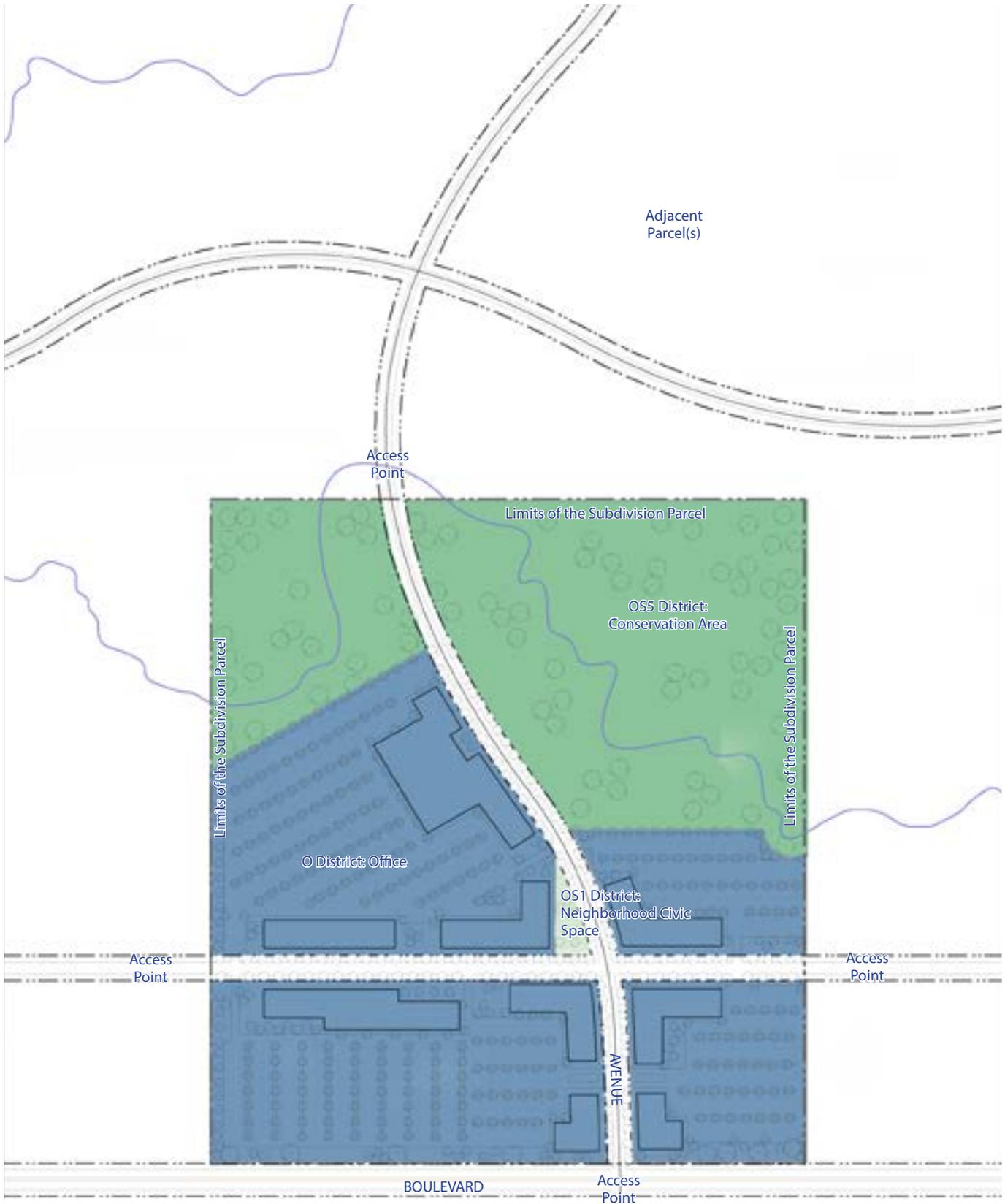


Figure 7.A-1. Campus Neighborhood Type Illustration (not to scale).

II. Neighborhood Development Regulations Section 7 - Campus Neighborhood Requirements

		Campus
		All Sizes
	Commercial Minimum Requirements minimum Gross Building Area (in sf) of permitted commercial and office districts	no minimum
	Commercial Maximum Limitations maximum Gross Building Area (in sf) of permitted commercial and office districts	no maximum
	Minimum Residential Mix Requirements minimum 10 Dwelling Units of minimum number of different permitted residential districts	not applicable
Mixed Use/Commercial, Office & Institutional Districts	NC District: Neighborhood Mixed Use/Commercial	
	C1 District: Community Mixed Use/Commercial maximum 50% of total commercial & office space	●
	C2 District: Regional Mixed Use/Commercial	●
	NO District: Neighborhood Office	
	O District: General Office	●
	P District: Institutional	●
Residential Districts	R7 District: Multifamily Building	
	R6 District: Attached House	
	R5 District: Urban Manor	
	R4 District: Urban Estate	
	R3 District: Suburban Cottage	
	R2 District: Suburban Manor	
	R1 District: Suburban Estate	
	RE District: Ex-Urban	
	AG District: Rural Single Family, Agriculture	

Table Key
● Permitted

Table 7.A-1. Campus Neighborhood Type Requirements.

II. Neighborhood Development Regulations

Section 7 - Campus Neighborhood Requirements

		Campus
		All Sizes
Neighborhood Scale Open Space Requirements	Residential: Neighborhood Scale Open Space Requirement	not applicable
	Non-Residential: Neighborhood Scale Open Space Requirement	One Open Space District (OS) required for every 100,000 sf of Gross Building Area, within 1/6 mile of entrance.
Permitted Open Space Districts	OS5 District: Conservation	● (Required for Conservation Areas, Streamside Management Buffers, and Scenic Corridor Buffers only. Refer to III.1.D(5)(e))
	OS4 District: Outdoor Recreation	
	OS3 District: General Open Space	●
	OS2 District: Neighborhood Open Space	●
	OS1 District: Neighborhood Civic Space	●
Street Configuration	Cul-de-sacs (refer to II.8.Q)	not permitted
	Intersections Minimum Number per Developable Square Mile	100
	Street Centerlines (miles) Minimum Number per Developable Square Mile	18
	Access Points Minimum Number per Open Boundary	minimum 2 total and 1 per every 1800' of Open Boundary
	Commercial Maximum Block Size (in feet)	600' deep by 1000' long
	Commercial Block Pedestrianway Requirement	every 400' of Block Face
	Residential Maximum Block Area size (in feet) (no maximum Block size for R-1 or AG District Blocks)	not applicable
Street Types	Street Type: Alley	permitted per Building Type (refer to III.3)
	Street Type: Boulevard	●
	Street Type: Urban Avenue	●
	Street Type: Rural Avenue	●
	Street Type: Urban Connector	●
	Street Type: Rural Connector	●
	Street Type: Urban Neighborhood Street	
	Street Type: Rural Neighborhood Street	
	Conservation Street Overlay	permitted on all Street Types (refer to II.8)

Table Key
● Permitted

Table 7.A-1. (continued) Campus Neighborhood Type Requirements.

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II. Neighborhood Development Regulations: Section 8 - Street Type Standards

II. Neighborhood Development Regulations Section 8 - Street Type Standards

- A. General Requirements.
1. Intent. The standards outlined in this Section are intended to accomplish the following.
 - a. Create a logical and comprehensible system of streets and street names that result in a simple, consistent and understandable pattern of Blocks, Lots, and house numbers.
 - b. Encourage safe and efficient traffic flow and provide adequate access to all Lots for vehicles and pedestrians.
 - c. Create streets that are appropriate for their contexts in residential, commercial, or mixed Use districts and are designed to encourage travel at appropriate volumes and speeds.
 - d. Encourage streets that respect natural features by following topography and drainage systems, rather than interrupting or dead-ending at the feature.
 - e. Create streets and public Rights-of-Way that result in stormwater runoff quantity reduction and improved quality of stormwater runoff.
 2. Applicability. These standards apply to all vehicular Rights-of-Way within the City.
 3. Authority. This Section, II.8 Street Type Standards, falls within Subdivision authority, per the State of Tennessee, and is regulated by the Municipal Planning Commission (MPC).
 4. General Requirements. All proposed streets, Planting or Furnishings Zones, and sidewalks shall be located in dedicated vehicular Rights-of-Way as required by this Section.
 - a. Public Street. All vehicular Rights-of-Way, with the exception of Alleys, shall be dedicated for public Use, unless otherwise stated in II.8.A(4), below.
 - b. Private streets, with the exception of private Alleys, are permitted when all of the following conditions are met:
 - (1) The Subdivision is located adjacent to a City Waterway with no bridge connection or the boundary of another municipality with no existing connecting street.
 - (2) None of the streets in the Subdivision are included in the Major Roads Plan as part of the Recommended Transportation Plan.
 - (3) Any access limitation, including gating of the street, shall be considered for approval, approval with conditions, disapproval, or other applicable action separately by the MPC and shall not interrupt the pedestrian, vehicular, and bicycle connectivity through the City or to any public open space.
 - (4) The private Rights-of-Way and street configuration shall be designed to the standards herein, including one of the Street Types.
 - c. Private Alleys are permitted, but shall be designed to meet the standards herein.
 - d. Right-of-Way Features. Where the design requirements stipulate the provision of turning lanes, turning radii, center medians, traffic control devices, or other installations which cannot be installed within the existing Right-of-Way (as otherwise required without the elimination of or conflict between those features and other Public Improvements), the developer shall dedicate such additional Right-of-Way as is necessary to accommodate all such improvements.
5. AASHTO standards. When a requirement is defined as per AASHTO standards, refer to "A Policy on Geometric Design of Highways and Streets," most current edition, prepared by the American Association of State Highway and Transportation Officials (AASHTO).
 6. Americans with Disabilities Act (ADA). All designs shall conform to the most recent version of the ADA standards and any more stringent State of Tennessee regulation.
 7. Street Names. New street names shall follow the Memphis Light, Gas, and Water's (MLGW) Street Naming Guide for Memphis and Shelby County, Tennessee, available at City Hall.
 - a. Existing Street Names. All existing street names that do not follow MLGW standards may continue to be used and those names may be used on extensions of the existing street.
 - b. Cul-de-sac Streets. Cul-de-sac street names shall be a continuation of the street of which they are a part.
 8. City Standards. Streets, sidewalks, and pedestrian ways, shall be constructed in accordance with the City of Lakeland Manual for Public Works Construction and Material Specifications.
- B. Map of Street Types.
- To better apply the provisions of these Land Development Regulations and to provide context for any future Rights-of-Way and future improvements to existing Rights-of-Way, existing streets and streets designated as future on the Comprehensive Plan are mapped in accordance with the Street Types outlined in II.G through P Street Type Standards (refer to Figure 8.B). This map is provided for reference only. Should the information included conflict with the Comprehensive Plan, the Comprehensive Plan shall prevail. .

II. Neighborhood Development Regulations

Section 8 - Street Type Standards

C. General Street Type Standards.

1. **Street Types.** The Street Types outline acceptable street configurations. New streets shall be designed using the principles and characteristics defined by each Street Type. The MPC may require additional Right-of-Way, pavement width, or additional street elements depending on unique site characteristics.
2. **Summary Street Type Table.** Table 8.C-2 summarizes the requirements of each Street Type.
3. **Conservation Street Overlay.** A Conservation Street Overlay may be required or optionally utilized over another Street Type when there are considerable natural resources to be preserved. Refer to II.8.P for specific requirements of the Conservation Street Overlay.
4. **Graphics.** The graphics provided here for each Street Type illustrate only one possible configuration of that Street Type. By applying the standards outlined, other configurations may be determined acceptable per II.8.A(1) Intent.
5. **Typical Street Elements.** Typical elements of a vehicular Right-of-Way are divided into the Vehicular and Pedestrian Realm. Each Street Type outlines which facilities are applicable. Refer to Figure 8.C-1: Typical Right-of-Way Elements.
 - a. **Vehicular Realm.** The vehicular realm is comprised of the travel lanes, bicycle lanes, and parking lanes.
 - b. **Pedestrian Realm.** The pedestrian realm is typically comprised of pedestrian facilities, such as sidewalk, path/trail, or off-street bicycle path, and a buffer area, consisting of a Planting Zone or Furnishings Zone that serves to buffer pedestrians or bicyclists from the movements of higher speed

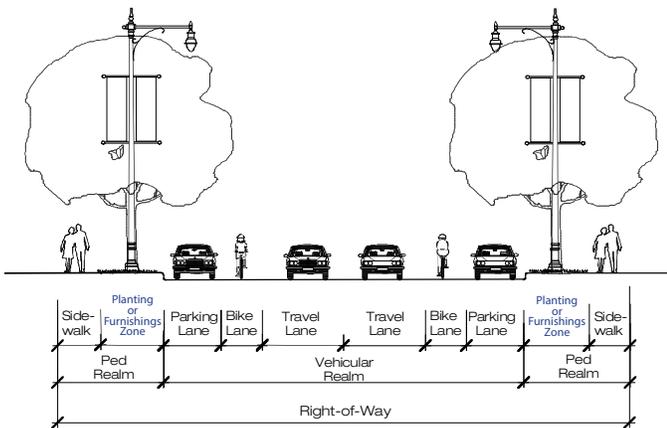


Figure 8.C-1. Typical Right-of-Way Elements.

vehicles in the vehicular realm.

- (1) **Planting Zone.** A Landscape Area from the back of curb or edge of pavement to the sidewalk in which street trees, Swales, lighting, and signage may be located. Sidewalks may cross the Planting Zone. Typically used adjacent to residential buildings.
 - (2) **Furnishings Zone.** A hardscape area that extends the sidewalk to the back of curb, in which street trees in Tree Wells, street furniture, lighting, and signage may be located. Typically used adjacent to commercial or office buildings and requires approval of MPC.
6. **Bicycle Facilities.**
 - a. Bicycle facilities shall be provided per the City's current Comprehensive Plan.
 - b. Three (3) types of bicycle accommodations are permitted in the vehicular realm.
 - (1) **Dedicated Bicycle Lane.** Dedicated bicycle lanes are striped lanes on the outside of the outermost travel lanes that are designated for only bicycle use. This lane occurs on both sides of the street and shall be five (5) to six (6) feet wide. Refer to Figure 8.C-2.
 - (2) **Designated Shared Lane.** A designated shared lane is a lane that is shared between vehicles and bicycles. This lane has a minimum width of fourteen (14) feet. An arrow and bicycle symbol is painted on the outer edge of the lane to denote shared use. This improvement occurs on both directions. Refer to Figure 8.C-2.

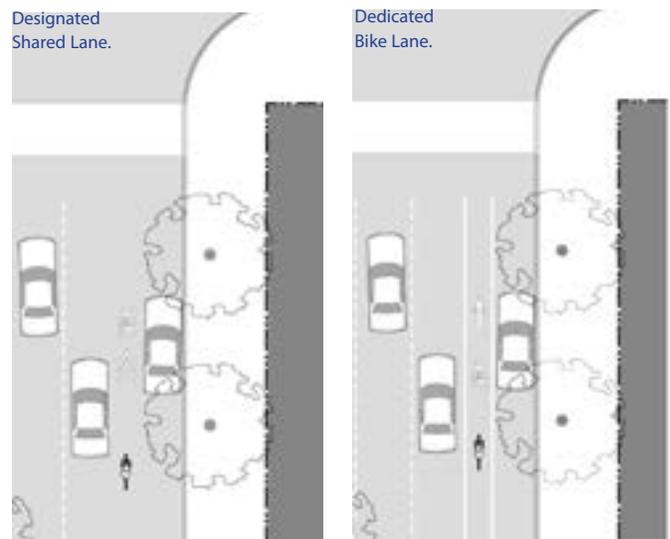


Figure 8.C-2. On-Street Bicycle Facilities.

II. Neighborhood Development Regulations Section 8 - Street Type Standards

- (3) Shared Lane. A shared lane refers to a street that does not have bicycle lanes or a designated shared lane, but the speed and configuration of the street is such that bicycles could comfortably share lanes with traffic.
7. Fire Access. Street configurations have been calculated to provide fire truck access. Where the total width of all travel lanes totaled is narrower than twenty-two (22) feet, the following shall apply.
 - a. Room to Pass. At one hundred (100) foot increments, a twenty (20) foot opening in the on-street parking or a twenty (20) foot dedicated pull-off space shall be provided to allow vehicles to pull over for a fire truck to pass.
 - b. Driveway or Fire Hydrant Zone. A driveway or fire hydrant zone may be utilized to fulfill the requirement.
 - c. County Fire Regulations. Refer to the Shelby County Fire Prevention Code, as amended, for additional information when applicable.
 8. Vehicular On-Street Parking. On-street parking, as permitted on designated Street Types, shall meet the following requirements.
 - a. Parallel and diagonal parking is permitted on designated Street Types.
 - b. Vehicular Parking Space Dimensions. The appropriate dimensions for parking spaces are outlined in Table 8.C-1 On-Street Parking Space Dimensions and Figure 8.C-3 Diagonal On-street Parking Layout. The width of a parking space shall be measured from the center of a stripe.
 9. Scenic Corridor Buffer. For the Scenic Corridor Street Type, Scenic Corridor Buffers are required adjacent to the existing or proposed street Right-of-Way.
 - a. Intent. Scenic Corridor Buffers are intended to preserve and extend the existing landscape character adjacent to the street so that the result is a consistent native tree buffer. Where a trail does no occur in the right-of-way, these buffers

may sometimes provide a location for a trail along the street, per the Street Type, and per the Comprehensive Plan.

- b. Platting. Scenic Corridor Buffers shall be established according to the following:
 - (1) For new Subdivisions (refer to I.4.C Preliminary Plat), Buffers shall be platted as separate Lots and zoned OS5.
 - (2) Buffers shall be fully accessible from the adjacent street Right-of-Way, so the street Right-of-Way and the Buffer is continuous.
 - (3) Fences are not permitted within Scenic Corridor Buffers.
 - (4) No structures shall be permitted in the Buffers.
- c. Size. Refer to Street Type for size of Buffer.
- d. Exception. See II.D.5(b) for potential reduction in Scenic Corridor Buffer.
- e. Tree Planting and Preservation Requirements. The Tree Planting and Preservation Requirements for Scenic Corridor Buffers in Section III.5.N of the Zoning Ordinance, as may be amended, are duplicated and incorporated by reference herein as part of the Subdivision Regulations.

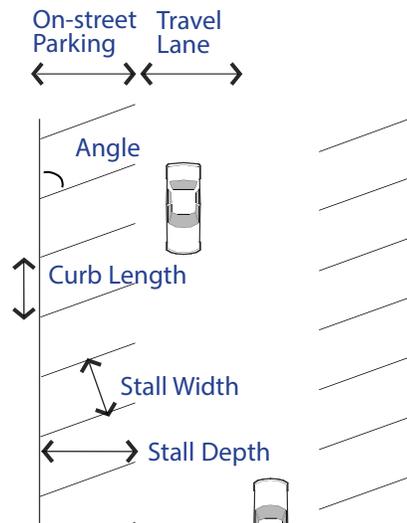


Figure 8.C-3. On-Street Parking Layout.

Angle (degrees)	Curb Length (feet)	Stall Width (feet)	Stall Depth (feet)	Travel Lane Width: One-Way (feet)	Travel Lane Width: Two-Way (feet)

Table 8.C-1. On-Street Parking Space Dimensions.

II. Neighborhood Development Regulations

Section 8 - Street Type Standards

10. Planting Zones and Street Trees. The plan submission, planting standards, and maintenance requirements for street trees and adjacent planting zones in Zoning Ordinance III.5 A & B are duplicated and incorporated into the Subdivision Regulations.
 11. Planting Zone Requirements. Refer to III.5 Landscape for all installation and maintenance requirements for landscape.
 - a. Ground Plane Vegetation. Planting Zones shall be planted with turf per all of the planting requirements of III.5 Landscape.
 - b. Irrigation. Temporary irrigation is required until complete establishment of the turf. Permanent irrigation may be provided.
 - c. Swales. Where drainage swales are required for the Street Type, refer to II.10 Stormwater Management.
 - (1) Landscape. All Swales shall be landscaped with appropriate plant materials.
 - (2) Maintenance. Swales shall be maintained as part of the Stormwater Management Plan for the site.
 - (3) Crossings. Sidewalks crossing Swales shall be handled in one of the following ways:
 - (a) Bridge.
 - (b) Panel of concrete sidewalk suspended over the Swale.
 - (c) Culverts under the sidewalk.
 12. Street Trees. Street trees are required along all new streets, planted within the Planting or Furnishing Zone.
 - a. Refer to III.5 Landscape for tree size, type, installation, and maintenance requirements for street trees.
 - b. Tree Plan and Schedule. During the Preliminary Plat Process, a tree plan and schedule shall be submitted, including the following information:
 - (1) Refer to Zoning Ordinance III.5.A, Street Tree and Landscape Schedule Requirements, which are duplicated and incorporated into the Subdivision Regulations by reference, for additional Street Tree and Landscape Plan requirements.
 - (2) Location of all street tree planting areas.
 - (3) Conservation Street Overlay locations, showing existing trees and any new infill street trees.
 - (4) Summary table with estimated number of street trees expected to be planted at completion
 - (5) Summary of street trees expected to be planted by homebuilders
 - (6) Summary of street trees expected to be planted by developer
- (7) General standards for the plantings including tree species mix and minimum, maximum, and average tree spacing.
 - c. Street Tree Size. All street trees are required to be a minimum two (2) inches in Caliper when installed.
 - (1) Adjacent to NC, C1, C2, and NO Districts, minimum clear branch height is six and a half (6 1/2) feet at time of planting.
 - d. Street Tree Type. Medium and large overstory trees are permitted to be installed as street trees. Refer to the list of permitted tree types maintained at City Hall.
 - e. Street Tree Spacing. Street trees shall be planted as follows.
 - (1) Each Lot is required to have one (1) tree for every forty (40) feet of street frontage with a minimum of one (1) street tree per street frontage.
 - (2) Spacing by Tree Size.
 - (a) Large trees shall be spaced a minimum of thirty (30) and a maximum of fifty (50) feet on center.
 - (b) Medium trees shall be spaced a minimum of twenty (20) and a maximum of forty (40) feet on center.
 - f. Tree Wells. In NC, C1, C2, NO, O, and P Districts, where the sidewalk extends from the back of curb to the Property Line, Tree Wells shall be utilized.
 - (1) For Tree Wells smaller than four (4) feet wide and six (6) feet in length, open pit is not permitted.
 - (2) The opening shall be covered with a tree grate or Semi-Pervious Surface.
 - (3) The opening in a tree grate for the trunk shall be expandable.

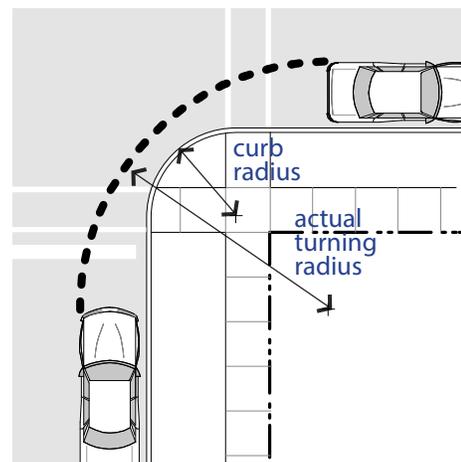


Figure 8.E-1. Actual Right Turn Radius with On-Street Parking.

II. Neighborhood Development Regulations Section 8 - Street Type Standards

- D. General Street Layout Requirements.
1. General Layout Standards. The following standards apply to new streets or newly Platted vehicular Rights-of-Way.
 - a. Treatment of Natural Features. Streets shall be designed to respect natural features by following rather than interrupting or dead-ending at the feature.
 - b. Curved Street Alignment.
 - (1) Hilly Character. Street layout shall retain the character of any existing hilly terrain, to the extent practical.
 - (2) Horizontal Alignment. When street lines deflect from each other by more than ten (10) degrees in alignment, the Street Centerline shall be connected by a curve with a minimum radius meeting American Association of State Highway and Transportation Officials (AASHTO) standards.
 - (3) Vertical Alignment. Minimum sight distances shall be designed to AASHTO standards.
 - c. Street pattern information is provided per each Neighborhood Type.
 2. Interconnected Street Pattern. The network of streets shall form an interconnected pattern with multiple intersections with the following features:
 - a. Street Network. The arrangement of streets shall provide for the continuation of existing streets from adjoining areas into new Subdivisions.
 - b. Public Access Points. All Subdivisions with new street Right-of-Way shall have a minimum of two (2) public Access Points, with the following exception.
 - (1) When less than three quarters (3/4) of the Parcel's perimeter is Open Boundary and the Applicant's Property is less than ten (10) acres, the MPC may accept one (1) Access Point.
 3. Disconnected streets may take the following forms:
 - a. Stub Streets. Where adjoining areas are not subdivided, streets in new Subdivisions shall be extended to the boundary line of the Applicant's Property to make provision for the future projection of streets into adjacent areas.
 - (1) Where abutting property is not subdivided, stub streets shall be provided at intervals no greater than the maximum Block Size required in II.1 to 7 Neighborhood Types.
 - (2) Existing stub streets adjacent to a proposed Subdivision shall be connected.
 - b. Half Streets. The construction of a Half Street shall be prohibited unless otherwise approved by the MPC in unusual circumstances that make it essential and where satisfactory assurance for Dedication of the remaining part of the street is provided.
 - (1) Proposed Half Streets along the periphery of the Subdivision shall have no less than one-half of the Right-of-Way Dedicated and fully constructed.
 - (2) Existing Half Streets adjacent to a proposed Subdivision shall be completed with the Dedication of the remaining Right-of-Way and the complete construction of the street with the development of said proposed Subdivision and property development.
- E. Intersection Design.
1. Intent. The following outlines the regulations for developing and reconstructing safe and accessible intersections for vehicles and pedestrians.
 2. Applicability. These standards apply to all planned intersections and shall also be applied to existing intersections when other improvements are made, such as redesign or reconfiguration.
 3. Alignment of Intersections. New streets shall be aligned with existing streets when possible. The following guidelines shall be used for intersection alignment.
 - a. Number of Streets. No more than two (2) streets shall intersect at any point.
 - b. Angle of Intersection. Streets should be aligned to intersect at right angle; the angle of intersection of Street Centerlines shall be not less than eighty (80) degrees nor more than one hundred (100) degrees.
 - c. Centerline Offsets. With the exception of Neighborhood Streets, Street Centerline offsets shall be avoided. Otherwise, Centerline offsets shall be greater than one-hundred twenty-five (125) feet.
 - d. Sight Triangles. Minimum clear sight distance at all intersections except a Neighborhood Street to a Neighborhood Street shall be defined by AASHTO.
 - e. Vertical Alignment. An extension of the through street cross slope shall be provided.
 - (1) This cross slope shall be carried back one hundred (100) to two hundred (200) feet each way from the intersection of the two (2) Street Centerlines.
 - (2) An allowance of two (2) percent maximum intersection grade shall be permitted.
 - f. Exceptions that are deemed necessary by MPC due to topography may result in an MPC waiver of any of these standards, if alternative standards that have been approved by the Code Administrator have been supplied.
 4. Curb Radii. The following curb radii shall be utilized.
 - a. Intersections shall be designed for the typical design vehicle as opposed to the maximum design vehicle.

II. Neighborhood Development Regulations

Section 8 - Street Type Standards

- b. Small curb radii shall be used at intersections to shorten pedestrian crossing distances and reduce vehicle turning speeds, balancing the ease of travel of the vehicles and pedestrians.
 - c. Neighborhood and Connector Streets. At the intersection of any street with a Neighborhood or a Connector Street, the following curb radii shall be utilized.
 - (1) With on-street parking on both streets, a ten (10) foot radius may be utilized.
 - (2) Without on-street parking, a twenty five (25) foot radius is required.
 - d. Avenue and Boulevard Streets. At the intersection of Avenues to Avenues or Boulevards, and Boulevards to Boulevards, the following curb radii shall be utilized.
 - (1) With on-street parking on both streets, a twelve (12) foot radius is required.
 - (2) Without on-street parking on either street, a thirty (30) foot radius is required.
 - e. Larger Radius. When the design vehicle requires a larger curb radius, a thirty (30) foot radius may be utilized for Avenue and Boulevard Streets. Larger radii require approval of the Code Administrator through Construction Plan process (refer to I.4.D) and may only occur in Type V Subdivisions or adjacent to M1 and M2 districts, C2 districts, or O districts.
 - f. Alley Intersections. The curb radius at intersections involving Alleys shall meet driveway curb radius requirements.
5. Crosswalks. Crosswalks shall be required at all intersections involving Connectors, Avenues, or Boulevards. Crosswalks shall also be required at mid-Block locations, or at spacings not longer than 350 feet, for areas where heavy pedestrian traffic is anticipated or Blocks are longer than one thousand (1000) feet.
 - a. Dimensions. Crosswalks shall be a minimum of six (6) feet and a maximum of ten (10) feet in width, measured from mid-stripe to mid-stripe.
 - b. Markings. Crosswalks shall be appropriately indicated on the finished street surface with taped markings unless MPC approves alternative materials.
 - c. Crossing Distances. To encourage pedestrian activity, typical crosswalks shall not extend over thirty-eight (38) feet without a landscape median, bulb-outs and/or other pedestrian refuge to mitigate the effects of vehicular traffic on crossing and increase pedestrian safety and comfort.
 - d. Any requirements of the American Disabilities Act (ADA) or any other more stringent state requirement shall be fulfilled.
 6. Accessible Ramps and Warning Panels. Accessible ramps and warning panels, per the American Disabilities Act (ADA) and any more stringent state requirement, are required where all sidewalks or trails terminate at a crosswalk or curb.
 - a. Ramp Orientation. Ramps shall be oriented perpendicular to traffic, requiring two ramps per corner at intersecting streets.
- F. Street Design Standards.
1. Intent. These standards shall ensure that all streets constructed within the City are done so with quality materials and with sound planning.
 2. Applicability. These standards apply to all planned vehicular Rights-of-Way and shall also be applied to existing intersections when other improvements are made, such as redesign, resurfacing, and reconfiguration.
 3. General Requirements. All streets, sidewalks, and pedestrian ways, shall use materials and be installed in a manner meeting or exceeding the requirements, standards, and specifications contained in this Section, The City of Lakeland Manual for Public Works Construction and Materials Specifications, and others contained in any documents referred to herein.
 4. Vehicular Realm. The vehicular realm shall be constructed or redeveloped using the following standards.
 - a. Grading.
 - (1) All trees that cannot be saved, stumps, boulders, and similar items in the street Right-of-Way shall be removed.
 - (2) All streets shall be graded to their full width, including side slopes and the subgrade of the areas to paved, unless an exception to II.8.D(3)(b) is provided by the MPC.
 - b. Width and Strength. Pavement width and structural strength shall be based on street classification, the expected traffic volume, and the Zoning District. Pavement width shall be measured to the front lip of the curb and gutter.
 - c. Materials and Methods.
 - (1) For all streets except Avenues and Boulevards, six (6) inches soil cement, two (2) inches asphalt binder, and one and a half (1 1/2) inches asphalt surface are required.
 - (2) For Avenues and Boulevards, eight (8) inches soil cement, two (2) inches asphalt binder, and two (2) inches asphalt surface are required.
 - (3) Geotechnical fabric for ground stabilization may be required.

II. Neighborhood Development Regulations Section 8 - Street Type Standards

- (4) The pavement thickness may be required to be substantiated per the methodology specified by the City and available at City Hall.
 - (5) All streets shall be designed and constructed in accordance with specifications, policies, and standards in current use by the City, available at City Hall.
 - d. Permeable Pavement. Where permeable pavement is required for any Street Type, acceptable permeable materials include permeable pavers, pervious concrete, or permeable asphalt. Gravel is not permitted.
 - e. Curbs, Gutters, and Ramps.
 - (1) Curb and gutters shall be constructed according to the standards approved by the City, available at City Hall.
 - (2) Refer to II.8.E(6) for accessibility requirements for curbs at sidewalks.
5. Pedestrian Realm. The pedestrian realm shall be constructed or redeveloped using the following standards.
 - a. Sidewalks. All sidewalks and Pedestrianways shall use materials and be installed in a manner meeting or exceeding the requirements approved by the Engineering Department.
 - b. Street Lighting. Refer to III.13 Site Lighting Requirements for additional information.
 - (1) The Applicant shall arrange with the local electric power company for electric service and shall bear the expense of any charge by the electric power company to furnish the service connection.
 - (2) The location of any service connection and the control equipment shall be shown on the construction drawings.
 - (3) Conduit shall be placed for all street lighting prior to pavement construction.
 - (4) Light poles and fixtures shall be coordinated with street tree location to ensure appropriate spacing.
 - (5) Light poles and conduits shall be installed prior to installation of trees and landscaping.
 - (6) All street lighting shall be owned and maintained privately, unless waived by the City of Lakeland.
 - c. Street Trees. Install Street Trees within all street Right-of-Ways per II.8.C(11) Street Trees.

II. Neighborhood Development Regulations
Section 8 - Street Type Standards

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II. Neighborhood Development Regulations Section 8 - Street Type Standards

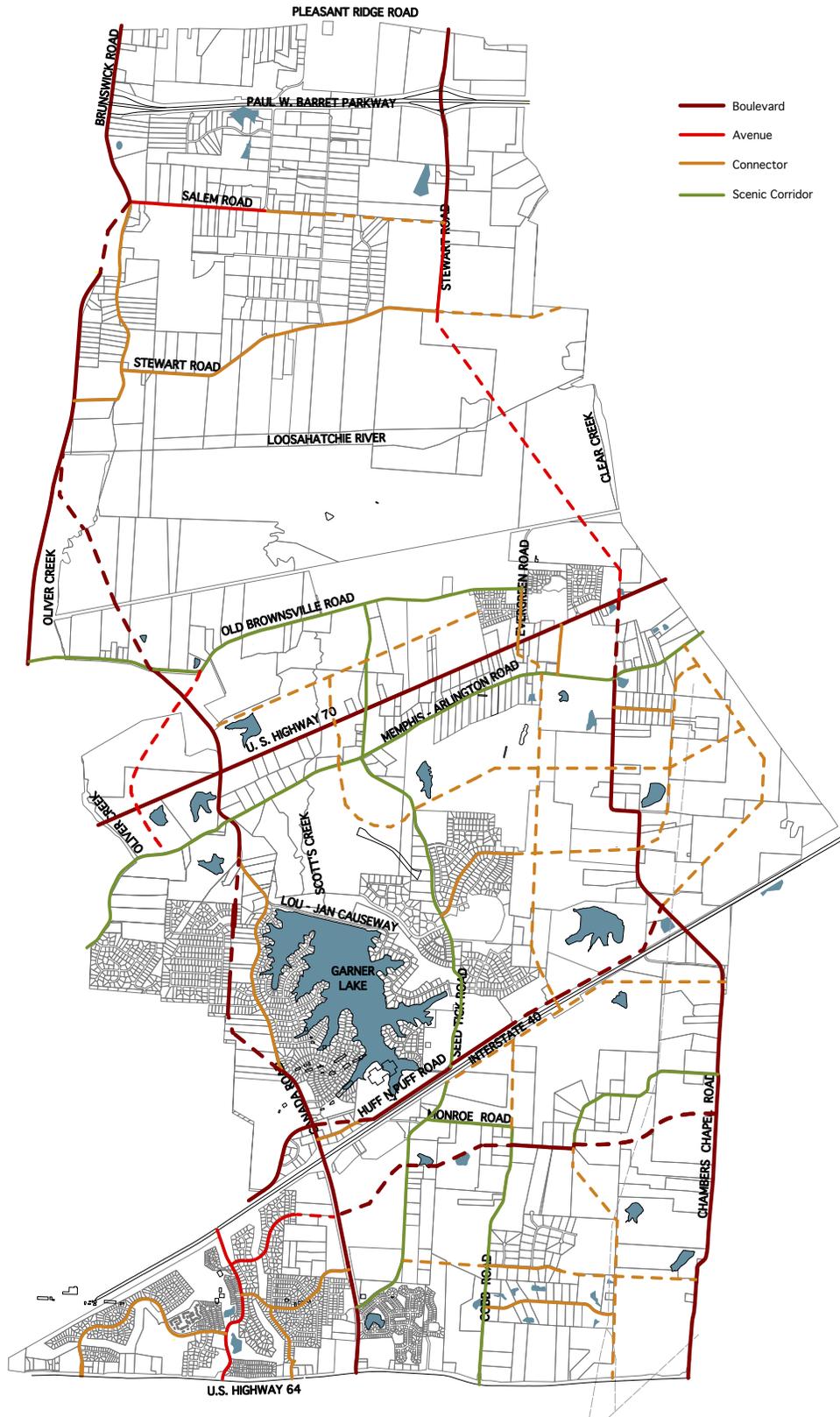


Figure 8.B. Street Type Map (not to scale).

II. Neighborhood Development Regulations

Section 8 - Street Type Standards

G. Alley.

1. Intent. The Alley is a very low capacity drive located at the rear of Parcels. From the Alley, access to parking facilities, loading facilities, and service areas, such as refuse and utilities is possible without a curb cut or driveway interrupting a Street Type. Refer to typical plan and section, Figure 8.G-1.
2. General Requirements. Alleys shall be developed using the standards in Table 8.G-1.
3. Location. Alleys are permitted per Neighborhood Types defined in II.1-7.
4. Ownership. Alley Right-of-Way shall be privately owned and maintained by a Owners' Association or other organization approved by the MPC as defined in the Covenants and Restrictions for the development (refer to I.5.D).
5. Dead-End Alleys. Dead-end Alleys are not permitted.

Section

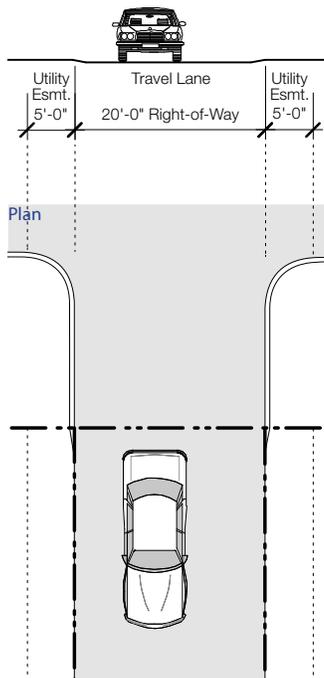


Figure 8.G-1. Typical Alley.

Alley Requirements

Alley Requirements	
Location	Permitted adjacent to the following districts: Commercial and Mixed Use Districts (NC1, C1, C2), Office District (NO,O), Residential (R1-R9)
Typical Right-of-Way Width	20'
Typical Capacity	Less than 200 average daily trips
Travel Lanes	1 yield lane
Lane Width	Minimum 9' Maximum 12'
Allowable Turning Lanes	None
Parking Lanes ¹	Prohibited in the Right-of-Way
Pavement Width	Minimum 16' Maximum 20'
Concrete Curbs	None, Concrete Ribbon, or Concrete Rollover
Target Speed	5 mph
Permitted Median	Prohibited
Bicycle Facilities ²	Shared
Pedestrian Facilities	Shared; travel lanes are shared among drivers, pedestrians, and bicyclists
Street Buffer	None required

1. Reference II.8.C(8) for on-street parking requirements

2. Reference II.8.C(6) for bicycle facility types and requirements.

Table 8.G-1. Alley Standards.

II. Neighborhood Development Regulations Section 8 - Street Type Standards

H. Rural Neighborhood Street.

1. **Intent.** The Rural Neighborhood Street is a low capacity street designed for slow speeds within a narrow Right-of-Way. It primarily serves those residences or businesses directly adjacent to it. Similar in Scale to the Urban Neighborhood Street, the Rural Neighborhood Street does not have raised curbs and the Right-of-Way includes a trail on at least one (1) side. Refer to typical plan and section, Figure 8.H-1.
2. **General Requirements.** The Rural Neighborhood Street shall be developed using the standards in Table 8.H-1.
3. **Location.** Rural Neighborhood Streets are permitted per Neighborhood Types defined in II.1-7.

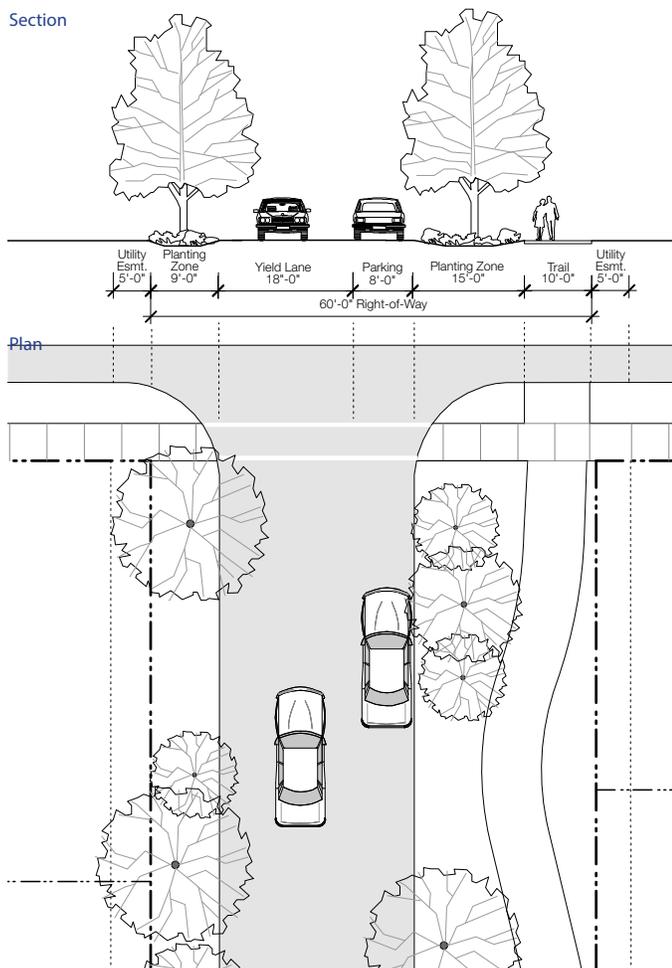


Figure 8.H-1. Typical Rural Neighborhood Street.

Rural Neighborhood Street Standards	
Location	Permitted adjacent to the following districts: Residential (R1-R9), Neighborhood Commercial Districts (NC1), Neighborhood Office District (NO), Agriculture District (A)
Typical Right-of-Way Width	60'
Typical Capacity	Less than 1,000 average daily trips
Travel Lanes	1 yield lane
Lane Width	18'
Allowable Turning Lanes	Permitted in place of parking at intersections
Parking Lanes ¹	Parallel optional on one side of street
Pavement Width	26'
Curbs / Shoulders	Concrete ribbon or 18" wide asphalt shoulder
Target Speed	15-20 mph
Median	Prohibited, unless conservation street
Bicycle Facilities ²	Shared
Pedestrian Facilities	Minimum 10' wide clear trail on one side
Street Buffer	Minimum 9' wide Planting Zone with drainage Swale on both sides

1. Reference II.8.C(8) for on-street parking requirements
2. Reference II.8.C(6) for bicycle facility types and requirements.

Table 8.H-1. Rural Neighborhood Street Standards.

II. Neighborhood Development Regulations

Section 8 - Street Type Standards

I. Urban Neighborhood Street.

- Intent.** The Urban Neighborhood Street is a low capacity street designed for slow speeds within a narrow Right-of-Way. It primarily serves those residences or businesses directly adjacent to it. Similar in Scale to the Rural Neighborhood Street, the Urban Neighborhood Street has curbs and the Right-of-Way includes sidewalks on both sides. Refer to typical plan and section, Figure 8.I-1.
- General Requirements.** The Urban Neighborhood Street shall be developed using the standards in Table 8.I-1.
- Location.** Urban Neighborhood Streets are permitted per Neighborhood Types defined in II.1-7.

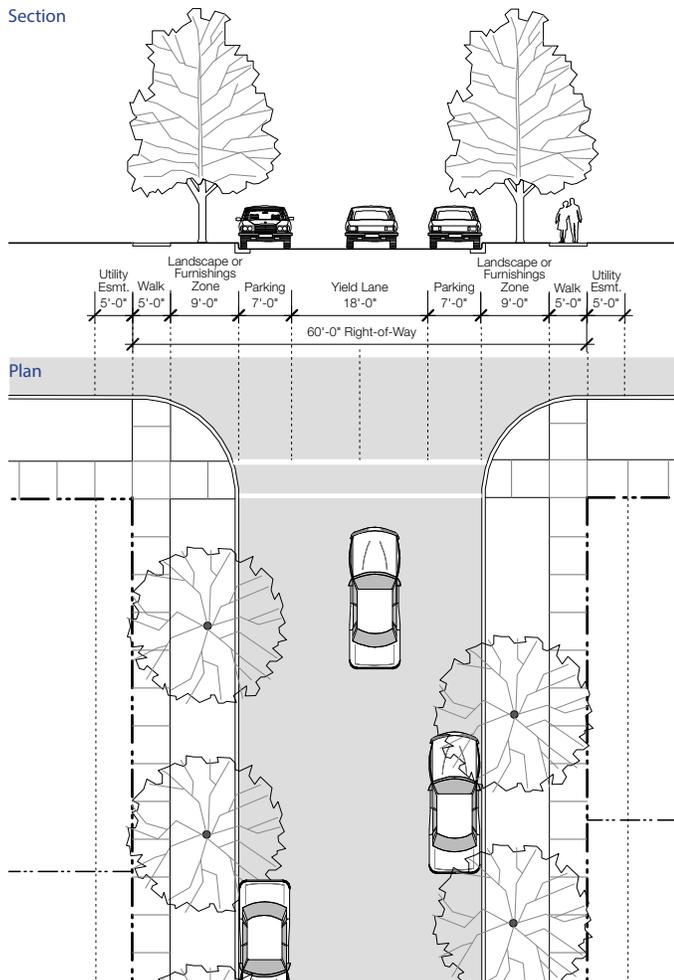


Figure 8.I-1. Typical Urban Neighborhood Street.

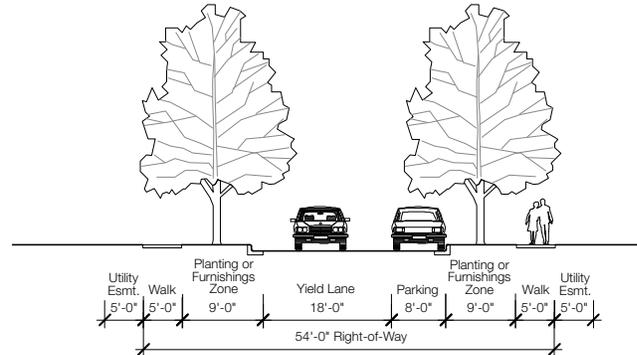


Figure 8.I-2. Alternative Urban Neighborhood Street.

Urban Neighborhood Street Standards	
Location	Permitted adjacent to all districts, except Manufacturing Districts; alternative permitted adjacent to all Residential Districts
Typical Right-of-Way Width	60'; alternative 54'
Typical Capacity	Less than 1,000 average daily trips
Travel Lanes	1 yield lane
Lane Width	18'
Allowable Turning Lanes	Permitted in place of parking at intersections
Parking Lanes ¹	Parallel required on at least one side of street; diagonal permitted on one side of the street in lieu of parallel adjacent to the following districts: Commercial and Mixed Use Districts (C1-C2, NC1), Office Districts (NO,O), Open Space and Recreational Districts (OS3-OS5)
Pavement Width	32' (50' if diagonal parking is provided)
Curbs / Shoulders	Concrete Vertical, Slotted, or Drop Back
Target Speed	15-20 mph
Median	Prohibited, unless conservation street
Bicycle Facilities ²	Shared
Pedestrian Facilities	Minimum 5' wide clear sidewalk on both sides
Street Buffer	Minimum 9' wide Planting Zone or Furnishings Zone; adjacent to Commercial and Mixed Use Districts (NC1, C1, C2), the Furnishings Zone is required; adjacent to Residential Districts (R1-R8) and Open Space and Recreation Districts(OS1-OS5), the Planting Zone is required

1. Reference II.8.C(8) for on-street parking requirements
 2. Reference II.8.C(6) for bicycle facility types and requirements.

Table 8.I-1. Urban Neighborhood Street Standards.

II. Neighborhood Development Regulations Section 8 - Street Type Standards

J. Rural Connector.

1. **Intent.** The Rural Connector is a medium capacity Street for slow speeds within a standard Right-of-Way. It primarily serves as a through street within a neighborhood and connects Neighborhood Streets to Avenues or Boulevards. Similar in Scale to the Urban Connector, the Rural Connector does not have raised curbs and the Right-of-Way includes trails on both sides. Refer to typical plan and section, Figure 8.J-1.
2. **General Requirements.** Rural Connectors shall be developed using the standards in Table 8.J-1.
3. **Location.** Rural Connector Streets are permitted per Neighborhood Types defined in II.1-7.

Section

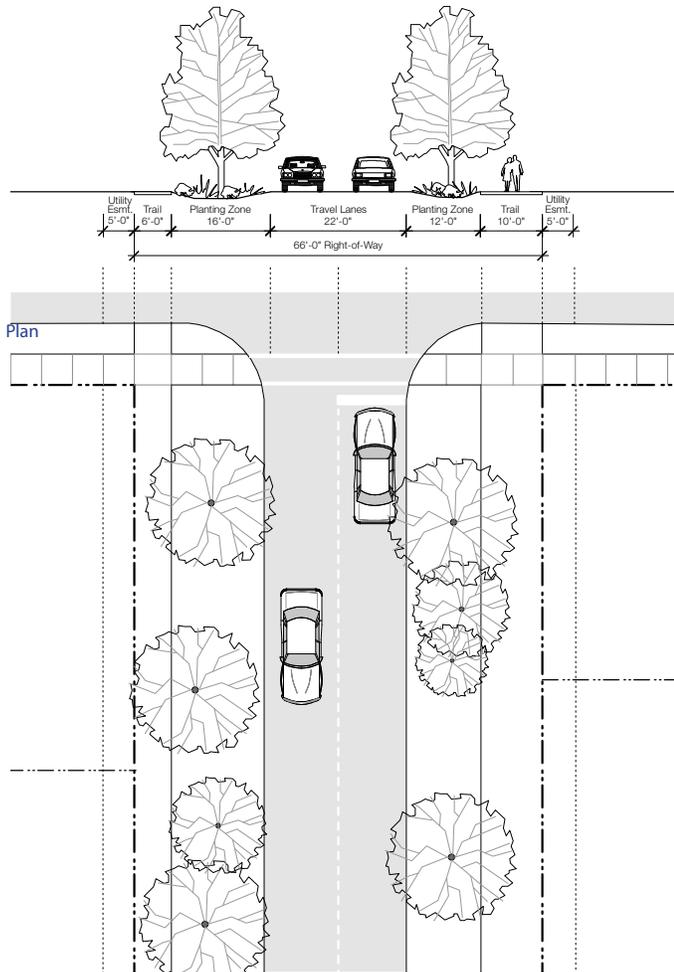


Figure 8.J-1. Typical Rural Connector.

Rural Connector Standards

Location	Permitted adjacent to all districts
Typical Right-of-Way Width	66' or 72' with diagonal parking or median
Typical Capacity	1,000 - 5,000 average daily trips
Travel Lanes	1 lane in each direction
Lane Width	11'; 14' for designated shared bicycle lane
Allowable Turning Lanes	As required at intersections with avenues or boulevards
Parking Lanes ¹	All parking must be permeable; parallel optional on both sides of street; diagonal permitted adjacent to the following districts: Commercial and Mixed Use Districts (NC1, C1, C2), Office Districts (NO, O), Open Space and Recreation Districts (OS1-OS5)
Pavement Width	22'
Curbs / Shoulders	Concrete ribbon or 18" wide asphalt shoulder
Target Speed	15-30 mph
Median	Prohibited, unless conservation street
Bicycle Facilities ²	Shared
Pedestrian Facilities	Minimum 10' wide clear trail on one side; Minimum 6' wide clear trail on the other
Street Buffer	Minimum 9' wide Planting Zone with drainage Swale on both sides; not required with diagonal parking

1. Reference II.8.C(8) for on-street parking requirements
2. Reference II.8.C(6) for bicycle facility types and requirements.

Table 8.J-1. Rural Connector Standards.

II. Neighborhood Development Regulations

Section 8 - Street Type Standards

K. Urban Connector.

1. **Intent.** The Urban Connector is a medium capacity Street for slow speeds within a standard Right-of-Way. It primarily serves as a through street within a neighborhood and connects Neighborhood Streets to Avenues or Boulevards. Similar in Scale to the Rural Connector, the Urban Connector has curbs and the Right-of-Way includes sidewalks on both sides. Refer to typical plan and section, Figure 8.K-1.
2. **General Requirements.** Urban Connectors shall be developed using the standards in Table 8.K-1.
3. **Location.** Urban Connector Streets are permitted per Neighborhood Types defined in II.1-7.

Section

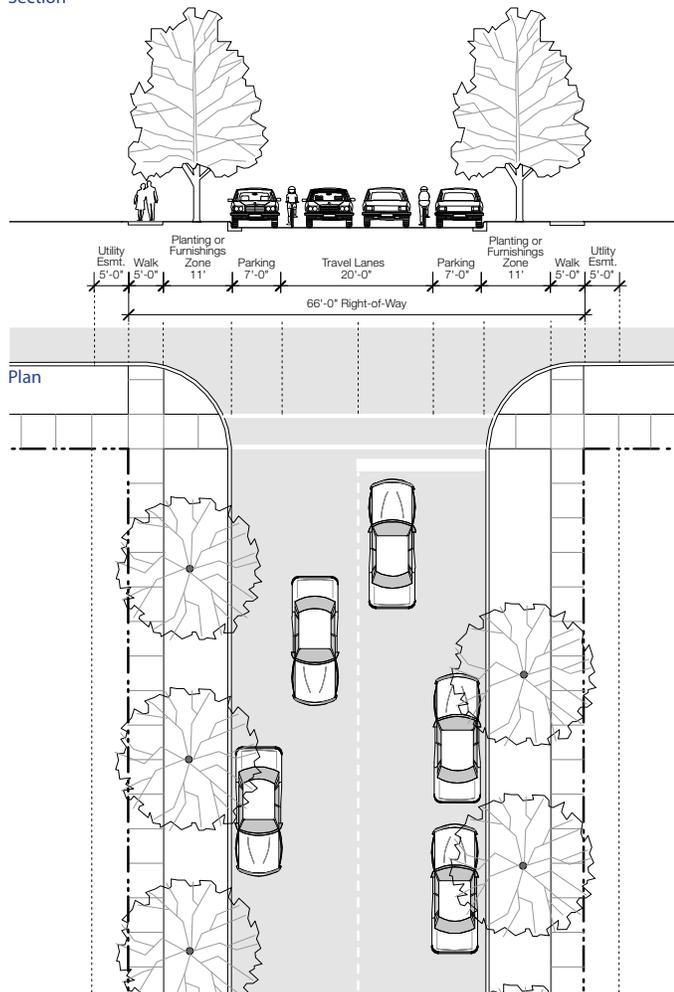


Figure 8.K-1. Typical Urban Connector.

Urban Connector Standards	
Location	Permitted adjacent to all districts
Typical Right-of-Way Width	66' or 72' with diagonal parking
Typical Capacity	1,000 - 5,000 average daily trips;
Travel Lanes	1 lane in each direction
Lane Width	10'; 14' for shared designated shared bicycle lane
Allowable Turning Lanes	Right permitted in place of parking at intersections with avenue or boulevard
Parking Lanes ¹	Parallel required on both sides of street; diagonal permitted in lieu of parallel on one side of street adjacent to the following districts: Commercial and Mixed Use Districts (NC1,C1-C2), Office Districts (NO,O), Open Space and Recreation Districts (OS1-OS5)
Pavement Width	36'; 46' with diagonal parking
Curbs	Concrete Drop Back, Vertical or Slotted
Target Speed	15-30-mph
Median	Prohibited, unless conservation street
Bicycle Facilities ²	Shared
Pedestrian Facilities	Minimum 5' wide clear sidewalk on both sides
Street Buffer	Minimum 10' wide Planting Zone or Furnishings Zone; in Commercial and Mixed Use Districts (NC1-C1,C2), the Furnishings Zone is required; in Residential Districts (R1-R8), the Planting Zone is required; Planting Zone or Furnishing Zone is not required with diagonal parking

1. Reference II.8.C(8) for on-street parking requirements

2. Reference II.8.C(6) for bicycle facility types and requirements.

II. Neighborhood Development Regulations Section 8 - Street Type Standards

L. Rural Avenue.

1. **Intent.** The Rural Avenue is a medium to high capacity street for medium speeds with narrow pavement within a standard Right-of-Way. It serves in a system of similar roads to provide smaller Scale crosstown connections. Similar in Scale to the Urban Avenue, the Rural Avenue does not have raised curbs and the Right-of-Way includes trails on one side. Refer to typical plan and section, Figure 8.L-1.
2. **General Requirements.** Rural Avenues shall be developed using the standards in Table 8.L-1.
3. **Location.** Rural Avenues may only be used for new roads shown on the City's Comprehensive Plan or Major Roads Plan.

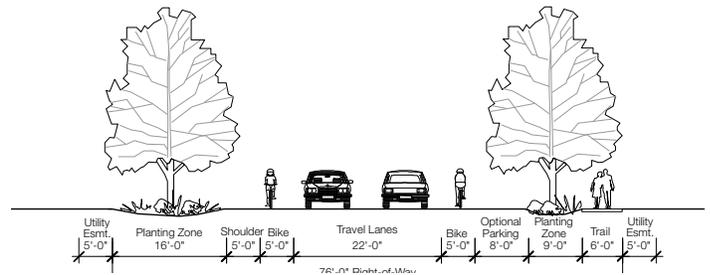
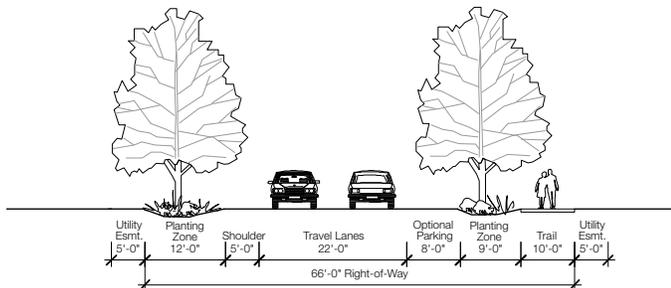


Figure 8.L-2. Alternative Rural Avenue.

Section



Plan

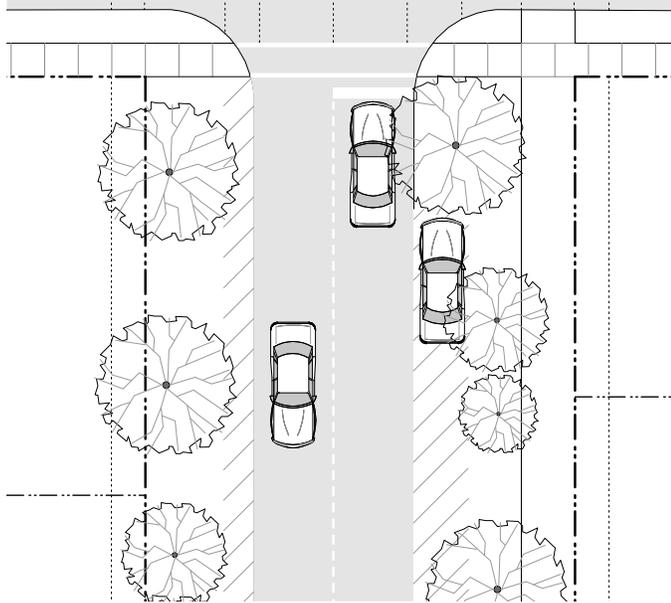


Figure 8.L-1. Typical Rural Avenue.

Rural Avenue Standards	
Location	Permitted adjacent to all districts
Typical Right-of-Way Width	66', 72' with bicycle lanes
Typical Capacity	5,000 - 10,000 average daily trips 10,000 - 15,000 average daily trips with median
Travel Lanes	1 lane in each direction
Lane Width	11'; 14' for designated shared bicycle lane
Allowable Turning Lanes	Left only with median; right permitted in place of parking at intersections
Parking Lanes ¹	Optional, both sides of street, parallel only; must be permeable
Pavement Width	Minimum 22'; 32' with designated bicycle lanes
Curbs	Concrete Ribbon or 18" asphalt shoulders beyond the travel lane when the minimum pavement width of 22' is constructed
Target Speed	25-35 mph
Median	Permitted, minimum 14' wide
Bicycle Facilities ²	Designated shared, or 5' wide designated lanes in each direction
Pedestrian Facilities	Minimum 10' wide clear trail on one side
Street Buffer	Minimum 9' wide Planting Zone with drainage Swale on both sides

Vehicular Realm

Pedestrian Realm

1. Reference II.8.C(8) for on-street parking requirements
2. Reference II.8.C(6) for bicycle facility types and requirements.

Table 8.L-1. Rural Avenue Standards.

II. Neighborhood Development Regulations

Section 8 - Street Type Standards

M. Urban Avenue.

1. **Intent.** The Urban Avenue is a medium to high capacity Street for medium speeds within a standard Right-of-Way. It serves in a system of similar roads to provide smaller Scale crosstown connections. Similar in Scale to the Rural Avenue, the Urban Avenue has curbs and the Right-of-Way includes an optional median and sidewalks on both sides. Refer to typical plan and section, Figure 8.M-1.
2. **General Requirements.** Avenues shall be developed using the standards in Table 8.M-1.
3. **Location.** Urban Avenues may only be used for new roads shown on the City's Comprehensive Plan or Major Roads Plan.

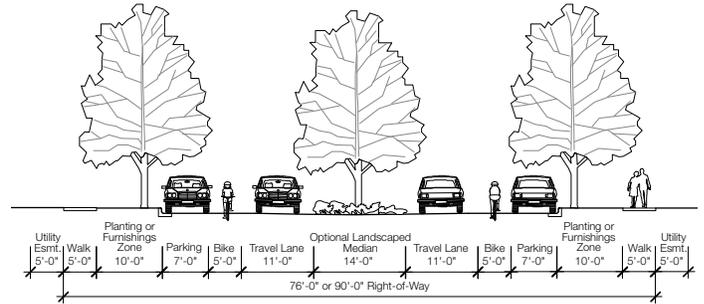
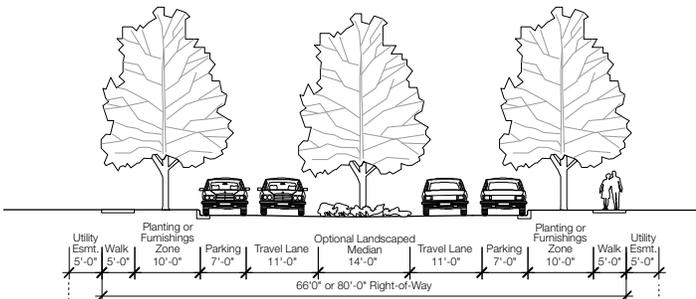


Figure 8.M-2. Alternative Urban Avenue.

Section



Plan

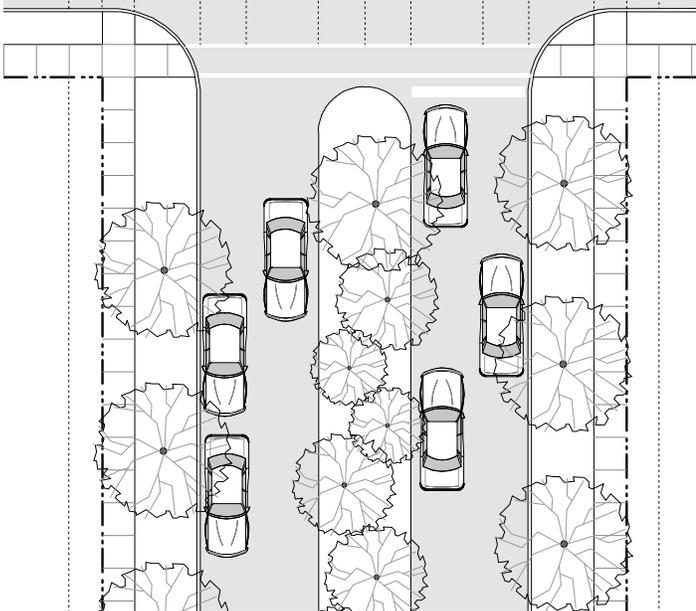


Figure 8.M-1. Typical Urban Avenue.

Urban Avenue Standards

Urban Avenue Standards	
Location	Permitted adjacent to all districts
Typical Right-of-Way Width	66', 80' with median
Typical Capacity	5,000 - 10,000 average daily trips; 10,000 - 25,000 average daily trips with median
Travel Lanes	1 lane in each direction
Lane Width	11'; 14' for shared designated shared bicycle lane
Allowable Turning Lanes	Left only with median; right permitted in place of parking at intersections
Parking Lanes ¹	Optional, both sides of street, parallel only
Pavement Width	36'; 46' with designated bicycle lanes
Curbs	Concrete Vertical or Slotted
Target Speed	25-35 mph
Median	Permitted, minimum 14' wide
Bicycle Facilities ²	Designated shared, or 5' wide designated lanes in each direction
Pedestrian Facilities	Minimum 5' wide clear sidewalk on both sides
Street Buffer	Minimum 10 feet wide Planting Zone or Furnishings Zone

1. Reference II.8.C(8) for on-street parking requirements
2. Reference II.8.C(6) for bicycle facility types and requirements.

Table 8.M-1. Urban Avenue Standards.

II. Neighborhood Development Regulations Section 8 - Street Type Standards

N. Boulevard.

1. **Intent.** The Boulevard is a high capacity street for higher speeds within a wider Right-of-Way. It serves all types of development and provides crosstown connections. The Boulevard has curbs on the outside to provide protection for the pedestrians on sidewalks on both sides. The median is not required to be curbed to allow stormwater filtration. Refer to typical plan and section, Figure 8.N-1.
2. **General Requirements.** Boulevards shall be developed using the standards in Table 8.N-1.
3. **Location.** Boulevards may only be used for new roads shown on the City's Comprehensive Plan or Major Roads Plan.

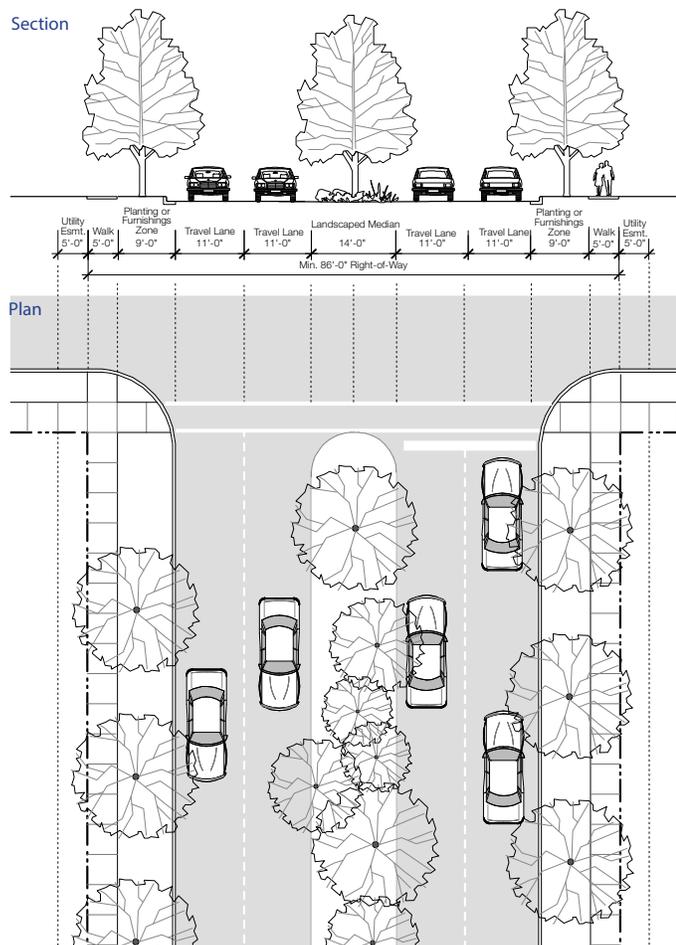


Figure 8.N-1. Typical Boulevard.

Boulevard Standards	
Location	Permitted adjacent to all districts
Typical Right-of-Way Width	86'; 96' with designated bicycle lane
Typical Capacity	15,000 - 24,000 average daily trips
Travel Lanes	2 lanes in each direction
Lane Width	11'; 14' for shared bicycle lane
Allowable Turning Lanes	Left only with median; right permitted in place of parking at intersections
Parking Lanes ¹	Optional both side, preferred permeable
Pavement Width	44'; 54' with designated bicycle lanes
Curbs	Concrete Vertical or Slotted
Target Speed	25-40 mph
Median	Required, minimum 14' wide
Bicycle Facilities ²	Designated shared or 5' wide designated lane
Pedestrian Facilities	Minimum 5' wide clear sidewalk on both sides
Street Buffer	Minimum 9' wide Planting Zone or Furnishings Zone; in Commercial and Mixed Use Districts (NC1, C1,C2), the Furnishings Zone is required; in Residential Districts (R1-R8), the Planting Zone is required

1. Reference II.8.C(8) for on-street parking requirements
2. Reference II.8.C(6) for bicycle facility types and requirements.

Vehicular Realm

Pedestrian Realm

II. Neighborhood Development Regulations

Section 8 - Street Type Standards

O. Scenic Corridor.

1. **Intent.** The Scenic Corridor is a medium to high capacity Right-of-Way that serves all types of development, including commercial and mixed Use development. Refer to typical plan and section, Figure 8.O-1.
2. **General Requirements.** Scenic Corridors shall be developed using the standards in Table 8.O-1.
3. **Location.**
 - a. Scenic Corridors are existing streets, mapped by the City. No new Scenic Corridors may be developed.
 - b. New development adjacent to an existing Scenic Corridor requires the inclusion of the following on the development and Plat:
 - (1) Minimum fifty (50) foot wide Scenic Corridor Buffer (refer to II.8.C(9)) with trail adjacent to the Scenic Corridor the length of the development.
 - (2) Dedication of that portion of a sixty eight (68) foot Right-of-Way, centered along the existing pavement of the Scenic Corridor, that falls on the Parcel.

Scenic Corridor Standards	
Location	As designated by city
Typical Right-of-Way Width	68', plus 50' Scenic Corridor Buffer on each side
Typical Capacity	3,000 - 10,000 average daily trips;
Travel Lanes	1 lane in each direction
Lane Width	10' to 12'
Allowable Turning Lanes	Not permitted
Parking Lanes ¹	Not permitted
Pavement Width	22'
Curbs	None or Ribbon or 18" wide asphalt shoulder
Target Speed	25-30 mph
Median	None
Bicycle Facilities ²	Off street trail only
Pedestrian Facilities	One minimum 10' wide trail in required buffer on at least one side
Street Buffer	Minimum 21' wide Planting Zone with drainage Swale on both sides, 50' Scenic Corridor Buffer (refer to II.8.C(9))

1. Reference II.8.C(8) for on-street parking requirements
 2. Reference II.8.C(6) for bicycle facility types and requirements.

Table 8.O-1. Scenic Corridor Standards.

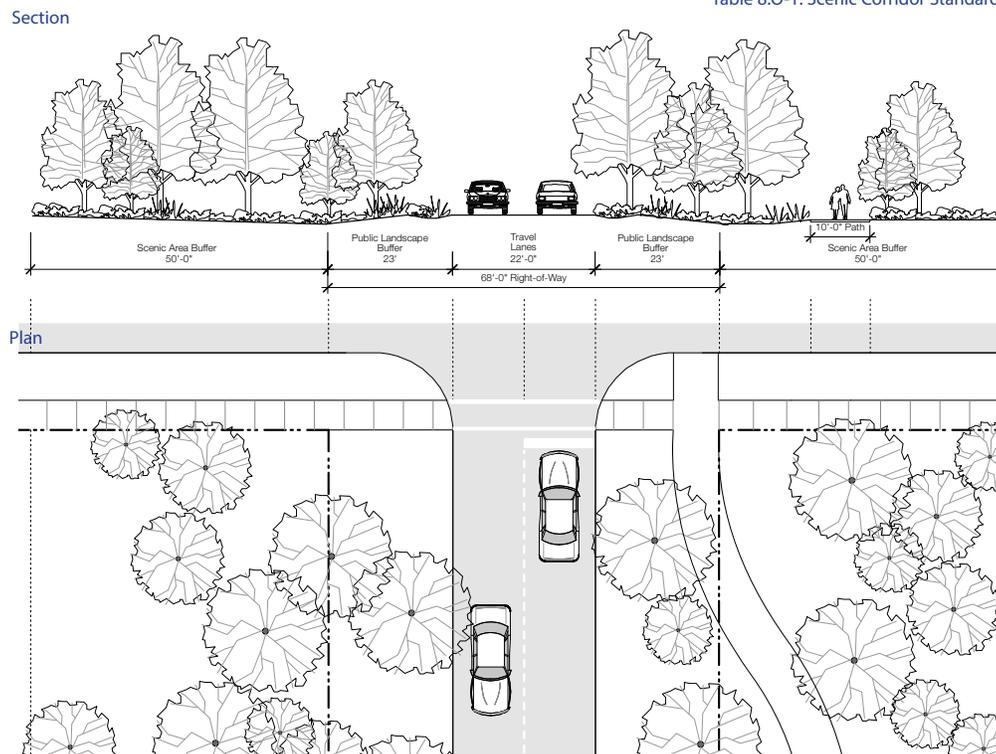


Figure 8.O-1. Typical Scenic Corridor.

II. Neighborhood Development Regulations Section 8 - Street Type Standards

- P. Conservation Street Overlay.
1. Intent. The Conservation Street Overlay, applied to any Street Type, allows flexibility in the horizontal design of a street, including definition of the Right-of-Way width, pavement location, and pavement width, in order to respect the existence of natural features and maintain the character of the site within the roadway. Refer to typical plan and section illustrating one situation, Figure 8.P-1.
 2. Applicability. The Conservation Street Overlay may apply to the development of any Street Type except the Boulevard.
 - a. The following are required locations for utilization of the Conservation Street Overlay:
 - (1) The Conservation Street Overlay is required for that section of any Street Type crossing a Conservation Area (refer to II.11).
 - (2) The City may require the use of the Conservation Street Overlay in locations with Landmark or Specimen Trees, or other natural features to maintain the existing character of the site.
 - b. The Conservation Street Overlay may be optionally utilized in any location where existing trees are being preserved within the street Right-of-Way.
 3. Approval. The conceptual location of the street pavement shall be submitted during the Pre-Application Conference (I.4.A), then further definition for the Preliminary Plat process (I.4.C) based on the required Tree Survey. Approval of the construction drawings is required during Construction Plan review (refer to I.4.D).
 4. General Underlying Street Requirements. The following general requirements of the underlying Street Type shall be maintained:
 - a. Travel Lanes.
 - b. Lane Width.
 - c. Allowable Turn Lanes.
 - d. Parking Lanes.
 - e. Pavement Width.
 5. Specific Requirements.
 - a. Topography. Street design shall generally follow the location, horizontally and topographically, of existing natural features to preserve and maintain these features; however, the streets shall provide safe vehicular travel.
 - b. Typical Right-of-Way. The Right-of-Way width shall be a minimum of fifty (50) feet at all

locations, but may widen and vary in width along the length of the overlay.

- c. Parking Lanes. In locations where parking lanes are permitted as optional, the parking lanes may be located where there is limited or no conflict with existing natural features. Parking lanes shall not be continuous along the street. All parking lanes shall be permeable (refer to II.8.F(4)(d) for permeable materials).
- d. Curbs. Use of curbs other than ribbon curbs shall be avoided except in locations where the existing topography demands the road grade vary significantly from the surrounding landscape, or where the presence of stormwater from the road could damage the surrounding landscape.
- e. Target Speed. The target speed of the street at the location of the overlay may be reduced to allow curving the road between natural features.

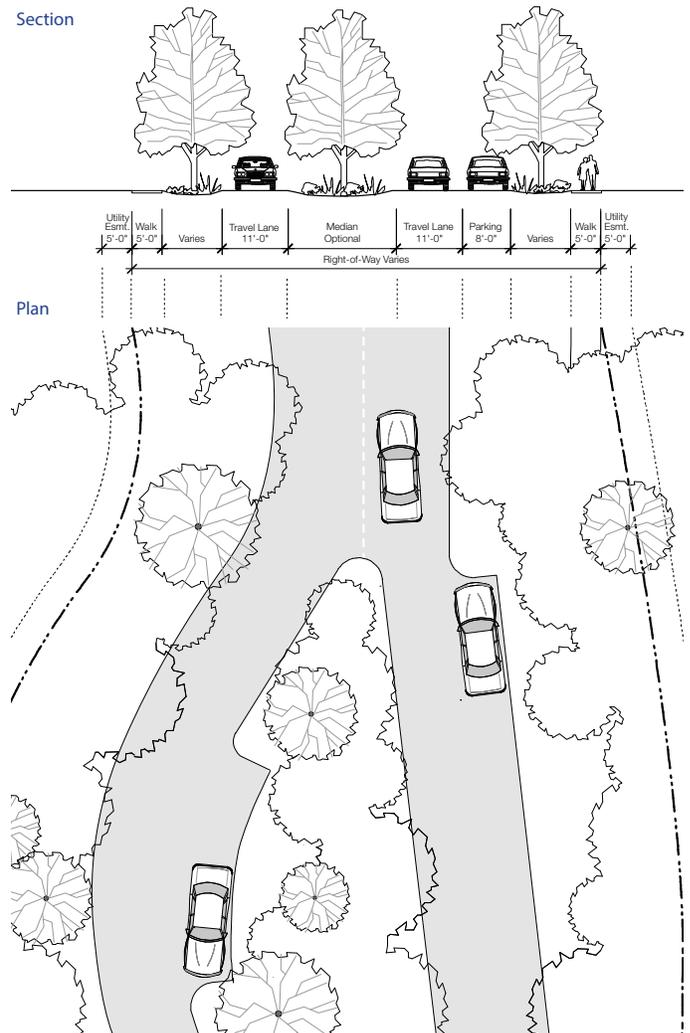


Figure 8.P-1. Typical Residential Conservation Street.

II. Neighborhood Development Regulations

Section 8 - Street Type Standards

- f. Permitted Median. Medians are permitted in all cases to allow flexibility in the location of the travel lanes for the preservation of natural features.
 - g. Bicycle Facilities. Designated shared and dedicated bicycle lanes shall be avoided in overlay areas to limit the width of the pavement, unless required for continuous access. Shared or off-street bicycle access may be provided.
 - h. Pedestrian Facilities. Pedestrian facilities shall be provided on both sides of the street and shall be appropriate to the type of adjacent development. Permeable pavement shall be utilized for all pedestrian facilities adjacent to existing trees.
 - i. Street Buffer. No shoulder is required. In all cases, minimum Planting or Furnishing Zone widths shall be maintained to provide drainage Swales and to buffer pedestrians from travel lanes. Buffers may contain existing trees.
 - j. General Street Layout Requirements. The street design shall follow all requirements, refer to II.8.D.
 - k. Fire Access. The street design shall meet all requirements for fire access, refer to II.8.C(7).
- Q. Cul-de-sacs & Eyebrows.
1. Intent. To design Cul-de-sacs and eyebrows, to limit the amount of uninterrupted pavement, provide green space, allow for emergency access, reduce vehicular and pedestrian travel time, reduce congestion, encourage walking, and encourage block arrangements that minimize rear-facing buildings along streets.
 2. Applicability.
 - a. Cul-de-sacs and eyebrows may be developed adjacent to either a Connector or a Neighborhood Street.
 - b. Cul-de-sacs and eyebrows may only be utilized adjacent to residential districts RE through R6, unless a modification is approved by MPC. See I.4.H.
 - c. The use of the cul-de-sac is limited by Neighborhood Type. Refer to II.1 through 7. The use of eyebrows is not limited.
 - (1) The number of cul-de-sacs may be permitted to exceed the cul-de-sac cap when one of the following conditions are met:
 - (a) The placement of the cul-de-sac can be demonstrated to avoid natural features deemed to be of high value per the Qualifying Features Delineation (refer to II.11.B), while also not substantively interfering with the objective of making conservation areas visible and accessible from the street within the overall Subdivision and adjacent developments. This includes locations adjacent to a City Waterway with no bridge connection, and designated type A or B conservation areas.
 - (2) The placement of the cul-de-sac is at the boundary of another municipality with no existing connecting street, at railroad tracks, or at major utility Easements (such as regional electrical transmission lines or interstate gas lines).
 - (3) The placement of the cul-de-sac avoids extreme topography, such that the alternative to the proposed cul-de-sac street would have otherwise required a combined cut-fill in excess of eight (8) feet in the immediate area.
3. General Underlying Street Requirements. The following general requirements of the underlying Street Type shall be maintained:
 - a. Pedestrian facilities are required on the outside of cul-de-sac or eyebrow only.
 - b. Any required Street Buffer is required on the outside of cul-de-sac or eyebrow only.
4. Specific Requirements. The following specific requirements apply.
 - a. Center Median. A center median is required, with a landscaped area of at least 1,400 square feet and a minimum dimension of twenty (20) feet in either direction.

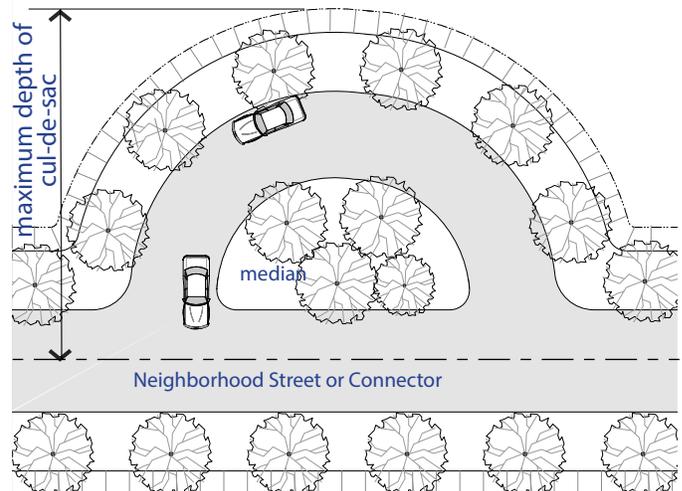


Figure 8.Q-1. Typical Eyebrow.

II. Neighborhood Development Regulations Section 8 - Street Type Standards

(1) For the center median to count towards Neighborhood Scale Open Space Requirements (refer to II.8.1-7 for requirements per Neighborhood Type), it shall meet minimum dimensions defined by one of the Open Space Types, such as the Green. Refer to III.4 Open Space Types.

b. One Way. The cul-de-sac or eyebrow may be one way to further reduce pavement width to a minimum of twenty two (22) feet, including one (1) travel lane and on-street parking on one side. A two way cul-de-sac or eyebrow shall meet the following criteria of the Neighborhood Street:

- (1) There shall be one (1) yield lane.
- (2) Travel lane width shall be eighteen (18) feet.
- (3) The pavement width shall be thirty-two (32) feet.

c. Maximum Depth. The maximum depth of the cul-de-sac or eyebrow, as measured from the intersection of the centerline of the cul-de-sac to the adjacent street to the furthest edge of the Right-of-Way is as follows:

(1) Cul-de-sac: two hundred fifty (250) feet.

(2) Eyebrow: ninety (90) feet.

d. Fire Access. The street design shall meet all requirements for fire access.

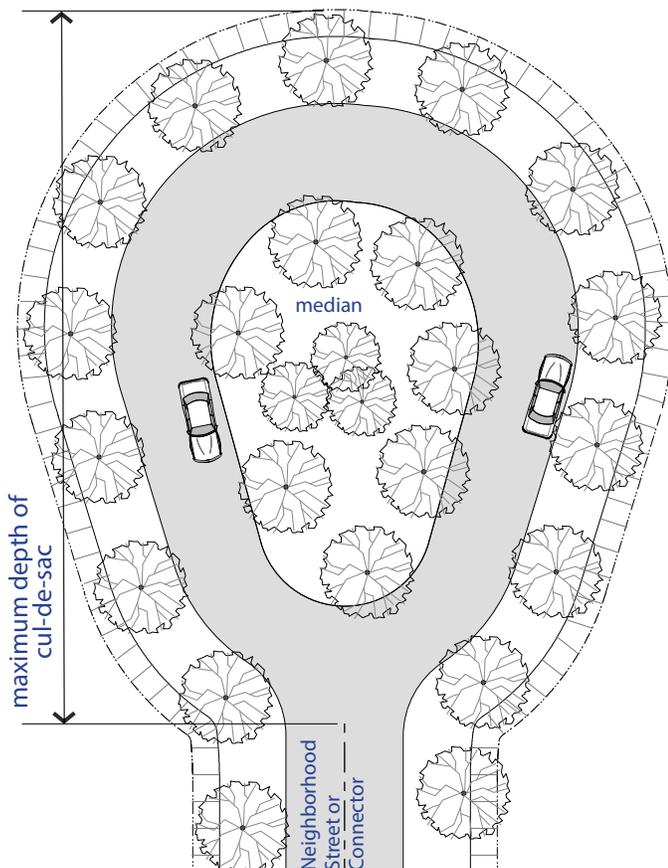


Figure 8.Q-2. Typical Cul-de-sac

II. Neighborhood Development Regulations:
Sections 9 through 13 - Utility Standards,
Stormwater Management,
Conservation Area Requirements,
Site Disturbance & Grading Soil,
Erosion & Sediment Control

II. Neighborhood Development Regulations Section 9 - Utility Standards

- A. General Requirements.
1. Intent. The intent of this Section is to:
 - a. Establish and define the public utility Improvements which shall required to be constructed by the Applicant for all approvals.
 - b. Outline the procedures and responsibilities of the Applicant and the various public officials and agencies concerned with the planning design, construction, and financing of public utilities.
 - c. Encourage efficient development by coordinating existing and proposed utility systems in the City.
 - d. Coordinate the operation and function of utility systems throughout the city, including access to and within individual Subdivisions.
 - e. Ensure that the design and operation of required utility Improvements are compatible with the street system, bicycle and pedestrian facilities, drainage facilities, and the resulting Block and Lot patterns.
 - f. Ensure that all new streets have access to the required utilities, or that the necessary Improvements can be efficiently constructed in coordination with future development.
 - g. Gravity flow shall be used, with lift stations and force mains only considered when necessary, such as in order to deal with extreme terrain or the protection of significant natural resources. The costs of lift stations shall be borne by the Applicant.
 - h. Minimize damage to all elements, including trees and vegetation within any Rights-of-Way, Scenic Corridor Buffers, Conservation Areas, or other natural areas.
 2. Applicability. These standards shall apply to Parcels being subdivided according to the processes outlined in I.4 Process Criteria and Application and in this Article.
 3. Authority. This Section, II.9, is part of the Subdivision Regulations and is under the purview of the Municipal Planning Commission (MPC).
 - a. Any modification from these regulations requires a Subdivision Modification approval (I.4.H).
 - b. Amendments to this Section require an Amendment to Subdivision Regulations (I.4.I).
 4. General Requirements. The Applicant shall provide adequate water, sanitary sewer, stormwater management, and energy service to all Lots resulting from a Subdivision by connecting to existing city systems that are deemed adequate by the City Engineer and Memphis Light Gas and Water to handle the additional volume resulting from the proposed development.
 - a. Installation of Public Utilities. Applicable public utilities shall be located in accordance with City and Memphis Light Gas and Water standards, and shall be stubbed through the subdivision.
 - (1) Underground Utilities. Except as specifically authorized by this Article, all public and quasi-public utilities, including gas lines, electrical lines, telephone lines, and cable transmission lines shall be located underground and, except for individual building or property services, shall be located in public Easements or dedicated public rights-of-way.
 - (2) Above-ground Utilities Screening. The Applicant shall provide adequate landscaping to screen any above-ground utility appurtenances, such as electrical transformers, pumping stations, and telephone pedestals, in accordance with III.5 Landscape Standards.
 - (3) Overhead Utilities. Overhead utilities shall be not be utilized unless approval is obtained from the MPC.
 - a. Exemption for electrical improvements. The following above-ground electrical improvements shall be exempt from undergrounding requirements.
 1. Service lines being dropped for an individual residence.
 2. A service line to any individual lot of record established prior to the date of this ordinance, if development in compliance with applicable regulations is proposed and does not require subdivision or new public improvements.

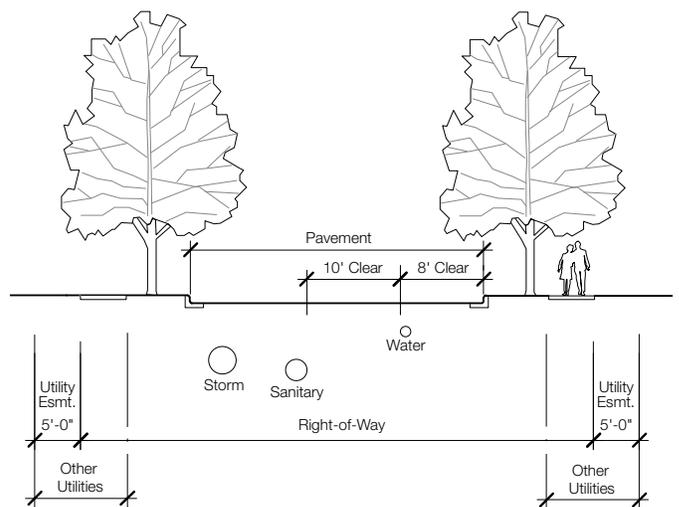


Figure 9.A-1. Diagram of Typical Utility Locations.

II. Neighborhood Development Regulations

Section 9 - Utility Standards

3. Above ground utility equipment installed, maintained, and utilized by utility companies for a period not to exceed thirty (30) days in order to provide emergency utility services. The time limitation may be extended, if warranted, by the Municipal Planning Commission.
 4. Utility equipment utilized for street lighting purposes.
 5. Utility equipment utilized exclusively for vehicular and pedestrian traffic control purposes.
 6. Utility equipment appurtenant to underground facilities, such as service-mounted, pedestal-mounted, or pad-mounted transformers, terminal boxes, meters, cross boxes, cabinets, vaults, electronic enclosures, pedestals, flush-to-grade hand holes, splice closures. . Related equipment shall be above ground, preferably within the furnishing zone between the curb and sidewalk, within the public utility easement, or within the required front yard setback or side yard setback adjacent to the street; equipment placed in the street right-of-way shall be subject to applicable laws and ordinances.
 7. Temporary utility equipment utilized or to be utilized exclusively in conjunction with construction projects, seasonal, or special event installations. Upon installation of permanent utility service, above ground service shall be removed.
 8. Overhead wires attached to the exterior surface of a building by means of a bracket or other fixture and extending from one location on the building to another location on the same building, or to an adjacent building or to the alley, without crossing any public street.
 9. Antennas, associated equipment and supporting structures, used by a utility for furnishing communication services.
 10. Electrical transmission lines, or switch gear.
 11. Equipment installed by the utility which should not be installed underground for engineering, safety, or environmental regulatory reasons, and which the Municipal Planning Commission agrees may be installed above ground accordingly.
- b. Water Main, Sanitary Sewer, and Storm Sewer Locations. Water mains, sanitary sewers, and storm sewers shall be located under the vehicular pavement of a street Right-of-Way. Refer to Figure 9.A-1. With MPC approval, portions of utilities may be located outside the pavement area if any of the following conditions exist:
- (1) Pavement width is not wide enough to provide defined clearances.
 - (2) Curvature of the street requires straight segments of utilities to extend beyond the pavement.
 - (3) Underground conditions prohibit locating utilities under pavement.
- c. Water and Sewer Easement Width. Easements outside the street Rights-of-Way, containing both water and sewer mains shall be at least thirty (30) feet in width. No other utilities or related items (sprinkler systems, buildings, electric cables, etc.) shall be installed in the Easement unless approved by the City.
- d. Required Access to Easements. Utility Easements or Rights-of-Way shall be of sufficient width and the utilities shall be installed at such locations therein as to permit open-cut installation, maintenance and repair within the confines of the Easement or Right-of-Way.
- e. Location of Appurtenances. All utilities and appurtenances located in a vehicular Right-of-Way shall be located to minimize visual impacts. Avoid locating multiple appurtenances on the corner and locate in the rear of the Lot.
- f. Construction Standards. All utility installations shall conform with the applicable City, state, regulatory, or accepted industry standards, whichever impose the highest and most demanding requirements for the preservation and protection of the public health, safety, and welfare.
- g. New Technology and Materials. New materials, equipment, or technology not covered by these design standards or the City's Public Works Construction and Material Specifications, may be considered on an individual basis if such a variance has the potential to initiate more cost-effective service to the citizens of Lakeland. Facilities not covered by these standards shall be reviewed and considered for approval, approval with conditions, disapproval, or other applicable action jointly by the City and the Tennessee Department of Environment and Conservation. Memphis Light Gas and Water is exempted from this standard.
- h. Tree Protection. Exercise care when working within the Critical Root Zone of protected trees. Refer to Tree Management Ordinance, Title 13, Chapter 4 of the Municipal Code, Section I: Tree Protection During Construction.
- i. Record Drawings. Prior to acceptance of public infrastructure, record drawings shall be submitted to the City, illustrating the constructed locations of all utilities and appurtenances. Record drawings

II. Neighborhood Development Regulations Section 9 - Utility Standards

shall be submitted in electronic format with a copy of the Final Plat, formatted per City requirements. The record drawings shall include, but are not limited to, the following information:

- (1) Contractors name and address.
- (2) Construction dates.
- (3) Street names and pavement widths.
- (4) Mains and sizes.
- (5) Material of mains.
- (6) Fire hydrant locations and manufacturer, and model.
- (7) Water valve locations, manufacturer, and model.
- (8) Sewer manhole locations.
- (9) Storm sewer manhole locations.
- (10) Storm sewer inlet locations.
- (11) Location of water and sewer stubouts.
- (12) Block and Lot numbers.
- (13) House numbers shall be obtained from the City Building Inspection Division.
- (14) All manhole invert and top of ring elevations.
- (15) Distance between manholes or cleanouts.
- (16) Orientation of north.
- (17) Scales shall be the same scale as those for construction drawings.

- B. Water Supply System.
 1. General Requirements. All Subdivisions shall be designed so the proposed water distribution and supply system meets the following requirements.
 - a. Plan Approval. All proposed plans shall be designed by Memphis Light Gas and Water (when applicable) or by the Applicant and a completed plan shall be provided to the City Engineer. Construction of improvements shall follow the City's Public Works Construction and Material Specifications.
 - b. Provider Requirements. Design of the water supply system shall conform to the requirements of Memphis Light, Gas, and Water.
 2. Systems in Public Rights-of-Way.
 - a. Extension of Existing Lines. Water mains shall be extended through the proposed Subdivision to serve otherwise unserved abutting properties.
 - b. Service Line Connections. The Applicant shall provide water service, with separate service connections terminating not less than two (2) feet inside the property or Easement line, to each proposed Lot of record.
 - c. Capacity. The Applicant shall ensure that there is adequate capacity to serve all the Lots proposed to be served by the utility, plus any additional extensions to the main which might be made to develop property in the same pressure area with the type of Uses and to the maximum Density permitted by the existing Zoning Regulations of the City with respect to the property within the corporate limits and by the anticipated Zoning for any land currently outside the corporate limits.
 - d. Configuration. Loop water mains to avoid dead ends.
 - e. Fire Hydrants. Standard fire hydrants shall be provided at each intersection of two (2) or more public streets or roadways, and additional hydrants shall be provided as necessary so that hydrants are not more than five hundred (500) feet apart in all areas. All fire hydrants shall have auxiliary valves.
 - f. Size Requirements. The minimum size water main shall be eight (8) inches in diameter; on cul-de-sac or other permanently disconnected streets, six (6) inches in diameter is acceptable.
 - g. Horizontal Distance of Main from Sewer. Water mains shall be laid at least ten (10) feet horizontally from any sanitary sewer, storm sewer, or sewer manhole. The distance shall be measured edge-to-edge.

Sewer Size (inches)	Minimum Slope (ft/100 ft)
------------------------	------------------------------

Table 9.C-1. Minimum Sewer Slope Requirements.

II. Neighborhood Development Regulations

Section 9 - Utility Standards

- (1) When local conditions prevent a horizontal separation of ten (10) feet, a water main may be laid closer to a storm or sanitary sewer provided that such construction is strictly in accordance with Tennessee Department of Environment and Conservation requirements.
- h. Vertical Distance Between Mains and Sewers. Water mains crossing house sewers, storm sewers, or sanitary sewers shall be laid above the sewers to provide a separation of at least eighteen (18) inches between the bottom of the water main and the top of the sewer.
3. Right-of-Way Dedication. All water mains shall be installed in public Easements or Dedicated public Rights-of-Way, with all associated Easements and Rights-of-Way having a minimum width of eighteen (18) feet plus the diameter of the water main.
4. Construction Standards. All water mains shall use materials and be installed in a manner meeting or exceeding the required standards and specifications approved by the City Engineer and Memphis Light Gas and Water.
5. Service Connections. Water service meter shall be stubbed out a distance of eighteen (18) inches from the back of curb or edge of pavement for each Lot.
6. Groundwater Wells. Refer to Chapter 20 of the Code of Ordinances.
- C. Sanitary Sewer System.
 1. General Requirements. All Subdivisions shall be designed to meet the requirements herein, or those of the Tennessee Department of Environment and Conservation Sanitary Sewer Design Guidelines, whichever is more restrictive.
 - a. Adjacent Areas. All sanitary sewers and appurtenances shall be designed to carry the design flows from all contiguous or adjacent areas..
 - b. Plan Approval. Contiguous or adjacent areas to be included in the design, and the tributary population to be provided for, shall be subject to approval by the City. The Board of Sewerage Commissioners (BOSC) shall review all public sewer connections and make a recommendation to the Board of Commissioners prior to any connection by the Applicant.
 - c. Sanitary Sewer Agreement. The Applicant shall submit a signed agreement during the Preliminary Plat Process (refer to I.4.C) for approval of the MPC and the BOSC. The agreement shall, at a minimum, include the following:
 - (1) Properties served by the system shall be limited to those described in an attached Sewer Plan Schematic Exhibit. No other properties or Lots shall be served without permission of the BOSC.
 - (2) Sewer service taps to the existing sewer main shall be installed at the request of the City, in accordance with current costs per current City standards.
 - (3) Prior to connection of any building, all sewer construction shall be inspected, and approval shall be obtained, from the City.
 - (4) If the Applicant's Property is adjacent to an existing City sewer main on which recapture charges are due because of oversizing, the Applicant shall pay the charges.
 - (5) The Applicant shall pay all development charges for each connection served by water and sewer.
 - (6) The Owner agrees to abide by the rules and regulations of the City regarding pretreatment of sewage, use of sewer facilities, and sewer service; and all state and federal rules and regulations including but not limited to all provisions of the Federal Pretreatment Regulations (40CFR, Part 403).
 - (7) The City does not waive any rights it may have pursuant to the Tennessee Governmental Tort Liability Act, and the City specifically reserves the right to assert any and all rights, immunities, and defenses it may have pursuant to the TGCA.
 - d. Sanitary Sewer Collection Study. A sewer study shall be provided for all commercial developments, industrial developments, and all residential developments consisting of twenty (20) or more Dwelling Units. The study shall be submitted during the Preliminary Plat Process (refer to I.4.C) and shall include, at a minimum, the following:
 - (1) Table of estimated sewage flows (peak and average daily flows) for the development as a whole and for each land Use. The table shall include the number of Dwelling Units and commercial units.
 - (2) All calculations shall be referenced with data from the design values acquired from the Texas Department of Environment and Conservation (TDEC). Should design values not be available from TDEC, the Applicant shall contact the City Engineer.
 - e. Development Limitations. No Subdivision of property shall occur if sewer does not service the property with the following exception:
 - (1) Lots of two (2) acres or more and containing adequate area and soils may utilize a septic system if approved by the County Health officer and the City.
 - (a) Soils Test. A soils test shall be conducted by a certified soils scientist and filed with the City.

II. Neighborhood Development Regulations Section 9 - Utility Standards

- (b) Proximity to Existing Sewer. If any portion of a Lot is located within one quarter (1/4) mile of an existing sanitary sewer line, septic systems are not permitted and connection to the sanitary system is required.
 - f. Design to Prevent Damage. All sewers shall be designed to prevent damage from superimposed loads as well as trench loading conditions. All sewers are to be bedded as required by the City's Public Works Construction and Material Specifications.
 - g. Anchoring on Steep Grades. Sewers on twenty (20) percent slope or greater shall be anchored securely with concrete anchors, or equivalent, spaced as follows:
 - (1) Not over thirty six (36) feet center-to-center on grades between twenty (20) percent and thirty five (35) percent.
 - (2) Not over twenty four feet center-to-center on grades between thirty five percent (35) and fifty (50) percent.
 - (3) Not over sixteen (16) feet center-to-center on grades over fifty (50) percent.
 - h. Potable Water Supply. There shall be no physical connection between a public or private potable water supply system and a sewer, or appurtenance thereto which would permit the passage of any sewerage or polluted water into the potable supply.
 - i. Materials approved for sewer main and service connections shall be those listed in the City's Public Works Construction and Material Specifications Manual.
2. Sewer Tap Procedures. Sewer tap procedures to be followed by plumbers and installers in connecting sanitary sewer lines from any and all buildings to sanitary sewer lines within the corporate limits of the City shall be as follows:
- a. Notification. Notify the City Engineer twenty-four (24) hours prior to any connection being made.
 - b. Uncovering the Service Line. Uncover the service line to the Lot in the presence of an authorized City representative or as directed by the City Engineer.
 - c. Tying In. Make a tie in to the service line only with an authorized City representative present. Back fill only when instructed to do so by the City representative.
 - d. Line Testing. The line shall be tested immediately by the introduction of water, which shall be monitored by an authorized City representative to determine the suitability of the connection. Dye or color shall be required if the line is active.
3. Sewer Easement Width. All Easements outside street Rights-of-Way containing only sewer mains shall be at least eighteen (18) feet plus the diameter of the sewer pipe in width and graded so that every manhole shall be accessible to maintenance equipment. No other utilities or related items (sprinkler systems, buildings, sidewalks, electric cables, etc.) shall be installed in the Easement unless approved by the City.
4. Design Flows.
- a. Peak Discharge. Sanitary sewers shall be designed to carry the peak discharge and to transport suspended material so that deposition in the sewer is precluded.
 - b. City Approval of Densities. The Applicant shall substantiate and have City approval of population densities per acre or per unit.
 - c. Daily Per Capita Flow. New sewer systems shall be designed on the basis of an average daily per capita flow of not less than one hundred gallons (100) per day or actual sewer flows determined from the City.
 - (1) Additional Allowance. Additional allowances may be made if conditions are unfavorable to accommodate an average daily per capita flow of one hundred gallons per day.
 - (2) Peak Load Parameters. To provide for peak loads, sanitary sewers shall be designed for peak flow to average flow at 0.75 pipe diameter depth, ratios of 4:1 for lateral sewers (8-inch); 3.5:1 for collector sewers (10-inch through 15-inch); and 2.5:1 for interceptor sewers (18-inch and larger).
 - d. Additional Submittal. When deviations from the foregoing procedure are requested, a description of the design procedure used shall be submitted with the plans and specifications for approval.
 - e. Sewage Flow Guidelines. The following sewage flow parameters shall be used as a general guideline for minimum estimated average flows generated from nonresidential land Use:
 - (1) Commercial Area 2,000 gal./acre/day
 - (2) Infiltration-Inflow Allowance 500 gal./acre/day
5. Depth of Cover. In no case shall sanitary sewers be designed for a depth of cover less than thirty six inches over the top of the pipe or sewer.
- a. Where shallower depths are unavoidable, construction of epoxy lined or polyurethane lined ductile iron, or similarly protected sewer, with or without insulation may be utilized with City Engineer approval. Proper allowance for loads on the sewer shall be made because of width and depth of trench.
 - b. Minimum Factor of Safety. Rigid pipe shall have a minimum factor of safety of 1.5. flexible pipe shall

II. Neighborhood Development Regulations

Section 9 - Utility Standards

have a minimum factor of safety of 1.25. Where necessary, special construction shall be required.

6. Velocity of Flow. All sewers shall be designed and constructed with hydraulic slopes sufficient to give mean velocities, when flowing full, of not less than two (2) feet per second, based on Manning's formula, using a value for "n" of 0.013. The minimum slopes to be provided for shall be as specified by Tennessee Department of Environment and Conservation.
 - a. The Applicant shall furnish computations for velocities and depth of flow for grades in excess of eight (8) percent and for extremely low flow situations.
 - b. Where velocities greater than ten (10) feet per second are attained, special provision shall be made to protect against displacement by erosion and shock.
7. Minimum Size. No public sanitary sewer shall be less than eight (8) inches in diameter. The minimum size of house connections shall be four (4) inches in diameter.
8. Alignment.
 - a. General Sewer Alignment. In general, sewers shall be designed for uniform slope and alignment between manholes, and shall be located parallel to and with a minimum of ten (10) feet separation from water lines.
 - b. Curvilinear Sewers. Curvilinear sewers shall be permitted only for sewers fifteen (15) inches in diameter and larger.
 - c. Energy Gradient Line. The energy gradient line shall be maintained whenever a smaller sewer joins a larger sewer. This shall be approximated by placing the 0.8 depth of both sewers at the same elevation (not considering head loss through the manhole).
9. Manholes.
 - a. Locations. Manholes shall be installed at the end of each line, at all changes in grade, size, or alignment, at all sewer main intersections, and at distances not greater than four hundred (400) feet apart for sewers fifteen (15) inches in diameter or less, and not greater than four hundred fifty feet (150) apart for sewers eighteen (18) inches in diameter or larger.
 - b. Manhole Diameter. Four (4) foot diameter manholes shall be used for pipes up to eighteen (18) inch diameter. Five (5) foot diameter manholes shall be used for pipes twenty one (21) inches in diameter and larger.
 - c. Lamp Holes. Lamp holes shall not be acceptable as a substitute for manholes.
 - d. Drop Manholes. Drop manholes shall not be used unless the invert elevations between the receiving pipe and the discharging pipe is more than three feet. If the discharging pipe has less than five feet of bury to the top of the pipe at the proposed drop manhole, the pipe shall be laid at a uniform grade to the manhole invert and no drop shall be permitted.
10. Service Connections.
 - a. Wyes. Service connections to any sanitary sewer shall be made only to a wye installed at the time of the sewer main installation or by machine tap and approved saddle appropriate to the main line sewer material. All connections to existing public sewers shall be made by a licensed plumber and approval must be obtained by the City. All wyes and service connections shall be made at the 10:00 or 2:00 position on the sewer main.
 - b. Water Tight. All connections and service lines shall be water tight.
 - c. Uniform Plumbing Code. All service connections shall be sized in accordance with the Uniform Plumbing Code.

II. Neighborhood Development Regulations

Section 9 - Utility Standards

- d. One Building Limit. Only one residence, structure, or building shall be served by each lateral connected to the public or private main, unless as approved by the City.
 - e. Commercial and Industrial Wastes. Attention is directed to City's Municipal Code relative to the use of public sewers and the requirements for discharge of certain materials (pretreatment).
 - (1) Inspection Manhole. An inspection manhole or other suitable structure shall be required on the service line for any use other than normal domestic use.
 - (2) Grease Interceptors. In addition to the above, acceptable grease interceptors shall be required of all restaurants, food preparation centers, or for any other discharge containing oil and grease.
 - (3) Sand and Oil Interceptors. Acceptable sand and oil interceptors shall be provided for all car washes and similar facilities which may discharge sand or dirt to the sewer.
11. Roof or Foundation Drains. Under no circumstance shall roof drains, foundation drains, storm drains, or sub-drains be connected to the sanitary sewer system.
12. Townhouse Manifolds. Townhouse developments may use a "manifold" sewage collection system for service to individual properties, if a valid Owners' Association exists among all property Owners. The "manifold" system is restricted to townhouse developments and shall conform to the following requirements:
- a. Owners' Association. The "manifold" system shall be owned and maintained by a viable Owners' Association. The Owners' Association shall be responsible for the manifold to the point of connection with the sewer main.
 - b. Four Unit Limit. No more than four (4) privately-owned units shall be placed on any "manifold."
 - c. Location. The "manifold" shall be located at the back side of the front Lot utility Easement.
 - d. Header Pipe. The common header pipe to the main shall be six (6) inches in size and shall be provided with cleanouts at the ends and at all bends.
 - e. Uniform Plumbing Code. The "manifold" shall meet all requirements of the Uniform Plumbing Code as adopted by the City. The inspection of the "manifold" beyond the sewer main shall be accomplished by the Plumbing Inspector.
- D. Storm Sewer System.
1. General Requirements. All Subdivisions proposed storm sewers and appurtenances shall meet the following requirements.
 - a. Adjacent Areas. All storm sewers and appurtenances shall be designed to carry the design flows from all contiguous or adjacent areas that may within a reasonable period in the future, be tributary thereto. Contiguous or adjacent areas to be included in the design, and the tributary population to be provided for, shall be subject to approval by the City.
 - b. State Requirements. Design of the storm sewer system shall conform to the requirements contained in the Tennessee Department of Environment and Conservation Storm Sewer Design Guidelines and herein..
 - c. Design to Prevent Damage. All storm sewers shall be designed to prevent damage from superimposed loads as well as trench loading conditions. All sewers are to be bedded as required by the City's Public Works Construction and Material Specifications.
 - d. Anchoring on Steep Grades. Sewers on twenty (20) percent slope or greater shall be anchored securely with concrete anchors, or equivalent, spaced as follows:
 - (1) Not over thirty six (36) feet center-to-center on grades between twenty (20) percent and thirty five (35) percent.
 - (2) Not over twenty four (24) feet center-to-center on grades between thirty five percent (35) and fifty (50) percent.
 - (3) Not over sixteen (16) feet center-to-center on grades over fifty (50) percent.
 - e. Potable Water Supply. There shall be no physical connection between a public or private potable water supply system and a storm sewer or appurtenance thereto which would permit the passage of any polluted water into the potable supply.
 - f. Materials approved for storm sewer main and service connections shall be listed in the City's Public Works Construction and Material Specifications Manual.
 2. Storm Sewer Tap Procedures. Storm Sewer tap procedures to be followed by contractors and installers in connecting drains lines from any and all buildings or properties to storm sewer lines within the corporate limits of the City shall be as follows:
 - a. Notification. Notify the City Engineer twenty-four (24) hours prior to any connection being made.
 - b. Uncovering the Service Line. Uncover the service line to the Lot in the presence of an authorized City representative or as directed by the City Engineer.

II. Neighborhood Development Regulations

Section 9 - Utility Standards

- c. Tying In. Make a tie in to the storm sewer pipeline only with an authorized City representative present. Back fill only when instructed to do so by the City representative.
 - d. Line Testing. The line shall be tested immediately by the introduction of water, which shall be monitored by an authorized City representative to determine the suitability of the connection.
3. Storm Sewer Easement Width. All Easements containing only storm sewer mains shall be at least eighteen (18) feet plus the diameter of the sewer pipe in width and graded so that every manhole shall be accessible to maintenance equipment. No other utilities or related items (sprinkler systems, buildings, sidewalks, electric cables, etc.) shall be installed in the Easement unless approved by the City.
4. Design Flows. Storm Sewer Hydraulic Design. Storm sewers shall be designed in accordance with the City of Memphis/Shelby County Storm Water Design Manual.
 - a. The design of a closed conduit storm sewer system shall be based on the 25 year 24-hour storm. This criterion shall be applied to both closed conduit and open channel systems. However, if the 25 year design flow for an open channel system is greater than 100 cubic feet per second (cfs), then the open or closed system shall be capable of passing the 100-year, 24-hour design flow within the drainage easement.
5. Depth of Cover.
 - a. Minimum Depth of Cover. In no case shall storm sewers be designed for a depth of cover less than thirty six (36) inches over the top of the pipe. Where shallower depths are unavoidable, consideration may be given to different bedding conditions. Proper allowance for loads on the sewer shall be made because of width and depth of trench.
 - b. Minimum Factor of Safety. Rigid pipe shall have a minimum factor of safety of 1.5. flexible pipe shall have a minimum factor of safety of 1.25. Where necessary special construction and bedding shall be required.
6. Velocity of Flow. All sewers shall be designed and constructed with hydraulic slopes sufficient to give mean velocities, when flowing full, of not less than 3.0 feet per second based on Manning's formula, using a value for "n" of 0.013. Curb and gutter shall be designed with a manning coefficient of 0.017.
7. Minimum Size. No public storm sewer shall be less than twelve (12) inches in diameter.
8. Alignment.
 - a. General Sewer Alignment. In general, sewers shall be designed for uniform slope and alignment between manholes, and shall be located parallel to and with a minimum of ten (10) feet separation from water lines.
 - b. Curvilinear Sewers. Curvilinear sewers shall be permitted only for sewers thirty six (36) inches in diameter and larger.
 - c. Energy Gradient Line. The energy gradient line shall be maintained whenever a smaller sewer joins a larger sewer. This shall be approximated by placing the 0.8 depth of both sewers at the same elevation (not considering head loss through the manhole).
9. Manholes.
 - a. Locations. Manholes shall be installed at the end of each line, at all changes in grade, size, or alignment, at all sewer main intersections, and at distances not greater than four hundred feet apart for sewers fifteen (15) inches in diameter or less, and not greater than four hundred fifty feet (450) apart for sewers eighteen (18) inches in diameter or larger.
 - b. Manhole Diameter. Manhole diameters shall be as described in the City's Public Works and Material Specifications.
 - c. Lamp Holes. Lamp holes shall not be acceptable as a substitute for manholes.
 - d. Drop Manholes. Drop manholes shall be provided for a lateral sewer entering a manhole at an elevation of twenty-one (21) inches or more above the manhole invert. .
 - e. Floor Troughs. Floor troughs shall be furnished for all sewers entering manholes. A larger diameter manhole shall be used to properly construct floor troughs where the incoming sewer inverts are substantially higher than the outgoing sewer invert. At all manholes with a change of direction, a drop from entrance to outlet of at least 0.1 ft. shall be provided to account for head loss through the manhole. More drop may be required for sewer mains twelve (12) inch and larger. Inverts shall be U-shaped to the pipe crown before sloping at a one to twelve (1:12) slope to the manhole walls.
 - f. Public Works Construction and Material Specifications. All manholes shall conform to the dimensions, construction details, materials, and testing requirements detailed in the City's Public Works Construction and Material Specifications.
 - g. Corrosion Protection. When directed by the City, manholes shall be internally coated for corrosion protection in accordance with the standard construction specifications.

II. Neighborhood Development Regulations Section 9 - Utility Standards

- h. All manholes located in Area of Special Flood Hazards shall be flat top manholes. All manhole ring and covers shall be water tight.
10. Inlets
- a. Storm Water inlets shall be precast or cast in place. Brick inlets are not permitted.
 - b. Storm sewer inlet grates shall be as specified in the City's Public Works Manual and Material Specifications.
11. Service Connections.
- a. Wyes. Service connections to any storm sewer shall be made only upon permission of the City. All connections to existing public sewers shall be made by a licensed plumber and approval must be obtained from the City. All wyes and service connections shall be made at the 10:00 or 2:00 position on the sewer main.
 - b. Water Tight. All connections shall be water tight.
- E. Sewage Lift Stations and Sewer Force Mains
1. General Requirements. All sewage lift stations shall be designed to meet the following requirements.
- a. Adjacent Areas. All sewage lift stations shall be designed to carry the design flows from all contiguous or adjacent areas that may within a reasonable period in the future be tributary thereto. Contiguous or adjacent areas to be included in the design, and the tributary population to be provided for shall be subject to approval by the City.
 - b. State Requirements. Design of the sewage lift station shall conform to the requirements contained in the Tennessee Department of Environment and Conservation Sewer Design Guidelines (addendum to the Subdivision Regulations).
 - c. Sewage lift stations and sewer force mains shall be installed in public rights of way or in dedicated public Easements. These facilities shall not be located in any OS Zoning District. Sewage Lift Stations areas shall be the footprint of the lift station plus twenty feet (20) on all sides.
 - d. Sewage lift stations shall be placed on reinforced concrete pads designed to withstand the weight and operational characteristics of the pumps.
 - e. Sewage lift stations shall be fenced on all sides with eight (8) foot high fencing. A gate suitable for vehicular traffic shall be installed on one side of the lift station. Fencing shall be a neutral color and blend into the surrounding area. Fencing shall be of a durable exterior coating of neutral colors. Wood fencing is not permitted. Sewage lift stations shall have a minimum of 15 feet of clearance surrounding the pump and wet well in order for maintenance equipment access.
2. Sewage Lift Stations.
- a. Total Dynamic Head. The total dynamic head rating of pumping units shall be based on pipe friction, pressure losses from piping entrances, exits, appurtenances (bends, valves, etc.), and static head at the rated flow.
 - b. Design Conditions.
 - (1) Grit. Where no grit removal is provided ahead of the pumping station, equipment and piping design shall minimize the deleterious effects of grit in the sewage.
 - (2) Screening. Screens or comminutors shall be provided ahead of pumps where the average daily flow is in excess of one (1.0) mgd (3,784 m³/d) to prevent solids larger than two and a half (2 ½) inches (6.4 cm) from entering the pump.
 - (3) Minimum Pump Opening. Except for grinder pumps, raw sewage pumps shall be capable of passing spheres of at least three (3) inches (7.6 cm) in diameter. Pump suction and discharge piping in all sewage and sludge services shall be no smaller than four (4) inches in diameter (10 cm).
 - (4) Pump Cycle Time. Intermittently operated pumps shall be designed to start no more often than once every ten (10) minutes at the minimum operating interval.
 - (5) Removal of Equipment. Pumping stations shall be designed to permit removal of all items of equipment including pumps, valves, electrical, and control equipment. Equipment located in wetwells shall be removable without entering the wetwell.
 - (6) Surge Control. Piping systems shall be designed to withstand the maximum possible surge (water hammer) from the pumping station, or adequate surge control provided to protect the piping. Pressure relief valves are not acceptable surge control.
 - (7) Net Positive Suction head. Pumps shall be selected so that the net positive suction head required at maximum flow (NPSHR) is less than the NPSH available minus four (4) feet (1.2 m) based on the hydraulic conditions and altitude of the lift station.
 - (8) Uplift. The pumping station chambers shall resist hydrostatic uplift pressures.
 - c. Siting requirements.

II. Neighborhood Development Regulations

Section 9 - Utility Standards

- (1) Access. Pumping stations shall be located so that they are readily accessible to operating and maintenance personnel at all times of day or night, and under all weather conditions. Pumping stations shall be located off of traffic ways.
 - (2) Flood Protection. Pumping stations shall be designed so there is no equipment or structural damage in the one hundred (100) year flood, and so the pumping station's operation is uninterrupted by the twenty-five (25) year flood.
 - (3) Security. The pumping station shall be designed to discourage unauthorized entry.
- d. Pumping Station Types.
- (1) Dry wells.
 - (a) Access. Pumping station dry wells and equipment rooms shall be accessible for equipment inspection, operation, and maintenance. Ladder and stair dimensions, locations of landings, and structural design shall comply with the Tennessee OSHA. Equipment shall be removable from pumping stations without making structural changes to the station.
 - (b) Separation from Wetwell. Dry wells and equipment rooms shall be completely separated from wetwells with no hatches, untrapped drains, or other connecting accessways.
 - (c) Dewatering. Dry pits and below-grade equipment rooms shall be provided with sump pumps sized to remove infiltration of water during normal seepage and leakage.
 - (2) Wetwell Design. Wetwells shall be designed to prevent vortexing and unstable pump operation. Pumps shall be located below the minimum water level, except suction lift pumps. Suction intakes shall be bell-mouthed. Provisions shall be made for isolating, bypassing and/or dewatering portions of the wetwell for maintenance. Hopper walls of wetwells shall be sloped at no less than 1.75 vertical to 1 horizontal.
 - (3) Submersible pumping stations. Submersible pumping stations shall be designed specifically for totally submerged operation and so that pumps may be readily removed from the wetwell without dewatering the wetwell or disconnecting piping in the wetwell. Submersible pumps shall have an adequate means of indicating motor seal failure. Electrical equipment shall be suitable for Class 1, Division 1, Groups C and D hazardous environments, as defined in the National Electrical Code
 - (4) Suction Lift. Pumping stations utilizing suction lift pumps shall have adequate priming means to prime the pumps quickly and shall be designed for priming the pumps when the water level in the wetwell is one (1) foot (0.3 m) below the lead pump starting elevation in the suction wetwell, and for maintaining prime when the wetwell level is one (1) foot (0.3 m) below the lead pump stopping level. Valving shall not be located in the wetwell.
 - (5) Pneumatic Ejectors. Pneumatic ejectors shall not be permitted by the City unless authorized by the Board of Sewerage Commissioners.
 - (6) Bypass Valves shall be installed for all pumps along with a spare parts kit.
- e. Air Release. Air release valves shall be provided at the high points in piping whenever the pipe crown elevation falls below the pipe invert elevation. On sewage lines, air or air and vacuum release valves shall be specifically designed for sewage service.
- f. Reliability.
- (1) Multiple units. Every pumping station shall have not less than two (2) pumping units. The number of units and their size shall be sufficient to permit pumping the maximum design flow with the largest pumping unit out of service.
 - (2) One of the following shall be provided:
 - (a) Alternative power source. Where the pumping station serves more than one hundred fifty (150) residential units (or equivalence), permanently installed or portable engine driven pumps or a separate, independent utility source provided. Where annual starting is required, sufficient storage shall be provided to allow notifying the operator and performing whatever tasks are necessary to get the pumping station in service. Where permanently installed engine driven equipment is provided, sufficient fuel shall be provided for at least eight hours operation under the maximum flow condition. Where more than one pumping station is affected by a power outage and portable equipment is planned for alternative power source, sufficient portable equipment shall be provided to provide alternative power to all pumping stations under maximum flow conditions.

II. Neighborhood Development Regulations Section 9 - Utility Standards

- (b) Generators. Generators shall be sized to permit starting the largest pump in the pumping station with all other pumps except one running. If the generator is not capable of starting all pumps simultaneously, suitable controls shall be provided to stagger the pump starts to remain within the capabilities of the equipment. Generators shall be diesel-fired, natural gas-fired or bottled gas-fired. The use of gasoline or digester gas-fired generators for permanently installed standby service is unacceptable. Gasoline-fired or diesel portable generators are acceptable.
 - (c) Engine driving pumps. Engine driven pumps shall be sized for maximum design flow. Diesel, natural gas, and bottled gas are acceptable fuels for portable engines only. Digester gas is unacceptable for standby fuel. Quick connecting couplings shall be provided for portable engine driven pumps.
 - (d) Storage. Wastewater storage may be provided in the form of underground storage or surface ponds or tanks in lieu of alternative power supplies. Storage shall be sized for the maximum anticipated power outage, but not less than twenty-four (24) hours at average design flow. Storage shall be water tight and arranged to drain back to the pumping station wetwell.
- g. Electrical.
- (1) Equipment Location. All electrical equipment, including motors, motor starters, and controls shall be located so as to be undamaged by the one hundred (100) year flood.
 - (2) Controls. Controls shall include a separate start/stop device for each pump or for each pumping position in the control sequence. Controls shall be arranged so that the failure of any one control system component will affect only the operation of one pumping unit. Manual override shall be provided for normal pump operating control.
 - (3) Code requirements. All electrical work shall comply with the National Electrical Code as adopted and amended by the local codes.
 - (4) Alarms. An alarm system shall be provided for each pumping station. As a minimum, alarms shall include high wetwell level and high water level in the dry well. The alarm system shall be compatible with the existing alarm system installed by the City of Lakeland.
- h. Safety.
- (1) Ventilation. All accessible pumping station areas shall be ventilated. Ventilation may be continuous or intermittent. If intermittent, ventilation in areas normally visited by operating personnel shall be started automatically at not greater than thirty (30) minute intervals. Permanently installed dry well ventilation shall provide at least six air changes per hour if continuous, and twelve (12) air changes per hour if intermittent. Permanently installed wetwell ventilation shall provide twelve (12) complete air changes per hour if continuous, and thirty (30) complete air changes per hour if intermittent. Wetwell ventilation shall be positive pressure, forcing air into the wetwell rather than exhaustion from it. All ventilation equipment shall be of a non-sparking design. Intermittent ventilating equipment shall insure starting upon entry of operating personnel. Wetwells may be ventilated by gravity means if normal access by operating personnel is unnecessary. Wetwells that are accessed infrequently shall be designed to permit the use of portable blowers that shall exhaust the space and continue to supply fresh air during access periods.
 - (2) Hoists. Where required for removing equipment, hoists shall be rated for not less than fifty (50) percent more than the weight of the heaviest single item to be lifted by the hoist.
 - (3) Lighting. Lighting levels shall be sufficient to permit safe operation and maintenance of all equipment within the pumping station, but not less than thirty (30) foot candles. All areas shall be lit in such a manner that the failure of one lighting fixture or lamp shall not cause the area to be completely dark.
 - (4) Equipment Guards. Provide shields to protect from rotating or moving machinery.
 - (5) Warning Signs. Provide warning signs for nonpotable water, electrical hazards, chemical hazards, or other unsafe features. Warning signs shall be permanently attached to the structure or appropriate equipment.
3. Force Mains
- a. Depth. Force mains shall be located a minimum of thirty six inches to the top of the pipe.
 - b. Size. Force mains shall be four (4) inches (10 cm) diameter or greater.
 - c. Velocity. Minimum velocity shall be 2.5 fps. Maximum velocity shall be ten (10) feet per second
 - d. Air Release. Air release facilities shall be provided at the high point in the piping whenever the pipe crown elevation falls below the pipe invert elevation. Access to air release manholes shall not be in traffic-ways.

II. Neighborhood Development Regulations

Section 9 - Utility Standards

- e. Pipe Materials to be used for force mains shall be required to obtain approval by the City.
- f. Force Main Easement Width. All Easements containing force mains shall be at least eighteen (18) feet plus the diameter of the sewer pipe in width and shall be accessible to maintenance equipment. No other utilities or related items (sprinkler systems, buildings, sidewalks, electric cables, etc.) shall be installed in the Easement unless approved by the City.
- g. Ball valves shall be placed on a new force main connecting to the existing Canada Road force main and/or in locations of 1,300 lineal feet with a pipe diameter of four (4) inches and 900 lineal feet with a pipe of six (6) inches or more in diameter.

II. Neighborhood Development Regulations

Section 10 - Stormwater Management

A. General Requirements.

1. Intent. This Section is intended to promote the protection of the City's natural environment, including drainageways, soils, topography, Open Water, and landscape, address the non-point source pollution aspects of the federal Clean Water Act, and to encourage the integration of stormwater management with the design of the built environment. The application of these standards shall serve the following goals.

- a. Prevent or reduce erosion and flood damages.
- b. Control runoff pollutants and improve water quality.
- c. Protect aquatic and riparian habitat.
- d. Recharge groundwater.
- e. Preserve the natural and beneficial functions of watercourses streams, lakes, wetlands, Areas of Special Flood Hazard, and flood prone areas.
- f. Simplify and reduce long-term maintenance obligations through better design.

2. Authority. This section is part of the Subdivision Regulations. Any modification from the requirements of these regulations requires a Subdivision Modification approval.

3. Applicability. The stormwater management standards of the Subdivision Regulations are intended to apply to any development site included within an application for Preliminary Plat, Construction Plans, or Final Plat, that is greater than or equal to the Size of Development, Redevelopment, or Land Disturbance indicated in Title 18, Chapter 6, Section 18-603 of the Lakeland Code, Storm Water Management And Pollution Control Ordinance.

4. Stormwater Management Plan. A Stormwater Management Plan is required for applicable developments in this section. The Stormwater Management Plan shall include, at a minimum, the following items.

- a. Soils report based on Natural Resource Conservation Service Soils mapping and corresponding hydrologic soils groups. Include typical infiltration rates for each soil type. Map areas available and unavailable for stormwater infiltration.
- b. Location of existing infrastructure features such as culverts, bridges, box culverts, detention ponds, and other downstream improvements within five hundred (500) feet of the proposed development.
- c. Proposed natural drainage features and man-made structures necessary to meet the standards of these Land

Development Regulations and other applicable stormwater requirements and standards.

d. Identify all existing drainage basins, associated wet weather conveyance systems, and blue line streams.

e. Delineated drainage areas for each of the proposed drainage features and structures.

f. Overland flow paths.

g. Easements locations.

h. A stormwater report describing the existing and proposed stormwater management system and the hydrologic and water quality analysis used to document conformance with these Land Development Regulations and other applicable stormwater requirements and standards.

5. Operation and Maintenance Plan. An Operations and Maintenance Plan shall be prepared for the stormwater management system. Modification of stormwater management systems, other than as necessary to maintain compliance with the Operations and Maintenance Plan, is not permitted.

a. The plan shall include, at a minimum, the following items.

(1) The Stormwater Management Plan.

(2) Inspection and maintenance tasks, including routine mowing, litter control, brush and vegetation control, and erosion and sediment control.

(3) A description of the dedicated sources of funding for the required maintenance and yearly estimates for the maintenance.

(4) Responsible parties for all maintenance.

(5) All items indicated in The Lakeland Municipal Code Title 13, Chapter 6, Section 18-604, Storm Water Management and Pollution Control Ordinance.

b. Vegetation Management. Naturally landscaped areas of detention and drainage facilities shall be maintained as Natural Landscape Areas. The Natural Landscape Areas provisions of the Lakeland Zoning Ordinance, Article III.5, Landscape Standards, as may be amended, are duplicated and incorporated by reference as part of the Subdivision Regulations. These areas shall be maintained via controlled burning every year, to control invasive weeds and promote healthy native vegetation. Where controlled burning is not feasible, mowing or other vegetation management measures shall be performed as needed.

B. General Design Principles.

Stormwater management systems are encouraged to utilize the following principles. Figures I.E.3, I.E.4, and I.E.5 illustrate potential systems on different scales.

II. Neighborhood Development Regulations

Section 10 - Stormwater Management

1. Design and construction of stormwater management systems shall conform to all specifications and procedures established by the City by code, ordinance, or policy.
 2. Treat Stormwater as a Valuable Resource. All stormwater shall be treated as a valuable resource not as a waste product. Stormwater shall be collected, stored, and reused to reduce surface water runoff.
 3. Replicate Natural Hydrology. The stormwater management system shall replicate the pre-development natural hydrology of the site, protecting natural drainageways, following the natural topography of the site, and preserving the natural infiltration characteristics of the site.
 4. Treat Stormwater Where It Falls. All stormwater shall be managed close to where it falls on the site, reducing the need for lengthy, single purpose conveyance.
 5. Minimize Discharge. The system shall minimize surface water discharge in smaller, more frequent rainfall events, and minimize the downstream impact of larger, more intense rain events which are far less frequent.
 6. Integrate Stormwater and Open Space. All stormwater management systems shall be an integral part of the neighborhood design and the open space design within the neighborhood, and shall serve the dual function of naturally managing the stormwater and creating usable open space. Applicable open space types of the Lakeland Zoning Ordinance are incorporated by reference into these subdivision regulations, and an applicable open space type shall be utilized.
 7. Integrate with Natural Resource Management. The location and design of the stormwater management system shall be closely integrated with the City's Natural Resource Inventory and Assessment, to maintain and enhance the City's Natural areas, including respecting the unique geology, soils, landscape cover, slopes, and long-term maintenance objectives of Conservation Areas.
 8. Stormwater Sewer System. Stormwater sewer systems shall be utilized as needed to convey heavy rainfall events beyond the requirements defined in herein, and at locations where naturalized stormwater treatment is infeasible.
 9. System Design Hierarchy. The design of the stormwater management system for all sites shall use the following hierarchy of methods of managing stormwater.
 - a. Natural Resource Conservation. Preserve and do not negatively affect natural resource features of the development site, including wetlands, Open Water, and woodlands.
 - b. Existing Natural Drainageways. Preserve and do not negatively affect existing natural streams, channels, and drainageways.
 - c. Vegetated Swales. Primarily utilize open, vegetated Swales to convey stormwater runoff.
 - d. Natural Infiltration. Preserve the natural infiltration and storage characteristics of the site.
 - e. Water Quality Structures. As needed, utilize structural measures that provide water quality and quantity control.
 - f. Structural Conveyance. Utilize structural measures that provide only quantity control and conveyance in instances where vegetated Swales and natural infiltration are infeasible.
- C. Design Standards.
1. Design of Stormwater Facilities. Minimum design standards for stormwater facilities shall follow the Memphis Shelby County Stormwater Design Manual, the City of Lakeland Subdivision Regulations, and The Lakeland Municipal Code, Title 13, Chapter 6, Storm Water Management and Pollution Control Ordinance, whichever is the more stringent. Detention Volumes and Maximum Release Rates are specified below.
 2. Detention Volume. The required detention volume shall be that volume necessary, given the hydraulic characteristics of the primary outlet structure, to attenuate the post-development mass outflow of water from the structure from hour 11 to hour 18 of the 24-hour storm to a level not to exceed the pre-development mass outflow for the same time period for both the 2-year and 5-year, 24-hour storms.
 3. Maximum Release Rate. The release rate from any detention facility shall be for the site for the same storm prior to the proposed development. The peak outflow rate from the 2 year-24 hour storm, 10 year- 24 hour storm and 25 year-24 hour storm shall not exceed that of the site prior to development. Detention facilities shall have a primary discharge structure capable of accommodating the 24-hour storms up through the 25-year with an emergency overflow capable of handling at least the 100-year, 24-hour post-development discharge unless waived by the Planning Commission.
 4. Storm Sewer Design Requirements. Design storm frequency for land use/development type for storm sewer systems shall be as follows:
 - (a) Residential - 25 years;
 - (b) Commercial/business/industrial - 25 years;

II. Neighborhood Development Regulations

Section 10 - Stormwater Management

For drainage swales, lined channels, and natural channels the system shall be designed to carry the 100 year 24 hour storm and have the capacity to convey storm runoff without life hazard or property damage.

The methodology for hydrologic and hydraulic design calculations for the pre-development and post-development conditions for the design storms is specified in the Memphis Shelby County Stormwater Design Manual.

5. Conservation Area Requirements. Refer to the Subdivision Regulations, Conservation Area Requirements section. No stormwater management facilities shall be located within a Conservation Area Type A open space, nor shall they be permitted with designs that are detrimental to such open spaces.

6. Existing Water Features. Existing streams, lakes, and wetlands shall not be modified for use as stormwater detention or retention.

a. On-stream impoundments shall be prohibited.

b. Stream Buffer Requirements. Refer to the Zoning Ordinance Streamside Management Buffers section. No stormwater management facilities shall be located within streamside buffers, nor shall they be detrimental to such buffers, unless a plan with appropriate mitigation is authorized by the MPC.

c. Drainage to Lakes and Wetlands. Site drainage patterns shall not be substantially altered to decrease or increase the tributary area to lakes or wetlands.

d. Existing wetlands shall not be used as stormwater detention basins.

e. Existing wetlands shall not be modified for the purposes of stormwater management facilities unless it is demonstrated that the existing wetland is low in quality and the proposed modifications shall maintain or improve its habitat and ability to perform beneficial functions.

(1) Low quality wetlands are those that have been substantially disturbed, usually reflected in low native species diversity and habitat quality.

(2) All runoff shall be pretreated prior to discharge and the runoff shall enter the wetland as subsurface flow.

7. Easement Standards. Easements and/or Rights-of-Way for stormwater facilities shall be of sufficient width to permit installation, maintenance, or repair within the confines of the Easement or Right-of-Way without relocation of or other unreasonable interference with other public utilities. Easements shall be granted to the City of Lakeland or another party defined in the Operations and Maintenance Plan as the party responsible for maintenance. Also refer to the Subdivision Regulations, Utility Standards, II.9.

8. Stormwater detention and surface infiltration basins shall be designed as naturalized basins for multiple uses

including stormwater detention, habitat enhancement, and passive recreational use. Basins shall not be designed solely for stormwater detention purposes.

a. Stormwater basins shall be designed and incorporated into a usable Open Space Type, accessible and open to the public (refer to III.4 Open Space Types).

b. Basins shall be planted with native or vegetation adapted to the area, suitable for the hydrologic conditions expected within the volume level of the basin to accommodate the two (2) year storm.

c. Water level fluctuation between normal and high water level shall not exceed eighteen (18) inches for the 2 year design event and shall not exceed five (5) feet for the 100 year design event.

d. If fish are to be supported, at least twenty-five (25) percent of the permanent pool of water shall be a minimum of ten (10) feet in depth.

e. Detention outlet structures shall be located a minimum of six (6) inches above the seasonal high groundwater table to promote infiltration and to improved stormwater residence time.

f. Detention inlet and outlet structures shall be located at opposite ends of the basin to maximize water quality benefits.

g. Maximum height of the face of any Retaining Walls utilized shall not exceed twenty four (24) inches above grade to minimize the visual impact and the need for fencing.

h. For wet detention basins, water entry slopes between one (1) foot above and one (1) foot below shall not exceed ten to one (10:1) to minimize shoreline erosion. Shallow entry angles will improve water quality treatment and increase aquatic habitat.

i. The basin shall be at least one hundred (100) feet away from any water supply wells.

j. The basin shall be at least ten (10) feet away from foundations and associated granular backfill unless measures approved by the City Engineer are taken to prevent leakage to foundation drains.

9. Parking Lots. Parking Lots may be utilized to detain or retain water with the following requirements.

II. Neighborhood Development Regulations

Section 10 - Stormwater Management

a. Maximum Depth. The maximum allowable depth of standing water at any time in parking Lots shall be six (6) inches at the curb line and one (1) inch in the drive lane.

b. The following landscape and infiltration treatments may be utilized within parking Lots along the edges of the parking area and within parking islands and medians to achieve the stormwater standards.

(1) Infiltration bio-swales.

(2) Vegetated Swales.

(3) Vegetated filter strips.

(4) Infiltration basins or trenches.

(5) Sand filters.

(6) Other similar measures designed to filter, retain, and infiltrate runoff, approved by the City Engineer.

c. Below grade stormwater storage and permeable paving practices are permitted.

10. Redevelopment and development sites shall meet local, State, and NPDES construction erosion and sediment control requirements.

II. Neighborhood Development Regulations Section 10 - Stormwater Management

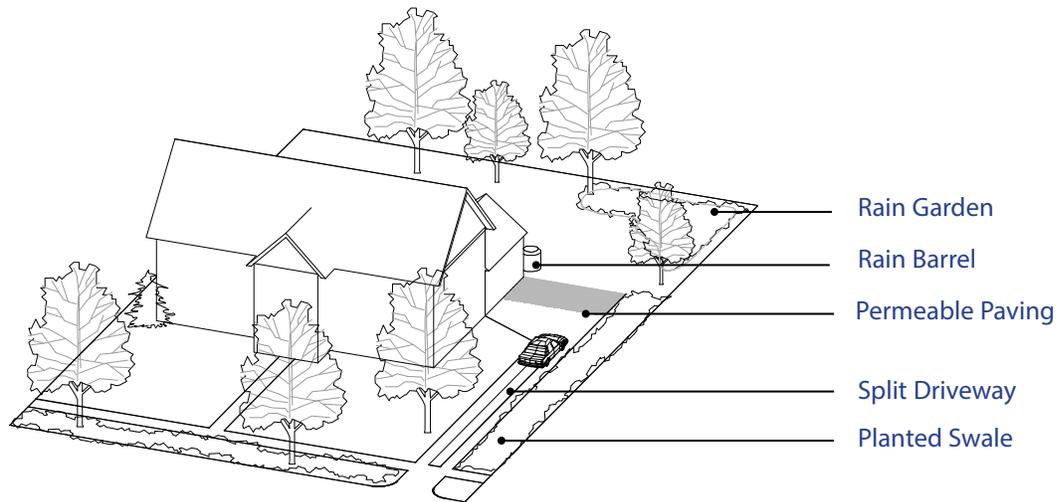


Figure 1.E-3. Residential Site Example incorporating Infiltration and Retention Methods.

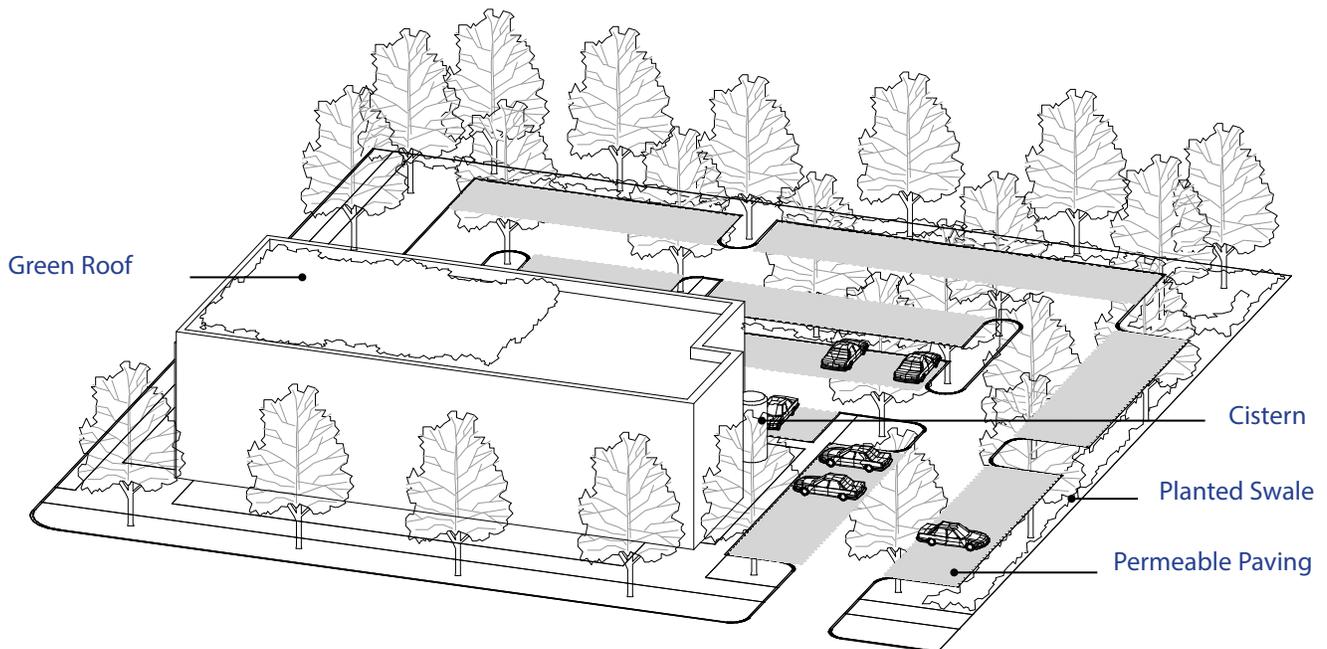


Figure 1.E-4. Commercial Site Example incorporating Infiltration and Retention Methods.

II. Neighborhood Development Regulations Section 10 - Stormwater Management

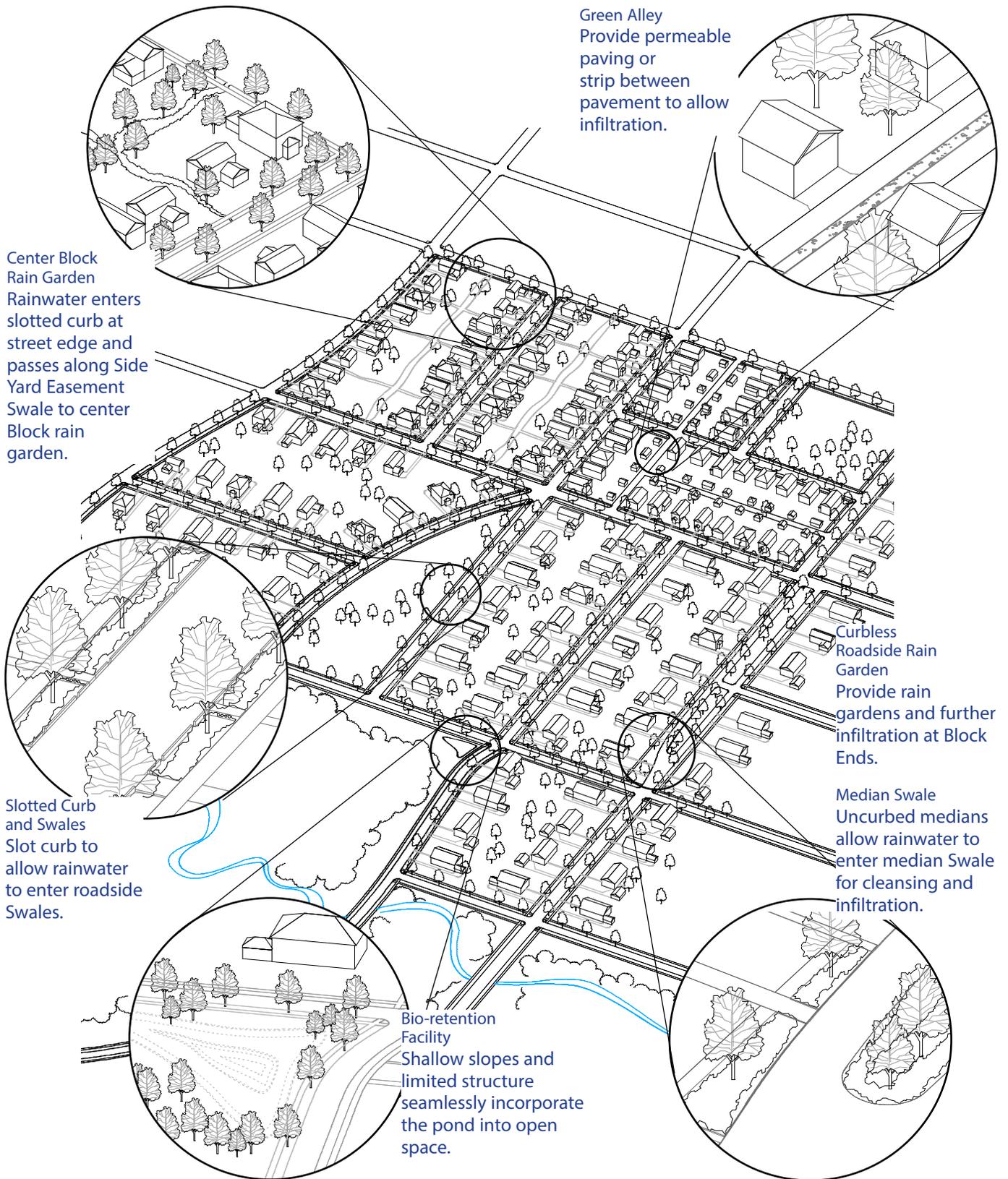


Figure 1.E-5. Neighborhood Example incorporating a Variety of Infiltration and Retention Methods.

II. Neighborhood Development Regulations

Section 11 - Conservation Area Requirements

- A. General Requirements.
1. Intent. The following applies to all requirements of this Section.
 - a. TN Code Title 13, Chapters 4 and 7, and Title 6, Chapter 19, enable requirements for adequate open spaces, parks, greenways, public grounds, green spaces, stormwater facilities, landscaping, and planting of shade trees, whether publicly or privately owned.
 - b. The Natural Resources Assessment component of the Comprehensive Plan places particular value on open spaces with forest cover, mature native trees, lakes, streams, wetlands, wildlife habitat, rolling terrain, and their environmental, scenic, and community character, as well as the quality of life benefits of the conservation and connection of such open spaces.
 - c. The recreation, greenways, and bicycle-pedestrian components of the Comprehensive Plan impact quality of life by providing for anticipated demand for recreation, fostering activity, fostering a family-friendly atmosphere, providing opportunities for relaxation, social interaction, and entertainment, protecting natural areas, connecting facilities to natural areas, and by increasing property values.
 - d. The standards outlined in this Section intend to:
 - (1) Preserve and protect the City's natural character while allowing development to occur.
 - (2) To protect and manage the City's natural areas through the restoration of Natural hydrology and sustainable land management, which shall maximize ecosystem health and biodiversity.
 - (3) To protect and enhance the water quality of the City's and surrounding waterways.
 - (4) Visibly incorporate these Natural areas into new developments.
 - (5) Prioritize Streamside Management Buffers and Very High and High Priority Areas, while still maintaining open space requirements of these Land Development Regulations.
 - (6) Provide continuity and connectivity between all conservation areas and open spaces, to allow migration of plants and animals.
 2. Applicability. The following standards apply to all development included within an application for Preliminary Plat (I.4.C), Construction Plans (I.4.D), or Final Plat (I.4.E).
 - a. When multiple Parcels are being utilized to create a new Plat, the standards shall be applied to the sum total of the Applicant's Property and not to individual Parcels.
 3. Authority. This Section, II.11, is considered part of the Subdivision Regulations and is under the purview of the MPC.
 - a. Any modification from these regulations requires a Subdivision Modification approval (I.4.H).
 - b. Amendments to the conservation area requirements of this section require an Amendment to Subdivision Regulations (I.4.I).
 4. Streamside Buffers. Required Streamside Management Buffers (refer to III.12) are calculated separately and do not count toward any Conservation Area requirement.
 5. Conservation Types. The following three (3) levels of conservation are defined, each with specific requirements, in this Section and referred to as "Conservation Types" or "Conservation Areas."
 - a. Conservation Area A.
 - b. Conservation Area B.
 - c. Conservation Area C.
 6. Required Amount of Conserved Area. For each Priority Area, percentages required to be set aside for Conservation Areas are defined within the Specific Requirements for each Priority Area and Conservation Area Type (See Table 2.A-1), with the following exception:
 - a. Refer to II.1.D for exceptions to Properties with more than fifty (50) percent of the Applicant's Property required to be Conservation Area and/or Open Space.
 7. Dedication of Conservation Areas to the City. The Applicant may Dedicate any or all of their Conservation Area to the City with the following requirements.
 - a. During the Preliminary Plat process (refer to I.4), the Applicant shall identify the properties for Dedication.
 - b. During the Final Plat process (refer to I.4.E), the Dedication shall be reviewed and considered for recommendation by the NRB and MPC, shall be considered for approval, approval or other applicable action by the BOC, and shall meet the following:
 - (1) The total area shall be a minimum of twenty (20) acres and shall be contiguous, with the exception of permitted street crossings.
 - (2) The area shall include any Conservation Area A on the Parcel.
 - (3) Areas smaller than twenty (20) acres will be considered for Dedication, if the area is contiguous with and increases the size of another publicly owned Conservation Area, Streamside Management Buffer, or Park.

II. Neighborhood Development Regulations

Section 11 - Conservation Area Requirements

(4) The area shall not block access to any existing publicly owned Conservation Area, Streamside Management Buffer, or Park.

(5) The area shall not decrease pedestrian or vehicular access throughout the City.

- c. The Applicant shall supply a Restoration and Management Plan, and shall pay a fee in lieu of restoration and management to be determined by the City. The fee shall include funding for implementation of the Restoration and Management Plan for ten (10) years.

B. Qualifying Features Delineation.

The following process shall be utilized by the Applicant to determine the location of Priority Areas and Conservation Areas on a Parcel.

1. Conservation Priority Map. The Conservation Priority Map, available at City Hall, determines approximate locations of initial Priority Areas (Very High, High, and Medium Priority) on each Parcel. These locations are defined for Owner information purposes only and shall be verified through a Qualifying Features Delineation (QFD) prior to application for Preliminary Plat (refer to I.4.C).
2. Qualifying Features Delineation (QFD). A survey and assessment is required to delineate areas of qualifying features and determine the accurate boundaries of Priority Areas on the Parcel.
3. Qualified Professional. Unless otherwise noted, the QFD shall be conducted by a forester, arborist, botanist, or other similarly qualified professional approved by the City. Approval includes, at a minimum, certification from a national organization or four (4) year degree in botany, natural resources, or a related field, and a minimum of five (5) years professional experience in the related field.
4. Release Letter. For any portion of the QFD process, the Applicant may submit a letter to the City from the qualified professional stating that no qualifying features exist on the Applicant's Property or a specified portion of the Applicant's Property. City staff will review the determination and make recommendations to the MPC during the Preliminary Plat approval process. The MPC may then release the Applicant from performing that step of the QFD on the applicable portions of the Applicant's Property.
5. Relief. When the Priority Area, verified through the Qualifying Features Delineation, exceeds the initial Priority Areas delineated on the Conservation Priority Map, the Applicant may seek a Subdivision Modification to the requirements of the applicable Conservation Area. Refer to II.11.F, II.11.G, II.11.H, and Table 2.A-1.
6. Qualifying Features Delineation Process. Document and submit the following on a boundary and topographic survey of the Applicant's Property, at a Scale of one (1) inch is no greater than one hundred (100) feet.
 - a. Forest Stand Groups. Delineate the boundaries of Forest Stand Groups, as defined by the City's Natural Resource Assessment, utilizing the required tree survey (refer to Tree Management Ordinance, Title 13, Chapter 4 of the Municipal Code, B(4)).
 - b. Initial Priority Area Delineation. Delineate the boundaries of initial Priority Areas (Very High, High, Medium) on the survey of the Applicant's Property utilizing the City's Natural Resource Inventory and Assessment and the Conservation Priority Map as well as review of recent aerial photography, site topography, soil surveys, National Wetland Inventory maps, and Natural Resource Conservation Service farmed wetland maps.
 - c. On Site Vegetation Survey. Utilizing the initial Priority Area boundaries, perform an on site survey during the growing season (April to November) to qualify the Priority Areas.
 - (1) Sampling Intensity. One plot per acre is required, preferably on a two chain by five chain grid.
 - (2) Sample Size. Sample size shall be adjusted base on the following physiognomic classes:
 - (a) Forest and Woodland. One one hundredth (1/100) acre fixed radius plot (11.78' radius).
 - (b) Shrubland and Grassland. One (1) square meter quadrat.
 - (c) Non-vascular and Sparse. If the majority of the area is non-vegetated (sparse) or composed of non-vascular plants, the sample may include a walkthrough or larger plot size documenting the dominant vascular plant composition.
 - (3) Sampling Methodology. Utilize the sampling form available at City Hall. Within each sample plot, record the following:
 - (a) Project title.
 - (b) General project location.
 - (c) Surveyor(s).
 - (d) Date(s) of survey.
 - (e) Slope and aspect.
 - (f) Elevation in feet.
 - (g) Plot size and configuration.
 - (h) Physiognomic class.
 - (i) Initial Priority Area.

II. Neighborhood Development Regulations

Section 11 - Conservation Area Requirements

- (j) Plot location.
 - (k) General Description.
 - (l) Species Composition and cover class by stratum.
 - (m) Photographs each class area.
 - (4) Heritage Species. For each sample plot, determine the percentage cover represented by the City of Lakeland's Heritage Plant List, available at City Hall. Cover is defined as the canopy overhanging the plot boundary.
 - (5) City Verification. Provide sufficient field delineation (flagging or other markings) of all Very High and High Priority Areas for on-site review by City staff during the administrative review of the Application and prior to any board or commission review meeting.
 - (a) The City may request additional samplings to validate the size and shape of any designated area.
 - d. Slope Measurements Documentation. Percentage of slope shall be measured across the Applicant's Property in increments no less than ten (10) percent.
 - e. Soils Delineation. Delineate the location of Soil Types, identified by the City's Natural Resource Assessment.
 - f. Open Water Delineation. Delineate the boundaries of all Open Water bodies.
 - g. Wetlands. As needed, perform a Field Survey of wetland locations per the current US Army Corps of Engineer's wetlands manual.
 - h. Archaeological Features. A qualified archaeologist shall perform an archaeological survey of the Parcel to determine locations of significant archaeological features, such as Native American sites or cemeteries.
7. Conservation Area Map.
- a. Qualify Each Area. The qualification of each area as Very High, High, or Medium Priority is based on the Qualifying Features of each Conservation Area (refer to II.11.F(2), II.11.G(2), and II.11.H(2)).
 - b. All areas that do not meet any qualifications are considered Low Priority and do not constitute a Conservation Area designation.
 - c. Conservation Area Map. Submit a map of Conservation Areas on the Applicant's Property per the requirements of this Section.
- C. Restoration and Management Plan.
1. Restoration and Management Plan Establishment. The Applicant shall establish a five (5) year restoration and a perpetual management plan for all Conservation Areas established by this Section to be kept on file at City Hall.
2. Purpose. The purpose of the plan is to establish the processes and responsible parties to assure the initial restoration and ongoing health and vitality of the Conservation Areas.
3. Plan Implementation. Implementation of the Restoration and Management Plan is the responsibility of the Applicant for a minimum period of five (5) years, unless a transfer of the Applicant's obligations is approved by the BOC.
- a. Implementation of the Plan after five (5) years shall be provided in the Covenants and Restrictions for the development (refer to I.7).
4. Restoration and Management Plan Requirements. Refer to the City's "Administrative Guidelines for Restoration and Management Plans", on file at City Hall, for Plan requirements. The plan shall, at a minimum, include the following items:
- a. Statement of Purpose. A narrative description of the goals of the restoration and management of the property.
 - b. Description and location of the Conservation Areas. The following shall be included:
 - (1) Vicinity map
 - (2) Legal description of the Conservation Areas.
 - (3) An aerial photograph of the site or photographs of representative locations, keyed to a site map.
 - (4) Topographic survey, no less than 5' increments.
 - (5) Map(s) of landcover types, streams, wetlands, and other water features.
 - (6) Location and description of any improvements or structures.
 - (7) Landowner information.
 - c. Qualifying Features Delineation Survey. The plan shall include the survey(s) developed to determine the Conservation Areas (refer to II.11.B).
 - d. Management Goals and Objectives. At a minimum, the following shall be included.
 - (1) A description of the general goals and objectives for establishing, restoring, and maintaining the natural landscape of each Conservation Area, per the requirements of this Section.
 - (2) Rare Species. Specific objectives for protection of any rare species or species of concern.
 - (3) Exotic Species. Requirement for removal or retention of exotic species that may occur on the site.
 - (4) Harvesting. Requirements for harvesting, if any, that may occur on the site.

II. Neighborhood Development Regulations

Section 11 - Conservation Area Requirements

- (5) Diversity. Specific goals for desired plant and/or Animal diversity.
- (6) Habitat. Requirements for protection or improvement of any habitat corridors.
- (7) Water Quality. Requirements for protection or improvement of water quality.
- (8) Forest Health. Requirements towards improvement of forest health.
- e. Action Plan. At a minimum, the Action Plan shall include:
 - (1) Timeline. A timeline for a minimum five (5) year restoration process and delineation of any change in responsible party throughout that time period.
 - (2) Responsible Party. Each action item shall include the responsible party.
 - (3) Restoration Practices. Restoration practices shall be defined to meet the goals and objectives and condition of the specific site(s). At a minimum, restoration shall address the following:
 - (a) Removal of hazardous trees.
 - (b) Remedy erosion issues.
 - (c) Removal of invasive and/or aggressive species.
 - (d) Planting and seeding.
 - (e) Control for significant insect and disease infestation.
 - (4) Management Practices. Specific management practices shall be defined to meet the goals and objectives. Actions shall include, at a minimum:
 - (a) Maintenance practices, including but not limited to, mowing heights and mowing frequencies, trash removal.
 - (b) Methods for control of invasive species.
 - (c) Processes for management of problem species including wildlife and plants.
- (d) Process for insect and disease control.
- (e) Details regarding pesticide use.
- (f) Method of replanting and/or seeding, including species, timing, and process.
- (g) Method of prescribed burning.
- (h) Requirements for erosion control.
- f. Monitoring Plan. Description of an annual monitoring process to measure the effectiveness of management techniques and the health of natural communities and natural processes. At a minimum, the monitoring plan shall include:
 - (1) Specific monitoring methods and protocols.
 - (2) How the monitoring results shall affect changes in the action plan, if the management practices defined in the action plan do meet the specified objectives.
- g. Monitoring Report. The plan shall require submittal of a monitoring report to the City, submitted on a biannual basis. The report shall include:
 - (1) Discussion of management practices completed during the prior growing season.
 - (2) Annual monitoring results, including the results from any previous years.
 - (3) Recommended revisions to the Restoration and Management Plan.
- h. Annual Inspection. Annually, a Qualified Professional (see II.11.B), shall visit the site to determine the status of the restoration and recommend any necessary modifications to the Restoration and Management Plan to achieve the goals and objectives.
- i. Funding Plan.
 - (1) Restoration. Funding of the restoration is the sole responsibility of the development. The

Qualified Priority Areas Existing on Site			Required Percentages of Priority Areas to Include in Protection/ Conservation Areas **		
Very High (A)	High (B)	Medium	Protection Area A	Conservation Area B	Conservation Area C
●			100%		
	●			50%	
		●			40%
●	●	●	100%	30%*	0%
●	●		100%	30%*	
●		●	100%		25%*
	●	●		50%	25%*

Note: 0% Conservation Area is required for parcels less than 14 acres, unless contiguity exists, per the design requirements of Areas A & B. See also II.11.B.

Table 2.A-1. Table of Required Conservation Areas as Percentages of Priority Areas.

II. Neighborhood Development Regulations

Section 11 - Conservation Area Requirements

restoration of any Conservation Area shall be part of a Development Contract.

- (2) Management. The process and estimated amounts for funding the Management Plan shall be provided for a five (5) year increment and continuously available to the City should the responsible party fail to implement the Management Plan. The funds shall be set aside in a form acceptable to the City, including but not limited to an escrow account.
- (3) Funding Amounts. The funding plan shall include total estimates, unit costs, and quantity estimated for all items on the Action Plan, with an additional fifteen (15) percent contingency.

5. Plan Approval and Revisions. The Restoration and Management Plan shall be submitted and considered for approval with application processes as defined in I.4.
 - a. Subdivision. The Restoration and Management Plan shall be reviewed by the NRB and considered for approval by the MPC concurrent with the Preliminary Plat (refer to I.4.C).
 - b. File. The Restoration and Management Plan shall be kept on file at City Hall.
 - c. Modifications. Any requested revisions to the Restoration and Management Plan shall be submitted to the City for review and approval.
 - (1) The Code Administrator shall review any requested revisions and provide written comments and status within sixty (60) days of submittal.
 - (2) Major revisions involving a change to activities defined in the Action Plan shall be reviewed by the NRB and considered for approval by the MPC.
 - d. Emergencies. Modifications to the plan, implemented due to an emergency situation, such as fire, flooding, insect infestation, or disease, shall be submitted to the City within thirty (30) days of implementation, to begin the review process discussed in II.11.C(5)(d).
 - (1) If the Code Administrator disagrees with the need for the emergency modifications, the Applicant shall submit the modification as a major revision for NRB review and approval by the MPC (refer to II.11.C).

D. Plat Requirements.

All Conservation Areas shall be included on the Preliminary (refer to I.4.C) and Final Plat (refer to I.4.E) .

E. General Design Requirements.

The following requirements apply to all Conservation Areas. Refer to Figure 2.E-1 and 2.E-2 for an illustration of these concepts.

1. Intent. General design requirements provide the standards to achieve the following:
 - a. Establish a high quality, diverse system of natural areas, with a maximum amount of continuity to permit the migration of wildlife and flora.
 - b. Maintain the natural character of the City and ensure high visibility of the natural areas.
 - c. Allow pedestrians, bicyclists, and equestrians access to a comprehensive, continuous system of open space and natural areas.
 - d. Encourage interconnected neighborhoods through required street connections.
2. Continuity. The following standards establish continuity and connectivity between Conservation Areas.
 - a. Continuity of Conservation Areas on Applicant's Property. Conservation Areas within a quarter (1/4) mile of other Conservation Areas on the Applicant's Property shall be contiguous via a minimum two hundred (200)foot wide area, which shall be maintained as Conservation Area C.
 - b. Continuity of Conservation Areas on Adjacent Property. Conservation Areas within a quarter (1/4) mile of Conservation Areas located on another Parcel adjacent to the Applicant's Parcel shall be connected via a minimum one hundred (100) foot wide area which shall be maintained as Conservation Area C where Very High and High Priority Areas which meet the requirement do not exist. Applicants shall provide this connection up to their Property Lines.
 - c. Other Forms of Connections. The following are permitted as connections to meet the requirements of II.11.E(above).
 - (1) Scenic Corridor Buffer. Scenic Corridor Street Type Buffers (refer to II.8.O) that provide the same connection may fulfill this requirement, with additional width beyond the buffer requirement to meet a total one hundred (100) width.
 - (2) Stream Buffers. Streamside Management Buffers, (refer to III.12) that provide the same connection may fulfill this requirement.
 - (3) Street crossings utilizing the Conservation Overlay do not interrupt contiguousness.
 - d. Exception. Refer to II.1.D for relief from these provisions based on the size of the Applicant's

II. Neighborhood Development Regulations Section 11 - Conservation Area Requirements

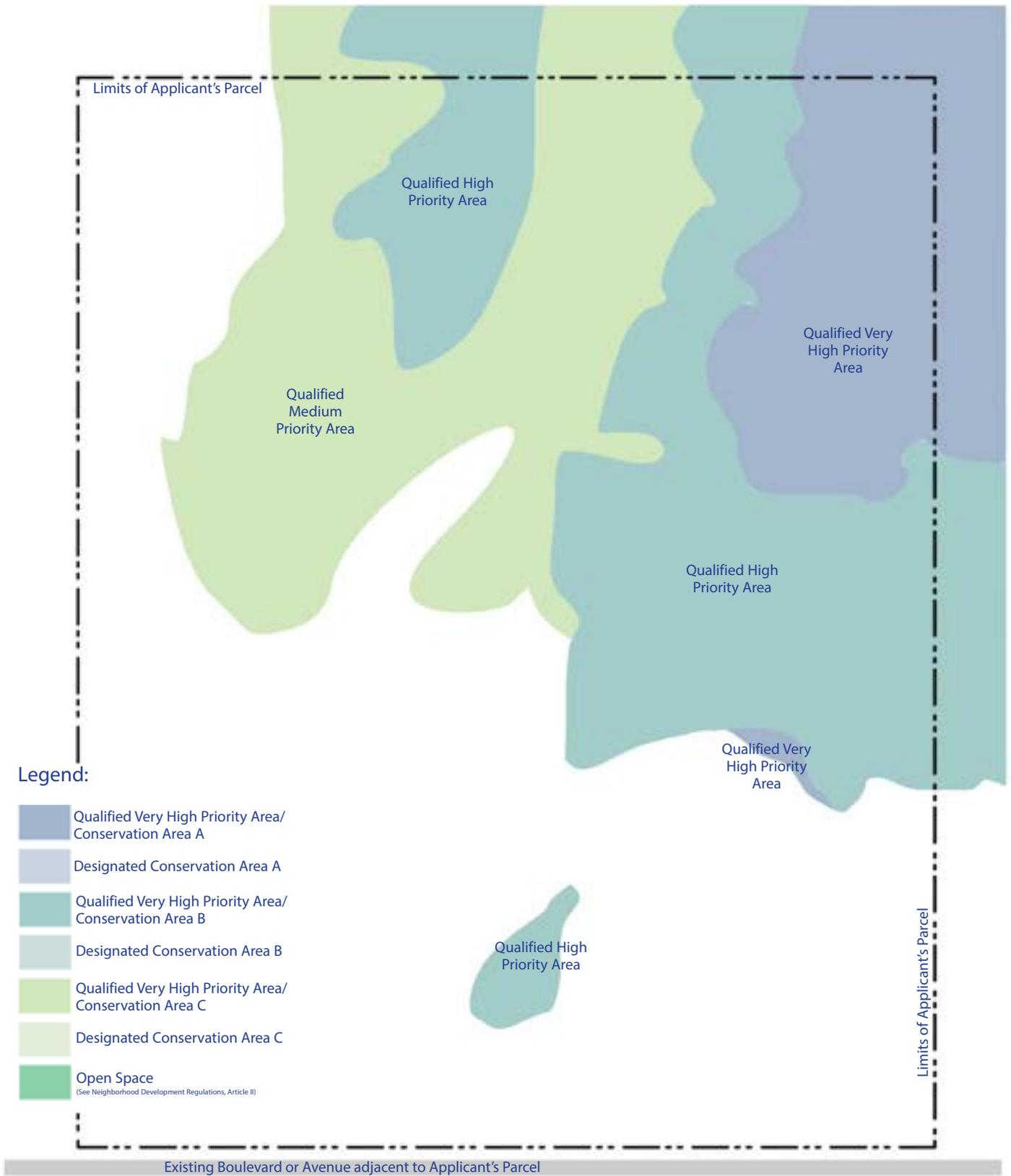


Figure 2.E-1. Priority Areas Delineated on a Parcel.

II. Neighborhood Development Regulations Section 11 - Conservation Area Requirements

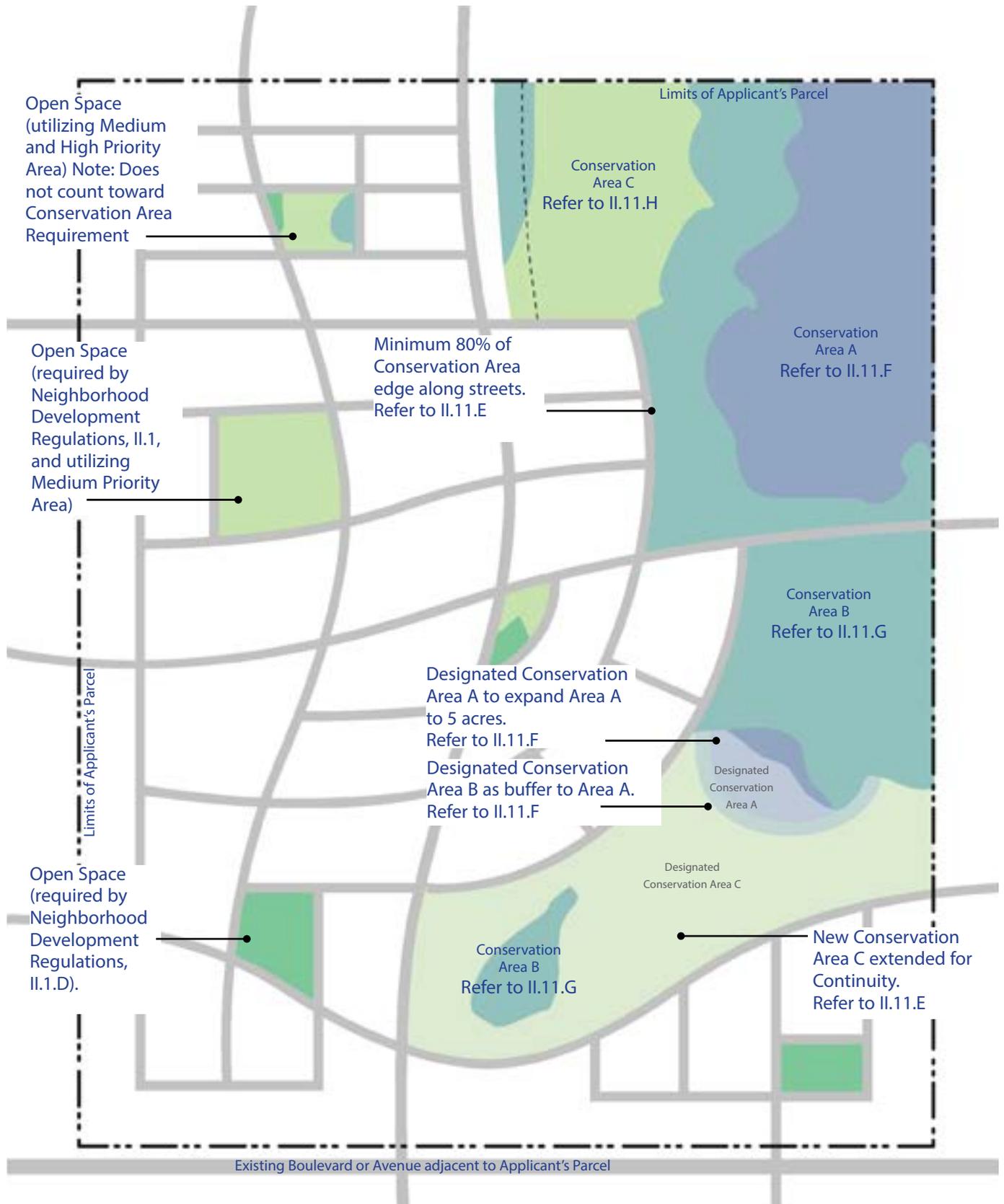


Figure 2.E-2. Illustration of Neighborhood design on Parcel, designating Conservation Areas.

II. Neighborhood Development Regulations

Section 11 - Conservation Area Requirements

- Property and the amount of Conservation Area and open space required.
3. Pedestrian, Bicycle, and Equestrian Access. Refer to the City's Comprehensive Plan, available at City Hall, for the recommended locations of pedestrian/bicycle, and equestrian trails.
 - a. Trails for the purpose of continuity may be permitted through Conservation Area A with the approval of the MPC.
 - b. Additional trails beyond what is recommended in the Comprehensive Plan may be provided through Conservation Types B and C with the approval of the MPC only.
 4. Street Connections. The following standards establish street connections through the Conservation Areas.
 - a. Existing Streets. Street connections through Conservation Areas shall connect to existing streets, unless otherwise permitted in these regulations.
 - b. Conservation Areas B and C. Street connections through Conservation Areas B and C shall occur a minimum of once every half (1/2) mile with the following exceptions:
 - (1) At the Parcel boundaries, when the adjacent Parcel is within another municipality and no connection exists.
 - (2) At City Waterways unless a street crossing is shown on the Applicant's Property on the City's Comprehensive Plan.
 - (3) At locations with slopes steeper than fifteen (15) percent over one (1) continuous acre.
 - (4) At Highways or railroads with limited access and no opportunity to connect to the other side.
 - (5) On small Parcels where the context of the site would not reasonably accommodate a street connection as determined by the MPC
 - c. Conservation Area A. Streets shall not cross Conservation Area A with the following exception.
 - (1) When Area A is greater than fourteen (14) acres, the minimum number of streets may cross Area A to meet II.11.E.
 - d. In locations where the Conservation Area blocks the minimum number of Access Points for a Neighborhood Type (refer to II.1.E) and no other location is available, the MPC may approve a reduction in the interval of street crossings to meet the Neighborhood Type requirement.
 - e. Right-of-Way Dedication. All street connections through Conservation Areas per these requirements will be dedicated Rights-of-Way, and will not be zoned OS5, nor considered Conservation Area.
 5. Street Frontage. The following standards require Conservation Areas to front on streets.
 - a. A minimum eighty (80) percent of the linear edge of all combined conservation areas shall abut street Right-of-Way with the following exceptions.
 - (1) Those edges of all combined conservation areas that abut other open space.
 - (2) Those edges that abut other developments under separate ownership.
 6. Fencing. Conservation Areas may be fenced, provided that the following requirements are met.
 - a. Height. Fencing shall be a maximum height of forty-two (42) inches.
 - b. Level of Opacity. Fence opacity shall be no greater than sixty (60) percent.
 - c. Gates or Openings. Gates or openings shall be provided on every Street Face at a minimum of every two hundred (200) feet.
 7. Open Water. A twenty (20) foot buffer of Conservation Area shall be provided adjacent to all Open Water bodies.
 - F. Specific Requirements for Very High Priority Areas and Conservation Area A.
 1. Intent. Very High Priority Areas shall be established as Conservation Area A to preserve and restore the City's prime Natural areas, including valuable forest stands, wetlands, Open Water bodies, and steep slopes.
 2. Qualifying Features. Very High Priority Areas are areas greater than two (2) acres that meet any one of the following criteria:
 - a. Greater than forty (40) percent Lakeland Heritage Plants, as determined by the vegetation survey, refer to II.11.B.
 - b. All wetlands.
 - c. All Open Water bodies.
 - d. Archaeologically historic sites, as determined by the required archaeological survey, refer to II.11.B.
 3. Amount of Area to be Conserved. One hundred (100) percent of the Very High Priority shall be preserved in its entirety (see Table 2.A-1) with the following exceptions:
 - a. Refer to II.1.D for the maximum total amounts of open space and permitted reductions in types of open space.
 - b. Refer to II.11.B for relief based on unexpected quantities of Conservation Area.
 - f. Types. Any Street Type, with the exception of a Boulevard, may cross a Conservation Area; however, the Conservation Street Overlay shall be utilized (refer to II.8.P).

II. Neighborhood Development Regulations

Section 11 - Conservation Area Requirements

4. Specific Design Requirements. The following specific design standards are required for all Conservation Area A locations.
 - a. Minimum Size of Conservation Area. Conservation Area A shall consist of at least five (5) acres of contiguous area.
 - (1) If the qualifying area consists of less than five (5) contiguous acres, the area shall be expanded to fulfill this requirement.
 - (2) Exception: For Subdivisions fourteen (14) acres or smaller where qualifying areas exist, Conservation Area A may be eliminated from open space requirements, unless it is contiguous to an existing or approved Conservation Area A, an existing, approved, or required Stream Management Buffer, a Scenic Corridor Buffer or Easement, or a public park, wherein the total of the combined areas reaches five (5) acres or more. In no instance shall more than fifty (50) percent of the Subdivision, including all Conservation Areas and Open Spaces (Total Open Space), be required. Due to the small size of the site, MPC may allow reduced continuity, street frontage, street connection, minimum width, and buffer requirements for the conservation area.
 - b. Minimum Width of Conservation Area. The minimum width of the area in any location shall be at least one hundred (100) feet.
 - c. Required Buffers. Fifty (50) foot buffers shall be established between the area and any adjacent Zoning District other than Open Space Districts.
 - (1) Buffer Designation. These buffers shall meet all the requirements of Conservation Area B areas, and will count towards the requirement quotas of that Area (see II.11.G).
 - d. Street Connections and Crossings. There shall be no street connections or crossings through Conservation Area A, except as permitted in II.11.E.
 - e. Impervious Coverage. No increase in impervious surfaces is permitted.
 - f. Uses and Structures. No Use other than Conservation (refer to III.2.J) is permitted.
 - (1) No structures are permitted in Conservation Area A.
 - (2) Sports fields and playgrounds are not permitted.
5. Restoration and Management Requirement. Restoration and Management of Conservation Area A shall be defined in the Restoration and Management Plan (refer to II.11.C) with the following minimum requirements.
 - a. Avoid or minimize soil damage, compaction, or other impacts to soil health.
 - b. Establish a stable vegetative condition for the entirety of the Parcel. Remove invasive or noxious trees, shrubs, and herbaceous plants.
 - c. In wooded areas, thin all trees to allow a light level on the ground plane that can sustain suitable grasses and flowering perennials, approximately thirty (30) to eighty (80) shade trees per acre.
 - d. Seed or plant bare (prepared) soil with suitable prairie, woodland, or meadow grasses.
 - (1) Provide adequate water, weed control, and other measures to allow healthy establishment of the vegetation.
 - (2) For warm season grasses, maintain with annual controlled prescription burning, or seasonal mowing, when burning is not feasible.
 - (3) For cool season grasses or meadows, maintain with seasonal mowing.
 - e. Improve and enhance biodiversity.
 - f. Restoration is required for one hundred (100) percent of the area of Conservation Area A.
6. Dedication. Conservation Area A may be dedicated in whole to the City or another organization approved by the City for restoration and/or management of the land, refer to II.11.A, pursuant to a Restoration and Management Plan approved by the City, and the fulfillment of all conditions required for the acceptance of said land.
- G. Specific Requirements for High Priority Areas and Conservation Area B.
 1. Intent. Conservation Area B is established to set aside appropriate portions of High Priority Areas, to maintain natural area through management, and to foster continuity between the natural areas.
 2. Qualifying Features. High Priority Areas include areas greater than two (2) acres with twenty (20) to thirty-nine (39) percent Lakeland Heritage Plants, as determined by the vegetation survey, refer to II.11.B.
 3. Amount of Area to be Conserved. Reference Table 2.A-1 for percentages of High Priority Areas to be designated as Conservation Area B with the following exceptions.
 - a. Refer to II.1.D for information on maximum total amounts of open space and permitted reductions in types of open space.

II. Neighborhood Development Regulations

Section 11 - Conservation Area Requirements

- b. Refer to II.11.B for relief based on unexpected quantities of Conservation Area.
4. Specific Design Requirements. The following specific design standards are required for all Conservation Area B locations.
 - a. Minimum Size of Conservation Area. Conservation Area B shall consist of at least two (2) acres of contiguous area.
 1. If the qualifying area consists of less than two (2) contiguous acres, the area shall be expanded to fulfill this requirement and all shall serve as Conservation Area B.
 2. Exception: For Subdivisions fourteen (14) acres or smaller where qualifying areas exist, Conservation Area B may be eliminated from open space requirements, unless it is contiguous to an existing or approved Conservation Area A or B, an existing, approved, or required Stream Management Buffer, a Scenic Corridor Buffer or Easement, or a public park, wherein the total of the combined areas reaches five (5) acres or more. In no instance shall more than fifty (50) percent of the Subdivision, including all Conservation Areas and Open Space (Total Open Space), be required. Due to the small size of the site, MPC may allow reduced continuity, street frontage, street connection, minimum width, and buffer requirements for the conservation area.
 - b. Contiguous. Streets crossing the Conservation Area developed with the Conservation Street Overlay do not interrupt the contiguousness of the area, but the street Right-of-Way shall not be included in the area quantity.
 - c. Minimum Width of Conservation Area. The minimum width of the area in any location shall be at least fifty (50) feet.
 - d. Relationship with Other Conservation Areas. The conservation area(s) shall comply with the continuity provisions of this section with other Conservation Area A, Conservation Area B, and Conservation Area C areas, both on the Parcel and adjacent Parcels. Refer to II.11.E).
 - e. Impervious Coverage. A maximum of five (5) percent of the Applicant's Property's Conservation Area B may be covered in Impervious surfaces, to accommodate permitted structures and parking. An additional area of five (5) percent may be Semi-Pervious.
 - f. Uses and Structures. All Uses, Accessory Uses, and Accessory Structures permitted in the OS5 district are permitted in Conservation Area B. Refer to III.2 Uses.
 - (1) Sports fields and playgrounds are not permitted.
 - (2) A Library/Museum (refer to III.2.D is permitted with the following development standards.
 - (a) The Conservation Area B Lot shall be a minimum of five (5) acres.
 - (b) The library/museum collection and/or programming shall be focused on the natural environment.
 - (c) The Civic Building Type (refer to III.3.M) shall be used for the Library/Museum.
 - (3) Accessory Structures are permitted only on Lots five (5) acres or larger.
5. Management Requirement. Management of Conservation Area B shall be defined in the Restoration and Management Plan with the following minimum requirements.
 - a. Soil Health. Avoid or minimize soil damage, compaction, or other impacts to soil health.
 - b. Establish a stable vegetative condition for the entirety of the Parcel. Remove invasive or noxious trees, shrubs, and herbaceous plants.
 - c. In wooded areas, thin all trees to allow a light level on the ground plane that can sustain suitable grasses and flowering perennials, approximately thirty (30) to eighty (80) shade trees per acre.
 - d. Seed or plant bare (prepared) soil with suitable prairie, woodland, or meadow grasses.
 - (1) Provide adequate water, weed control, and other measures to allow healthy establishment of the vegetation.
 - (2) For warm season grasses, maintain with annual controlled prescription burning, or seasonal mowing, when burning is not feasible..
 - (3) For cool season grasses or meadows, maintain with seasonal mowing.
 - e. Improve and enhance biodiversity.
 - H. Specific Requirements for Medium Priority Areas and Conservation Area C.
 1. Intent. Conservation Area C is established to set aside appropriate portions of Medium Priority Areas, to maintain Natural areas through management, to foster continuity between the Natural areas, and to preserve the existing character of the City.
 2. Qualifying Features. Medium Priority Areas include all areas greater than one (1) acre, not included in Very High or High Priority, with ten (10) to nineteen (19) percent Lakeland Heritage Plants, as determined by the vegetation survey, refer to II.11.B.
 3. Amount of Area to be Conserved. Reference Table 2.A-1 for percentages of Medium Priority Areas to be

II. Neighborhood Development Regulations

Section 11 - Conservation Area Requirements

designated as Conservation Area C with the following exceptions.

- a. Refer to II.1.D for information on maximum total amounts of open space and permitted reductions in types of open space.
 - b. Refer to II.11.B for relief based on unexpected quantities of Conservation Area.
4. Specific Design Requirements. The following specific design standards are required for all Conservation Area C locations.
- a. Minimum Size of Conservation Area. There is no minimum area required. The size of this area is determined by other open spaces on the site, and Total Open Space, if medium priority qualifying features exist. In no instance shall more than fifty (50) percent of the Subdivision, including all Conservation Areas and Open Space (Total Open Space), be required.
 - (1) Exception: For parcels less than fourteen (14) acres, no medium priority conservation area is required. Due to the small size of the site, MPC may allow reduced continuity, street frontage, street connection, minimum width, and buffer requirements for the conservation area, if it is utilized.
 - b. Minimum Width of Conservation Area. The minimum width of the area in any location is thirty (30) feet.
 - c. Relationship with Other Conservation Areas. The conservation area(s) shall comply with the continuity provisions of this section with other Conservation Area A, Conservation Area B, and Conservation Area C areas, both on the Parcel and adjacent Parcels.
 - d. Impervious Coverage. A maximum of five (5) percent of the Property's Conservation Area C may be covered in Impervious surfaces. An additional area of five (5) percent may be Semi-Pervious.
 - e. Uses and Structures. All Uses, Accessory Uses, and Accessory Structures permitted in the OS5 district are permitted in Conservation Area C. Refer to III.2.
 - (1) Sports fields and playgrounds are not permitted.
 - (2) A Library/Museum (refer to III.2.D.4) is permitted with following development standards.
 - (a) The Conservation Area C Lot shall be a minimum of five (5) acres.
 - (b) The library/museum collection and/or programming shall be focused on the natural environment.
 - (c) The Civic Building Type (refer to III.3.M) shall be used for the Library/Museum.
 - (3) Accessory Structures are permitted only on Lots five (5) acres or larger.
5. Management Requirement. Management of Conservation Area C shall be defined in the Restoration and Management Plan (refer to II.11.C) with the following minimum requirements.
- a. Avoid or minimize soil damage, compaction, or other impacts to soil health.
 - b. Establish a stable vegetative condition for the entirety of the Parcel. Remove invasive or noxious trees, shrubs, and herbaceous plants.
 - c. In wooded areas, thin all trees to allow a light level on the ground plane that can sustain suitable grasses and flowering perennials, approximately thirty (30) to eighty (80) shade trees per acre.
 - d. Seed or plant bare (prepared) soil with suitable prairie, woodland, or meadow grasses.
 - (1) Provide adequate water, weed control, and other measures to allow healthy establishment of the vegetation.
 - (2) For warm season grasses, maintain with annual controlled prescription burning, or seasonal mowing, when burning is not feasible..
 - (3) For cool season grasses or meadows, maintain with seasonal mowing.
 - e. Improve and enhance biodiversity.

II. Neighborhood Development Regulations

Section 12 - Site Disturbance and Grading

- A. General Requirements.
1. Intent. The following provisions are established to accomplish the following:
 - a. Preserve existing topography, drainage patterns, perviousness, and soil characteristics.
 - b. Design sites to fit and follow the topography and soil so as to create the least potential for tree and natural vegetation loss.
 2. Applicability. The following standards apply to all development included within an application for Preliminary Plat (I.4.C), Construction Plans (I.4.D), or Final Plat (I.4.E).
 3. Authority. This Section, II.12, is considered part of the Subdivision Regulations and is under the purview of the MPC.
 - a. Any modification from these regulations requires a Subdivision Modification approval (I.4.H).
 - b. Amendments to this Section, II.12, require an Amendment to Subdivision Regulations (I.4.I).
 4. Submittal. A Protection Zone Plan is required per I.4. Scale shall be one inch is no greater than one hundred feet, including the following:
 - a. Protection Zones with dimensions of site disturbance areas per II.12.B.
 - b. Fencing required for Protection Zones.
- B. Site Disturbance and Grading.
1. Site Disturbance. Limit site disturbance and any construction activities to the following maximum dimensions:
 - a. Forty (40) feet beyond all building perimeters.
 - b. Ten (10) feet beyond all surface walkways, patios, surface parking, pools, and utilities less than twelve (12) inches in diameter;
 - c. Fifteen (15) feet beyond Accessory Structures, street curbs, and utilities larger than twelve (12) inches.
 - d. Twenty five (25) feet beyond constructed areas with permeable surfaces (permeable paving areas, stormwater detention facilities, playing fields) that require additional staging areas in order to limit compaction in the construction areas.
 - e. To the extent that these areas occupy the entirety of the Lot, the Code Administrator (for I.4.D Construction Plans) or the Municipal Planning Commission (MPC) (for I.4.C Preliminary Plat), depending on the applicable process, may exempt the Applicant from establishing Protection Zones.
 2. Conservation Areas. Conservation Areas as designated shall not be disturbed. See II.11.
 3. Tree Protection. Tree protection areas shall be delineated separately outside the disturbance areas. Refer to Tree Management Ordinance, Title 13, Chapter 4 of the Municipal Code.
 4. Limit Areas of Disturbance. Confine construction, staging, and disturbance zones to only those necessary for the current stage of work, and to areas previously disturbed.
 5. Install Erosion and Sedimentation Controls. Site clearing operations shall not commence until temporary erosion- and sedimentation-control and plant-protection measures are in place.
- C. Grading and Slope Preservation.
1. Maximum Cut and Fill. The following maximums apply to all sites.
 - a. Cuts shall not exceed four (4) feet of depth except for construction of a building foundation, basement or swimming pool excavation.
 - b. Fill shall not exceed four (4) feet of depth.
 - c. A combination of cut and fill in any location shall not exceed eight (8) feet.
 - d. All cuts and fill shall be restored and stabilized.
 2. Steep slopes. Slopes greater than fifteen (15) percent shall be protected and incorporated as follows:
 - a. Areas with slopes greater than fifteen (15) percent across one (1) or more contiguous acres shall incorporate the area into Open Space (refer to III.4), Conservation Area (refer to II.11), Streamside Management Buffer (refer to III.12), or general site Landscape Areas (refer to III.5.)
 3. Modification. For approval of cut and/or fill exceeding four (4) feet of depth, all of the following shall apply:
 - a. No other site layout is feasible resulting in the same amount of gross building square footage; and
 - b. The cut and/or fill shall not be located within Conservation Area Type A or within Streamside Management Buffers, and shall not detrimentally impact nearby Stream Management Buffers, or Conservation Open Spaces; and
 - c. Fifty (50) percent or more of the site is unavailable for development if the maximums defined in II.12.C are adhered to.
 - d. The resulting total amount of cut and fill is no more than is necessary to accomplish the proposed site layout

II. Neighborhood Development Regulations

Section 12 - Site Disturbance and Grading

D. Existing Vegetation and Soil Protection.

1. Intent. Protect existing soils and vegetation from disturbance during construction processes.
 - a. To preserve existing Tree Canopy and natural or existing vegetation, until such time as an area is to be disturbed for development; and
 - b. To help hold soils in place, to enhance absorption, retention, and infiltration of precipitation and minimize runoff; and
 - c. To maintain infiltration and subsurface drainage of existing soils.
2. Protection Zone Plan. Develop a site vegetation and soil Protection Zone Plan, and designate areas outside the limits of disturbance as Protection Zones, including the following areas:
 - a. All areas to be landscaped.
 - b. All areas required for stormwater management-per Stormwater Management Plan. Refer to II.10.
 - c. All areas of existing trees and landscape to be retained.
 - d. All areas outside the limits of site disturbance. See II.12.B.
3. Fencing. Install fencing, per standard City detail available at City Hall, along edges of Protection Zones before materials or equipment are brought on the site and construction operations begin.
4. Prohibited Practices. The following practices are prohibited within Protection Zones during construction:
 - a. Storage of construction materials, debris, waste, or excavated material.
 - b. Parking vehicles or equipment.
 - c. Foot traffic.
 - d. Erection of sheds or structures.
 - e. Impoundment of water.
 - f. Excavation or other digging unless otherwise indicated.
 - g. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
 - h. Disposal of any waste material or substance.
5. Construction Zone Soils. In unprotected locations receiving construction activities:
 - a. Maintain the infiltration and subsurface drainage capacity of existing soils by avoiding rutting and compaction.
 - b. Regularly apply thick layers of mulch to minimize soil compaction in areas of high traffic.
 - c. Avoid working on wet soils with heavy equipment.

E. Retaining Walls.

1. Intent. The purpose of this chapter is to provide minimum standards to safeguard life, health, property and public welfare by governing the construction and placement of Retaining Wall systems through the adoption of specific standards to augment existing codes.
2. Applicability. These provisions shall apply to the construction and/or alteration of Retaining Walls on all public and private property that is not within a public Right-of-Way of the city.
3. Exemptions. Retaining walls with a height of wall not exceeding four feet are exempt from this standards if:
 - a. The wall is set back from any adjacent property lines or structures at a minimum distance equal to the height of the wall;
 - b. The material retained by the wall slopes up and away from the wall at a ratio not exceeding one foot vertical per three feet horizontal distance; and
 - c. The wall is not supporting a surcharge.
4. Definitions. For the purposes of this chapter, the following definitions shall apply:
 - a. "Height of wall" means the measured distance between the bottom of the footing to the top of a wall.
 - b. "Structural repairs" means to replace, restore, or remove any part of a Retaining Wall which affects its ability to resist the lateral or vertical forces of the adjacent soils.
5. Permit requirement. It shall be unlawful to construct, enlarge, or make structural repairs to any Retaining Wall without acquiring Construction Plan approval if associated with a Plat, Site Plan Review if associated with other development, or Minor Site Plan if unassociated with other development. Cosmetic repairs that do not affect the ability of the wall to resist lateral and vertical soil forces shall not require a permit.
6. Emergency Repairs. Emergency repairs required to stabilize slopes may exceed the height limits set forth in this Chapter provided the City Engineer determines the following criteria are met:
 - a. An imminent danger of slope failure exists that will threaten life or the safety of existing up slope or down slope property; and
 - b. The Code Enforcement Official certifies that strict compliance with the other provisions of this Chapter is likely to result in insufficient time to

II. Neighborhood Development Regulations

Section 12 - Site Disturbance and Grading

complete the repairs to provide for the necessary stabilization of the active area.

- c. The emergency repairs are not necessitated by actions of the Applicant or property Owner in violation of City codes.
 - d. The height of the Retaining Walls is the minimum necessary to stabilize the slope.
7. Design and Construction. Retaining wall systems that are newly constructed, structurally repaired or enlarged shall be designed or reviewed by a professional engineer licensed to practice in the state of Tennessee for all loads as specified in the Building Code and within this Chapter and in keeping with nationally recognized standards. Designs shall be based upon sound engineering and geotechnical principles.
- a. Utility Easements. Retaining Walls shall not restrict access to utilities.
 - b. Drainage Easements. Retaining Walls shall not impede the normal flow of storm water and shall not cross an open drainage channel.
 - c. Retaining walls shall not be constructed over a public or private access easement.
 - d. Retaining walls constructed near street intersections shall provide a reasonable degree of traffic visibility.
8. Maximum Wall Heights.
- a. The maximum height of a retaining wall in a fill section shall be limited to ten (10) feet.
 - b. The maximum height of a retaining wall in a cut section shall be limited to twelve (12) feet. A section that consists of a combination of a cut and a fill shall be considered as a cut; provided that the fill above the cut is no more than two (2) feet in depth.
 - c. Where multiple walls are situated in a terrace-like pattern, they shall be considered one wall for purposes of determining the height of wall if the horizontal separation between adjacent walls is less than or equal to the combined height of the walls.

II. Neighborhood Development Regulations

Section 13 - Soil Erosion and Sediment Control During Construction

- A. General Requirements.
1. Intent. To regulate erosion and sediment control on land disturbance or construction sites and to promote clean water in all waters of the state, storm sewers, and drainage structures.
 2. Applicability. Any land disturbance activity, except as exempted by Subdivision or Zoning Regulations, included within an application for Preliminary Plat (I.4.C), Construction Plans (I.4.D), or Final Plat (I.4.E), requires development of a Soil Erosion and Sediment Control Plan per II.13.B, below.
 3. Authority. This Section, II.13, is considered part of the Subdivision Regulations and is under the purview of the MPC.
 - a. Any modification from these regulations requires a Subdivision Modification approval (I.4.H).
 - b. Amendments to this Section, II.13, require an Amendment to Subdivision Regulations (I.4.I).
 4. Pre-Construction Design. All development shall be planned and designed to minimize soil erosion and sedimentation of drainageways using the following principals.
 - a. Plan the development to fit the existing topography, soils, drainage patterns, and natural vegetation of the site.
 - b. Minimize the amount of cut and fill.
 - c. Retain and protect natural vegetation and soil structure.
- B. Soil Erosion and Sediment Control Plan.
- A Soil Erosion and Sediment Control (SESC) Plan is required in accordance with the General Criteria established in the Tennessee Department of Environment and Conservation Erosion Sediment Control Handbook, A Guide for Protection of State Waters through the use of Best Management Practices during Land Disturbing Activities, distributed by Tennessee Department of Environment and Conservation, Second Edition March 2002 and any future amendments to same, is hereby adopted. The handbook shall be used to develop the SESC Plan and as guidance in methods and materials in the installation and construction of erosion control measures as shown on the approved plan.
1. The SESC Plan shall be designed and worded to address all potential field conditions to ensure compliance with the intent of these regulations.
 2. The SESC Plan shall be stamped and sealed by a professional engineer.
3. The SESC Plan, at minimum, shall include the following:
 - a. A list and brief description of each control measure that will be used.
 - b. A scaled site map clearly showing the existing and proposed contour lines, drainage ways, north arrow and location and type of each erosion and sediment control measure.
 - c. An implementation sequence indicating the order in which the erosion and sediment control activities will take place.
 - d. An inspection and maintenance schedule for all disturbed areas, material storage areas and erosion and sediment controls that were identified in the plan. This schedule shall identify, at a minimum, all erosion and sediment control measures to be inspected every seven (7) calendar days and within 24 hours of any storm event exceeding 1/2-inch precipitation.
 - e. Designated areas for equipment maintenance and repair.
 - f. Provisions for waste receptacles at convenient locations, the regular collection of waste, protected storage areas for chemicals, paints, solvents, fertilizers and other potentially toxic materials and adequately maintained sanitary facilities.
 4. Approval. Depending on the type of development, the SESC Plan shall be submitted with the Construction Plans process.
 - a. The City Engineer's signature of approval is required on all SESC Plans.
 - b. Approval of the Construction Plans shall constitute approval of the SESC Plan.
 5. Other Permits. All other required permits must be obtained from other federal, state, and local governments. Copies of approvals from other agencies shall be provided to the City to assure compliance.
- C. Soil Erosion and Sediment Control Techniques.
1. Phasing and Disturbance.
 - a. Minimize the extent of the area exposed at one time and the duration of the exposure.
 - b. Stabilize disturbed areas immediately after soil exposure or disturbance or after finish grade has been attained.
 - c. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross Protection Zones unless no other path exists, refer to II.12. Crossing Protection Zones shall be minimized and consolidated.

II. Neighborhood Development Regulations

Section 13 - Soil Erosion and Sediment Control During Construction

- d. No soil storage piles shall be located with a downslope drainage length of less than thirty-five (35) feet from wetlands, channels, detention basins or drainage Swales.
 - (1) Cover or vegetate (with an appropriate grass matrix) soil stock piles that remain on site longer than two weeks.
 - (2) Filter fence or equivalent shall be installed at a minimum distance of ten (10) feet from stockpile edge to reduce water build-up behind fence and potential failure of sediment control structure.
 - (3) Do not store soil stockpiles within Critical Root Zone of remaining trees or within protection areas.
 - e. SESC shall remain in place and in functioning condition for the duration of construction activity and until the areas that they protect are completely stabilized.
 - f. At the completion of the project, stormwater management facilities shall be inspected by the City to determine any cleaning or flushing of trapped sediment which may be required due to erosion. The responsibility for any needed cleaning or flushing lies with the site developer.
2. Erosion Control Practices:
- a. Apply perimeter control practices such as silt fences or earthen dikes to protect the disturbed area from offsite runoff and to filter concentrated runoff from the site to prevent sedimentation damage to areas below/downslope of the development site.
 - b. Remove sediment from storm water before it leaves the site by allowing runoff to pond in controlled areas (traps or basins) or by using vegetative cover, silt fences or hay bales.
 - c. Keep runoff velocities low and retain runoff on the site.
 - d. Direct upslope water to other rainwater facilities to avoid disturbed areas.
 - e. Transport surplus surface runoff down steep slopes through lined channels or piping. Ensure appropriate conditions at the bottom of the slope to avoid any impact from piped or channeled water and diffuse the energy and volume of the storm flow.
 - f. Straw bales or silt fence filters are required around inlet structures, catch basins, manholes, and other stormwater management facilities and structures.
 - g. Construction entrances shall be limited to two per site and shall be kept clean during the process.
 - h. Washing or cleaning of equipment shall be relegated to a designated area with appropriate controls.
- i. Examples of acceptable temporary structural SESC controls include diversion, silt fences, straw bale barriers, storm drain inlet protection, outlet protection, sediment traps, sediment basins, slope drains, subsurface drains, riprap, check dams, level spreaders, paved flumes, construction road stabilization and temporary gravel construction entrances and exits.
 - j. Examples of acceptable vegetative SESC include vegetative buffer zones, protection of trees, temporary seeding, permanent seeding, mulching, topsoiling, erosion & sediment control blankets and surface roughening. Sod is not an acceptable vegetative SESC control.
 - k. If it is necessary to remove topsoil, remove sod and grass before stripping and reuse topsoil on site.
 - (1) Grade and shape topsoil stockpiles to drain surface water and cover stockpiles to prevent erosion by wind or water.
 - (2) Do not stockpile topsoil within Protection Zones.
 - (3) If supplemental topsoil is needed beyond what is available on site, obtain from a local source.
3. Revegetation and Stabilization.
- a. When natural drainage ways, including stream channels, are disturbed, revegetate stream banks with suitable native vegetation, and with appropriate soil stabilization and establishment practices.
 - b. All disturbed areas shall be stabilized with appropriate temporary or permanent measures within seven (7) calendar days of final grading or when left idle for more than seven (7) days, excluding maintained haul roads, sediment basins, site runoff storage facilities, and utility corridors less than twenty (20) feet in width.
 - c. If work is discontinued for thirty (30) days or more in a disturbed area before the project is completed, appropriate interim controls shall be initiated within seven (7) calendar days from the day that work was discontinued.
4. Inspection and Maintenance
- a. Inspect, maintain, and repair SESC measures during construction until permanent vegetation has been established.
 - b. Damaged and ineffective erosion control measures shall be repaired, replaced or supplemented within forty-eight (48) hours of discovery or as soon as field conditions allow.
 - c. Straw bales and silt fences shall be inspected weekly and after rainfall event in excess of one half inch to determine required repairs and/or replacement. As a minimum, straw bales are to be

II. Neighborhood Development Regulations

Section 13 - Soil Erosion and Sediment Control During Construction

replaced every three (3) months or more frequently as required by the City. If tributary drainage area is greater than one acre, sediment basins shall be constructed in addition to using straw bales and silt fences.

- D. Post-Construction Restoration.
1. Vegetation native to the site or plant community shall be restored in areas affected by construction activities. Temporary vegetation, sufficient to stabilize the soil, shall be required on all disturbed areas as needed to prevent soil erosion.
 2. Following development, the infiltration capacity shall be restored and compaction of soils shall be reduced by breaking up compaction, adding organic matter, and planting vegetation.