

ARTICLE 18: INFRASTRUCTURE AND PUBLIC IMPROVEMENTS

18.01: GENERAL PROVISIONS

A. Purpose. The purpose of this article is to establish the minimum design and performance standards for the development of land in order to ensure sound subdivision development that is an asset to the community and is aligned with the *Major Road Plan for the City of Knoxville and Knox County*, the *Knox County Comprehensive Land Use and Transportation Plan*, and all other applicable County design standards, ordinances, and regulations. Furthermore, street design and public improvements shall be context-sensitive, meaning they must respond to and support the character of the surrounding area and balance vehicular mobility with pedestrian safety, access, and capacity to serve.

B. Resources Commonly Referenced. The most following best practice resources are commonly used and referenced throughout this article to support required infrastructure design standards:

1. American Association of State Highway and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets ("Green Book")
2. The Manual on Uniform Traffic Control Devices (MUTCD)
3. Tennessee Department of Transportation (TDOT) Design Guidelines and Standards Specifications for Road and Bridge Construction
4. Public Right-of-Way Accessibility Guidelines (PROWAG)

The most current version of the above resources, as well as any additional resources referenced throughout, shall be the default when referencing an applicable standard or requirement.

C. Application of Alternative Design Standards. Minimum design and performance standards shall apply to all development, as appropriate, unless an alternative design standard is permitted within this Article and approved by the Department of Engineering and Public Works. The alternative design standard requested must meet either the intent of the standard in these regulations or an alternative, nationally recognized engineering standard from an established resource in Section 18.01.B.

D. Monumentation Required of Subdivision. Permanent reference markers and/or monuments shall be required for all subdivisions of six (6) lots or more and placed at not less than three (3) locations within, or on the boundary of the property being subdivided. The location of all such markers and/or monuments shall be determined by the surveyor and shown on the plat.

1. When permanent reference markers are set within a public street they shall be set flush with the driving surface at the point of intersection (PI) of the centerline of the right-of-way of two (2) intersecting streets, at the point of intersection (PI) of the center point of a cul-de-sac and the centerline of the street right-of-way. For subdivisions with new streets, the permanent reference markers shall not be set until the top pavement coat is completed for the streets.
2. Property Monuments. Property monuments meeting the current edition of the *Rules of Tennessee State Board of Examiners for Land Surveyors – Standards of Practice*, shall be placed at all points on subdivision boundary lines where there is a change of direction and at all lot corners. Property monuments shall be placed only after all grading of the area and sidewalk construction have been completed. A guard stake shall be placed next to each property monument with the lot number and number of the adjoining lot plainly lettered on the flat faces of the stake.

18.02 STREETS, FRONTAGE, AND ACCESS

A. Streets.

1. Conformance Required. The subdivision or development of land and the design of streets servicing such land shall be undertaken in conformance with the *Major Road Plan*, the Transportation Improvements Programs and the Capital Improvements Program of Knox County. Dedication of streets and rights-of-way may be required to ensure conformance with the plan or programs.
2. Right-of-Way Dedication Along Existing Streets.

- a. Any proposed subdivision of property that adjoins an existing street and will result in the creation of additional lots may be subject to right-of-way dedication to bring the right-of-way closer to compliance with the *Major Road Plan*. When right-of-way dedication is required pursuant to Section 18.02.C, the entire right-of-way shall be provided where any part of the subdivision is on both sides of the existing street. When the subdivision is located on only one (1) side of an existing street, one-half of the required right-of-way, measured from the centerline of the existing roadway, shall be provided.
 - b. The right-of-way being dedicated shall be shown on the plat by providing all necessary bearings and distances, and the total area, pursuant to Section 18.01.D above.
 - a. If a street improvement project has been completed by the Tennessee Department of Transportation or the Department of Engineering and Public Works, and all the right-of-way needed for the project has been acquired, a waiver may be granted from the right-of-way requirements specified in the *Major Road Plan* and the right-of-way corner radius requirements of Sections 18.0X and 18.0X of these regulations, if recommended for approval by the Department of Engineering and Public Works.
3. Classification of Streets. Streets shall be functionally classified as follows, or in accordance with the most recent adopted version of the *Major Road Plan*:
- a. Interstate. A divided highway designated under the Interstate Highway System, designed for the safe, unimpeded movement of large volumes of through traffic with full access control and grade separation at intersections.
 - b. Expressways. A divided highway designed for the safe, unimpeded movement of large volumes of through traffic with full or partial access control that may contain both at-grade intersections and grade separated intersections.
 - c. Major Arterial. A street which provides major movement within the area, provides intercommunity connections to the local street system, and moves through traffic between activity centers. Access management is desirable.
 - d. Minor Arterial. A street that augments the principal arterial system, carries trips of moderate length and moves through traffic between activity centers. Access management is desirable.
 - e. Major Collector. A street that primarily provides for short distance traffic movements and primarily functions to collect and distribute traffic between local streets and high-volume traffic generators and arterials.
 - f. Minor Collector. A street that primarily functions to collect and distribute traffic between local streets and arterials and provides direct access to abutting land.
 - g. Local Street. A minor street that provides direct access to abutting land.
 - h. Cul-de-sac streets are local streets having only one (1) open end providing no access to another street. The closed end provides a turnaround circle for vehicles. No other street intersects between the two (2) ends, and property fronts on both sides of the street.
 - i. Dead-end streets are similar to cul-de-sacs except they provide no turnaround circle at their closed end. They are not permitted as streets in any proposed subdivision. Stub streets planned for future continuation are not considered to be dead-end streets but require a recorded easement to ensure future connectivity.
 - j. Alleys. Alleys are rights-of-way dedicated to shared use, typically for one way traffic flow, and to the back or side of properties otherwise abutting a street and which may be used for public utility purposes. Alleys generally have two (2) open ends, and each end connects with a different street.
4. Street Connectivity.

1. Connecting to existing streets. The proposed street system of a subdivision or development shall provide for the continuance of existing or dedicated right-of-way or streets to adjoining or nearby tracts, pursuant to zoning district requirements established in Articles 4 through 7 of this ordinance and in conformance with the requirements of the connectivity index in Section 18.06.A of this article.
2. Providing for future street and multi-modal connections to adjoining undivided property.
 - a. The proposed street system of a subdivision or development may be required to include street stub-outs for the logical extension of the street system into the surrounding area, pursuant to zoning district requirements established in Articles 4 through 7 of this ordinance and/or the Knox County Comprehensive Land Use and Transportation Plan. If required by the Department of Engineering and Public Works, a turnaround may be required for the street stub-out. The restoration and extension of the street shall be the responsibility of any future developer of the abutting land.
 - b. Where the logical extension of a street network is not feasible, an easement for future multi-modal connectivity shall be provided in place of a stub-out.
3. Notification of future connectivity. When streets or multi-modal easements are designed for future connectivity between developments, the end of the new street, easement, or multi-modal connection shall be posted with a sign designating the end point as a future connection. The sign shall be clearly visible from the end of the new street, easement, or multi-modal connection and shall be of a size and design meeting the requirements of the Department of Engineering and Public Works. The Concept Plan and final plat for the subdivision or development shall also clearly identify that the street end, easement, or multi-modal connection is designed for future connection.

B. Frontage.

1. Applicability. The following standards shall apply to lots that have legal access to a public or private street. Street frontage shall be developed in accordance with the applicable Frontage Type, pursuant to Table XX.
2. Dimensional Requirements.
 - a. Residential lots shall meet the minimum lot width required per the applicable zoning district requirements.
 - b. Where the flag stem of a flag lot is the sole means of access for the lot, the flag stem must have a minimum width of 25 feet for its entire length and be used to provide physical access to the lot. Serial flags, where stems are stacked one after the other so all are adjacent, are prohibited under this ordinance.
2. If a lot meets the minimum street frontage requirement, but access to the property is restricted and cannot occur at the street frontage, legal access shall be provided by one of the access options identified below in Sections C-G.
3. Frontage Types Established. Frontage types govern the relationship between site development, public right-of-way, and infrastructure elements necessary to serve the development proposed. The Table 18.01 establishes frontage types and identifies design standards based on the functional road classifications established in *The Master Road Plan*, alignment with adopted placetypes, and the underlying zoning districts:

[Table 18.01 Street and Frontage Types]

C. Access.

1. Applicability. The following requirements govern access improvement outside of the established road right-of way.

2. Access Standards. All lots shall have either frontage on a public street in accordance with Section 18.02.B of these regulations or have approved access to a public street by one or any combination of the following:
 - a. Access to a public or private street by an approved access easement;
 - b. Access to a public or private street by an approved private right-of-way;
 - c. Access to a public or private street by a previously approved joint permanent easement;
 - d. Access to a public or private street by an alternative access standard or shared driveway easement; or
 - e. Access provided to a public or private street through some other legally binding document to be reviewed by the Department of Engineering and Public Works, and which meets the criteria of Section 18.02.B.

Such access shall provide a readily apparent physical means of traversable pedestrian and vehicular access from the lot(s) onto the street and shall meet the standards identified below in Section 18.02.B.

3. Access Easement. The access easement shall meet the following standards:
 5. The plat shall identify both the total area of the lot and the area excluding the access easement, the latter of which must meet the minimum zoning requirements. The driveway width and surface material shall be regulated by the Department of Engineering and Public Works in accordance with the most current version of the Access Control Manual and related policy.
 - a. An access easement shall serve a maximum of five lots.
 - b. An access easement may serve residential or commercial properties. However, for residential properties, an access easement may only serve a single-unit, two-unit, single unit attached, or townhouse lot, provided no more than ten (10) dwelling units are accessed via the easement.
 - c. A lot with frontage on a public right-of-way, through which the access easement crosses, shall be required to utilize the access easement as its only means of access. A note shall be provided on the plat stating that the lot or lots with right-of-way frontage must use the access easement for access. The frontage lot(s) shall count toward the five lot maximum.
 - d. Applicants may seek a waiver from the Department of Engineering and Public Works to allow a driveway location change for the frontage lot(s). However, the frontage lot(s) would count toward the five-lot maximum regardless of whether a waiver was granted to allow a change in the driveway location and regardless of whether the frontage lot(s) connected to the access easement. Said waiver should be clearly noted on the plat.
 - e. The access easement shall not be less than twenty-five (25) feet in width. The perimeter bearings and distances for the access easement shall be shown on the plat.
 6. The driving surface within the access easement shall be a minimum of 18 feet and meet the standards of the Access Control Manual. The access easement must meet intersection sight distance criteria at the right-of-way connection pursuant to Section 18.02.6.12.
- f. The access easement should also serve as an easement for drainage, utilities, and County access.
- g. A dead-end access easement shall be required to provide a suitable turnaround when deemed necessary by the Department of Engineering and Public Works and may need to meet American Association of State Highway and Transportation Officials (AASHTO) guidelines.
- h. An access easement shall not connect two public streets.
- i. A maintenance agreement shall be created in accordance with Article 21. All property owners using the access easement for access shall be included in the maintenance agreement. The plat shall include all lots, buildings, or structures using the access easement for access, except for any existing lots, buildings, or structures that have access

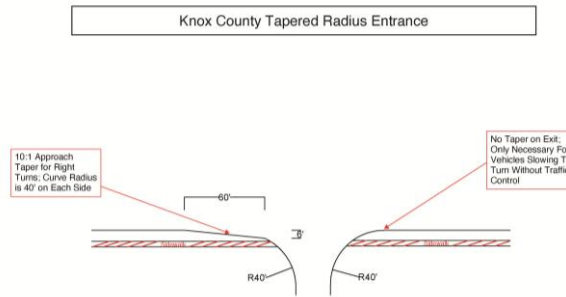
to the access easement beyond the point of the required improvements. Planning staff may require all lots, buildings, or structures using the access easement to be shown on the plat or approved development plan.

- j. A street name may be required for an access easement, pursuant to the appropriate naming procedures established by Knoxville-Knox County Planning.
4. Private Right-of-Way. A private right-of-way may serve two (2) or more lots without frontage on a public street, but is required where an easement serves six or more lots. The private right-of-way was previously identified as a joint permanent easement under these regulations. A private right-of-way shall meet the following standards:
- a. A lot shall be considered to be served by a private right-of-way if the lot abuts and has legal traversable access to the private right-of-way.
 - b. Subdivisions with a private right-of-way shall conform to the general purpose of these regulations and shall be designated on the plat as a private right-of-way. More specifically, the subdivision shall be considered in the context and pattern of neighboring developments and shall not create double frontage lots except as directed in Section 18.02.B. A private right-of-way shall not be approved if it will create a connection between two (2) public streets.
 - c. All lots fronting on the private right-of-way shall meet the sight distance requirements for public streets as specified in Section 18.02.
 - d. A private right-of-way shall not be less than forty (40) feet in width. The area of the right-of-way shall not be included as a part of the lots and lot area calculations. The perimeter bearings and distances for the private right-of-way shall be shown on the plat
 - e. The maximum grade on a private right-of-way shall not exceed twelve (12) percent. However, when special topographical or other conditions justify it, the Department of Engineering and Public Works may increase the maximum allowable grade on a local street to up to fifteen (15) percent or in accordance with AASHTO.
 - f. A dead-end private right-of-way shall provide a suitable turnaround meeting AASHTO guidelines and the requirements of the Department of Engineering and Public Works.
 - g. A homeowner's association or other legal entity shall be established that addresses maintenance of the private right-of-way. The document must demonstrate that the private right-of-way will be properly maintained. A note shall be placed on the plat stating the private right-of-way is not a public street and will not be maintained by Knox County.
 - h. A private right-of-way shall also function as a utility easement, and a note shall be placed on the plat specifying such use.
 - i. A private right-of-way that serves nonresidential lots shall be subject to the requirements of Section 18.02.
 - j. A private right-of-way serving less than six (6) lots shall meet the following additional standards:
 - a. Roadway construction standards shall be approved by the Department of Engineering and Public Works. A minimum twenty-foot (20) wide, unobstructed driving surface shall be required, capable of supporting the imposed loads of emergency apparatus under all weather conditions. A gravel surface may be permitted, although paving may be required, particularly for erosion control when the road grade exceeds eight (8) percent. A narrower driving surface width may be approved by the Department of Engineering and Public Works.
 - i. A road profile may be required to determine whether a proposed private right-of-way will be traversable.
 - ii. Any subdivision of land that creates additional lots to be served by an existing private right-of-way or extend the private right-of-way shall be subject to the requirements of Sections 18.02. A note shall be placed on the plat or approved development plan stating this requirement as a condition of approval.
 - k. A private right-of-way serving six (6) or more lots. A private right-of-way serving six (6) or more lots, or a system of private rights-of-way where the total number of lots is six (6) or more, shall meet the following standards:

- i. A private right-of-way serving six (6) or more lots shall meet the same design and construction standards as a public street with the exception of a turnaround as permitted above. The Department of Engineering and Public Works may reduce the required width of the right-of-way from fifty (50) feet to forty (40) feet when deemed appropriate based on the grading, drainage and traffic characteristics of the subdivision. Department of Engineering and Public Works (EPW) may reduce the required driving surface width to twenty (20) feet. A narrower driving surface width may be approved by the Planning Commission with support from EPW. A street profile and driving surface cross-section shall be required. A private right-of-way serving six (6) or more lots that does not conform to the public street standards of Section 18.02.B must obtain a variance approval by the Planning Commission as outlined in Article 22 of this ordinance.
 - ii. All private rights-of-way that serve six (6) or more lots shall be named in conformance with applicable street naming ordinances. Private rights-of-way serving six (6) or more lots shall be designated “Way” unless extending a previously named street.
- 5. Previously Approved Joint Permanent Easement. A subdivision may be considered that would create additional lots on a previously approved joint permanent easement or create additional lots that would require the extension of a previously approved joint permanent easement. Such subdivision of land shall be subject to the applicable requirements of Section 18.03.
- 6. Alternative Access Standards.
 - E. If access to a property cannot be provided by an access standard listed in Section 18.02.C, the Department of Engineering and Public Works may consider alternative access standards for a development that would address unique conditions of a site or development allowed under these regulations. Alternative access standards may also be used for property with a previously existing nonconforming access. Legal documentation of the new or existing alternative access shall be required pursuant to Section 18.03.
 - F. Shared Driveway Easement. A single driveway which does not meet the minimum 25-foot width requirement of an access easement, may serve a maximum of two dwelling units. A shared driveway must meet the minimum dimensions and standards of an individual driveway as determined by the Department of Engineering and Public Works. The easement area of the shared driveway shall count towards the total lot size. The perimeter bearings and distances for the shared driveway easement shall be shown on the plat.
 - b. This section shall not be used in lieu of approval for a variance from another access standard.
 - G. Legal Documentation. Where access to a lot is provided by a proposed easement, private right-of-way or other approved means of access in lieu of direct frontage on a public street, such approved access shall be shown on the subdivision plat along with all engineering data, or reference to recorded documents, necessary to locate the approved access on the ground. The deed or other legal document establishing the easement, private right-of-way, or other approved means of access, must be approved by the Law Department, as to legality and permanence of access rights, and a written statement of the Law Department’s approval must be submitted prior to certification for recording. The document must also address property ownership and maintenance responsibilities for the approved access. Reference to such deed or other legal document shall also be shown on the plat. If a new lot(s) is added to an existing easement, the easement agreement shall be updated to include the new property owners and establish updated maintenance responsibilities, to ensure the maintenance of the driving surface is shared by all parties using it and the existing parties responsible for the easement support the addition of more lots or dwellings on the easement. This documentation must be reviewed and approved by the Law Department, as provided above.
 - H. Use of Alley for Vehicular Access. The Department of Engineering and Public Works may approve the use of alleys as the sole means of vehicular access to lots, subject to meeting these

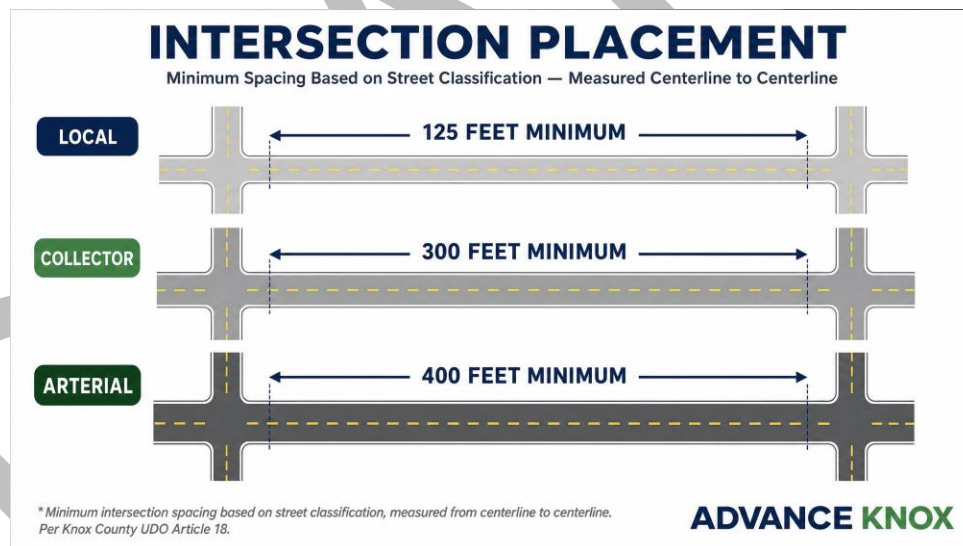
regulations. The alley shall be designed and improved to a design standard approved by the Department of Engineering and Public Works. Such lots shall meet the minimum lot frontage requirements of Section 18.02 of these regulations.

- I. Street Design Standards for Expressways, Arterials, and Collectors. Street design standards for future expressways, major and minor arterials, and major and minor collectors shall be determined by the government agencies responsible for their design and construction. Relevant agencies may include the Tennessee Department of Transportation and the Department of Engineering and Public Works.
7. Right-of-way and travel lane widths shall meet the requirements specified within the Street and Frontage Types Table.
8. Grading of Streets and Alleys. Established grades of streets and alleys shall be as follows:
 - a. Minimum Grade. The minimum grade of any street shall not be less than two (2) percent.
 1. Maximum Grade. The maximum grade on a street shall not exceed 12 percent. However, when special topographical or other conditions justify, the Planning Commission, on the recommendation of the Department of Engineering and Public Works may increase the maximum allowable grade on a street up to fifteen (15) percent.
 - b. Grades at Intersections. The maximum grade of any street at the approach to an intersection shall not exceed two (2) percent. A grade of up to three (3) percent may be approved by the Department of Engineering and Public Works. The maximum grade shall not exceed the cross-slope requirements of the Public Rights-of-Way Accessibility Guidelines (PROWAG) or the most current ADA Standards as appropriate when a pedestrian crossing is proposed.
 - c. Grades for Roundabouts. The maximum grade of any street at the approach to a roundabout shall be four (4) percent.
 - d. Maximum Grade in the Bulb of Cul-de-Sac Streets. The maximum grade in the bulb of cul-de-sac streets shall not exceed ten (10) percent. The maximum cross-slope shall not exceed three (3) percent.
 - e. Measurement of Maximum Grade in Cul-de-Sac. The maximum grade is to be measured along the proposed centerline of the roadway extended through the center of the cul-de-sac bulb.
 - f. Measurement of Cross-Slope. The cross-slope of the cul-de-sac bulb is to be measured on a line ninety (90) degrees to the centerline of the roadway extended to pass through the center of the cul-de-sac bulb.
 - g. Horizontal and Vertical Curves and Tangents. For safety of travel, curves and tangents shall be as designed according to AASHTO standards, as approved by the Department of Engineering and Public Works.
9. Intersections Standards. Requirements for intersections shall be as follows:
 - a. Angle of Intersection. Roads within a development shall be laid out so that intersections are as nearly as possible at right angles, and in no case shall the intersection of roads yield angles of less than seventy-five (75) degrees.
 - b. Radii of Property Lines and Edge of Driving Surface at Intersections.
 - i. The minimum property line and edge of driving surface radius at corners of intersections in agricultural, residential and office zones shall not be less than 25 feet unless approved by the Department of Engineering and Public Works.
 2. The minimum curb and property line radius at corners of intersections in commercial, and industrial zones shall not be less than 75 feet. A radius reduction to 50 feet may be approved by the Department of Engineering and Public Works.



- c. Intersection Placement. The intersections of public or private streets shall be spaced in accordance with the specifications of the Department of Engineering and Public Works. The minimum spacing between intersections is based on the street classification of the road between both intersections, as follows, and is measured from centerline to centerline.

Intersection Class	Spacing (Feet)*
Local	125'
Collector	300'
Arterial	400'



- d. Intersection Sight Distance. The minimum sight distance for new intersections shall meet the following standards:
- The minimum sight distance at the intersection in both directions along the major street shall be measured using intersection sight distance standards identified in the AASHTO Geometric Design of Highway and Streets.
 - The minimum sight distance for new lots with access to an existing public street shall have adequate sight distance meeting the standards identified in Section 18.02.6.12. If a specific driveway location is needed to meet the minimum sight distance requirement, the driveway location shall be identified on the Final Plat and the driveway restriction shall be clearly noted.

10. Other Street Design Standards

- a. Reserve Strips. Reserve strips controlling access to public streets shall be prohibited except where their control is placed in the county or city under conditions approved by the Planning Commission. Stub-outs shall be a requirement for future access for development.
- b. Cul-De-Sacs. All streets having only one (1) open end which serve two (2) or more lots on the same side of the street shall provide adequate turnaround space in accordance with the following:
 - i. The cul-de-sac shall have a right-of-way radius of fifty (50) feet and a transition curve radius of no less than seventy-five (75) feet. Paved area of the cul-de-sac shall have a radius of not less than forty (40) feet.
 - ii. A cul-de-sac shall be permitted only on a local street where continuation of the street is infeasible because of topography, a watercourse or floodplain, protected natural resource, existing development, adopted transportation plan, or another documented physical constraint. A cul-de-sac shall not be used to avoid a logical street connection.
 - iii. A permanent cul-de-sac shall not exceed six hundred (600) feet in length, measured along the street centerline from the centerline of the nearest intersecting street to the center point of the turnaround.
 - iv. A cul-de-sac shall provide the sole vehicular access to no more than thirty (30) dwelling units, calculated at ultimate buildout. A development exceeding this threshold shall provide two (2) separate and approved fire apparatus access routes, unless an alternative is approved by the Fire Code Official pursuant to the adopted fire code.
 - v. Cul-de-sacs shall not terminate a planned collector street, an existing dedicated right-of-way, or a required future street connection.
- c. Edge of Roadway. The applicant shall provide permanent concrete curb and gutter, standard rolled curbs and concrete or asphalt gutters that meet the appropriate standards. Concrete banding can be used instead of curbing for streets designed to drain directly from the street to appropriate water quality improvements (i.e. bioswale), adjacent to the road. Other construction options can be considered and approved by the Department of Engineering and Public Works.
3. Non-Standard Cross-Sections. The use of non-standard, context-sensitive street cross-sections is permissible within the TND and TC districts or when implementing approved frontage types. Whenever non-standard cross-sections are proposed, an engineering analysis demonstrating complete streets functionality, pedestrian safety, and compliance with nationally recognized street design standards (e.g., National Association of City Transportation Officials) must be submitted for approval by the Department of Engineering and Public Works.
4. Construction Standards. The construction of all streets and alleys shall be in accordance with the most recently adopted standards established by the Tennessee Department of Transportation (TDOT), and any additional applicable standards required by the Department of Engineering and Public Works, including base, binder, and surface thickness requirements for certain types of development established in Table XX below. Engineering and Public Works may require geotechnic analysis and pavement design in place of the specifications located within the table below.

DEVELOPMENT TYPE	BASE THICKNESS	BINDER THICKNESS	SURFACE THICKNESS
Residential	8 inches	2-½ inches "B" Mod.	1-½ inches
Commercial	8 inches	3 inches "B" Mod.	2 inches
Industrial	10 inches	3 inches A-S and 2 inches "B" Mod.	inches

- d. Costs. The cost of the required street improvements shall be borne by the developer. The developer may also be responsible for the costs of off-site street improvements that are

directly proportional to the traffic generated by the development as identified in a required Traffic Access and Impact Study, in accordance with applicable state law.

- J. Dedication of Right-of-Way. The applicant may be required to dedicate sufficient right-of-way as deemed necessary by the Department of Engineering and Public Works, for the proposed street network.

18.03 TRAFFIC CONTROL.

- A. Authorization. In accordance with Article 62 of the Knox County Regulations, the Department of Engineering and Public Works is authorized to:
1. Place, erect, and maintain official traffic control devices, signage (including but not limited to stop signs, yield signs, restricted turns signs, etc.);
 2. Indicate the ownership of traffic signs, signals, or markers on such devices;
 3. Establish no-passing zones, one-way roadways, reverse the direction of/permit two-way traffic, restrict the movement of traffic, and designate center turn lanes;
 4. Regulate or prohibit the use of any controlled access roadway or highway;
 5. Make and enforce temporary or experimental regulations to cover emergencies or special conditions;
 6. Temporarily close any roadway to vehicular or foot traffic, or to divert such traffic therefrom when it is deemed in the interest of public safety or convenience.
 7. Designate and maintain crosswalks, by appropriate marks upon the surface of the roadway, at intersections and at such other places where an engineering investigation indicates there is a particular danger to pedestrians crossing the roadway;
 8. Mark traffic lanes upon any roadway where a regular alignment of traffic is necessary;
 9. Establish safety zones of such kind and character and at such places as may be deemed necessary for the protection of pedestrians; and,
 10. Erect and maintain signs naming roadways at intersections and other appropriate locations as it may deem necessary.

18.04: UTILITIES

[This section will be updated following the conclusion of the utility study presently underway; all content below subject to change.]

18.05: REQUIRED IMPROVEMENTS

- K. Completion of Required Improvements. No final subdivision plat or development shall be approved by the Department of Engineering and Public Works or by the Planning Commission or accepted for recording by the Register of Deeds until all required improvements have been constructed in a satisfactory manner except as hereinafter provided.
- A. Performance Bond or Other Form of Security in Lieu of Completion of Required Improvements.
1. In lieu of completion of required improvements, Department of Engineering and Public Works may approve a final subdivision plat provided sufficient security is posted with the Department of Engineering and Public Works, which will ensure the completion of the required improvements. A plat shall not be certified for recording until the appropriate stamps for the guarantee of completion of required improvements identified in this article have been certified by the Department of Engineering and Public Works.
 2. Required improvements may include, but are not limited to, public or private streets, sidewalks and pedestrian facilities, stormwater facilities as required in Article 19 of this ordinance, and permanent reference markers, monuments and benchmarks.
 1. The type of security and the process for determining the amount, life, extensions and draw-down procedures shall follow the requirements of the Department of Engineering and Public Works.

3. The bond or security will include funds to cover the cost for setting permanent reference markers, monuments, and benchmarks upon the completion of subdivision improvements. The bond or security shall not be released until the registered land surveyor provides certification that all permanent reference markers, monuments, and benchmarks have been installed.

18.06: MULTI-MODAL CONNECTIVITY

- A. Sidewalks and Pedestrian Facilities.
 2. Sidewalk Improvements. Any required sidewalks shall be provided by the developer in accordance with the design and construction standards of the Department of Engineering and Public Works.
 1. Alternative Pedestrian Circulation Systems. The Planning Commission may consider and approve an alternative plan for pedestrian traffic within a subdivision.
 2. Block Length and Perimeter Standards. Maximum block lengths shall be established to ensure pedestrian connectivity and walkability, consistent with the Comprehensive Plan; refer to Table 18.01 Street and Frontage Types for maximum block length and perimeter standards based on frontage type.
 3. Pedestrian Mid-Block Passages. In the TND, TC, and NMU zoning districts, where block lengths exceed the thresholds identified in Table 18.01, a publicly accessible pedestrian passage (minimum 10 feet wide with a minimum 6-foot clear path) shall be provided to allow pedestrian through-access.
 4. Connectivity Index. Development within [the MR, NMU, TND, and TC zoning districts shall achieve a minimum connectivity index of 1.4, calculated as the number of street links divided by the number of street nodes (intersections and cul-de-sac heads). The Planning Commission may approve a lower index where topographic constraints, stream buffers, or other environmental features prevent connections.
- B. Sidewalk Construction.
 1. In all new residential subdivisions of six (6) or more lots, and for all new commercial developments, all developers of real property in Knox County shall:
 - a. Install sidewalks in developments that create a connection between two collector (or higher) classified streets. The sidewalks required by this subsection shall be along at least one side of each street within the development that creates the connection between classified streets.
 - b. Install sidewalks on local streets designed and posted at speeds greater than 25 mph. The sidewalks required by this subsection shall be along at least one side of each such street.
 - c. Install sidewalks along the developments' frontage of existing adjoining roadways where the proposed development is:
 - i. Within the parental responsibility zone;
 - ii. Within ¼ mile of public facilities such as libraries, parks, senior centers, and greenways or proposed greenways per the Knox County Greenway Corridor Study;
 - iii. Within ¼ mile of commercial facilities such as convenience stores or similar uses that would generate pedestrian traffic; or
 - iv. Within ¼ mile of other established pedestrian facilities.
 - d. Install sidewalks along new internal streets where the anticipated average daily traffic exceeds 1,000 vehicles per day.
 - e. Install sidewalks in locations where the Director of Engineering and Public Works determines that sidewalks are necessary to provide significant pedestrian connectivity, enhance pedestrian safety, or are in the overall best interest of the county taxpayer.
 2. The developer of property may install sidewalks in addition to those sidewalks required by this section. Prior to the installation of such additional sidewalks, the developer shall record a maintenance agreement obligating subsequent landowners to maintain these sidewalks in perpetuity. The maintenance agreement shall be in a form approved by the Law Director's Office.
 3. All sidewalks shall meet the following minimum standards:

- a. Sidewalks shall be constructed or reconstructed in accordance with the design standards and specifications set forth in the most current Tennessee Department of Transportation (TDOT) Design Standards;
 - b. Sidewalks shall conform to the most recent published version of the Public Rights-of-Way Accessibility Guidelines (PROWAG) or the most recent published version of ADA Standards as appropriate; and
 - c. Sidewalks shall have a minimum width of five feet and shall be designed to support the weight of vehicles at all driveway crossings.
4. The Director of Engineering and Public Works may modify the requirements of this section under the following circumstances:
 - a. In locations where street improvements are currently funded in either the operating budget or the officially adopted capital improvements plan, or where there are sufficient existing pedestrian circulation facilities, the director may eliminate the sidewalk requirement in whole or in part.
 - b. In locations where existing physical features on the property such as utilities, drainage ditches, historic wall(s) or stone wall(s), tree(s) or steep topography, or other hardship, the director may approve an alternative design or identify an alternative location that is in the overall best interest of the county taxpayer.

18.07: EASEMENTS

- L. Standard Utility Easements. A standard utility easement, situated along lot lines in a subdivision, shall be dedicated to the public and to the appropriate Utility Agencies as follows:
 1. These required utility easements shall be 10 feet in width inside all exterior lot lines adjoining public streets and private rights-of-way (including Joint Permanent Easements). Easements of five feet in width shall be provided along both sides of all interior lot lines and on the inside of all other exterior lot lines. Such dedication shall be noted on the plat of the subdivision.
 1. These easements are not required along specific lot lines for property that is zoned to allow less than a five-foot building setback, and this shall be clearly noted on the plat.
 2. The Department of Engineering and Public Works may waive the requirement for the standard utility easement in specific areas when:
 - a. There are no existing utilities within the specific area that is being considered for the waiver.
 - b. Such waiver shall be clearly identified and certified for approval by the Department of Engineering and Public Works on the plat to be recorded.
 2. If the standard utility easement already exists through the recording of plat, the existing easement would have to be released by the applicable Utility Agencies for the waiver to be approved.
 3. Maintenance of standard utility easements is the responsibility of the property owner and not the responsibility of the Department Engineering and Public Works.
- B. Other special utility easements may be required through the review process and shall be designated on the plat to be recorded.
- C. Elimination of lot lines and release of any recorded easements.
 1. When lots are being resubdivided and a lot line(s) is being eliminated that has a recorded utility easement along the lot line(s), the applicable Release of Easements certification stamp found in the appendices of this UDO shall be signed by all parties having rights associated with the recorded easement. In signing the certification stamp, the parties do not release any rights that may have accrued for their use and benefit where there are existing facilities within the previously established easement, whether or not shown on this plat. Any relocation of existing facilities will be made at the property owner's expense. If the facilities are relocated, the easement rights will be released.
 2. The owner(s) of the property being resubdivided shall also sign the Release of Easement certification stamp found in the appendices of this UDO verifying that they understand that easement rights for any existing facilities are not being released and it is their responsibility to

- verify with Knox County and utility companies if there are any existing facilities along the lot lines being eliminated by this plat before digging or constructing any building or structure.
3. If a lot line(s) is being eliminated and there are no known recorded easements along the lot line(s), the surveyor shall certify on the plat that there are no known recorded easements before the subdivision plat can be approved and recorded.

18.08: STREET NAMING AND ADDRESSING

- A. Knoxville-Knox County Planning (Planning) is the addressing authority for Knox County. Planning shall be responsible for creating standards for subdivision names, establishing rules for naming public and private rights-of-way, access easements and private driveways, and standardizing methodology for assigning addresses. Planning shall establish a uniform system of numbering structures, keep a record of the date addresses were assigned, resolve address number or street name conflicts, reassign addresses and propose any change, which in its opinion, is necessary to protect the safety and welfare of the county's residents, businesses, and visitors. Planning shall maintain a database of official addresses and street names, which shall be shared with the Knox County Emergency Communications District to ensure emergency dispatchers and responders can locate 911 callers.
- B. Planning shall designate the address number and street name of all occupiable buildings within the county in accordance with their Addressing Guidelines and Procedures. Every structure with more than one principal use or occupancy shall have a separate address for each use or occupancy. Non-occupiable or accessory structures may be assigned an address to establish utility services or obtain a building permit. Vacant or unused property is not required to have an address.
- C. The County shall contact Planning to either certify the official address or assign an appropriate address prior to issuance of a building permit for new construction or when the use or occupancy of an existing building changes.
- D. It shall be the responsibility of the landowner or occupant of each residence, business establishment or other building to ensure an address has been issued. If no such address has been issued, it shall be the responsibility of the landowner or occupant thereof to notify Planning for property assignment.
- E. Building required to have number. It shall be the duty of the owners, occupants or lessees of all dwellings, apartment houses, hotels, commercial establishments, and other buildings to number such buildings with numerals not less than 3½ inches in height, and/or of such contrasting color and so located as to be readily visible from the street in daylight or when a light is shined upon them at night. Where such buildings have access to an alley, the numbers shall also be posted on the rear of the building, subject to the same requirements, so as to be easily seen from the alley. All building numbering shall conform to the size and placement provisions established in Article 15 of this ordinance.
- F. Subdivision and street names.
 1. Names for subdivisions, public or private rights-of-way, access easements, and driveways shall be reviewed and approved by Planning in accordance with its Addressing Guidelines and Procedures. Approved names may be reserved for up to five years. Subdivision and street names are not official until the plat with the name is recorded.
 2. Street name duplications including phonetic duplications within Knox County are prohibited. Existing duplications shall be corrected in a manner which is least disruptive to affected landowners and the community.
 3. Requests to rename a subdivision, whereby the official subdivision name is replaced or modified, shall be reviewed by Planning. Subdivision name changes require approval by the Knoxville-Knox County Planning Commission in accordance with its Administrative Rules and Procedures.
 4. Requests to rename a public right-of-way or name an unnamed public right-of-way, whereby the official street name is replaced or modified, shall be reviewed by Planning and require approval by the Knoxville-Knox County Planning Commission in accordance with its Administrative Rules

and Procedures. Approved request shall be forwarded to the Knox County Commission for a final vote. A street name change shall become effective upon two readings, or a reading on emergency by the Knox County Commission.

5. Request to rename private rights-of-way, access easements, or driveways shall be reviewed by Planning and may be approved administratively if there is no opposition to the name change. Disputed requests require approval by the Knoxville-Knox County Planning Commission.
6. A street name change may be required when the closure, realignment or other modification of a public right-of-way creates a noncontiguous street name. Planning will coordinate with Knox County Engineering and Public Works and the Knox County Emergency Communications District to determine if a street name change is required.

G. Street signs.

1. All named public or private rights-of-way, access easements and driveways shall be signed at intersections. Street signs shall be built in compliance with the latest edition of the Manual on Uniform Traffic Control Devices for Streets and Highways. All street signs shall display the street name, any required prefix letter designation, and the block number.
2. Street signs for newly created public rights-of-way shall be provided by the developer prior to issuance of building permits. Street signs for private rights-of-way, access easements and driveways shall be provided by and installed by the landowner. The county may provide and install required signage upon written request and permission by the landowner to the Department of Engineering and Public Works.
3. Any repair or replacement of street signs shall be the responsibility of the county after road acceptance.

H. Address reassignment

1. Planning shall have the authority and responsibility to reassign addresses are required by these regulations to the extent practicable to maintain the health and safety of the county's residents, businesses and visitors. All address reassignments shall be done according to Planning Addressing Guidelines and Procedures in a manner which is the least disruptive to affected landowners and the community.
2. It shall be the responsibility of the landowner or occupant to remove old address numbers and post the official address assigned by Planning.