

Subdivision & Infrastructure Standards

6.1 PURPOSE AND INTENT

The purpose of this chapter is to establish criteria for the site development and subdivision of real property within the jurisdiction of the Town of Wake Forest. These standards are set forth to:

- Provide for the orderly growth and development of the Town of Wake Forest; and
- Coordinate proposed development with existing development and with officially adopted plans for the future development of the town; and
- Provide for suitable residential and nonresidential development with adequate streets, utilities and appropriate building sites; and
- Ensure the proper legal description, monumentation, and recordation of subdivided land; and
- Create conditions essential to public health, safety, and general welfare.

6.2 APPLICABILITY

6.2.1 AUTHORITY AND APPLICABILITY

- A. **Authority:** According to the provisions of NCGS 160A-371, the Town of Wake Forest has the authority to regulate the subdivision of land within its territorial jurisdiction.
- B. **Subdivision Defined:** For the purposes of this ordinance, “subdivision” shall mean all divisions of a tract or parcel of land into 2 or more lots, building sites, or other divisions for the purpose of sale or building development (whether immediate or future) and shall include all divisions of land involving the dedication of new streets or a change in existing streets.
- C. **Statutory Exemptions:** The following are not included within the definition for subdivision above and are exempt from the regulations of this ordinance. All such exempt documents or plats to be recorded shall bear the notation, “Exempt pursuant to the Town of Wake Forest Unified Development ordinance,” and the signature of the Administrator before being presented for recordation.
 1. The combination or recombination of portions of previously subdivided and recorded lots where the total number of lots is not increased and the resultant lots meet or exceed the standards of the UDO; or
 2. The division of land into parcels greater than 10 acres in size where no street right-of-way dedication is involved; or
 3. The public acquisition by purchase of strips of land for the widening or opening of streets or for public transportation corridors; or
 4. The division of a tract in single ownership whose entire area is no greater than 2 acres into not more than 3 lots, where no street right-of-way dedication is involved, and where the resultant lots meet or exceed the standards of the UDO.
- D. **Site Plans Defined:** A site plan is an architectural and/or engineering drawing of proposed improvements for a specific location that depicts such elements as building footprints, driveways, parking areas, drainage, utilities, lighting, and landscaping. The specific elements that are required of Site Master Plans, Site Construction Plans and Final Plats are outlined in Section 15.4.

E. Conformity Required: From and after the adoption of this ordinance, no real property lying within the jurisdiction of the Town of Wake Forest shall be developed or subdivided except in conformance with all applicable provisions of this ordinance.

6.2.2 REQUIRED CONFORMANCE TO THE WAKE FOREST MANUAL OF SPECIFICATIONS, STANDARDS AND DESIGN (MSSD)

The Town of Wake Forest Manual of Specifications, Standards and Design (MSSD) is herein incorporated by reference. Conformance to the MSSD is required in addition to the standards in this ordinance.

6.2.3 PROVISION OF SERVICES AND ACCEPTANCE BY TOWN

According to the Town of Wake Forest Streets and Utilities Acceptance Policy, no street shall be maintained or accepted by the town, nor shall any water or sewer service be extended to or connected with any subdivision of land, nor shall any permit be issued by an administrative agent or department of the Town of Wake Forest for the construction of any building or other improvement requiring a permit, upon any land for which a plat is required to be approved, unless and until the requirements set forth in this ordinance and the MSSD and all other applicable municipal, county, State and Federal requirements have been complied with and the Final Plat has been approved and recorded with the Wake County Register of Deeds.

6.3 REQUIRED IMPROVEMENTS FOR ALL DEVELOPMENT

All required improvements set forth in this chapter shall be installed or constructed by the developer at no cost to the town except as may otherwise be specifically provided herein or by town policy or agreement. Required improvements under this chapter shall not be installed or constructed until required construction plans have been approved by the Administrator. Improvements shall be required according to the districts established in Chapter 2 as outlined in the following table:

Required Improvements	Zoning Districts														
	RD	GR3	GR5	GR10	NB	HB	ICD	LI	HI	UR	RMX	RA-HC*	NMX	UMX*	PUD
Underground Drainage*	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X
Curb and Gutter*	-	-	X	X	X	X	X	X	X	X	X	X	X	X	X
Public Water and Hydrants	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Public Sewer	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Street lights	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Street trees	-	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Paved Streets	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Street signs (public streets)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Underground Wiring	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Park/Open Space	X	X	X	X	-	-	X	-	-	X	X	X	X	X	X
Sidewalks*	See Section 6.8.1														

* The Administrator may waive or alter requirements for underground drainage and curb and gutter according to the stormwater management exemptions granted in Section 12.5.1. In certain situations, such waiver or alteration may be dependent upon the use of approved Low Impact Development Infrastructure subject to the provisions of Chapter 12.

6.3.1 CONNECTION TO MUNICIPAL WATER SUPPLY AND SANITARY SEWER SYSTEMS

A developer shall connect all lots shown on the Subdivision Plat with the municipal water supply and sanitary sewage systems according to the requirements of the City of Raleigh Public Utilities Department, The Town of Wake Forest, and the table below.

Number of Lots	Distance to Municipal Water Supply or Sewage System*			
	0 ft to 300 ft	301 ft to 500 ft	501 ft to 1,000 ft	1,001 ft or more
5 to 20	X	•	•	•
21 to 50	X	X	•	•
51 to 100	X	X	X	•
100 or more	X	X	X	X

X - Indicates the developer MUST connect the subdivision with the municipal water supply and sewage systems at their expense.

• - Indicates the developer MAY connect the subdivision with the municipal water supply and sewage systems at their expense.

* If any part of the subdivision lies within the specified distance, the entire subdivision is considered within the specified distance.

6.3.2 STREET TREES

The location and specification of trees to use in the public right of way is provided in Section 8.6 and in the Wake Forest Official Planting List maintained by the Urban Forestry Board.

6.3.3 STORM DRAINAGE & FLOOD PREVENTION

- A. A developer shall provide an adequate drainage system, including necessary open ditches, pipes culverts, drop inlets, bridges, fill-in lots, etc. for the proper drainage of all surface water, according to the provisions of this section, Chapter 12 of this ordinance and the requirements of the MSSD. The developer shall provide the storm water system necessary to carry the water in a manner approved by the Administrator.
- B. All storm drainage shall be designed to accommodate the following design storm frequency:
 1. Storm Sewer Collection: 10-year storm
 2. Ditch Cross Drainage: 25-year storm
 3. Catch Basins: 2-year storm
- C. Stormwater Best Management Practices and Low Impact Development Techniques are encouraged in the design of all subdivisions and developments. See the *North Carolina Division of Water Resources: Stormwater Best Management Practices Manual* and the *North Carolina Cooperative Extension: Low Impact Development Guidebook*.
- D. All development proposals shall be consistent with the need to minimize flood damage according to the provisions of Chapter 12 of this ordinance. All development proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage. All subdivisions and developments shall have adequate drainage provided to reduce exposure to flood hazards.

6.3.4 STREET NAME SIGNS

- A. Appropriate street name signs which meet standard municipal specifications shall be placed at all street intersections. The developer shall bear the expense.
- B. Proposed street names shall be submitted and subject to the approval of Wake County or Franklin County as appropriate. New names shall not duplicate or be similar to existing street names. Existing street names, however, shall be extended where appropriate.

6.3.5 WASTE MANAGEMENT

The developer shall provide for adequate waste collection and disposal as outlined in the Town of Wake Forest Code of Ordinances.

6.3.6 SUBDIVISION SURVEYS

Prior to the approval of a Final Plat, the following survey reference markers shall be installed.

- A. **Permanent Concrete Monuments:** Permanent concrete monuments 4 inches in diameter or square, 3 feet long, shall be placed at not less than 2 corners of the subdivision and at all corners of all intersections, provided that additional monuments shall be placed where necessary so that no point within the subdivision lies more than 500 feet from a monument. Two or more of the required monuments shall be designated as control corners. The top of each monument shall have an indented cross, metal pin, or metal plate to identify properly the location of the point. All monuments shall be shown on the Final Plat.
- B. **Markers:** All lot corners, all points where the street lines intersect the exterior boundaries of the subdivision, and all angle points and points of curve in each street shall be marked with iron pipe either 3/4 inches or one inch in diameter and 18-24 inches long, driven so as to be within one inch of finished grade.
- C. **Property Corner Tie:** One or more corners of the subdivision shall, by a system of azimuths or courses and distances, be accurately tied to a monument of some United States or State Agency Survey System, such as the United States Coast and Geodetic Survey Systems, where such monument is within 2,000 feet of said corner. Where the North Carolina Grid System coordinates of said monument have been published by the North Carolina Department of Natural and Economic Resources, the coordinates of the referenced corner shall be computed and shown X and Y ordinates on the map. Where such a monument is not available, the tie shall be made to some pertinent and permanent recognizable landmark or identifiable point.
- D. **Accuracy:** The angular error of closure shall not exceed 25 seconds times the square root of the number of angles turned. The linear error of closure shall not exceed one foot per 10,000 feet of perimeter of the lot or tract of land. The accuracy of the survey shall be designated on the Final Plat.

6.3.7 OVERSIZED IMPROVEMENTS AND REIMBURSEMENTS

Where deemed necessary, in the interest of the health, safety, and general welfare of the residents of Wake Forest, the developer shall make certain water and sewer improvements at sizes in excess of those which would normally be required to serve only the subdivision. Where such oversized improvements are required, the developer shall be reimbursed for costs incurred over and above those required to serve the subdivision, according to the adopted water and sewer extension policy of the City of Raleigh Public Utilities Department.

6.3.8 TIME LIMIT FOR COMPLETION OF IMPROVEMENTS

- A. Time Limit:** Improvements must be completed by the developer for each phase of a development before any of the following occur:
1. 80% of the building construction work is complete in the recorded phase.
 2. 2 years have passed since the subdivision or master plan plat, or phase thereof, has been recorded.
 3. 1 year has passed since the approval of the performance guarantee as outlined in Section 6.12.
- B. Extension of Time Limit:** This time limit may be extended at the discretion of the Administrator upon submittal by the applicant of sufficient justification for the extension. Sufficient justification may include, but is not limited to, delays in other regulatory permits, financing institution delays, or other similar reasons beyond the control of the applicant.

6.4 LAND SUITABILITY

Land subject to flood hazard, improper drainage, or erosion; OR land that has been used for the disposal of solid waste; OR land that is for other reasons unsuitable for residential or commercial use as determined by the Administrator, shall not be platted or developed for any uses that will continue or increase the danger to health, safety, or property unless the hazards can be and are corrected.

6.4.1 FLOOD HAZARD AREA

Special Flood Hazard Areas and Floodway Areas in Zone AE subject to periodic inundation by 1% annual flood as shown on FEMA flood insurance rate maps shall be identified on all plats. Special Flood Hazard Areas shall be built on only in accordance with Section 12.4 of this ordinance. No grading, clearing, removal of significant vegetation, placement of structures, fill, or any other encroachment activity shall occur within designated Special Flood Hazard Areas which would interfere with the natural water course without approval from the Administrator based upon certification that such activity mitigates the potential adverse impact to flood hazard. Streets, utility lines and structures may be placed within the Special Flood Hazard Area only if their elevation is raised above maximum flood heights or if they are otherwise flood protected.

6.4.2 WATERSHED DEVELOPMENT

All land located within a Watershed Protection Overlay District shall comply with the provisions of Sections 2.4.5, 12.6 and all other provisions of this ordinance regarding Watershed Protection.

6.4.3 LANDFILL DEVELOPMENT

Land that has been used for the disposal of solid waste and not adequately mitigated shall not be subdivided into commercial or residential building sites. This includes areas that have been used, and not adequately mitigated, for the disposal of trash, demolition waste, construction debris, stumps, and other waste materials.

6.5 CONNECTIVITY**6.5.1 STREET NETWORK**

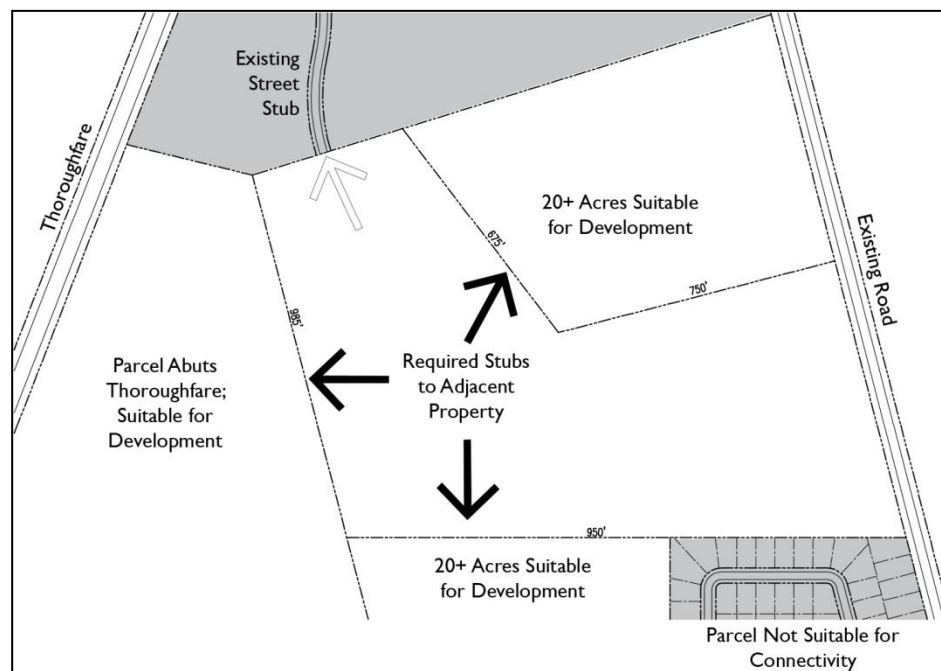
- A. General:** Streets shall be designed and located in proper relation to existing and proposed streets, to the topography, to such natural features as streams and tree growth, to public safety and convenience, and to the proposed use of land to be served by such streets. All proposed streets shall provide for the appropriate projection of principal streets in surrounding areas and provide reasonable access for surrounding acreage or tracts. Requirements may vary at the discretion of the Administrator where compliance is determined not feasible because of topography, the existence of environmentally sensitive lands, the need to preserve cultural resources, and/or other similar considerations.
- B. Streets to be Interconnected:** All streets shall be designed to form part of an interconnected street pattern. Streets must connect with adjacent street networks to the extent possible. Street designs will be assessed, in terms of meeting this interconnectivity standard, on their ability to: permit multiple routes between origin/destination points; diffuse traffic; and, shorten walking distances.
- C. Block Lengths:** Block lengths shall adhere to the standards in the following table:

	Minimum Block Length	Maximum Block Length
Rural & Suburban Districts*	250 feet	800 feet
Urban Districts *	250 feet	400 feet

**District classifications as urban vs. rural & suburban is outlined in Section 2.2*

- D. Block Width:** Blocks shall have sufficient width to provide for 2 tiers of lots of appropriate depth except where otherwise required to separate residential development from through traffic.
- E. Cul-de-Sacs:** Permanent dead-end streets or cul-de-sacs shall be no longer than 400 feet. In general, streets with one end permanently closed shall be avoided unless the design of the subdivision and the existing or proposed street system in the surrounding area clearly indicates that a through street is not essential at the location of the proposed cul-de-sac.
- F. Reserve Strips Prohibited:** Reserve strips and non-access easements adjoining street rights-of-way for the purpose of preventing access to or from adjacent property (except those required by the Board of Commissioners to prevent access to thoroughfares), and half-streets shall not be permitted.
- G. Subdivision Access Points:** Subdivisions shall maintain external access points through street connections to existing roads and/or stubs to future development at the rate of at least one external access point for every 100 single family lots.
- H. Street Stubs:**
- 1. Connection to Street Stubs Required:** New developments shall connect to any existing street stubs from adjacent properties.
 - 2. Street Stub Prioritization:** New development shall stub to all adjacent properties where practical at the rate of at least one street stub per 800 feet of property boundary when connecting to rural and suburban districts and at least one stub per 400 feet when connecting to urban districts. The location of new required street stubs shall be prioritized as follows: (See illustration below)

- a. Adjacent parcels 20 acres or greater
- b. Adjacent parcels that abut or are traversed by existing or proposed thoroughfares or collector streets.
- c. Where any adopted transportation or land use plan recommends a street connection.
- d. Where a required street stub necessitates the crossing of a stream or designated drainageway at the property line to make the required connection to an adjacent parcel, the owner or applicant shall provide a payment in lieu of building the stream crossing equal to half the total cost of the construction based on an engineer certified estimate. Such payment shall be set aside to offset the cost of constructing the stream crossing for future development.

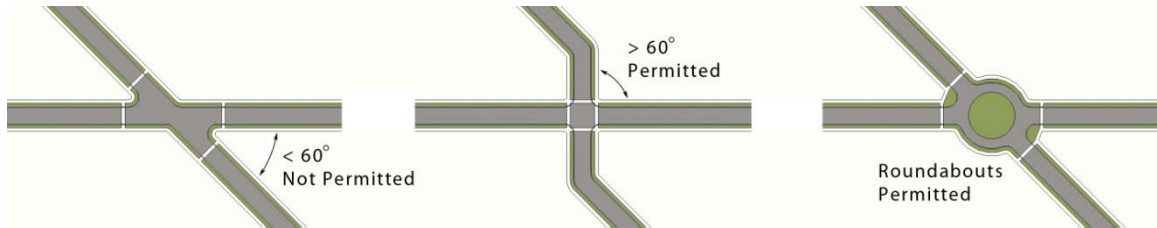


3. **Stub Street Details:** Stub streets and streets intended for extension during future phases shall be designed and constructed to the property line or as close to the line, vertically and horizontally, as practical. It shall be the responsibility of the second development to construct the connection to an existing stub street. Stub streets shall not exceed 150 feet in length without a paved turnaround (permanent or temporary) per the MSSD. A clearly visible street sign shall be erected at the end of the stub street stating that the street is planned to connect to a future street. See MSSD for sign specifications.
- I. **Developer Responsible for Grading, Paving and Drainage:** In all cases the developer shall be responsible for the cost and installation of the street foundation, paving of all streets and appropriate curbs and gutters as provided on the approved Construction Plan in accordance with the specifications of the Town of Wake Forest and the Division of Highways, N. C. Department of Transportation and Highway Safety. The installation of all street elements shall be in accordance with the MSSD.

6.5.2 INTERSECTIONS

Street intersections shall be designed in the following manner:

- A. No more than 2 streets shall intersect at one point, unless the intersection is designed as a roundabout.
- B. Streets shall intersect as nearly as possible at right angles, and no street shall intersect any other street at an angle of less than 60 degrees, unless the intersection is designed as a roundabout, as illustrated below.



- C. Intersections with major thoroughfares shall be at least 800 feet apart, measured from centerline to centerline. The Board of Commissioners may waive this requirement if such requirement would prevent a property owner fronting on a major thoroughfare from having access to such a facility.
- D. Street jogs with centerline offsets of less than 150 feet are prohibited.
- E. Property lines at street intersections shall be rounded with a minimum radius of 20 feet.
- F. All proposed connections to NCDOT roads shall meet the criteria of the latest revisions of the NCDOT “Subdivision Roads Minimum Construction Standards,” and the “Policy on Street and Driveway Access to North Carolina Highways.”

See section 9.8.1.H for sight distance standards

6.5.3 PEDESTRIAN/BICYCLE CONNECTIONS

- A. **Connections to Greenways and Parks:** When a development abuts greenways, parks and open space areas, pedestrian/bicycle accessways must be provided at a minimum of every 600 feet when feasible as determined by the Administrator. Where a cul-de-sac street is permitted within a development, pedestrian/bicycle accessways to greenways, parks and open space areas must be provided where such streets back up to these areas.
- B. **Connection of Cul-de-sacs:** Where 2 cul-de-sac streets end within 300 feet of each other, pedestrian/bicycle accessways shall be provided between the cul-de-sacs where feasible as determined by the Administrator.

C. Dedication of Pedestrian/Bicycle

Accessways: Where pedestrian/bicycle accessways are required by this chapter, a strip of land of at least 20 feet in width shall be dedicated to the town or a homeowner's association to accommodate such pedestrian/bicycle accessways and shall be laid out along front, side or rear property lines. (Also see Section 6.10.1 – Easements and Dedications.)

D. Pedestrian/Bicycle Accessways to be

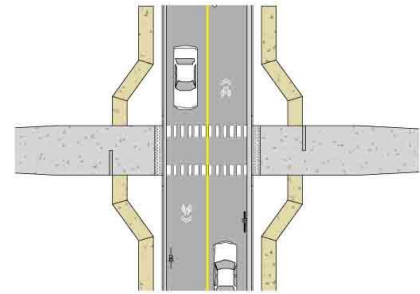
Public: All pedestrian/bicycle accessways shall be maintained for use by the general public.

E. Minimum Width: Pedestrian/bicycle accessways shall not be less than 5 feet in width.

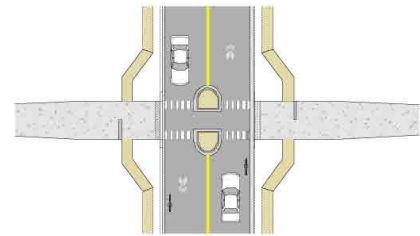
F. Surface Treatment of Accessways:

Pedestrian/bicycle accessways shall comply with the Federal Americans with Disabilities Act. The surface of accessways shall be constructed of a smooth, compactable material that is accessible for wheelchairs and strollers, unless connecting to a greenway specified in the Wake Forest Open Space Greenway Plan as a Type 2 Trail (low-impact dirt or gravel trail).

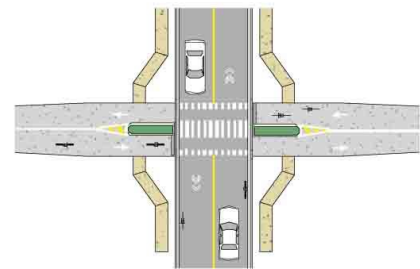
G. Midblock Crosswalks: A pedestrian crosswalk not less than 10 feet in width shall be required across any street 800 feet or more in length where deemed essential by the Administrator. When required such crosswalks shall utilize ladder striping to enhance their visibility.



MID-BLOCK INTERSECTION
Shared Use Path with Sidewalks



MEDIAN REFUGE
Shared Use Path with Sidewalks



MIDBLOCK CROSSING
Shared Use Path with Sidewalks and Medians

6.5.4 PUBLIC TRANSIT CONNECTIONS

Projects with 100 or more residential units or 100,000 square feet of non-residential space that are adjacent to present or planned transit routes shall provide adequate and well-located space for a shelter and bus drop-off area as specified by the local transit operator/authority.

6.6 IMPLEMENTATION OF TRANSPORTATION PLAN & TOWN STREET CLASSIFICATIONS

6.6.1 PROPOSED NEW STREETS

A. New Streets Designated in Transportation Plan: Where a proposed subdivision or development includes any part of a thoroughfare which has been designated as such on the officially adopted Town of Wake Forest Transportation Plan, as provided for by G.S. 136-66 and G.S. 160A, paragraphs 361 and 363, respectively, such part of such thoroughfare shall be reserved, platted, dedicated and constructed in the location shown on the plan and at the width specified in the Transportation Plan.

- B. New Streets Not Designated in Transportation Plan:** Where a proposed subdivision or development includes a new street, which is not included in the Transportation Plan, the developer shall plat, dedicate and construct the street in accordance with one of the preferred street sections outlined in the Town Street Classifications in Section 6.7.2. The street classification chosen shall be approved by the Administrator and shall reflect the expected intensity of land uses fronting the proposed street and the needs of the surrounding street network. In special instances, as approved by the Administrator, required roadways may only need to be reserved or dedicated, not constructed.

6.6.2 EXISTING SUBSTANDARD STREETS

Development along existing streets of inadequate right-of-way shall provide additional right-of-way as follows:

- A. Improvements Specified in Transportation Plan:** For streets that have specific improvements outlined in the Wake Forest Transportation Plan, additional right-of-way shall be dedicated where necessary to meet the width specified in the Transportation Plan.
- B. Improvements Specified in the Town Street Classifications:** If the Transportation Plan does not outline specific improvements for a street, development along existing streets shall dedicate additional right-of-way where necessary to meet the minimum widths specified in the Town Street Classifications in Section 6.7.2.
- C. Minimum Improvements:** Where the existing street is not assigned specific improvements by the Transportation Plan, development shall provide a minimum sidewalk and planting zone according to the table below and the provisions in Section 6.8.

District	OS, RD	GR3, GR5, GR10, LI, HI	UR, RMX, NB, ICD, HB, PUD	HB, NMX	RA-HC, UMX
Minimum Sidewalk Width	n/a	5 feet	5 feet	8 ft sidewalk and 8 ft planting strip OR 12 ft sidewalk with tree wells	12 ft sidewalk and 6 ft planting strip OR 16 ft sidewalk with tree wells
Minimum Planting Strip Width	n/a	6 feet (curb) 8 feet (swale, GR3 only)	5 feet		

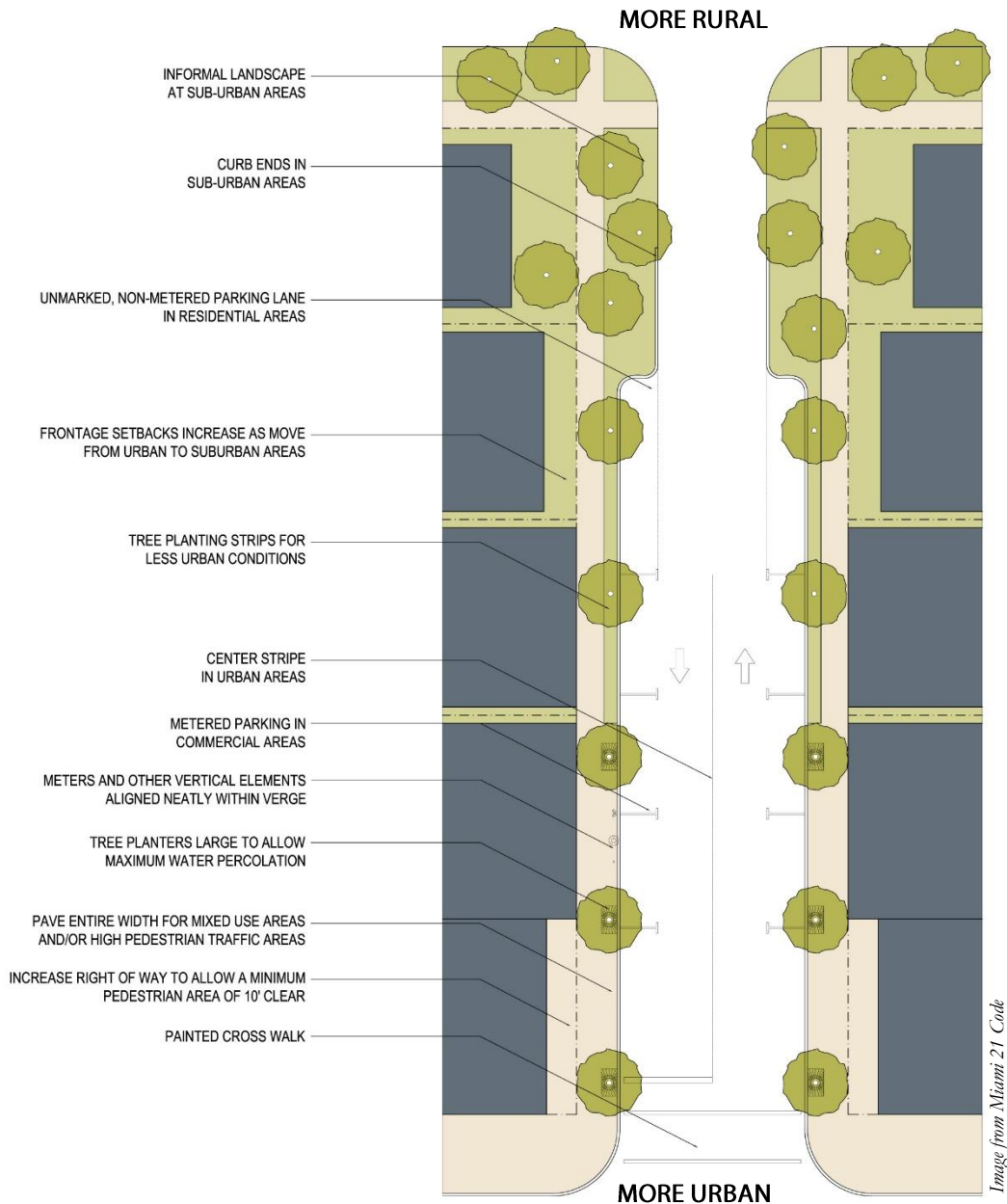
- D. Determination of Required Right-of-Way Dedication:** The entire right-of-way shall be provided where any part of a new subdivision or development is on both sides of an existing street, and one-half the required right-of-way measured from the center line of the existing street shall be provided where a new subdivision or development is located only on one side of an existing street. However, the development may not be required to construct a multilane facility unless a Transportation Impact Analysis (see Section 6.11) requires the additional capacity.
- E. Installation of Required Street Improvements:** In addition to dedication of rights-of-way where required, development along existing streets of substandard improvements shall install all required street improvements that occur outside the vehicular travel lanes, including, but not limited to, street trees, planting strips and/or tree wells, sidewalks, and multi-use paths. Lighting and street furniture shall be the responsibility of the town.

6.7 TOWN STREET CLASSIFICATION & DESIGN

The following standards are intended to provide general clarity for most conditions in Wake Forest. Deviations to these standards may be granted by the Administrator subject to generally accepted safety and engineering practices. For additional guidance, the town may use the “Designing Walkable Urban Thoroughfares: A Context Sensitive Approach” by the Institute of Transportation Engineers and the Congress for the New Urbanism or a similarly generally accepted document.

6.7.1 RULES FOR ASSIGNMENT OF APPROPRIATE STREET DETAILS

The illustration below is a simplified diagram of the many different parts that go into the assemblage of each street. Care should be taken to ensure that context plays a primary role in the selection of the various right-of-way elements.



- A. Rights-of-Way:** The right-of-way should be the minimum required to accommodate the street, median, planting strips, sidewalks, utilities and maintenance consideration.
- B. Measurement of Pavement Area Details:** The dimensions established in Section 6.7.2 below for lane widths, sidewalks, bike lanes and parking lanes indicate the required face of curb to face of curb measurement, or to the edge of pavement for roadways with open drainage.
- C. Turn Lanes:** Dedicated right turn lanes, where required, may be taken from the parking lane.
- D. Dimension Ranges:** Where ranges are given, the project designer should consult with the Administrator as to the appropriate detail.
- E. Street Names:** Street names shall be subject to the approval of the Wake County GIS. New names shall not duplicate or be similar to existing street names. Existing street names; however, shall be projected where appropriate. The contractor is required to provide block numbers on all street signs.

6.7.2 TOWN STREET CLASSIFICATIONS

The street sections in this section are intended to provide **typical** street sections for the purposes of identifying future improvements by both the town and fronting property owners.

- A. Concurrency with Transportation Plan:** Unless otherwise indicated on the officially adopted Town of Wake Forest Transportation Plan, all streets, public or private, shall comply with the preferred arrangement indicated on the following street sections. Street sections may deviate from these standards where topographic and environmental conditions necessitate, as determined by the Administrator. The table below indicates which of these street sections correspond to the classifications required in the Transportation Plan.

UDO Street Type	Corresponding Transportation Plan Classification					
	Primary Major Thoroughfare	Secondary Major Thoroughfare	Local Major Thoroughfare	Minor Thoroughfare	Collector Street	Local Street
Urban Boulevard (6.7.2.B) ADT: 25,000 to 55,000*	•	•	•	•		
Avenue (6.7.2.C) ADT: 15,000 to 30,000*			•	•		
Commercial Street (6.7.2.D) ADT: 10,000 to 18,000*				•	•	
Large Residential Street (6.7.2.E) ADT: 2,500 to 15,000*					•	
Residential Yield Street (6.7.2.F) ADT: 0 to 1,000*					•	•
Lane (6.7.2.G) ADT: 0 to 3,000*						•
Alley (6.7.2.H) ADT: n/a (intended for limited access only) *						•

* ADT = Average Daily Traffic

6.7.2.B Urban Boulevard Boulevards provide multi-lane access to commercial and mixed-use developments. Boulevards also serve to carry regional traffic throughout the town.	1. Right-of-Way Width	100 - 124 ft (Curb & Gutter)
	2. Lane Widths	10-12 ft
	3. Median Width	12-20 ft
	4. Design Speed	30-35 mph
	5. Traffic Lanes	4 lanes
	6. Parking Lanes	Both sides @ 8 feet marked (If Provided)
	7. Curb Radius	15-25 ft (See MSSD)
	8. Walkway Type	6 ft sidewalk both sides (Residential districts), 8 ft all other districts
	9. Planter Type	Continuous planting strip - 6 ft (curb) or 8 ft (swale)
	10. Pedestrian Facilities	Intersection bulb outs (Required) & Mid-block crosswalks
	11. Curb Type	Vertical curb & gutter or approved alternative (Additional right-of-way may be required for natural drainage sections)
	12. Landscape Type	1 canopy tree per 50 ft of street frontage (See also 8.6.1)
	13. Bicycle Facilities	5 ft Bike Lane (See also 6.10) or 6 ft w/on-street parking

6.7.2.C Avenue Avenues serve as connectors between neighborhoods and area centers. As such, they are used both in residential and commercial areas, often terminating at prominent buildings or plazas. Avenues may also circulate around squares or neighborhood parks.	1. Right-of-Way Width	80 - 104 ft (Curb & Gutter)
	2. Lane Widths	10-12 ft
	3. Median Width	12-18 ft (optional)
	4. Design Speed	25-30 mph
	5. Traffic Lanes	2 lanes
	6. Parking Lanes	Both sides @ 8 feet marked
	7. Curb Radius	15-25 ft (See MSSD)
	8. Walkway Type	6 ft sidewalk both sides (Residential districts), 8 ft all other districts
	9. Planter Type	Continuous planting strip - 6 ft (curb) or 8 ft (swale)
	10. Pedestrian Facilities	Intersection bulb outs (Required) & Mid-block crosswalks
	11. Curb Type	Vertical curb & gutter or approved alternative (Additional right-of-way may be required for natural drainage sections)
	12. Landscape Type	1 canopy tree per 50 ft of street frontage (See also 8.6.1)
	13. Bicycle Facilities	5 ft Bike Lane (See also 6.10) or 6 ft w/on-street parking

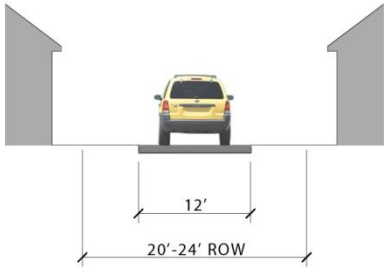
6.7.2.D Commercial Street Main streets are intended to provide access to neighborhoods and high density residential and commercial areas.	1. Right-of-Way Width	60 - 80 ft (Curb & Gutter)
	2. Lane Widths	10-12 ft
	3. Median Width	n/a
	4. Design Speed	20-25 mph
	5. Traffic Lanes	2 lanes
	6. Parking Lanes	Both sides @ 8 feet marked (Or One side only as appropriate)
	7. Curb Radius	15-25 ft (See MSSD)
	8. Walkway Type	12 ft sidewalk both sides (16 ft required for outdoor seating areas) (measured from back of curb to the outside edge of sidewalk)
	9. Planter Type	6 ft continuous planting strip or tree wells (included in walkway type dimension)
	10. Pedestrian Facilities	Intersection bulb outs (Required) & Mid-block crosswalks
	11. Curb Type	Vertical curb & gutter
	12. Landscape Type	1 canopy tree per 50 ft of street frontage (See also 8.6.1)
	13. Bicycle Facilities	5 ft Bike Lane (See also 6.10) or 6 ft w/on-street parking

6.7.2.E Large Residential Street Residential streets (large and yield types) serve as the primary transportation network in the community. Generally, Large Residential Streets serve as the primary travel routes and entryways through residential neighborhoods.	1. Right-of-Way Width	60 ft (Curb & Gutter), 70 ft (Swale)
	2. Pavement Width	30-36 ft
	3. Median Width	n/a
	4. Design Speed	20 mph
	5. Traffic Lanes	2 lanes
	6. Parking Lanes	Informal, one side only if bike lane is included
	7. Curb Radius	15 ft (See MSSD)
	8. Walkway Type	5 ft sidewalk both sides
	9. Planter Type	Continuous planting strip 6 ft (Curb) or 8 ft (Swale)
	10. Pedestrian Facilities	n/a
	11. Curb Type	Vertical curb & gutter, valley curb or approved alternative
	12. Landscape Type	1 canopy tree per 50 ft of street frontage (See also 8.6.1)
	13. Bicycle Facilities	Informal OR 5 ft Bike Lane (See also 6.10)

6.7.2.F Residential Yield Street Residential streets (yield and large types) serve as the primary transportation network in the community. Generally, Residential Yield Streets are 2 to 6 blocks in length.	14. Right-of-Way Width	50 ft (Curb & Gutter), 60 ft (Swale)
	15. Pavement Width	20-26 ft
	16. Median Width	n/a
	17. Design Speed	20 mph
	18. Traffic Lanes	2 lanes
	19. Parking Lanes	Informal, one side only
	20. Curb Radius	15 ft (See MSSD)
	21. Walkway Type	5 ft sidewalk both sides
	22. Planter Type	Continuous planting strip 6 ft (Curb) or 8 ft (Swale)
	23. Pedestrian Facilities	n/a
	24. Curb Type	Vertical curb & gutter, valley curb or approved alternative
	25. Landscape Type	1 canopy tree per 50 ft of street frontage (See also 8.6.1)
	26. Bicycle Facilities	Informal

6.7.2.G Lane Lanes are small traveled ways intended to provide direct access to the front of a limited number of single-family structures. Lanes are limited in the number of lots served. Generally, they are very short; often less than 400 feet. Items including, but not limited to, traffic carrying capacity, topography and connectivity, shall be a consideration when permitting a lane in lieu of a street.	1. Right-of-Way Width	40 ft (Curb & Gutter) or 50 ft (Open Drainage)
	2. Pavement Width	16 ft (Curb & Gutter)* or 18 ft (Open Drainage)*
	3. Design Speed	20 mph
	4. Traffic Lanes	2 lanes
	5. Parking Lanes	Informal, one side only if one way
	6. Curb Radius	15 ft (See MSSD)
	7. Walkway Type	5 ft sidewalk one side only (For R and SR Districts See 6.8.1)
	8. Planter Type	Continuous planting strip 6 ft (Curb) or 8 ft (Swale)
	9. Pedestrian Facilities	n/a
	10. Curb Type	Vertical curb & gutter or LID or Swale (Additional right-of-way may be required for natural drainage sections)
	11. Landscape Type	1 canopy tree per 50 ft of street frontage (See also 8.6.1)
	12. Bicycle Facilities	Informal
	13. Maximum Length	800 ft unless approved by the Administrator

*May need to be wider if required by fire code

		
6.7.2.H Alley Alleys are intended to be privately maintained and to provide indirect, limited access to the rear of properties but not to accommodate through traffic. Utilities, either above ground or underground, may be located in alleyways to provide service connections to rear elevations.	1. Right-of-Way or Easement Width	20-24 ft
	2. Pavement Width	12 ft – inverted crown*
	3. Parking Lanes	None
	4. Curb Radius	Taper
	5. Walkway Type	Path optional
	6. Curb Type	n/a
	7. Landscape Type	None
	8. Building Setback from Alley Centerline	15 ft
	9. Maximum Length	150 ft with no connection or turnaround; or Up to 400 ft with a permanent turnaround at the terminus per the MSSD Detail. Over 400 ft must be unless approved by Administrator

*May need to be wider if required by fire code

6.8 SIDEWALKS AND OTHER PEDESTRIAN FACILITIES

Sidewalk, pedestrian pathways and other required or proposed pedestrian amenities shall be reflected in all site and subdivision plans.

6.8.1 SIDEWALKS

- A. **General Standards/Location:** Sidewalks are required in accordance with the Town of Wake Forest Transportation and Pedestrian Plan, and the Town Street Classifications in Section 6.7.2. Alternative facilities or a payment in lieu may be considered in accordance with C and D below.
- B. **Design Standards**
 1. Where existing sidewalk abuts an area where new sidewalk is to be developed, the new sidewalk shall be the same width as the existing sidewalk or meet the standards of Section 6.7.2, whichever standard width is greater.
 2. Where the existing right of way is substandard, the fronting property owner shall be required to dedicate the appropriate amount of right-of-way (as measured from the centerline of the existing street) as well as install all noted sidewalk zone improvements including expanded sidewalks and street trees. Lighting and street furniture shall be the responsibility of the town.
 3. Where a sidewalk is required on only one side of the street, in accordance with Section 6.7.2, the Administrator shall determine on which side of the street the sidewalk will be constructed.
 4. Within commercial areas and places with high pedestrian volumes, sidewalks should be designed to meet the anticipated pedestrian/traffic volume as well as accommodate outdoor seating areas.
 5. Multi-family and planned developments shall provide sidewalks for interior movement of pedestrians and for interior to connect to public sidewalk system.

6. Sidewalks shall be constructed of concrete or other approved materials (such as pavers) and built in accordance with the MSSD and applicable ADA provisions.
 7. Where a sidewalk abuts a curb because of right-of-way, topographic or existing building limitation, or by Administrator discretion, the minimum width shall be 6 feet. Where a sidewalk abuts a wall, the minimum width shall increase by 1 foot.
- C. Alternative Compliance:** Alternative provisions for pedestrian movement meeting the intent of this section may be used where unreasonable or impractical situations would result from application of these requirements. Such situations may result from significant street trees, impending road widening, topography, utility easements, lot configuration or other unusual site conditions. In such instances, the Administrator may approve an alternate plan that proposes different pedestrian amenities provided that the intent of this section is fulfilled.
- D. Payments in Lieu:** In lieu of alternative compliance in C above, the Administrator may approve a payment in lieu (in accordance with an adopted annual fee schedule) where any one or a combination of factors render compliance impractical:
1. Steep slopes
 2. Absence of existing sidewalks along the corridor and in the general neighborhood
 3. Where sidewalks are not shown on the town's adopted Pedestrian Plan.

6.8.2 GREENWAYS

When required by the Wake Forest Open Space & Greenways Plan or the Wake Forest Transportation Plan, greenways and multi-use paths shall be provided according to the provisions below.

- A. Standards for Greenway Types:** Greenway width and surface treatment shall comply with the standards for Greenway Types in the Wake Forest Open Space & Greenways Plan as follows:

Greenway Type	Trail Width	Surface Treatment	Right-of-Way / Easement Width
Type 2 – Low-Impact Trail	3 feet minimum 6 feet maximum	Gravel or dirt**	See Section 6.10.1
Type 3 – Unpaved Multi-Use Trail	10 feet minimum* 14 feet maximum	Compacted gravel, soil cement, compacted limestone screenings, crushed stone**	
Type 4 – Paved Multi-Use Trail	10 feet minimum* 14 feet maximum	Asphalt or concrete**	

**The Administrator may allow a reduction of the minimum width in instances where topographical conditions, the presence of drainageways, or similar circumstances prevent the construction of a wider path.*

*** Or other material approved by the Administrator*

- B. Connections to Sidewalks:** Trail stubs at property lines should be placed in areas that are easily accessible for future connectivity through adjacent parcels. Pedestrian and bicycle connections to greenways shall comply with the provisions in Section 6.5.3.

6.8.3 PEDESTRIAN CROSSWALKS

Mid-block crossings, bulb-outs, raised crosswalks and similar crossing techniques should be commonly used to accommodate pedestrians when appropriate for traffic conditions and site-specific situations as directed by the Administrator. All designs shall be consistent with the town's adopted Pedestrian Plan, the town's MSSD and the FHWA Manual on Uniform Traffic Control Devices. For examples of pedestrian crosswalks see Section 6.5.3

6.8.4 CLUSTER MAIL BOX UNITS

Cluster mail box units shall be provided in accordance with the United States Postal Service regulations. Units may not encroach into the public right-of-way and shall be placed in an easement on private property.

6.9 BICYCLE FACILITIES**6.9.1 REQUIREMENT FOR INSTALLATION**

- A. Bike lanes or separate off-street multi-use paths shall be installed on new or modified roadways where designated for such by the Town of Wake Forest Transportation Plan or similarly adopted plan; and/or as specified in Section 6.9.3 below where the adopted plan does not provide sufficient guidance.
- B. Where a proposed development does not include new or widening of existing collector or thoroughfare streets, the developer shall reserve right-of-way sufficient to accommodate the appropriate bikeway facility.

6.9.2 DESIGN STANDARDS

Bike lanes and bike paths shall be designed according to the North Carolina Bicycle Facilities Planning and Design Guidelines published by NCDOT and shall include all appropriate signage and pavement markings. Variations from the NCDOT standards may be allowed subject to approval from the Administrator based on the standards below.

6.9.3 APPLICABILITY OF BICYCLE FACILITIES

Bicycle facilities shall be included in the cross-sections of Section 6.7.2, Town Street Classification based on the matrix below. Motor vehicle volumes shall be based on projected motor vehicle volumes in a 20-year time horizon. Speeds shall be based on the design speed of the proposed roadway.

		Projected Motor Vehicle Volumes (Average Daily Traffic)					
		< 2,500 ADT	2,500 – 5,000 ADT	5,000 – 10,000 ADT	10,000 – 20,000 ADT	20,000 – 40,000 ADT	> 40,000 ADT
Roadway Design Speed	< 25 mph	N	N	W	BL	BL	BL
	25 mph	N	W	BL	BL	BL	BL
	30 mph	N	W	BL	BL	BL	S
	35 mph	W	W	BL	BL	BL	S
	40 mph	W	BL	BL	BL	BL	S
	45 mph	W	BL	BL	BL	S	S
	> 45 mph	S	S	S	S	S	S

- N** Normal Lane, 9-12 feet wide. Cyclists would operate in mixed traffic near the middle of the lane.
- W** Wide Lane (Sharrows), 13-15 feet wide. Cyclists would generally operate in the right most portion of the lane. MUTCD-approved shared lane markings (sharrows) shall be used. (See image at right)
- BL** Bike Lane, 4-6 feet wide (striped/marked) or narrow shoulder. In general, bike lanes should be at least 5 feet wide at higher traffic volumes (over 20,000 ADT) and higher speeds (40 mph and higher) and 6 feet wide next to on-street parking.
- S** Separated Lane. Anything wider than 6-foot bike lane, including wide bike lanes/shoulders or parallel multi-use paths.



Sharrows provide designated bicycle routes through wide vehicular travel lanes with shared-lane markings.

Image Source: National Association of City Transportation Officials. "Urban Bikeway Design Guide." 2012.

6.10 EASEMENTS AND DEDICATIONS

6.10.1 EASEMENT WIDTH

Easements shall be conveyed to the town or other appropriate agency for underground and overhead utility installation, stormwater drainage, pedestrian/bicycle access, and other purposes as required by the town. Easements shall be centered along rear or side lot lines. The minimum width for easements is set out in the table below. The Administrator may vary easement widths if the topography along the proposed right-of-way is such that maintenance equipment or other necessary access cannot reasonably be achieved within the minimum width specified by the table.

Easement Type	Minimum Width
Greenway	50 feet
Pedestrian/Bicycle Accessway	20 feet (See also Section 6.5.3)
Alleys	20 feet
Watercourse or drainage channel	25 feet
Underground storm drainage	20 feet
All other easements	20 feet
Public utility access easement (Suburban Districts only)	5 feet envelope
Utility (water & sewer)	Per City of Raleigh Public Utilities Department

6.10.2 DEDICATION OF STORMWATER INFRASTRUCTURE

- A. Stormwater Management Facilities:** The Town of Wake Forest in its discretion may accept dedication of any existing or future stormwater management facility for maintenance, provided such facility meets all the requirements of this ordinance and includes adequate and perpetual access and sufficient area, by easement or otherwise, for inspection and regular maintenance. This section is subject to Section 6.10.2.C.
- B. Limits of Public Ownership and Maintenance Responsibility:** The following components of the drainage infrastructure will not be maintained by the Town of Wake Forest:
 1. All drainage easements shall be public to the end of any storm drainage pipe system device. All drainage beyond that point shall be carried in drainage easements which are private and will be owned and maintained by the individual property owner.
 2. The Town of Wake Forest assumes no liability or responsibility for adjudicating disputes between property owners regarding non-publicly generated storm water.
 3. Drainage systems on private property that do not have dedicated easements.

4. Drainage systems maintained by NCDOT as part of its State highway system.
- C. Private Detention/Retention/Water Quality Pond Areas:** The town will not accept these areas for maintenance; however, the town reserves the right to enter these areas and remove any debris/blockage that is adversely affecting the town's drainage system. This will be done in an emergency situation without notice. Under normal conditions, the town will contact the owner/developer to have said blockages removed. If unable to do so within a reasonable time, the town reserves the right to charge the owner/developer for any expense incurred by the town in doing so.
- D. Natural Water Courses:** Natural ditches, streams, creeks, and rivers shall not be maintained by the Town of Wake Forest except to remove debris/blockages that are adversely affecting the town's drainage system.
- E. Limitation of Consequential Damage to Private Facilities Located on Public Easements:** All public easements, including storm sewers, are to remain clear of obstructions. No buildings, fences, trees, shrubs or other obstructions shall be placed in any easement. Driveways, walkways, asphalt and parking lots may be permitted in easements; however, the town reserves the right to remove such asphalt, concrete, base course and sod as necessary to access its facility in the case of emergency. Pavement or concrete will be replaced with a patch. Sod will be replaced with Fescue or rye seeding. The town will not be responsible for replacing a property owners sod after repairing a drainage line.

6.11 TRANSPORTATION IMPACT ANALYSIS

The Transportation Impact Analysis (TIA) is a specialized study that evaluates the effects of a development's traffic on the surrounding transportation infrastructure. The TIA helps identify where the development may have a significant impact on safety, traffic and transportation operations, and provides a means for the developer and government agencies to mitigate these impacts. Ultimately, the TIA can be used to evaluate whether the scale of development is appropriate for a particular site and what improvements may be necessary, on and off the site, to provide safe and efficient access and traffic flow.

6.11.1 WHEN REQUIRED

The necessary level of analysis for different development categories is defined in the following table:

Level of Study Required by Development Type	Residential	Office	Hotel	Industrial or Warehouse	Retail/Shopping Center	Other
None (unless located in area of special concern)	<100 units	<50,000 sf	<100 rooms	<150 employees	n/a	<100 peak hour trips
Standard TIA	100 to 500 units	50,000 sf to 350,000 sf	100 to 500 rooms	150 to 1,000 employees	<100,000 sf	100 to 500 peak hour trips
Enhanced TIA	>500 units	>350,000 sf	>500 rooms	>1,000 employees	>100,000 sf	>500 peak hour trips

6.11.2 STANDARD TIA REQUIREMENTS

A standard TIA includes the following elements:

- A. Abstract or Summary:** Summarize description of proposed development, location, traffic generation, existing and future conditions (level of service), and recommended improvements. The report should not exceed 2 pages and preferably limited to one page.

- B. Description of Development:** Describe acreage included in development, existing and proposed land use, existing and proposed zoning, proposed density (number of houses, square feet of development, etc.)
- C. Study Area:** Generally ¼ mile to ½ mile from each proposed site access along roads accessed by the site. This area may, in a few cases, be greater if the site is on a road with no intersections within that distance.
- D. Site Location:** Include location map showing site in relation to major streets and at least one-mile radius from site.
- E. Traffic Generation:** Indicate number of trips generated by site daily, AM peak hour, PM peak hour (AM peak hour may be omitted for retail uses which are not expected to generate significant traffic volumes during this period). Indicate internal or pass-by traffic generation if appropriate. For rezoning, indicate traffic generation under existing zoning as well as proposed zoning. Indicate source of trip generation rate, land use code, and units used to derive generation.
- F. Trip Distribution:** Indicate percentage distribution of trips, by direction, within study area and method used to obtain.
- G. Access Location(s):** Location of planned streets or driveways and access to existing streets. Indicate other streets or driveways within study area, including those across the street. Indicate coordination with NCDOT where appropriate.
- H. Existing Road and Traffic Conditions:** Street laneage and classification, traffic control devices, existing daily traffic volumes within study area. Show traffic volumes and level of service of signalized intersections and proposed site access points within study area during AM and PM peak hour (PM only for retail). Include work sheets or computer printouts showing counted traffic volumes and level-of-service. Illustrate in figure(s) showing peak hour volumes, lanes, and level of service. For unsignalized intersections, show level-of-service for individual movements. Discuss transit service if applicable. Discuss accident history, if appropriate.
- I. Planned Improvements:** Discuss and describe any planned road improvements in the study area which could affect future traffic. Note whether project is shown on thoroughfare plan, collector street plan, or NCDOT TIP.
- J. Future Conditions:** Same as for existing conditions, plus site traffic assigned to driveways or access points, for condition with full build-out of project, at build-out year. Include growth in background traffic due to other approved developments or to general growth in area. May show more than one phase, if project is to be phased. Discuss any conflict with other driveways or streets, queuing problems, potential safety problems.
- K. Pedestrian Facilities:** Indicate location of existing and proposed sidewalks and crosswalks, internal pedestrian paths.
- L. Recommended Improvements:** Indicate improvements required for access points and signalized intersections within study area to operate at acceptable level of service (D or better). These may include site access, internal site circulation, signalization, signal modification (retiming, additional phases), lane modifications or additions, or street widening. A signal warrant study is not required but may be included as supporting documentation where a traffic signal is requested. Note: showing recommended improvements does not necessarily indicate responsibility for improvement. Report may indicate which improvements are due to development and which are due to existing problems or other growth in traffic, and

may suggest responsibility of developer or of other parties for improvements. Proposed improvements should be shown schematically on figure.

- M. Engineer's Seal:** All TIAs are to be prepared and sealed by an engineer registered in the State of North Carolina and specializing in traffic or transportation, with experience in preparing TIAs.

6.11.3 ENHANCED TIA REQUIREMENTS

An enhanced TIA includes all of the elements of a standard TIA plus the following:

- A. Study Area:** Generally from 1 to 3 miles from each proposed site access along roads accessed by the site. The extent of the study area should be discussed with town staff prior to initiating the TIA.
- B. Internal Circulation:** Review internal circulation patterns and note recommended changes.
- C. Trip Distribution:** Use of a computer model for distribution may be desirable for major projects.
- D. Future Conditions:** Projects in this category, other than perhaps shopping centers, are likely to be phased. It is desirable to show conditions at end of planning period (generally 20-year or horizon used for thoroughfare plan).
- E. Recommended Improvements:** For major projects, these may involve changes to the thoroughfare plan or collector street plan. The project may include the construction of portions of thoroughfares within or adjacent to the site.

6.11.4 IMPROVEMENTS MAY BE REQUIRED

Based on the findings of the analysis, if a proposed development does not meet the applicable service level standards, the applicant shall be required to upgrade the facilities in accordance with the adopted level of service program. Mitigation measures may involve strategies other than roadway construction or other physical improvements such as changes to traffic signal timing or phasing, and transportation management strategies.

6.11.5 THRESHOLDS FOR MITIGATION

The town requires consideration of roadway and/or operational improvements when the proposed development increases the intersection Volume-to-Capacity Ratio (V/C) beyond the thresholds indicated in the table at right. The town evaluates the impacts of proposed development at intersections (primarily under existing year conditions) based on the increase in V/C ratio as a result of the projected site traffic. This increase is determined by comparing the V/C ratio under existing development conditions and proposed development conditions. For the purposes of this comparison, all unsignalized intersections are analyzed as signalized intersections.

Existing V/C	Allowable Increase in V/C By Development
0.00 – 0.60	0.10
0.61 – 0.70	0.07
0.71 – 0.80	0.05
0.81 – 0.90	0.03
0.91 – 1.00+	0.02

6.11.6 PAYMENTS-IN-LIEU OF IMPROVEMENTS

The town may, at its discretion, accept either mitigation measures to be completed by the developer or a fee paid to the town in lieu of mitigation. The fee shall be equal to the costs of the required mitigation measures, as determined by the Administrator. A combination of mitigation measures and payments-in-lieu of dedication may be permitted. Payments-in-lieu of dedication shall be approved as part of the Subdivision or Site Master Plan.

6.12 IMPROVEMENT GUARANTEES & PERFORMANCE SECURITIES

6.12.1 IMPROVEMENT GUARANTEES

- A. Applicability:** In lieu of construction of the permanent improvements required by this ordinance, the developer shall guarantee that such improvements will be carried out according to the Town of Wake Forest's specifications at his/her expense. At minimum, improvements such as public utilities and initial surface of street right-of-way shall be installed and inspected by the Administrator for compliance. The remaining improvements shall be built or bonded prior to the recording of the final plat.
- B. Amount of Improvement Guarantees:** Such guarantees shall be in an amount of not less than 125% of the estimated cost of the construction of the required improvements. The amount of guarantee shall be approved by the Administrator based on a Professional Engineers certified cost estimate and shall be provided in the manner outlined in Section 6.12.3.
- C. Release of Improvement Guarantees:** The Administrator shall authorize the release of all or a portion of any guarantee posted as the improvements are completed. Such funds shall be released within 32 days after submittal of an improvements completion certification from a Professional Engineer and approval of applicable improvements by the Administrator.
- D. Warranty Against Defects**
 1. Upon completion of construction of new streets, stormwater controls or other required utilities, the developer shall request a warranty inspection. Once all the improvements are deemed acceptable by the Administrator and pass the warranty inspection, the developer shall submit the following to the Administrator:
 - a. A set of acceptable as-built drawings,
 - b. A written warranty against defects which shall guarantee the material and workmanship of required improvements for a period of not less than one year from the date of such acceptance.
 - c. A financial guarantee payable to the town equal to at least 25% of the cost of the installation of such improvements as determined by the Administrator. Such financial guarantee shall be in a form as provided for in Section 6.12.3.
 2. Upon approval of these materials and acceptance of the improvements by the town, a 1-year warranty period shall commence. During the 1-year warranty period, the developer shall repair any latent defects that occur. For the purposes of this section, the term "defects" refers to any condition in publicly dedicated facilities, utilities or streets that requires the town to make repairs to such improvements over and above the normal amount of maintenance that

they would require. If such defects appear, the warranty may be enforced regardless of whether the facilities, utilities or streets were constructed in accordance with the requirements of this ordinance. At the end of the one-year warranty period, the developer shall request a final inspection. Upon successful completion of all warranty items, the developer shall be released from maintenance responsibilities for the warranted construction.

3. Warranty repairs shall be corrected in accordance with the recommendations of the Administrator.
4. If a developer fails to complete warranty items, future projects of the developer may not be reviewed by the town. In addition, the town shall take appropriate legal action against the developer.

6.12.2 PERFORMANCE SECURITIES

A. **Applicability:** Performance securities shall be required as follows:

1. **Stormwater Structures:** The Town of Wake Forest may, at its discretion, require the submittal of a performance security in order to ensure that the structural BMPs are maintained by the owner as required by the operation and maintenance agreement.
2. **Temporary Erosion, Sedimentation, and Stormwater Controls:** Performance securities must be provided to the town for all projects of ½ acre (21,780 square feet) or more in surface area.

B. **Amount of Performance Security**

1. **Stormwater Structures:** The amount of a performance security for the maintenance of structural BMPs, as required by Section 12.5, shall be the present value of an annuity of perpetual duration based on a reasonable estimate of the annual cost of inspection, operation and maintenance of the BMPs approved under the permit, at a discount rate that reflects the jurisdiction's cost of borrowing minus a reasonable estimate of long term inflation. Such security shall be provided in the manner outlined in Section 6.12.3.
2. **Temporary Erosion, Sedimentation, and Stormwater Controls:** The amount of a performance security for temporary erosion, sedimentation and stormwater controls shall be 125% of the cost to remove, maintain or repair all erosion control measures. Such security shall be provided in the manner outlined in Section 6.12.3.

C. **Costs in Excess of Established Amounts:** If Town of Wake Forest takes action upon failure by the applicant or owner, the Town of Wake Forest may collect from the applicant or owner any difference should the amount of the reasonable cost of such action exceed the amount of the performance security held.

D. **Release of Performance Securities**

1. **Stormwater Structures:** Not applicable.
2. **Temporary Erosion, Sedimentation, and Stormwater Controls:** Securities will be released upon issuance of a Certificate of Compliance and final Land Disturbance Permit closeout.

6.12.3 TYPES OF GUARANTEES / SECURITIES

Improvements guarantees and performance securities shall be made in one or more of the following forms:

- A. A surety bond made by a surety company licensed to do business in North Carolina,
- B. A certified check drawn in favor of the Town of Wake Forest, or
- C. Cash deposited with the Town of Wake Forest.

6.12.4 FORFEITURE AND DEFAULT

- A. **Forfeiture Provisions:** All improvement guarantees and performance securities shall contain forfeiture provisions for failure, after proper notice, to complete work within the time specified, or to initiate or maintain any actions which may be required of the applicant or owner in accordance with this ordinance, approvals issued pursuant to this ordinance, or an operation and maintenance agreement established pursuant to this ordinance.
- B. **Default by Developer**
 - 1. Upon default, meaning failure on the part of the developer or surety to make timely completion of the required improvements, or to maintain privately owned improvements in accordance with an approved operations and maintenance agreement, the town may require the developer, the surety, or the financial institution holding the escrow account to pay all or any portion of the bond or escrow account fund to the town.
 - 2. Upon payment, the town, at its discretion, may expend such portion of the funds as it deems necessary to complete all or any portion of the required improvements.
 - 3. Such expenditure of funds shall only be made after requesting the owner to comply with the permit or maintenance agreement.

6.13 PROVISION OF SERVICES AND ACCEPTANCE BY TOWN

The following shall not occur upon any land for which a plat is required to be approved, unless and until the requirements set forth in this ordinance have been complied with and the Final Plat has been approved and recorded with the Wake County Register of Deeds:

- No street shall be maintained or accepted by the town, and
- No water or sewer shall be extended to or connected with any subdivision of land, and
- No permit shall be issued by an administrative agent or department of the Town of Wake Forest for the construction of any building or other improvement requiring a permit.

6.14 OWNERSHIP & MAINTENANCE OF COMMON AREAS

All developments containing land, amenities or other facilities under private common ownership shall provide for the ownership & maintenance of such areas. Multi-family developments that are subject to fee-simple lot/unit ownership shall convey all such common areas to a non-profit corporate homeowners' association with a membership of 100% of the lots/units in the development. The developer shall file with the Franklin or Wake County Register of Deeds a "dedication of covenants" and must meet the following criteria:

- The homeowners' association must be established before the units are sold;
- The homeowners' association is established as the responsible entity for the liability insurance, pertinent local taxes, and maintenance of all recreation and other facilities;
- Sums levied by the homeowners' association that remain unpaid shall become a lien on the delinquent property;

- For condominium development, documents must meet the requirements of NCGS 47A Unit Ownership
- All easements over common areas for access, ingress, egress and parking shall be shown and recorded on a final plat with the Franklin or Wake County Register of Deeds

See Section 7.7 for ownership & maintenance requirements specific to open space.