

TRANSPORTATION MASTER PLAN

I. INTRODUCTION

The Knightdale Transportation Master Plan addresses mobility needs throughout the Town of Knightdale's planning jurisdiction and urban service area. The Plan seeks to encourage the development of a network of interconnected streets that work to disperse traffic while connecting and integrating neighborhoods within the existing urban fabric of the Town.

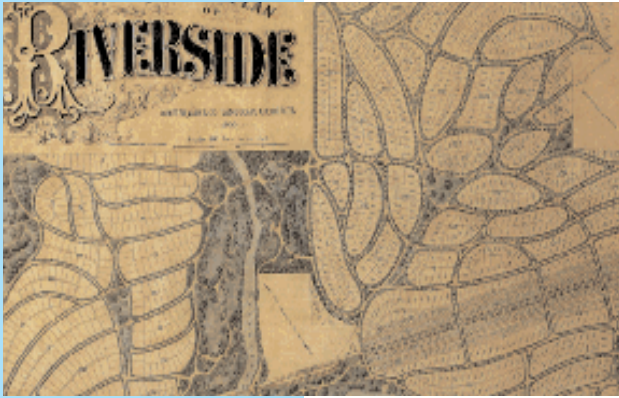
Equally as important the Transportation Master Plan encourages the development of a network of sidewalks, bicycle lanes, and mass transit options to provide an attractive and safe mode of travel for cyclists and pedestrians. In addition to dispersing traffic, interconnected street networks encourage alternate modes of transportation to the automobile, enhance transit service opportunities, and potentially reduce vehicle miles traveled within the street network. The overall network function, and the comfort and safety of multi-modal or shared streets to disperse traffic are primary to the system's efficiency.

One of the biggest challenges facing Knightdale during the next twenty-years is planning for a safe and efficient transportation system. As the population of Knightdale and the region continues to increase so will traffic demand. The result without proper planning is congestion and unsafe conditions.

The goal of the Plan is to address regional as well as local issues. While the plan focuses on mobility, it is also designed to preserve the local character and heighten community design. In achieving this goal, the plan recommends street design guidelines that serve the traffic needs, while encouraging type and density of development suitable to the area.

Finally, the plan is intended to function cooperatively with the long-range plans of agencies such as the Triangle Transit Authority (TTA), Capital Area Metropolitan Planning Organization (CAMPO), the North Carolina Department of Transportation (NCDOT), other neighboring municipalities (Raleigh, Wendell and Zebulon) and Wake County government.

The intent of the Transportation Master Plan is to plan a transportation network that enhances quality community design. The purpose of evaluating the transportation system is the understanding of which improvements are needed now and which improvements are needed in the future.



Original Plan for Riverside (IL), Riverside Historic Society

The Six Major Parts of the Transportation Plan:

1. Transportation System Plan

Serves as a basis for the coordinated implementation of roadway improvements to protect the integrity and safety of the street network and provide an acceptable level of mobility to the citizens of Knightdale.

The system plan includes:

- History of Transportation Planning in Knightdale
- Existing Conditions

2. Street System Classifications

Provide guidelines regarding ultimate cross sections for all street classification types.

3. Transportation Map

Includes the thoroughfare plan and the collector street plan.

4. Street Design Principles

Provide guidelines regarding the design of Town streets (1) to promote a safe and pedestrian friendly street system and (2) an interconnected pattern of streets throughout Town.

5. Transportation Objectives and Action Items

Outlines the Town's main transportation objectives and tasks to be completed to achieve these objectives.

6. Greenway Corridor Map

Shows proposed locations of the Town's Greenway System. This map, though part of the transportation plan, is found in the Open Space and Greenway System chapter of the 2027 Comprehensive Plan.

II. TRANSPORTATION SYSTEM PLAN

The plan contains recommendations for maintaining and improving the Town's street network. Road design details are only generalized in this plan; specific cross section construction details and dimensions can be found in the Town of Knightdale Standard Specifications and Construction Details and the Town's Unified Development Ordinance after rewrites of these documents are completed by Year 2004.

A. History of Transportation Planning In Knightdale

I. Creation of the 1993 Knightdale Thoroughfare Plan

On May 19, 1993, the Town of Knightdale adopted its first Thoroughfare Plan. The original Thoroughfare Plan was a cooperative effort between the Town of Knightdale



and the North Carolina Department of Transportation (NCDOT) and was created to meet the following objectives:

- Guide the development of the urban street system to meet changing traffic demands
- Develop an adequate major street system as land development occurs
- Reduce travel and transportation costs
- Reduce the cost of major street improvements to the public by coordinating the street system with community development
- Enable citizens to make plans and improvements with full knowledge of public intent
- Minimize disruption and displacement of people and businesses through long-range planning for major street improvements
- Reduce air and noise pollution that may be created by traffic
- Increase travel safety
- Mitigate urban sprawl on U.S. 64
- Reduce Knightdale's dependency on U.S. 64 for vehicular trips internal to Knightdale

The plan objectives are still in place. However, in 2002, the NCDOT initiated a new program for transportation planning as required by the North Carolina General Assembly. The Thoroughfare Plan, as approved in 1993, will be replaced by a new NCDOT Transportation Plan. The NCDOT Thoroughfare Plan is being replaced to:

- Provide opportunities for multi-modal transportation options, which are not addressed on the current plan
- Provide a series of maps outlining multi-modal options rather than the provision of one thoroughfare plan map
- Provide a larger hierarchy of streets rather than limiting the map to thoroughfares only
- Break down each category of street type into three levels: "existing, proposed and needs improvement".

Though the new NCDOT Transportation Plan is not yet approved, the ultimate goal is to have this plan in place within the next two years. This will cause the 1993 Knightdale Thoroughfare Plan to be out of date and no longer useful. Also note that the Capital Area Metropolitan Planning Organization has approved a Long Range Transportation Plan.

The new Knightdale Transportation Plan has been organized to align with the basic guidelines of NCDOT's new Transportation Plan by:

1. Encouraging similar street terminology,
2. Providing multi-model transportation options
3. Providing a series of maps and guidelines to show the various options of the transportation system.

II. Creation of the Functional Classification Map

On August 7, 1995, the Town of Knightdale adopted its first Unified Development Ordinance. The Unified Development Ordinance merged the zoning and subdivision regulations into one comprehensive document. The Street Ordinance section of the UDO outlines standards for the street hierarchy system and provides street cross section requirements. The Functional Classification Map adopted as part of the UDO outlines requirements for street cross sections throughout the Knightdale planning jurisdiction and urban service area.

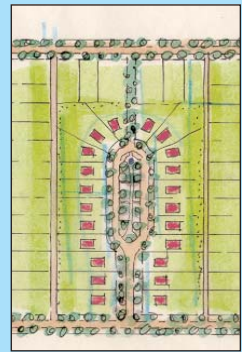
The Functional Classification Map will be used until the Town completes a major rewriting of the Unified Development Ordinance. The UDO rewrite will update the Functional Classification Map in accordance with the guidelines provided from 2027 Comprehensive Plan's Transportation Master Plan. Expected completion date of the Unified Development Ordinance is July 2004. The functional classification will also be based on the Federal Functional Classification designation provided by FHWA. There is a process for changing the classification as spelled out in the guidelines provided by FHWA.

B. Existing Conditions

U.S. HIGHWAY 64

U.S. Highway 64 is not only the gateway into Knightdale, but also one of the Town's most important transportation and economic corridors. Because of the importance of U.S 64, the Town has dedicated much attention to its appearance and function. The Town adopted a Special Thoroughfare Overlay District, the U.S 64 Corridor Plan, and established the Planning and Appearance Board. Knightdale also continues to request and receive enhancement funding for median landscaping on US 64 at several locations.

Because this is an important facility, the Town should continue to plan for traffic improvements and aesthetic enhancements. Planning includes the implementation of Village Park Drive as a parallel collector street system. The parallel collector street



Close, sketch by Ciriello

allows traffic to access the commercial property adjacent to U.S. 64 without having to travel on U.S. 64. The commercial areas created by this marginal access street is, and should continue to be, pedestrian friendly. It is designed to promote slower travel speeds and is required to have sidewalks on both sides of the street.

The Town has programs and projects in place to improve the appearance of U.S. 64 and to help ensure quality development. The Town should continue to plan and implement projects that enhance the appearance, efficiency, and safety of the U.S. 64 corridor. The corridor width and high volume of traffic presents a barrier to cyclists and pedestrians. The Town should coordinate an effort with NCDOT to explore techniques that allow for the safe crossing of U.S. 64 for non-motorized transportation.

One important issue for U.S. 64 is the construction of the U.S. 64 Bypass. The US 64 Bypass will initially remove a tremendous volume of thru traffic from U.S. 64. This will allow US 64 to function focus more on local service. Greater emphasis should be placed on designing U.S. 64 as one of Knightdale's main streets rather than as a regional highway.

U.S.HIGHWAY 64 BYPASS AND EASTERN WAKE EXPRESSWAY (INTERSTATE-540)

As part of the NCDOT highway system, two major limited access freeways are being constructed through the Town of Knightdale's planning area: The US 64 Bypass and the Eastern Wake Expressway. These two freeways are prompting a tremendous amount of inquiries from citizens and the development community. Both roads will have an incredible impact upon the development of Knightdale. These roads, and especially the interchanges associated with these roads, should be carefully planned well before completion.

THE US 64 BYPASS

The US 64 Bypass is a 10.2-mile, 6-lane freeway with 7 interchanges serving Raleigh, Knightdale and Wendell. It connects the US 64 with the Raleigh I-440 Beltline. Upon completion it will provide 125 miles of controlled access from Williamston in eastern North Carolina to the Town of Cary.

The US 64 Bypass was the number one priority on the CAMPO Transportation Improvement Program priority list. Due to incredible traffic congestion at peak hours along the existing highway, the Bypass was determined to be the best solution to ease traffic congestion. The project is estimated to cost \$188 million dollars, including right-of-way acquisition and construction.



Existing 64 carries between 43,000 and 62,000 vehicles daily (NCDOT 1998 ADT counts). Projections for the Bypass are between 53,800 to 59,800 vehicles daily by 2018 (CAMPO Transportation Plan 2025). The six-lane highway will be constructed within a 350-foot right-of-way with a 60-foot median. The Bypass's completion was expedited in July 2001 when the construction method was changed to a design-build schedule to start in 2002 and to be completed by November of 2004; three years earlier than originally scheduled.

The purpose of the US 64 Bypass Interchange Final Report is to ensure that local municipalities and future highway users get the maximum benefit from the Bypass project by preserving mobility, addressing citizen concerns, increasing public safety, ensuring economic viability, and facilitating regional cooperation in planning efforts. To fulfill these goals, the corridor study provides land use and transportation recommendations in the areas along the Bypass corridor and near the proposed interchanges.

The Town of Knightdale has adopted the U.S. Highway 64 Bypass Interchange Final Report, a land use plan for the interchanges of the freeway. This Final Report also serves as a Focus Area Plan, and is contained in the 2027 Comprehensive Plan. Recommendations from the US 64 Knightdale Bypass Interchange Final Report should be implemented as development occurs.

THE EASTERN WAKE EXPRESSWAY (I-540)

The Eastern Wake Expressway (I-540) will run perpendicular to the Bypass with two interchanges in Knightdale's planning jurisdiction. The Eastern Wake Expressway is part of I-540 (commonly called the 'Raleigh Outer Loop') and will provide access to areas west of Knightdale, including Durham and Research Triangle Park. This easier regional access is making Knightdale most attractive to developers seeking land for commercial, residential and industrial projects. The I-540 section through Knightdale is expected to be completed by late 2006.

As previously stated, careful consideration should be given to the effects of these freeways on traffic flow and land use, especially in the areas surrounding the interchanges associated with both facilities.

LOCAL ROADS

In Knightdale, Smithfield Road, Bethlehem Church Road, Robertson Street, and Old Knight Road function as streets radial to downtown Knightdale. If all radial streets met in a central area, an intolerable congestion problem could result. To avoid this problem, it is important to have a system of cross-town streets that create a loop

around the central area. This cross-town street system allows traffic moving from one side of the central area to the other to follow the area's border and then enter the area near a given destination. A good cross-town system frees the central area of cross-town traffic. This permits the central area to function as a Town Center mixed use, higher density area. Forestville Road and Old Faison Road function as cross town streets.

Loop system streets move traffic between suburban areas of the town. Although a loop may completely encircle the town, a typical trip may be from one place in the outskirts of town to another place in the outskirts of town. Loop streets do not necessarily carry heavy volumes of traffic, but relieve central areas. There may be one or more loops, depending on the size of the area, and they are generally spaced one-half mile to one mile apart, depending on the intensity of land use. Currently, Knightdale does not have a loop system. A loop system is planned as part of the Transportation Plan. The proposed loop will connect Old Faison and Forestville Road.

The function of the local street system is to provide direct access to property. To provide for a safe local street system, facilities should be designed in such a way as to reduce travel speeds. Traffic calming techniques such as entryway landscaping, traffic throttles, speed humps, bulb outs, textured treatments, and pavement markings should be utilized. Careful selection of traffic calming techniques is recommended so as not to interfere with emergency services.

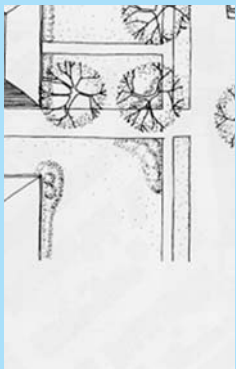
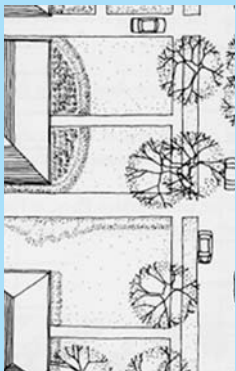
In addition, local street planning should favor a modified grid system, rather than long dead-end or long cul-de-sac streets. The use of the grid allows traffic to disperse over several routes, rather than relying on a single street. It also allows for better access by emergency vehicles.

TOWN CENTER STREET PLAN

As development, and redevelopment, of the downtown area continues, the current grid system of streets should be maintained. The Town initiated a Town Center revitalization program, to encourage "neo-traditional" development. Items such as streets, parking, sidewalks, and landscaping should be planned in accordance with the Town Center program.

III. STREET SYSTEM CLASSIFICATIONS

An adequate road system must be maintained to allow motorists to travel in an efficient and safe manner. In planning for a road network, it is important to first have an understanding of the different classifications of roads that are proposed by the



Transportation Master Plan. These classification differ from the current Unified Development Ordinance and Standard Specification and Construction Detail Standards. The goal of the new classification system is to:

1. To update terminology and cross section details to meet new demands for increased multi-model planning in the region.
2. To follow similar transportation planning objectives of the new NCDOT Transportation Plan expected to be completed within two years from adoption of the 2027 Comprehensive Plan.

A. The Street Classification System

Streets are classified according to their function. Higher order classification focus on mobility, while lower order classifications accommodate access. As a result, separate design standards are applicable to each class. The intent of the 2027 Comprehensive Plan is to assure the classification in each system is compatible, and the cross section and right-of-way recommended is in compliance with adjacent towns and Wake County.

Transportation plans throughout the state generally included two types of maps: A thoroughfare map and a collector street map. Under the new NCDOT terminology one comprehensive map is proposed which shows both. The terms thoroughfare and collectors are replaced.

The collector street plan facilitated the connection between residential and commercial properties and the minor thoroughfares. These connections helped reduce traffic on major facilities by providing a means for inter-neighborhood travel without the need to access higher order streets.

The collector street component of the Transportation Map was developed based on the design district types and densities expected at each district as presented in the 2027 Comprehensive Plan. The roads, and their corresponding cross sections, are planned in such a way as to accommodate neighboring density. For example, roads in the less dense rural areas are predominantly two lanes. While roads through higher density development zones are proposed as three to five lanes where traffic is expected to surpass the capacity of a two-lane roadway. Figure 8.1 shows typical cross sections for various street classifications. Figure 8.2 expands on street classifications for specific streets in Knightdale.

The street classifications are:

Freeway (old terminology Freeway): A multi-lane median divided facility with full

control of access. US 64 Bypass and the Eastern Wake Expressway are identified as Freeways.

Parkway (old terminology: Principal Arterial): A parkway is a street used to promote moderate mobility with limited access, moderate volume and medium speed. Travel speeds are projected at 30 to 45 miles per hour with a four-lane cross section plus medians with turning pockets or turning lanes. Driveways are encouraged to be primarily right-in/right-out with occasional median crossovers permitted. The street should also focus on design standards that enhance pedestrian safety and aesthetics. Traffic calming measures, reduced turning radii, and landscaping highlight this type of facility.

Boulevard (old terminology: Major and Minor Thoroughfare): A boulevard is a street used to promote moderate mobility with limited access, moderate volume and medium speed. Travel speeds are projected at 30 to 45 miles per hour with a cross section of 4 lanes plus medians with turning pockets or turning lanes. Driveways are encouraged to be primarily right-in/right-out with occasional median crossovers permitted. The street should also focus on pedestrian safety, and design standards should be used that enhance pedestrian safety and aesthetics.

Avenue (old terminology Major and Minor Collector): Avenues focus on access, typically at the expense of speed and mobility. Their intended purpose is to distribute traffic from the boulevards and parkways to the local system. Traffic calming measures, reduced turning radii, and landscaping highlight this type of facility.

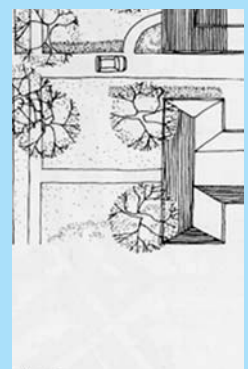
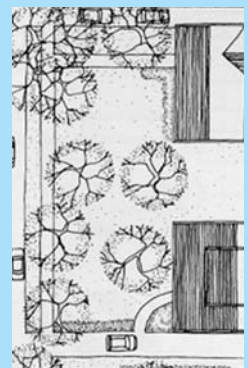
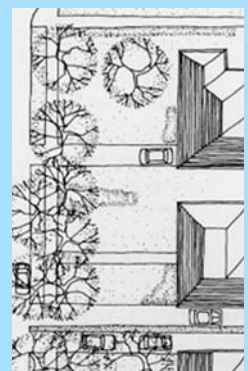
Local: A minor street, which is intended to carry local traffic from avenue streets to the system of minor streets within large residential neighborhoods, and provide access to local streets, cul-de-sac streets or abutting residential property.

Street Classification cross sections are provided on the following pages and as previously stated will be used to adopt new cross section standards as part of the Unified Development Ordinance rewrite to be completed in July 2004.

B. Level of Service

In addition to an understanding of street classifications, before planning a road network it is important to have an understanding of how a road is evaluated.

The level of service (LOS) is one criteria used to evaluate streets. Traffic volumes and roadway capacity largely determine a level of service. Levels of service are used to identify needed roadway improvements. Levels of service represent a range of





conditions, not a precise volume or condition. Standardized descriptions of road segment LOS are:

- LOS A:** Highest level of service, describes primarily free flowing traffic at average travel speeds. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream.
- LOS B:** Represents reasonably unimpeded traffic flow operations at near free flow speeds. The ability to maneuver within the traffic stream is only slightly restricted.
- LOS C:** Represents stable traffic flow operations. Ability to maneuver and change lanes is more restricted than in LOS B, although traffic continues to move.
- LOS D:** Ability to maneuver in traffic is restricted. Small increases in traffic flow may cause substantial increases in queues. Events in the traffic stream can take longer to dissipate.
- LOS E:** Traffic flow is characterized by significant delays and lower operating speeds. Small disruptions in the traffic stream can lead to long queues. Queues are not easily dissipated, and can often cause stop and go conditions on roadways.
- LOS F:** Traffic flow is characterized by very low speeds. Traffic operations become stop-and-go. Comfort and convenience are extremely low and frustration is high.

In addition to segmental LOS, there is also an intersection LOS. Intersection LOS is based on average delay.

IV. THE TRANSPORTATION MAP

The Knightdale Transportation Map is located at the end of this section (Figure 8.3). The map replaces the official Knightdale Thoroughfare Plan Map and eventually will replace the current Functional Classification Plan map when the Unified Development Ordinance is rewritten and adopted by July 2004.

As previously stated, the Functional Classification Map is currently used to guide decisions about street type and cross sections required for streets within Knightdale's planning jurisdiction. It is the intent of the 2027 Comprehensive Plan Transportation Map to eventually become the map used to guide decision making for street type and

cross section. At this time it will be used for guidance. When the UDO is rewritten by July 2004, the Functional Classification Map and Transportation Map contained in this section will be merged to form one comprehensive map for street type and cross section requirements.

The Transportation Map is derived through analyzing the 1993 Knightdale Thoroughfare Plan, the 1995 Functional Classification Plan, CAMPO Thoroughfare Plan and suggestions made by the Town's transportation consultant team (Stantec Consulting Services Inc.). A primary concept that evolved from the Transportation Map is that one street may not have the same street classification throughout the length of the street. This Plan intends to recognize that street classifications be allowed to change character as they pass from one design district to another. This Transportation Map is directly correlated to the Design District Map contained in the Design District Master Plan.

A. Mass Transit Component of the Transportation Plan

The Transportation Map shows proposed locations of a commuter rail line and stations. The Town of Knightdale has underway a commuter rail feasibility study to determine the feasibility of commuter rail stations in Knightdale. This study is expected to be completed by December of 2003.

The Town of Knightdale has been exploring commuter rail since 1990, when a study was conducted by Barton-Aschman Associates and Hammer, Siler, George Associates (to) evaluated the potential for transit in the Triangle Region. The findings of the study indicated a transit system would be viable if land use development patterns changed dramatically over the next 20 years. The long-term possibility of transit in the Knightdale area is very good. The railroad line through Knightdale has been designated a future transit route.

In 1992, the Triangle Region Planning Directors Exchange (PDX) authored a report titled, "Land Use and Development Standards to Support Transit in the Research Triangle Region of North Carolina." The PDX was charged, by the Greater Raleigh Metropolitan Planning Organization (which is now the Capital Area MPO) and the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization, to develop land use and development standards to support transit.

Numerous other reports have been prepared on commuter rail potential in the Triangle Region. The Triangle Transit Authority (TTA) is preparing for design and construction of Phase I of its commuter rail system.

Other modes of transportation are also being explored. An express bus service connecting Knightdale with the region is being evaluated. Express bus service should be designed to meet the needs of the commuter. The Triangle Transit Authority offers express bus service between Raleigh, Durham, Chapel Hill, Research Triangle Park, and Raleigh-Durham International Airport. The Town of Knightdale will continue to work with the TTA, CAMPO and other organizations to plan for additional modes of transportation.

V. STREET DESIGN GUIDELINES

It is the intent of the Street Design Guidelines to build streets that are integral components of community design. The guidelines encourage the development of a network of interconnecting streets that disperse traffic while connecting and integrating the rural and urban areas of town. Equally important, the guidelines encourage the development of a network of sidewalks and bicycles lanes that provide an attractive and safe mode of travel for cyclists and pedestrians. It is also the intent of these guidelines to be further developed into standards as part of the Unified Development Ordinance rewrite to be completed by July 2004.

The Street Design Guidelines provide a tool to retain, recognize or modify significantly the urban and rural character of streets emerging throughout Knightdale.

A. Street Guidelines

1. Streets in the Town Center, Neighborhood Design Districts and within the Countryside Design District's Village Center should provide on-street parking.
2. Streets should interconnect within a development and with adjoining development. Cul-de-sacs are permitted only where topographic conditions offer no practical alternatives for connections. Street stubs should be provided within a development adjacent to open land to provide for future connections. Streets should be planned with due regard to the designated corridors shown on the Town's transportation, design districts, and open space and parks master plans.
3. Street designs should permit the comfortable use of the street by cars, bicyclists, and pedestrians.
4. The streetscape should include street trees planted in a manner appropriate to their function. Commercial streets should have trees which compliment the façade of the buildings and which shade the sidewalk. Residential streets should provide for an appropriate canopy, which shades both the street and the sidewalk.
5. In the Countryside and Neighborhood Design Districts, natural features like streambeds and stands of significant trees or topographic features like rock outcroppings should be utilized as public amenities and for the visual enhancement of the streetscape.

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6. Closed or gated streets should be discouraged.
 7. Where practical, a "close" should be encouraged in place of a cul-de-sac. A close is a front space for buildings interior to the block. It may be pedestrian or it may have a one-way roadway loop around a green area, typically used for passive recreation. Its minimum width must coincide with emergency vehicle turning radii.
 8. The use of traffic calming measures such as raised (table) intersections, lateral shifts, changes in pavement material, and traffic circles should be encouraged as alternatives to conventional traffic control measures. Speed bumps (or humps) should be discouraged.
 9. Valley curbing is encouraged along streets serve homes with front-loaded off-street parking or have occasional off-street parking.
 10. As a rule, shorter street light poles are preferred in lieu of fewer, taller, high-intensity lights. The scale of lighting fixtures and the illumination provided should be appropriate for both pedestrian and vehicular movements.
 11. Generally on-street parking may provide a physical buffer between the pedestrian and traffic and may reduce the need for off-street surface parking. Parking along all streets should be signed, marked, or otherwise clearly delineated. Marked, on-street parking requires guideline curb and gutter.
 12. Blocks should not be less than 200 feet nor more than 1,320 feet (1/4 mile), unless site and topography or other special circumstances are present, or the block is part of a Village Center, Neighborhood Center or Town Center District.
 13. Street should be encouraged to have minimum 9' and maximum 12' foot wide travel lanes.
 14. Emergency vehicles will have more access routes with a gridded streets and alleys system, so use of the grid street system shall be encouraged throughout higher density areas of the town.

B. Pedestrian and Bicycle Travel

Walking serves an important role in Knightdale's local transportation system. Adequate and safe facilities, such as sidewalks, walking paths, and trails, are necessary to promote pedestrian activity and should be designed to comfortably separate pedestrians from automotive traffic.

Cycling offers an excellent alternative to motorized transportation. While the typical commute distances of current travel patterns do not lend themselves to cycle trips, the increase in employment in Knightdale, coupled with the proposed mixed land use development will offer more cycling opportunities. In addition, opportunities for recreational cycling provides an excellent source of activity, and enhance the quality of life. For these reasons, Knightdale has developed a comprehensive bike plan including both transportation and recreational uses. The plan recommends locations

for independent trails such as the Mingo Creek Greenway, as well as shared facilities along roadways. The recommendations of the bike plan are to be included in the Unified Development Ordinance rewrite as applicable.

The following guidelines are established:

1. Sidewalks should be buffered from fast moving, and heavy volumes of traffic.
2. Sidewalks should be located on both sides of the street within the Town Center and Neighborhood Districts.
3. The design of street intersections should include provisions for safe pedestrian crossing.
4. Sidewalks serving non-residential uses within the Town Center or in any Village Center within the Neighborhood or Countryside Design Districts should be a minimum of eight (8) feet in width, with 10-12 preferable in front of shops.
5. The planting area between the sidewalk and the road should be designed to accommodate both plantings and underground utilities.
6. Planting strips should typically located between the curb and sidewalk and parallel to the street. Within commercial areas and other sidewalks with high pedestrian volumes, grated tree wells may be used in lieu of planting strips. Trees should be planted to not impede the site distances of intersections. The minimum width of all planting strips should be at least 4 feet so as to provide a comfortable and safe separation between vehicular and pedestrian movement.
7. Curb radii should be designed to reduce pedestrian crossing times along all streets requiring sidewalks. In general, curb radii should not exceed 20' in non-pedestrian areas and should not exceed 15' in pedestrian areas. Roll curbs should be allowed for access to commercial or industrial facilities to accommodate large vehicles.
8. Mid-block crossings, bulb-outs, raised crosswalks, and similar techniques may be used to accommodate pedestrians when appropriate traffic and site conditions exist.
9. Street furniture such as benches, waste containers, flower and shrub planters, trees, bollards, lampposts and kiosks should be required to encourage walking.
10. Streets shall have well-marked crosswalks, with medians on wider streets to encourage pedestrian safety.
11. Bicycle travel should be supported with bike lanes on wider streets, and bicycle signal preference or speed tables and medians where bike trails intersect streets.

VI. TRANSPORTATION OBJECTIVES AND ACTION ITEMS

The Objectives and Action Items are provided to direct the planning and implementation strategies related to transportation planning in Knightdale and are in

accordance with the overall goals of the 2027 Comprehensive Plan.

A. Objectives

The Town of Knightdale shall seek to:

1. Ensure that development enhances the mobility options of all residents.
2. Ensure that all development provide safe and convenient accessibility to pedestrians, bicyclists, and vehicles.
3. Work with other regional entities, public and private, to pursue a multi-modal network of transportation options and facilities.
4. Encourage land use development patterns that shorten the average length of vehicle trips as a means of reducing congestion and delay throughout the Town.

B. Action Items

The following are the tasks which provide a course of action to implement the objectives for transportation planning:

1. The Town shall annually review and update the Transportation Plan and Transportation Plan Map to ensure that the Plan is current and meet the needs of the Town and region.
2. The Town shall incorporate regionally-adopted long-range transportation plans into the Town's Transportation Plan.
3. The Town's Transportation Plan shall ensure that all new site plans facilitate safe and direct access for pedestrians. Site plans that emphasize automobile access over universal access shall be discouraged.
4. The Town shall use the development approval process to ensure that new roads are built and existing roads are improved in accordance with adopted plans, ordinances, regulations and policies.
5. The Town shall use the development approval process to ensure right-of-way protection.
6. The Town shall prominently display and keep current the Transportation Plan to enable citizens to make plans and improvements with full knowledge of public intent.
7. Transportation related capital improvement projects shall be evaluated using the following criteria:
 - Is the project needed to protect public health and safety and fulfill the Town's legal obligation to provide facilities and services?
 - Does the project increase the efficiency of existing facilities?
 - Is the project in conformance with the goals and objectives of the Transportation Plan?
8. Knightdale's Transportation Plan shall achieve and continue to achieve the

following goals:

- Ensures street connectivity;
 - Encourages alleyways for single-family homes in the Town Center and Neighborhood Districts;
 - Discourages through traffic on local streets;
 - Reduce the number of access points on major roads.
9. The Town shall require developers to use proven traffic calming design techniques to slow automobile traffic through residential areas.
 10. The streets in the Town Center and Neighborhood Districts should be designed to follow the current grid system where possible.
 11. The Town shall continue to plan and implement projects that enhance the appearance of major vehicular corridors.
 12. The Town shall adopt strategies to allow for the safe and convenient crossing of U.S. 64 at intersections located within the Town Center District. This effort should be coordinated with the NCDOT.
 13. The Town shall request that existing US 64 be reclassified upon completion of the US 64 Bypass to reflect the local character of the road. Knightdale shall request to rename existing US 64 to a name appropriate to its new identity.
 14. The Town shall review and update the requirements for the Special Highway Overlay District and the Special Thoroughfare Overlay District as they relate to transportation issues.
 15. The Town shall continue to explore the provision of mass transit, including commuter rail and bus service.
 16. The Town will continue to work with regional public transportation systems to create, encourage, support, and maintain safe and convenient park-and-ride programs and transit-oriented developments.
 17. The Town shall prioritize sidewalk and multi-purpose path construction and repair as part of the sidewalk program. An annual update of the sidewalk plan shall be required.
 18. The Town shall work toward receiving funds from local, state, federal, and non-profit sources for pedestrian and bicycle related transportation improvements.
 19. The Town shall pursue and participate in efforts to introduce commuter rail service along the Town's existing, underutilized rail corridor.

FIGURE 8.1: Typical Street Cross-Section - Town Center District

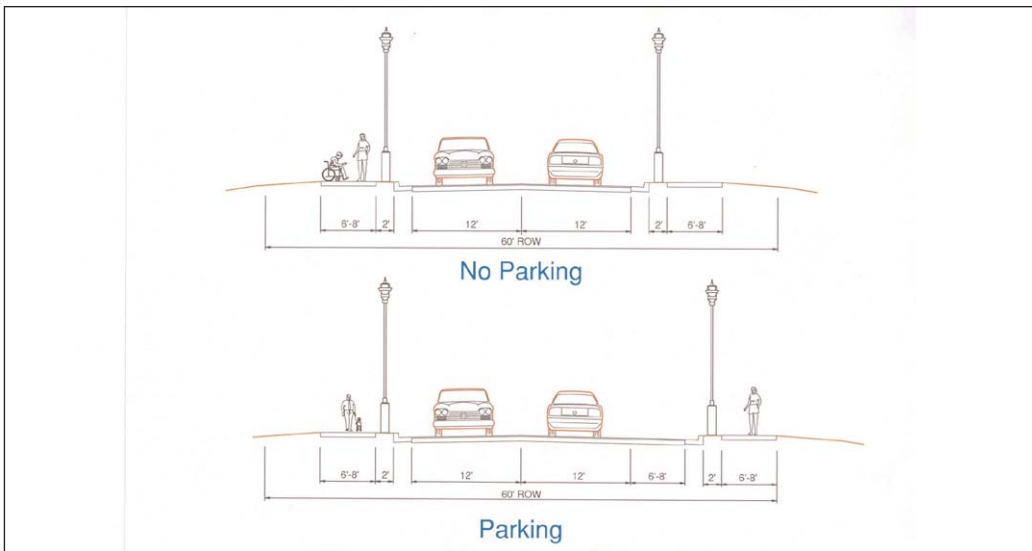


FIGURE 8.2: Typical Street Cross-Section - Countryside/Suburban District

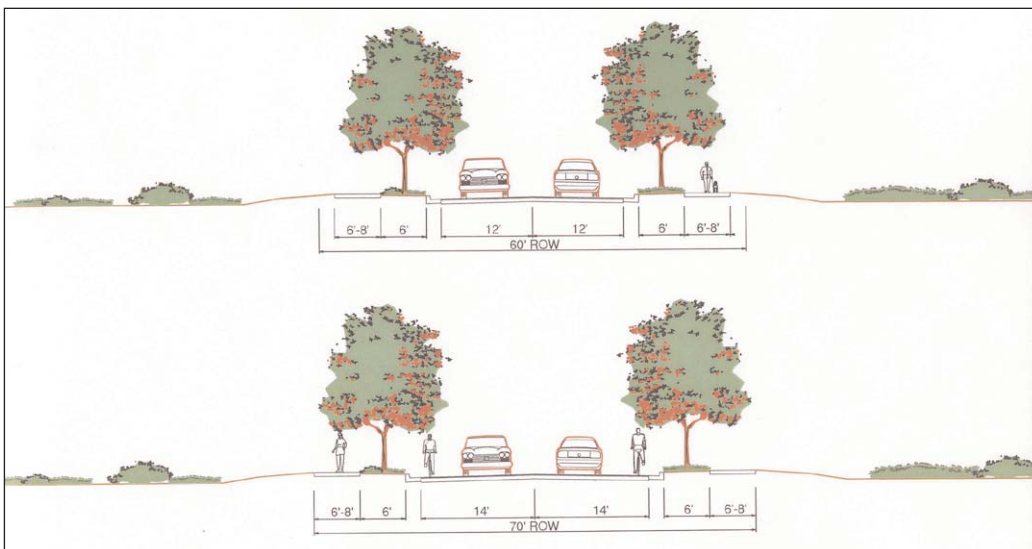
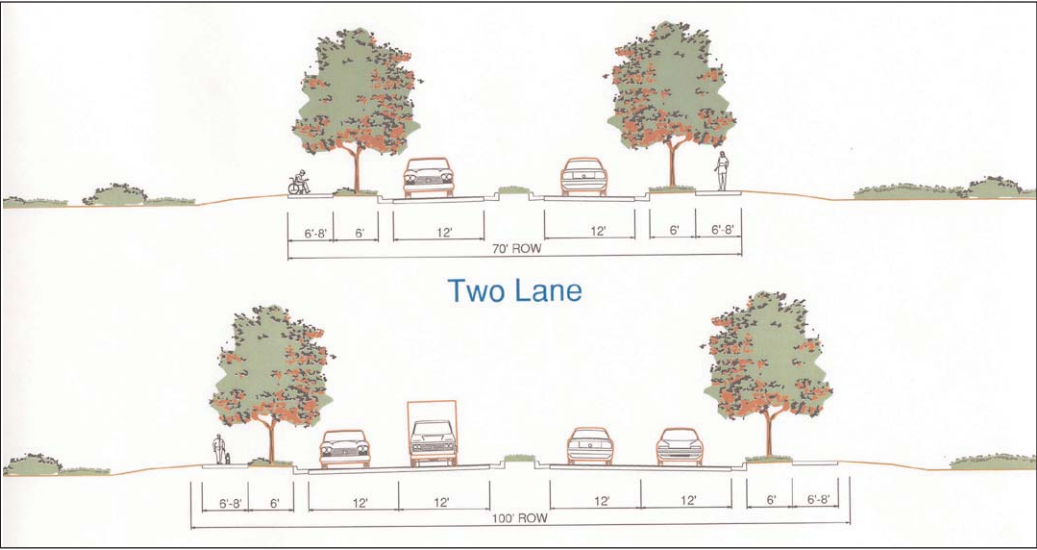


FIGURE 8.3: Typical Street Cross-Section - Highway/Special Purpose District



SEE FIGURE 8.4: RECOMMENDED CROSS SECTIONS

SEE FIGURE 8.5: TRANSPORTATION MAP